PATENT AGENT EXAMINATION

PAPER A

2020

Paper A is a patent drafting exercise in which you are being requested to prepare a full patent specification, with significant weight (61%) given to the claims.

A description of the technology as the hypothetical inventor understands it is provided in the form of an Invention Disclosure form that has been completed by the inventor. The inventor has also provided the attached drawings. You are to assume that there is no more relevant prior art than what is mentioned in the Invention Disclosure form. You are cautioned not to impart your own knowledge of the subject matter into your analysis and preparation of the patent application.

On the basis of the description of the invention, drawings, and prior art provided by the inventor, prepare a patent application. Please note:

- The Petition and other such formal portions of an application are not required;
- Titles for sections of the patent application must be provided to assist with correction;
- Order of sections of the patent application is not important for Exam purposes.

Claims

You are required to submit a first independent claim of the apparatus type (36 marks) with **four** dependent apparatus claims (4 marks, 1 mark each), a second independent claim of the method type (15 marks) and **two** dependent method claims (2 marks, 1 mark each). You are to ignore any issues relating to unity of invention.

NOTE: FOR THE DEPENDENT CLAIMS, MARKS WILL BE GIVEN FOR ONLY THE FIRST 4 DEPENDENT APPARATUS CLAIMS, AND FOR ONLY THE FIRST 2 DEPENDENT METHOD CLAIMS. ADDITIONAL DEPENDENT CLAIMS WILL NOT BE MARKED.

DEPENDENT CLAIMS THAT FURTHER DISTINGUISH THE CLAIMED INVENTION FROM THE PRIOR ART WILL BE GIVEN MORE MARKS THAN DEPENDENT CLAIMS THAT DESCRIBE KNOWN SUBJECT MATTER.

Description of the Embodiments

While clever, the inventor is unlikely to have provided language, structure and organization appropriate for a patent application. Accordingly, full marks for the description will not be awarded for merely copying the transcript and, historically, lower marks have been awarded for exclusively cutting and pasting portions from the examination itself. The description should not simply consist of an enumeration of the elements on each figure. The description must address with more details the point(s) of invention including the subject matter recited in the dependent claims. Alternative embodiments provided by the inventor should also be discussed.

Drawings

An unmarked clean version of the drawings is provided in MS Word® format for your use. Reference signs can be added by inserting textboxes and/or shapes, such as lines, arrows or callout boxes.

MARK BREAKDOWN

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PART A – Long Answer Question (95 marks)

You have been approached by an inventor with an invention that she would like to patent. In order to obtain preliminary information, you asked the inventor to complete a standard "Invention Disclosure" form. Provided below is the completed Invention Disclosure form that has been returned to you by the inventor to explain her invention.

The inventor has given you the mandate to prepare and file a patent application, in Canada, for the invention described in the Invention Disclosure form. Her instructions were specific that the patent application should include:

- an independent claim towards the floatation device; and
- an independent claim towards a method of assembling the floatation device.

INVENTION DISCLOSURE FORM

1. TITLE OF THE INVENTION

PERSONAL FLOATATION DEVICE

2. BACKGROUND TO THE INVENTION

I came up with a personal floatation device that is different and better than existing ones.

Floatation loungers and aquatic mattresses are widely known.

Existing inflatable flotation devices such as the one shown above have been around forever. They are simple and inexpensive and come in a variety of shapes and sizes. However, they must be inflated (either by a pump or a user blowing into a valve) which is time-consuming, annoying and leads to concerns related to over- or under-inflation. Such

inflatable devices can also be ripped or punctured causing them to lose buoyancy and thus become useless.

I've identified two other examples of existing floatation devices in section 5 below. The first example is a floating chair that has a metal frame that can bend or rust over time. In addition, the chair and arm rests are bulky and cannot be easily disassembled.

The second example is a floating mattress. Unfortunately, this design makes it easy to lose balance since lying on the mattress results in a high center of gravity above the surface of the water. Also, if the casing of the mattress is accidentally punctured or slit, bacterial or algae growth and moulding can build up within the product due to water contamination.

3. DETAILED DESCRIPTION OF THE INVENTION

My floatation device is a simple device that includes a sling provided with sleeves and a foam tube that is positioned within the sleeves.

The foam tube is made out of an elongated body of buoyant material, such as the well-known "noodles" that are sold for recreational purposes for swimming pools. These "noodles" are particularly well-suited for the invention because they are resilient and, when bent or deformed, they naturally want to return to their original straight or un-bent configuration. It is this resiliency that allows them to provide tension to the sling so that the sling provides a nice surface for a user to lie on.

The foam tube of my invention should be an integrally-formed or continuous piece of material. Suitable materials include closed-cell extruded polymers such as polypropylene, polyethylene or polystyrene. The foam tube can be made of water-proof material, and can also be treated to prevent any water absorption that could decrease the tube's floatation and affect user security.

As I mentioned, the foam tube is intended to be positioned within the sleeves of the sling. The sling is not made of a buoyant material and instead may be made of a water-repellent fabric or mesh material so that it is light-weight and easily foldable for storage. The sling has two sides and a sheet of material in-between the two sides. It is the sheet of material that supports a user's weight during use. The sling also has sleeves provided at each of its two sides to retain the tube in a bent configuration for keeping the sheet under tension so that it can adequately support the user's weight. It is important that there is a sleeve on both sides of the sling. This allows the two ends of the tube to be spaced-apart from each other when it is retained in place by the sleeves. If the sleeves are not positioned on opposing sides of the sheet, or at least spaced-apart from each other, the tube does not provide sufficient tension in the sheet to create a good floating effect for a user.

My floatation device can be easily assembled. To position the tube within the sleeves, the tube is simply bent into a bent, U-shaped, curved or arcuate configuration. It is then attached to the sling by inserting it into the sleeves. This is done by sliding one end of the tube into one sleeve and the other end of the tube into the other sleeve. In this manner the tube is secured to either side of the sling with the two ends of the tube positioned in a spaced-apart manner. Because the tube is made of resilient material, the foam tube tries to return to its natural un-bent or straight shape, which stretches the sling in tension. This tension provides a nice platform or surface that can support the user as s/he floats within the water. In addition, because it is the foam tube that applies tension to the sling, the sling does not need to have a complex frame or structure to make it usable. This allows the sling to be lightweight and compact when not in use, which are both desirable characteristics for customers.

In order to help keep the foam tube positioned within the sleeves, one or more draw-strings can be provided within each sleeve such that when the foam tube is positioned within the sleeve, the draw-string(s) can be tightened around the tube to prevent the tube from slipping out of the sleeve.

I wanted to keep my design simple, but still provide a headrest for the user. As you can see in Figure A, the U-bend of the foam tube can be used as a headrest by the user.

General dimensions of the sling are 60 inches long and 46 inches wide, and it can have a curved shape or a rectangular shape, both of which are shown in my drawings. The sleeves may be formed by folding over pieces of the sheet and sewing them in place. The sleeves are approximately 12 inches in circumference.

The foam tube may have a length of 12 feet and a diameter of 3 ½ inches. The tube could be hollow and have a round, rectangular, or even square cross-section.

4. ADVANTAGES & VARIANTS OF THE INVENTION

4.1 List all advantages of the invention.

First, my new floatation device does not need to be inflated and it will therefore not lose its buoyancy if punctured. Also, because my device comprises a minimum number of parts, it is lightweight and can be easily disassembled (by removing the tube from the sling) for storage, cleaning or replacement. In addition, due to the type of materials used for the sling and the tube, the entire device will dry quickly and completely when out of the water, with no opportunity for mold growth to occur.

Ideally, I would like my floatation device to be sold in an assembled state. I may either provide retail stores with a pre-packaged assembled device, or provide them with the sling and the tube separately and have the retail stores assemble the floating devices in-store prior to being sold.

My device also improves floatation and stability in the water by creating a comfortable surface on which a person can lie down. Specifically, when the sheet is under tension it creates a nice surface or platform that supports the user's weight. Because the person's weight pulls down the center portion of the sling (i.e. the sheet), a low center of gravity results. By utilizing the floatation properties of the foam tube, full body (weight) support in the water can be achieved without the need for the person to grasp the foam tube.

My device also offers a simple headrest that is provided by the U-bend of the foam tube. Specifically, the U-bend supports the head (i.e. the point of greatest buoyancy) and the rest of the user's weight is distributed over the sling, with the foam tube positioned on either side and providing tension to the sling.

4.2 Describe any variants/alternatives for this invention that would achieve the same result

Instead of two sleeves, I spent a lot of time trying to find a way to have just one single sleeve that extends from one side of the sling all the way to the other side of the sling in an arcuate shape. However, it didn't work at all. It was too difficult to insert the tube into such a long sleeve, and for some reason, having only one long sleeve prevented the tube from applying sufficient tension to the sling to provide a surface on which a user could rest. Therefore, don't waste time trying to protect this in the patent. I have found that it is necessary to have at least two, spaced-apart sleeves so that the tube provides sufficient tension to the sling.

Also, instead of sleeves, my sling may have other types of retaining members that retain the foam tube attached to the sling. For example, the sleeves may be replaced by hook and loop fasteners, draw-strings or elastics. Whatever type of retaining members the sling includes, they must be sufficiently strong to hold the foam tube under strain in a bent configuration. Therefore, multiple hook and loop fasteners, draw-strings or elastics may be needed along the sides of the sling to provide sufficient support for the foam tube.

When the sling includes hook and loop fasteners, draw strings, or elastics, these retaining members may either be permanently attached to the sling itself or be detachable from the sling. If they are detachable from the sling, they may be threaded through holes or slots in the sides of the sling so that they are able to stay secured to the sling while they hold the tube to the sides of the sling. Regardless of whether the retaining members are permanently attached to the sling, or detachably attached to the sling, I consider them part of the sling and the sling would always be sold together with these retaining members.

It may also be desirable to adjust the amount of tension that the foam tube applies to the sling. This may be achieved by including another draw-string between the two sleeves, along the edge of the sling that is opposite from the U-bend in the foam tube. By tightening this draw-string, the distance between the sleeves (and accordingly the sling tension) can be adjusted.

In some of the higher end versions of my floatation device, I'd like to include a canopy to provide shelter from the sun. In Figure E I've shown a version of my device that includes a canopy attachment that removably connects to the foam tube to provide sun protection. The canopy is formed from a semi-circle of fabric or mesh material that is provided with a series of flexible ribs that allow the canopy to be flexed to form an arch over the U-bend of the foam tube.

5. RELEVANT PRIOR ART DOCUMENTS

Type of Document	Title	Date of Document
D1 - 3,XXX,XXX (George)	Buoyant chair	6/24/1980
D2 - 4,YYY,YYY (Galapaga)	Aquatic mat	6/15/1993

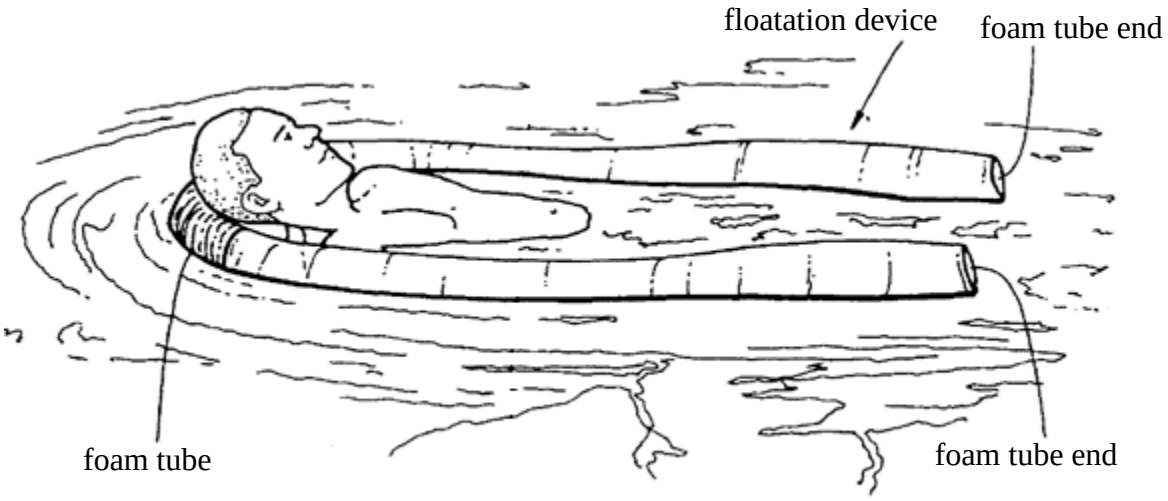


Figure A

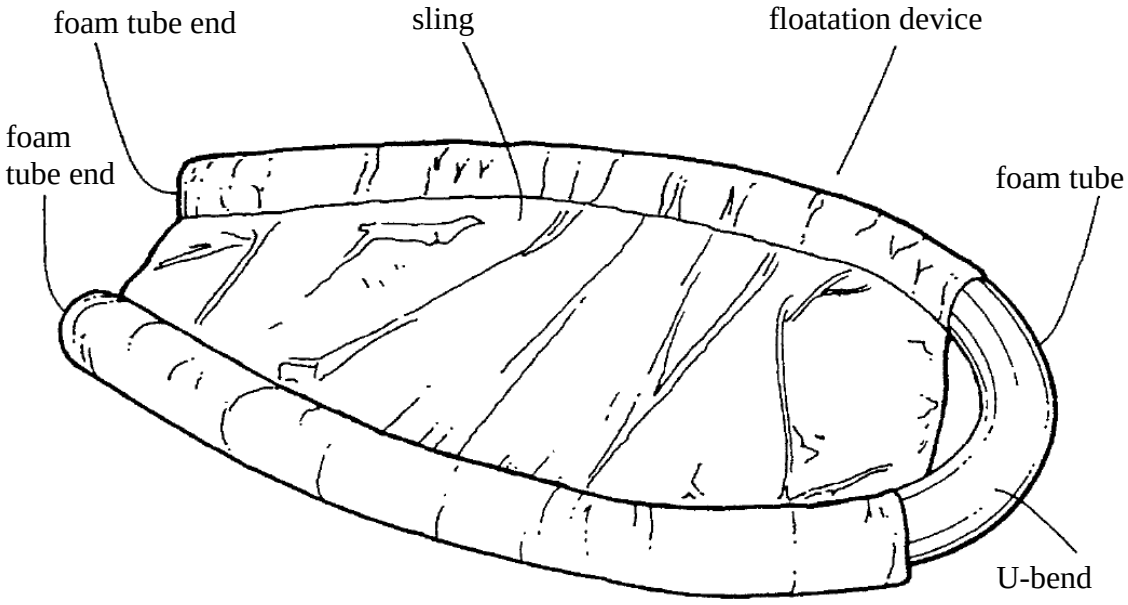


Figure B

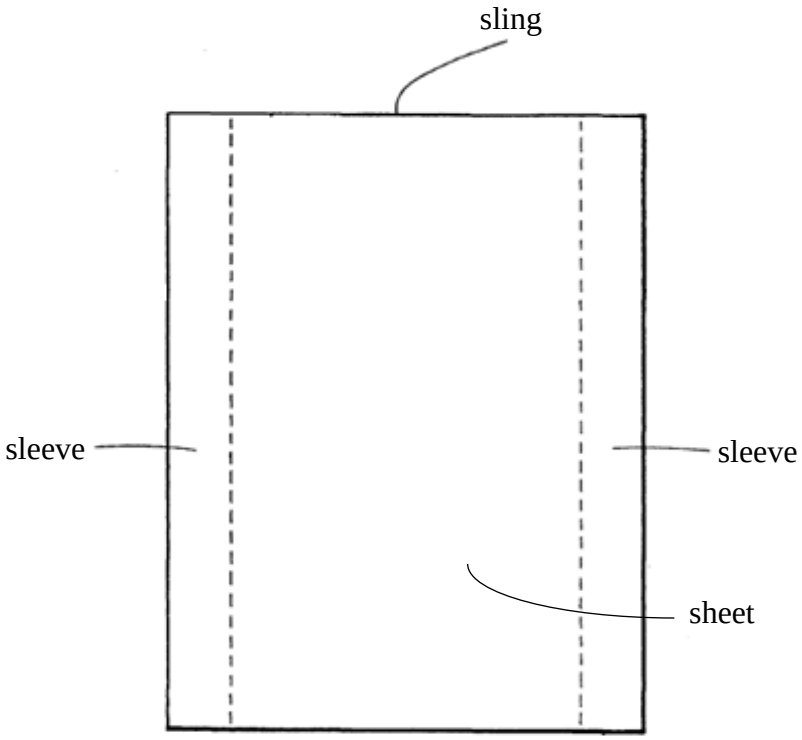


Figure C

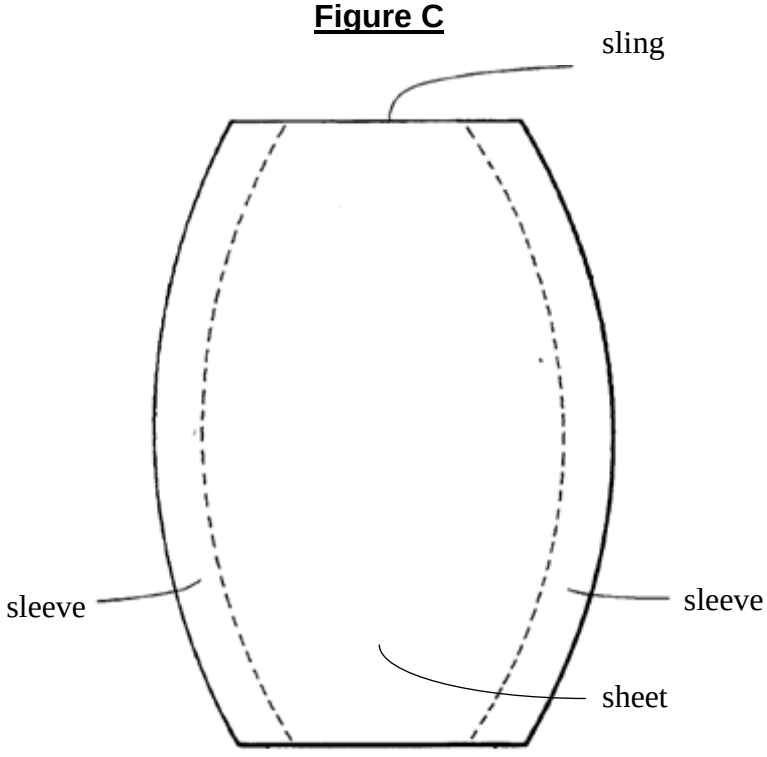


Figure D

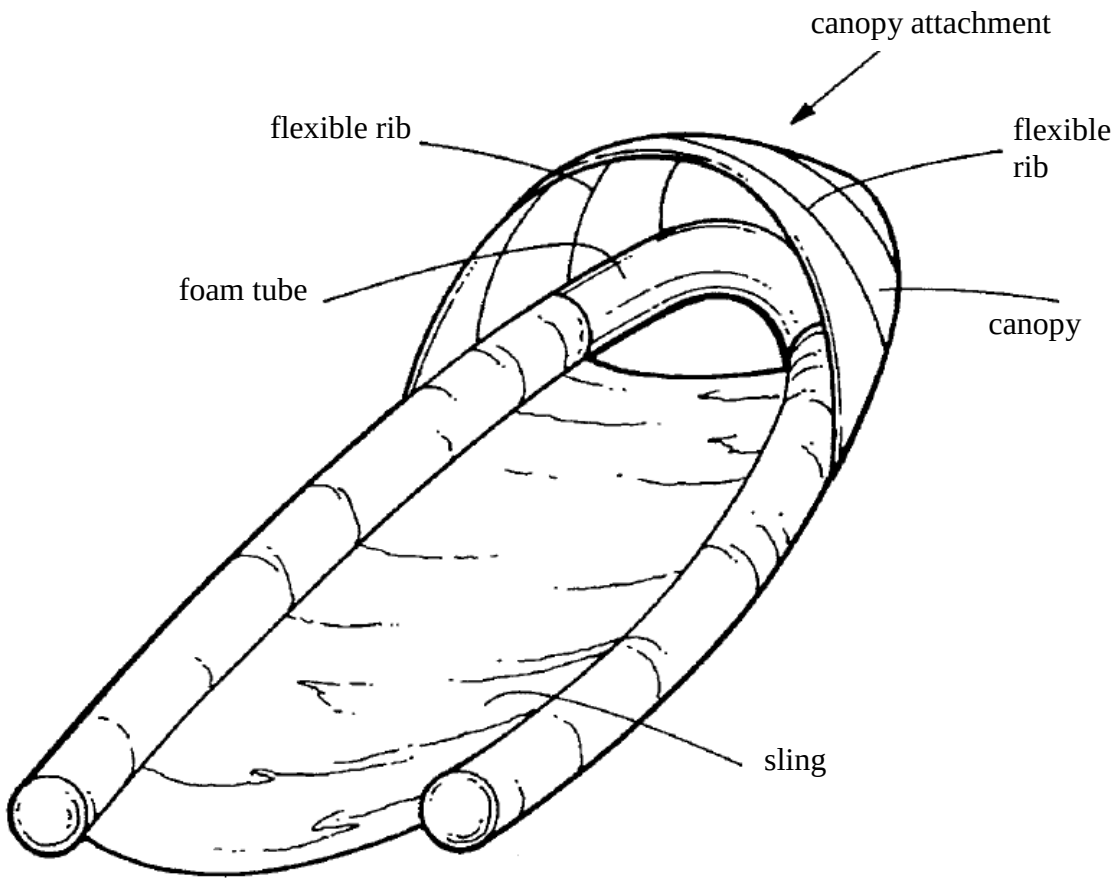
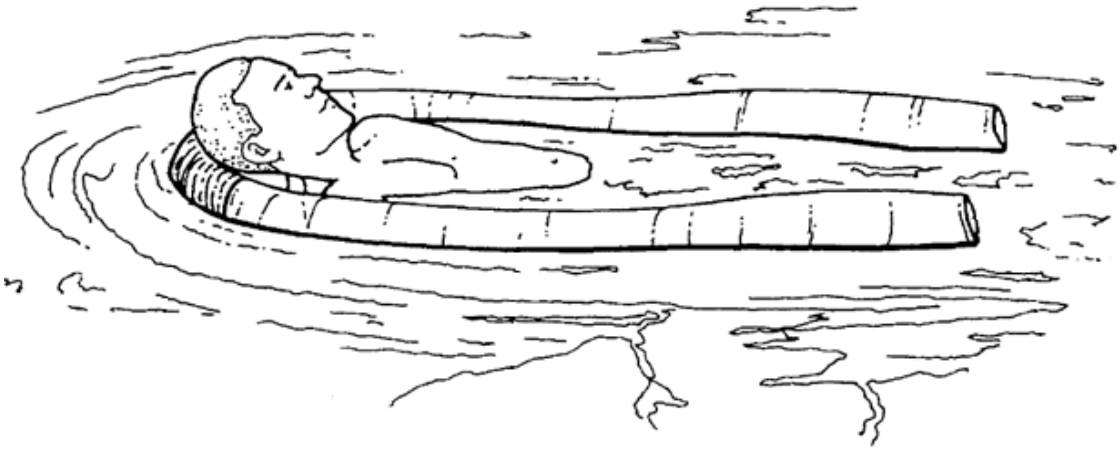
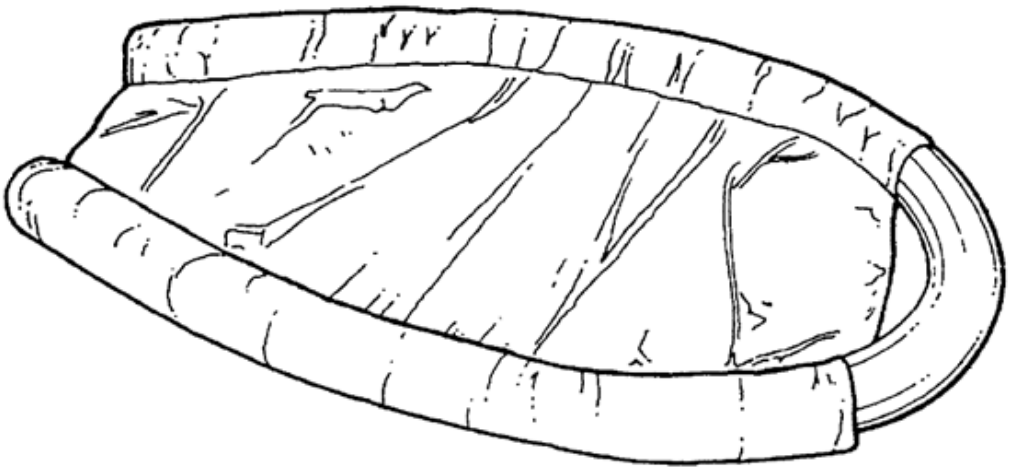
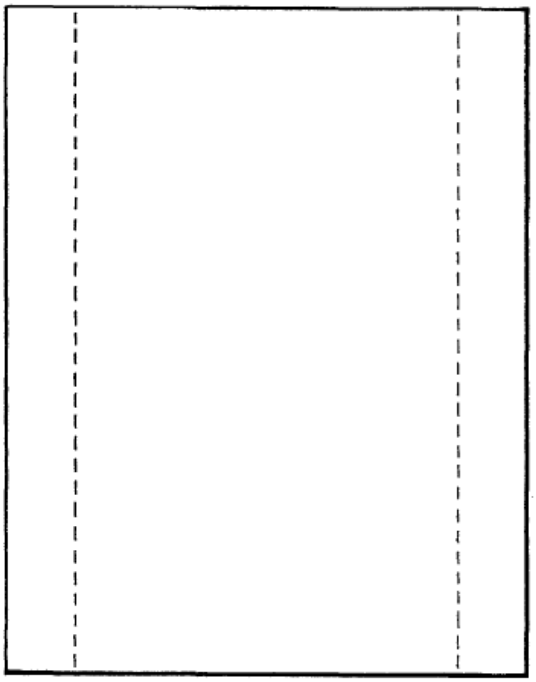
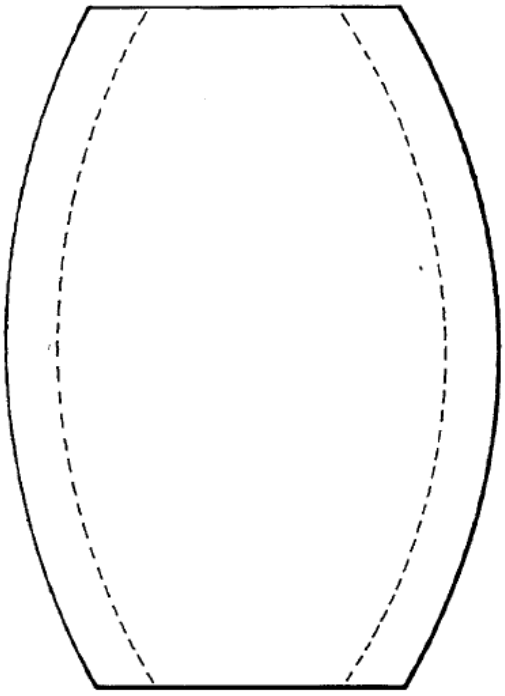


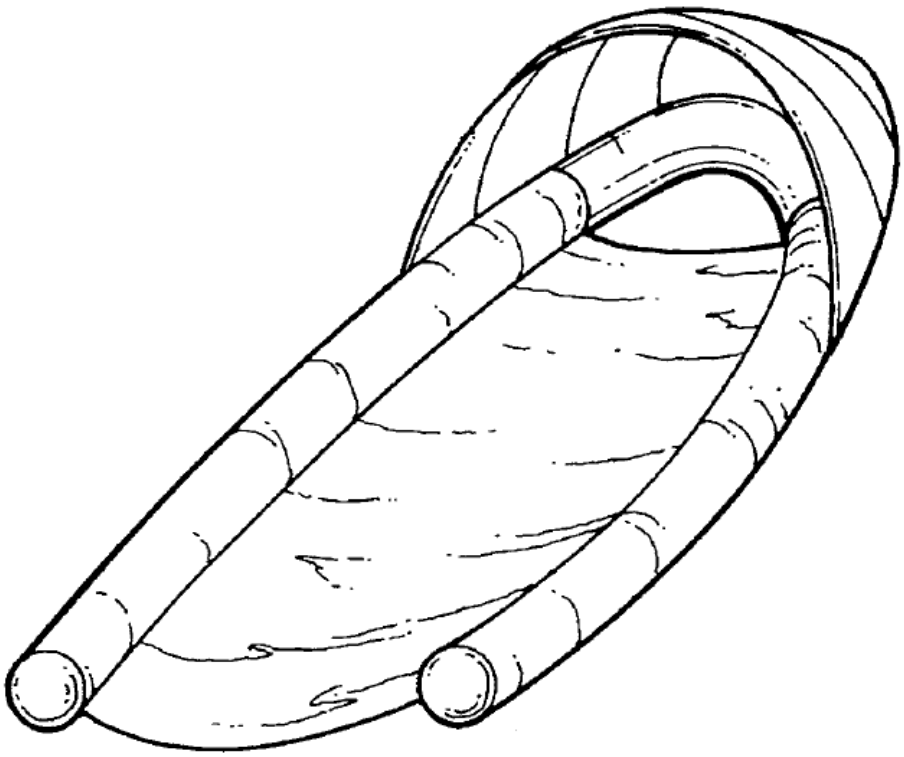
Figure E (Alternative embodiment)











United States Patent [19]
George

[11] **Patent Number: 3,XXX,XXX**
[45] **Date of Patent: June 24, 1980**

[54] **BUOYANT CHAIR**

[75] Inventor: **Pinta GEORGE**
Santa Cruz, Ecuador

[73] Assignee: **Tortoise Toys Inc.,**
San Diego, CA

[21] Appl. No.: **ABC,DEF**

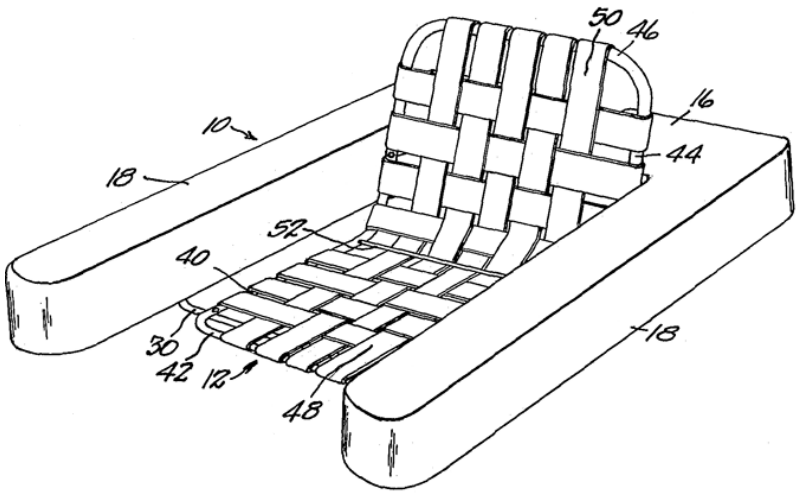
[22] Filed: **Dec. 13, 1977**

Primary Examiner - Llerana, F.

[57] **ABSTRACT**

A buoyant chair comprising a rigid buoyant unit having arm rests and rear portions formed of shape-retaining buoyant material and a tubular metal reinforcing frame having portions embedded in said buoyant material and a portion interconnecting the free end portions of the arm rests. Spaced portions of the frame project from the buoyant material, and a seat unit has a rigid part secured to said projecting frame portions.

1 Drawing Sheet



U.S. Patent No. 3,XXX,XXX

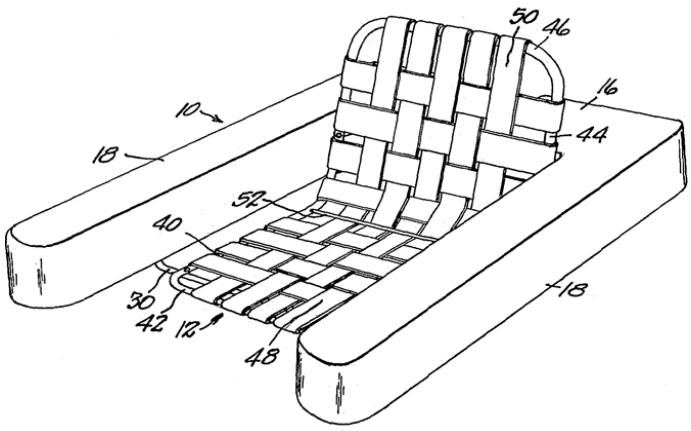


FIG. 1

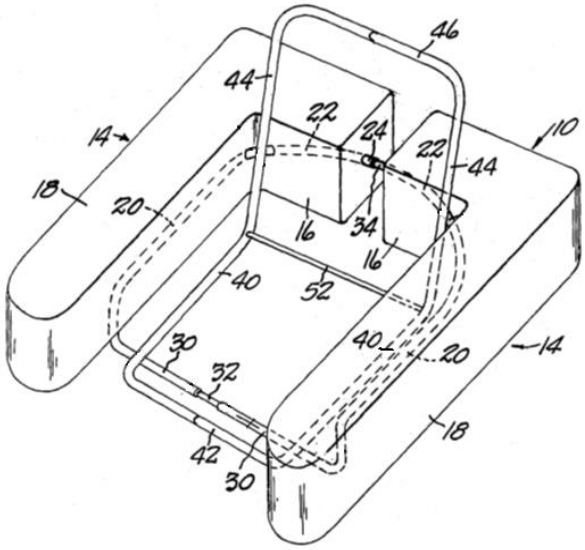


FIG. 2

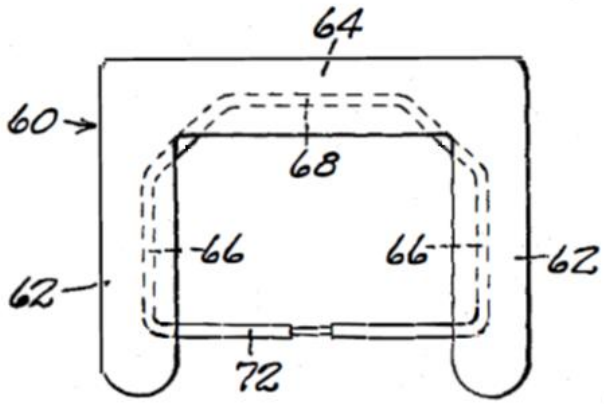


FIG. 3

BUOYANT CHAIR

FIELD OF THE INVENTION

This invention relates to buoyant seats, and more particularly to a chair, lounger or support which may be used by bathers and swimmers as a means to float upon water in a comfortable seated, reclined or lounging position.

BACKGROUND OF THE INVENTION

Buoyant chairs can be used to allow a user to move about in water. While seated thereon, a user may propel her/himself through water while staying afloat. Buoyant chairs tend to be complex in construction. Attempts to simplify construction have resulted in loss of stability, comfort, and buoyancy during use.

SUMMARY OF THE INVENTION

An object of the invention is to provide a buoyant chair having a buoyant section formed of shape-retaining buoyant material and reinforced by a rigid frame to which a supporting seat may be secured easily and conveniently without danger of impairment of the buoyant properties of the device and without sacrificing the strength of the connection between the buoyant portion and the seat supported thereby.

A further object is to provide a device which may be constructed from preassembled component parts and can be assembled and disassembled for storage and shipment.

DESCRIPTION OF THE DRAWINGS

Referring to the drawings, wherein like elements are numbered alike in the several FIGURES:

FIG. 1 is a perspective view of one form of the device;

FIG. 2 is a perspective view of the device shown in FIG. 1, illustrating the buoyant unit and only the frame of the seat unit; and

FIG. 3 is a top plan view of the buoyant section of another form of the device.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1 to 2, buoyant unit 10 has detachably secured thereto a support 12. The buoyant unit 10 comprises a pair of L-shaped buoyant members 14 arranged with comparatively short arm portions 16 thereof in aligned relation, and with elongated leg portions 18 thereof coplanar and substantially parallel. The buoyant members 14 are formed of any desired cross-sectional shape or configuration and preferably are substantially square, round or rectangular, but other shapes are also possible. Each of the buoyant members 14 is formed of a shape-retaining buoyant material, preferably of an extruded closed cell polymer foam material. The buoyant units 10 are preferably formed of a material that is waterproof. Examples of materials particularly well-suited for the buoyant members 14 are expanded polystyrene, expanded urethane resins, and expanded polyethylene.

Each of the buoyant members 14 has a reinforcing member extending therethrough and projecting from said buoyant member 14. The reinforcing members are preferably metal tubes, and aluminum tubes are particularly well suited for this purpose because of their light weight and resistance to corrosion. However, non-ferrous tubing, such as copper tubing, may also be utilized, and, if desired, ferrous tubing may also be employed. In the L-shaped form shown in FIGS. 1 and 2, the reinforcing members comprise runs of metal tubing. Each of the members 14 has a run 20 of metal tubing extending substantially centrally in the leg portion 18 longitudinally thereof, and a run 22 extending through the arm portion 16 and projecting from the end of the arm portion 16. The buoyant members 14 and their reinforcing frames are complementary so that, when they are arranged in coplanar relation, with the arms 16 aligned and confronting, the tube ends 24 and 30 of each will similarly be aligned and confronting.

The aligned tube ends 24 and 30 may be interconnected by tube unions 32 and 34 having a snug telescoping fit in the parts 30 and 24, respectively. Each of the tube unions 32 and 34 may be secured permanently or detachably, or may be connected permanently to one of the cooperating tubes and detachably to the other. The tube unions 32 and 34 will be of such strength and character as to rigidly unite the two frame sections of the buoyant members 14 in substantially U-shape as illustrated in FIGS. 1 and 2.

A removable support 12 is provided with a tubular frame of lightweight rigid construction.

This frame is preferably a contoured closed loop having side seat-supporting runs 40, and a front seat-supporting run 42 interconnecting runs 40 and substantially parallel to the frame tube parts 30. The frame also includes substantially parallel upwardly projecting side members or runs 44 for supporting a back rest, and upper cross member 46 connecting the runs 44 preferably at a level above the level of the buoyant unit 10. The support comprises a seat 48 and backrest 50 which may consist of flexible strips or tapes formed of fabric or any other suitable flexible material. Such material is preferably resistant to deterioration by moisture and by sun. Examples of such material are synthetic resin webbing woven as illustrated in FIG. 1. The seat 48 and backrest 50 may be secured to the seat frame 42, 44, 46 in any suitable manner well understood in the art, as by the use of screws or other securing means (not shown). A cross brace 52 is preferably provided extending between opposite sides of the frame adjacent the junction of the runs 40 and 44 of the frame to assist in maintaining the shape or contour of both the frame 42, 44, 46 and the seat 48 and backrest 50.

With the frame of the two sections of the buoyant unit 10 being detachably interconnected, the chair may be disassembled for purposes of compactness during shipment and storage. Upon interconnection of the parts, as illustrated in FIGS. 1 and 2, the support 12 and the buoyant unit 10 serve mutually reinforcing purposes. The parts of the device, when assembled, assume a seat-forming position, have stability when floating in the water whether occupied or empty, and provide a convenient and comfortable seat in which a user may float upon the water, and in which s/he may move upon the water by propelling her/himself by movement of either her/his arms or legs in the water, or by the use of paddles or oars (not shown).

The formation of the buoyant unit in sections is optional. Thus a buoyant unit 60 may be provided as illustrated in FIG. 3, characterized by a unitary body of shape-retaining buoyant material. The unitary body may be of a U-shape or other selected shape having spaced buoyant arm rest portions 62 and one or more integral cross members 64. Within this buoyant unit 60 is embedded a unitary supporting frame formed of rigid material, such as metal tubing having projecting parts. Thus as seen in FIG. 3, the frame may be characterized by runs 66 extending through portions of buoyant arms 62, run 68 extending through the cross member 64 of the buoyant portion, and a cross frame member 72 interconnecting the free ends of the arms 62. A support 12 of the character described above will be supported upon the buoyant unit and secured thereto at part 72.

United States Patent [19]
Galapaga

[11] **Patent Number: 4,YYY,YYY**
[45] **Date of Patent: June 15, 1993**

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[54] **AQUATIC MAT**

[75] Inventor: **Berlang GALAPAGA**
Quito, Ecuador

[73] Assignee: **Blue Foot Co.,**
Chicago, IL

[21] Appl. No.: **JKL,MNO**

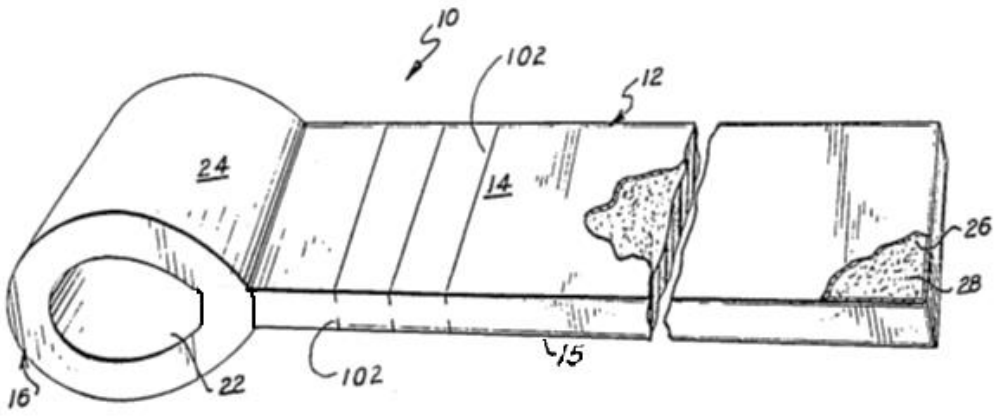
[22] Filed: **Jan. 25, 1990**

Primary Examiner - Darwin, C.

[57] **ABSTRACT**

A buoyant, flexible, resilient aquatic mat adapted to support one or more persons for use on water. The mat comprises an elongated slab and a headrest formed of the same material. The material of the mat comprises a unicellular, non-water absorbent, plastic foam. The mat has a tough plastic casing that covers the elongated slab.

1 Drawing Sheet



U.S. Patent No. 4,YYY,YYY

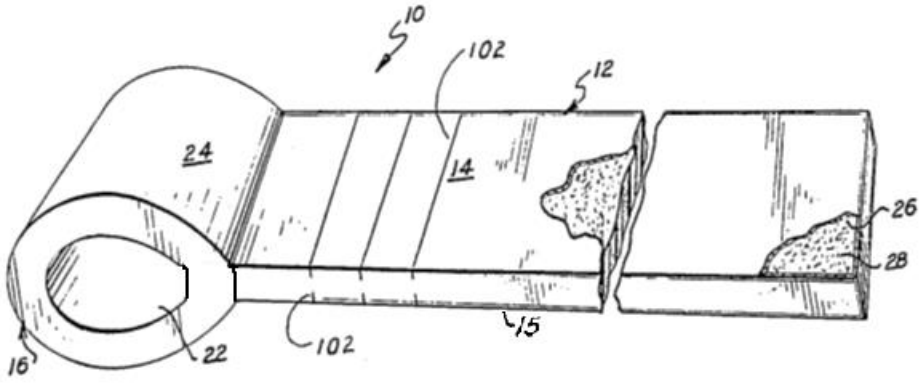


FIG. 1

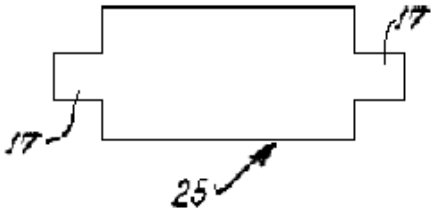


FIG. 2

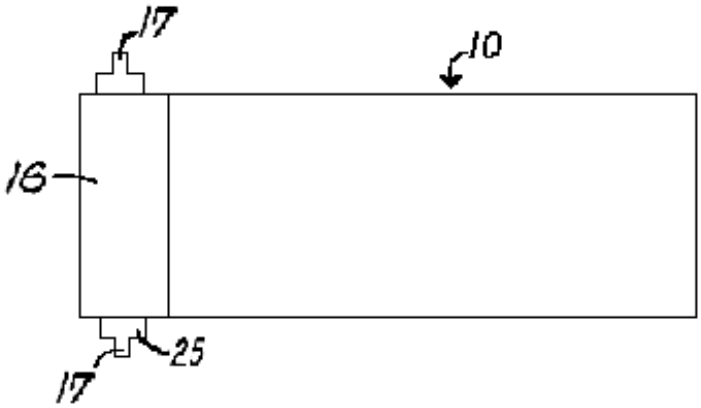


FIG. 3

AQUATIC MAT

FIELD OF THE INVENTION

This invention relates to an aquatic floatation mat or mattress providing sufficient buoyancy to permit a person to lie on the mat in water.

BACKGROUND OF THE INVENTION

Aquatic mats now used for recreation and sports purposes are generally of the inflatable type, which require the task of inflating them prior to use and deflating them after use. Furthermore, inflatable mats can easily be punctured, ripped or torn. This will require patching, and if the tear or rip is large enough and cannot be patched, will render the mat useless.

SUMMARY OF THE INVENTION

The floatation mat of the present invention eliminates the requirement for inflation.

Generally, the buoyant aquatic mat comprises an elongated, flexible, resilient, planar slab member and a headrest member containing a transverse void formed from the same material as the planar slab member. The slab material can comprise a unicellular, non-water absorbent plastic foam. The mat has a tough plastic casing surrounding the slab material.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of one embodiment of the aquatic mat of this invention;

FIG. 2 is a plan view of a stability handlebar; and

FIG. 3 is a top plan view of the stability handlebar of FIG. 2 used in conjunction with the aquatic mat of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1 of the drawings, an aquatic mat 10 in accordance with an embodiment of the invention is shown. The mat 10 comprises an elongated slab 12 having planar surfaces 14 and 15 and a generally rectangular shape. Although a rectangular shape is shown, other geometric shapes can be used such as circular, ovate, polygonal, etc. The slab 12 is of a sufficient surface area, i.e., length and width, to accommodate a person or persons lying prostrate on one of its surfaces 14 or 15.

The slab 12 is constructed or molded from a suitable buoyant and resilient material 28, which is non-water absorbent, such as plastic foam. In some embodiments, the buoyant material 28 comprises a unicellular, flexible, plastic foam, i.e., a foam having closed cells, such as foams produced from polyvinylchloride, polypropylene, polyethylene and the like.

While FIG. 1 shows the slab 12 constructed out of a unitary body of material 28, in some embodiments of the invention, the slab 12 is constructed out of a plurality of elongate foam strips or tubes laid side-by-side. Such strips or tubes are known to have diameters of between 3-4 inches and lengths of 8-12 feet. The resilient material is relatively firm, but at the same time has buoyancy in water and flexibility for supporting a person.

The slab 12 is positioned inside a casing 26, as shown in FIG. 1. The casing 26 is preferably smooth and is intended to fit around the entire slab 12. The casing 26 is formed of a non-buoyant material and is preferably tough, pliable and tear resistant. The casing 26 may be made of a suitable plastic material, or the like. Plastic materials are preferred for the casing since there are available on the market many tough, rugged, pliable plastic casing materials such as polyvinylchloride, etc.

The slab 12, whether in the form of a unitary rectangular piece of foam or a plurality of foam tubes, may be inserted within the casing 26 from a bottom side of the casing. The casing 26 may then be zippered or snapped closed in order to seal the slab 12 within the casing 26 and form the mat 10.

Mat 10 also comprises a headrest 16. Headrest 16 is located at one end of mat 10. In the preferred construction of the mat 10 the casing 26 includes a portion to receive a slab of buoyant and resilient material that forms the headrest 16.

The constructed mat can be used with or without a surface treatment.

The headrest 16 of mat 10 comprises headrest surface 24 upon which a person's head can rest. Thus, the mat 10 can be used on either side 14 or 15. A transverse void 22 in the headrest 16 is open at both ends and provides a certain amount of buoyancy to the headrest area. The

entire mat 10 is adapted to float on a surface of water and is designed to support the weight of one or more persons, depending on their sizes.

In some embodiments, such as the one shown in FIGS. 2 and 3, a stability handlebar 25 can be provided. The handlebar 25 can be sized and shaped to fit snugly through the transverse void 22 and to protrude at both ends to provide handholds 17 for a user when the user is floating on their frontside on mat 10. Such handholds 17 can impart stability to the user while on mat 10. Handlebar 25 could be made out of any suitable material, such as wood or plastic, and in some cases can be made out of a foam tube to provide additional buoyancy to the headrest 16.

In FIG. 1, the mat 10 is shown with the slab 12 having creases 102 so as to enable the device of this invention to be easily rolled up and stored.

From the above description of the aquatic floatable mat of the invention, it is clear that a novel mat is provided for use in water sports, leisure, etc. The casing 26 provides a surface which is smooth and protects the plastic foam 28 within. However, even if the casing 26 is damaged, ripped or torn, etc., the buoyancy of the mat 10 is not diminished, because of the use of non-water absorbent plastic foam. Although the mat 10 has particular adaptability for use on water surfaces, it is understood that the mat 10 can also be used on solid surfaces and also on uneven surfaces, such as sand beaches, to which the bottom of the mat 10 will conform.

PART B – Short Answer Question (5 marks)

When preparing the patent application, you were specifically instructed by the inventor to prepare an independent claim towards the floatation device and its method of assembly.

As her patent agent, you understand that there is also value in providing a claim directed towards only a sling. Please:

1) Draft an independent claim towards the sling (4 marks); and
2) Provide an explanation to the inventor as to why it may be valuable to have an independent claim towards the sling (1 mark).

END OF PAPER A EXAM

CANADIAN PATENT AGENT QUALIFYING EXAMINATION 2020: PAPER A – DRAFTING MARKING GUIDE AND MARKS BREAKDOWN	
Candidate #	
Total # of Exam Pages Received From CIPO	

CLAIM 1	**APPARATUS – INDEPENDENT CLAIM – 36 MARKS MAXIMUM**

A floatation device, comprising:
- an elongated body of buoyant and resilient material;
- a sling defining:
  - first and second side portions;
  - a weight-supporting portion positioned between the first and second side portions;
- retaining members positioned at each of the first and second side portions that retain the body of buoyant and resilient material in a bent configuration, such that the body of buoyant and resilient material applies tension to the weight-supporting portion.

Claim Element	Explanation	Mark
A floatation device	Will accept: anything that indicates that it is floaty.	0 or 1
- an elongated body (2) of buoyant (2) and resilient (3) material;	2 pts = elongated body; will accept: *strip, length, longitudinal piece* 2 pts = buoyant; will accept: *floatable;* 3 pts = resilient; will accept: *flexible, deformable, bendable, pliable (last 3 require mention of "non-permanent" in description)*	0 to 7
- a sling defining: - first and second side portions (2); - a weight-supporting portion (2) positioned between the first and second side portions;	For sling: will accept: *weight-supporting portion, sheet,* For "first and second side portions" (2pts); will accept*: two lateral sides, two longitudinal sides, two opposed sides; two spaced-apart sides* For "weight-supporting portion positioned between the first and second side portions" (2 pts); will accept: *body-supporting, torso-supporting, user-supporting, platform, surface, sheet*	0, 2 or 4
- retaining members (8) positioned at each of the first and second side portions…	For retaining members, will accept: *receiving members, attachment members, securing members, fastening members, at least two retaining members* *For positioned, will accept: attached, located, coupled to*	0 or 8
that retain the buoyant and resilient member in a bent configuration (10)…	Will accept: *in a curved configuration; in an arcuate configuration, a deformed configuration; under strain*	0 or 10
such that the body of buoyant and resilient material applies tension to the weight-supporting portion (6).	Will accept: *under tension, that applies tension to the sling*	0 or 6

DEDUCTIONS:		**Amount**
If the 1st claim element is not explicitly claimed. (i.e. indirectly or passively claiming the "elongated body of buoyant and resilient material")	-5	
For including: *sleeves* or *canopy*	-15	
For each other superfluous claim limitation or element (i.e. headrest, non-buoyant sling)	-5	
For unclear language or inconsistencies	Max -5	
TOTAL INDEPENDENT APPARATUS CLAIM (MINIMUM = 0)		**/36**

CLAIMS 2-5	APPARATUS – DEPENDENT CLAIMS – 4 MARKS MAXIMUM: ONLY THE FIRST 4 DEPENDENT APPARATUS CLAIMS ARE CONSIDERED	
Claim Element		
Worth 1 point		

- the buoyant material is treated to prevent water absorption
- the bent configuration provides a curved/ arcuate/ U-shape
  o the buoyant material provides a head-rest at the "U-shape"
- the sling comprises fabric/ mesh
- the sling is water-repellent
- the sling has a dimension of 60 inches long and/or 46 inches wide
- the sling OR the weight-supporting portion comprises a curved shape
- the first and second side portions of the sling are lateral OR opposed sides
- the retaining members comprise sleeves
  o the sleeves comprise folded over pieces of the sling or weight-supporting portion
  o the sleeves are 12 inches in circumference
- the retaining members comprise hook & loop fasteners, draw strings, elastics
- the sling comprises multiple retaining members on each side
- the floatation device comprises a canopy attachment
  o the canopy attachment comprises a plurality of flexible ribs		

Worth 0.5 points		

- the buoyant material is a tube/hollow
  o the tube has a 3 ½ inch diameter
  o the tube has a length of 12 ft
- the buoyant material is integrally formed/continuous
- the buoyant material is made of closed cell extruded polymer
- the buoyant material is polypropylene, polyethylene, polystyrene
- the buoyant material has a cross section that is round, square, rectangular.
- the buoyant material is water-proof
- the sling OR weight-supporting portion comprises a rectangular shape
- the floatation device comprises a headrest.		

Claim Marking		**Mark**
Claim 2		0 to 1
Claim 3		0 to 1
Claim 4		0 to 1
Claim 5		0 to 1
DEDUCTIONS:		
For each dependent claim that does not have a proper dependency (-0.5 per claim)		
For unclear language or inconsistencies (max -0.5 per claim)		
Total Dependent Apparatus Claims Mark:		**/4**

CLAIM 6	METHOD – INDEPENDENT CLAIM – 15 MARKS MAXIMUM	
Sample claim: A method of assembling a floatation device, said method comprising: - providing an elongated body of buoyant and resilient material; - providing a sling comprising first and second side portions; - bending the elongated body of buoyant and resilient material into a bent configuration; - attaching, using retaining members, the elongated body of buoyant and resilient material in the bent configuration to the first and second side portions of the sling so that tension is applied to the sling.		
Claim Element	**Explanation**	**Mark**
A method of assembling a floatation device, said method comprising:		0 or 1
- providing an elongated body of buoyant (1) and resilient (1) material;	The explicit step of "providing" does not need to be included in the claim so long as the feature of an elongated body of buoyant and resilient material is indirectly introduced in the claim. will accept: *strip, length, longitudinal piece* For buoyant; will accept: *floatable;* For resilient; will accept: *flexible, deformable, bendable, pliable (last 3 require mention of "non-permanent" in description)*	0, 1 or 2
- providing a sling (1) comprising first and second side portions (1);	This explicit step of "providing" does not need to be included in the claim so long as the feature of a sling that comprises first and second side portions is indirectly introduced in the claim. For "sling", will accept: *platform, sheet, weight-supporting portion;* *For "first and second side portions", will accept two lateral sides, two longitudinal sides, two opposed sides; two spaced-apart sides*	0, 1 or 2
- bending the elongated body of buoyant and resilient material into a bent configuration (4);	For bending, will accept: deforming or folding into an arcuate or bent configuration Will accept: *a curved configuration; an arcuate configuration; a deformed configuration, under strain*	0 or 4
- attaching, using retaining members, (3) the elongated body of buoyant and resilient material in the bent configuration …	Will accept: *securing, affixing, coupling* For "retaining members" will accept: *receiving members, attachment members, securing members, fastening members, at least two retaining members*	0 or 3
to the first and second side portions of the sling …	Will accept: *in a spaced-apart manner on the sling*	0 or 1
so that tension is applied to the sling (2).	Will accept: *under tension, applied to the weight-supporting portion, sheet, platform*	0 or 2
DEDUCTIONS:		**Amount**
If the elongated, buoyant material is not explicitly claimed. (i.e. indirectly or passively claiming the "elongated body of buoyant and resilient material")	-5	
For including: *sleeves* or *canopy*, in each instance	-10	
For each superfluous claim element	-3	
For unclear language or inconsistencies	Max -4	
Total Independent Method Claim Mark:		**/15**

CLAIMS 7-8	METHOD – DEPENDENT CLAIMS – 2 MARKS MAXIMUM: ONLY THE FIRST 2 DEPENDENT METHOD CLAIMS ARE CONSIDERED	
Claim Element		
Worth 1 point		

- Wherein attaching the body comprises sliding/inserting a first end of the body into a first sleeve and sliding/inserting a second end of the body into a second sleeve.
  o Wherein attaching the body comprises tightening a draw-string located within each of the first and second sleeves around the body.
  o Wherein attaching the body comprises adjusting the distance between the two sleeves;
  ▪ Wherein adjusting the distance comprises adjusting a drawstring between the first and second sleeves.
- Wherein providing the body of buoyant and resilient material comprises applying a treatment to the body of buoyant and resilient material to prevent water absorption.		

Claim Marking		**Mark**
Claim 7		0 to 1
Claim 8		0 to 1
DEDUCTIONS:		
For each dependent claim that does not have a proper dependency (-0.5 per claim)		
For unclear language or inconsistencies (max -0.5 per claim)		
Total Dependent Method Claims Mark:		**/2**

DISCLOSURE	**DISCLOSURE/DRAWINGS – 38 MARKS MAXIMUM**	
Disclosure/Drawings Element	**Requirement for Full Marks**	**Mark**
ABSTRACT *NOTE: Independent claims inserted in sentence form may not be fully suitable. For example, even good claims might not "be drafted in a way that allows a clear understanding of the technical problem, the gist of the solution of the problem by means of the invention, and the principal uses of the invention" as required by S. 55(3) of the Patent Rules.*	Is consistent with claims and disclosure as drafted **AND** does not contain more than 150 words; **AND** method and apparatus both need to appear (if above three criteria are met = 0.5 marks) **AND** drafted in a way that allows clear understanding of technical problem and gist of the solution (if all four criteria are met = 1 mark) However, see below: ***Note***: due to wording constraint, the Abstract does not need to parrot the entirety of each of the apparatus and method claims	0, 0.5 or 1
TITLE Example: A Floatation Device and Method of Assembling a Floatation Device	Must be consistent with description / claims as drafted **AND** must indicate both apparatus and method aspects	0 or 1
FIELD OF INVENTION Example: The present invention relates to floatation devices and methods of assembling floatation devices, and more particularly to floatation devices that comprise a portion of buoyant, resilient material and a sling.	Must be consistent with description / claims as drafted **AND** must indicate both a general field and a particular field (if above two criteria are met = 1 mark) **AND** must mention both apparatus and method (if all three criteria are met = 2 marks)	0, 1 or 2
BACKGROUND D1 –3,XXX,XXX	Must mention: • rigid frame • Shape-retaining buoyant material **AND** • Bulky and not easily disassembled OR • Metal tubes can bend or rust OR • Prone to lose balance with high center of gravity above water.	0 to 3
BACKGROUND D2 – 4,YYY,YYY	Must mention: • Slab of buoyant material • Casing **AND** • Prone to lose balance with high center of gravity above water OR • casing can be slit and invite mold-growth.	0 to 3
BACKGROUND – Inflatable	Must mention: • inflatable • risk of puncture.	0 to 2

SUMMARY *NOTE: If candidate has merely asked that the independent claims be considered inserted in sentence form into this section by reference, it will typically be the case that, even if the inserted claims are very good as claims, they are not fully suitable for the Summary. For example, even good claims might not "describe the invention in terms that permit the technical problem and its solution to be understood, even if not expressly stated" as required by S. 56(1)(d) of the Patent Rules.*	Must include paragraph that uses the same language as the independent apparatus claim **AND** must include a paragraph that uses the same language as the independent method claim **AND** must include a concise summary of the technical problem and the solution (if only one criteria is met = 0) (if two criteria are met = 2 marks) (if three criteria are met = 4 marks)	0 to 4
BRIEF DESCRIPTION OF DRAWINGS Example: Note that order of Figures may be different	Must be correctly described (views) **AND** must be numbered (Arabic numerals) **AND** must use terms consistent with description/claims (if one of the above criteria is not met = 0 marks; if above three criteria are met = 1 mark) **AND** must include relationship between the drawings (if all four criteria are met = 2 marks)	0, 1 or 2
Sub-total before description of embodiments and drawings		**/18**

DESCRIPTION OF EMBODIMENTS AND DRAWINGS	
Requirement	Mark
CONSISTENCY	
If independent apparatus claim as drafted is fully and clearly supported by description and drawings [claim language used in spec, consistent language used throughout, all elements clearly described]	0 or 4
If ALL dependent apparatus claims as drafted are fully and clearly supported by description and drawings (i.e. if one or more dependent claims not fully supported, mark is 0)	0 or 2
If independent method claim is fully and clearly supported by description and drawings:	0 or 2
If ALL dependent method claims as drafted are fully and clearly supported by description and drawings (i.e. if one or more dependent claims not fully supported, mark is 0)	0 or 1
If proper reference numerals are used in text and drawings (different numerals for different elements, no text matter in drawings, consistent use of reference numerals, etc.	0 or 2
COMPLETENESS	
If the following features are ALL described clearly (if any is missing: 0): A floatation device, comprising: - an elongated body of buoyant and resilient material; - a sling defining: - first and second side portions; - a weight-supporting portion positioned between the first and second side portions; - retaining members positioned at each of the first and second side portions that retain the body of buoyant and resilient material in a bent configuration, such that the body of buoyant and resilient material applies tension to the weight-supporting portion.	0 or 3
If the following features are described clearly (3 marks = 18 or more features described, 1.5 marks = 9 to 17 features described, 0 marks = 8 or less features described): - the buoyant material is treated to prevent water absorption. - the bent configuration provides a curved/ arcuate/ U-shape o the buoyant material provides a head-rest at the "U-shape" - the sling comprises fabric/ mesh, - the sling is water-repellent - the sling has a dimension of 60 inches long and/or 46 inches wide - the sling OR the weight-supporting portion comprises a curved shape. - the first and second side portions of the sling are lateral OR opposed sides - the retaining members comprise sleeves o the sleeves comprise folded over pieces of the sling or weight-supporting portion o the sleeves are 12 inches in circumference. - the retaining members comprise hook & loop fasteners, draw strings, elastics - the sling comprises multiple retaining members on each side - the floatation device comprising a canopy attachment - the canopy attachment comprises a plurality of flexible ribs. - the buoyant material is a tube/hollow. - the tube has a 3 ½ inch diameter o the tube has a length of 12 ft - the buoyant material is integrally formed/continuous - the buoyant material is made of closed cell extruded polymer. - the buoyant material is polypropylene, polyethylene, polystyrene. - the buoyant material has a cross section that is round, square, rectangular - the buoyant material is water-proof. - the sling OR weight-supporting portion comprises a rectangular shape.	0, 1.5 or 3

If the following features are ALL described clearly (the "providing" steps may be omitted so long as the body of resilient material and sling are indirectly introduced): A method of assembling a floatation device, said method comprising: - providing an elongated body of buoyant and resilient material; - providing a sling comprising first and second side portions; - bending the elongated body of buoyant and resilient material into a bent configuration; - attaching, using retaining members, the elongated body of buoyant and resilient material in the bent configuration to the first and second side portions of the sling so that tension is applied to the sling.	0 or 2

If the following features are described clearly (1 mark = 3 or more features described, 0 mark = 2 or less features are described):
 	
- wherein attaching the body comprises sliding/inserting a first end of the body into a first sleeve and sliding a second end of the body into a second sleeve.
  ○ wherein attaching the body comprises tightening a draw-string located within each of the first and second sleeves around the body.
  ○ wherein attaching the body comprises adjusting the distance between the two sleeves;
  ▪ wherein adjusting the distance comprises adjusting a drawstring between the first and second sleeves.
- wherein providing the body of buoyant and resilient material comprises applying a treatment to the body of buoyant and resilient material to prevent water absorption.
	0 or 1

DEDUCTIONS	
Non-essential element characterized as essential or essential element characterized as optional -3	
For unclear or informal language, inconsistencies in language, poorly organized draft Max -3	
Sub-total for description of embodiments and drawings	**/20**

Part B – Short Answer Question		
Claim Element	**Requirement for Full Marks**	**Mark**
A sling comprising: - first and second side portions (1);	For "first and second side portions"; will accept: *two lateral sides, two longitudinal sides, two opposed sides; two spaced-apart sides*	0 or 1
- a weight-supporting portion positioned between the first and second side portions (1);	For "weight-supporting portion positioned between the first and second side portions"; will accept: *body-supporting, torso-supporting, user-supporting, platform, surface, sheet*	0 or 1
- retaining members positioned at each of the first and second side portions (1) for retaining a body of buoyant and resilient material in a bent configuration to apply tension to the weight-supporting portion (1).	For retaining members, will accept: *receiving members, attachment members, securing members, fastening members, at least two retaining members* For positioned, will accept: *attached, located, coupled to* ***IF BODY OF BUOYANT AND RESILIENT MATERIAL IS NOT INDIRECTLY REFERENCED, NO POINTS FOR WHOLE CLAIM. SHOULD INCLUDE FUNCTIONAL LANGUAGE.*** ***MUST USE "FOR" OR "ADAPTED TO" LANGUAGE AND NOT LANGUAGE THAT REQUIRES THE BODY OF BUOYANT AND RESILIENT MATERIAL TO BE PART OF THE CLAIM.***	0, 1 or 2
Acceptable Answers	**Requirement for Full Marks**	**Mark**
Answers - Because they may want to sell the sling separately from the tube. - Because they may want to protect against competitors making and/or selling replacement parts (i.e. aftermarket components).	An answer that identifies either one of the two reasons mentioned gets full marks.	0 or 1

TOTAL	**TOTAL MARK – 100 MARKS MAXIMUM**	
Independent Apparatus claim	**Mark on 36**	
Dependent Apparatus claims	**Mark on 4**	
Independent Method claim	**Mark on 15**	
Dependent Method claims	**Mark on 2**	
Sub-total before description of embodiments and drawings	**Mark on 18**	
Sub-total for description of embodiments and drawings	**Mark on 20**	
Short Answer Question	**Mark on 5**	
Total	**100**	

PATENT AGENT EXAMINATION

PAPER B

2020

PART A

The following four (4) documents are provided:

1. Canadian Patent No. 2,xxx,400
2. D1: United States Patent No. 8,xxx,435
3. D2: United States Patent No. 9,xxx,916
4. D3: Canadian Patent No. 2,xxx,631

INSTRUCTIONS TO CANDIDATES

Review the following background and documents provided and include an appropriate response to each question. Do not provide extraneous commentary if not directly relevant to the question. For example, if the question requires a determination as to novelty, do not comment on other criteria such as utility, obviousness, etc. Note that statements of authorities or pertinent law (which may include case law and statutory and regulatory provisions), analysis and argument are required ONLY when requested. Point form answer is acceptable.

BACKGROUND

Your client is Vero who is a yoga instructor at her own studio and she employs another yoga instructor, Kate. Kate works only part-time due to her second job as a chef. To promote a healthy lifestyle among her students, Vero replaced the pop machine with a juicer on June 1, 2015. The juicer was invented by her boyfriend Sam, an engineer working at Cuisine Appliances, Inc., where he designed and built the juicer in the company's machine shop during his lunch breaks. The juicer is met with rave reviews by the students who enjoy complimentary juice after class.

Based on ideas for improvements to the juicer by Kate and the positive feedback from the students, Vero and Sam started a company "Yoga Innovations, Inc." and filed a United States provisional patent application on July 14, 2015 and a subsequent Canadian patent application on May 30, 2016 to cover the juicer, and obtained Canadian Patent No. 2,xxx,400 on March 13, 2018.

Vero is meeting with you because she found an announcement which was published on the Internet last week. A former student, Ted, is opening his own gym. This announcement states that for its grand opening, "Spartan Fitness, Inc." is offering a discounted juicer with every new gym membership. Vero is suspicious that Ted's juicer might fall within the scope of her Canadian Patent No. 2,xxx,400.

Before approaching Ted regarding the potential issue of patent infringement, Vero asks you to assess the validity of Canadian Patent No. 2,xxx,400. Vero provides you with Canadian Patent No. 2,xxx,400 and the results of her prior art search which revealed documents D1-D3, which do not appear to have been considered by the Canadian Examiner.

<u>QUESTION 1:</u> [5.0 marks]

a) Name the leading Canadian Supreme Court case pertaining to novelty and obviousness. **[0.5 marks]**

b) Evaluate the citability of D1-D3 in view of anticipation and obviousness. Provide reasons why the documents are citable or not and apply all the appropriate sections of the *Patent Act*. **[4.5 marks]**

QUESTION 2: [12 marks]

Assuming that these elements are essential, construe the following selected claim terms of Canadian Patent No. 2,xxx,400:

a) "concave grating disk" (claims 1, 2, 3, 6) **[2.5 marks]**

b) "frustoconically-shaped filter" (claims 1 and 6) **[2.0 marks]**

c) "grating members" (claims 2 and 6) **[1.5 marks]**

d) "food chute" (claims 1, 5, and 6) **[2.0 marks]**

e) "anti-rotation member" (claims 6 and 7) **[2.0 marks]**

f) "pusher configured for insertion into the food chute" (claims 1 and 6) **[2.0 marks]**

QUESTION 3: [26.0 marks]

Are claims 1, 2, 3, 4, and 5 anticipated by any one of D1-D3? Provide detailed supporting arguments and reference to the appropriate sections of the documents and figures. In the event that features are repeated in subsequent claims, it is acceptable to refer to analysis in previous claim(s).

QUESTION 4: [31.0 marks]

Is claim 6 obvious in view of D1-D3? Provide detailed supporting arguments, apply the appropriate test from the case law, and refer to the appropriate sections of the documents and figures.

QUESTION 5: [4.0 marks]

Apart from issues related to D1-D3, identify and briefly explain **two** potential issues that may affect the validity of Canadian Patent No. 2,xxx,400.

QUESTION 6: [2.0 marks]

Assuming Vero replaced the pop machine with a juicer on May 1, 2015, identify and briefly explain **one** potential issue that may affect the validity of Canadian Patent No. 2,xxx,400 filed on May 30, 2016. Cite the relevant section of the *Patent Act*.

END OF QUESTIONS IN PART A

CA ‘400

Canadian Patent No. 2,xxx,400
Issue Date: March 13, 2018

JUICER

Filing Date: **May 30, 2016**
Publication Date: **January 14, 2017**
Priority Data: **US 62/xxx,261 filed July 14, 2015**
Inventors: **Vero Jones and Sam Smith**
Owner: **Yoga Innovations, Inc.**

FIELD OF THE INVENTION

[1] The present invention relates to a juicer for preparing fruit and vegetable juices.

BACKGROUND OF THE INVENTION

[2] Juice extractors are known in the small appliance art. Typically, juice extractors have small food chutes through which smaller diameter food items like carrots and celery can be passed to extract juice therefrom, typically one-by-one. However, if a user wishes to extract juice from a larger food item like an apple, the user must first chop the larger food item into smaller pieces sized to fit through the smaller chute. This process can be particularly cumbersome and time-consuming when the user wishes to produce a larger amount of juice.

[3] To address this problem, juice extractors have been produced with larger food chutes to enable more than one smaller food item or at least one larger food item to be passed through the food chute at a time. A problem with larger food chutes, however, is that smaller food items rotate violently around the food chute. For this reason, some juice extractors include knife edges within the food chutes to restrain rotational motion of such food items within the food chute. Since the knife edges are prone to breakage, and, because the knife edges physically cut into the food items as the food items are passed through the food chute, the knife edges tend to make it relatively difficult to pass harder food items through the larger food chute.

CA ‘400

SUMMARY OF THE INVENTION

[4] In one aspect, a juicer is provided comprising a lower portion, upper portion, and top cover. The lower portion houses a motor assembly. The upper portion is mounted above the lower portion and includes a spout. An extraction assembly is housed in the upper portion and is rotatably coupled to the motor assembly. The extraction assembly comprises a concave grating disk and a frustoconically-shaped filter. The top cover is mounted on the upper portion and is integrated with a food chute for receiving food. A pusher is configured for insertion into the food chute for forcing the food towards the extraction assembly. A pulp bin is provided proximate to the lower portion. Activation of the motor assembly rotates the extraction assembly to extract juice from the food.

[5] In another aspect, a juicer is provided comprising a lower portion, upper portion, and top cover. The lower portion houses a motor assembly. The upper portion is mounted above the lower portion and includes a spout. An extraction assembly is housed in the upper portion and is rotatably coupled to the motor assembly. The extraction assembly comprises a concave grating disk and a frustoconically-shaped filter. The concave grating disk comprises grating members arranged in rows along its inclined surface. The top cover is mounted on the upper portion and is integrated with an enlarged food chute for receiving food. The food chute is configured at a bottom end with an anti-rotation member partially along an axial direction. A pusher is configured for insertion into the food chute for forcing the food towards the extraction assembly. The pusher comprises a slot configured to receive the anti-rotation member, and has a convex bottom to fit flush with the concave grating disk, when the pusher is fully inserted into the food chute. A pulp bin is provided proximate to the lower portion. Activation of the motor assembly rotates the extraction assembly to extract juice from the food.

BRIEF DESCRIPTION OF THE DRAWINGS

[6] The invention will now be described in more detail with reference to the accompanying drawings which by way of example illustrate different embodiments of the invention.

CA ‘400

[7] FIG. 1 is an assembled perspective view of a juicer according to the invention.

[8] FIG. 2 is an exploded perspective view of the juicer of FIG. 1.

[9] FIG. 3 is a cross-sectional view of the juicer of FIG. 1.

[10] FIGS. 4A-B show a perspective view (FIG. 4A) and a front sectional view (FIG. 4B) of a first embodiment of a grating disk of the juicer of FIG. 1.

[11] FIGS. 5A-B show a perspective view (FIG. 5A) and a front sectional view (FIG. 5B) of a second embodiment of a grating disk of the juicer of FIG. 1.

[12] FIG. 6 is a perspective view showing a first embodiment of an integral anti-rotation member of the juicer of FIG. 1.

[13] FIG. 7 is a perspective view showing a second embodiment of an integral anti-rotation member of the juicer of FIG. 1.

DETAILED DESCRIPTION

[14] The invention will now be described in more detail by means of embodiments and with reference to the accompanying drawings. FIGS. 1-3 generally show the juicer 21 comprising a lower portion 1, an upper portion 2, and a top cover 3. The lower portion 1 houses a motor assembly comprising a motor 6 and a motor shaft 4. A coupling 5 is screwed on top of the motor shaft 4 which is driven to rotate by the motor 6. Upper portion 2 is mounted on the lower portion 1 and receives an extraction assembly 10 which is fitted onto the coupling 5. A spout 7 is provided at one lower side of the upper portion 2 to release the extracted juice into a glass or other container.

[15] In the top cover 3, there is provided a hollow cylindrical food chute 8 which is relatively large when compared with food chutes of conventional juicers to receive multiple and/or larger food. It is preferred that the food chute 8 be three inches in diameter, thereby enabling multiple foods and/or larger foods to pass therethrough at one time. While it is preferred that the food chute 8 be cylindrical and perpendicular with respect to the top cover 3, it is within the scope of the invention that the food chute 8 be sized or shaped differently or be disposed at a different orientation with respect to the

cover 3, provided the food chute 8 is capable of functioning in the same manner of receiving food.

[16] The food chute 8 includes an integral anti-rotation member 9 located at the bottom of the food chute 8 and running partially along the axial direction to minimize obstruction of the passage of food through the food chute 8. The anti-rotation member 9 is safe for use and does not comprise any sharp edge which can harm a user. The anti-rotation member 9 is also less prone to breakage and is relatively easy to pass food by, even if the food is relatively hard. The anti-rotation member 9 prevents the foods from spinning inside the food chute 8. In the absence of the anti-rotation member 9, the spinning foods inside the feeding tube can cause excessive noise and vibration. The top cover 3 is fitted on the upper portion 2 and the food chute 8 is positioned concentrically in relation to the extraction assembly 10. The pusher 11 is inserted into the food chute 8 and is used to force the food deep into the food chute 8. A pulp bin 12 is attached to one lower side of the top cover 3 and collects pulp centrifugally thrown out of the juicer 21.

[17] The extraction assembly 10 generally comprises a grating mechanism and a filter. The grating mechanism has a plurality of grating members. The grating members may be any slicing items including blades, cutting apertures, perforations, protrusions, graters, cutting edges, sharp ribs, and cutting teeth. Preferably, the grating members are cutting teeth. The density and size of the cutting teeth may vary. In embodiments, FIGS. 4A-B and FIGS. 5A-B show the extraction assembly 10 comprising a filter 13 and a grating mechanism that comprises a grating disk 14. The grating disk 14 is concave-shaped, and has a plurality of cutting teeth 15 arranged on the inclined surface of the grating disk 14. The grating disk 14 configured with a concave design allows an increased number of cutting teeth 15 to be stamped onto the grating disk 14 which facilitates more effective grating and ensures that the motor 6 does not easily stall during grating. The concave shape also limits clogging of the filter 13 during use.

[18] FIGS. 4A-B show a first embodiment of the grating disk 14 as being concave shaped. The concave grating disk 14 can be of a different shape such as a “dish” shape

while maintaining the concave profile. In other words, the concave grating disk 14 could be of a deeper or shallower dish shape in profile, but not flat. The cutting teeth 15 are arranged in rows on the inclined surface towards the center area of the concave grating disk 14, which has a small flat circular surface. The lower part of the concave grating disk 14 is attached to a base 16, which is connected with the coupling 5 and is driven by the motor shaft 4.

[19] FIGS. 5A-B show a second embodiment of the concave grating disk 14, where the cutting teeth 15 are arranged in rows on the inclined surface towards the center area of the concave grating disk 14, which has a small flat circular surface to which is fixed a center blade 17. The center blade 17 and cutting teeth 15 grate the hard core of certain types of fruits and vegetables. The lower part of the grating disk 14 is attached to a base 16 which is connected to the coupling 5 and is driven by the motor shaft 4. While the described and shown configurations of the concave grating disk 14 are preferred, it is within the scope of the invention that the cutting teeth 15 and blades 17 be shaped differently or be configured differently on the grating disk 14.

[20] The filter 13 may be any type of suitable device which removes or filters out the unwanted solids (i.e., fruit or vegetable pulp) from the desired liquids (i.e., fruit or vegetable juice). Suitable filters include strainers, screens, sieves, or mesh filters. Preferably, the filter 13 comprises a frustoconically-shaped mesh filter which is attached to an outer periphery of the concave grating disk 14, and projects upwardly and outwardly from the concave grating disk 14.

[21] The food chute 8 may have different types of anti-rotation members. Examples include a cone-shaped protrusion and an arc-shaped protrusion. Neither of these two anti-rotation protrusions has a knife-edge, and is therefore safer for the user to handle and is less prone to breakage. FIG. 6 shows a first embodiment of an integral anti-rotation member 18 that is cone-shaped. The pusher 11 has a cylindrical body with a large end head and a slot 19 at one side, such that the lower end of the slot 19 has a cone-shape opening. The anti-rotation member 18 matches and fits into the slot 19 when the pusher

11 is fully inserted into the food chute 8. In another embodiment, the bottom of the pusher 11 is convex-shaped and corresponds to the concave grating disk 14 when the pusher 11 forces the fruit or vegetable through the food chute 8 onto the grating disk 14.

[22] FIG. 7 shows a second embodiment of an integral anti-rotation member 20 as arc-shaped. A pusher 11 has a cylindrical body with a large end head and a slot 22 at one side, such that the lower end of the slot 22 has an arc-shape opening. The anti-rotation member 20 matches and fits into the slot 22 when the pusher 11 is fully inserted into the food chute 8. In addition, according to an embodiment, the bottom surface of the pusher 11 comprises a textured surface or a surface having raised projections to further facilitate placing force against the food onto the concave grating disk 14. The juicer 21 provides a very high juicing rate that prevents waste from fruits or vegetables.

[23] Due to the enlarged size of the food chute 8 compared to those of conventional juicers, several smaller diameter foods, such as carrots, for instance, can be passed therethrough at the same time. In addition, larger foods, such as apples, can be passed through the food chute 8 without having to chop up the apples or other larger food before passing them through it. The integral anti-rotation member 9 inhibits rotation of the food within the food chute 8, thereby reducing noise and vibration emanating from the juicer 21. When the convex-shaped pusher 11 forces the fruit or vegetable through the food chute 8 towards the center of the concave grating disk 14, the fruit or vegetable is completely grated by the concave grating disk 14, discouraging lumps of food from being flung into the filter 13 to cause violent vibration and shaking. The juicer 21 can thus operate at a lower rpm (i.e., 7,000-9,000 RPM compared to 12,000 RPM required for conventional centrifugal juicers) with reduced noise and vibration. The grated fruit or vegetable is filtered by the filter 13 to produce rich amounts of juice that flows out of the upper portion 2 through the spout 7. The residual pulp from the grated fruit or vegetable is centrifugally thrown out of the filter 13 and is collected in the pulp bin 12. The juicer 21 thoroughly cuts food in the juicer, is safe to handle, and obtains maximum juicing capability.

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CLAIMS:

1. A juicer comprising:

a) a lower portion housing a motor assembly;

b) an upper portion mounted above the lower portion and comprising a spout;

c) an extraction assembly housed in the upper portion and rotatably coupled to the motor assembly, the extraction assembly comprising a concave grating disk and a frustoconically-shaped filter;

d) a top cover mounted on the upper portion and integrated with a food chute for receiving food;

e) a pusher configured for insertion into the food chute for forcing the food towards the extraction assembly; and

f) a pulp bin proximate to the lower portion;

wherein activation of the motor assembly rotates the extraction assembly to extract juice from the food.

2. The juicer of claim 1, wherein the concave grating disk comprises grating members arranged in rows along an inclined surface of the concave grating disk.

3. The juicer of claim 2, wherein within each row along the inclined surface, beginning from a center of the concave grating disk, each grating member sits at a higher elevation than a preceding grating member.

4. The juicer of claim 1, wherein the pusher comprises one or more projections on a bottom surface to facilitate juice extraction.

5. The juicer according to claim 4, wherein the food chute has a diameter of three inches.

6. A juicer comprising:

a) a lower portion housing a motor assembly;

b) an upper portion mounted above the lower portion and comprising a spout;

c) an extraction assembly housed in the upper portion and rotatably coupled to the motor assembly, the extraction assembly comprising a concave grating disk and a frustoconically-shaped filter, the concave grating disk comprising grating members arranged in rows along an inclined surface of the concave grating disk;

d) a top cover mounted on the upper portion and integrated with an enlarged food chute for receiving food, the food chute configured at a bottom end with an anti-rotation member partially along an axial direction;

e) a pusher configured for insertion into the food chute for forcing the food towards the extraction assembly, the pusher comprising a slot configured to receive the anti-rotation member, and having a convex bottom to fit flush with the concave grating disk, when the pusher is fully inserted into the food chute; and

f) a pulp bin proximate to the lower portion;

wherein activation of the motor assembly rotates the extraction assembly to extract juice from the food.

7. The juicer of claim 6, wherein the anti-rotation member is a cone-shaped or an arc-shaped protrusion.

8. The juicer of claim 6 or 7, wherein the convex bottom of the pusher comprises a textured surface or a surface having raised projections for placing force against the food onto the concave grating disk.

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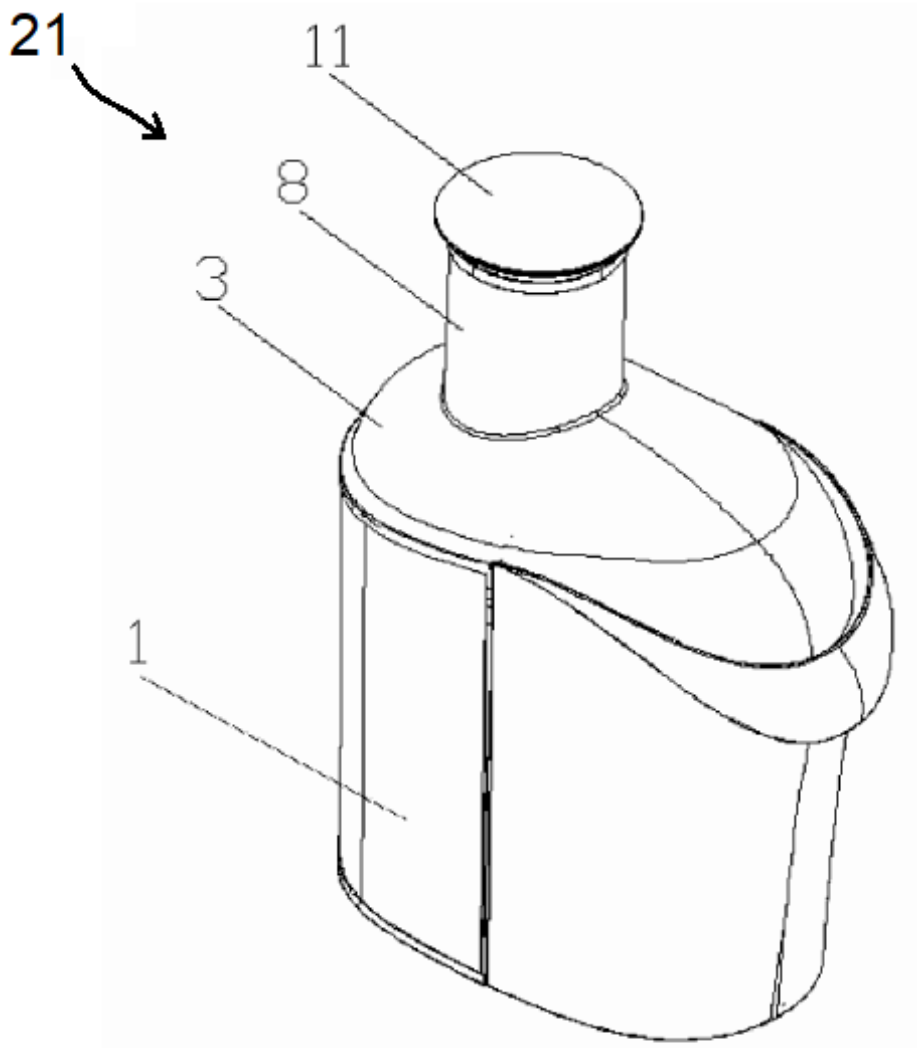

FIG.1

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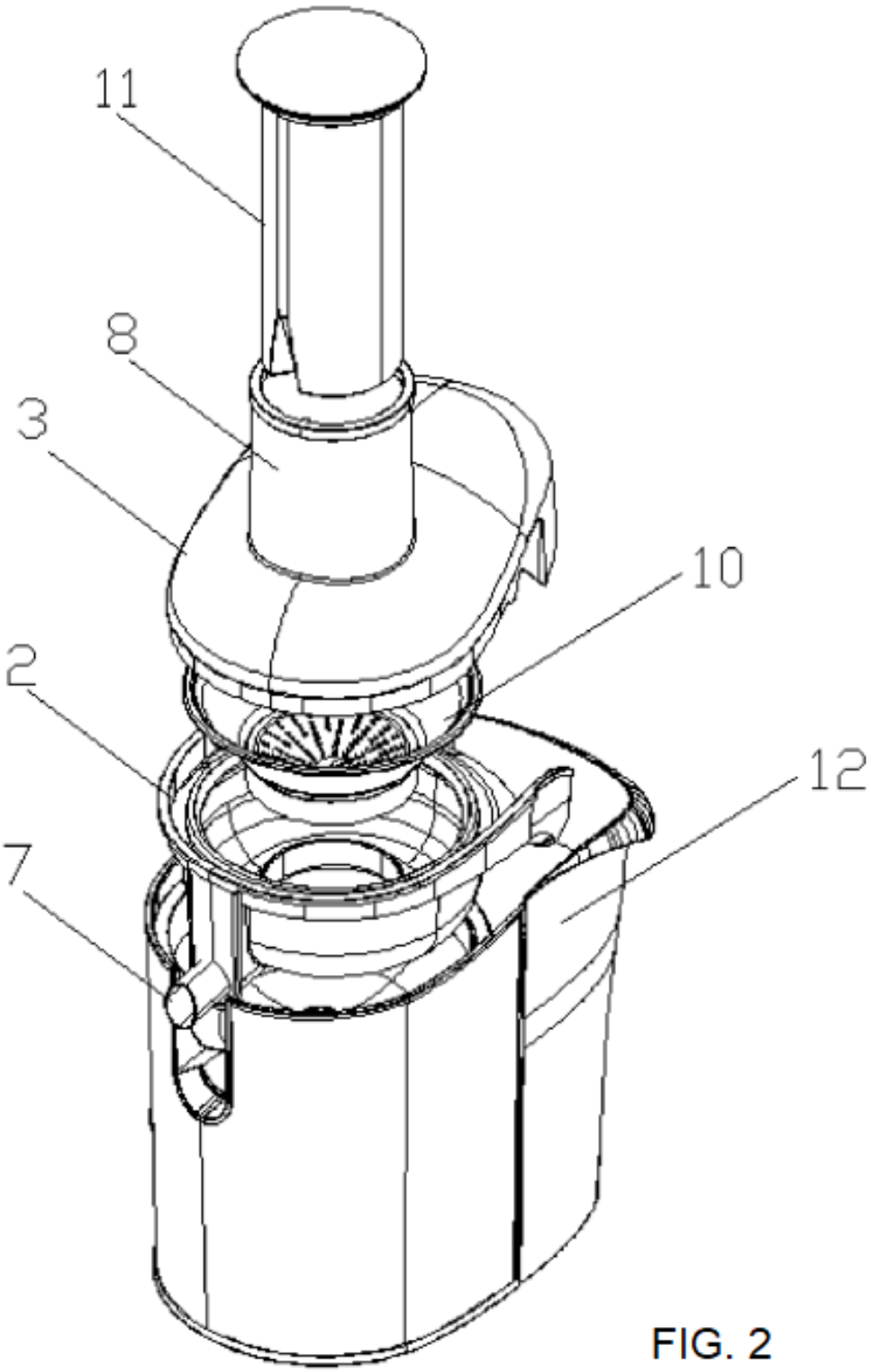

FIG. 2

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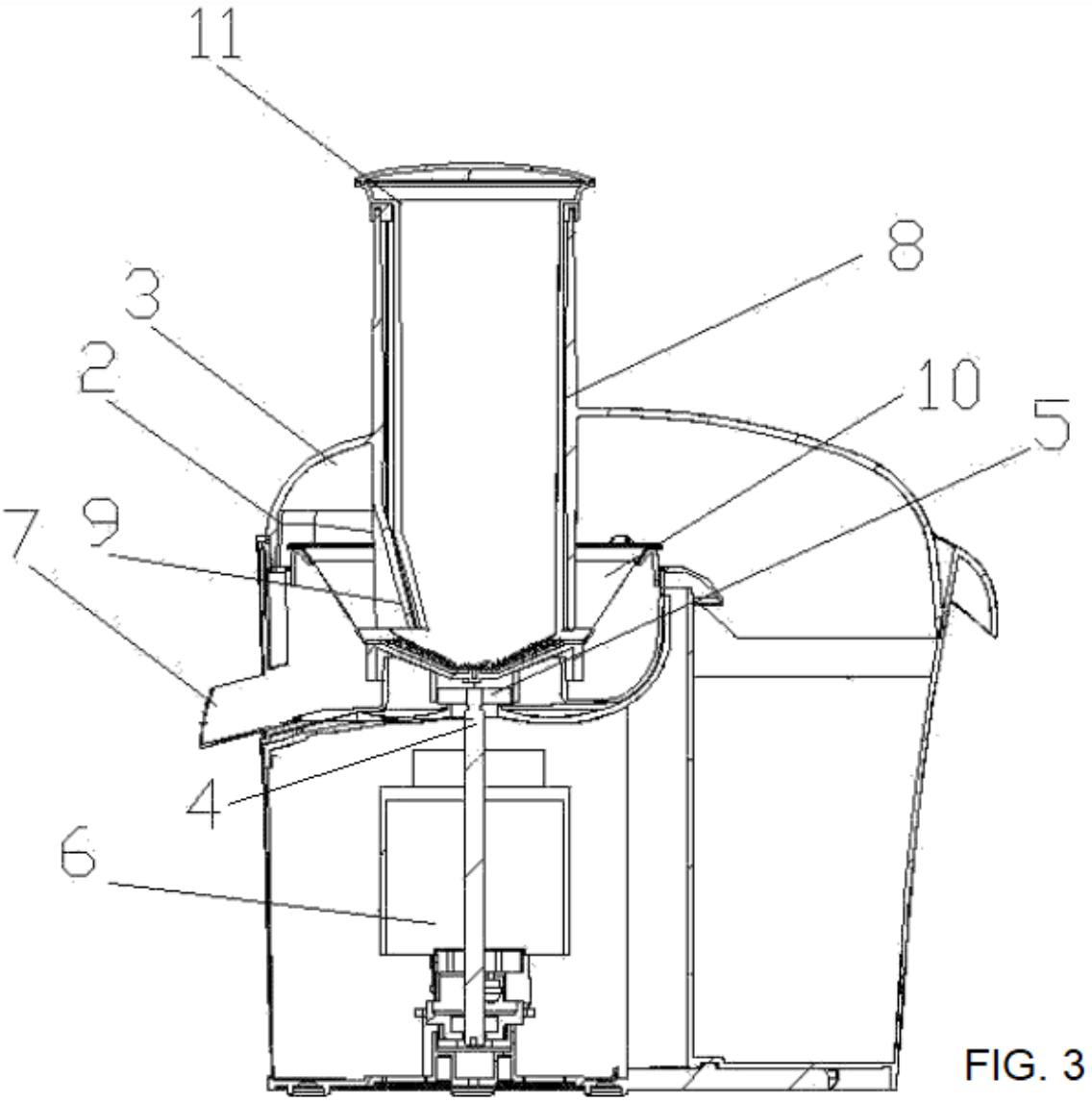

FIG. 3

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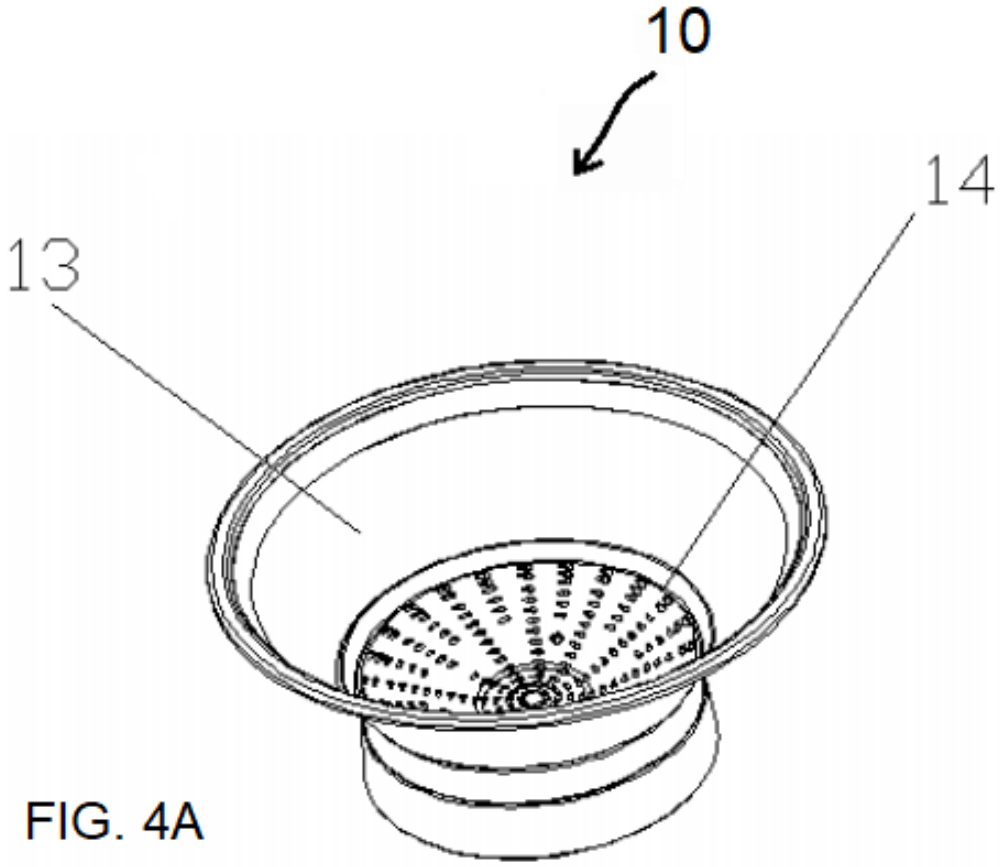

FIG. 4A

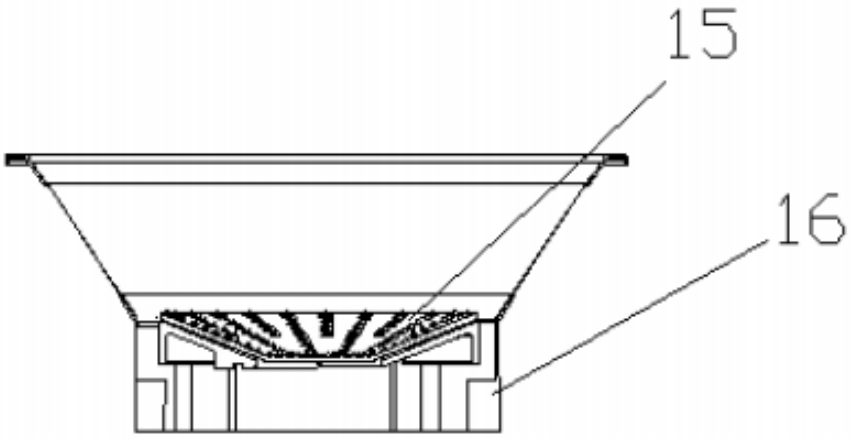

FIG. 4B

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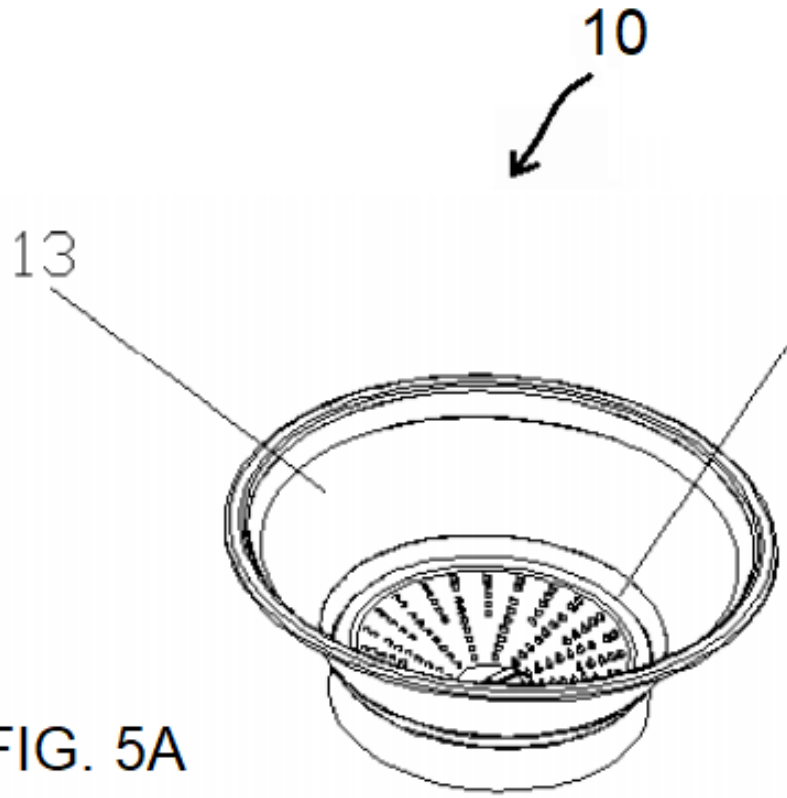

FIG. 5A

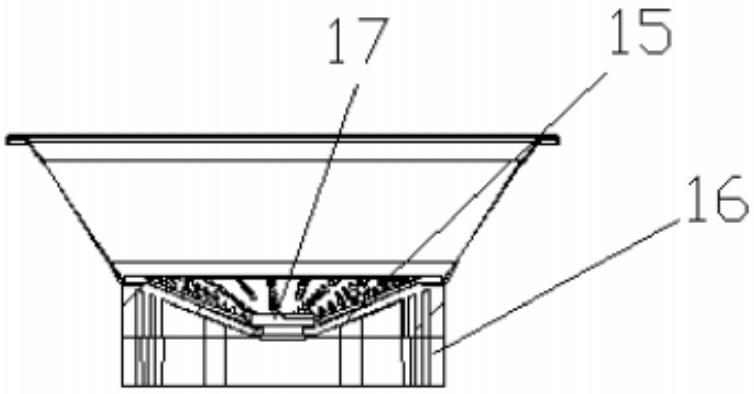

FIG. 5B

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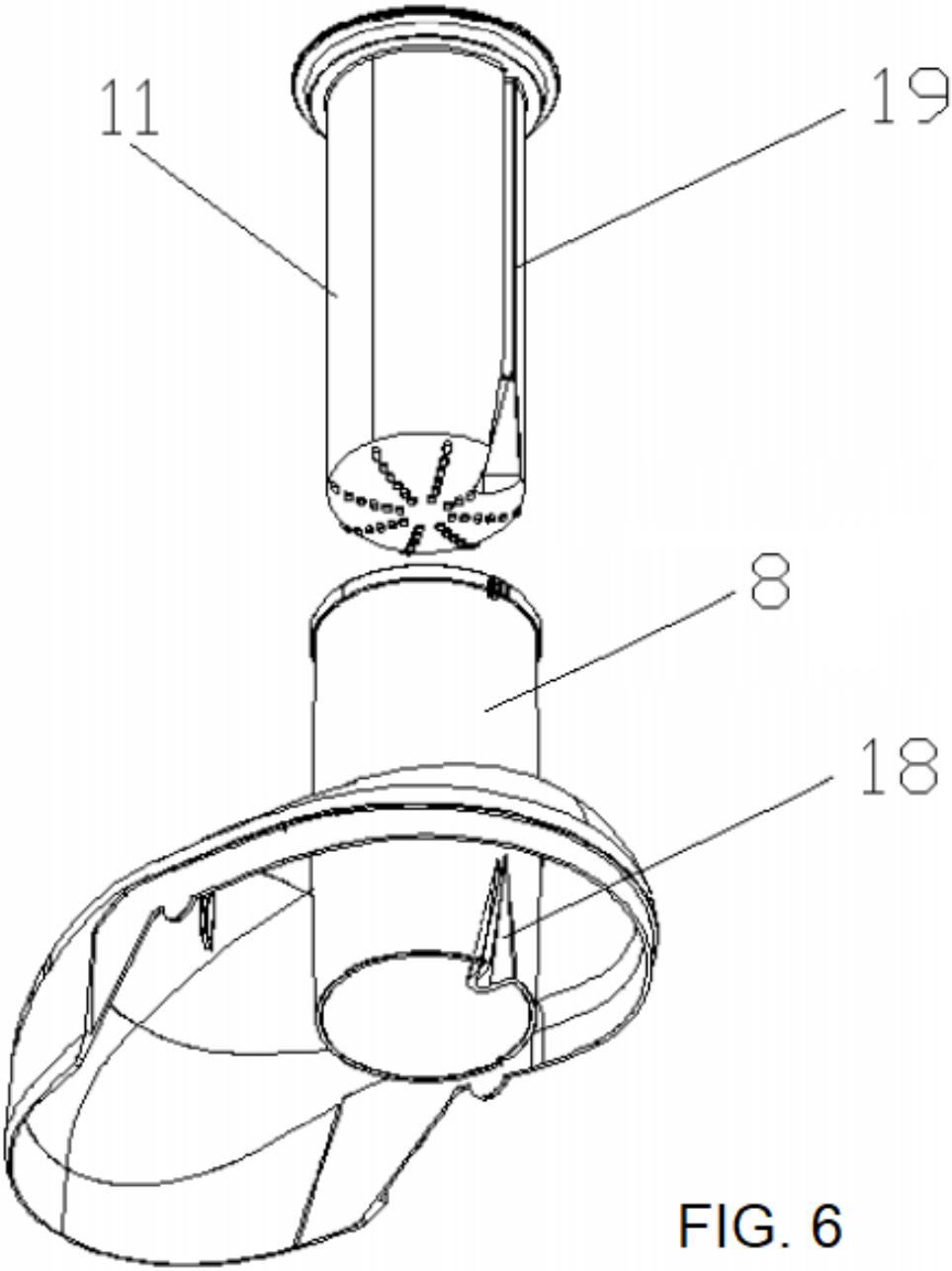

FIG. 6

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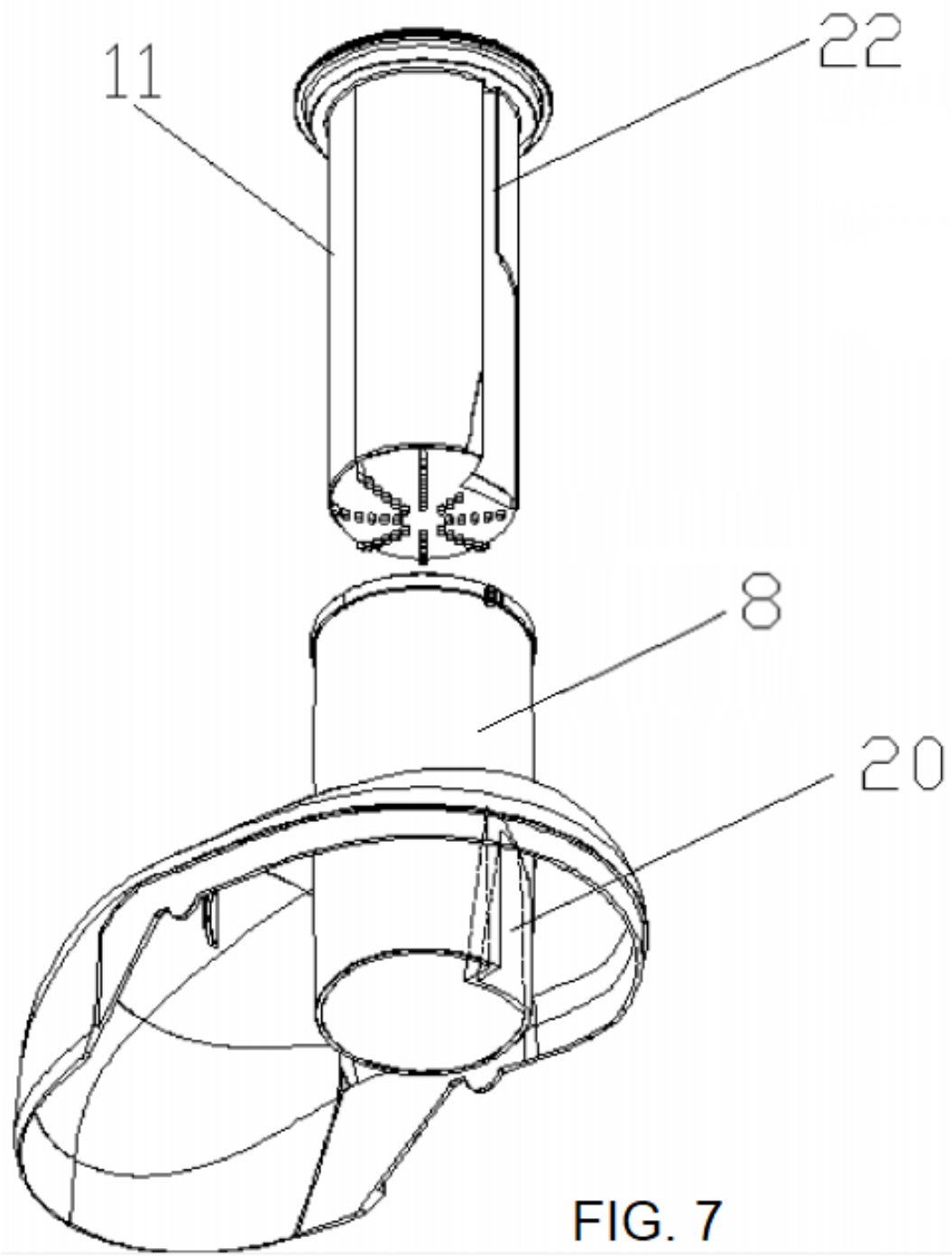

FIG. 7

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DOCUMENT D1

United States Patent No. 8,xxx,435
Issue Date: June 14, 2011

JUICE EXTRACTOR

Filing Date: **April 24, 2008**
Publication Date: **August 21, 2008**
Priority Data: **Continuation of application no. 10/xxx,281 filed on Nov. 13, 2004, now Pat. No. 7,xxx,957, which is a continuation of application no. 10/xxx,757 filed on Aug. 26, 2003, now Pat. No. 6,xxx,750.**

Inventors: **Ian Gates and Glen Fitzgerald**
Owner: **Healthy Solutions, Inc.**

BACKGROUND OF THE INVENTION

[1] Various juicers are available for extracting juice from fruits and vegetables. Masticating juicers are the slowest juicers which use an auger to crush fruits and vegetables against a mesh at only 80-100 RPM rather than shredding with blades. However, masticating juicers yield juice containing a high amount of pulp. Twin gear juicers have two augers and separate the juice in two stages. First, the twin gear juicers crush the fruit and vegetables and then, in the second stage, press the juice from them. Twin gear juicers are expensive, harder to clean, and produce juice containing a high amount of pulp. Similarly, hydraulic juice presses produce cold-pressed juice in two stages. First, the fruit or vegetables is ground up into pulp, and, in the second stage, the juice is slowly extracted by pressing the pulp under thousands of pounds of pressure. Such juice presses are too large and expensive for household use, difficult to clean, and more suitable for commercial use.

BRIEF DESCRIPTION OF THE DRAWINGS

[2] FIG. 1 is a front left side perspective view of a juice extractor.

[3] FIG. 2 is a cross sectional perspective view of the juice extractor shown in FIG. 1.

[4] FIG. 3 is an exploded perspective view of the upper half of the juice extractor

shown in FIG. 1.

[5] FIG. 4 is an upper left side perspective view of the juice extractor shown in FIG. 1, having the pusher removed from within a food chute.

[6] FIG. 5 is an enlarged bottom perspective view of a pusher of the juice extractor of FIG. 1.

DETAILED DESCRIPTION

[7] Referring to FIGS. 1-5, the juicer 10 includes a motor housing 14 with a cylindrical juice box or upper housing 16 having an open top mounted to the top of the motor housing 14. The motor housing 14 is hollow and contains electrical components of the juicer 10. The upper housing 16 has a hollow interior and includes a spout 18 extending downwardly therefrom through which juice extracted from food stuffs within the juicer 10 can flow. The spout 18 is oriented such that a glass can be placed underneath the lower end of the spout 18 to enable the juice to be collected therein. A switch 20 is exposed on a front face of the motor housing 14 to allow a user to activate the juicer 10. The switch 20 is pivotable between an OFF position and an ON position to activate an electric motor 50. The juicer 10 has an open-topped, hollow pulp bin 24 removably attached thereto, preferably proximate the upper housing 16 and motor housing 14, for the collection of pulp.

[8] A removable lid 28 is placed on top of the upper housing 16 and pulp bin 24 to enclose an interior of the juicer 10. The lid 28 includes a food chute 12 extending through the lid 28 and centrally located with respect to the upper housing 16 when the lid 28 is engaged thereto. The food chute 12 is perpendicular to the lid 28 and extends upwardly from the lid 28 and also downwardly from the lid 28 so that the food chute 12 extends into the upper housing 16 of the juicer 10. The food chute 12 is no greater than two inches in diameter to receive fruits and vegetables which have been chopped into small chunks. A knife edge 12a extends radially inwardly from an inside surface of the food chute 12 (FIGS. 2 and 4). The knife edge 12a extends the length of the food chute 12 and functions to inhibit rotation of food within the food chute 12 to minimize shaking

during operation of the juicer 10.

[9] Referring to FIGS. 1-3 and 5, a food pusher 30 is insertable into the food chute 12 for urging food down the food chute 12. The food pusher 30 is shaped to fit within the food chute 12. The food pusher 30 includes a larger end 30a at the top to prevent the food pusher 30 from slipping into the food chute 12. The larger end 30a also acts as a handle for easier grasping of the food pusher 30. The food pusher 30 further includes a slot 30b extending in the axial direction and projecting radially inwardly for accommodating the knife edge 12a in the food chute 12 (FIGS. 2 and 5). The slot 30b is in sliding engagement with the knife edge 12a when the food pusher 30 is inserted into the food chute 12. The distal end of the food pusher 30 opposite the larger end 30a includes protrusions 30c to grip onto the food when the food pusher 30 urges the food down the food chute 12. The protrusions 30c help to prevent independent rotation of the food with regard to the food pusher 30. The knife edge 12a prevents the food pusher 30 from rotating within the food chute 12.

[10] Referring to FIGS. 2 and 3, the upper housing 16 further includes a juice ring 32 engaged with an inner surface of the upper housing 16, preferably proximate the top of the upper housing 16. The juice ring 32 directs pulp into the pulp bin 24 and inhibits pulp from entering the interior of the upper housing 16 and potentially flowing through the spout 18 with the juice or clogging the spout 18.

[11] Referring now to FIGS. 2-4, the grating disk 34 is rotatable about a substantially vertical axis. A frustoconically-shaped filter 36 is attached to the outer periphery of the grating disk 34. The filter 36 projects upwardly and outwardly from the grating disk 34. The food chute 12 is arranged above the grating disc 34 and the filter 36. The food chute 12 is centrally located along the axis of rotation of the grating disc 34 and the diameter of the grating disc 34 is at least as large as the inner diameter of the food chute 12.

[12] The filter 36 and grating disk 34 are sized to fit within the open center of the juice ring 32 with sufficient clearance so that the filter 36 does not come into contact with the

juice ring 32. At the same time, the clearance between the filter 36 and the juice ring 32 is small enough to inhibit pulp from falling therebetween and into the interior of the upper housing 16. The grating disk 34 and filter 36 function to grind, tear, and otherwise cut food passing through the food chute 12 and to separate the juice from the pulp. The grating disk 34 and filter 36 are attached together using rivets 38. The rivets 38 are recessed into the grating disk 34 such that the top of the rivets 38 are flush with the top of the grating disk 34.

[13] When assembled, the filter 36 is sandwiched between the grating disk 34 and a filter holder 40 such that the grating disk 34 is exposed within the filter 36 at the bottom thereof. The grating disk 34 has an upper side 34a provided with a pair of cutters 34b and a plurality of toothed blades 34c (FIG. 3). The cutters 34b are centrally located on the grating disk 34 and each includes a cutting edge that faces in the rotational direction. Each of the tooth blades 34c has a semi-circular seat section extending slopingly and upwardly to form a triangular tip facing in the rotation direction. The toothed blades 34c function to grind and tear food stuffs inserted within the juicer 10 when the grating disk 34 is rotated during normal operation of the juicer 10, thereby enabling juice to be extracted from the food. The grating disk 34 also includes one or more recessed bores 34d to receive the rivets 38.

[14] Referring now to FIG. 2, the filter holder 40 is engageable with a clutch hub 42 of the juicer 10. The clutch hub 42 imparts rotational motion on the filter 36 and grating disc 34. The clutch hub 42 is fixed to a shaft 50a of the motor 50, such that rotation of the shaft 50a causes rotation of the clutch hub 42. The motor 50 is a conventional electric motor. The motor 50 is retained within housing 52 and the housing 52 is engaged with the motor housing 14 and/or the base 22 to anchor the motor 50 within the motor housing 14. The motor 50 is electrically connected to the switch 20 which powers the motor 50 with activation of the switch 20. When the juicer 10 is assembled, powering of the motor 50 causes rotation of the shaft 50a, which, in turn, causes rotation of the clutch hub 42 and the filter 36 and grating disc 34 engaged therewith.

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[15] In use, fruits and vegetables are chopped into small pieces so as to be insertable into the two inch (or less) diameter food chute 12. Having the two inch diameter food chute 12 minimizes ejection of the small pieces from the food chute 12. The juicer 10 is plugged into a power source and the food pusher 30 is removed from within the food chute 12. The switch 20 is then set to the ON position and food is placed within the food chute 12 so that the food comes into contact with the grating disk 34 within the juicer 10. The grating disk 34, rotated by the motor 50 at about 12,000 RPM, grates pieces of the food through interaction of the cutters 34b and toothed blades 34c of the grating disk 34 with the food. In doing so, lumps of the food and juice extracted therefrom are flung or forced outwardly against the filter 36 by rotation of the filter 36, causing the juicer 10 to vibrate. The juice passes through the filter 36 and into the upper housing 16 to flow out of the upper housing 16 through the spout 18 while the pieces of food are retained within the filter 36. Due to the shape of the filter 36 and the rotation thereof, the pieces of food are forced upwardly with respect to the filter 36 and are forced out of the filter 36 and into the pulp bin 24. The juice flowing through the spout 18 is collected by a glass disposed thereunder.

[16] Because the filter 36 and grating disc 34 are rotating, food engaging the grating disk 34 tends to rotate therewith. The knife edge 12a extending inwardly from the inner wall of the food chute 12 abuts rotating food and restrains rotational motion thereof to enable the food to be passed downwardly through the food chute 12 without the food rotating in an unrestrained manner within the food chute 12. Once food passes below the top of the food chute 12, the food pusher 30 can be inserted within the food chute 12 and pushed downwardly to urge the food further down through the food chute 12. The protrusions 30c extending axially from the end of the food pusher 30 help to inhibit rotation of the food. Once one batch of food is passed through the juicer 10, the pusher 30 can be removed from the food chute 12 to enable the user to process additional food in the same manner. Once a sufficient amount of food has been passed through the juicer 10, the switch 20 is flipped to the OFF position and the juicer 10 can be disassembled for cleaning.

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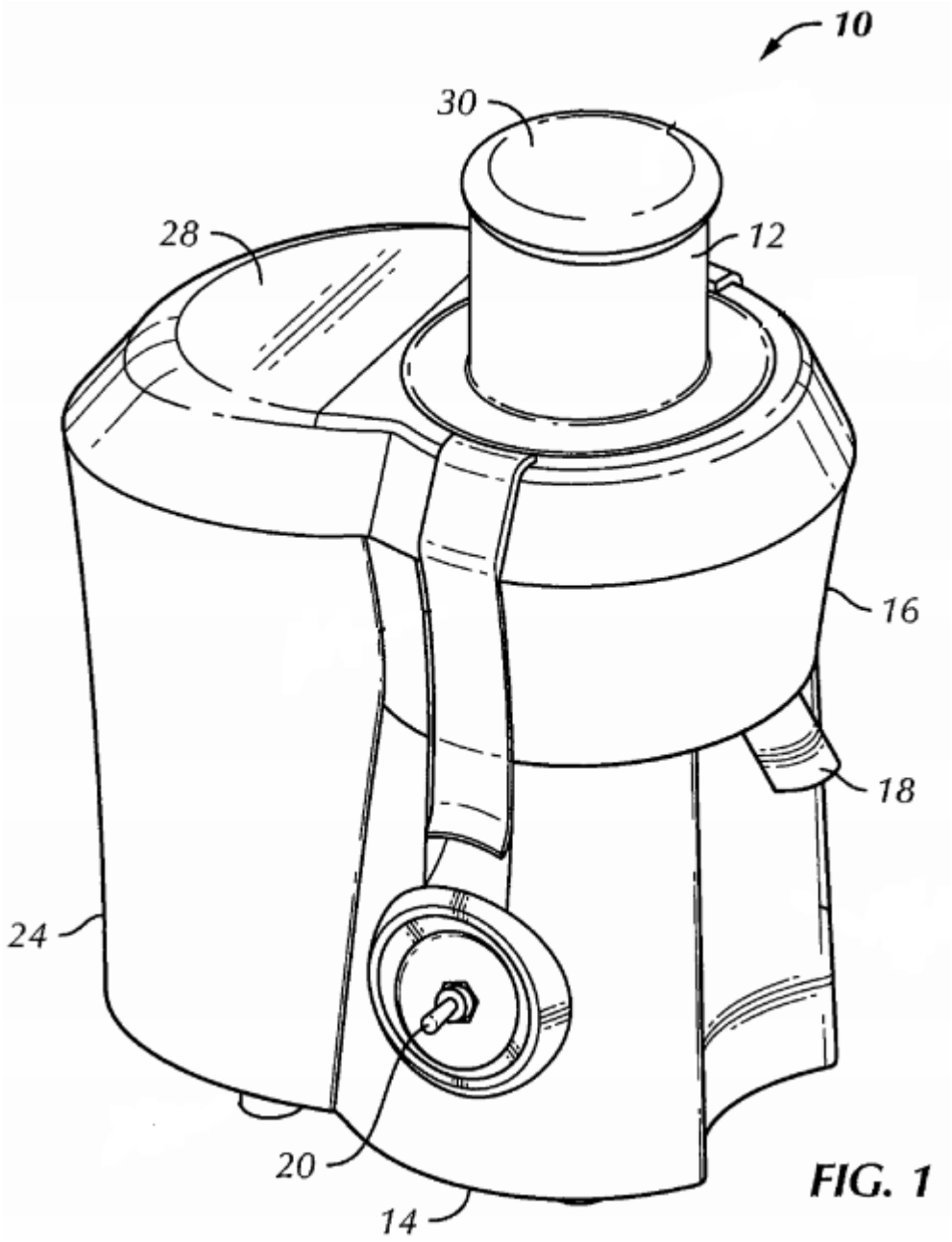

FIG. 1

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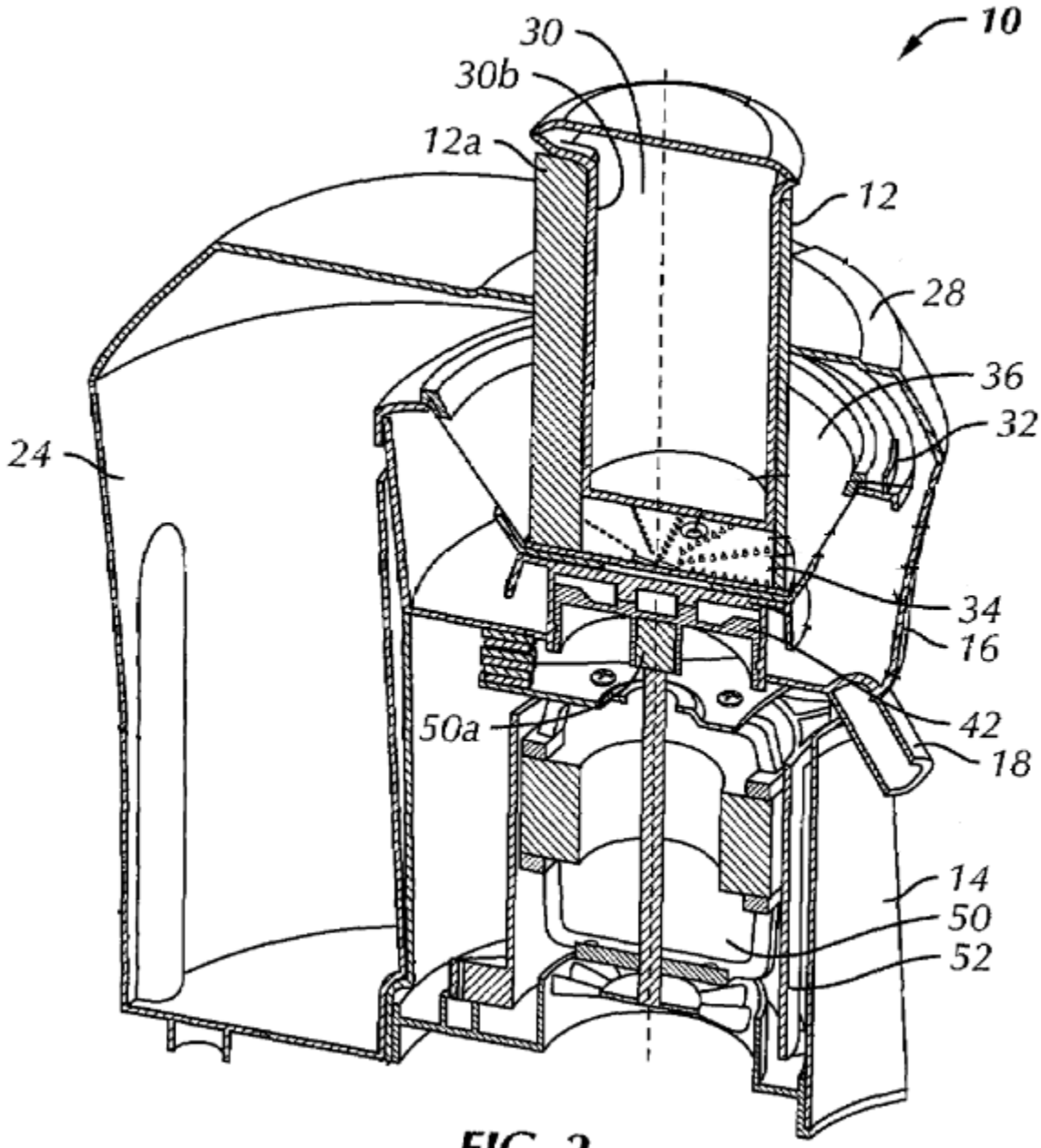

FIG. 2

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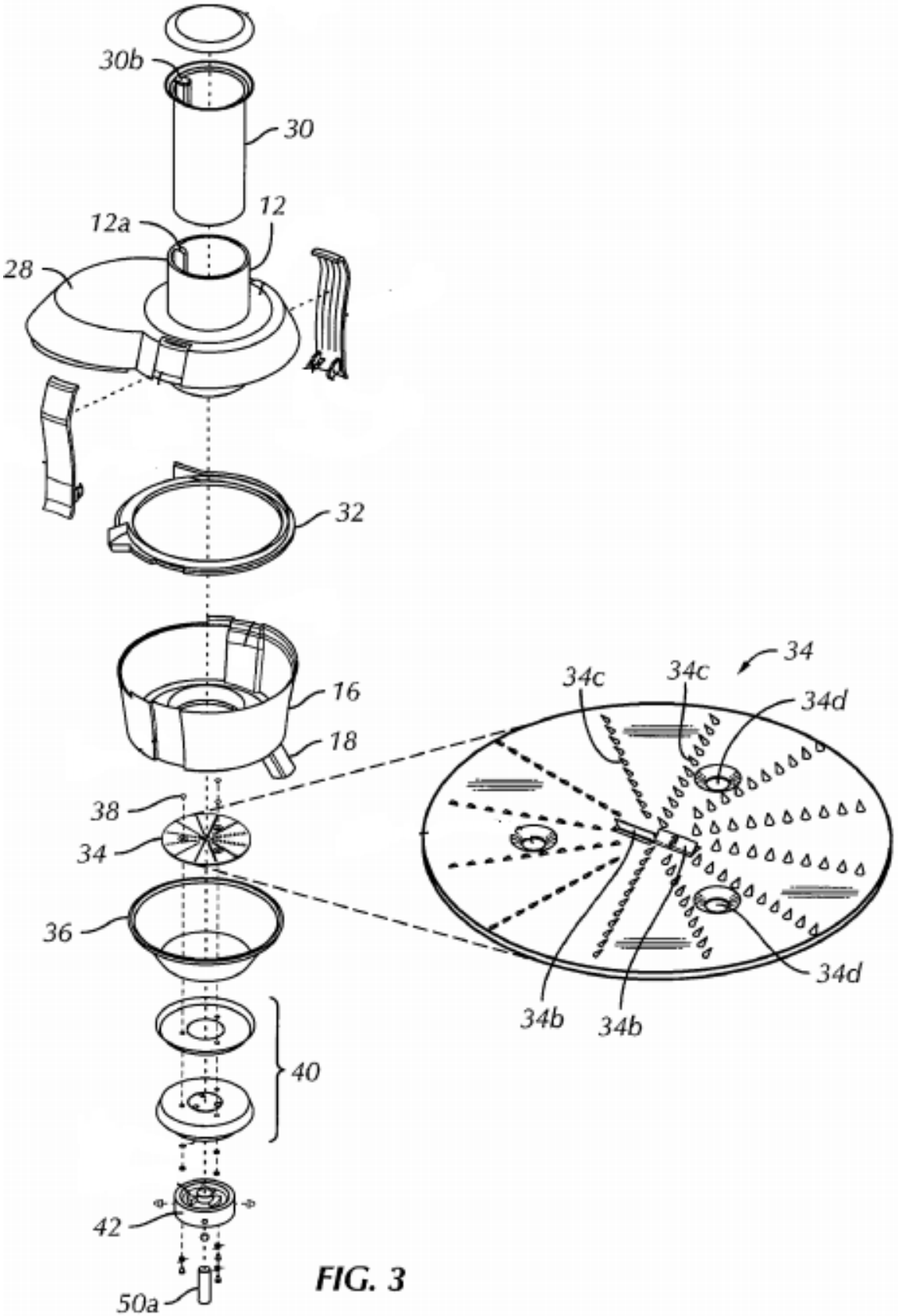

FIG. 3

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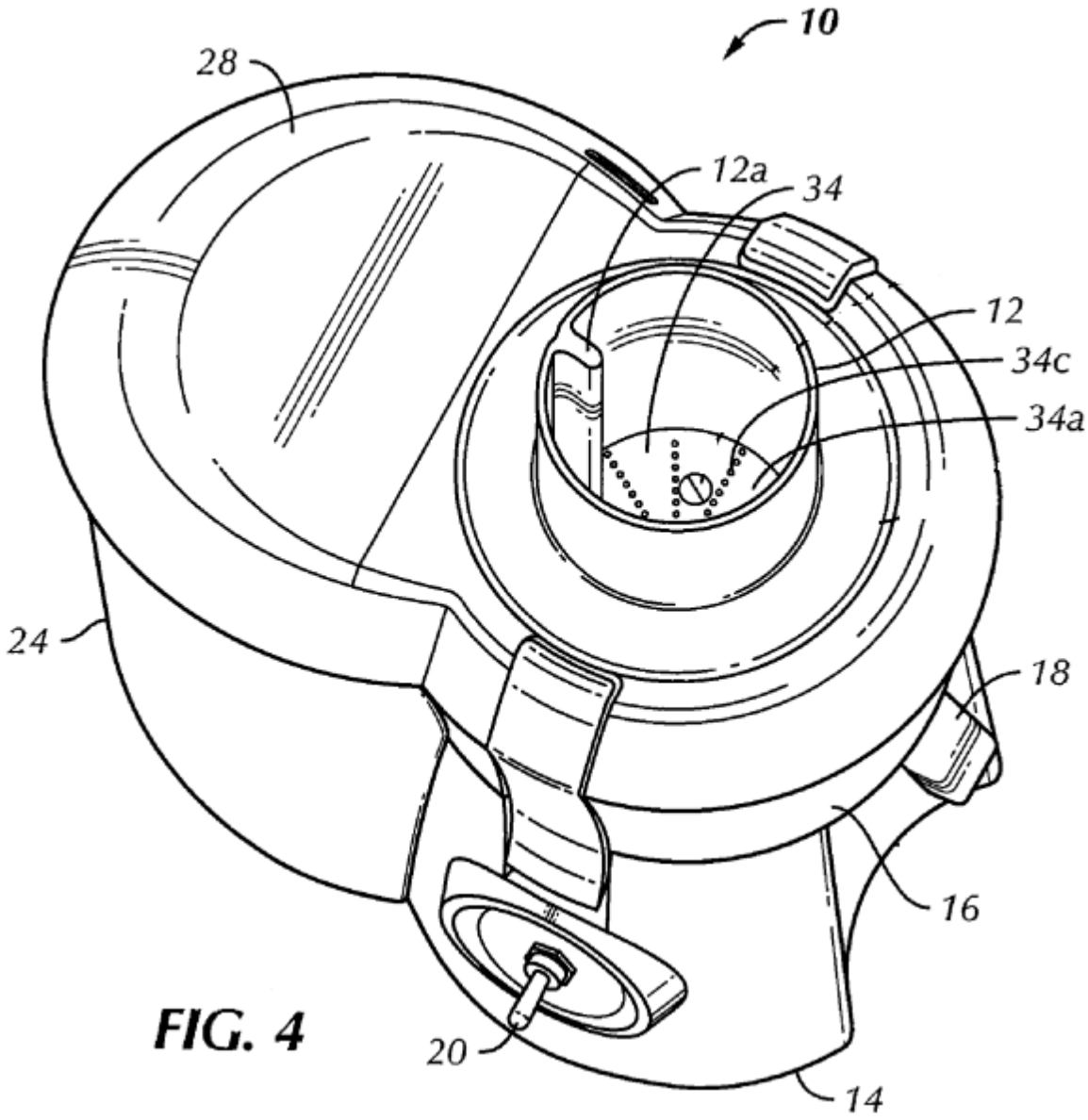

FIG. 4

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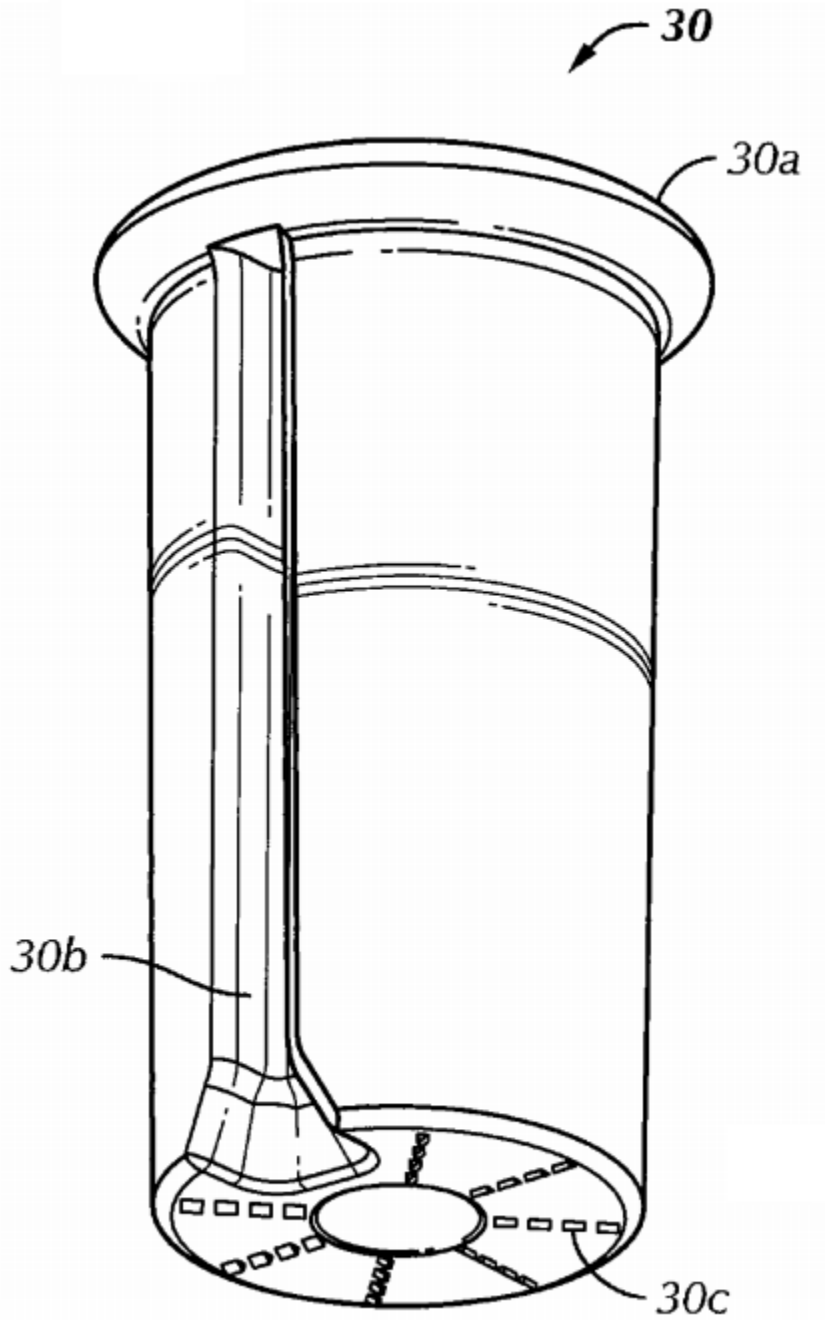

FIG. 5

* * *

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DOCUMENT D2

United States Patent No. 9,xxx,916
Issued Date: November 19, 2019

JUICING DEVICE

Filing Date: **March 20, 2017**
Publication Date: **July 5, 2018**
Priority Data: **CN 2016 2,xxxx,830 U filed on December 30, 2016;**
CN 2017 2,xxxx,174 U filed on February 27, 2017

Inventors: **Harpinder Sidhu and Garry Singh**
Assignee: **Healthy Kitchen, Inc.**

BACKGROUND OF THE INVENTION

[1] Devices for pulverizing fruits and vegetables to separate the liquid content from the solid fibrous portion have become popular among health fanatics. However, the problem arises that there is a need for an improved device for pulverizing fibrous fruits and vegetables, and for separating the juice from the solid portion with a high degree of efficiency.

BRIEF DESCRIPTION OF THE DRAWINGS

[2] FIG. 1 is a side elevational view of the juicer, partly in section.

[3] FIG. 2 is a section taken along the line I-I of FIG. 1.

[5] FIG. 3 is a section taken along the line II-II in FIG. 1.

[6] FIG. 4 is an enlarged fragmentary sectional view showing the relation between two of the pulverizing elements.

DETAILED DESCRIPTION

[7] Referring to FIG. 1, the juicer 10 comprises a casing 36 which is generally divided into a liquid juice collection portion and a solid collection portion by various components, as will be described. The juicer 10 includes a base 16 having a motor 17 mounted therein. The motor 17 has a rotatable drive shaft 18 extending vertically and

carrying a clutch l9 secured thereto by set screws 21. A rotatable basket 22 is mounted upon the clutch l9 and is removably secured to the clutch 19 by nut 23.

[8] The rotatable basket 22 includes a pulverizing portion 26 and a mesh filter 27; the pulverizing portion 26 is formed with a first portion 28 extending outwardly and downwardly from the clutch 19 and being continued by an upwardly extending second portion 29. The two portions 28, 29, when viewed in cross section, are in the form of a "W" and are disposed about the drive shaft 18. The rotatable basket 22 rotates within a casing 36. The casing 36 is generally divided into a juice collection portion and a solid collection portion. To collect juice passing through the mesh filter 27, the casing 36 carries a collecting ring 39 having a spout 40 through which the juice is drained. The upper portion of casing 36 is closed by cover 41.

[9] Mounted upon the cover 41 by screws 50 is a stationary cutting member 51 having a feed duct 52 therein leading into a lower portion 55 which is arcuately formed as at 53 and sloping downwardly in the direction of rotation to feed material in to engage the teeth 54 on the rotatable basket 22 (FIG. 2). The terminal portion 60 of the stationary cutting member 51 is adjacent to the rotatable basket 22. The teeth 54 on each "V" of the "W" of the rotatable basket 22 are arranged in staggered rows and extend radially outwardly in the direction or rotation of the rotatable basket 22 (FIG. 3).

[10] The stationary member 51 includes an annular flange 61 which cooperates with a similar annular flange 62 of the rotatable basket 22 (FIG. 4). A narrow gap is provided between the rotatable basket 22 and the stationary member 51 to retain fibrous particles between the stationary member 51 and the rotatable basket 22 until they are cut to a very small size. Flange 61 can be continuous or can be formed in several segments each separated by a relatively narrow passage 66 from the next segment, with the several segments curving inwardly in the direction of rotation of the rotatable basket 22 (FIG. 2).

[11] In use, solid material is fed into the feed duct 52 and passes downwardly between the stationary member 51 and the rotatable basket 22 to be pulverized by the cooperately

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positioned teeth 54 and stationary member 51. Because of the close engagement between flanges 61 and 62, any solid material which emerges is relatively fine and a maximum release of juice is effected.

[12] The solid material passes up mesh filter 27 upon which it is subject to centrifugal force occasioned by rotation of the mesh filter 27 at several thousand revolutions per minute. The solid material builds upon the mesh filter 27, being retained by ring 71 until it is whirled completely dry of juice, after which the solid material passes between the ring 71 and the edge of the mesh filter 27 or over the lip of flange 74 to emerge finally as a substantially bone-dry solid.

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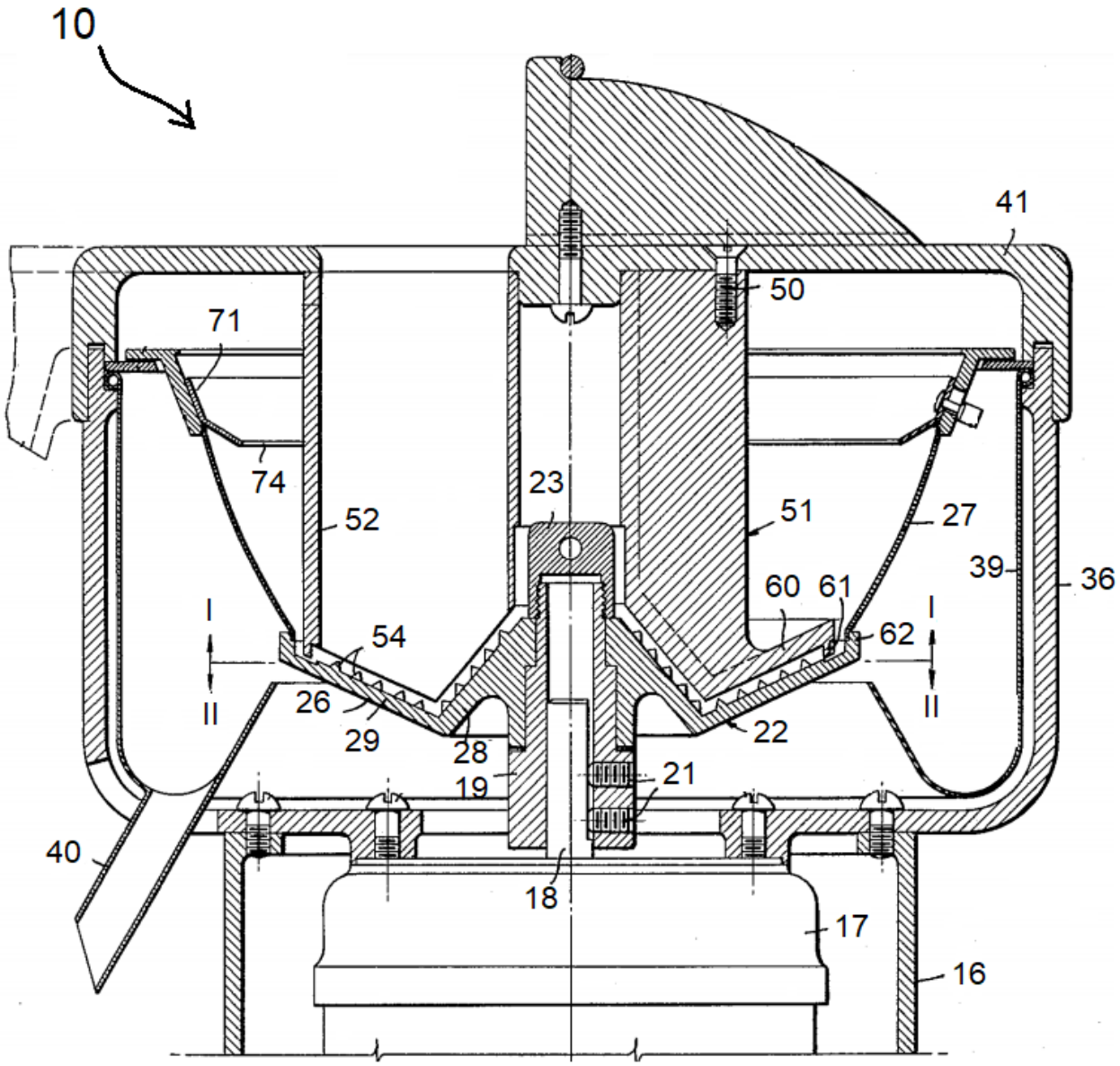


FIG. 1

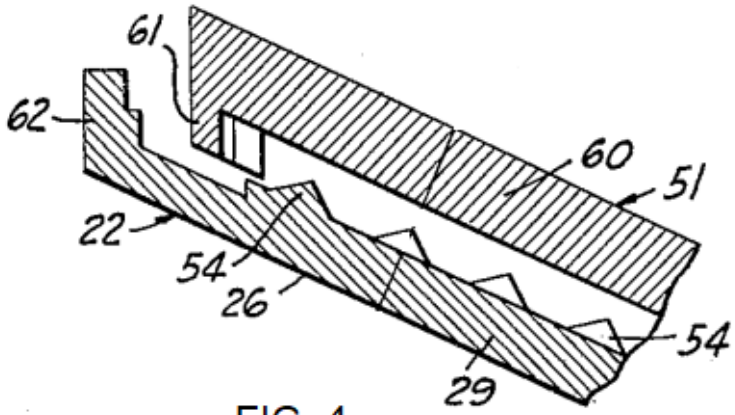


FIG. 4

DOCUMENT D2

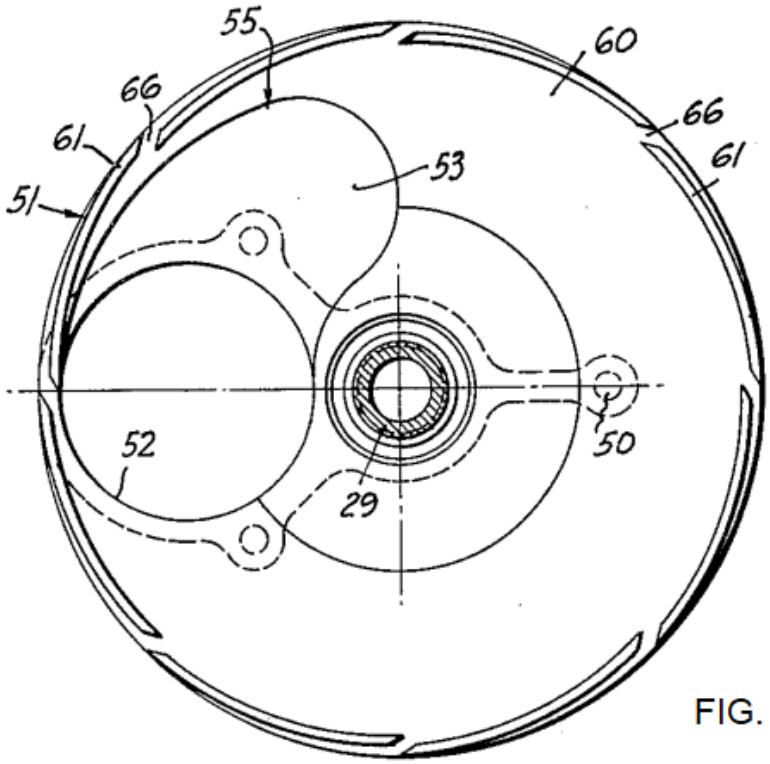


FIG. 2

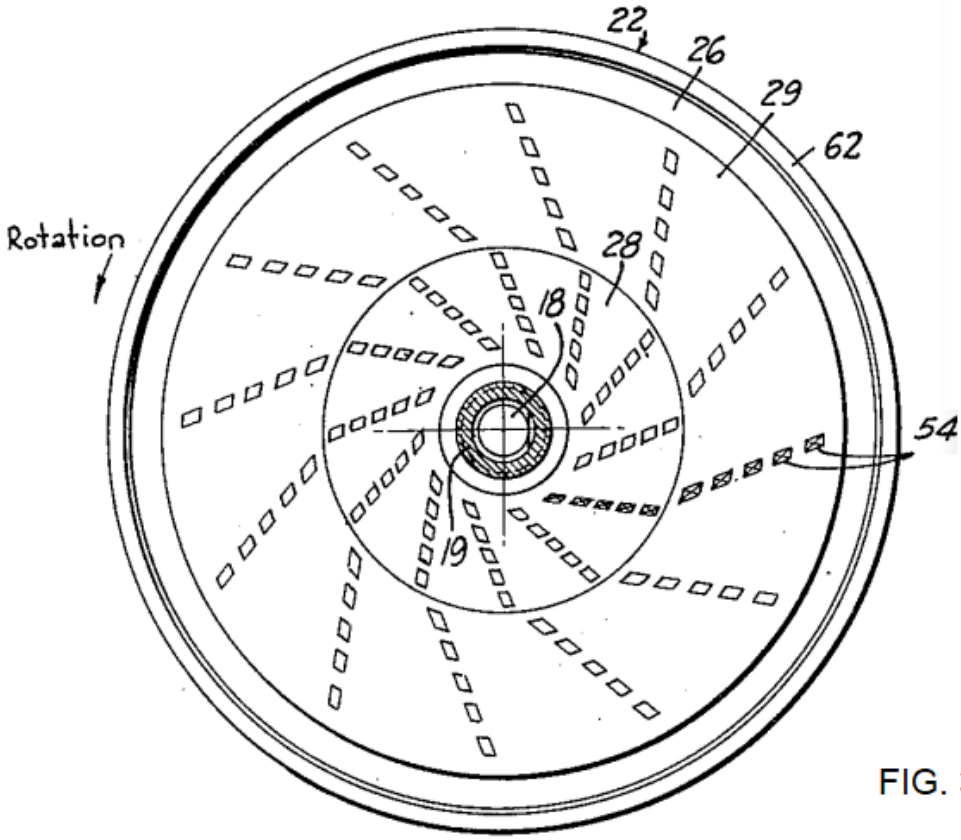


FIG. 3

* * *

DOCUMENT D3

Canadian Patent No. 2,xxx,631
Issue Date : June 23, 2015

CITRUS JUICER

National Entry: **January 25, 2013**
PCT Filing Date: **July 28, 2011**
Publication Date: **February 2, 2012**
PCT: **PCT/CN2011/xxx,710**
Priority Data: **CN 2010xx,xxx,xxx.3 filed on July 28, 2010**

Inventor: **Pui Kwok**
Assignee: **HK Technologies, Inc.**

BACKGROUND OF THE INVENTION

[1] A citrus juicer extracts citrus juice such as oranges, lemons, and grapefruits. The simplest citrus juicers consist of a bowl for receiving the squeezed juice and a cone disposed on the bowl. The user cuts a citrus fruit in half, and then presses and rotates the citrus half against the cone to extract the juice. However, the cone does not properly separate the juice from the pulp, and the citrus half can easily slip out of position on the cone such that the juice is not completely expressed from the citrus half.

BRIEF DESCRIPTION OF THE DRAWINGS

[2] Fig. 1 is a vertical sectional view of a juicer according to the invention, showing a fruit section positioned in the juicer for juice extraction.

[3] Fig. 2 is a horizontal sectional view of the juicer as taken on the line I-I of Fig. 1.

[4] Fig. 3 is a sectional view of a portion of a receiving member of the juicer of Fig. 1.

[5] Fig. 4 is a partial sectional view through the juicer of Fig. 1, showing the plunger in the raised position.

[6] Fig. 5A is a partial sectional view of the juicer of Fig. 1, showing the plunger in the lowermost position for juice extraction.

DOCUMENT D3

[7] Fig. 5B is a partial sectional view of Fig. 5A taken along line II-II, showing cooperation between the plunger and receiving member to flip the fruit section inside out for extracting juice.

DETAILED DESCRIPTION

[8] As shown in Fig. 1, the juicer 1 includes a base 10 to receive a glass 12. An upright stand 13 extends upwardly from the base 10 and has a ring-like flange 14 which overhangs the base 10. The flange 14 removably engages and seats a funnel 17 having a shoulder 16 which rests on the flange 14 and a downwardly opening juice discharge spout 18. The funnel 17 has a plurality of upward projections 19 arranged as radially disposed ribs on its inner surface (Figs. 2, 5B).

[9] A receiving member 20 has a concave shape which conforms to the inner surface of the funnel 17. The receiving member 20 is the part upon which the cut side of a fruit section 34 (e.g., one-half of an orange, lemon or other juicy fruit) is engaged for the purpose of expressing juice therefrom. The receiving member 20 has a diameter at the top end which approximates the diameter of a grapefruit (i.e., about five inches). The receiving member 20 rests upon the projections 19 of the funnel 17, thereby providing a space 21 between the funnel 17 and receiving member 20 and into which juice may flow through openings 22 formed in the receiving member 20 (Figs. 1, 2 and 5B). The openings 22 are sized to prevent seeds of the fruit passing therethrough, allowing the receiving member 20 to function as a strainer. The receiving member 20 is provided with a hole 23 that is arranged coaxially with the spout 18 of the funnel 17. Preferably, the receiving member 20 includes sharp annular ribs 24 separated by grooves 25 which cut into the pulp of the fruit section 34, but predominantly provide a gripping surface 20a so that the fruit section 34 will not slip when being pressed (Fig. 3). Holes 22a through the receiving member 20 are positioned at the bottom of each groove 25 to allow drainage of the juice into the space 21.

[10] A plunger 27 cooperates with the receiving member 20 in expressing the juice from the fruit section 34 placed upon the gripping surface 20a of the receiving member 20. The plunger 27 has a cross-sectional shape that conforms to the gripping surface 20a of the receiving member 20. The plunger 27 has an inverted conical bottom surface substantially angularly complemental

DOCUMENT D3

to the gripping surface 20a of the receiving member 20. The plunger 27 has a sharp point 29 of a diameter smaller than the diameter of the hole 23 of the receiving member 20 so that it may enter the hole 23.

[11] A lever 33 and associated components are provided. When the lever 33 is swung in one direction, this will impart a downward movement to move the plunger 27 into juice expressing position with respect to the receiving member 20 (Figs. 5A-B). When the lever 33 is swung in the other direction, this will impart an upward movement which will raise or lift the plunger 27 into a position well above the flange 14 to permit the easy placing of a fruit section 34 in the receiving member 20 (Fig. 4).

[12] In operation, the user cuts the citrus fruit (for example, an orange) into appropriate sections or parts, typically two halves. As shown in Fig. 1, the fruit section 34 is placed with its rind 34a facing the plunger 27 and the cut edge or pulp facing the receiving member 20. After placing a glass 12 on the base 10, the user swings the lever 33 in a position to move plunger 27 downwardly. As the plunger 27 moves downwardly, the sharp point 29 engages and penetrates the rind 34a and enters the pulp. Upon further downward movement of the plunger 27, the sharp point 29 depresses the central part of the engaged rind 34a and initiates a turning inside out of the fruit section 34 to present the pulp to the gripping surface 20a of the receiving member 20. The ribs 24 have a relatively sharp edge so as to grip the pulp to remain more even in its distribution over the gripping surface 20a and to prevent slippage as the fruit section 34 turns inside out. A better juice expressing action is thus possible. Further pressure of the plunger 27 on the fruit section 34 squeezes it between the plunger 27 and the receiving member 20 so that a complete expressing of all juice from the fruit section 34 is accomplished. As the juice is expressed from the fruit section 34, it runs through the openings 22 in the receiving member 20 into the space 21 and then runs down the inner surface of the funnel 17 out of the spout l8 into the glass 12.

[13] By swinging the lever 33 in the other direction, the plunger 27 is raised. By reason of the sharp point 29 having penetrated through the rind 34a of the fruit section 34, it will retain the remainder of the fruit section 34 upon the plunger 27 and withdraw the fruit section 34 from the receiving member 20. When the plunger 27 is in its upper position, the remainder of the fruit

DOCUMENT D3

section 34 is easily removed from the sharp point 29 by hand. The juicer, which is especially adapted for both counter use and home use, may be readily disassembled or taken apart for cleaning and then as readily reassembled.

DOCUMENT D3

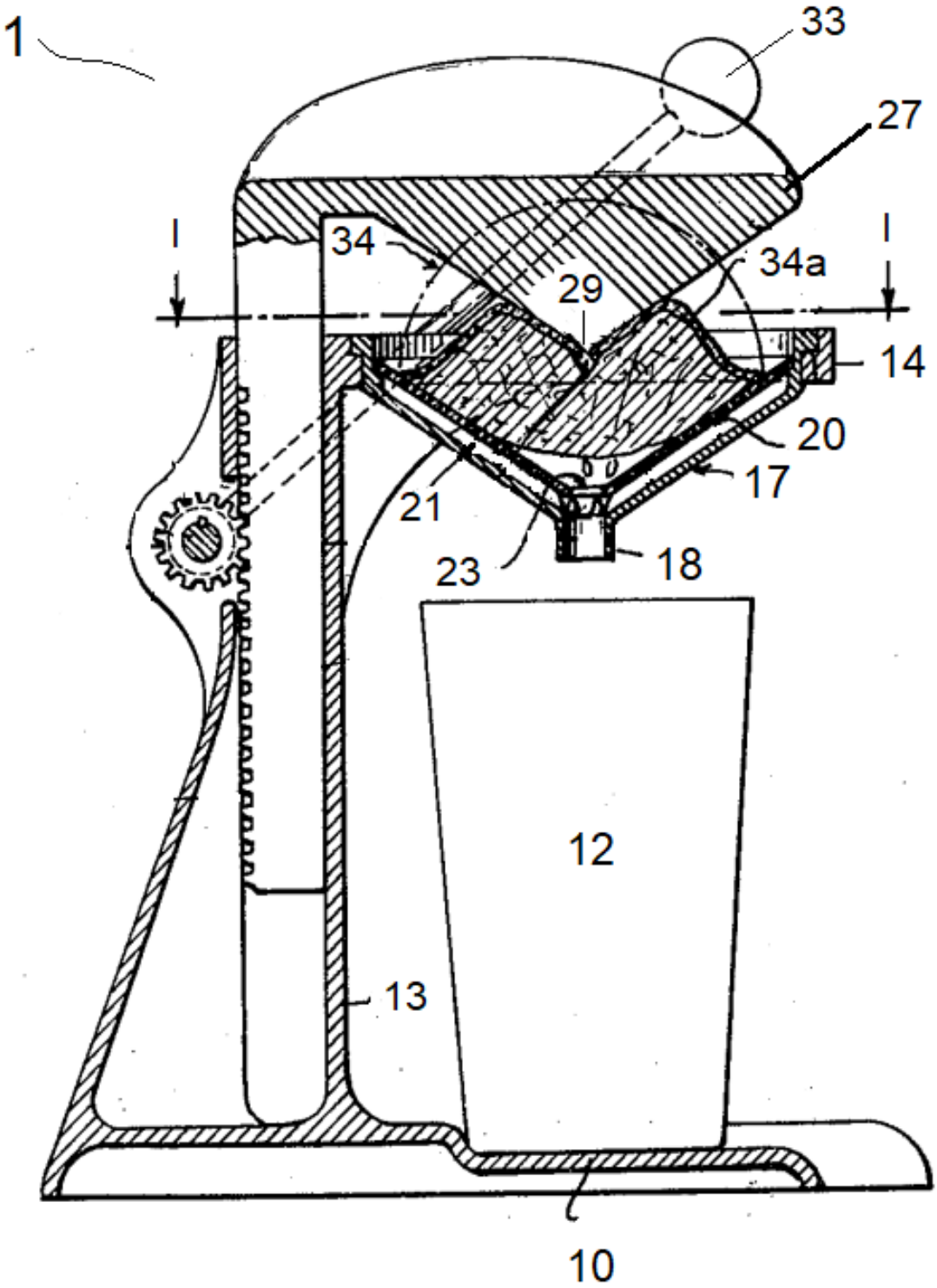


Fig. 1

DOCUMENT D3

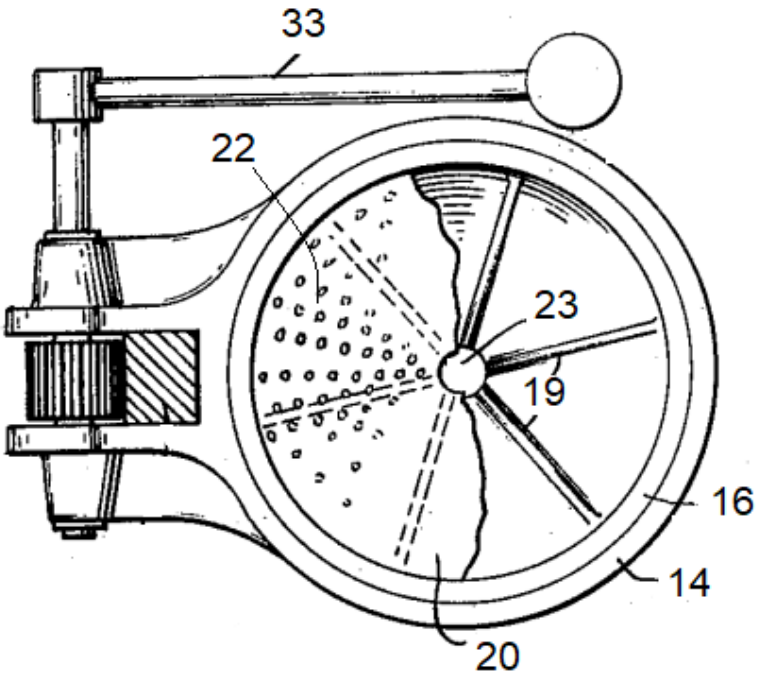


Fig. 2

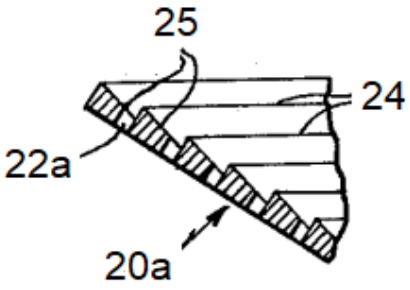


Fig. 3

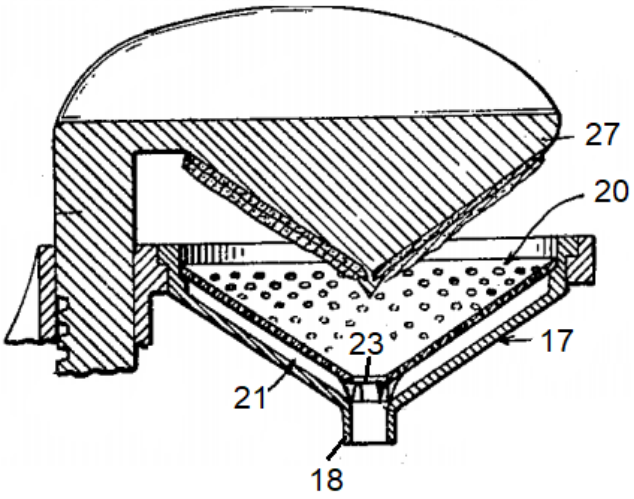


Fig. 4

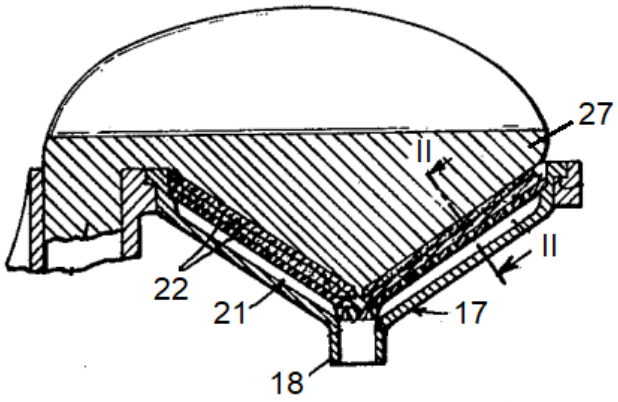


Fig. 5A

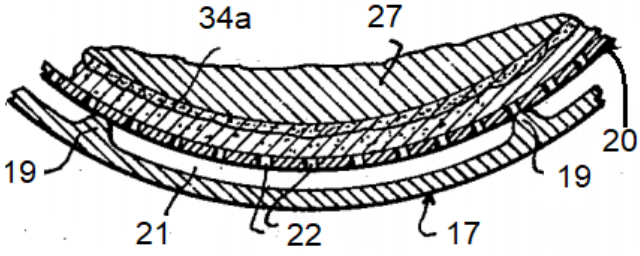


Fig. 5B

* * *

PART B – Short Answer Questions

INSTRUCTIONS TO CANDIDATES

Provide an appropriate response to each question. Do not provide extraneous commentary if not directly relevant to the question. Note that statements of authorities or pertinent law (which may include case law and statutory and regulatory provisions) and analysis are required ONLY when requested.

QUESTION 7: [2.0 marks]

A math professor contacts you to discuss a new method he developed for identifying large prime numbers. This method can be performed using a pen and paper but it is much more practical to use a computer to perform the required calculations. The professor further explains that one of the practical applications of his method is to encrypt messages transmitted across digital networks.

A) Can you help the professor obtain a Canadian patent for his method of identifying large prime numbers? Cite the relevant case law and section of the *Patent Act*.

B) Based on the information provided in the question, does the professor have another option for obtaining a Canadian patent?

QUESTION 8: [2.0 marks]

On November 28, 2019, a representative of ABC Corp. gets in touch with you about the possibility of obtaining a patent for their new product in Canada. You ask them to tell you whether they disclosed the details of their new product to anyone, and the date of any such disclosure. They provide you with the following list.

1. A presentation to potential investors on September 12, 2018, prior to which the investors signed a Non-Disclosure agreement.

2. A promotional video, published on the Internet on December 5, 2018.

3. A training session for ABC Corp.'s sales team, which occurred on August 21, 2018.

A) Do any of these disclosures represent an absolute bar to patentability in Canada if today's date is November 28, 2019? Cite the relevant section of the *Patent Act*.

B) By what date should you file a patent application directed to ABC Corp.'s new product in Canada?

C) The representative of ABC Corp. also tells you that they foresee worldwide demand for their product, and they want to obtain patents in Europe and the United States as well. What advice can you give them in this regard if today's date is November 28, 2019?

QUESTION 9: [2.0 marks]

Your client is being sued for patent infringement by Plaintiff Inc., the owner of Canadian Patent No. 2,XXX,001. The '001 patent only has one claim directed to a process for separating pistachio kernels from their shells. The claimed process includes a step of placing whole pistachios on a shaker table. Your client tells you that from his experience, the process only works properly when the shaker table is operated at a frequency between 300 to 500 cycles per minute. Your client also tells you that he is aware that Plaintiff Inc. recommends to its clients to operate the shaker table at a frequency of 425 cycles per minute. However, neither the description nor the claims of the '001 patent mention a frequency at which the shaker table should be operated.

Identify two grounds of invalidity which are suggested by the above scenario. Cite the relevant sections of the *Patent Act*.

QUESTION 10: [2.0 marks]

You are the patent agent responsible for International Patent Application PCT/CA2017/XXXXX2, filed by a sole inventor, Johnny B. Goode, at the receiving Office on April 15, 2017. No priority claim was made. On March 10, 2020, Mr. Goode provides you with instructions to file a National Phase application in Canada based on PCT/CA2017/XXXXX2. Are you permitted to enter national phase late in Canada? Please explain, assuming regular requirements for national phase entry are met. Cite the relevant sections of the *Patent Rules*.

QUESTION 11: [2.0 marks]

A) Who is eligible for requesting re-examination of a Canadian Patent?

B) What should a request for re-examination of a Canadian Patent include?

QUESTION 12: [2.0 marks]

The validity of a Canadian pharmaceutical patent is challenged in Federal Court for lack of utility. The specific claim under attack covers at least 100 drugs. The patent includes examples directed to ten different drugs that fall within the scope of the claim. The examples include substantive experimental details with respect to making and using the drugs. Name the one main defence to counter the lack of utility attack based on the information provided. Name the three-part test and list the relevant case associated with the test.

QUESTION 13: [5.0 marks]

You receive a Notice of Allowance dated March 2, 2020 from the Canadian Intellectual Property Office for Canadian Patent Application No. 2,XXX,102 and you report the Notice of Allowance to your client (large multi-national company). The due date for payment of the Final Fee is July 2, 2020.

i) The client contacts you on April 10, 2020 and advises that they now have additional claims that they would like to include in the Canadian patent application. List the steps required

to add these new claims and the due date for doing so. Cite the relevant sections of the *Patent Rules*.

ii) The client contacts you on April 10, 2020 and advises that they would like to abandon the application. On July 3, 2020, however, the client changes their mind and contacts you that same day, advising that they now wish for the application to issue. List the steps required to obtain the issued patent and the due date for doing so. Cite the relevant sections of the *Patent Act* and *Patent Rules*.

QUESTION 14: [1.0 mark]

On March 31, 2020, you receive instructions from a US Associate to file a regular Canadian patent application on April 1, 2020. The US associate would like you to claim priority to one or more of the applications listed in A to D below. By letter, please identify from which application(s) you CANNOT claim priority.

A) US provisional patent application filed June 3, 2019.
B) US provisional patent application filed March 1, 2019.
C) US design patent application filed July 15, 2019.
D) European patent application filed April 1, 2019.

QUESTION 15: [2.0 marks]

Which of the following is NOT patentable subject matter in Canada?

A) A claim to a new method of medical treatment
B) A claim to a new use for a known drug
C) A new product claimed as a product by process
D) A new mathematical theorem
E) A new device

END OF QUESTIONS IN PART B

END OF PAPER B

MARKING GUIDE - PAPER B (2020)

PART A

QUESTION 1: [5.0 marks]

a) Name the leading Canadian Supreme Court case pertaining to novelty and obviousness. **[0.5 marks]**

Apotex Inc. v. *Sanofi-Synthelabo Canada Inc.*, 2008 SCC 61, [2008] 3 S.C.R. 265.

b) Evaluate the citability of D1-D3 in view of anticipation and obviousness. Provide reasons why the documents are citable or not and apply all the appropriate sections of the *Patent Act*. **[4.5 marks]**

- **D1** – Third party US patent published before claim date. Citable for anticipation [28.2(1)*(b)*] and obviousness [28.3*(b)*].
- **D2** – Third party US patent published after the claim date of Canadian Patent No. 2,xxx,400. NOT citable for anticipation [28.2(1)*(b)*] and obviousness [28.3*(b)*].
- **D3** – Third party CA patent published before claim date or filed before claim date. Citable for anticipation [28.2(1)*(b)*] or [28.2(1)*(c)*] and obviousness [28.3*(b)*].

QUESTION 2: [12 marks]

Assuming that these elements are essential, construe the following selected claim terms of Canadian Patent No. 2,xxx,400:

a) "concave grating disk" (claims 1, 2, 3, 6) **[2.5 marks]**

- Grating disk 14 is "concave," meaning that the grating disk is curved or converges inwards.
- Concave design allows an increased number of grating members to be stamped onto the grating disk 14 which facilitates more effective grating.

- Concave grating disk 14 can be of a different shape such as a “dish” shape while maintaining the concave profile (i.e., a deeper or shallower dish shape in profile), but not flat.
- “Grating” disk 14 has grating members arranged on the inclined surface for cutting food items.

b) “frustoconically-shaped filter” (claims 1 and 6) **[2.0 marks]**

- Filter 13 is “frustoconical,” meaning in the shape of a truncated cone.
- The filter 13 may be any type of suitable device which removes or filters out the unwanted solids (i.e., fruit or vegetable pulp) from the desired liquids (i.e., fruit or vegetable juice).
- Suitable filters include strainers, screens, sieves, or mesh filters.

c) “grating members” (claims 2 and 6) **[1.5 marks]**

- The grating members may be any slicing items including blades, cutting apertures, perforations, protrusions, graters, cutting edges, sharp ribs, and cutting teeth.
- Example: the grating members are cutting teeth 15 arranged on the inclined surface of the grating disk 14.

d) “food chute” (claims 1, 5, and 6) **[2.0 marks]**

- Food chute 8 is, for example, hollow, cylindrical and relatively large to receive multiple and/or larger food stuffs.
- Food chute 8 may be sized or shaped differently or be disposed at a different orientation with respect to the cover 3, provided the food chute 8 is capable of functioning in the same manner.

e) “anti-rotation member” (claims 6 and 7) **[2.0 marks]**

- Anti-rotation member 9 (FIG. 3) of the food chute 8.
- The shape can vary. Examples: cone-shaped (18 - FIG. 6) or arc-shaped (20 - FIG. 7) protrusion to be received within slot 19, 22 of pusher 11.
- "Anti-rotation" means the inhibition of food stuff rotating around the food chute 8 when the juicer is in use.

f) "pusher configured for insertion into the food chute" (claims 1 and 6) **[2.0 marks]**

- Pusher 11 is sized and shaped for placement into the food chute 8 to force food deep into the food chute 8.
- Pusher 11, for example, has cylindrical body with a large end head and a slot 19 at one side, such that the lower end of the slot 19 has a cone-shape or arc-shape opening to correspond to anti-rotation member (9, 18, 20) when the pusher 11 is fully inserted into the food chute 8.
- Bottom of pusher 11 is, for example, convex-shaped and corresponds to the concave grating disk 14 when the pusher 11 forces the food through the food chute 8 onto the grating disk 14.

QUESTION 3: [26.0 marks]

Are claims 1, 2, 3, 4, and 5 anticipated by any one of D1-D3? Provide detailed supporting arguments and references to the appropriate sections of the documents and figures. In the event that features are repeated in subsequent claims, it is acceptable to refer to analysis in previous claim(s).

Anticipation Breakdown CA '400	**D1 – US '435**	**D3 – CA '631**
Claim 1		
A juicer comprising:	Yes, juicer 10 (Fig. 1)	Yes, juicer 1 (Fig. 1)
a) a lower portion housing a motor assembly;	Yes, motor housing 14 housing motor 50, shaft 50a, clutch hub 42 (Fig. 2).	No, there is no motor in lower portion (base 10/lower portion of stand 13). Juicer is manually operated.

b) an upper portion mounted above the lower portion and comprising a **spout**;	Yes, upper housing 16 mounted above motor housing 14 and has spout 18 (Figs. 1, 2).	Yes, flange 14 or funnel 17 is mounted above lower portion (base 10) and has spout 18 (Figs, 1, 4, 5A).
c) an extraction assembly housed in the upper portion and	Yes, grating disk 34 and filter 36 are housed in upper housing 16 (Fig. 2).	Yes, receiving member 20 seats on flange 14 within funnel 17 (Figs. 1, 4, 5).
rotatably coupled to the motor assembly,	Yes, grating disk 34 and filter 36 are rotatably coupled to the motor 50 through shaft 50a and clutch hub 42 (Fig. 2).	No, there is no motor. Juicer is manually operated.
the extraction assembly comprising a **concave grating disk** and	No, grating disk 34 is not concave, but a flat plate (Fig. 3).	Yes, receiving member 20 is a concave grating disk (Figs. 1, 3) with sharp annular ribs 24 for grating.
a **frustoconically-shaped filter**;	Yes, filter 36 is frustoconically-shaped (Fig. 3).	Yes, receiving member 20 is frustoconically-shaped and acts as a strainer (Figs. 1, 4, 5).
d) a top cover mounted on the upper portion and integrated with a **food chute** for receiving food;	Yes, lid 28 mounted on upper housing 16, and has integral food chute 12 (Figs. 1, 2, 4).	No top cover. No food chute. Receiving member 20 receives food but is not a food chute.
e) a pusher configured for insertion into the food chute for forcing the food towards the extraction assembly; and	Yes, pusher 30 configured in the shape of the food chute 12 to enable its insertion (Figs. 2, 5).	No, plunger 27 configured in the shape of the receiving member 20 to enable its insertion (Fig. 5A) but receiving member 20 is not a "food chute".
f) a pulp bin proximate to the lower portion;	Yes, pulp bin 24 is proximate to the motor housing 14 (Fig. 1).	No pulp bin. Food residue is retained by the sharp point 29 of the plunger 27.
wherein activation of the motor assembly rotates the extraction assembly to extract juice from the food.	Yes, grating disk 34 and filter 36 are rotatably coupled to the motor 50 through shaft 50a and clutch hub 42 (Fig. 2). Grating disk 34 cuts food and juice passes through filter 36.	No, there is no motor. Juicer is manually operated by lever 33 to move plunger 27 into receiving member 20 to turn fruit section 34 inside out. Fruit section 34 is squeezed between plunger 27 and receiving member 20 to extract juice.

Enablement + Conclusion	No, with support	No, with support
	[9.0 marks]	**[7.0 marks]**
Claim 2 (dep on 1)		
The juicer of claim 1, wherein the concave grating disk comprises **grating members** arranged in rows along an inclined surface of the concave grating disk.	No, grating disk 34 has grating members in the form of cutters 34b and toothed blades 34c arranged in rows, but grating disk 34 is a flat plate (Fig. 3).	Yes, receiving member 20 has grating members in the form of sharp ribs 24 which are arranged in a tiered fashion along gripping surface 20a which is inclined (Fig. 3).
Enablement + Conclusion	No, with support	No, with support
	[1.5 marks]	**[1.5 marks]**
Claim 3 (dep on 2)		
The juicer of claim 2, wherein within each row along the inclined surface, beginning from a center of the concave grating disk, **each grating member sits at a higher elevation than a preceding grating member.**	No, grating disk 34 has grating members in the form of cutters 34b and toothed blades 34c arranged in rows beginning from a center of the grating disk 34, but sitting at the same elevation since grating disk 34 is a flat plate.	Yes, receiving member 20 has grating members in the form of sharp ribs 24 which are arranged in a tiered fashion (e.g. rows) beginning from a center, along gripping surface 20a which is inclined **[0.5]**. Each rib 24 sits above a preceding rib 24 (Fig. 3).
Enablement + Conclusion	No, with support	No, with support
	[1.5 marks]	**[1.5 marks]**
Claim 4 (dep on 1)		
The juicer of claim 2, wherein the pusher comprises **one or more projections** on a bottom surface to facilitate juice extraction.	Yes, pusher 30 has protrusions 30c for gripping food to facilitate juice extraction (Fig. 5).	Yes, plunger 27 has a sharp point 29 which engages and penetrates rind 34a of fruit section 34 to position it for juice extraction (Fig. 1).
Enablement + Conclusion	No, with support	No, with support
	[1.0 mark]	**[1.0 mark]**
Claim 5 (dep on 4)		

The juicer according to claim 4, wherein the food chute has a diameter of three inches.	No, food chute 12 is no greater than two inches in diameter to receive fruits and vegetables which have been chopped into small chunks (paragraph 8).	No food chute-receiving member 20 has a diameter of five inches to accommodate citrus fruit (paragraph 9).
Enablement + Conclusion	No, with support	No, with support
	[1.0 mark]	**[1.0 mark]**

QUESTION 4: [31.0 marks]

Is claim 6 obvious in view of D1-D3? Provide detailed supporting arguments, apply the appropriate test from the case law, and refer to the appropriate sections of the documents and figures.

A) POSITA and CGK **[1.0 mark]**

(i) Person skilled in art

- engineer or designer experienced in manufacture of small kitchen appliances (e.g., Sam). (A restaurant chef or kitchen worker is not the person skilled in the art (e.g., Kate)).

(ii) Common general knowledge

- person skilled in the art would be familiar with small kitchen appliances for household use for extracting juice from fruits and vegetables. Examples of various types of juicers include centrifugal force juicers, masticating juicers, twin gear juicers, and hydraulic juice presses.

B) Inventive concept **[10.0 marks]**

Inventive concept is a combination of the following features:

a) Concave Grating Disk

- The grating disk is concave-shaped. The concave design allows increased number of grating members to be placed onto the grating disk, thus promoting improved grating.

- The concave grating disk has grating members arranged into rows on the inclined surface. In the center area of the concave grating disk, there may be (a) a straight blade or (b) cutting teeth or a combination of both. The center blade and cutting teeth grate the core of certain types of fruits and vegetables.

- The concave design induces efficient grating action, thus ensuring that the motor does not easily stall during grating.

- Downward pushing of the food inside the food chute pushes the food towards the disk center, thereby promoting complete grating by the grating members.

- The improved grating also discourages large lumps of food from being flung into the filter, preventing violent vibration and shaking.

- With improved grating, the juicer operates at a lower rpm with reduced noise and vibration during the juicing process.

b) Enlarged Food Chute with Anti-Rotation Member

- The food chute is enlarged, having a large diameter to accommodate larger amounts and sizes of foods, either whole or cut into a suitable size.

- The food chute is configured at a bottom end with an anti-rotation member partially along an axial direction, thereby causing minimal obstruction of the passage of food through the food chute.

- The anti-rotation member is able to inhibit rotation of food within the food chute, thereby reducing noise and vibration emanating from the juicer.

- The food chute may have different types of anti-rotation protrusions. Examples include a cone-shaped protrusion and an arc-shaped protrusion. Neither of these two anti-rotation protrusions has a knife-edge, and is therefore safer for the user to handle and is less prone to breakage.

c) Pusher

- The pusher is configured for insertion into the food chute for forcing the food towards the extraction assembly.

- The pusher comprises a slot configured to receive the anti-rotation member, and having a convex bottom to fit flush with the concave grating disk, when the pusher is fully inserted into the food chute. This design further facilitates placing force against the food onto the concave grating disk.

C) Differences **[4.0 marks]**

- D1 **[2.5 marks]**
  - i) No concave grating disk.
  - ii) No grating members arranged in rows along an inclined surface of the concave grating disk.
  - iii) No enlarged food chute.
  - iv) No anti-rotation member partially along the axial direction.
  - v) No convex bottom on pusher.

- D3 **[1.5 marks]**
  - i) No food chute.
  - ii) No anti-rotation member.
  - iii) No motor assembly.

D) Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require a degree of inventiveness? **[16.0 marks]**

a) Not obvious in view of D1 alone [5.0 marks]

i) No concave grating disk. Grating disk 34 is a flat plate which rests in line with the edge of the filter.

ii) No grating members arranged in rows along an inclined surface of the concave grating disk. Grating disk 34 has grating members in the form of cutters 34b and toothed blades 34c on a flat surface.

iii) No enlarged food chute. The food chute 12 is no greater than two inches in diameter to receive fruits and vegetables which must be chopped into small pieces.

iv) No anti-rotation member partially along the axial direction. Food chute 12 has an anti-rotation member in the form of knife-edge 12a extending the entire length of the food chute 12.

v) No convex bottom on pusher. Pusher has a flat bottom corresponding with the flat grating disk.

b) Not obvious in view of D3 alone [3.0 marks]

i) No food chute. The receiving member of D3 receives food.

ii) No anti-rotation member. D3 teaches only a manual press juicer devoid of any grating disk which rotates to grate food. The receiving member does not rotate, but includes a gripping surface with annular ribs and grooves. The annular ribs form a set of rings to grip the fruit to keep it from slipping when being pressed. The juicer applies to only citrus fruit, which needs to be sliced in half.

iii) No motor assembly. The juicer is manually operated.

c) Not obvious when combining D1 and D3 [7.0 marks]

- **Not obvious to combine centrifugal juicer of D1 with manual juice press of D3.**

- D3 is believed non-analogous to electrical juicers of D1 with high speed rotating grating disks by disclosing a manual juice press for squeezing juice out of fruit with no rotation at all. Although the sharp annular ribs cut into the pulp of the fruit section when the plunger is lowered into the receiving member, the ribs predominantly serve to grip the fruit to keep it from slipping when being pressed.

- One skilled in the art would not combine the annular ribs of D3 with the teachings of D1 since the annular ribs of D3 are meant to grip the fruit section to keep it from slipping when being pressed. This would essentially make the juicer of D1 ineffective since the flat grating disk in D1 rotates against the food, and thereby must fundamentally rotate and move against the food to grate it in D1. There is no suggestion or motivation to combine D1 and D3 since to prevent rotation (i.e. so that the fruit does not slip) would leave the electrical centrifugal juicer of D1 inoperable.

- D1 has no concave grating disk. Grating disk 34 is a flat plate which rests in line with the edge of the filter and rotates about the shaft 50a (i.e. in a plane perpendicular to the shaft). In D3, the receiving member 20 with sharp annular ribs cut into the pulp of the fruit section in an axial direction, without rotation, when the plunger is lowered. Therefore, there is no suggestion or motivation to combine D1 and D3 due to the disparate nature of the motions. Due to the different manner in which the food is handled within each type of juicer, one would not combine the rotatable flat grating disk of D1 with the non-rotatable concave receiving member of D3.

E) Conclusion: Not obvious **[1.0 mark]**

QUESTION 5: [4.0 marks]

Apart from issues related to D1-D3, identify and briefly explain **two** potential issues that may affect the validity of Canadian Patent No. 2,xxx,400.

- Issue of whether proper inventors have been named – Kate provided "ideas" for improvements. If she knew and advised how to reduce her idea to a "practical shape" and the improvement was claimed in the patent, then Kate's contribution to the invention would

justify adding her name as a co-inventor. Vero is not an inventor and should not have been named as an inventor.

- Issue of ownership – Although he was on his lunch breaks, Sam invented the invention using company resources (i.e., company's machine shop) while he was employed as an engineer at Cuisine Appliances, Inc.

QUESTION 6: [2.0 marks]

Assuming Vero replaced the pop machine with a juicer on May 1, 2015, identify and briefly explain **one** potential issue that may affect the validity of Canadian Patent No. 2,xxx,400 filed on May 30, 2016. Cite the relevant section of the *Patent Act*.

- Issue of public disclosure – The invention was disclosed before the one-year period immediately preceding the filing date in such a manner that the subject-matter became available to the public in Canada or elsewhere (Section 28.2(1)(*a*)).

END OF QUESTIONS IN PART A

PART B – Short Answer Questions

QUESTION 7: [2.0 marks]

A math professor contacts you to discuss a new method he developed for identifying large prime numbers. This method can be performed using a pen and paper but it is much more practical to use a computer to perform the required calculations. The professor further explains that one of the practical applications of his method is to encrypt messages transmitted across digital networks.

A) Can you help the professor obtain a Canadian patent for his method of identifying large prime numbers? Cite the relevant case law and section of the *Patent Act*.

B) Based on the information provided in the question, does the professor have another option for obtaining a Canadian patent?

ANSWER TO QUESTION 7: [2.0 marks]

A) No, the method of identifying large prime numbers is not patentable pursuant to Section 27(8) of the Patent Act, as it is a "mere scientific principle or abstract theorem". If the method can be performed by a pen and paper (or mental steps), none of the essential elements fall within a category of statutory subject matter (*Amazon.com Inc.* v. *Canada (Commissioner of Patents)* 2011 FCA 328 or *Amazon.com Inc.* v. *Canada (Commissioner of Patents)* 2010 FC 1011.

B) It may be possible to obtain a patent for a method of encrypting messages transmitted across digital networks which uses the method for identifying large prime numbers.

QUESTION 8: [2.0 marks]

On November 28, 2019, a representative of ABC Corp. gets in touch with you about the possibility of obtaining a patent for their new product in Canada. You ask them to tell you whether they disclosed the details of their new product to anyone, and the date of any such disclosure. They provide you with the following list.

1. A presentation to potential investors on September 12, 2018, prior to which the investors signed a Non-Disclosure agreement.
2. A promotional video, published on the Internet on December 5, 2018.
3. A training session for ABC Corp.'s sales team, which occurred on August 21, 2018.

A) Do any of these disclosures represent an absolute bar to patentability in Canada if today's date is November 28, 2019? Cite the relevant section of the *Patent Act*.

B) By what date should you file a patent application directed to ABC Corp.'s new product in Canada?

C) The representative of ABC Corp. also tells you that they foresee worldwide demand for their product, and they want to obtain patents in Europe and the United States as well. What advice can you give them in this regard if today's date is November 28, 2019?

ANSWER TO QUESTION 8: [2.0 marks]

A) None of the disclosures are a bar to patentability in Canada (Section 28.2(1)(a) of the *Patent Act*).

B) The patent application should be filed on or before December 5, 2019 to stay within the grace period.

C) The publication of the promotional video prevents obtaining a European patent, but does not prevent obtaining a U.S. patent if filed by December 5, 2019.

QUESTION 9: [2.0 marks]

Your client is being sued for patent infringement by Plaintiff Inc., the owner of Canadian Patent No. 2,XXX,001. The '001 patent only has one claim directed to a process for separating pistachio kernels from their shells. The claimed process includes a step of placing whole pistachios on a shaker table. Your client tells you that from his experience, the process only works properly when

the shaker table is operated at a frequency between 300 to 500 cycles per minute. Your client also tells you that he is aware that Plaintiff Inc. recommends to its clients to operate the shaker table at a frequency of 425 cycles per minute. However, neither the description nor the claims of the '001 patent mention a frequency at which the shaker table should be operated.

Identify **two** grounds of invalidity which are suggested by the above scenario. Cite the relevant sections of the *Patent Act*.

ANSWER TO QUESTION 9: [2.0 marks]

Lack of utility – Section 2 of the *Patent Act*

Insufficient disclosure – Section 27(3) of the *Patent Act*

Overbreadth – Section 27(4) of the *Patent Act*

QUESTION 10: [2.0 marks]

You are the patent agent responsible for International Patent Application PCT/CA2017/XXXXX2, filed by a sole inventor, Johnny B. Goode, at the receiving Office on April 15, 2017. No priority claim was made. On March 10, 2020, Mr. Goode provides you with instructions to file a National Phase application in Canada based on PCT/CA2017/XXXXX2. Are you permitted to enter national phase late in Canada? Please explain, assuming regular requirements for national phase entry are met. Cite the relevant sections of the *Patent Rules*.

ANSWER TO QUESTION 10: [2.0 marks]

Yes, pay the fee for reinstatement of rights set out in item 22 of Schedule 2 (i.e. $200). Section 154(3) and 210(3).

QUESTION 11: [2.0 marks]

A) Who is eligible for requesting re-examination of a Canadian Patent?

B) What should a request for re-examination of a Canadian Patent include?

ANSWER TO QUESTION 11: [2.0 marks]

A) Any person may request re-examination.
B) Prior art, prescribed fee, and a statement regarding the pertinency of the prior art.

QUESTION 12: [2.0 marks]

The validity of a Canadian pharmaceutical patent is challenged in Federal Court for lack of utility. The specific claim under attack covers at least 100 drugs. The patent includes examples directed to ten different drugs that fall within the scope of the claim. The examples include substantive experimental details with respect to making and using the drugs. Name the one main defence to counter the lack of utility attack based on the information provided. Name the three-part test and list the relevant case associated with the test.

ANSWER TO QUESTION 12: [2.0 marks]

- **Sound Prediction**

1) Factual basis for the prediction

2) An articulable and "sound" line of reasoning

3) Sufficient disclosure

- **Apotex Inc. v Wellcome Foundation Ltd., [2002] 4 S.C.R. 153**

QUESTION 13: [5.0 marks]

You receive a Notice of Allowance dated March 2, 2020 from the Canadian Intellectual Property Office for Canadian Patent Application No. 2,XXX,102 and you report the Notice of Allowance to your client (large multi-national company). The due date for payment of the Final Fee is July 2, 2020.

i) The client contacts you on April 10, 2020 and advises that they now have additional claims that they would like to include in the Canadian patent application. List the steps required to add these new claims and the due date for doing so. Cite the relevant sections of the *Patent Rules*.

ii) The client contacts you on April 10, 2020 and advises that they would like to abandon the application. On July 3, 2020, however, the client changes their mind and contacts you that same day, advising that they now wish for the application to issue. List the steps required to obtain the issued patent and the due date for doing so. Cite the relevant sections of the *Patent Act* and *Patent Rules*.

ANSWER TO QUESTION 13: [5.0 marks]

i) 1) Request withdrawal of the Notice of Allowance (Subsection 86(17) of the *Patent Rules)*.

2) Pay the $400 withdrawal fee (item 14 of Schedule 2 of the *Patent Rules*) no later than four months after it was sent, and before the day on which the final fee is paid.

3) The application is now subject to further examination and a Voluntary Amendment can be filed to add the new claims.

ii) 1) Request reinstatement for failure to pay the final fee by July 2, 2020 (Section 73(3) of the Patent Act and Subsections 87(1), 133(1), and 135(1)(a) of the *Patent Rules) and does not depend on showing of due care*.

2) Pay the $300 final fee (item 13 of Schedule 2 of the *Patent Rules*) and pay the $200 reinstatement fee (item 15 of Schedule 2 of the *Patent Rules*) by July 2, 2021.

QUESTION 14: [1.0 mark]

On March 31, 2020, you receive instructions from a US Associate to file a regular Canadian patent application on April 1, 2020. The US associate would like you to claim priority to one or more of the applications listed in A to D below. By letter, please identify from which application(s) you CANNOT claim priority.

A) US provisional patent application filed June 3, 2019.
B) US provisional patent application filed March 1, 2019.
C) US design patent application filed July 15, 2019.
D) European patent application filed April 1, 2019.

ANSWER TO QUESTION 14: [1.0 mark]

B, C

QUESTION 15: [2.0 marks]

Which of the following is NOT patentable subject matter in Canada?

A) A claim to a new method of medical treatment

B) A claim to a new use for a known drug

C) A new product claimed as a product by process

D) A new mathematical theorem

E) A new device

ANSWER TO QUESTION 15: [2.0 marks]

A and D

END OF QUESTIONS IN PART B

CANADIAN PATENT AGENT QUALIFYING EXAMINATION

2020

PAPER C - PATENT OFFICE PRACTICE

This examination is four (**4**) hours in length.

This examination is composed of two parts:

Part A, comprising question C1 (**70** marks); and

Part B, comprising questions C2 to C17 (**30** marks).

For Part A, you will be evaluated on the following:

Dealing correctly with all issues; and

Appropriate statutory/regulatory citations.

For Part B, you will be rated on the correctness and clarity of the answers.

Please pay attention to organization and neatness in your answers.

PART A: Question C1 (70 marks)

C1. You are the patent agent responsible for the prosecution of Canadian patent application no. 2,XXX,999. You are provided with the following documents:

1. A copy of the patent examiner's office action dated 23 October 2020.
2. A copy of application 2,XXX,999 that is the object of the office action.
3. A copy of each of the prior art references cited in the office action. Although these references are based on actual documents, please note that they have been altered for the purposes of this examination.
4. A supplemental copy of the claims of the application.

Instructions to Candidates

Respond to the situation above by providing a response to the office action, including:

(i) a set of claims drafted with due consideration to their allowability and the rights of your client; marks will be deducted for any unnecessary limitations in independent claim(s) [33 marks including 24 marks for claim 1 and 9 marks for other claim amendments];

(ii) a discussion of the cited art indicating how the anticipation [6 marks] and obviousness [6 marks] defects have been overcome; and an indication where support is derived for any claim amendments [2 marks]; and

(iii) a specific response to each of the other defects raised in the office action, including a statement explaining the nature thereof and how it corrects each of the noted defects. It is not required to physically amend the description. [23 marks]

23 October 2020 (23-10-2020)

RAY AGENT
ipmail@ra.com

Application No.:	**2,XXX,999**
Owner:	BETTER PACKAGING INC.
Title:	**NEW CONTAINER**
Classification:	B65D 81/00 (2006.01)
Your File No.:	**WXYZ-000**
Examiner:	P. Latraverse

YOU ARE HEREBY NOTIFIED OF A REQUISITION BY THE EXAMINER IN ACCORDANCE WITH SUBSECTION 86(2) OF THE PATENT RULES. IN ORDER TO AVOID ABANDONMENT UNDER PARAGRAPH 73(1)(*a*) OF THE *PATENT ACT*, A WRITTEN REPLY MUST BE RECEIVED WITHIN THE **FOUR (4)** MONTH PERIOD AFTER THE ABOVE DATE.

This application has been examined as originally fied.

The number of claims in this application is 10.

Documents Cited:

D1:	US 6,962,111	GARDINER	8 November 2005 (08-11-2005)
D2:	US 2007/0196222	MANSFIELD	23 August 2007 (23-08-2007)

The examiner has identified the following defects in the application:

Novelty

Claims 1, 3, 4, 6, and 9 encompass subject-matter that was disclosed in D1 before the claim date and do not comply with paragraph 28.2(1)(b) of the *Patent Act.*

Regarding claim 1, D1 discloses a plastic food container comprising a lid (11) and a base (10), the lid and base each having a peripheral rim (14, 15); the lid rim adapted for closing engagement with the base rim (via 16, 17); the lid rim and base rim when in closed engagement forming an interior of the container, wherein the lid rim and base rim are configured to permit air to enter the container to enable the cross-flow of air underneath food contents (par. 28, 44, 45); the base comprising a floor, the floor having at least one channel (13a) formed therein; the lid (11) including a top surface and one or more outermost side surfaces, wherein the lid comprises a plurality of exhaust vents (22; Figs. 1-3).

Regarding claim 3, D1 discloses the lid includes a contour and the plurality of exhaust vents on the lid are disposed on the lid so that they follow the contour of the lid shape (see Fig. 3).

Regarding claim 4, D1 discloses wherein the exhaust vents disposed on the lid are formed so that they direct rising gases and vapours outward in relation to the outermost side surfaces of the lid (par. 28, 47).

Regarding claim 6, D1 discloses wherein the lid is hinged (12) to the base.

Regarding claim 9, D1 discloses that the container is formed of a polyethylene or polyethylene terephthalate material (par. 46).

Obviousness

Claims 2, 7, and 8 do not comply with section 28.3 of the *Patent Act.* These claims are directed to subject-matter that would have been obvious at the claim date to a person skilled in the art or science to which it pertains having regard to D1 in view of common general knowledge. The additional features defined in these claims represent only minor constructional changes and/or mere design choices which would be within the ability of a person skilled in the art. The defined combination of features does not produce an unexpected result. The subject-matter of claims 2, 7 and 8 is therefore considered obvious.

Claim 5 does not comply with section 28.3 of the *Patent Act.* This claim is directed to subject-matter that would have been obvious at the claim date to a person skilled in the art or science to which it pertains having regard to D1 in view of D2. D1 discloses all of the features of the claim except the peripheral rim of the lid comprising at least two sealing projections, the peripheral rim of the base having a channel and when the lid and base are in the closed arrangement the at least two sealing projections of the lid rim are engaged by the channel in the peripheral rim of the base. D2 discloses a rigid domed food container comprising a lid with a peripheral rim (31) which comprises at least two sealing projections, and a base with a peripheral rim (33) comprising a channel; when the lid and base are in the closed arrangement, the at least two sealing projections of the lid rim are engaged by the channel in the peripheral rim of the base, in order to provide a tight seal between the lid and the base (Figs. 1, 6, 9; par. 31). Thus these features are known design features as shown by D2 and would have been obvious to incorporate into the container of D1.

Desired Result

Claim 1 does not comply with section 60 of the *Patent Rules*. The limitation “wherein the lid rim and base rim allow air to enter the container to enable the cross-flow of air underneath food contents” is directed to the desired result rather than to the combination necessary to achieve that result as described in the description.

Lack of Support

Claim 8 is not fully supported by the description and does not comply with section 60 of the *Patent Rules*. There is no support in the description for the container lid comprising between six and sixteen vents.

Other Defects in the claims

Claim 1 is indefinite and does not comply with subsection 27(4) of the *Patent Act*. This claim is missing the structure or relationship between the lid rim and the base rim allowing for air to enter

the container to enable the cross-flow of air underneath food contents, thus causing the design of the container to be unclear.

Claim 1 is indefinite and does not comply with subsection 27(4) of the *Patent Act*. It is unclear where on the lid the exhaust vents are disposed since the lid comprises a top surface and one or more outermost side surfaces.

Claim 4 is indefinite and does not comply with subsection 27(4) of the *Patent Act*. The preamble of claim 4 does not match the preamble of the claim to which it refers.

Claim 5 is a dependent claim that refers to more than one claim not in the alternative and does not comply with subsection 63(3) of the *Patent Rules*. A preamble such as “according to any one of claims”, would make it clear that the above claim depends upon each claim in the alternative only.

Claim 6 is indefinite and does not comply with subsection 27(4) of the *Patent Act*. The elements “lid” and “base” are defined with indefinite articles, causing a lack of clarity as to whether they are intended to refer to the same elements previously defined in the claims or an additional element thereto.

Claim 7 is a dependent claim that does not refer to a preceding claim by number and does not comply with section 63 of the *Patent Rules*.

Claim 8 is a dependent claim that does not include all of the limitations contained in the claim to which it refers, and does not comply with subsection 63(4) of the *Patent Rules*. Specifically, the number of vents defined in claim 8 is broader than the number of vents defined in claim 2, on which it depends.

Claim 9 is indefinite and does not comply with subsection 27(4) of the *Patent Act*. Uncommon abbreviations should be fully defined on their first occurrence in a claim. The abbreviations “PE”, “PP”, “PVC” and “PET” should be defined as “polyethylene”, “polypropylene”, “polyvinyl chloride” and “polyethylene terephthalate”, respectively.

Claim 9 is indefinite and does not comply with subsection 27(4) of the *Patent Act*. The term “or” before the last element of the list of materials causes a lack of clarity as it is not clear whether the last element is part of the group or represents an alternative to the group (see section 16.11 of the *Manual of Patent Office Practice*).

Claim 10 unnecessarily refers to the description and drawings and does not comply with subsection 62(1) of the *Patent Rules*. Features of the invention should not, unless required, rely on references to the description or drawings. The technical features being defined can be described in words and, as such, reference to the description and drawings is not required.

Defects in the title and description

The title of the invention is not precise and does not comply with paragraph 56(1)(a) of the *Patent Rules*. In addition, a title shall not include words such as “new”.

The description uses reference to the claims to teach the nature of the invention and does not comply with subsection 27(3) of the *Patent Act*. Statements such as those found at paragraph 11

do not correctly describe the invention and should be removed.

The description includes reference to a document that is not fully identified and does not comply with subsection 57(3) of the *Patent Rules*. The patent document referred to in paragraph 8 should be identified by **country** and either patent or publication number.

In view of the foregoing defects, the applicant is requisitioned, under subsection 86(2) of the *Patent Rules*, to amend the application in order to comply with the *Patent Act* and the *Patent Rules* or to provide arguments as to why the application does comply.

Under section 102 of the *Patent Rules*, any amendment made in response to this requisition must be accompanied by a statement explaining the purpose of the amendment and identifying the differences between the new page and the replaced page.

P. Latraverse
Patent Examiner
819-555-4213

(21) **CA 2,XXX,999**

(12) APPLICATION FOR CANADIAN PATENT

(54) TITLE: NEW CONTAINER
(86) FILING DATE: 2015/02/26
(87) PUBLICATION DATE: 2016/08/26
(51) INT. CL.: B65D 81/00
(71) APPLICANT: BETTER PACKAGING INC.
(72) INVENTOR: DOWNIE, G.

TITLE OF THE INVENTION

NEW CONTAINER

ABSTRACT

A plastic food container for crisp or crunchy foods includes a lid adapted for sealing arrangement with a base. Exhaust vents are selectively disposed on the top surface of the container, such that when the container is closed, rising vapours in the container easily flow out of the container. The convection movement of rising hot vapours causes the induction of ambient air into the container through a first air intake port and a counterpart air intake port disposed between the two engaged rims. The first intake port and its counterpart allow inducted air to enter directly and horizontally into the container. One or more channels are formed in the floor of the base and are aligned with a line defined by the first intake port and its counterpart to allow for the cross flow of drier inducted air underneath the container's food contents.

FIELD OF INVENTION

[0001] This invention relates generally to ventilated plastic food containers. The invention is more specifically related to disposable plastic food containers designed to hold heated or freshly-cooked crisp, crunchy or texture-sensitive foods that require significant amounts of humidity removal.

BACKGROUND OF THE INVENTION

[0002] It is known to use disposable plastic containers in the food preparation and restaurant industry to package prepared or take-out foods. The typical food container of the prior art consists of a clear or solid color base and a clear lid. The clear lid of the prior art plastic food container allows visible inspection of the container contents. The lid and base of the prior art plastic food container may be separate articles or may be hingedly attached to each other.

[0003] The lid and base of the prior art plastic container have complementary interlocking rim structures that seal the container. This interlocking rim arrangement is beneficial in preventing

spillage of food contents from the container. In addition, this interlocking rim arrangement promotes heat build-up inside the container during microwaving and retains the temperature of hot foods placed in the container. When warm foods are placed in a closed container, steam and condensation can develop inside the container. This is particularly so when the container with warm food is placed into a storage area at room temperature or less. Steam and condensation may also form inside a container holding food when the container is stored in an environment where external heat is applied to it (for example through microwaving, heat plates, heat lamps, warming tunnels, etc.). The build up of condensation and steam inside the container can result in the over-moistening of the contained food. This build up is particularly unwanted in the case of any food of sensitive texture, especially crisp or crunchy foods. In addition, undesirable food moistening is exacerbated when condensation drips down onto the food contents. In extreme cases, the condensate may pool at the bottom of the container leaving desirably crisp foods (e.g., vegetables) or crunchy foods (e.g., fried chicken or fried seafood) unpalatably soggy.

[0004] In the case of supermarket fried chicken (or seafood) for example, the supermarket prepares the fried chicken in its deli department, resulting in a cooked food product having a temperature of about 190 degrees Fahrenheit. After cooking, the hot fried chicken is placed into the container. The container may be sold immediately. If not, the container containing the fried chicken is typically placed in a heated display area and made available for sale as a "hot" food item for up to 4 hours. In the prior art container, the heat from the hot chicken builds up in the container and, in turn, causes moisture build-up in the container. As a consequence to this moisture build-up, the fried chicken's crisp battered coating becomes soggy.

[0005] The solution to preventing over-moistening of cooked food, however, is not simply a case of providing unregulated venting. In the first respect, unregulated venting allows the food to dry out and over-harden. More importantly, in addition to palatability concerns, containers for cooked foods must address safety issues. If the container is vented too much, the temperature of the fried chicken can drop below the minimum temperature required by health departments or good food serving practice. These same concerns hold true for other establishments like restaurants and with respect to other texture sensitive foods like unbreaded cooked crab that can degrade if heat and moisture are not properly removed from the container:

[0006] In order to maintain the crispness of food contents within a closed container, it is known to provide the prior art food container with exhaust ventilation means. In this regard, the lid of the prior art plastic food container typically contains one or two surface vents in the form of cruciate slits. The cruciate slits form near-circular tabs that can be deformed upward to permit egress of steam formed inside the container. The one or two slits are located on the surface of the container lid, not in relation to other venting structures of the container, but instead in a manner that detracts least from the aesthetic appeal of the container. Though these slits assist in the exhaust venting of steam gases from the container, moisture build-up inside the container still occurs.

[0007] In the case of microwavable storage containers (as opposed to deli case containers) manufacturers have chosen to deal with removal of moisture damaging steam by constructing container rims whereby the lid rim can assume two different positions on the base rim. One

position keeps the container sealed. The other position allows exhaust venting. In the case of these latter containers, the sealed lid assumes a second fixed exhaust venting position on the base either through manual repositioning or by the lifting action of rising pressure inside the container. Once the lid is in the fixed exhaust venting position, steam can escape the container by flowing along and between the contour of the rim structures and out through the container. The contour of these rim structures can require egressing steam to undergo flow restricting direction changes (including direction reversals). The drawback to these exhaust venting solutions is that they still result in the creation of interior vapours and condensation in the container, particularly in the case of the self-activating lid. Also, because air must flow around the contour of rims, these containers promote only the egress of air out of the container and do not allow drying air into the container.

[0008] Patent No. 6,257,401 discloses a thermoplastic container for food with a cover that is removably attached to the base to define a food storage chamber. A downwardly extending rib formed in the cover rim is intermittently provided with a plurality of notches that are aligned with respective notches formed in an upwardly extending elongated rib of the base. With the cover in place atop the base, the conjunction of the base notches and the cover notches define apertures. However, as is best shown in FIG. 11 of that patent, the notches of the lid rim and base rim are offset, such that air flow into the container is directed upward toward the upper apertures of the lid. Another set of apertures for additional ventilation are provided in the side walls of the cover.

[0009] Because of the venting drawbacks of the prior art container with respect to desirably crisp or crunchy foods, container manufacturers have designed containers having textured surface grids on the container floor that keep the food contents raised above pooled food juices or condensate. These grids can create pooling areas that collect the condensate and juices. The container of U.S. Patent No. 6,257,401 includes a plurality of small wells in the container bottom, the function of which is to purposefully retain food juices via capillary action or surface tension. These solutions, however, do not completely remedy the creation of food-damaging steam and fluids inside the container. In fact, they can make it worse. In particular, the condensate and juices may drip into and pool in the wells of the container's floor grid and be retained. This pooled liquid absorbs heat and creates rising steam that infuses the lower portion of the container's food contents with texture damaging moisture.

[0010] There is thus a need in the art for a plastic food container that reduces steam creation and enhances container venting to prevent over-moistening of desirably crisp or crunchy foods.

SUMMARY OF THE INVENTION

[0011] The invention as defined in claim 1 is a plastic food container comprising a lid and a base, the lid and base each having a peripheral rim; the lid rim adapted for closing engagement with the base rim; the lid rim and base rim when in closed engagement forming an interior of the container, wherein the lid rim and base rim allow air to enter the container to enable the cross-flow of air underneath food contents; the base comprising a floor, the floor having at least one

channel formed therein; the lid including a top surface and one or more outermost side surfaces, wherein the lid comprises a plurality exhaust vents.

[0012] The present invention comprises a plastic food container including a lid and a base. The lid and base each have a peripheral rim. The lid rim is adapted for sealing engagement with the base rim. When the container is sealed with hot food contents, the heat load created by the food causes the moisture laden air to rise and exit through selectively positioned and numbered exhaust vents in the top surface of the container lid. In this regard, the top surface exhaust vents are numbered and positioned in relation to the expected temperature and humidity of the container's contents. The convection movement of warm moist air upwardly in the container and through the top surface exhaust vents causes the induction of air through the intra-rim intake ports hereinafter described.

[0013] It is a further feature of the present invention container that the lid rim and base rim when in closed engagement form at least one first intake port disposed between the two rims. To achieve optimum balanced venting and eliminate humidity dead zones in the container, each first intake port has a counterpart intake port disposed between the two rims. Additionally, the first intake port and its counterpart intake port are oriented such as to permit air to enter, directly and generally horizontally, into the container through them and not encounter obstructing rim structures or have to change directions or angles while traveling through the rims.

[0014] The first intake port and its counterpart intake port define a line inside the container. The container's floor can have at least one channel formed in it, which is aligned with the line defined by the first intake port and its counterpart intake port. By aligning the floor channels with at least one intake port, a cross flow of inducted ambient air is allowed whereby the container promotes the flow of relatively drier air under the container's food contents. This flow of air not only helps evaporate collected condensate and food juices, it removes the vapour away from the underside of the food content, preventing its damaging absorption. The container floor may comprise channels aligned with two or more sets of intake ports.

[0015] In more specific summary, the present invention plastic food container comprises a lid adapted for sealing arrangement with a base. The lid has a peripheral rim structure that complementarily engages the peripheral rim structure of the base. The base has a floor and a sidewall extending between the floor and the rim. In contrast to prior art containers utilizing through-the-rim exhaust or intake venting, it is a feature of the present invention that when the lid is fully closed to the base, the mating rim structures create at least two intake ports that allow generally horizontal and direct (unrestricted) flow of air into the container through the closed rims. Preferably, each intake port is located on the rim in opposing relationship to another intake port. Hence, each intake port is located such that it is across from another intake port on the other side of the container. The positioning of the intake ports allows for the cross-flow of air through the container.

[0016] In the preferred embodiment, the rim structure of the lid has a channel shaped to receive spaced apart projections on the base rim structure. When the lid is closed to the base, the channel

of the lid rim structure receives the projections on the base rim structure. The height of the projections emanating from the base rim structure prevents the lid flange from sealing completely against the base flange. As a result, when the lid is fully engaged to the base, the spaces between the base rim projections create rim air intake ports.

[0017] The present invention container further comprises elevated (preferably embossed) projecting ribs from the base floor. These ribs create one or more channels on the container floor that compared to the prior art are specifically aligned with a line defined by at least two intake ports located within the engaging container rims. These ribs and channels provide for several beneficial effects. First, as in the case with the grid or textured surface of the prior art container, the ribs keep the food contents elevated from the base floor and away from collecting liquids. However, in combination with the intake ports, the aligned channels act like baffles and allow for the free passage of gases and vapours underneath the food contents. Thus, should pooled liquids in the container start steaming, the channels of the present invention container allow for the evacuation of steam out through the top surface exhaust vents in the lid instead of into the food. In addition, by virtue of their alignment with the intake ports, the channels of the present invention container allow for the end-to-end cross flow of moisture-removing air underneath the container's food contents in the event a pressure differential exists between the ends of the channels. This arrangement not only enhances the removal of pooled moisture, but also aids in drying of the bottom of the food contents. Thus, the convective movement of warm air inside the container causes induction of air through the rim intake ports. That air, being relatively cooler than the existing vaporous air inside the container, drops to the floor of the container. This drop is effected, in part, by the generally horizontal (not upwardly angled) orientation of the rim intake ports. Once the cool, dry air reaches the container floor, it flows as guided by the channels. Thus, the intake ports along with the aligned one or more channels allow the direct, unimpeded flow of relatively dry air to enter into the container from the intake ports and pass under the food contents. While passing under the food contents, heat is transferred from the food contents to the incoming air. That heated air rises, scavenging moisture from the existing air in the container as it rises.

[0018] To further enhance the convection flow in the container, the preferred embodiment container includes a plurality of exhaust vents disposed about the top surface of the container lid and not along any of the lid's outermost side surfaces. This arrangement of top-surface-only vents removes the dead-air effect caused by having apertures on the side of the lid in close proximity to the rim intake ports. By removing this dead-air effect, convection in the container is enhanced. In addition, by removing the vents from the extreme side of the lid by the intake ports, rising air in the container does not intercept the inducted air from the intake ports and push it out of the container.

[0019] While the invention is susceptible to various modifications and alternative forms, a specific embodiment thereof has been shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that it is not intended to limit the invention to the particular forms disclosed. Quite to the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the scope of the invention as defined by the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] FIG. 1 is a perspective view of a preferred embodiment of the present invention container in the open arrangement.

[0021] FIG. 2 is a perspective view of a preferred embodiment of the present invention container in the closed arrangement.

[0022] FIG. 3 is a plan view of the present invention container in the open arrangement.

[0023] FIG. 4 is a cross-section view taken along line A-A of FIG. 3.

[0024] FIG. 5 is a side elevation view of a preferred embodiment present invention container in the closed arrangement.

[0025] FIG. 6 is a perspective view of the inside of the base of a preferred embodiment present invention container.

[0026] FIG. 7 is a perspective view of the inside of the lid of a preferred embodiment present invention container.

[0027] FIG. 8 is a side elevation view of the lid of a preferred embodiment present invention container.

[0028] FIG. 9 is a side elevation view of the base of a preferred embodiment present invention container.

[0029] FIG. 10 is an enlarged view of detail area Z of FIG. 4.

[0030] FIG. 11 is an enlarged view of detail area Y of FIG. 4.

DETAILED DESCRIPTION

[0031] A preferred embodiment container **10** of the present invention in the open and closed arrangement is shown in FIGS. 1 and 2. In practical use, the outer surface of floor **31** of base **25** will normally rest upon a surface (such as a table top) considered horizontal in reference to the user. Thus, the directional terms "vertical" and "horizontal" and the like are used to describe the container **10** and its components with respect to the orientation illustrated in FIG. 2 and are employed merely for the purposes of clarity and illustration. For example, in the orientation shown in FIG. 2, lid **11** of closed container is spaced "vertically" from the base **25**. The directional terms "inner," "outer," and the like are used herein with respect to the described container to refer to directions along the directional component toward and away from the geometric center of the container.

[0032] Container **10** is preferably thermoformed. As shown by the figures, container **10** is composed of lid **11** and base **25**. Lid **11** includes top surface **12**, descending surface (sidewall) **19** and multi-segment rim **14**. Lid **11** and base **25** are manufactured from a conventional plastic material. Lid **11** is preferably clear. Top surface **12** may include levels or features of varying height, but is preferably flat. It may also be contoured and have ribs **16** in accordance with the prior art to enhance such factors as container volume, strength, nesting of multiple lids, stackability of closed containers and see-through visibility. In the preferred embodiment, lid top surface **12** includes top plateau **15**. Sidewall **19** extends from top surface **12** to horizontal segment **17** and may include ribs **13** for strength. Horizontal segment **17** extends from sidewall **19** to vertical inner wall **18**. Sidewall **19** preferably includes ribs **7** for strength and, in the depicted preferred embodiment, represents an outermost side surface of the lid.

[0033] The structure of preferred embodiment lid rim **14** will now be discussed in further detail. As best shown in FIG. 10, lid rim **14** includes peripherally projecting segment **20**, which extends between inner wall **18** and outer wall **21**, creating channel **23**. The cross-section profile of segment **20** is generally horizontal. The profile, however, can be shaped to include structure such as ribbing, curves or bends to modulate rim rigidity or flexibility so as to enhance the closing, sealing and opening functions of the rim as needed. The drawings depict a preferred embodiment cross-section profile of this peripherally projecting segment. As viewed in FIG. 10 outer wall **21** extends downwardly between peripherally projecting segment **20** and peripheral flange **22**. Outer wall **21** is preferably angled to frictionally engage projection **35** further described below.

[0034] The structure of preferred embodiment rim structure **30** of base **25** is best shown in FIG. **11**. Base **25** includes a bottom-most level or floor **31** adjoined to sidewall **32**. Sidewall **32** extends between base floor **31** and multi-segment rim **30**. Sidewall **32** preferably includes ribs **41** for strength. The structure of base rim **30** is adapted to complementarily engage the structure of lid rim **14** when lid **11** and base **25** are placed in sealing arrangement. In this respect, the lower portion of base rim **30** includes sidewall-to-rim transition segment **33**. Transition segment **33** flares outwardly from the top of sidewall **32** and curves upwardly into base shelf **34**. Base shelf **34** extends outwardly from base **25** and curves upwardly to form sealing projection **35**. Preferred embodiment container **10** has at least two sealing projections **35**. As viewed in FIG. 11, sealing projection **35** comprises outer vertical segment **36** and inner ascending segment **37**. Top sealing segment **38** spans between segments **36** and **37**. Peripheral flange **42** extends outwardly from segment **36**.

[0035] As shown in FIG. 9, projections **35** are located at spaced apart intervals on shelf **34** so as to create base rim gaps **39** between two adjacent projections. Each base rim gap **39** is preferably located so as to geometrically oppose a counterpart base rim gap **39** located on the container. For example, in the disclosed embodiment square container depicted in FIG. 1, base rim gaps **39** are disposed in opposing relationship on each pair of parallel container sides. Lid rim structure **14** preferably contains similar projections **26** located on horizontal segment **17**. Projections **26** are complementarily located on rim structure **14** such that they align with and frictionally contact projections **35** when lid **11** is closed to base **25**. Projections **26** serve to buttress projections **35**

and keep lid **11** from twisting about base **25**. Lid rim gaps **27** are disposed between projections **26** on lid rim **14**. In addition, by frictionally engaging projections **35**, projections **26** make the engagement between lid **11** and base **25** stronger. As shown in the drawings, the height of projections **35** emanating from the base rim structure prevents lid flange **22** from sealing completely against base flange **42**. As a result, when the lid is fully engaged to the base, projections **35** of base rim **30** are engaged by channel **23** and projections **26** of lid rim **14**. However, the height of engaged projections **35** is such that flange **22** and flange **42** do not meet when the lid is engaged by the base. In this regard, when the container is closed, one or more lid rim gaps **27** between projections **26** of the lid align both vertically and horizontally with a base rim gap **39** of the base rim. Hence, base rim gaps **39** between the base rim projections are now roofed by rim **14** and create at least two rim intake ports **40** that allow air to directly enter the container generally horizontally.

[0036] In carrying out the invention it is not important which rim, lid or base, is provided with the projections **35** or the engaging channel **23**. Accordingly, in another embodiment, base rim **30** could be provided with channel **23** and lid rim **14** could be provided with projections **35**. In fact, other rim engaging methods could be used as long as the sealing rim structures of the lid and base create intake ports **40** when the rims are in sealing arrangement.

[0037] When the lid rim and base rim are in sealing arrangement, the container comprises at least one set of counterpart intake ports **40** (a first intake port and a first counterpart intake port). More specifically, in the present invention container, the lid rim and base rim when in closed engagement form at least one first set of intake ports disposed between the two rims. In addition, it is a feature of the invention that each first intake port has at least one first counterpart intake port disposed between the two rims. In contrast to prior art containers, the intake ports of the present invention allow air to flow directly through the rims of the container and not travel a serpentine course through rim structure. In addition, in comparison to prior art containers, the intake ports of the present invention allow air to flow directly into the container in a generally horizontal manner without having to travel an angled path. Hence, in the present invention, intake ports **40** are not angled toward the container top.

[0038] The at least one first intake port and its one or more first counterpart intake ports are disposed between the two rims such as to permit air to enter the container through an intake port, cross at least a portion of the interior of the container under the food contents and then, as it warms, rise and exit the container through the exhaust vents in the top surface of the lid. For balanced moisture removal, each first intake port **40** is located in the engaged rims **14**, **30** and has at least one first counterpart intake port **40** similarly located in the engaged rims **14**, **30**. In the shown preferred embodiment container, each first intake port **40** is located on the closed container such that it geometrically opposes (is perpendicularly across from) one counterpart intake port **40** on the other side of the container. This arrangement enables the cross-flow of air underneath food contents throughout the entire container in the case of a pressure differential between the ends of the one or more channels. The invention thus allows drier air to flow into the container through an intake port **40**, under the container contents and out through the exhaust vents **28** in the top surface of the lid. Though the depicted embodiment container shows an intake

port **40** to have only one counterpart intake port **40**, an intake port **40** may have more than one counterpart intake port **40**.

[0039] Floor **31** includes two or more ribs **50** and may have alternating levels or elevations for strength and fluid control. To further enhance food crispness, floor **31** of base **25** comprises ribs **50** in floor recess **51**. Floor recess **51** is a preferred embodiment feature. Ribs **50** project upward from floor recess **51**. Spaced apart elongated ribs **50** are aligned with the line defined by at least one set of counterpart intake ports **40** and form at least one channel **55**. The one or more channels **55** act as flow paths for the relatively drier air inducted into the container through intake ports **40**. In this regard, the formation of aligned channels **55** on floor **31** differs from the prior art container with floor bottoms provided with grids, wells or other structural features intended to capture and retain liquid. These structural floor elements, though useful in preventing sloshing of liquids or keeping food raised above pooled liquids, serve as barriers to air flow underneath the container's food contents.

[0040] In the depicted preferred embodiment, the one or more channels **55** are lengthwise centered along one dimension of the floor and extend substantially across the length of the floor. Further, recess **51** is formed in floor **31** so as to guide incoming air to the channels and allow incoming air to fan (branch) out to the multiple channels disposed in it. The at least one channel **55** is oriented such that it extends in the direction of one set of counterpart intake ports **40** and thus the sides of the channel act like interior baffles. In the disclosed embodiment, the container depicts six channels **55** aligned with intake ports **40** disposed on the ends of the container. By virtue of being oriented in this fashion, channel **55** allows steam gases that may form from pooled liquid to rise and be conveyed away from food contents by convection, thus reducing the over-moistening of the bottom of food. Additionally, by virtue of the intake ports **40**, drier air may flow into intake ports **40** and around and under the container contents. Specifically, by virtue of the baffle effect of channel **55**, drier air entering into the container through an intake port **40** may flow under food contents and exit out through top surface exhaust vents **28**. In an alternative embodiment, floor **31** could comprise a plurality of channels **55**, at least two of which are aligned in two different directions so as to provide channels that align with more than one set of counterpart intake ports **40**. Additionally, in the preferred embodiment, floor **31** includes textured surface platforms **52**. Platforms **52** are embossed (raised) above the interior surface of floor **31** (and thus substantially higher than the surface of recess **51**). By virtue of this arrangement, food contents are lifted off the surface of floor **31** and the drier air entering the container from the intake ports **40** can more easily flow under the food contents and into the one or more channels **55**.

[0041] The terms "opposing," "opposed" or "opposite" as used herein to describe the location of the base rim gaps **39** or intake ports **40** means that the gaps or portals are oriented to allow the flow of ventilation into the container through one port, through a certain length or width of the interior of the container and then toward at least one other intake port. Hence, in the depicted rectangular container embodiment, a first intake port **40** is situated on one side of the container and a counterpart intake port **40** is located across the container on the opposing parallel side of the container. In this case, the at least one other counterpart intake port **40** would be preferably, but not necessarily, located perpendicularly across from the first intake port **40**. Similarly, with a

round container, the set of counterpart intake ports **40** would be preferably, but not necessarily, diametrically across from each other. Variations in the locations of counterpart ports **40** (and gaps **39**) and the alignment of the floor ribs **50** and channel **55** may be made such that air only flows through a portion of the container and not its entire width or length. For example, in a rectangular container the intake ports **40** could be located on adjacent sides of the container to promote the diagonal flow of cross ventilation. The cross flow of ventilation in such an embodiment would be enhanced by having one or more diagonally oriented floor channels **55** aligned with the intake ports. Additionally, each intake port **40** preferably has at least one counterpart intake port **40** to achieve cross flow ventilation. Thus, an intake port **40** could have more than one counterpart intake port **40**.

[0042] As shown in FIG. 2, to further enhance the convection flow in the container, the lid of the preferred embodiment container includes a plurality of exhaust vents **28** disposed about the top surface **12** of the container lid. For optimum convection movement in the container, it is critical that exhaust vents **28** be disposed and arranged on the top surface **12** of the container and not on any of the outermost side surfaces of the lid. Otherwise, the inductive action on intake ports **40** is lessened or the inducted air may not have an opportunity to drop to the container floor before being pushed out by convection forces. At the same time, to enhance convective movement inside the container it is preferable that the plurality of exhaust vents **28** on the top surface **12** of the lid be disposed away from the lid center so that they follow the contour (as viewed from overhead) of the lid shape. In the depicted embodiment shown in FIG. 2, an exemplary number and arrangement of surface exhaust vents is shown on an approximately 9" x 8" rectangular container. Tests on this exemplary embodiment show that the optimum convection movement in the container occurs with a plurality of 14 exhaust vents disposed in the shown pattern about the periphery of the top surface of the lid and located within the range of 1" to 1 1/4" (measured from the front edge of the vent) from the nearest outer edge of the top surface of the container. For most food service applications (side dish sized containers to entrée sized containers) a plurality of at least 8 top surface exhaust vents **28** works well, with the range of 8 to 14 vents (cruciate slit type) showing optimum results. As shown in FIG. 2, it is further preferable that exhaust vents **28** be disposed so that they direct rising gases and vapours outward in relation to the container's outermost exterior side surfaces. This arrangement of exhaust vents on the lid top surface and the absence of vents on the outermost side surfaces of the lid removes the dead-air effect caused by having apertures on the side of the lid in close proximity to (particularly above) the rim gaps. By removing this dead-air effect, convection in the container is enhanced.

[0043] A container constructed in accordance with the present invention can be manufactured in a variety of shapes and sizes, and is preferably formed of resins or plastic materials including, but not limited to, polyethylene (PE), polypropylene (PP), polyvinyl chloride (PVC) or polyethylene terephthalate (PET). The container lid and base can be transparent or translucent, and may be colored in either instance. The size and number of intake and exhaust vents can be varied to accommodate the food heating environment or the requirements of the food placed in the container. The container can be made by a variety of processes including thermoforming, vacuum forming, blow molding, extrusion molding or injection molding. Further, the container can be of any shape, including round or polygonal. The lid and base of the container may be separate

articles or may include the depicted hinge such that the lid and base are connected to each other in a clamshell configuration.

[0044] Having described the invention in detail, those skilled in the art will appreciate that modifications may be made of the invention without departing from its scope. Therefore, it is not intended that the scope of the invention be limited to the specific embodiment illustrated and described.

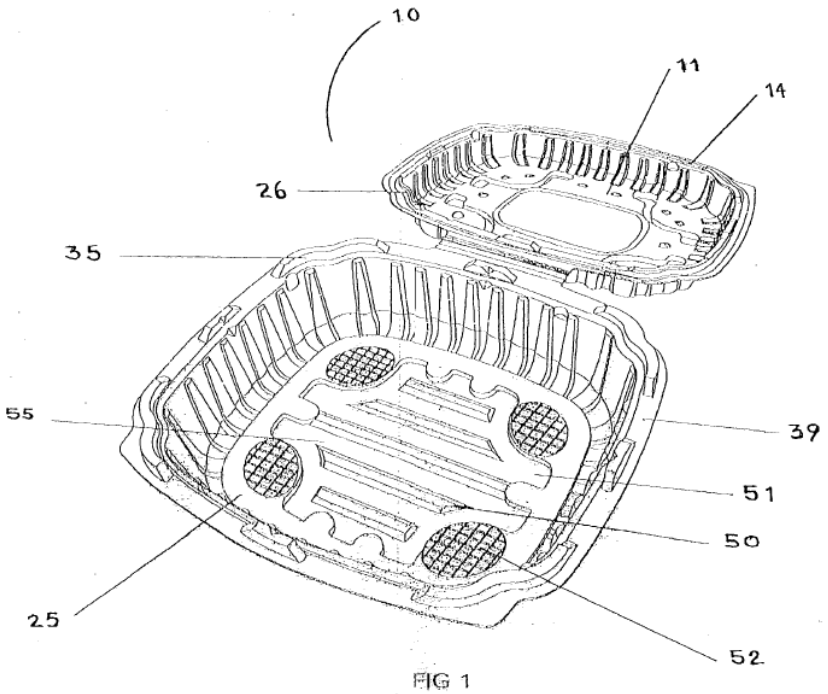


FIG 1

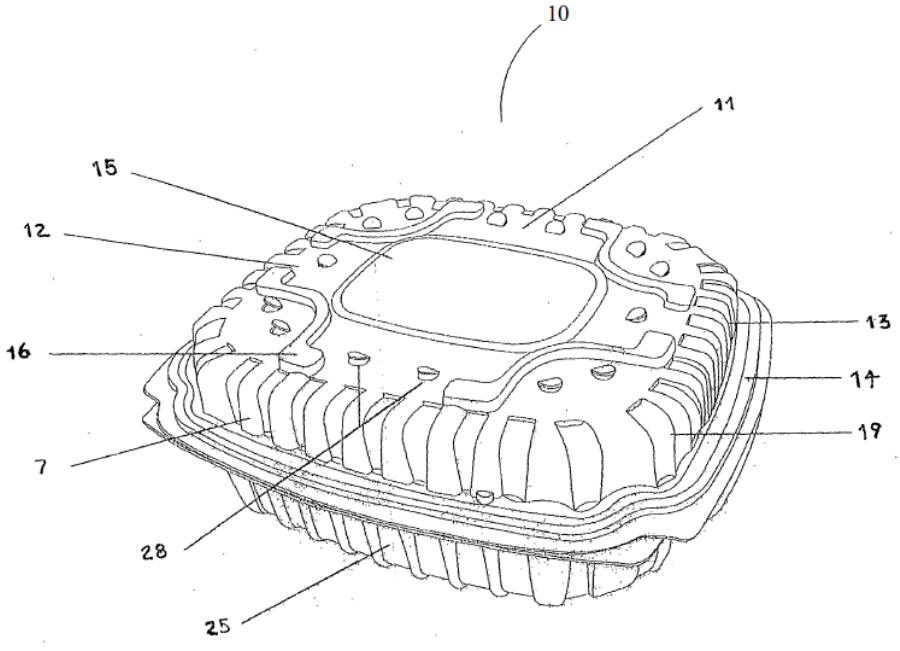
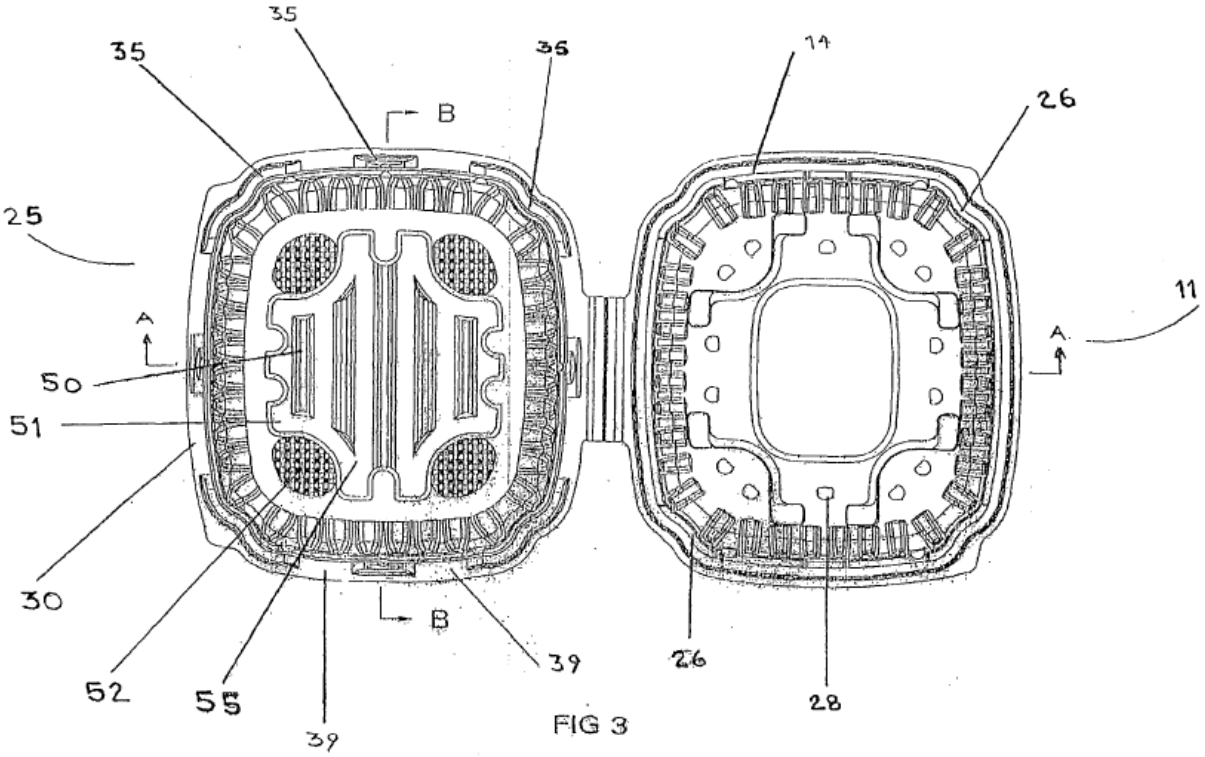


FIG 2


35
35
36
14
26
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A
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51
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FIG 3

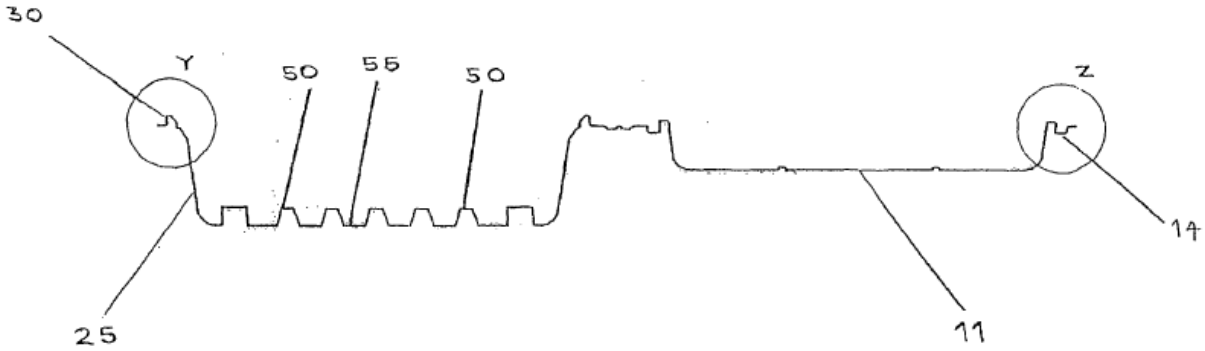
30
Y
50
55
50
Z
14
25
11

FIG 4

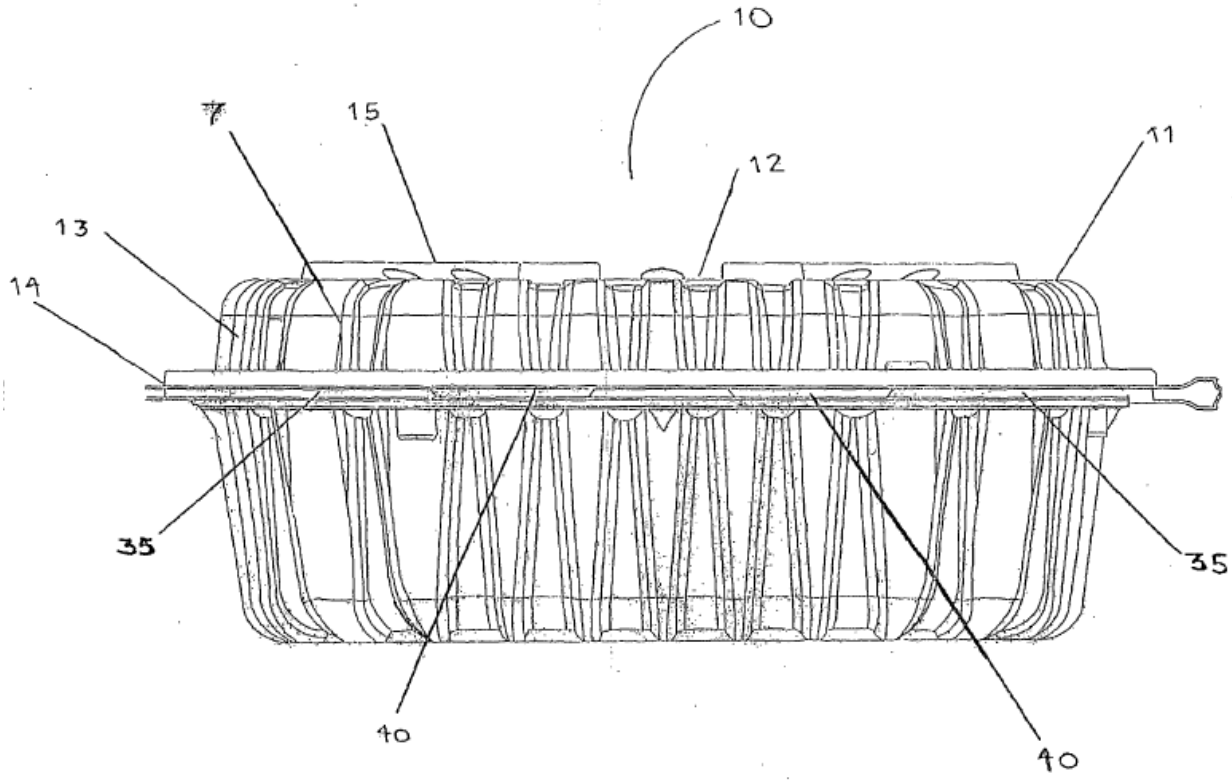

FIG 5

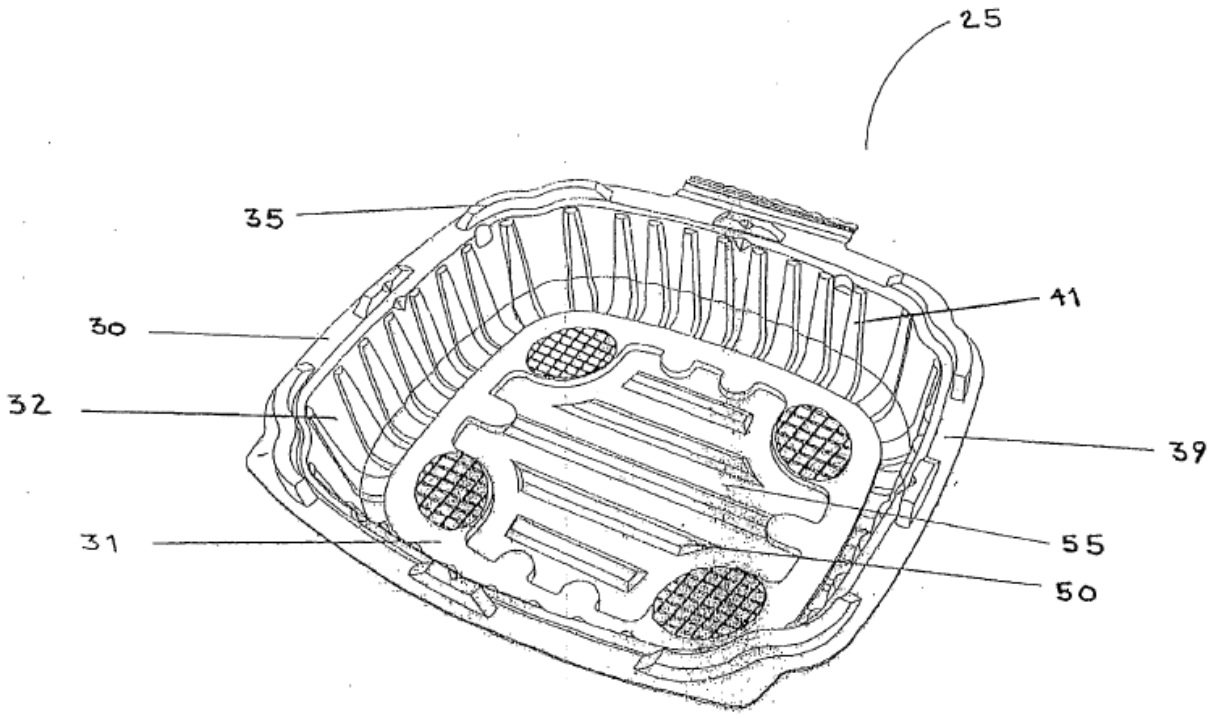

FIG 6

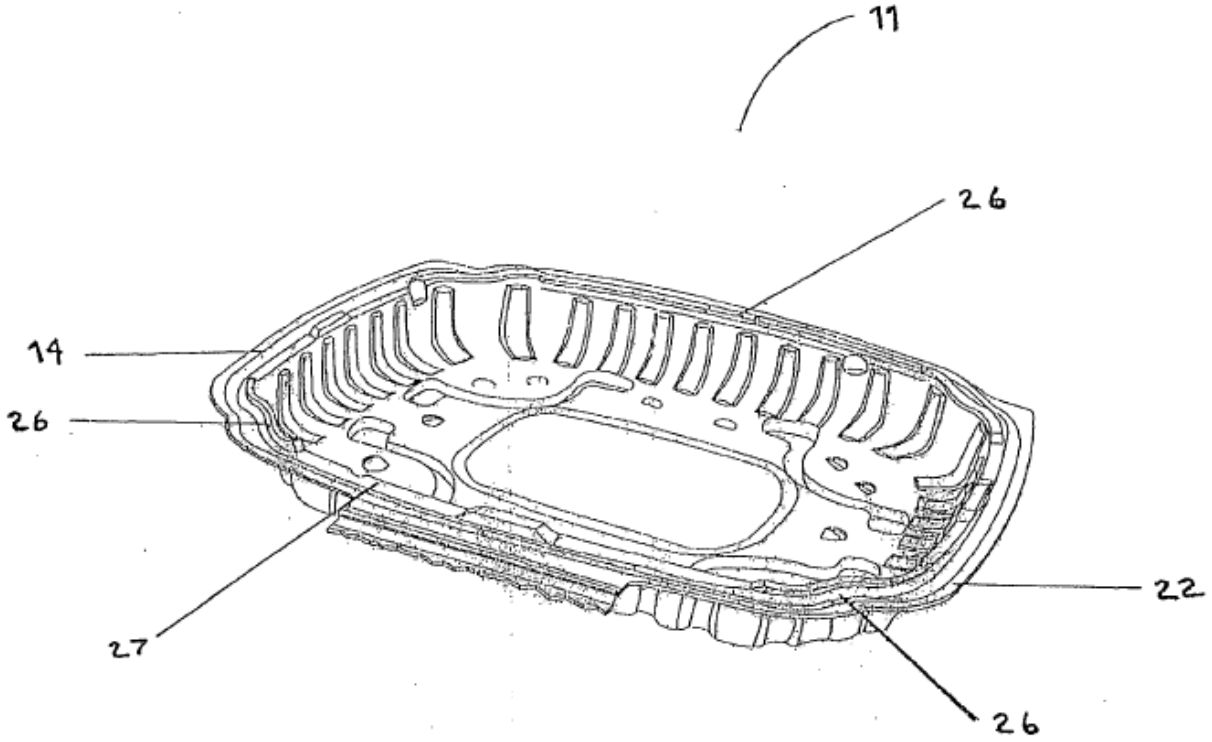

FIG 7

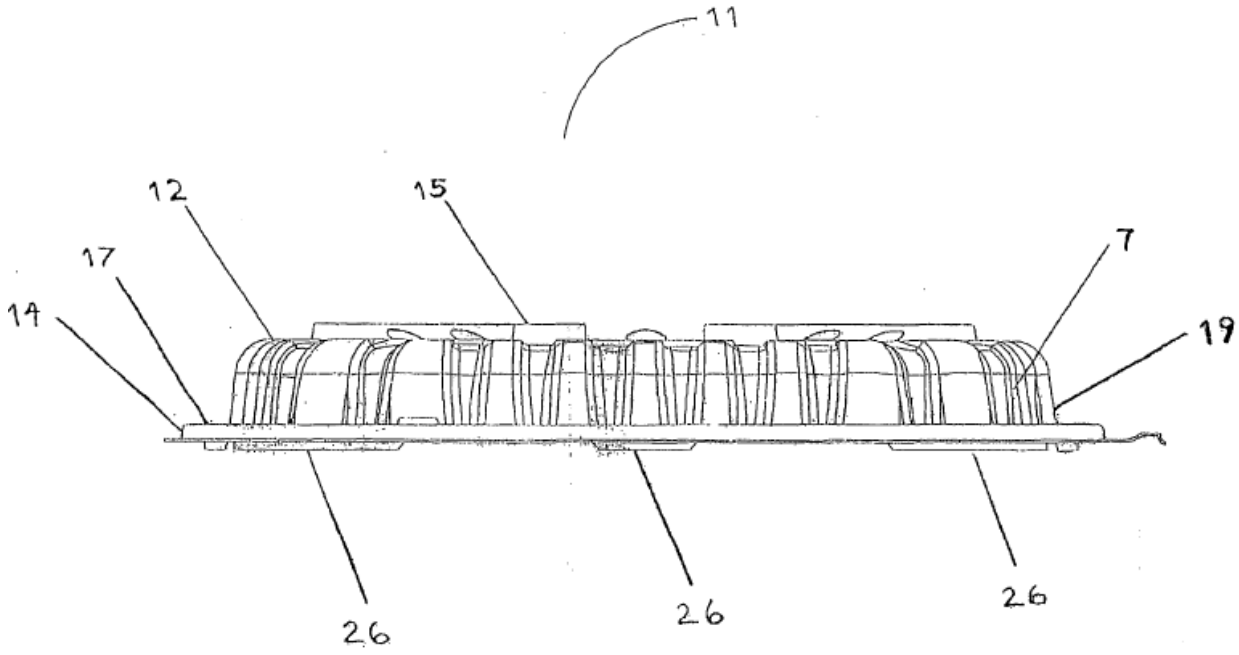

FIG 8

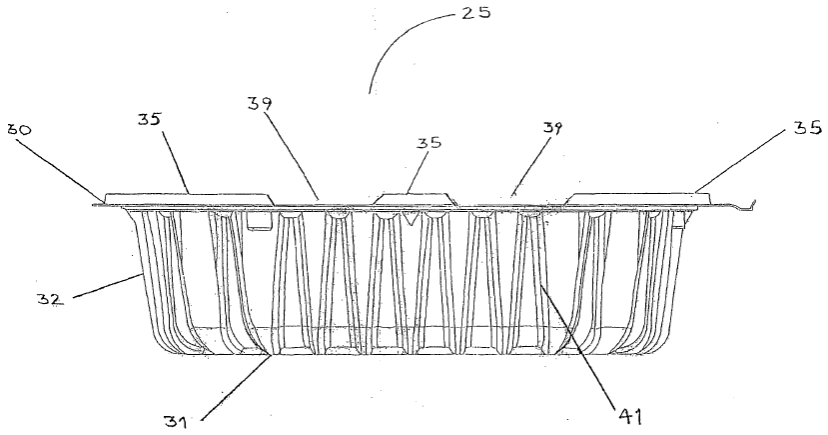

FIG 9

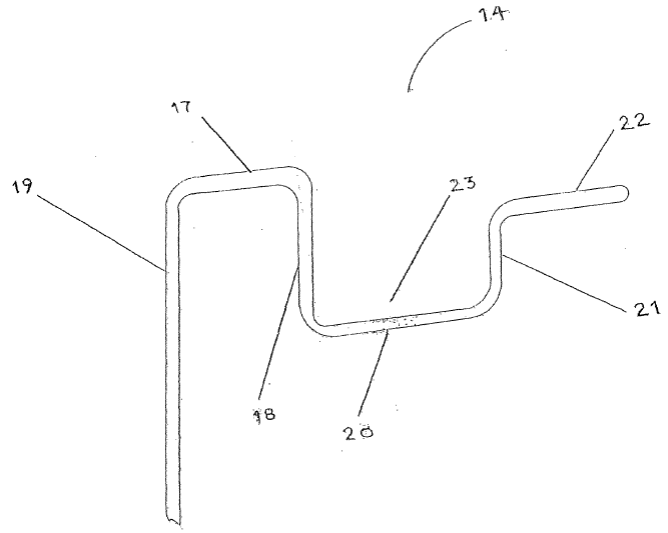

FIG 10

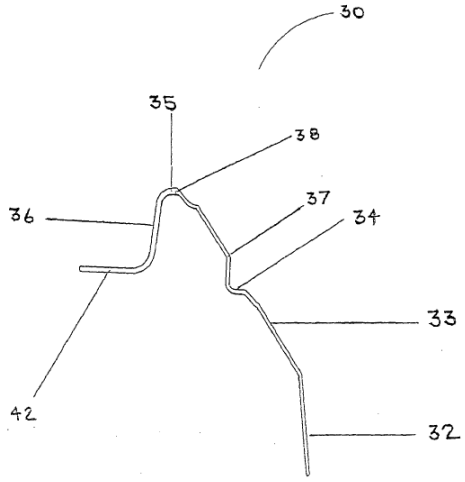

FIG 11

CLAIMS

1. A plastic food container comprising:

   a lid and a base, the lid and base each having a peripheral rim;

   the lid rim adapted for closing engagement with the base rim;

   the lid rim and base rim when in closed engagement forming an interior of the container,

   wherein the lid rim and base rim allow air to enter the container to enable the cross-flow

   of air underneath food contents;

   the base comprising a floor, the floor having at least one channel formed therein;

   the lid including a top surface and one or more outermost side surfaces, wherein the lid

   comprises a plurality exhaust vents.

2. The container of claim 1 wherein the plurality of exhaust vents of the container lid numbers between eight and fourteen vents.

3. The container of claim 1 wherein the lid includes a contour and the plurality of exhaust vents on the lid are disposed away from the lid center so that they follow the contour of the lid.

4. The packaging of claim 1 wherein the exhaust vents disposed on the lid are formed so that they direct rising gases and vapours outward in relation to the outermost side surfaces of the container.

5. The container of claims 1-4 wherein the peripheral rim of the lid comprises at least two sealing projections, the peripheral rim of the base has a channel and when the lid and base are in the closed arrangement the at least two sealing projections of the lid rim are engaged by the channel in the peripheral rim of the base.

6. The container of claim 1 wherein a lid is hinged to a base.

7. The container of any of the preceding claims wherein the floor includes textured surface platforms.

8. The container of claim 2 wherein the plurality of exhaust vents of the container lid numbers between six and sixteen vents.

9. The container claim 1 wherein the container is manufactured from a material selected from the group consisting of PE, PP, PVC, or PET.

10. A food container having any new and inventive features, combination of features, or sub-combination of features as described and illustrated herein.

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CLAIMS – SUPPLEMENTAL COPY

1. A plastic food container comprising:

   a lid and a base, the lid and base each having a peripheral rim;

   the lid rim adapted for closing engagement with the base rim;

   the lid rim and base rim when in closed engagement forming an interior of the container,

   wherein the lid rim and base rim allow air to enter the container to enable the cross-flow

   of air underneath food contents;

   the base comprising a floor, the floor having at least one channel formed therein;

   the lid including a top surface and one or more outermost side surfaces, wherein the lid

   comprises a plurality exhaust vents.

2. The container of claim 1 wherein the plurality of exhaust vents of the container lid numbers between eight and fourteen vents.

3. The container of claim 1 wherein the lid includes a contour and the plurality of exhaust vents on the lid are disposed away from the lid center so that they follow the contour of the lid.

4. The packaging of claim 1 wherein the exhaust vents disposed on the lid are formed so that they direct rising gases and vapours outward in relation to the outermost side surfaces of the container.

5. The container of claims 1-4 wherein the peripheral rim of the lid comprises at least two sealing projections, the peripheral rim of the base has a channel and when the lid and base are in the closed arrangement the at least two sealing projections of the lid rim are engaged by the channel in the peripheral rim of the base.

6. The container of claim 1 wherein a lid is hinged to a base.

7. The container of any of the preceding claims wherein the floor includes textured surface platforms.

8. The container of claim 2 wherein the plurality of exhaust vents of the container lid numbers between six and sixteen vents.

9. The container claim 1 wherein the container is manufactured from a material selected from the group consisting of PE, PP, PVC, or PET.

10. A food container having any new and inventive features, combination of features, or sub-combination of features as described and illustrated herein.

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D1

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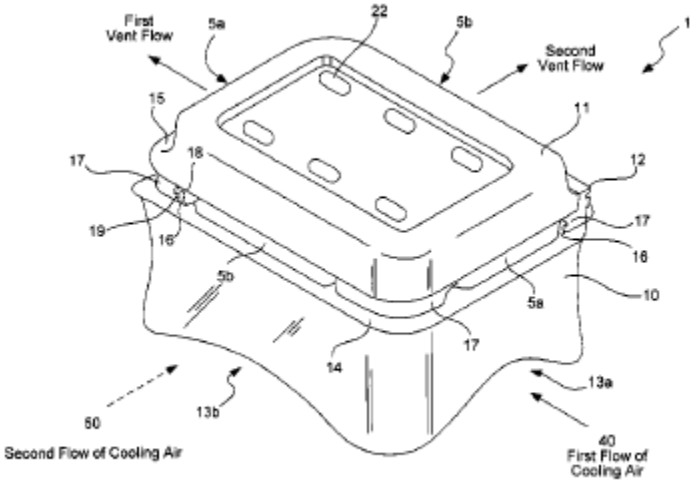
[51] Int. Cl.: B65D 1/22 (2006.01)
[71] Applicant: Cool Packaging Inc.
[72] Inventor: H. Gardiner

[54] Title: Produce packaging system

Abstract

A produce packaging system incorporates a tray for receiving a plurality of produce carrying baskets. The baskets each include upper ventilation slots and lower ventilation channels. The lower ventilation channels are formed by arching the bottoms of the baskets to form transversely oriented channels in the bottoms of the baskets configured to enable bi-directional cooling airflow to pass underneath the baskets in at least two transverse directions. Bi-directional airflow is also achieved in the upper portion of the baskets through the ventilation slots. The trays are configured such that, when the baskets are loaded into the trays, the upper ventilation slots and the lower cooling channels are aligned with sets of cooling vents in the trays thereby facilitating efficient cooling of produce contained in the baskets.



Description

[0001] Deleted

TECHNICAL FIELD

[0002] The present invention relates to apparatus and methods for the improved packing, cooling, storage, and shipping of produce. More particularly, the present invention teaches produce containers with ventilation slots and ventilation channels that are loaded into an improved shipping tray. More particularly still, the present invention enables the flow of cooling air to flow through and underneath the produce containers in more than one direction relative to the container system in order to facilitate improved cooling.

BACKGROUND

[0003] Many produce products are harvested and packed in the field into containers, which are ultimately purchased by the end consumer. Examples of such produce items include, but are not limited to, strawberries, raspberries, other berries, tomatoes, grapes, mushrooms, radishes and broccoli florets. Many of these produce items require substantial post-harvest cooling in order to enable shipping over long distances and to prolong shelf life.

[0004] In use, a grower's harvesting crew harvests produce items of the type previously discussed directly from the plant in the field into the container. The containers are then loaded into trays, which contain a specific number of individual containers and the trays, when filled, are loaded onto pallets. The most common pallet used in the produce industry in the United States is the forty by forty-eight inch (40″×48″) wooden pallet, and the vast majority of produce handling, storage and shipping equipment is designed around pallets of this size.

[0005] After the pallets have been filled and loaded in the field, they are transported to shippers who perform a variety of post-harvest processes to enhance the marketability of the produce itself. For many types of produce, including berries, a significant packing evolution is the post-harvest cooling of the packed fruit. Indeed, berry shippers are often referred to as “coolers”. The process of cooling berries typically includes injecting a stream of cooling air into one side of a tray and thence through the individual baskets inside the tray and around the berries stored therein. As the air cools the berries, it picks up heat therefrom which is exhausted from apertures on the opposite side of the tray.

[0006] A difficulty with such systems is that while they cool the fruit near the outside edges of the trays relatively well, they are less effective at cooling the fruit in the centers of the trays. This problem is exacerbated by placing many trays on a pallet, and then many pallets in a refrigerated transport compartment. The pallet and tray stacking can inhibit the cooling airflow to the extent that the innermost fruit remains relatively warm compared to the cooler outer fruit. This can lead to spoilage in some of the fruit. In order to reduce spoilage, conventional approaches use excessive cooling temperatures to cool the produce. This is relatively effective at cooling the innermost fruit, but is an expensive solution due to higher cooling costs. Additionally, an undesirable consequence of such excess cooling is that the outermost fruit can freeze or nearly freeze resulting in unacceptable product damage. Thus there is a need for a packaging system that can achieve more efficient cooling airflow through the trays and baskets thereby facilitating more even and efficient cooling of produce.

[0007] Packages for use by berry coolers have undergone a systematic process of evolution to improve the storing and cooling of the fruit while reducing packaging costs. While early berry packaging products included the use of folded wood or chipboard containers, a common package for the marketing of strawberries for instance, is a one-pound vacuum formed plastic basket developed in conjunction with Michigan State University. This one piece package, hereinafter referred to for brevity as a “Michigan basket”, includes a basket body formed with an integral hinged lid which, after the basket is filled with fruit, is folded over and locked in place with respect to the basket body. The lid is retained in position by means of a detent, which engages an edge flange of the basket body. Disposed at or near the substantially flat bottom of the basket body is a plurality of apertures, typically elongate slots, to provide airflow through the body of the packed fruit in the basket. This airflow continues through a similar series of apertures formed in the lid. In the case of the strawberry package, typically, eight (8) sixteen ounce (16 oz) baskets are loaded into a formed and folded corrugated cardboard tray.

[0008] The tray developed for use with the Michigan basket has one or more openings along either of its short ends to enable airflow through the tray. From the previous discussion on berry cooling, it will be appreciated that in the typically formed strawberry package system in current use, the two individual baskets within the tray which are immediately adjacent to the air intake apertures formed in the ends of the tray receive substantially more cooling from air inflow than do the two packages at the discharge end of the tray. To overcome this deficiency in air flow, berry coolers are currently required to utilize substantial amounts of cooling energy to ensure that fruit packed at the discharge side of the tray receives sufficient cooling to prolong its shelf life, while precluding the freezing of berries at the intake side of the tray.

[0009] The previously discussed problem is due to the fact that the one-pound strawberry baskets, and the trays which now contain them, were developed separately. Specifically, the design of the previously discussed one-pound strawberry basket was finalized prior to the design of the tray, which ultimately receives eight of these baskets therein. The previously discussed one pound strawberry containers in current use measure approximately four and three quarter inches by seven and one quarter inches (4¾″×7¼″) and are three and one half inches (3½″) tall with the top secured. As a result, the commonly used eight basket tray measures approximately fifteen and one-half inches by nineteen and three quarters inches (15½″×19¾″). This tray size is to some extent mandated by the size of the baskets it contains. While no great difficulty was likely encountered in forming a tray to fit a given number of the baskets, the area or “footprint” of the resultant tray was not given sufficient consideration in the design of the baskets. This has given rise to a significant inefficiency of packaging.

[0010] Because the current eight (8) one pound strawberry trays, and the baskets shipped therein, are not fitted together properly, the package does not fully utilize the surface area of a forty by forty eight inch pallet, therefore shipping of those pallets is not optimized. Specifically, using current basket technology, a layer of strawberries comprises six (6) trays per layer on the pallet. With eight (8) one pound baskets per tray, this means that forty eight pounds of fruit can be packed per layer on a standard 40 inch by 48 inch pallet. Because there is no way with current use packages to completely fill the pallet with trays, a significant portion of the pallet remains unused. This of course forms a further inefficiency of shipping.

[0011] Another problem with current use plastic produce baskets is that they are usually formed with vertical stiffening ribs. This is done to maximize the resistance of the relatively thin basket to deformation. These ribs also provide salient intrusions into the body of the basket. Where a pulpy fruit, such as berries, are packed in the basket, handling shock to the packed fruit, combined with the fruit's own weight turns these intrusions into sites where significant bruising of the packed fruit

occurs. This loss of fruit quality results in higher costs to the shipper, transporter, retailer and consumer alike.

[0012] The previous discussion has centered on the specific case of the one pound whole strawberry container preferred by consumers. It should be noted, however, that while strawberries comprise the bulk of all U.S. berry consumption, other berry crops also enjoy a significant position in the marketplace. Each of these berry crops has, to a certain extent, given rise to preferred packaging embodiments. By way of illustration but not limitation, while strawberries are typically sold in eight ounce or one-pound containers, blueberries are typically sold by volume. Specifically, consumers tend to prefer the one pint package of blueberries. Raspberries, on the other hand, are typically marketed in small five or six ounce trays.

[0013] The trays into which each of these differing types of berry baskets are ultimately installed have not been designed with a view to integrating them with other berry or indeed other produce crops. This presents a problem to the small-to-medium sized grocery establishment, which may not order berries in multiple pallet lots but may prefer, for various reasons, to mix quantities of berries on one pallet. Because the trays used in the several aspects of the berry industry are not integrated one with another this capability is, at present, not realized. Accordingly, smaller lots of berries as commonly shipped to small-to-medium sized grocers must typically be sold at a premium cost in order to compensate the grower, shipper and transporter for the packing and shipping inefficiencies occasioned by the lack of packaging design cohesion.

[0014] Another problem with the previously discussed Michigan basket is the latch, which retains the lid in the closed position with respect to the body. The Michigan basket uses a single detent formed in the lip of the lid to engage the edge of the basket body lip. This latch arrangement has proven troublesome in that it is difficult to quickly and securely close in the field while being prone to unwanted opening during packing, shipping and while on the grocer's shelves.

[0015] Other workers in the packaging arts have attempted to solve the previously discussed latch deficiencies by means of forming snap fasteners in the edge material of the plastic baskets, which they produce. The results obtained by this design are mixed. While the snap fasteners may be slightly more secure than the previously discussed edge latch, they are at least as difficult to align properly by pickers in the field as the Michigan basket latch.

[0016] The trays currently available for use with Michigan baskets designed for one pound strawberry packing are not generally well suited for the baskets in that the baskets are allowed considerable freedom of movement within the trays. This results in an increased incidence of shifting of the baskets within the trays, which causes an increase in bruising of the fruit stored in the baskets.

[0017] Another problem not contemplated by the prior art is that different quantities, types, and external forms of produce require different cooling airflow regimes. Some combinations of fruit types and quantities benefit from the relatively laminar flow provided by the invention of U.S. Pat. No. 5,738,890. Further research has shown that some combinations of produce quantity and type benefit from a relatively turbulent air flow through the basket during the cooling process.

[0018] Finally, while the inventions taught and claimed in U.S. Pat. Nos. 5,738,890, 6,074,676, and 6,074,854, incorporated herein by reference, provide hitherto unmatched cooling for produce items, they require that the containers all be aligned alike with respect to the flow of cooling air. See for instance FIG. 8 of U.S. Pat. 6,074,854. Where the containers in one layer on a pallet are aligned perpendicular to one another, the flow of cooling air is interrupted. One example of such pallet loading is “5-down” or “10-down”, an example of the former being shown at FIG. 8 herewith.

[0019] What is clearly needed is an improved berry packing system, which will significantly reduce the cooling time and cooling expense for the fruit contained in the baskets. Moreover, an effective cooling system is needed that facilitates efficient airflow through the trays and baskets of the system in order to maximize air transfer rates. Such a system should result in more uniform cooling in all the fruit in a tray. To make such an improved system feasible, it must interface with commonly used and preferred materials handling apparatus, specifically the previously discussed forty by forty eight inch pallets in current use in the grocery industry. Moreover, where a different pallet size has been adopted as standard, for instance in another country, what is further needed is a system which can be scaled to effect the advantages hereof in that pallet system.

[0020] The baskets of such a system should be capable of being formed in the preferred size or quantity configuration preferred by the end consumer, while simultaneously maximizing their footprint on existing pallet technology. The baskets should be formed to minimize bruising and other damage to the fruit packed therein. Furthermore, such a system should provide for the mixing of lots of different types, quantities and sizes of produce on a single pallet without substantial losses of packaging efficiency occasioned by differing types of misaligned trays.

[0021] The basket should possess a lid latch capable of being quickly and securely fastened in the field. The same lid should be capable of being repeatedly opened and closed during packing, while on the grocer's shelves and ultimately by the end consumer. Moreover, the basket should be configured to reduce the chances that a basket crushes produce contained therein as a result of improperly closing a basket.

[0022] The packaging system should enable the packaging of one layer, or a plurality of layers of filled baskets therein.

[0023] The several components of the packaging system should be capable of providing cooling airflow regimes relatively optimal for the type and quantity of produce to be stored in the baskets.

[0024] Finally, the system should enable the placement of trays substantially perpendicular with one another while still enabling the previously discussed cooling advantages.

[0025] If possible, the system should be formed utilizing existing equipment and machinery from materials of the same or lesser cost than currently available fruit packages.

SUMMARY OF THE INVENTION

[0026] In accordance with the principles of the present invention, produce packaging systems are disclosed. Implementations of the present invention include, without limitation, packaging systems such as the Mixim™, MiximPlus™, Mixim5D™ or Mixim10D™ packaging systems, each available from Cool Packaging inc. or Plexiform Inc., both of Watsonville, Calif., which system comprises an improved produce packing system which matches trays with baskets to significantly reduce cooling time and expense for the fruit contained in the baskets.

[0027] Embodiments of the invention include a system for packaging produce. The system includes a plurality of specifically constructed baskets loaded into an associated tray. The baskets each comprise a basket body with a lid. The baskets also include ventilation slots arranged to facilitate the flow of cooling air through the baskets in at least two transverse directions. Further, the baskets include ventilation channels arranged to facilitate the flow of cooling air underneath the baskets in at least two transverse directions. The associated tray is suitably configured to hold the baskets in a manner that enables the flow of the cooling air through and underneath the

baskets in at least two transverse directions. In order to accomplish this, the tray includes upper cooling vents arranged to align with the ventilation slots in the baskets. Also, the tray includes lower cooling vents arranged to align with ventilation channels of the baskets. This enables cooling air to flow through the tray, and baskets contained therein, in two (or more) transverse directions.

[0028] In another embodiment, the invention discloses a produce container capable of facilitating cooling airflows both underneath and through the container. Moreover, the container facilitates the flow of the cooling air in at least two transversely oriented directions. The containers include a produce basket having a basket body and a lid for covering the basket body. Each basket also includes a plurality of ventilation slots and a plurality of ventilation channels that are formed in the basket to facilitate the flow of cooling air through the baskets and underneath the baskets.

[0029] Embodiments of the invention also include trays incorporating the principles of the invention. For example, one tray in accordance with the principles of the invention contains a plurality of produce baskets, with the baskets including a plurality of ventilation slots and a plurality of ventilation channels. The tray is configured to hold the baskets so that flows of cooling air pass through and underneath the baskets in at least two transverse directions. In one implementation, the tray includes upper cooling vents arranged so that the upper cooling vents align with ventilation slots of baskets loaded into the tray. The tray also includes lower cooling vents arranged to align with ventilation channels of the baskets loaded into the tray.

[0030] In another embodiment, a basket includes a basket body and lid. The basket includes a latch for securing the lid to the basket body. Additionally, the basket includes a hinge for attaching the lid to the basket body so that, when closed, the hinge applies tension at the hinge to prevent the lid from extending beyond an outside edge of the basket body and thereby prevents the latch from improperly securing the lid to the basket body.

[0031] These and other aspects of the present invention are described in greater detail in the detailed description of the invention set forth herein below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] The following detailed description will be more readily understood in conjunction with the accompanying drawings, in which:

[0033] FIG. 1 is a perspective view of one closed produce basket embodiment according to the principles of the present invention.

[0034] FIG. 2 is an end view of the closed produce basket shown in FIG. 1.

[0035] FIG. 3 is plan view of the open produce basket shown in FIG. 1.

[0036] FIG. 3A is a plan view of an alternative embodiment of an open produce basket illustrating an alternative hinge design and alternative latches.

[0037] FIG. 3B is a plan view of another alternative embodiment of a basket illustrating an alternative ventilation channel configuration.

[0038] FIG. 4 is a perspective view of one tray implementation constructed in accordance with the principles of the present invention.

[0039] FIG. 5 is a perspective view of an alternative tray implementation having a plurality of closed produce baskets loaded into the tray as taught by the present invention.

[0040] FIG. 6 is a perspective view of a plurality of trays of the present invention shown loaded on a pallet in a 5-down configuration.

[0041] FIG. 7 is a perspective view of a plurality of closed produce baskets loaded into an alternative tray embodiment formed to receive a plurality of baskets arranged in at least two layers.

DETAILED DESCRIPTION OF THE INVENTION

[0042] It is to be understood that, in the drawings, like reference numerals designate like structural elements. Also, it is understood that the depictions in the Figures are not necessarily to scale.

[0043] The present invention has been particularly shown and described with respect to certain embodiments and specific features thereof. The embodiments set forth herein below are to be taken as illustrative rather than limiting. It should be readily apparent to those of ordinary skill in the art that various changes and modifications in form and detail may be made without departing from the spirit and scope of the invention. For instance, the basket could be easily modified to hold hot or cold prepared foods such as fried chicken and seafood.

[0044] Having reference to FIG. 1, a first preferred embodiment of the produce basket **1** of the present invention is shown. Produce basket **1** is a one-piece structure incorporating both basket body **10** and lid **11**. That portion of produce basket **1** joining basket body **10** and lid **11** is formed as a hinge, **12**. The basket body **10** further includes a concavity formed in the bottom portion of the basket body **10**. This concavity defines a first ventilation channel **13a**. In the depicted embodiment, the first ventilation channel **13a** extends longitudinally along the long axis of the basket body **10**. This first ventilation channel **13a** enables a portion of the first cooling airflow (passing in the direction indicated by the associated arrow) to pass a cooling airflow underneath the basket **1** to enhance cooling.

[0045] Additionally, the basket body **10** includes another concavity formed in the bottom portion of the basket body **10**. This concavity defines a second ventilation channel **13b**. The second ventilation channel **13b** is arranged transversely with respect to the first ventilation channel **13a**. In the depicted embodiment, the second ventilation channel **13b** extends in a direction that is perpendicular to the first ventilation channel **13a**. As a result, the second ventilation channel **13b** enables a portion of the second cooling airflow (passing in the direction indicated by the associated dashed arrow **50**) to pass another cooling airflow underneath the basket **1** to enhance cooling. Thus, two transversely directed airflows can pass underneath the basket **1** to greatly enhance cooling effectiveness. This is especially so in view of the fact that portions of the first cooling airflow and second cooling airflow pass through a first ventilation slot **5a** and a second ventilation slot **5b**, respectively.

[0046] While this first preferred embodiment is a vacuum formed plastic structure, the principles of the present invention are equally applicable to alternative materials and manufacturing technologies. In the depicted embodiment, the basket is formed of a PET material such as Copolyester 9921, available from Eastman Kodak. Alternative materials include, but are not limited to, various polymeric and monomeric plastics including, but not limited to, styrenes, polyethylenes (including HDPE and LPDE), polyesters, and polyurethanes; metals and foils thereof; paper products including chipboard, pressboard, and flakeboard; wood and combinations

of the foregoing. Alternative manufacturing technologies include, but are again not limited to, thermocasting; casting, including die-casting; thermosetting; extrusion; sintering; lamination; the use of built-up structures and other processes well known to those of ordinary skill in the art.

[0047] With continuing reference to FIG. 1 and also now having reference to FIGS. 2 and 3, some of the improved ventilation features of this first preferred embodiment of the present invention are shown. Lateral (e.g., first) ventilation channel **13a** is formed at a substantially lower portion of body **10**. Channel **13a** is disposed on body **10** to provide an improved flow of cooling air and ventilation through the lower portion of body **10**. To enhance this effect, some embodiments include at least one, and preferably a plurality of ventilation openings (not shown here) within vent bosses **20**. In order to provide a similarly improved flow of cooling air and ventilation through the upper portion of basket body **10**, a first set of ventilation slots **5a** are defined when lid **11** and body **10** are secured together. Slots **5a** are maintained at a fixed distance by latches (depicted here as paired detent latches **16** and **17**). The flow of cooling air through the basket **1** can be further improved by at least one, and again preferably a plurality of upper ventilation openings **22** in the upper surface of lid **11**. A second set of ventilation slots **5b** are also formed when lid **11** and body **10** are secured together. In the depicted embodiment, the second set of ventilation slots **5b** are positioned perpendicular to the first set of ventilation slots **5a**. Such an arrangement enables a portion of the second flow of cooling air to enter, and flow through, the basket **1** in a direction transverse to that of the first flow of cooling air. In some embodiments, it is intended that these transverse airflows be in a direction substantially perpendicular from one another.

[0048] With reference to FIG. 3, a hinge **12** is depicted as connecting the lid **11** to the basket body **10**. An opening **14′** in the hinge defines one ventilation slot of the second set of ventilation slots **5b** when the lid **11** is closed onto the body **10**. In the depicted embodiment, the hinge **12** also features tensioning grooves **12′**. These tensioning grooves **12′** serve to apply a tension on the lid **11** that reduces the likelihood that the lid **11** will be improperly closed during field loading. As a result, less produce will suffer damage from loose, improperly closed lids **11** being crushed down on the produce contained in the basket body **10**. Also, in one embodiment, the tension applied by the grooves **12′** in the hinge **12** exerts a pressure on the upper detent latch **17** that more firmly engages the bottom detent latch **16**. As a result, the tension exerted by the grooves **12′** in the hinge **12** helps keep the baskets **1** closed during ordinary handling.

[0049] The upper and lower vent apertures, **22** and **21**, are clearly shown in FIG. 3. Also depicted is a general arrangement of a latch embodiment having detent latches **16** and **17**. In the depicted embodiment, lower latches **16** are disposed about a substantially inner portion of lower lip **14**, while upper latches **17** are disposed about a substantially outer portion of upper lip **15**. In this manner, when lid **11** is secured to body **10**, lower latches **16** are substantially captured within upper latches **17**, and maintained in an engaged configuration by the elastic deformation of latches **16** and **17** in operative combination with teeth **18** and **19** (not shown in this figure). In some embodiments, this engagement is enhanced by the presence of the tensioning grooves **12′** in the hinge **12**. Furthermore, latches **16** and **17** (e.g., latches disposed about the portions of body **10** and lid **11** immediately adjacent to hinge **12**) substantially preclude lateral movement and potential disengagement of lid **11** from body **10**.

[0050] With continued reference to FIG. 3, it will be apparent that in closing lid **11** onto body **10**, latches **16** and **17** disposed about the portions of body **10** and lid **11** immediately adjacent to hinge **12** will be the first to engage as lid **11** is closed. After teeth **18** and **19** (not shown in this figure) of this latch pair engage, the act of closing lid **11** continues, and latches **16** and **17** at the front end of basket **1** are engaged. The operator, by applying further closing pressure, elastically deforms to some degree at least some of latches **16** and **17**, engaging teeth **18** and **19** (not shown

in this figure) and thereby securing lid **11** onto body **10**. Additionally, the tension supplied by the tensioning grooves **12′** further acts to maintain secure engagement of the lid **11** to the body **10**.

[0051] While the preceding discussion regarding a first preferred embodiment has centered on a one piece basket incorporating the basket body and lid joined by a hinge, it will be immediately apparent to those of ordinary skill in the art that the principles of the present invention may with equal facility be embodied in a two piece implementation utilizing a separate body and lid. This embodiment is specifically contemplated by the teachings of the present invention.

[0052] While the previously discussed latch configuration has been shown to be particularly effective, the principles of the present invention specifically contemplate alternative latching methodologies. These include, but are specifically not limited to, edge catches, button catches, snaps, hook-and-loop closures, and other closure methodologies well-known to those having ordinary skill in the art. Moreover, the term “latch” as used herein may further comprise alternative lid closure methodologies known to those having ordinary skill in the art including shrink-wrap banding the lid to the body, and the use of elastic bands or adhesive tapes to perform this latching function. One basket formed utilizing such an alternative closure methodology is shown having reference to FIG. 3A.

[0053] FIG. 3A further discloses an alternative to the single aperture **14′** shown in FIG. 3. According to this aspect of the present invention, the single aperture **14′** may be replaced by a plurality of smaller apertures **57** defined across the vertical aspect of hinge **12**. The present invention specifically contemplates a number of geometries for both aperture **14′** and apertures **57**. These include, but are specifically not limited to, circles, oblongs, squares, rectangles, polygons, and figures. Examples of the latter may include letters, numerals, and geometric or cartoon shapes. When the lid **11** is closed on the body **10**, the plurality of apertures **57** defines ventilation slots of the second set of ventilation slots **5b**. Thus, the plurality of apertures **57** facilitates the second flow of cooling air to pass through the basket **1**.

[0054] Also shown in FIG. 3A is the use of a median catch for precluding lateral motion between basket body **10** and lid **11**. It has been found that when large baskets are handled, for instance the large baskets used for multiple-pound industrial packs of strawberries, it is often advantageous to provide a methodology for precluding the lateral movement of lid **11** with respect to basket body **10**. One methodology of precluding this unwanted movement is the placement of a button catch, for instance the button catch defined by pairs **59** and **61**, at some point between latch pairs **51** and **53**. In order to provide the requisite compression strength to enable securing this median button catch (defined by **59** and **61**), one or both of button catch members **59** and **61** may be advantageously mounted on a pilaster formed in one or both of basket body **10** and basket lid **11**.

[0055] FIG. 3B depicts an alternative basket embodiment. The basket **5** of FIG. 3B is substantially larger than the previously disclosed embodiments. Such baskets **5** can, for example, be used to hold two pounds of produce. Due to the larger size and weight, certain adjustments can be made in the basket. As with the previously discussed embodiments, the basket **5** includes a lid **31** and basket body **32**. As with other embodiments, the basket **5** can be secured using latches **33** and can include a hinge **34**. Also, a first set of ventilation slots **41** is formed in an upper portion of the basket **5** to facilitate cooling flow from the first flow of cooling air **40** through the basket **5**. A second set of ventilation slots **42** is formed in an upper portion of the basket **5** to facilitate cooling flow from the second flow of cooling air **50** through the basket **5**. Although not directly shown in this view, the second set of ventilation slots **42** can include one or more apertures in the hinge **34**. In the depicted embodiment, the front facing ventilation slot (comprising one of the second set of ventilation slots **42**) includes a button latch **33a**. The button latch **33a** can be incorporated for

added strength and to better secure the lid **31** to the body **32**. A significant aspect of the embodiment concerns the lower portion of the basket **5**. In the depicted embodiment, the cooling flow can be passed underneath the basket **5** using a plurality of first ventilation channels **38**. Although depicted here with two ventilation channels **38**, more can be implemented. These first ventilation channels **38** facilitate the efficient passage of the first cooling flow **40** underneath the basket **5**. Similarly, a second plurality of ventilation channels **37** are used to facilitate the flow of a transversely directed second cooling flow of air **50** as it passes underneath the basket **5**. Typically, the first ventilation channels **38** are perpendicular to the second ventilation channels **37**. The inventors contemplate many related embodiments including, but not limited to, embodiments having two, three, or more ventilation channels.

[0056] FIGS. 4 and 5 depict related tray embodiments formed according to the principles of the present invention. The trays are sized to hold at least one, and preferably, a plurality of baskets (not shown in FIG. 4). In one preferred embodiment of the present invention, tray **2** holds eight baskets **1**. A particular feature of tray **2** is the plurality of lower tray vents **25a** and **25b**. A first set of lower tray vents **25a** enables a cooling flow to pass along the bottom of the tray in a first cooling direction **40** (shown here with the arrow). Moreover, a second set of lower tray vents **25b** enables a second cooling flow to pass along the bottom of the tray in a second cooling direction **50** (shown here with the dashed arrow). The first lower tray vents **25a** are intended to align with the first ventilation channels **13a** of the previously discussed baskets (e.g., FIG. 1). Similarly, the lower tray vents **25b** are intended to align with the second ventilation channels **13b** of the previously discussed baskets. Another particular feature of tray **2** is the plurality of upper tray vents **35a** and **35b**. A first set of upper tray vents **35a** enables a cooling flow to pass through baskets in a first cooling direction **40** (shown here with the arrow). Moreover, a second set of upper tray vents **35b** enables a second cooling flow to pass through baskets in a second cooling direction **50** (shown here with the dashed arrow). The first upper tray vents **35a** are intended to align with the first ventilation slots **5a** of the previously discussed baskets (e.g., FIG. 1). Similarly, the upper tray vents **35b** are intended to align with the second ventilation slots **5b** of the previously discussed baskets. In this way the embodiment provides excellent cooling flow throughout the many baskets loaded into the tray. In one alternative implementation, tray **2** can be constructed so that, for example, the first set of upper tray vents **35a** can comprise only one extended length vent on each side of the tray. Such an embodiment can provide the needed cooling air flow through the baskets. Such an embodiment has the advantage of being simpler to manufacture and therefore may be preferred for some implementations.

[0057] FIG. 5 depicts a slightly different tray **3** embodiment than that of FIG. 4, but the essential principles are the same. In the depicted embodiment, a plurality of closed baskets **1** (six baskets **1** are depicted here) is loaded into the tray **3**. In the bottom portion of the tray **3**, tray vents **25a** and **25b** align with the previously discussed ventilation channels formed in the bottom of baskets **1**. As shown here, a first set of lower tray vents **25a** is aligned with ventilation channels **13a** of the baskets **1**. In the depicted embodiment, the tray includes a first set of lower tray vents **25a** having six vents **25a** (three on each side of the tray). Similarly, a second set of lower tray vents **25b** is aligned with ventilation channels **13b** of the baskets **1**. The depicted tray includes a second set of lower tray vents **25b** having four vents **25b** (two on each side of the tray). Additionally, the upper portion of the tray **3** includes tray vents **35a** and **35b** that are aligned with the previously discussed ventilation slots of the baskets **1**. As shown here, a first set of upper tray vents **35a** is aligned with ventilation slots **5a** of the baskets **1**. The depicted tray includes six vents **35a** (three on each side of the tray). Similarly, a second set of upper tray vents **35b** is aligned with ventilation slots **5b** of the baskets **1**. Here the tray includes four vents **35b** (two on each side of the tray). In this manner, a number of direct paths are created from the ambient atmosphere to the bottom surface of each basket **1** and through upper portions of the baskets loaded into tray **3**.

[0058] Additionally, when trays **3** (and also other embodiments, e.g., **2**) are stacked together (e.g., on a pallet), lateral vent slots **26** are formed between each pair of trays **3**. These lateral vent slots **26** can provide additional airflow inside trays **3**. These improvements in basket ventilation combine to ensure that all berries in the tray receive significantly greater cooling ventilation than any previous fruit cooling and packaging system. As a result, the cooling energy requirements for such systems are greatly reduced. Indeed, preliminary testing indicates that the improved cooling afforded by the ventilation arrangement of the present invention may cut cooling costs for some strawberry packing operations by as much as 25%. Additionally, by implementing a bi-directional cooling regime (e.g. applying a first cooling flow **40** and a second cooling flow **50**), such trays **3** with appropriately loaded baskets **1** exhibit very high cooling flow through the trays **3** (and baskets **1**).

[0059] Cooling flows on the order of 1.0 c.f.m. (cubic feet per minute) or greater through the trays are difficult to obtain with existing technologies. Such cooling flows are highly desirable. One illustration of the advantages of the embodiments of the present invention is that cooling flows in the range of about 1.5 c.p.m. to about 2.6 c.p.m. can be obtained. This is especially true with respect to the tray **2** embodiment of FIG. 4. These advantages are further enjoyed when these tray embodiments are stacked on pallets. Where adjacent trays (e.g., **2** or **3**) are arranged perpendicularly to each other, for instance on a pallet, the lower vents **25a** of one tray align with lower vents **25b** of an adjacent (perpendicularly positioned) tray to enable the previously described cooling flows to pass through trays (and underneath the baskets) which are positioned perpendicular to one another. Additionally, the trays are configured such that upper vents **35a** of one tray align with upper vents **35b** of an adjacent (perpendicularly positioned) tray to enable the previously described cooling flows to pass through trays (and through the slots of the baskets) in an efficient cooling flow. More advantageously, these cooling flows can be passed through the trays (and baskets) in at least two directions.

[0060] Having reference now to FIG. 6, a significant savings in shipping costs is realized by sizing baskets **1** and trays **2** as a system to maximize the area or shipping footprint of a layer of trays on a pallet. As previously discussed, the 40″ (inch) by 48″ pallet is the preferred standard size in the grocery business in the United States. Current Michigan baskets measure approximately 4¾″ by 7¼″ by 3½″ tall when closed and are loaded eight per tray. This tray measures approximately 19¾″ by 15¾″. A maximum of six such trays constitute a layer on a 40″ by 48″ pallet. Where the trays are loaded with one pound strawberry baskets, a maximum of 48 pounds of fruit may thus be loaded in each layer. In contrast, baskets of the present invention designed to receive therein one pound of strawberries are sized approximately 6⅜″×5″×3¾ high, when closed. One embodiment of tray 2 is sized at approximately 16″×13¼″. This size maximizes the footprint on a standard pallet. This means that nine such trays can be loaded as a layer on the previously described pallet, for a total of 54 pounds of fruit per layer. This represents an increase of 6 pounds, or 16 percent per layer over the Michigan basket. Since the shipper is not paying for wasted shipping volume, his shipping costs are reduced, which can result in further savings to the consumer. Moreover, the sizing of baskets and trays may be optimized to effect the “5-down” stacking shown in FIG. 6.

[0061] The preceding discussion of a first preferred embodiment of the present invention has focused on one specific berry package design. It will be immediately obvious to those of ordinary skill in the art that the principles set forth herein are also applicable to a wide range of produce package sizes and utilizations. By way of illustration but not limitation, the present invention specifically contemplates the forming of 1 pint and ½ pint (also referred to as 8 oz. or 250 g.) berry baskets, as well as baskets configured to receive therein specific produce shapes, types and counts. An example of the latter is the “long stem pack” used in the berry industry for shipping

specific package counts of large, premium berries. Furthermore, while the discussion of the principles set forth herein has centered on packages for the berry industry, it is recognized that these principles may be applied with equal facility to the packaging of a broad range of materials including other foodstuffs or any item, which would benefit from the advantages set forth herein. Such applications are specifically contemplated. These principles include the use of a family of trays, having fixed “footprints” or lengths and widths, but with whose heights are varied to accommodate baskets having different heights and/or counts per tray. By maintaining the footprint at a constant value, the advantages of minimizing lateral movement between individual trays and between layers of trays are attained because the trays of one layer interlock with the layer of trays above or below it. This is true even where adjacent tray layers contain significantly differing sizes of baskets, holding the same or different produce items.

[0062] Where the tray is designed to receive one pound strawberry baskets as previously discussed, the height of the tray is approximately 3 ¾ inches. Where other berries, or indeed other produce products, are shipped, the length and width of the tray do not change, but remain at the previously defined optimal size. Changes in tray volume necessary to accommodate differing numbers and volumes of baskets are accommodated by altering the height of the tray. In similar fashion, baskets designed for use in the present system are sized to fit within the previously discussed tray. In this manner, baskets suitable for substantially any size basket designed for consumer use, as well as many baskets sized for the food service industry, may be accommodated by the present invention. This presents the previously described advantage of enabling the shipment of a mixed pallet of differing produce by loading trays optimized for each type of produce onto separate, compatible layers.

[0063] Moreover, tray embodiments can be constructed to receive a plurality of layers of filled baskets **1**. For example, with reference to FIG. 7, one embodiment of the present invention designed to hold two layers of the filled baskets is shown. In this embodiment, twelve baskets **1** are held in the tray **4**. The ventilation slots **5a** and **5b** of the top layer of baskets **1** are aligned with an uppermost set of vents **71a** and **71b**, respectively. The ventilation channels **13a** and **13b** of the top layer of baskets **1** are aligned with a set of vents **72a** and **72b**, respectively. The ventilation slots **5a** and **5b** of a bottom layer of baskets **1** are aligned with another set of vents **73a** and **73b**, respectively. Ventilation channels **13a** and **13b** for the bottom layer of baskets **1** are aligned with a bottom set of vents **74a** and **74b**, respectively. Such a configuration enables bi-directional cooling flows (first cooling flow **40** and second cooling flow **50**) to be directed efficiently through the tray **4** in order to effectively cool the contained produce items. In one such embodiment, the first cooling flow **40** and second cooling flow **50** are directed perpendicularly to each other in order to establish bi-directional cooling. Additionally, tray vents (e.g., **71a**, **71b**, **72a**, **72b**, **73a**, **73b**, **74a**, and **74b**) may be formed having a number of different shapes and geometries. In one alternative implementation, the middle sets of vents **72a**, **72b**, **73a**, **73b** can be consolidated such that **72a** and **73a** comprise one larger set of vents and **72b** and **73b** also make another set of larger vents. Each of the larger vents is configured so that a ventilation slot of the lower layer of baskets and a bottom ventilation channel of a basket of the upper layer of baskets shares the same larger vent.

[0064] The tray embodiments can be formed of cut and folded corrugated cardboard formed in a manner well known to those of skill in the art. One such corrugated cardboard is Georgia-Pacific USP120–33sml-USP120, although any number of packaging materials well known to those of ordinary skill in the art could, with equal facility, be used. Such alternative materials include, but are not limited to, various cardboards, pressboards, flakeboards, fiberboards, plastics, metals and metal foils. In some embodiments, it may further be advantageous to incorporate a gluing, adhesive or fastening step in fabrication of the tray, again in accordance with generally accepted practices in container design and fabrication.

[0065] Because of the smaller size of the trays of the present invention, a lighter grade of corrugated board can be used for their manufacture than are trays required to support the greater weight and greater area of the Michigan baskets previously described. This lighter weight not only minimizes shipping costs, but can significantly reduce packaging costs for the shipper, again lowering consumer costs. While the tray of a first preferred embodiment is formed of corrugated cardboard, the principles of the present invention may with equal facility be implemented on a variety of alternative tray materials. Such alternative materials include, but are not limited to, various polymeric and monomeric plastics again including, but not limited to, styrenes, polyethylenes including HDPE and LPDE, polyesters and polyurethanes; metals and foils thereof; paper products including chipboard, pressboard, and flakeboard; wood; wire; and combinations of the foregoing.

[0066] Each of the embodiments shown in FIGS. 1–7 enables the flow of cooling air from any side of the tray and basket, with a corresponding outflow of vent from the opposite side of the tray and basket. This in turn enables the positioning of trays, within a given layer, in either perpendicular or parallel orientations with respect to one another, as shown at “X” and “Y” in FIG. 6. This finally enables the previously discussed “5-down” and “10-down” arrangement of trays, currently deemed desirable by the produce and packaging industries.

[0067] The present invention has been particularly shown and described with respect to certain preferred embodiments and features thereof. However, it should be readily apparent to those of ordinary skill in the art that various changes and modifications in form and detail may be made without departing from the spirit and scope of the inventions as set forth in the appended claims. In particular, the use of alternative basket forming technologies, tray forming technologies, basket and tray materials and specifications, basket shapes and sizes to conform to differing product requirements, and vent configurations are all contemplated by the principles of the present invention.

(**Claims omitted**)

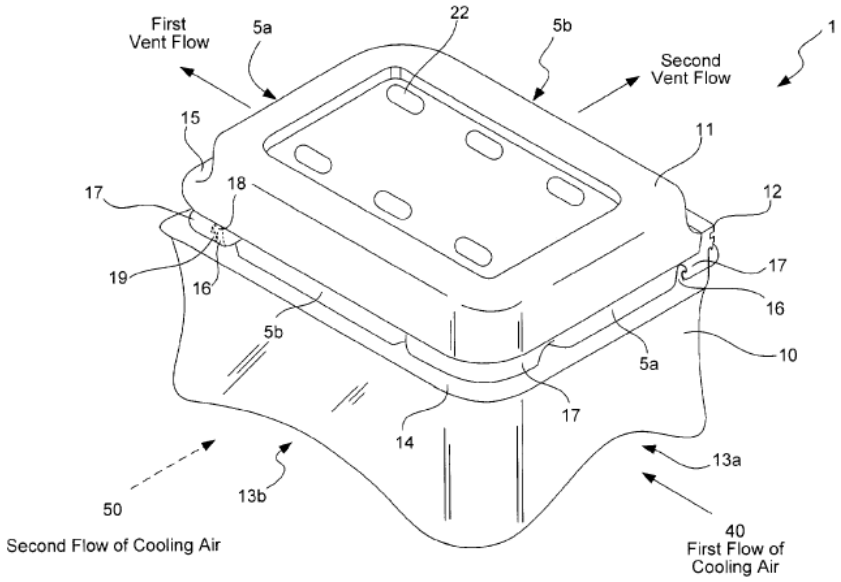

First
Vent Flow
5a
22
5b
Second
Vent Flow
1
15
11
17
18
12
19
16
17
16
5b
5a
10
17
14
13a
50
13b
40
First Flow of
Cooling Air
Second Flow of Cooling Air

FIG. 1

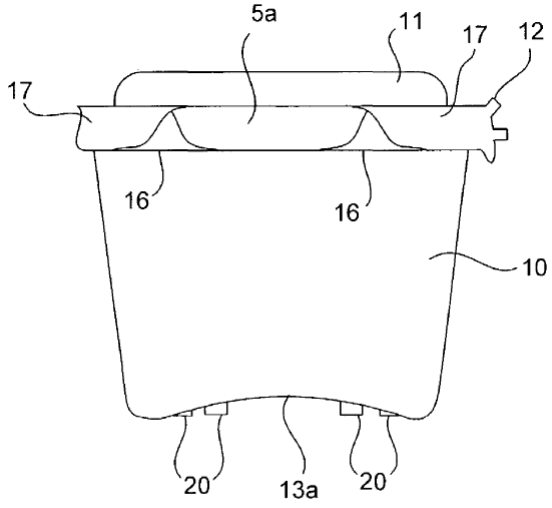

5a
11
17
12
17
16
16
10
20
13a
20

FIG. 2

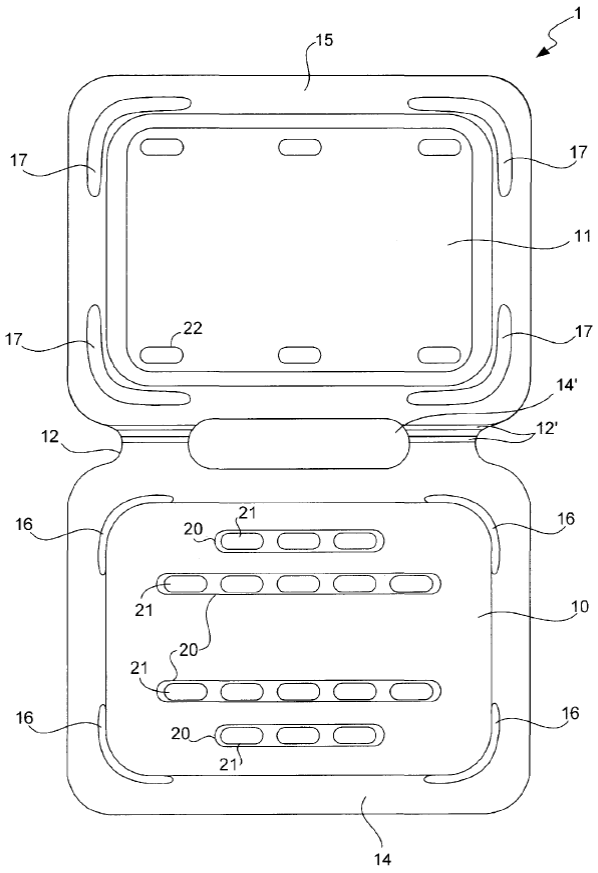

1
15
17
17
11
17
22
17
14'
12'
12
16
20
21
16
21
10
20
21
16
20
21
14

FIG. 3

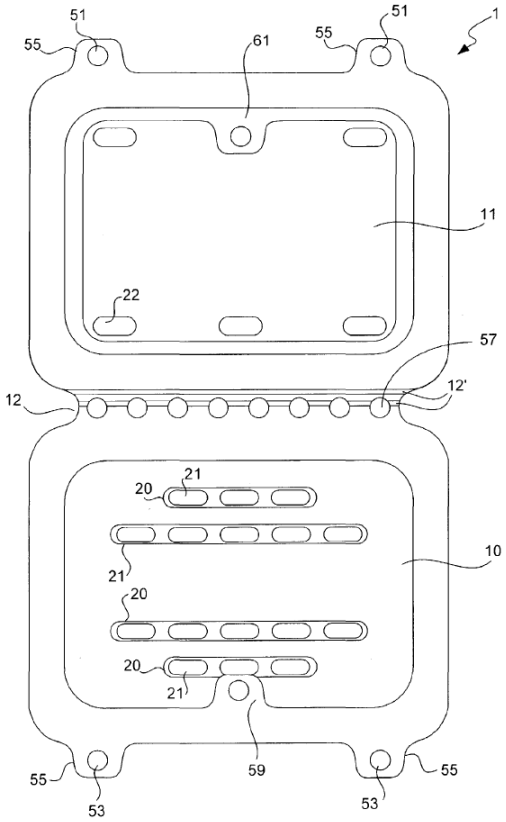

1
51
55
61
55
51
11
22
57
12'
12
21
20
10
21
20
20
21
59
55
55
53
53

FIG. 3A

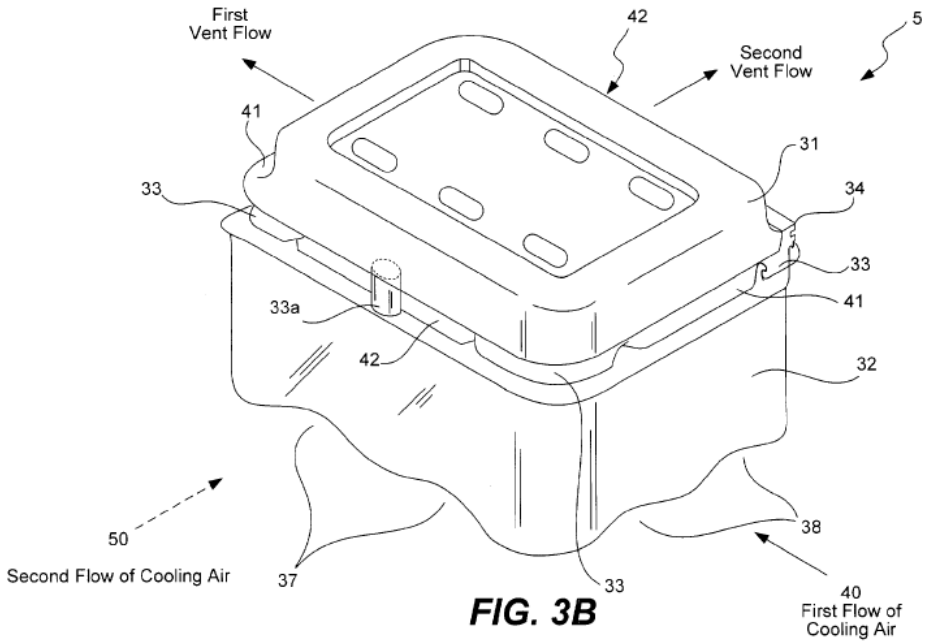

First
Vent Flow
42
5
Second
Vent Flow
41
31
33
34
33
33a
41
42
32
50
38
Second Flow of Cooling Air
37
33
40
First Flow of
Cooling Air

FIG. 3B

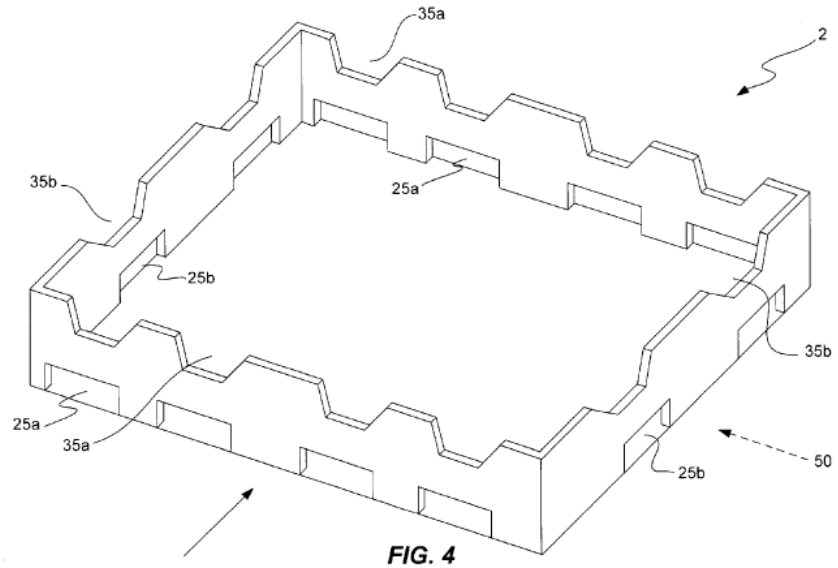

35a
2
35b
25a
25b
35b
25a
35a
50
25b

FIG. 4

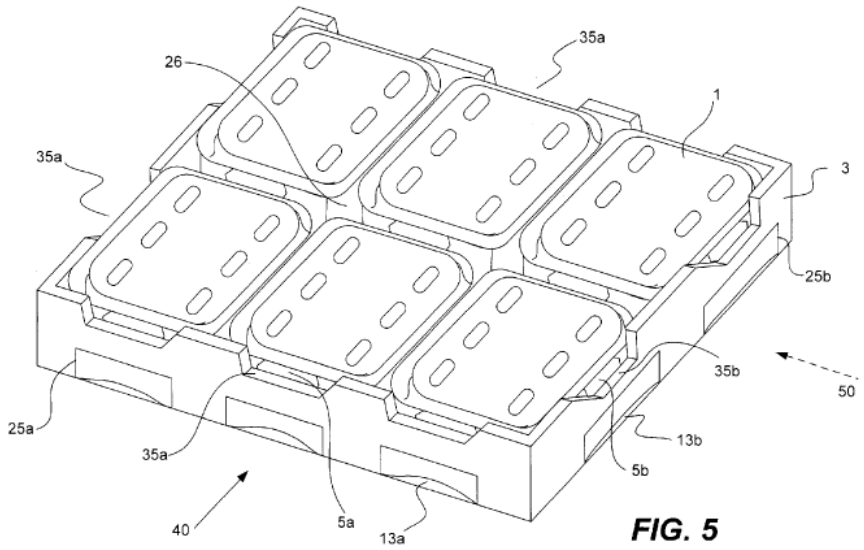

35a
26
1
35a
3
25b
35b
50
25a
35a
13b
5b
40
5a
13a

FIG. 5

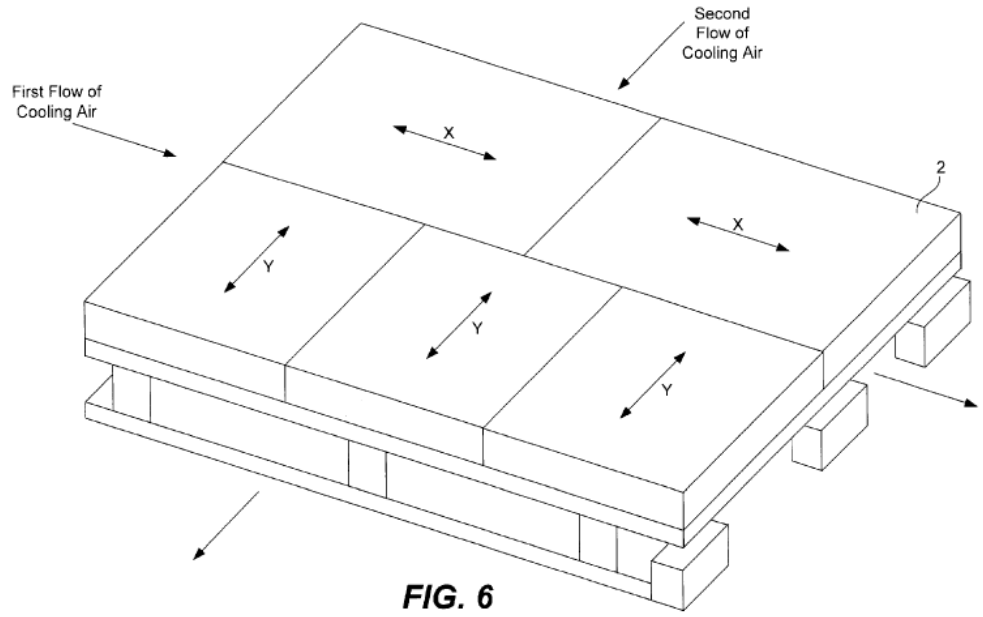

Second
Flow of
Cooling Air
First Flow of
Cooling Air
X
2
X
Y
Y
Y

FIG. 6

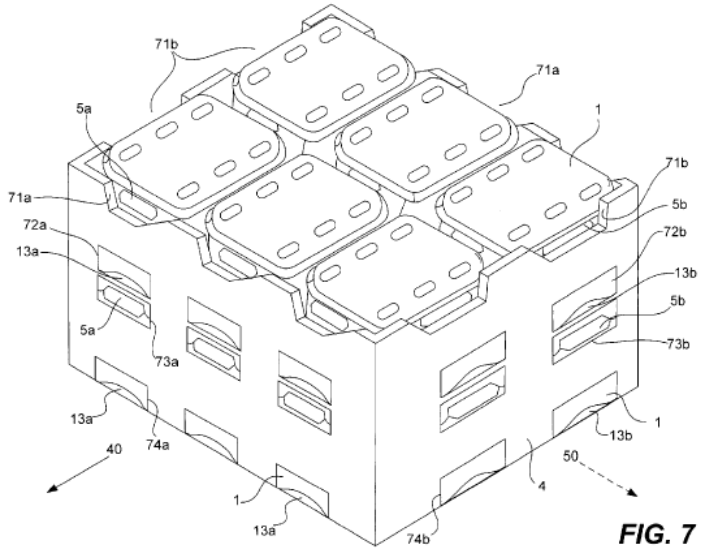

71b
71a
5a
1
71b
71a
5b
72a
72b
13a
13b
5b
5a
73b
73a
13a
1
13b
40
74a
50
4
1
13a
74b

FIG. 7

D2

[19] UNITED STATES PATENT APPLICATION
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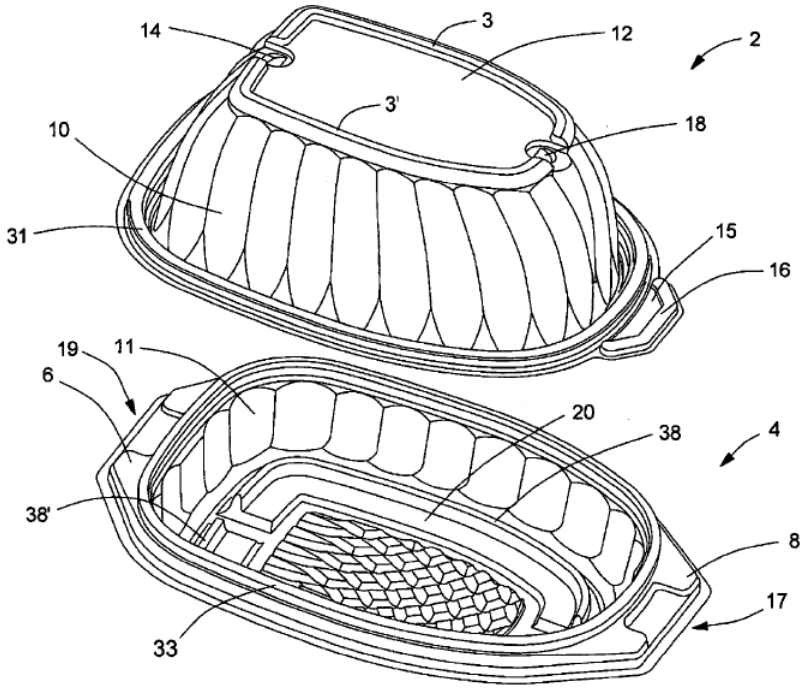
[71] Applicant: Pactiv Packaging
[72] Inventor: P. Mansfield

[54] Title: Domed food container system

Abstract

A rigid polymer domed food container system suitable for heated food products is described. Recessed vents in the lid of the food container systems permit stacking of multiple container systems while allowing heated gases to escape without restriction. Other features of this container system include the retention of food product within the central region of the tray, rigidized handholds to allow the consumer to lift the heated container, and a releaseably lockable snap-fit grip mechanism that facilitates opening of the container system among other things.



Description

FIELD OF THE INVENTION

[0001] The present invention relates to container system configurations for foodstuff. More particularly, the invention relates to a food packaging containment system that is suitable for heated food items such as rotisserie chicken and the like, and includes a tray compartment and a lid member. The container system preferably includes tamper-resistant features, as well as tamper-evident features that visually evidence unauthorized ingress if interfered either inadvertently or with the intent to cause harm.

BACKGROUND OF THE INVENTION

[0002] Retail markets have utilized rigid and flexible plastic containers to protect and display both perishable and fragile food items such as sandwiches, salads and bakery items. These traditional roles of plastic packaging are now the minimum expected standards, and the requirements placed on plastic food packaging continue to expand as increasing demands are placed upon it. Presentation, brand presence, consumer desires, added value to enhance commercial competitiveness, differentiation, imagery and psychology has resulted in the design and application of plastic packaging becoming more challenging. Convenience and versatility continue to shape the future of packaging, with consumers gravitating toward packaged convenience items that minimize the impact on their behavior. This has forced packaging manufacturers to include social and environmental considerations into their development process. The provision of multiple compartments in a variety of shapes and utilities in rigid plastic containers has been one such direction that packaging manufacturers have been pursuing.

[0003] Rigid plastic food containers are typically manufactured from Polystyrene, Polypropylene, Polyethylene Terephthalate (PET), Polylactide, Polyvinyl Chloride (PVC), or other rigid polymers. They generally comprise either of two-parts—a tray and lid—or they may be a one-piece construction with a hinge that modifies one portion of the container to act as the tray and the other connected portion to act as a lid. Furthermore, they are available in a variety of shapes and cross-sections—circular, rectangular, square, and elliptical, etc.

[0004] The use of such plastics for holding heated food has gained favor with the rotisserie chicken being one of the fastest growing applications. However, many currently available food packages have not been designed to cater to the consumer's needs as related to the handling of such container systems for heated foods. Heating of the container contents result in high temperature fluids and gases result in increased pressure build-up, can be painful to the touch. Such constraints also place limitations on the logistical elements such as containerization of large quantities of heated food product. This invention provides for a unique approach that achieves this objective.

SUMMARY OF THE INVENTION

[0005] In a preferred embodiment of the invention, the tray and lid members of the container system possess edges that are designed to mate with and be releaseably lockable to each other. The releaseably lockable mechanism is usually accomplished using a snap-fit grip and the

elements comprising the releaseably lockable snap-fit grip enable a force fit between the lid member and the tray member of the container system. In this embodiment, the releaseably lockable mechanism is further designed to have a uniform cross-section along its entire periphery and is specially configured to hinder condensate from escaping at the lid-tray interface.

[0006] In another embodiment of the invention, opposing sides of the lid and tray members are extended to act as handholds to help the consumer lift the heated container system. Generally, markets that offer heated food products such as rotisserie chickens in plastic container system either provide gloves for the consumer to handle the heated package or the heated package is placed in a cardboard lifting cradle with a handle that resides over the top of the lid member of the container system. This embodiment of the present invention eliminates the need for such devices and additionally enables the food manufacturer and retailer to stack the container systems.

[0007] Without venting, expansion of the container as a consequence of heated gases including steam would cause the lid to pop from the tray member. Vents permit the release of these trapped vapors. In another embodiment of the invention, the vents are recessed into the top of the lid member. The recessed vents serve to permit stacking of the containers without blocking of the vents, thus allowing the food retailer additional space savings while maintaining the display effectiveness of the container system.

[0008] In another embodiment of the invention, the lid of the container system is secured to the tray by means of a tamper-evident tamper-resistant snap-fit grip mechanism. Rigid plastic tamper-evident packaging generally provide visible-to-the-naked-eye indication that a container has been interfered with, that is, it had previously be opened and then re-closed prior to purchase. This invention is a novel plastic packaging solution that improves significantly on the convenience and therefore marketability of food product.

[0009] Further areas of applicability of the present invention will become apparent from the detailed description provided hereinafter. It should be understood that the detailed description and specific examples are intended for purposes of illustration only and are not intended to limit the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWING

[0010] The present invention will become more fully understood from the detailed description and the accompanying drawings, wherein:

[0011] FIG. 1 is an isometric view of an embodiment of the present invention showing the disassembled lid and tray members.

[0012] FIG. 2 is a plan view of the container system in FIG. 1.

[0013] FIG. 3 is a plan view of the bottom of the tray member in FIG. 2.

[0014] FIG. 4 is an enlarged perspective view of a recessed vent depicted in FIG. 1.

[0015] FIG. 5 is a side view of the assembled container system in FIG. 1.

[0016] FIG. 6 is an enlarged cross-sectional view of the releaseably locking mechanism and handle of the container system in taken in the 5-5 plane in FIG. 2.

[0017] FIG. 7 is a side view of an embodiment of the present invention.

[0018] FIG. 8 is a cross-sectional view of the container systems in FIG. 2 taken along the line 7-7 in FIG. 2.

[0019] FIG. 9 is a fragmentary sectional view of the releaseably locking mechanism of the container system taken in the Y-Y plane of FIG. 8.

[0020] FIG. 10 is a fragmentary sectional view of a portion of the tray member of the container system taken in the Z-Z plane of FIG. 8.

[0021] FIG. 11 is cross-sectional view of two container systems each similar to that depicted in FIG. 8 illustrating how the food container systems is stacked.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] The present invention will now be described more fully hereinafter with reference to the accompanying drawings, in which a preferred embodiment of the invention is shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, this embodiment is provided so that this disclosure will be thorough and complete and will fully convey the scope of the invention to those skilled in the art.

[0023] Referring to the drawings and in particular to FIGS. 1 & 2, there is shown a dome-shaped, rigid polymer construct food container system according to the present invention. The food container system includes a lid member **2** and tray member **4** which forms the primary recess into which heated foodstuff, such as a rotisserie chicken, is placed.

[0024] The lid and tray members **2**, **4** of the container system can be molded, through known thermoforming manufacturing means, from a single sheetline of polymer material work piece into a predetermined shape and thickness as required. The lid and tray members **2**, **4** of the container system may also be formed, through known thermoforming manufacturing means, into a curvilinear geometry to thereby provide the end user with a variety of polygonal shapes. In the container system of the invention, the lid member **2** has geometry that permits even mating with the tray member **4** at their peripheral edge. Additionally, mating between lid member **2** and tray member **4** is releaseably lockable and achieved using a snap-fit grip **25**. As shown, the releaseably lockable mechanism is a slotable mechanical interface wherein the tray member snap-fit grip component **33** is the male element and the lid member snap-fit grip component **31** is the female element. Rib element **16** increases the rigidity and strength of the lid member handhold **15**. Separating the lid member **2** from the tray member **4** is facilitated by pulling the lid member handhold **15** away from the tray member handhold **17**. Also shown are raised ribbed sidewalls **10**, **11** in the lid and tray members that improve the overall rigidity of the container system.

[0025] Also shown is the planar surface **12** of the lid member **2** that is bordered by a raised rib periphery **3**, **3′** with the raised rib periphery **3**, **3′** separated at their ends by recessed vents **14**, **18**. In addition to improving the structural integrity of the lid member, the raised rib periphery **3**, **3′** serves to hold in place the tray member **4** of a second identical container system that may be

stacked on the lid member **2**. This feature is illustrated in greater detail in FIG. 11. The lid member **2** may be made from material that is dissimilar from the material used to make the tray member **4** so that when temperatures are elevated, dissimilar coefficients of thermal expansion of the lid member **2** and the tray member **4** increase the effectiveness of the mechanically fastening of the releaseably lockable snap-fit grip and thereby promote the retention of heated gases and condensate. The raised retaining ribs **38**, **38′** is designed restrict movement of the food product contents generally so that they stay within the central portion of the tray member **4**.

[0026] FIG. 3 further illustrates the complementary female grooved elements **21**, **22** & **24** that form a mechanical fit with the raised rib **3** of the lid member **2**. The female grooved element **21** sitting on the lid member planar surface **12** is illustrated in FIG. 2. The female grooved elements **22**, **24** are straddled by the raised rib periphery **3**, **3′** and sit above but are not in mechanical contact with the recessed vents **14**, **18**.

[0027] The extended flange lip **23** of the tray member is defined by the points **13** and **54**, and extending outwards to points **9** and **39**, and raised rib **6**, together form the tray member handhold **19**. Similarly, the extended flange lip **37** of the tray member defined by the points **27** and **55**, and extending outwards to points **29** and **50**, and raised rib **8**, together form the tray member handhold **17**. This design significantly increases the rigidity and the strength of the handholds **17** and **19** of the tray member **4**. Together with the lid member handhold **15**, tray member handholds **17**, **19** give the consumer increased control when both lifting and opening the heated container system.

[0028] Turning to FIG. 4, shown therein is a fragmentary enlarged view of the recessed vent **18** of the present invention. The recessed vent **18** is straddled by the raised edge **28** of the raised rib periphery **3** and the raised edge **30** that leads to the planar surface **12** of the lid member **2**. For illustrative purposes, venting means is achieved through the flap **26** comprising the recessed vent **18**; however, any suitable perforation large enough to permit hot gas to pass through would suffice.

[0029] Turning to FIGS. 5 and 6, therein is shown a side view of the embodiment of present invention in FIG. 1 and the enlarged fragmentary cross-section of the lid and tray members' handhold elements **15**, **17**. Also shown is the releaseably lockable snap-fit grip mechanism **25** that secures the lid member **2** and tray member **4** together when the container system is assembled. The raised rib element **16** ends on an flat edge **32** that is vertically displaced from tray member edge **34** to facilitate gripping by fingers and further provides a gap **36** to allow the consumer to pry open and separate the lid member **2** from the tray member **4**.

[0030] Turning to FIG. 7, therein is shown a side view of a variation of the embodiment of the present invention as in FIG. 1. As shown, the container system is a single piece construction with its lid member **2** and tray member **4** hingeably attached with a hinge **35**.

[0031] Turning now to FIG. 9, therein is shown an enlarged cross-sectional view of the releaseably lockable snap-fit grip **25** of the present invention. The elements comprising the releaseably lockable snap-fit grip **25** are integral parts of the lid member **2** and tray member **4**, wherein the tray member snap-fit grip component **33** is the male element that slots into the female lid member snap-fit grip component **35** element. Improved retention of the fluids and hot gases is achieved

by the five choke points **42**, **44**, **46**, **48** & **49**. The choke points serve to hinder the passage of fluids or gases from the interior of the container system. The planar surface **51** lying between choke points **42** and **46** but coincident with choke point **44**, and the planar surface **53** lying between choke points **46** and **49** but coincident with choke point **48** are angled relative to each other making a concave angle Ω between the two surfaces such that a tight fit is achieved. Edges **47** and **49** of the tray member **4** are incident with the choke points **42** and **49**, and as shown, the edges are vertically displaced by a distance L, wherein the interior edge **47** is lower relative to the exterior edge **49**. In order to remove the lid member **2** from the tray member **4**, the lid edge **43** is lifted up. The differential ledge height L serves to facilitate the opening of the container system by permitting the lid member element of the snap-fit grip to pivot about the ledge **47**.

[0032] Turning now to FIG. 10, therein is shown an enlarged cross-sectional view of a portion of the tray member **4** illustrating the raised rib edge **38** that is located in the interior near the periphery of the tray member **4**. The raised ribs **38**, **38′** as shown in FIG. 1 are designed to encourage the food product to remain within the central portion of the tray **4**. The greater the height M of the raised rib edge **38**, the greater its ability to encourage the food product to remain within the central portion of the tray **4**. The height of raised rib edge **38** is limited by the thermoforming or other manufacturing process used to produce the tray member **4**.

[0033] Also shown in FIG. 10 is the sloped portion **20** of the tray member **4** lying between the raised rib edge **38** and the tray footing **40**. The slope is at an angle β from the horizontal plane and is designed to encourage the hot condensate and other fluids to flow toward the tray footing **40**. The sloped portion **20** of the tray member **4** is also identified in FIG. 1 and FIG. 3.

[0034] Turning finally to FIG. 11 therein is shown a cross-sectional view of a first container system **45** of the present invention that is stacked on top of a second container system **43** of the present invention. The first container system **45** is held in place by a mechanical fit between raised rib peripheries **3**, **3′** of the lid member **2** of the second container system **43** into which the complementary raised ribs that form the foot **40**, **40′** of the tray member **4** of the first container system **45** slotably interfaces.

[0035] Plastic packaging sealing mechanisms generally include snap-fit grips that effectively provide a leak-proof seal that allows the consumer to open, close and releaseably lock the container system multiple times. Some of the advantages of this aspect of the invention are that food freshness can be extended then would otherwise occur without sealing and spillage of the food content is prevented.

[0036] Although particular embodiments of the invention have been described in detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be limited except as by the appended claims.

(**Claims omitted**)

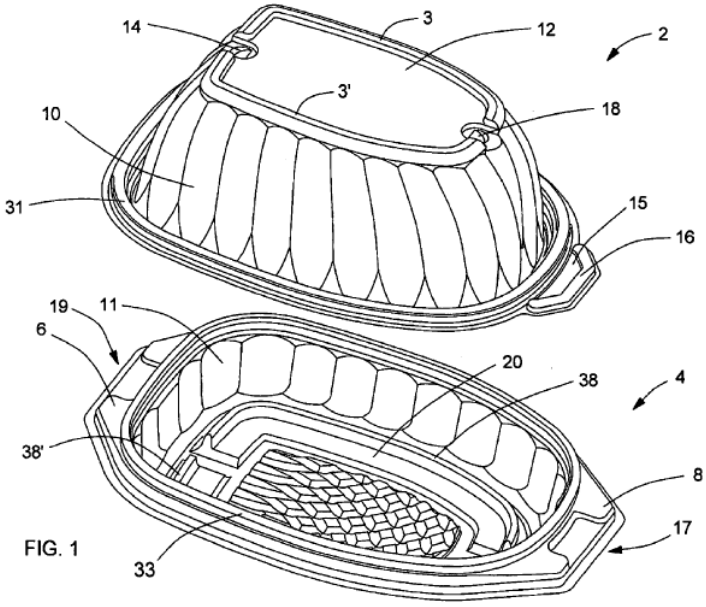

14
3
12
2
3'
10
18
31
15
16
19
11
6
20
38
4
38'
8
17
33

FIG. 1

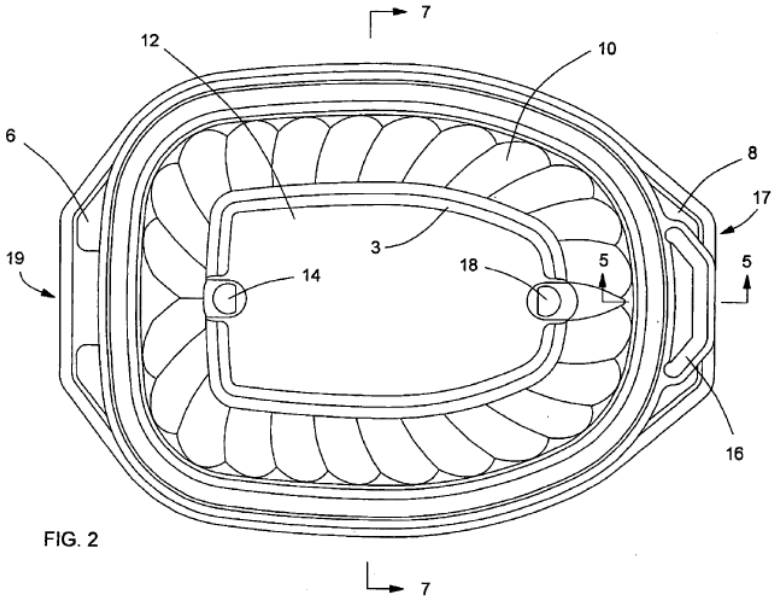

7
12
10
6
8
17
3
19
18
5
5
14
16
7

FIG. 2

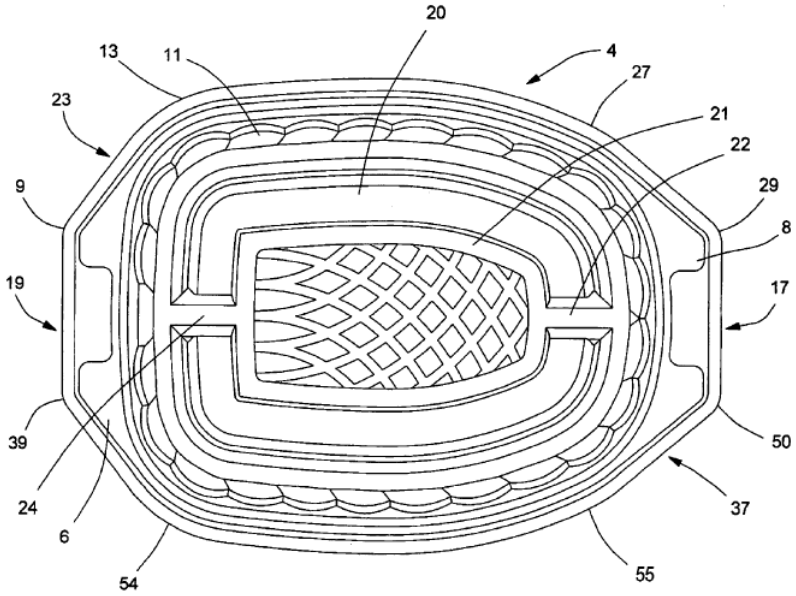


FIG. 3

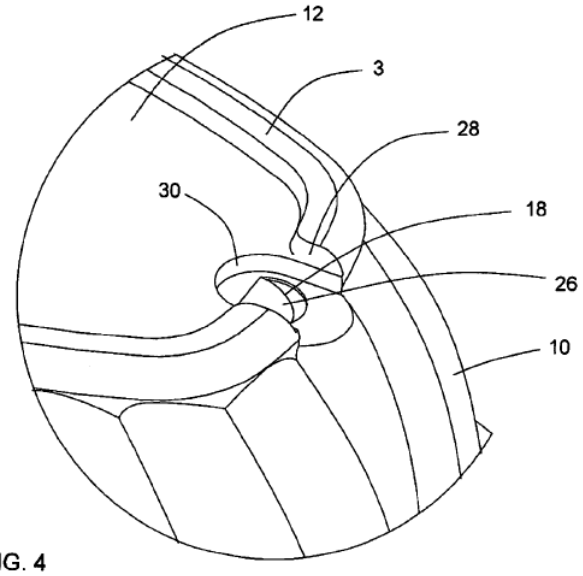


FIG. 4

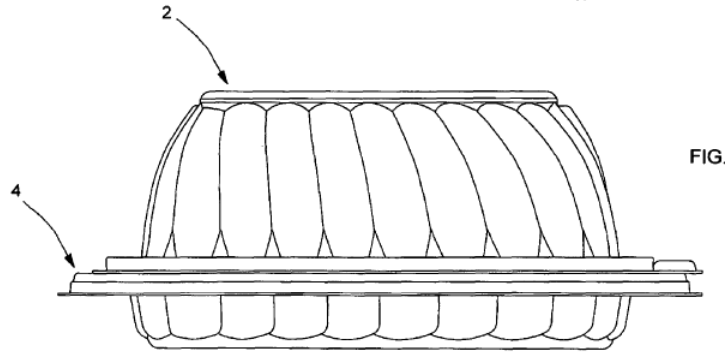
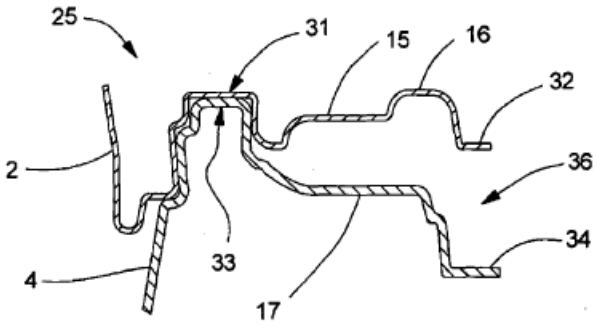


FIG. 5

FIG. 6



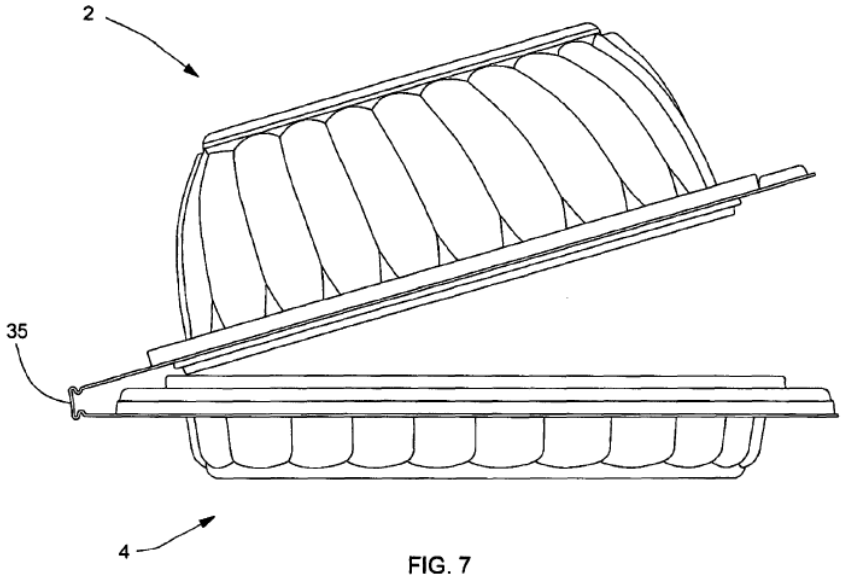


FIG. 7

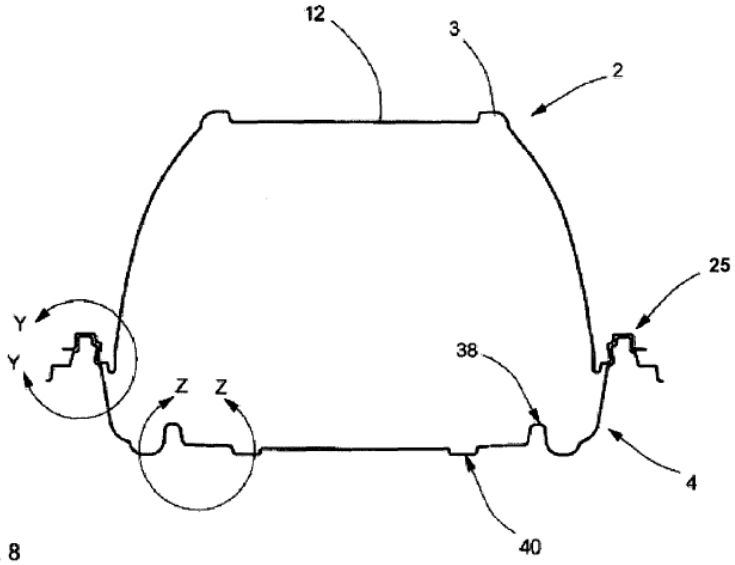


FIG. 8

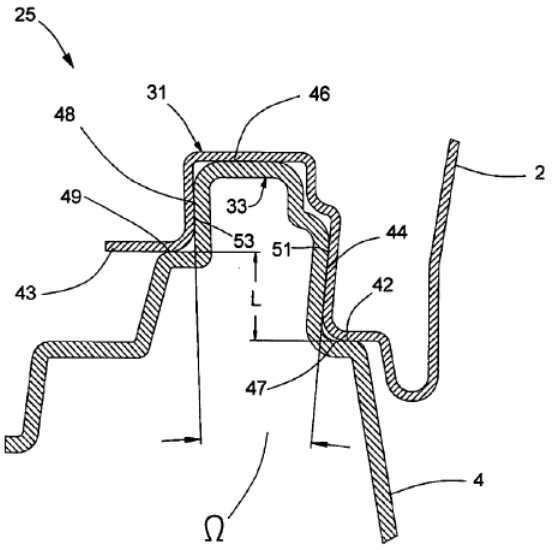


FIG. 9

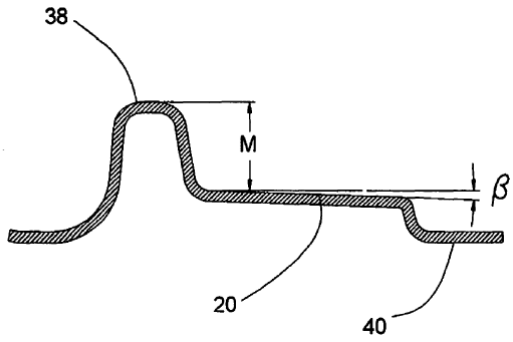


FIG. 10

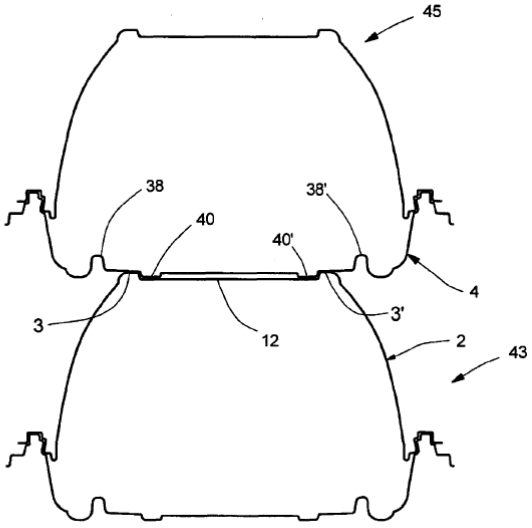


FIG. 11

PART B: Questions C2 to C17 (30 marks)

C2. An applicant has filed a Canadian patent application on April 8, 2015, with a valid US priority date of October 22, 2014. State whether the following pieces of prior art would, or would not, be citable with regards to (i) anticipation, and (ii) obviousness. If citable, indicate the relevant subsections of the *Patent Act*.

(a) A Canadian application filed by another applicant on May 13, 2015, with a Japanese priority date of August 20, 2014. [1 mark]

(b) A disclosure by the same inventors of the patent application at a conference on April 8, 2014. [1 mark]

C3. True or False [4 marks]

(a) If an application is removed from the Patent Prosecution Highway (PPH) during prosecution (*i.e.* after at least a first office action), an applicant can reapply to have the application re-enter the PPH.

(b) Once a patent application is found allowable by an examiner, the prescribed time period to pay the final fee is six (6) months from the date of the notice of allowance.

(c) A decision of the re-examination board can be appealed to the Patent Appeal Board.

(d) Photographs submitted as part of a patent application may be in colour.

(e) An abstract is not a requirement for obtaining a filing date.

(f) A claim set comprising (i) claims to a new product, (ii) claims to a process for making that product, and (iii) a claim to a use of that product generally lacks unity and is therefore not permissible.

(g) In the event an inventor refuses to apply for a patent, the other inventors may still apply for the patent.

(h) A PPH request for a Canadian application can be made on the basis of a US national application claiming priority to a US provisional patent application if the Canadian application claims priority to the same provisional patent application and if the US national application is determined to be allowable by the USPTO.

C4. What is the PCT deadline for filing a Chapter II Demand? [2 marks]

C5. What is the main difference between Article 19 and Article 34 amendments filed under the PCT? [2 marks]

C6. With respect to a document cited in an International Search Report, what does the code "E" represent? [1 mark]

C7. What are the requirements for a sound prediction? [3 marks]

C8. What is a “reach-through” claim? [1 mark]

C9. Name two mechanisms by which a notice of allowance can be withdrawn. [2 marks]

C10. Indicate whether or not the following are patentable: [2 marks]
(a) Mushrooms
(b) Multipotent stem cells
(c) Microscopic algae
(d) Seeds

C11. When considering unity of invention, what is the difference between *a priori* evaluation and *a posteriori* evaluation? [2 marks]

C12: What is a synergistic combination? [2 marks]

C13: Under what circumstance would an amendment after allowance be acceptable? [1 mark]

C14. What is a Summary of Reasons? [2 marks]

C15. How long does an applicant have to respond to a lack of unity defect identified in Form ISA/206 during the International stage? [1 mark]

C16. An examiner’s requisition dated November 12, 2019 required a response within four months; the time limit for a response is therefore March 12, 2020. A response was not provided by March 12, 2020 and therefore the application was deemed abandoned. On what date does the reinstatement period end? [1 mark]

C17. Briefly define “restoration of the right of priority”. [2 marks]

CANADIAN PATENT AGENT QUALIFYING EXAMINATION 2020
MARKING GUIDE for PAPER C – PATENT OFFICE PRACTICE

Part A – Question C1 [total of 70 pts]

Amendments to claim 1 [24 pts]

Addition of:

- a first intake port disposed between the two engaged rims and a first counterpart intake port disposed between the two engaged rims (par. 13, 37, 38) [4 pts]
- the first intake port and the first counterpart intake port being further disposed between the two engaged rims such as to permit air to enter directly and generally horizontally into the container (par. 13, 15, 37, 38) [4 pts]
- the first intake port and the first counterpart intake port defining a line in the interior of the container that extends from the first intake port to the first counterpart intake port (par. 14) [4 pts]
- the floor having a plurality of ribs projecting upwardly into the interior of the container (par. 17, 39) [4 pts]
- the plurality of upwardly projecting ribs forming at least one channel within the interior of the container and aligned with the line defined by the first intake port and the first counterpart intake port (par. 17, 39) [4 pts]
- the top surface of the lid having a plurality of exhaust vents disposed on it (par. 18, 38, 40, 42) [2 pts]

Remaining features kept [2 pts]

Other claim amendments [9 pts]

Correction of the following:

- Claim 4: “The container…” [1 pt]
- Claim 5: “any one of claims…” [1 pt]
- Claim 6: “the lid”; “the base” [2 pts]
- Claim 7: reference to claims by number [1 pt]
- Claim 8: *e.g.* by referring to claim 1, or by deletion of claim 8 [1 pt]
- Claim 9: definition of abbreviations (ok if unchanged with appropriate justification) [1 pt]
- Claim 9: replacement of “or” with “and” [1 pt]
- Claim 10: deletion [1 pt]

Introduction of new formality defects (-1 per defect; maximum -3)

Response to examination report [37 pts]

Discussion of the following points:

- Novelty [6 pts]
- Obviousness [6 pts]
- “Desired result” for claim 1 [4 pts]
- Support for features added to claim 1 [2 pts]
- Support for claim 8 (deletion of claim, or amdt of description) [2 pts]
- Clarity of amended claim 1 wrt structure of lid rim & base rim [2 pts]
- Clarity of amended claim 1 wrt position of vents [2 pts]
- Defect in claim 4 [1 pt]
- Defect in claim 5 [1 pt]
- Defect in claim 6 [1 pt]
- Defect in claim 7 [1 pt]
- Defect in claim 8 [1 pt]
- Defect in claim 9 wrt abbreviations [1 pt]
- Defect in claim 9 wrt Markush [1 pt]
- Defect in claim 10 [2 pts]
- Provision of a new title [2 pts]
- Amdt of description to remove reference to the claims [1 pt]
- Amdt of description to add country in patent document of par. 8 [1 pt]

Example Claims

1. A plastic food container comprising:
   a lid and a base, the lid and base each having a peripheral rim;
   the lid rim adapted for closing engagement with the base rim;
   the lid rim and base rim when in closed engagement forming an interior of the container;
   a first intake port disposed between the two engaged rims and a first counterpart intake port disposed between the two engaged rims [par. 13, 37, 38];
   the first intake port and the first counterpart intake port being further disposed between the two engaged rims such as to permit air to enter directly and generally horizontally into the container [par. 13, 15, 37, 38];
   the first intake port and the first counterpart intake port defining a line in the interior of the container that extends from the first intake port to the first counterpart intake port [par. 14];
   the base comprising a floor, the floor having a plurality of ribs projecting upwardly into the interior of the container [par. 17, 39];
   the plurality of upwardly projecting ribs forming at least one channel within the interior of the container and aligned with the line defined by the first intake port and the first counterpart intake port [par. 17, 39];
   the lid including a top surface and one or more outermost side surfaces; the top surface of the lid having a plurality of exhaust vents disposed on it [par. 18, 38, 40, 42].

2. The container of claim 1 wherein the plurality of exhaust vents of the container lid numbers between eight and fourteen vents.

3. The container of claim 1 wherein the lid includes a contour and the plurality of exhaust vents on the lid are disposed away from the lid center so that they follow the contour of the lid.

4. The container of claim 1 wherein the exhaust vents disposed on the lid are formed so that they direct rising gases and vapours outward in relation to the outermost side surfaces of the lid.

5. The container of any one of claims 1-4 wherein the peripheral rim of the lid comprises at least two sealing projections, the peripheral rim of the base has a channel and when the lid and base are in the closed arrangement the at least two sealing projections of the lid rim are engaged by the channel in the peripheral rim of the base.

6. The container of claim 1 wherein the lid is hinged to the base.

7. The container of any one of claims 1-6 wherein the floor includes textured surface platforms.

8. The container of claim 1 wherein the plurality of exhaust vents of the container lid numbers between six and sixteen vents.

9. The container claim 1 wherein the container is manufactured from a material selected from the group consisting of polyethylene (PE), polypropylene (PP), polyvinyl chloride (PVC) and polyethylene terephthalate (PET).

Part B – Questions C2 – C17 [30 pts]

C2. An applicant has filed a Canadian patent application on April 8, 2015, with a valid US priority date of October 22, 2014. State whether the following pieces of prior art would, or would not, be citable with regards to (i) anticipation, and (ii) obviousness. If citable, indicate the relevant subsections of the *Patent Act*.

(a) A Canadian application filed by another applicant on May 13, 2015, with a Japanese priority date of August 20, 2014.
   (i) Citable, *Patent Act* 28.2(1)(d). [0.5 pt]
   (ii) Not citable. [0.5 pt]

(b) A disclosure by the same inventors of the patent application at a conference on April 8, 2014.
   (i) Not citable. [0.5 pt]
   (ii) Not citable. [0.5 pt]

C3. True or False

(a) If an application is removed from the Patent Prosecution Highway (PPH) during prosecution (*i.e.* after at least a first office action), an applicant can reapply to have the application re-enter the PPH.
False [0.5 pt] – Reference: page entitled "Frequently Asked Questions about the Patent Prosecution Highway" on CIPO website

(b) Once a patent application is found allowable by an examiner, the prescribed time period to pay the final fee is six (6) months from the date of the notice of allowance.
False [0.5 pt] – Reference: *Patent Rules*, 86(1)

(c) A decision of the re-examination board can be appealed to the Patent Appeal Board.
False [0.5 pt] – Reference: MOPOP 30.01.06

(d) Photographs submitted as part of a patent application may be in colour.
True [0.5 pt] – Reference: *Patent Rules*, 59(3)

(e) An abstract is not a requirement for obtaining a filing date.
True [0.5 pt] – Reference: MOPOP 13.01; *Patent Rules*, 71

(f) A claim set comprising (i) claims to a new product, (ii) claims to a process for making that product, and (iii) a claim to a use of that product generally lacks unity and is therefore not permissible.
False [0.5 pt] – Reference: MOPOP 21.08.01

(g) In the event an inventor refuses to apply for a patent, the other inventors may still apply for the patent.
True [0.5 pt] – Reference: MOPOP 6.02

(h) A PPH request for a Canadian application can be made on the basis of a US national application claiming priority to a US provisional patent application if the Canadian application claims priority to the same provisional patent application and if the US national application is determined to be allowable by the USPTO.

True [0.5 pt] – Reference: page entitled “Frequently Asked Questions about the Patent Prosecution Highway” on CIPO website PPH, under “United States (Global PPH program)”

C4. What is the PCT deadline for filing a Chapter II Demand?

3 months from the transmittal date of the ISR and WO, or 22 months from the priority date, whichever is later. [2 pts] - Reference: PCT Regulations, Rule 54bis

C5. What is the main difference between Article 19 and Article 34 amendments filed under the PCT?

Under Article 19, only claims can be amended while under Article 34, claims, description and drawings can be amended. [2 pts] - Reference: PCT Articles 19 and 34

C6. With respect to a document cited in an International Search Report, what does the code "E" represent?

Earlier application or patent but published on or after the international filing date. [1 pt] - Reference: PCT/ISA/210 form

C7. What are the requirements for a sound prediction?

Factual basis; sound line of reasoning; and proper disclosure. [3 pts] - Reference: MOPOP 19.01.03

C8. What is a “reach-through” claim?

A “reach-through” claim seeks to encompass subject-matter extending beyond the described invention in cases where the matter has not yet been identified by the inventor but may be discovered through future use of the invention. [1 pt] - Reference: MOPOP 23.09

C9. Name two mechanisms by which a notice of allowance can be withdrawn.

Withdrawal upon request by the applicant; withdrawal by the Commissioner. [2 pts] - Reference: MOPOP 25.02

C10. Indicate if the following are patentable:
(a) Mushrooms : No [0.5 pt]
(b) Multipotent stem cells : Yes [0.5 pt]
(c) Microscopic algae : Yes [0.5 pt]
(d) Seeds : No [0.5 pt]

Reference: MOPOP 23.02.01

C11. When considering unity of invention, what is the difference between *a priori* evaluation and *a posteriori* evaluation?

A priori: assessed without regard to the state of the art; *a posteriori*: requires the state of the art to be considered. [2 pts] - Reference: MOPOP 21.06

C12: What is a synergistic combination?

A combination in which the combined use of two or more compounds or products generates a result that is greater than the sum of its parts and provides an unexpected advantage. [2 pts] - Reference: MOPOP 23.08

C13: Under what circumstance would an amendment after allowance be acceptable?

Only to correct an obvious error. [1 pt] - Reference: MOPOP 25.01.01

C14. What is a Summary of Reasons?

A document written by an examiner in preparation for the Commissioner's review of a rejected application in which the examiner briefly sets out why the application does not comply with the *Patent Act* and *Patent Rules*. [2 pt] - Reference: MOPOP 26.06

C15. How long does an applicant have to respond to a lack of unity defect identified in Form ISA/206 during the International stage?

One month from the date on the 206 form. [1 pt] - Reference: PCT Regulations, Rule 40

C16. An examiner's requisition dated November 12, 2019 required a response within four months; the time limit for a response is therefore March 12, 2020. A response was not provided by March 12, 2020 and therefore the application was deemed abandoned. On what date does the reinstatement period end?

March 12, 2021. [1 pt] - Reference: MOPOP 9.03.02

C17. Briefly define "restoration of the right of priority".

A mechanism whereby the time limit for filing an application accompanied by a request for priority is extended beyond the normal twelve-month period after the filing of a priority document. [2 pts] – Reference: MOPOP 7.06

PATENT AGENT EXAMINATION 2020

PAPER D – PATENT INFRINGEMENT

This examination comprises **Part A** (analytical questions) and **Part B** (short questions).
Part A comprises Questions A1 to A3 and also includes documents D1 and D2.
Part B comprises Questions B1 to B7.

Instructions

Provide the best answer to the following questions.

Unless expressly indicated otherwise, every answer must include a discussion and/or reasoning appropriate to the mark allocation. Do not provide irrelevant or extraneous commentary. Answer only what is asked and do not assume any facts that are not expressly stated.

Citations to legal authority (case law, statutory provisions, and/or regulatory provisions) are only required when explicitly requested and should be clear and precise. No marks will be awarded for boilerplate language.

Your infringement analyses must address all elements of the claims on their own merits. Do not simply conclude that a claim is uninfringed by virtue of its dependency on an uninfringed claim. However, when a claim refers to a previous claim by number, you may incorporate your earlier analysis of the previous claim by reference rather than repeat your analysis. Any incorporation must be specific and relevant to the question at hand, and the location of the incorporated matter in the answer booklet(s) must be clearly and unambiguously identified.

PART A – TOTAL 79 MARKS

The following two documents are included in Part A:

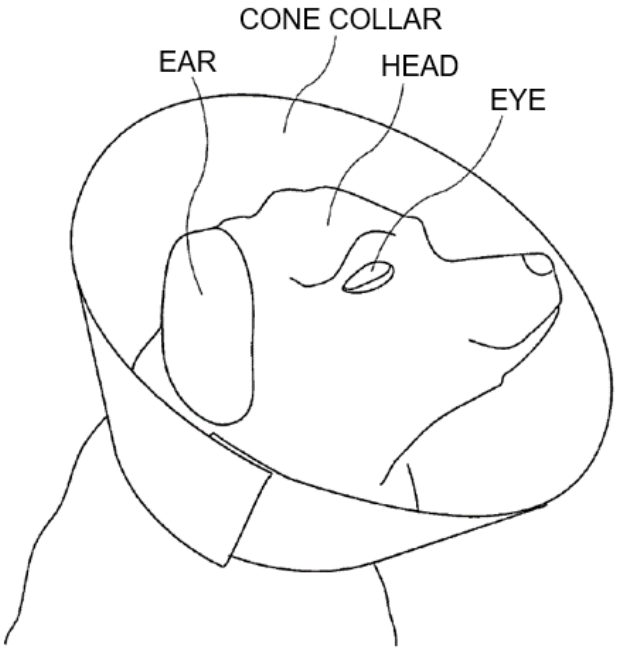
D1: Canadian Patent No. 2,XXX,825 issued to Pet Protectors Inc. (the '825 Patent)

D2: Description and drawings labelled "The Super Soft Pet Cone", a product sold in Canada by Soft Pets Ltd. which is alleged to infringe the '825 Patent.

Two duplicate sets of '825 Patent claims are at the end of this paper for your optional use.

Background

The subject matter of this examination is pet cone collars, as may be used to prevent animals from scratching their facial regions or licking portions of their body. For those unfamiliar with pet cone collars, as shown in the prior art drawing below, the cone collar is formed into a generally frustoconical shape in use and secured about the animal's head. For example, this can prevent the animal from using its hind legs to scratch its eyes or ears.



PRIOR ART

Question A1 [45.5 Marks Total]

A1A. For each of the following elements of the ‘825 Patent, provide a **mapping** of that element to the corresponding element described in the ‘825 Patent and a brief explanation of the **function** of that element. **(8 marks) [2 marks each]**

(i) a substantially flexible and resilient three-layer sheet (claim 1);

(ii) the outer arcuate edge having a radius that is greater than a radius of the inner arcuate edge (claim 1);

(iii) support elements extending between the inner and outer arcuate edges (claim 5);

(iv) a reinforced edge (claim 7).

A1B. Provide a construction of each of the following terms that you would present if representing the indicated party in an infringement action, and after providing such construction, explain how your construction supports a finding that the essential elements of each construed term are present in D2 (if representing the patentee) or are not present in D2 (if representing the alleged infringer). **[37.5 marks total]**

Support your construction with appropriate explanation, having regard to the essential features of each claim term as construed, explaining why a feature is considered to be essential or non-essential. If you rely on a citation to a specific portion of the ‘825 Patent to support your construction, you must specifically cite the relevant portion and explain how that citation supports your construction. No marks are awarded for merely citing portions of or repeating passages of the ‘825 Patent without explaining how and why they support your answer.

No marks are awarded for mapping to the corresponding element of the ‘825 Patent in this sub-question.

(i) representing the patentee Pet Protectors Inc. and explaining how your construction supports a finding this element is present in D2, “a substantially flexible and resilient three-layer sheet” (claim 1) **(7.5 marks)**;

(ii) representing the patentee Pet Protectors Inc. and explaining how your construction supports a finding this element is present in D2, "a reinforced edge" (claim 7) **(7.5 marks)**;

(iii) representing the alleged infringer Soft Pets Ltd. and explaining how your construction supports a finding this element is **not** present in D2, "a middle layer [of the three-layer sheet] provides the flexible and resilient properties [of the three-layer sheet]" (claim 3) **(7.5 marks)**;

(iv) representing the alleged infringer Soft Pets Ltd. and explaining how your construction supports a finding this element is **not** present in D2, "support elements extending between the inner and outer arcuate edges" (claim 5) **(7.5 marks)**; and

(v) representing the alleged infringer Soft Pets Ltd and explaining how your construction supports a finding this element is **not** present in D2, "a reinforced edge" (claim 7) **(7.5 marks)**.

Question A2 [16 Marks Total]

A2A. Representing the patentee Pet Protectors Inc. and applying your claim construction from question A1(b)(i), explain whether claims 1 **(4.5 marks)**, 2 **(2 marks)**, 4 **(2 marks)** or 10 **(2.5 marks)** of the '825 Patent are infringed, including a mapping to the accused device and a brief explanation of how that element is or is not present. No further exposition on claim construction needs to be provided (i.e. you may assume a literal construction for any claim elements not construed in question A1(b)(i)). **[11 marks total]**

A2B. Representing the alleged infringer Soft Pets Ltd. and applying your claim construction from question A1(b)(iii), explain whether claim 3 of the '825 Patent is infringed, including a mapping to the accused device and a brief explanation of how that element is or is not present. No further exposition on claim construction needs to be provided (i.e.

you may assume a literal construction for any claim elements not construed in question A1(b)(iii)). **(5 marks)**

Question A3 [17.5 Marks Total]

You have been retained by Pet Protectors Inc. to advise it on what action to take in response to infringement of the '825 Patent by Soft Pets Ltd.

Pet Protectors has retained a private investigator and determined how Soft Pets Ltd. is selling the Super Soft Pet Cone in Canada. The products are manufactured in China by SP Mfg. Co. to Soft Pets' specifications. Soft Pets takes delivery of the Super Soft Pet Cone in Guangdong, China, and ships the product from there to Toronto.

The private investigator was also able to obtain the following information as to the sales of Super Soft Pet Cone in Canada to Super Soft's licensee SP Distributing Inc. as follows:

July 15, 2014	1,200 Units
December 15, 2014	700 Units
January 1, 2018	1,500 Units

The private investigator also determined that the person behind Soft Pets Ltd. is Karen Smith, one of the named inventors on the '825 Patent. Your client advises that Karen used to be employed by Pet Protectors Inc. as its janitor. Karen did not have any written employment agreement with Pet Protectors Inc. and never signed any documents relating to the invention. She and Pet Protectors' product designer Joe Barnes came up with the idea for the invention claimed in the '825 Patent over coffee one day at Pet Protectors' head office in Ottawa, sketching out drawings on napkins at the coffee station that are substantially similar to what is reflected in the formal drawings of the '825 Patent.

A3A. Assuming that the Super Soft Pet Cone infringes at least one claim of the ‘825 Patent, advise Pet Protectors which parties from the fact pattern are or are not liable for infringement and briefly state why. Cite statutory and case law authority. **(5 marks)**

A3B. Based on the sales information obtained by the private investigator, advise Pet Protectors as to the potentially available damages assuming it commences an infringement action against Super Soft on May 1, 2020. In explaining the available damages, specify only the general nature of the damages available—do not explain in detail how those damages would be quantified. Cite statutory authority. **(5 marks)**

A3C. Pet Protectors advises that it has an activist shareholder that is anti-patent. Given this, Pet Protectors tells you it does not want to be involved in any litigation involving the ‘825 Patent because this could raise negative publicity issues. Instead, Pet Protectors suggests that any legal action should be taken by its non-exclusive licensee Pet Mart Canada Inc., with no involvement by Pet Protectors. Advise Pet Protectors if this is possible, citing case law and statutory authority. **(3 marks)**

A3D. Advise Pet Protectors Inc. if there are any issues relating to the fact that it has no documentation signed by Karen Smith relating to the ‘825 Patent that might impact its ownership of the ‘825 Patent. Limit your answer to issues of ownership only, not any issues relating to the respective rights of patent owners. **(4.5 marks)**

END OF QUESTIONS IN PART A

PART B – TOTAL 21 MARKS

B1A. Can statements made during the prosecution of a patent application impact the defense of a Defendant in a patent infringement action? Briefly explain your answer and cite statutory authority. **(1.5 marks)**

B1B. Are there any circumstances where prosecution history in foreign jurisdictions may impact the defense of a Defendant in a patent infringement action? Briefly explain your answer and cite case law authority. **(1.5 marks)**

B2. Under Canadian law, a plaintiff claiming contributory infringement must prove three elements. List those three elements. Cite case law authority. **(2 marks)**

B3. A maintenance fee for an issued patent was due on November 1, 2019 and was not paid. A Notice was issued from CIPO on April 1, 2020, setting a two month deadline of June 1, 2020 as the due date to pay the fee along with a late fee. None of these dates fall on a day on which CIPO is closed for business. What is the potential consequence of waiting until June 1, 2020 to pay the fee? When should the fee be paid to avoid this potential consequence? Cite the relevant section of the *Patent Act*; it is <u>not</u> necessary to cite the *Patent Rules*. **(2 marks)**

B4. A new invention disclosure has come across your desk from a researcher at a well-known Canadian university. The researcher has indicated that she is using a patented antibody to try to develop a new version of the antibody with improved properties. Because the antibody is very expensive to purchase, the researcher has taken the information available in the patent and made the antibody herself in the lab. Is the researcher liable for patent infringement? Briefly state why or why not. Cite statutory authority. **(2 Marks)**

B5. A patent application was filed in Canada on December 1, 2019, claiming priority to an application with a filing date of November 1, 2018, a period of more than one year. On November 2, 2018, the subject matter of the patent application was entirely disclosed and enabled in a press release by the Applicant. In an infringement suit brought after the patent issued, it was argued that there can be no infringement because the patent is

entirely anticipated by the November 2, 2018 disclosure. Briefly state how this argument could fail, assuming that the subject matter of the Canadian patent application is fully supported by the priority filing. Cite statutory authority. **(4 Marks)**

B6. Company A sells patented bicycle wheels. Company B has designed a new and improved bicycle that incorporates Company A's wheels. Can Company B buy Company A's patented wheels and sell bicycles using the wheels without infringing Company A's patent? Briefly explain your answer and cite case law authority. **(2 marks)**

B7. **[6 marks total]** Joe Beef Packing Inc. ("Joe Beef"), a meat packing and processing company with facilities in Montreal, Quebec, is the owner of a patent in Canada covering one of its proprietary methods that is the subject of Canadian Patent No. 2,xxx,741 (the '741 Patent). The '741 Patent was filed on September 23, 1997 and issued on March 3, 2007. Claim 1 of '741 Patent reads as follows:

> A method for preparing a raw base material for use in a processed meat product, the method comprising:
>
> (1) at a meat packing plant, deboning whole muscle meat to thereby create boneless whole muscle meat;
>
> (2) mixing an initial processing mixture with the boneless whole muscle meat at the meat packing plant and packing the resultant mixture into a container;
>
> (3) shipping the container to a meat processing plant such that the boneless whole muscle meat is partially processed for at least two hours during said shipping; and
>
> (4) further processing the meat at the meat processing plant by at least one of smoking, salting, pickling or grounding.

Bestia Inc. ("Bestia"), a competitor to Joe Beef, with facilities in Toronto, Ontario and Buffalo, New York. Joe Beef just discovered that Bestia has been using Joe Beef's claimed process since 2010. Bestia conducts all of the initial meat packing steps at its meat packing plant in Toronto and ships the container containing the initial processing

mixture and the boneless whole muscle meat to its meat processing plant in Buffalo, New York, where the remaining processing steps take place.

B7A. Assuming Bestia is selling meat only in the US market, briefly state whether Joe Beef can bring an action against Bestia for patent infringement in Canada. Cite case law authority. **(2.5 marks)**

B7B. How would your answer to B7A change if Bestia exports the processed meet from its Buffalo processing plant back to Canada for sale? Cite case law authority. **(1.5 marks)**

B7C. Joe Beef commences an infringement action against Bestia today, May 1, 2020. State the period for which Joe Beef can obtain damages for patent infringement. Cite statutory authority. **(2 marks)**

END OF QUESTIONS IN PART B

CA 2XXX825 C 2017/06/15

(11)(21) **2 XXX 825**

(12) **BREVET CANADIEN**

CANADIAN PATENT

(13) **C**

(22) Date de dépôt/Filing Date: 2014/02/20	(72) Inventeurs/Inventors:
(41) Mise à la disp. pub./Open to Public Insp.: 2014/08/21	SMITH, KAREN, CA
(45) Date de deliverance/Issue Date: 2017/06/15	BARNES, JOE, CA
(30) Priorité/Priority: 2013/02/21	(73) Propriétaires/Owners:
	PET PROTECTORS INC., CA

[REMAINDER OF COVER PAGE AND ABSTRACT, AND SUMMARY OMITTED]

PET PROTECTIVE CONE COLLAR

Field of the Invention

[0001] The present invention, in some embodiments, relates to a pet protective cone collar. Some embodiments relate to a flexible pet protective cone collar that minimizes injury and discomfort to animals wearing the cone collar.

Background

[0002] Protective animal collars, commonly referred to as Elizabethan collars or cone collars, are roughly frustoconical in shape and designed to be worn around an animal's neck with the collar extending upward and outward around the animal's head. The collars are generally used to prevent an animal from licking or biting a wounded or diseased area on the animal's body. They can also be used to protect an animal's head or neck from scratching or rubbing with its paws.

[0003] Protective animal collars are commonly used after an animal has undergone a surgical procedure to prevent the animal from further aggravating the surgical site or disrupting the sutures and to decrease the risk of infection due to continued irritation of the site. However, they can also be used to prevent an animal from licking topically applied products such as medication or to prevent an animal from over-grooming.

[0004] Typically protective animal collars are made from flexible but fairly rigid material such as plastic or cardboard. The rigidity of the material prevents the animal from accessing the wounded or diseased area on its body with the more rigid materials doing a better job of keeping the head isolated. However, the rigidity of the material tends to negatively correlate with the animal's comfort in wearing the collar. Increasing rigidity also tends to increase the weight of the collar, which in turn increases the chaffing on the wearer.

[0005] Also, the more rigid the material, the more difficulty the animal has moving around and the more jarring for the animal if it runs into an object with the collar. Accordingly, there is a need for a protective animal collar that is functional and comfortable for the wearer, while still being able to retain a generally frustoconical shape to ensure the animal cannot access any wounded area on its body and/or to isolate the animal’s head e.g. against scratching.

Description of the Drawings

[0006] FIG. 1 is a top view of an embodiment of the protective collar in the unfolded configuration.

[0007] FIG. 2 is a section view of the protective collar of FIG. 1 through line 2-2 of FIG. 1, depicting the arrangement of first and second exterior sheets and a padding layer and the stitching along each of the arcuate edges.

[0008] FIG. 3 is a perspective view of the protective collar of FIG. 1, as it would appear when fitted on an animal.

Detailed Description of the Invention

[0009] Referring to FIGS. 1, 2 and 3, the present invention provides a protective cone collar **1** effective as a veterinary restraint when fitted on an animal. In this embodiment of the invention the protective collar **1** comprises a first exterior sheet **10** comprising a soft and flexible material having inner and outer arcuate edges **12** and **14** respectively, the edges being generally concentric around a common centre and extending between a first end **16** and a second end **18**. A second exterior sheet **20** (underneath sheet **10** in FIG. 1 but visible in FIGs. 2 and 3) also comprises a soft and flexible material. The second exterior sheet **20** is substantially the same size

and shape to enable creating the two sides of the collar with a space for a resilient support layer **22** to interpose the first and second exterior sheets **10**, **20**, as shown in FIG. 2.

[0010] The resilient support layer **22** is also of a generally similar shape to the first and second exterior sheets **10** and **20**, and is sized to be located between the first and second exterior sheets **10** and **20** as shown in FIG. 2. When assembled, the first and second exterior sheets **10** and **20** and the resilient support layer **22** form a substantially at least semi-circular shape, as has been shown in FIG. 1.

[0011] The materials selected for first and second exterior sheets **10**, **20** and resilient support layer **22** are selected to provide a three-layer construction that is flexible and resilient, without being rigid. The aforementioned design overcomes the disadvantages of substantially rigid prior art cone collars by providing greater comfort for the animal wearing the collar, as well as reducing harm to the animal and damage to property in the event the animal collides with objects such as people or furniture. In the event of such a collision, protective collar **1** will flex and yield, rather than transmitting the full force of the impact to the animal and the struck object, as is the case with more rigid prior art cone collars. Thus, a smaller proportion of the force of the impact will be transmitted to both the animal and the struck object by protective collar **1** than by other more rigid prior art cone collars.

[0012] However, the materials used in the three-layer construction, and in particular the material of resilient support layer **22**, are selected to be sufficiently resilient so that protective collar **1** will hold and return to its frustoconical shape after normal deformation, i.e. so that protective collar **1** will not buckle or fold during normal usage. Buckling or folding means that the generally frustoconical shape of protective collar **1** would be disrupted for a period of time (e.g. until a user physically intervenes to restore the collar to its generally frustoconical shape), which might allow an animal to access an area intended to be protected by the protective collar **1**.

[0013] The desired level of flexibility and resiliency is generally provided by the material properties of the resilient support layer **22**, while first and second exterior sheets **10** and **20** act generally as protective covering layers, preventing physical damage to resilient support layer **22**. The first and second exterior sheets **10** and **20** can be fashioned from a variety of materials including cloth such as nylon, rubberized cloth, soft plastic and the like.

[0014] The resilient support layer **22** may also be fashioned from a variety of materials. The material used in the resilient support layer **22** should be flexible enough to provide a collar that is softer and therefore more comfortable than a traditional cone collar, yet is rigid enough to maintain the desired cone-like shape of the collar when worn by an animal and sufficiently resilient to return to its cone shape when bent, to avoid buckling of the collar during normal use. It is preferred that the first and second exterior sheets **10** and **20** be quite flexible with little resilience and resistance to bending, while the resilient support layer **22** be more resilient such that when the three layers are formed into a unit and applied to an animal in a frustoconical cone shape, the collar will be sufficiently rigid to maintain its cone configuration yet will easily give when hit or pushed or bent, and will also be and resilient enough to thereafter recover its cone shape, avoiding buckling of the collar in normal use. Foam plastic is a good material for use as the resilient support layer, and a wide range of resiliency and thickness is available.

[0015] In the embodiment of FIGS. 1, 2 and 3 the resilient support layer **22** comprises a layer of resilient foam sandwiched between the first and second exterior sheets **10** and **20**, as shown in FIG. 2. Other materials such as soft rubber or like materials may be used to provide a sufficiently resilient and flexible support layer. The first exterior sheet **10** and the second exterior sheet **20** are joined along their peripheries **12** and **14** by sewing.

[0016] In the embodiment shown in FIGS. 1, 2 and 3, separate exterior sheets **10** and **20** are sewn together along the inner arcuate edge **12** and the outer arcuate edge **14** using conventional hem sewing techniques. While there are many different types of specialized hem stitches that are known and which can result in different stiffness properties of the edge of the material provided by the hem, all such edges being more rigid than an unhemmed edge, but some such edges being more rigid than a conventional hem sewing technique and some being less rigid than a conventional hem sewing technique, conventional hem sewing techniques or another technique that produces a similarly rigid edge are preferred to reinforce the strength of the materials being joined together, and allow the formation of a strong and sufficiently rigid edge at the junction of the two exterior sheets **10** and **20** to minimize buckling. Formation of such a reinforced edge using conventional hem sewing techniques as aforesaid can help to strengthen protective collar **1**, and can help to avoid damage or the buckling of protective collar **1** if outer arcuate edge **14** collides with objects while protective collar **1** is worn by an animal.

[0017] In some embodiments, inner arcuate edge **12** and outer arcuate edge **14** are further reinforced beyond the reinforcement provided by the conventional hem sewing technique by using inner and outer hem strips **26** and **24** to join exterior sheets **10** and **20**, as shown in FIG. 2, with the resilient support layer **22** inside. This further helps to avoid damage and prevents the protective cone collar **1** from buckling if outer arcuate edge **14** is strongly impacted against objects by the animal wearing protective collar **1**.

[0018] Stitching can also be used to further strengthen the collar. Radially extending stitching **28a**, **28b** and **28c** (FIG. 1), each comprising two parallel rows of stitching in the illustrated embodiment, provides some additional rigidity radially, and further strengthens the integrity of the collar against buckling when in use. The preferred stitching is zigzag type or parallel rows of straight stitching that is of a selected width dimension such as about ⅛ inch to about ¼ inch and the stitching extends fully and continuously across the material of the collar from the arcuate edge **14** to the arcuate edge **12** so that the protective collar **1** benefits from enhanced support and rigidity along its entire length. If stitching **28a**, **28b** and **28c** did not extend fully in a continuous line from arcuate edge **14** to arcuate edge **12**, then weak points could be created along the length of protective collar **1** that might allow the collar to buckle and fold, thereby failing to return to its frustoconical shape after deformation by an impact.

[0019] The invention further comprises a means of closure, effective to secure the ends of the protective collar, such that when the ends of the protective collar are secured, the collar forms a truncated cone with an inner opening **30** and an outer opening **32** as shown in FIG. 3. Various means of closure are suitable for use in the invention. In one embodiment hook and loop fastener strips such as Velcro™ products conveniently secure the ends of the collar to form the desired cone shape as shown in FIG. 3. In the embodiment shown in FIGS. 1, 2 and 3, a plurality of first hook and loop strips **34** are on the exterior sheet **10** (facing up in FIG. 1), and are positioned and configured to be mated with at least one of a corresponding mating plurality of three second hook and loop strips **36** that are provided on the exterior sheet **20** (facing down in FIG. 1). One or more tabs **38** of Velcro™ can also be provided to serve a similar purpose.

[0020] Conveniently, a number of neck closure means may be provided in order to provide the ability to fashion a protective collar capable of fitting different size animals. As shown in FIGS.

1 and 3, a series of loops **54** are sewn into the inner hem. These can be made of elastic material so as to stretch to accept the pet's normal collar. Alternatively, as shown in FIG. 3, a drawstring or other fastening member **60** can be threaded through the loops **54** and used to secure protective cone collar **1** in place on an animal.

[0021] When placed on an animal, the inner opening **30** is adapted to fit securely around the neck of the animal, and the outer opening **32** is of sufficient size to prevent the animal fitted with the protective collar from contacting an area of the body to be protected.

[0022] The invention further provides a method of using a pet protective collar as described above as a veterinary restraint. The method comprises placing a collar such as that described herein around the neck of an animal, and securing as described. Conveniently, the collar of the invention is suitable to protect an area from contact by the animal's mouth, and yet is comfortable enough to wear that the animal will tolerate the collar.

[0023] The collar is thus suitable for use in a method of protecting a wound from a surgical procedure, an injury that is non-surgical in nature, or to prevent mouth contact of an area to which a topical medicament has been applied.

[0024] While various embodiments of the present invention have been described above, it should be understood that they have been presented by way of example only, and not of limitation.

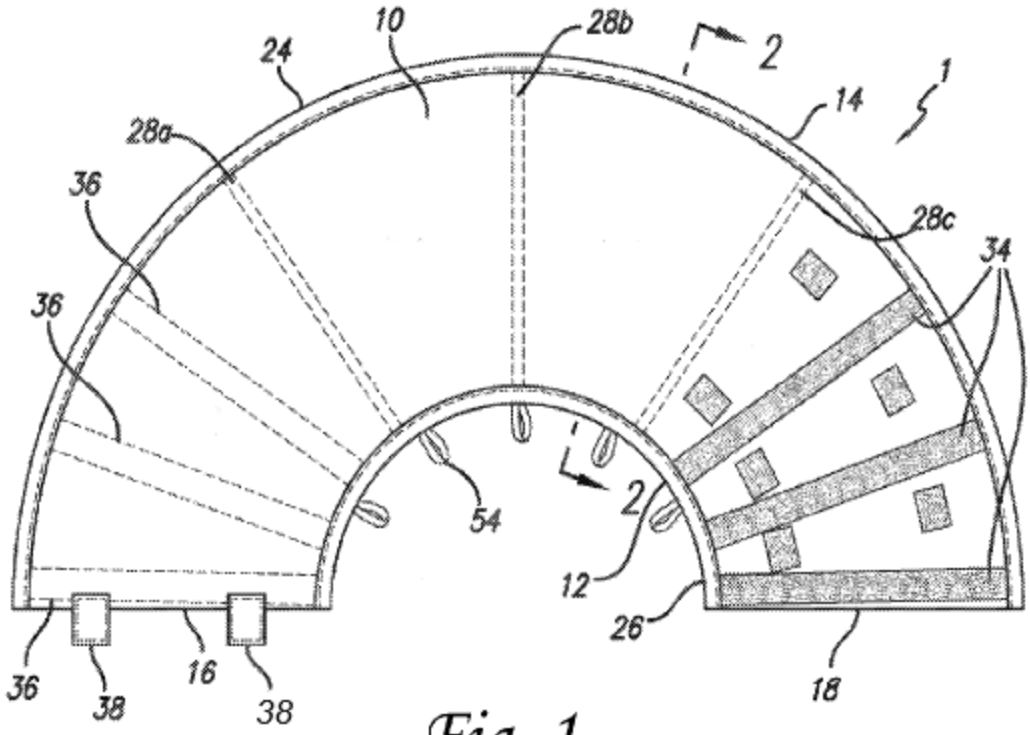

10
28b
2
24
1
14
28a
36
28c
34
36
2
54
12
26
36
38
16
38
18

Fig. 1

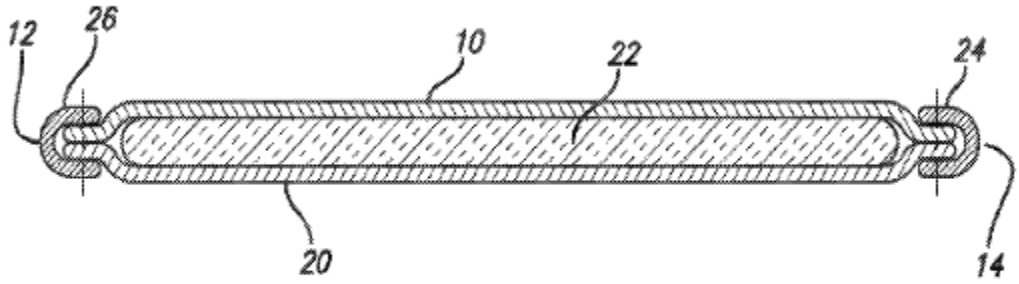

12
26
10
22
24
20
14

Fig. 2

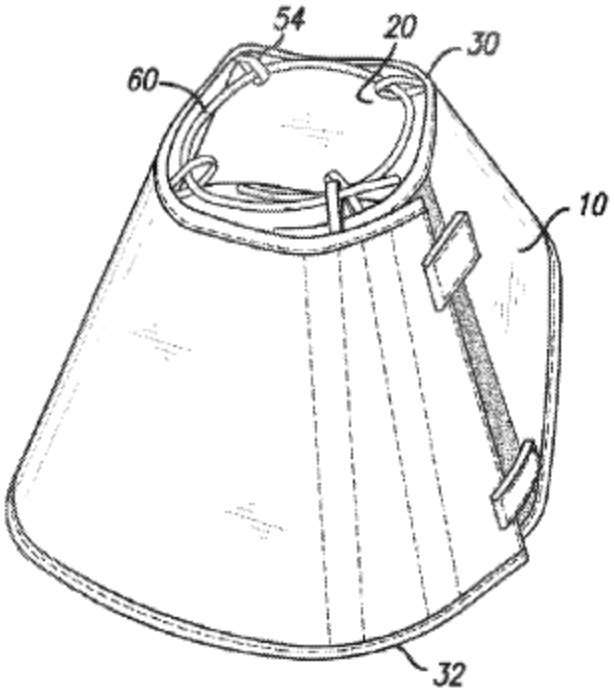


Fig. 3

Claims

1. A protective pet cone collar comprising:

a substantially flexible and resilient three-layer sheet having inner and outer arcuate edges extending between a first end and a second end of the sheet,

the inner and outer arcuate edges comprising single circular arcs,

the outer arcuate edge having a radius that is greater than a radius of the inner arcuate edge; and

at least one fastener for securing the pet cone collar in a generally frustoconical three-dimensional configuration.

2. A protective pet cone collar as defined in claim 1, wherein the three-layer sheet comprises an inner layer, a middle layer, and an outer layer, wherein the inner layer and the outer layer comprise a soft protective fabric.

3. A protective pet cone collar as defined in claim 1, wherein a middle layer of the three-layer sheet provides the flexible and resilient properties of the three-layer sheet.

4. A protective pet cone collar as defined in claim 2, wherein the middle layer comprises a resilient foam.

5. A protective pet cone collar as defined in claim 1, wherein the three-layer sheet comprises a plurality of support elements extending between the inner and outer arcuate edges.

6. A protective pet cone collar as defined in claim 5, wherein the plurality of support elements comprise rows of stitching.

7. A protective pet cone collar as defined in claim 1, wherein the outer arcuate edge comprises a reinforced edge.

8. A protective pet cone collar as defined in claim 7, wherein the reinforced edge comprises a conventional hem stitch.

9. A protective pet cone collar as defined in claim 8, wherein the reinforced edge further comprises a hem strip.

10. A protective pet cone collar as defined in either one of claims 1 or 4, wherein the fastener comprises a hook and loop fastener.

THE SUPER SOFT PET CONE

As can be seen in the top view of FIG. A and the cross-sectional view of FIG. B taken through line B—B in FIG. A, the Super Soft Pet Cone is a cone collar **P** that has a first exterior sheet **C** and a second exterior sheet **D**. First and second exterior sheets **C, D** are made from a generally soft and flexible material such as nylon. Interposing first and second exterior sheets is a layer of loose fill material **E**.

Fill material **E** is a generally soft and loose bulk material, such as down (duck feathers) or cotton batting as might be used to provide insulation in a winter coat. During manufacture of cone collar **P**, fill material **E** is very firmly packed in between first and second exterior sheets **C**, **D**, so that although fill material **E** itself is soft and collapsible, the overall structure of exterior sheets **C**, **D** and fill material **E** is quite resilient, so that cone collar **P** will return to its generally frustoconical shape after being bent, for example by reason of a collision with an object.

As can be seen in FIG. B, first and second exterior sheets **C**, **D** are sewn together at the outer arcuate edge **F** with a blind hem stitch while the inner arcuate edge **G** has a conventional hem stitch with a hem strip **H**. A blind hem stitch is different from a conventional hem stitch in that it provides a much narrower line of stitching from conventional hem stitching techniques, with the stitching being hidden inside the hem. The result of this is that the blind hem stitch provides a much softer and more flexible edge than does a conventional hem stitch, even though the edge is slightly more stiff and rigid than an unhemmed edge would be.

This makes the outer arcuate edge **F** more flexible than inner arcuate edge **G**, which is reinforced with hem strip **H** to help maintain the generally circular shape of the opening in cone collar **P**. The construction of outer arcuate edge **F** using a very soft blind hem stitch can help to minimize impacts to the animal and to objects struck by the collar in the event of collisions, because outer arcuate edge **F** will yield significantly on any such impact. In some cases, this may result in the generally frustoconical shape of cone collar **P** being disrupted during normal use, as the outer arcuate edge **F** may buckle under the force of some impacts, thereby disrupting the generally frustoconical shape of the collar and requiring an animal’s caretaker to intervene to physically unbend the collar at the point where it buckled, to restore the generally frustoconical shape. While this may be inconvenient to pet guardians, allowing such buckling to occur in response to

harder impacts as may be experienced during normal use helps to keep cone collar **P** soft and is important to avoiding injury, particularly to smaller animals such as puppies or cats.

The Super Soft Pet Cone is also provided with radial stitching **I** to further strengthen cone collar **P** to help it maintain its frustoconical shape in a greater range of circumstances. Radial stitching **I** does not extend to the outer arcuate edge **F** or to the inner arcuate edge **G** but rather stops short of them leaving a space **J** adjacent the outer arcuate edge **F**. There is also a space **K** adjacent the inner arcuate edge **G**. The spaces **J** and **K** allow for easy bending, thereby ensuring that the collar is flexible and yields on impact with a struck object, again minimizing the risk of injury to the animal or damage to property if the animal collides with objects while wearing the Super Soft Pet Cone, although the cone collar **P** may thereby be more likely to buckle in certain circumstances during normal use than if radial stitching **I** extended fully and continuously between outer arcuate edge **F** and inner arcuate edge **G**.

Ends **L** and **M** have near them fasteners such as strips of mating Velcro™ **N** and **O**. Also a tab **Q** can fasten either to one of the strips **O** or to a patch **R**. This allows the Super Soft Pet Cone **P** to be assembled into a generally frustoconical shape encircling an animal's neck and secured in place on the animal's collar using loops **S**.

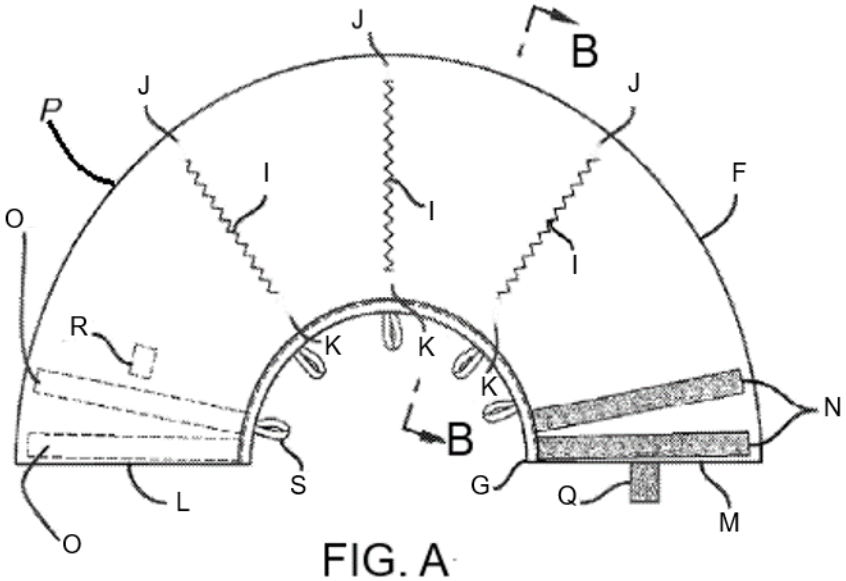


FIG. A

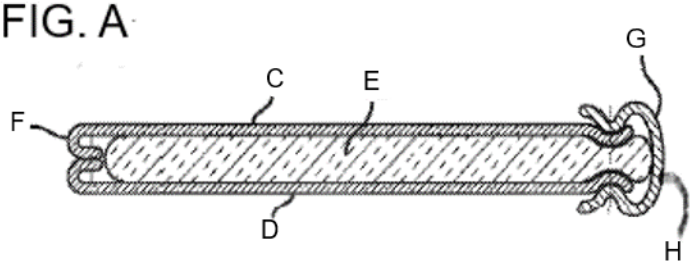


FIG. B

Duplicate ‘825 Patent Claims (Copy 1)

1. A protective pet cone collar comprising:

a substantially flexible and resilient three-layer sheet material having inner and outer arcuate edges extending between a first end and a second end of the sheet,

the inner and outer arcuate edges comprising single circular arcs,

the outer arcuate edge having a radius that is greater than a radius of the inner arcuate edge; and

at least one fastener for securing the pet cone collar in a generally frustoconical three-dimensional configuration.

2. A protective pet cone collar as defined in claim 1, wherein the three-layer sheet comprises an inner layer, a middle layer, and an outer layer, wherein the inner layer and the outer layer comprise a soft protective fabric.

3. A protective pet cone collar as defined in claim 1, wherein a middle layer of the three-layer sheet provides the flexible and resilient properties of the three-layer sheet.

4. A protective pet cone collar as defined in claim 2, wherein the middle layer comprises a resilient foam.

5. A protective pet cone collar as defined in claim 1, wherein the three-layer sheet comprises a plurality of support elements extending between the inner and outer arcuate edges.

6. A protective pet cone collar as defined in claim 5, wherein the plurality of support elements comprise rows of stitching.

7. A protective pet cone collar as defined in claim 1, wherein the outer arcuate edge comprises a reinforced edge.

8. A protective pet cone collar as defined in claim 7, wherein the reinforced edge comprises a conventional hem stitch.

9. A protective pet cone collar as defined in claim 8, wherein the reinforced edge further comprises a hem strip.

10. A protective pet cone collar as defined in either one of claims 1 or 4, wherein the fastener comprises a hook and loop fastener.

Duplicate ‘825 Patent Claims (Copy 2)

1. A protective pet cone collar comprising:

a substantially flexible and resilient three-layer sheet having inner and outer arcuate edges extending between a first end and a second end of the sheet,

the inner and outer arcuate edges comprising single circular arcs,

the outer arcuate edge having a radius that is greater than a radius of the inner arcuate edge; and

at least one fastener for securing the pet cone collar in a generally frustoconical three-dimensional configuration.

2. A protective pet cone collar as defined in claim 1, wherein the three-layer sheet comprises an inner layer, a middle layer, and an outer layer, wherein the inner layer and the outer layer comprise a soft protective fabric.

3. A protective pet cone collar as defined in claim 1, wherein a middle layer of the three-layer sheet provides the flexible and resilient properties of the three-layer sheet.

4. A protective pet cone collar as defined in claim 2, wherein the middle layer comprises a resilient foam.

5. A protective pet cone collar as defined in claim 1, wherein the three-layer sheet comprises a plurality of support elements extending between the inner and outer arcuate edges.

6. A protective pet cone collar as defined in claim 5, wherein the plurality of support elements comprise rows of stitching.

7. A protective pet cone collar as defined in claim 1, wherein the outer arcuate edge comprises a reinforced edge.

8. A protective pet cone collar as defined in claim 7, wherein the reinforced edge comprises a conventional hem stitch.

9. A protective pet cone collar as defined in claim 8, wherein the reinforced edge further comprises a hem strip.

10. A protective pet cone collar as defined in either one of claims 1 or 4, wherein the fastener comprises a hook and loop fastener.

END OF PAPER D

MARKING GUIDE

2020 PAPER D

In order for full marks to be awarded, in the markers' assessment it must be determined that:

- The candidate has dealt correctly with all relevant issues in accordance with the Answer Guide; and
- Supporting legal authority was cited with sufficient precision to be identifiable (see guidelines at end of this document).

Question A1A Mapping and Function

Element	Mapping	Function
(i) a substantially flexible and resilient three-layer sheet (claim 1);	First and second exterior sheets 10, 20 and resilient padding layer 22 [**1 mark**]	To provide a material that is flexible to absorb impacts and overcome disadvantages of prior art rigid cones, while being sufficiently resilient to maintain its shape (e.g. para. [0011]) [**1 mark**, cite not required for full marks]
(ii) the outer arcuate edge having a radius that is greater than a radius of the inner arcuate edge (claim 1);	Outer edge 14 has a larger radius, being distance between the centre of a circle and its perimeter, i.e. is spaced farther apart, relative to a notional common centre than inner edge 12 [**1 mark**]	Provides the overall frustoconical shape of the cone when assembled (i.e. if radius was not greater, then shape would be e.g. cylindrical rather than frustoconical) [**1 mark**, must provide some explanation of how different radii produce the frustoconical shape for full marks]
(iii) support elements extending between the inner and outer arcuate edges (claim 5);	Stitching 28a, 28b, 28c [**1 mark**]	Add rigidity to the structure of collar 1 [**1 mark**]
(iv) a reinforced edge (claim 7).	Outer arcuate edge 14 is reinforced with conventional hem sewing and outer hem strip 24 [**1 mark**]	Helps to avoid damage to outer arcuate edge if the collar collides with objects while being worn by the animal (e.g. para. [0016]) [**1 mark**, cite not required for full marks]

Question A1B Claim Construction

Note: Marks are only awarded where the reason why a particular passage or explanation is relevant to the construction of the claims is provided (i.e. for any marks to be awarded for such citation or explanation, even if it appears in the answer guide, it must be expressly stated that such is being used to infer inventor's intent from the language of the claims (or claim differentiation is accepted), or that the analysis relates to an evaluation of material effect, and an adequate explanation of how such citation supports the claim construction is provided). No marks are awarded for importing limitations from the specification into the claims in the absence of a specific explanation as to why this is permissible in the specific context. No marks are awarded for merely copying or paraphrasing portions of the patent or description of the accused device.

(i) "a substantially flexible and resilient three-layer sheet" [**7.5 marks**]

- Patentee will argue that it is an essential feature that the three-layers of the sheet of material together provide the "substantially flexible and resilient" properties described in A1(a) [**0.5 marks**], specifically it is not essential that the middle layer alone provide these properties [**0.5 marks**]
- Supported by inventor's intent as inferred from the language of the claims, claim differentiation [**0.5 marks**]
    - Language of claim 1 that the "three-layer sheet" has these properties [**0.5 marks**] is broader than [**0.5 marks**] the language of claim 3 [or 4] where it is "the middle layer" that provides the flexible and resilient properties [**0.5 marks**]
    - The fact of referring to only the middle layer to provide those properties versus the three layer sheet providing those properties suggests it is not essential for claim 1 that the middle layer itself possess the relevant properties [**0.5 marks**]
- Material effect [**0.5 marks**]
    - Person skilled in the art would recognize that the purpose of the invention is to provide a material that is resilient but not rigid [**0.5 marks**] to overcome the defects of the prior art in terms of causing injury and damage in the event of a collision (e.g. as described at paras. [0005], [0011], but cite not required for full marks) [**0.5 marks**]
    - As long as the three-layer sheet in the aggregate has these properties, then the beneficial effects of the invention will be achieved [**0.5 marks**], i.e. whether the middle layer alone confers these properties or all three layers together confer these properties, the invention will work in substantially the same way [**0.5 marks**]

- This construction supports a finding of infringement because this feature is present in the Super Soft Pet Cone [**0.5 marks**] – although the Super Soft Pet Cone achieves flexibility via the interaction of a middle fill layer with the outer two layers [**0.5 marks**], the net effect of the way that the three layers interact provides a flexible and resilient three-layer sheet [**0.5 marks**]

(ii) "a reinforced edge" [**7.5 marks**]

- The patentee will argue that any type of stitched hem can be used to provide the reinforced edge [**0.5 marks**], specifically it is not essential that a conventional hem stitch be used to provide the reinforced edge [**0.5 marks**]
- This interpretation is supported by the inventor's intent as inferred from the language of the claims via claim differentiation [**0.5 marks**]
    - Language of claim 7 that uses the term "reinforced edge" [**0.5 marks**] is intended to be broader than [**0.5 marks**] the language of claim 8 wherein the reinforced edge is a conventional hem stitch [**0.5 marks**] because there are other ways a reinforced edge could be provided than a regular hem stitch (e.g. a hem strip) [**0.5 marks**]
- Material effect [**0.5 marks**]
    - The purpose of the reinforced edge is to help prevent damage to the outside edge of the cone collar, e.g. in the event of a collision with another object [**1 mark**]
    - Person skilled in the art would recognize that any type of hem stitch would be stiffer and more rigid than an unhemmed edge, e.g. as acknowledged at the description at paragraph [0016] [**0.5 marks**, cite not required for full marks], so that other types of hem stitches can provide an edge that is still reinforced as compared with an unhemmed edge [**0.5 marks**]
- This interpretation supports a finding of infringement because this feature is present in the Super Soft Pet Cone [**0.5 marks**] – although the Super Soft Pet Cone uses a blind hem stitch [**0.5 marks**], this still provides a hem that would be more rigid than an unhemmed edge, as confirmed by D2 at lines 17-19 [**0.5 marks**, cite not required for full marks]

(iii) "a middle layer [of the three-layer sheet] provides the flexible and resilient properties [of the three-layer sheet]" [**7.5 marks**]

- Super Soft will argue that it is an essential feature that the middle layer of the sheet of material itself be flexible and resilient to provide these properties [**1 mark**]
- Supported by inventor's intent as inferred from the language of the claims, claim differentiation [**0.5 marks**]
    - Language of claim 1 that the "three-layer sheet" has these properties [**0.5 marks**] is different from, and broader than [**0.5 marks**] the language of claim 3 where it is specifically "the middle layer" that provides the flexible and

resilient properties [**0.5 marks**], which suggests that claim 3 is intended to mean the middle layer specifically has the flexible and resilient properties [**0.5 marks**]

- Material effect [**0.5 marks**]
    - A person skilled in the art would understand that in order for the collar to function as intended to be less rigid than prior art collars, it is necessary that the overall fabric assembly that provides the collar itself be flexible and resilient [**1 mark**]
    - While a three-layer assembly that is overall flexible and resilient provides a function equivalent to the middle layer alone providing these properties [**0.5 marks**], in this case the inventor's intent that a narrower meaning be applied prevails (self-inflicted wound) [**0.5 marks**]
- This construction supports a finding of no infringement because this feature is absent [**0.5 marks**] – although the Super Soft pet cone achieves flexibility via the interaction of a middle fill layer with the outer two layers, the fill material itself does not have any flexible and resilient properties [**1 mark**]

(iv) "support elements extending between the inner and outer arcuate edges" [**7.5 marks**]

- Super Soft will argue that it is an essential feature that the support elements extend <u>fully</u> between each arcuate edge of the protective collar [**1 mark**]
- Inventor's intent based on the language of the claims [**0.5 marks**]
    - The plain meaning of "extending between" is potentially ambiguous so guidance from the specification is needed [**0.5 marks**], as this phrase does not necessarily inherently require that the stitching extend <u>fully</u> between the inner and outer arcuate edges [**0.5 marks**]
    - The specification teaches at paragraph [0018] that the stitching must extend fully and continuously between the arcuate edges to avoid creating weak points along the length of the collar, suggesting the intended meaning is that it is essential for the stitching to extend fully between the edges [**1 mark**, citation required for full marks]
- Supported by material effect [**0.5 marks**]
    - The function of the support elements is to strengthen the collar across its length, which suggests that there should be no weak points across the length that might allow buckling [**1 mark**]
    - Any gaps in the stitching will result in weak points that might allow folding of the collar, and therefore leaving gaps in the stitching results in a collar that functions materially differently [**1 mark**]
- This construction supports a finding of no infringement because this feature is absent [**0.5 marks**], because the Super Soft Pet Cone includes spaces J and K so that the stitching does <u>not</u> extend <u>fully</u> between the outer arcuate edge F and the inner arcuate edge G [**1 mark**, cite to J or K required for full marks]

(v) "a reinforced edge" [**7.5 marks**]

- Super Soft will argue that it is an essential feature that a conventional hem stitch or stitching method that provides equivalent rigidity be used to provide the reinforced edge [**1 mark**]
- Inventor's intent based on the language of the claims [**0.5 marks**]
    - Although claim 8 "reinforced edge comprises a regular hem stitch" may suggest other types of stitching are encompassed [**0.5 marks**], the meaning of "reinforced edge" is not itself clear as to the degree of reinforcement required [**0.5 marks**]
    - The specification teaches that a reinforced edge requires at least the use of "conventional hem sewing techniques" at para. [0016], which suggests that a sewing technique that provides a less rigid edge is not sufficient to provide a "reinforced edge" [**1 mark**, cite required for full marks]
- Material effect [**0.5 marks**]
    - The function to be performed by the reinforced edge is to prevent damage or buckling of the protective collar in the case of a collision [e.g. as described at para. [0016] [**1 mark**, cite not required for full marks]
    - The person skilled in the art would understand that a softer hem stitch might provide a much softer and more flexible edge than a regular hem stitch that could result in buckling of the collar upon experiencing certain impacts, as explained by D2 at lines 24-27 [**1 mark**, cite not required for full marks]
- This interpretation supports a finding of no infringement because this feature is not present in the Super Soft Pet Cone [**0.5 marks**] - the use of the blind hem stitch provides an edge that functions is less rigid in a material way (because buckling of the collar may occur during regular use) so that the edge cannot be considered to be "reinforced" [**1 mark**]

Question A2A Analysis of Claim Infringement [11 marks]

Claim 1 [4.5 marks]

A protective pet cone collar comprising:	Present: cone collar P [**0.5 marks**]
a substantially flexible and resilient three-layer sheet	Present: overall structure of exterior sheets C, D and fill material E is quite resilient (D2, lines 9-11) [**0.5 marks**, cite or specific mapping of all three components required for mark]
having inner and outer arcuate edges extending between a first end and a second end of the sheet	Present: inner arcuated edge G and outer arcuate edge F [**0.5 marks**] extend between first and second ends L, M [**0.5 marks**]
the inner and outer arcuate edges comprising single circular arcs,	Present: inner and outer edges G, F have a generally arcuate, i.e. generally curved

	shape, as can be seen in FIG. A [**0.5 marks**, cite required for mark but merely citing FIG. A insufficient]
the outer arcuate edge having a radius that is greater than a radius of the inner arcuate edge; and	Present: a radius defined between a notional centre and outer edge F is longer than a radius defined between the notional centre and inner edge G [**0.5 marks**]
at least one fastener	Present: mating Velcro™ strips N, O [**0.5 marks**]
for securing the pet cone collar in a generally frustoconical three-dimensional configuration.	Present: fasteners allow the pet cone to be assembled into generally frustoconical shape encircling animal's neck: D2 at lines 44-45 [**0.5 marks**, cite required for mark]
Conclusion	Infringed as all elements are present [**0.5 marks**]

Claim 2 [2 marks]

A protective pet cone collar as defined in claim 1,	Present: all elements of claim 1 are present [**0.5 marks**]
wherein the three-layer sheet comprises an inner layer, a middle layer, and an outer layer,	Present: first and second exterior sheets C, D and loose fill material layer E [**0.5 marks**]
wherein the inner layer and the outer layer comprise a soft protective fabric.	Present: sheets C, D are made from a soft material such as nylon, D2 at lines 4-5 [**0.5 marks**, cite not required if nylon specifically named]
Conclusion	Infringed as all elements are present [**0.5 marks**]

Claim 4 [2 marks]

A protective pet cone collar as defined in claim 2,	Present: all elements of claim 2 are present [**0.5 marks**]
wherein the middle layer comprises resilient foam.	Not present [**0.5 marks**]: middle layer is loose fill material E [**0.5 marks**]
Conclusion	Not infringed as not all elements are present [**0.5 marks**]

Claim 10 [2.5 marks]

A protective pet cone collar as defined in either one of claims 1	Present: all elements of claim 1 are present [**0.5 marks**]
or 4,	Not present: not all elements of claim 4 are present [**0.5 marks**]
wherein the fastener comprises a hook and loop fastener.	Present: mating Velcro™ strips N, O [**0.5 marks**]

Conclusion when dependent on claim 1	Infringed as all elements present [**0.5 marks**]
Conclusion when dependent on claim 4	Not infringed as not all elements present [**0.5 marks**]

Question A2B Analysis of Claim Infringement

Claim 3 [5 marks]

A protective pet cone collar comprising:	Present: cone collar P [**0.5 marks**]
a substantially flexible and resilient three-layer sheet [claim 1], wherein a middle layer of the three-layer sheet provides the flexible and resilient properties of the three-layer sheet [claim 3]	Not present as construed when representing Soft Pets [**0.5 marks**]: fill material E is generally soft and loose bulk material, does not possess any flexible and resilient properties on its own (D2, lines 10-11) [**0.5 marks**]
having inner and outer arcuate edges extending between a first end and a second end of the sheet	Present: inner arcuated edge G and outer arcuate edge F [**0.5 marks**] extend between first and second ends L, M [**0.5 marks**]
the inner and outer arcuate edges comprising single circular arcs,	Present: inner and outer edges G, F have a generally arcuate, i.e. generally curved shape, as can be seen in FIG. A [**0.5 marks**, cite required for mark but merely citing FIG. A insufficient]
the outer arcuate edge having a radius that is greater than a radius of the inner arcuate edge; and	Present: a radius defined between a notional centre and outer edge F is longer than a radius defined between the notional centre and inner edge G [**0.5 marks**]
at least one fastener	Present: mating Velcro™ strips N, O [**0.5 marks**]
for securing the pet cone collar in a generally frustoconical three-dimensional configuration.	Present: fasteners allow the pet cone to be assembled into generally frustoconical shap encircling animal's neck: D2 at lines 43-45 [**0.5 marks**, cite required for mark]
Conclusion	Not infringed as not all elements are present [**0.5 marks**]

Question A3

A3A Who is or is not liable? (**5 marks**)

- SP Mfg. Co. cannot be liable (**0.5 marks**) – it does not carry out any infringing act (**0.5 marks**) because its activities occur fully outside of Canada (**0.5 marks**), cite e.g. *Domco Industries Ltd v Mannington Mills Inc.* (1988), 29 C.P.R. (3d) 481 (FCTD).
- Section 42 of the *Patent Act* grants the exclusive right to make, use and sell the invention in Canada (**0.5 marks**)
- Soft Pets is liable for infringement for importing the Super Soft Pet Cone into Canada (**0.5 marks**); although not specifically enumerated in s. 42, importation deprives the patentee of the full enjoyment of its monopoly (*Monsanto v Schmeiser*, 2004 SCC 34) (**0.5 marks**) [or accept citation to *Wellcome Foundation Ltd v Apotex Inc* (1990), 32 C.P.R. (3d) 350 (F.C.T.D.) finding judicial interpretation considers importation to fall within patentees exclusive right, or appropriate explanation analogizing to *Saccharin* doctrine for product made abroad by patented process and imported into Canada]
- SP Distributing Inc. is liable for direct infringement (**0.5 marks**) for reselling the Super Soft Pet Cone in Canada (**0.5 marks**)
- Consumers are liable for direct infringement (**0.5 marks**) for using the Super Soft Pet Cone in Canada (**0.5 marks**)
- [Since issue of inducing infringement is not raised on the facts, award marks regardless of whether infringement is described as direct or not.]

A3B Period of liability? (**5 marks**)

- No liability for sales made July 15, 2014 (**0.5 marks**) as the patent had not been published or issued yet (**0.5 marks**)
- Liable for reasonable compensation (**0.5 marks**) for the 700 units sold December 15, 2014 (**0.5 marks**), these sales occurred after the application was published but prior to grant (**0.5 marks**), sub-section 55(2) of the *Patent Act* (**0.5 marks**)
- Liable for damages (**0.5 marks**) for the 1,500 units sold January 1, 2018 (**0.5 marks**), since patent had granted (**0.5 marks**) sub-section 55(1) of the *Patent Act* (**0.5 marks**)
- Note: to be awarded marks for confirming liability for the specific sales, either the number of units or date of sale must be specifically indicated.

A3C Standing to bring action (**3 marks**)

- Pet Mart Canada Inc. has standing to bring an action (**0.5 marks**) as a non-exclusive licensee (**0.5 marks**), which is considered to be a person claiming under the patentee (**0.5 marks**) any acceptable cite (e.g. *Domco Industries Ltd v Armstrong Cork Canada Ltd*, [1982] 1 SCR 907; *Jay-Lor International Inc v Penta Farm Systems Ltd*, 2007 FC 358, *Signalisation de Montréal Inc v Services de Bèton Universels Ltée*, [1993] 1 FC 341 (**0.5 marks**)
- However, even if this is done, Pet Protectors would still need to be joined as a party to the action (**0.5 marks**), sub-section 55(3) of the *Patent Act* (**0.5 marks**)

A3D Ownership issue (**4.5 marks**)

- Karen may retain rights in the invention as an inventor (**0.5 marks**)
- The default position is that an employee will own inventions they create unless they were employed for the purpose of inventing (**0.5 marks**), *Comstock Canada v. Electec Ltd.* (1991), 38 C.P.R. (3d) 29 (F.C.T.D.) or other suitable authority (**0.5 marks**)
- Here as a janitor (**0.5 marks**) Karen does not appear to have been employed for the purpose of inventing (**0.5 marks**). Also the invention appears to have been developed in casual conversation during a break (**0.5 marks**) so not in the course of her employment duties (**0.5 marks**)
- Since there is no written employment agreement or assignment (**0.5 marks**), Karen could potentially bring an action to establish her joint ownership of the patent (**0.5 marks**)

PART B

B1. Prosecution History Estoppel **[3 marks]**

A. Section 53.1 of the *Patent Act* **(0.5 marks)** provides that any written communication between an applicant (or patentee) and the Commissioner, an officer or employee of the Patent Office or a member of a re-examination board relating to the prosecution of a patent application **(0.5 marks)** may be admitted into evidence in a patent proceeding in order to rebut any representation made by the patentee relating to claims construction **(0.5 marks)**.

B. Yes, these extraordinary circumstances arise where, during patent prosecution, (1) the patentee acknowledges it has amended its claims in a substantially similar manner as its claims submitted in another jurisdiction, **(0.5 marks)** and (2) the patentee admits the amendments have limited the scope of the claims to make them novel and non-obvious. **(0.5 marks)** In these extraordinary circumstances, the prosecution history of a foreign application is can be made part of the prosecution history of the Canadian patent. (See *Canmar Foods Ltd v TA Foods Ltd*, 2019 FC 1233) **(0.5 marks)**

B2. Contributory Infringement **[2 marks]**

The elements are that there is direct infringement by another party; **(0.5 marks)** that the defendant knew that infringement would take place; **(0.5 marks)** and that the defendant encouraged the infringing conduct. **(0.5 marks)** *MacLennan v. Produits Gilbert Inc.,* 2008 FCA 35 or other suitable authority **(0.5 marks)**

B3. Third Party Intervening Rights **[2 marks]**

The consequence is that the third party rights exception to infringement begins **(0.5 marks)** on May 1, 2020 **(0.5 marks)**, 6 months after the original maintenance fee due date (*Patent Act*, s. 55.11 [Patent Rules s. 128 but cite to Patent Rules not required for mark]) **(0.5 marks)**. The fee should be paid by May 1, 2020 to avoid this. **(0.5 marks)**

B4. Experimental Use **[2 marks]**

This is not likely an infringement **(0.5 marks)** – *Patent Act*, s. 55.3 (1) **(0.5 marks)**: An act committed for the purpose of experimentation relating to the subject-matter of a patent is not an infringement of the patent **(0.5 marks)**, and testing to develop an improved antibody arguably relates to the subject matter of the patent **(0.5 marks)**.

B5. Restoration of Priority and Grace Period **[4 marks]**

This argument would fail if priority was successfully restored **(0.5 marks)** pursuant to sub-section 28.4(6) of the *Patent Act* **(0.5 marks)** [accept cite to R. 77]. This section allows restoration of priority where the Canadian application was filed within two months of the twelve month priority deadline **(0.5 marks)**, and here the December 1, 2019 filing date is one month after the twelve month priority deadline **(0.5 marks)**. In such circumstances, sections 28.2(1) and 28.3 **(0.5 marks)** provide that where the claim date (here November 1, 2018) **(0.5 marks)** precedes the one-year period before the filing date (here December 1, 2018) **(0.5 marks)**, the grace period for disclosures by the applicant is applicable **(0.5 marks)**.

B6. Exhaustion **[2 marks]**

Yes Company B can sell the bicycles **(0.5 marks)**. The wheels were purchased from Company A **(0.5 marks)**, which gives an implied license to use the patented article **(0.5 marks)** (patent exhaustion) (*Eli Lilly and Co v Novopharm Ltd*, 2 [1998] 2 SCR 129 or other suitable authority) **(0.5 marks)**.

B7A and B. Territoriality **[4 marks]**

A. Yes, Joe Beef can bring an action in Canada **(0.5 marks)**. While some steps of the method claim at issue are carried out outside of Canada **(0.5 marks)**, specifically part of the shipping step (3) and the processing step (4) **(0.5 marks)**, Canadian law is not clear as to whether or not this is an infringement [or such a claim was not struck as disclosing no cause of action, or equivalent commentary] **(0.5 marks)** *Canadian National Railway Company v. BNSF Railway Company*, 2018 FC 614 **(0.5 marks)**.

B. If the meat is exported to Canada for sale, there would clearly be infringement **(0.5 marks)**, since importation of a product made by a patented process even fully conducted abroad infringes a Canadian patent **(0.5 marks)** *Saccharin Corporation Ltd. v. Anglo-Continental Chemical Works*, [1901] 1 Ch. 414 (Eng. Ch. D.) or any suitable decision confirming its adoption in Canada, e.g. *Monsanto Canada Inc. v. Schmeiser*, 2004 SCC 34 **(0.5 marks)**

B7C. Patent Expiration and Limitation Period **[2 marks]**

Joe Beef can obtain damages starting from May 1, 2014 [or accept six years before the action is commenced] **(0.5 marks)**, because of the limitation period provided by s. 55.01 of the *Patent Act* **(0.5 marks)**. Joe Beef can obtain damages until September 23, 2017 [or accept twenty years after filing date] (**0.5 marks)**, which is the date the ‘741 Patent expires pursuant to section 44 of the Patent Act **(0.5 marks)**.

Citations to legal authority

Statutory and regulatory provisions: All citations are assumed to be to the *Patent Act* in the absence of a specific indication. A reference to a "rule" will be construed as a reference to the *Patent Rules*.

Otherwise, citations to statute or regulation must be sufficiently precise so as to exclude contradictory or irrelevant matter.

Case law: Candidates must provide a citation that is readily recognizable as a single decision setting out the correct ratio or holding pertaining to the issue at hand.

Generally, only a distinguishable party name need be provided, usually with a year and/or identification of the court. In some cases the year or court may be omitted if there is only one decision with that party name relevant to the matter at hand.

- For example, citing "*Distrimedic*" in an answer about the use of an amendment in claim construction is sufficient because only one decision with that party name exists. Had *Distrimedic* been appealed and reversed, a reference to the court or year would be required.
- Where there are two decisions in the same proceeding dealing with the same matter, it may be possible to omit the year or court if one decision affirms the other on that point without variance. For example, "*Nycomed*" cited for contributory infringement is acceptable because the FCA affirmed the FC decision with little comment, and no other *Nycomed* decisions on contributory infringement exist.
- In some cases a subject matter name or acronym may be accepted as long as it is, again, sufficiently distinct e.g. "*FWT SCC*", "*Sildenafil SCC*", "*Viagra SCC*" are acceptable; however "*Omeprazole FCA*" without a year, other party, or some other information is not because there are many decisions relating to omeprazole on similar issues.
- Leading or notorious cases of sufficient vintage that the lower court or Commissioner's decision is never/seldom cited in regular practice may not need a court or year, e.g. "*FWT*", "*Progressive Games*", "*Farbwerke Hoescht*", "*Shell Oil*" are acceptable, but a citation to more recent leading cases (e.g., "*Sildenafil*" with nothing more) may not be sufficiently distinctive.
- A citation to the SCC in a case where a party had sought leave to appeal from the FCA to the SCC but had been denied should still receive marks if the rest of the citation is otherwise sufficiently distinct.
- A correct neutral or case reporter citation without a style of cause or party name is sufficient.

Clearly leading cases on claim construction and infringement must be cited as they are the best authority. Neither "*Distrimedic*" nor any non-SCC decision is a correct citation for the principles of claim construction, even though the principles might be mentioned.

Commissioner's Decisions: Commissioner's Decisions must be identified as such, or as PAB decisions.