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(54) Inflatable box and method of use thereof

(57) An inflatable box 1 or tube container and method of use are disclosed. The inflatable container may be designed in any shape or size and be made up of any rigid material. The box is uniquely designed to allow for a simple one-step process using a box with an integrated inflating tube 7 and bottom liner to expand internally by inflation with a gaseous fluid, thereby three-dimensionally cushioning an article to be shipped. This completely protects the article and removes the need for peanuts, paper or other fillers in boxes used for shipping goods once the box is closed. The box may further include a bleed valve 8 that releases the gaseous fluid if the inflating tube and/or bottom liner are over-inflated.

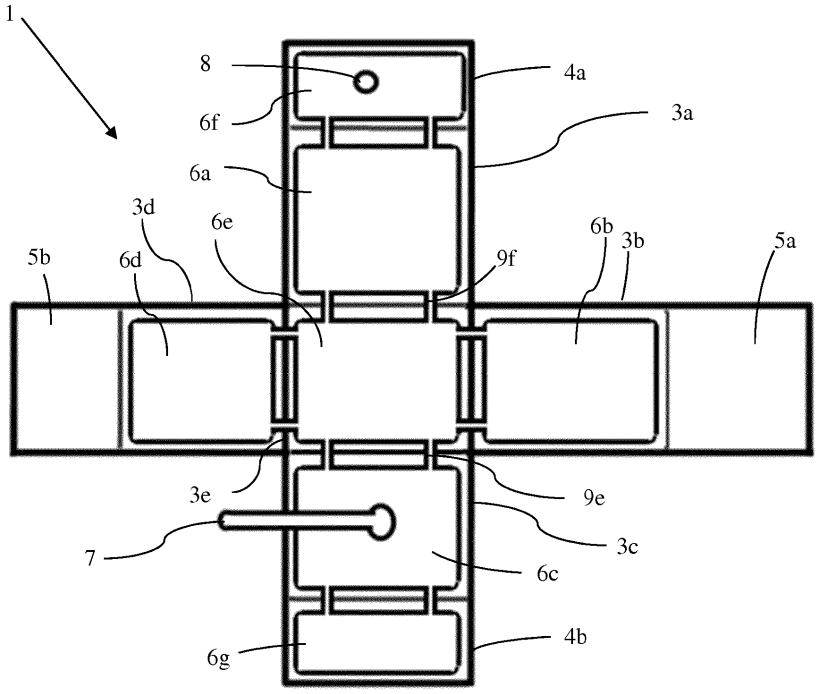

Figure 2.

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Description

FIELD OF THE INVENTION

[0001] This invention relates, generally, to methods of packaging and shipping items. More particularly, it relates to a method of cushioning an item to be shipped.

BACKGROUND OF THE INVENTION

[0002] The use of different types of packaging for shipping articles is well known. Shipped articles can come in all sizes and shapes. These articles can be fragile or hardy (i.e., the article is considered non-fragile). There are several types and forms of packaging, including peanuts, paper, bubble plastic, foam, etc. However, all of the packaging materials mentioned can cause waste disposal and recycling issues.

[0003] Different attempts at providing an effective inflatable packaging material and/or system have been made, such as U.S. Pat. Nos. 4,905,835 and 4,969,312 to Pivert, which are limited to a rectangular box with inflatable structures that are inserts into the box, thereby requiring multiple steps for use, from insertion of the inflatable structures to closure of the box. In addition, U.S. Pat. No. 5,588,533 to Farison provides an inflatable cushion through a single inflation valve, which must be inserted into the box with the article. U.S. Pat. No. 6,076,677 to Pozzo is a shipping container and inflatable packaging cushion that must be partially filled, then the article is inserted, and following steps are required.

[0004] Hollingsworth, et al. (U.S. Pat. No. 6,334,534) discloses a package having foam cushions coated in a cover with an air flow controlling vent, permitting air to escape from the cushion upon impact. Sperry (U.S. Pat. No. 6, 253,919) discloses a single air bladder design. Kim (U.S. Pat. No. 5,624,035) discloses a carrying case having inflation sections and air interconnect conduits. Pharo (US 4,793,123) discloses an inflation bladder that can be wrapped around an item and inflated.

[0005] While the prior art provides protection to the articles within a box, the conventional art suffers from a number of drawbacks. The inflation, insertion, and closure of the prior art devices all require multiple steps and are not simple, efficient methods of shipping articles or products using an inflatable cushion. The prior art requires tedious methods for inflation. For instance, the prior art requires that certain cushions be inflated before others in a specific sequence, that cushions be inflated before insertion into the box, and complex sequences of events for closure of box flaps and/or self-locking flaps. They require optimal inflation to work properly and finally require multiple cushions to provide adequate protection to the article shipped. The present invention is designed to address these shortcomings by providing a package as described below.

SUMMARY OF THE INVENTION

[0006] The present invention is designed to advance the art of packaging past the drawbacks of the prior art and provide packaging that is simple to use, requires minimal instruction, has the minimum number of parts, and is cost-effective. Another object of the present invention is to provide a method that allows for an easily automated process.

[0007] Certain embodiments of the present invention include a packaging device comprising a box or tube container having at least one fluid bladder disposed on the interior of the package. The at least one fluid bladder is optionally fixed by adhesive, tape, welding, or other means to the interior face of the box or tube container walls. For example, for the box the at least one fluid bladder is disposed on the interior face of the bottom wall, first side wall, second side wall, third side wall, fourth side wall, and at least one top wall panel of the box. For the tube container, the at least one fluid bladder is disposed on the interior face of the bottom wall, the side tubular wall, and the top wall. As an alternative, the at least one fluid bladder may include more than one fluid bladder. For example, the packaging may include a first fluid bladder having a plurality of edges and at least one fluid channel disposed on at least one of the plurality of edges and a second fluid bladder having a plurality of edges and at least one fluid channel disposed on at least one of the plurality of edges, wherein the at least one fluid channel on the second fluid bladder is in fluid communication with the at least one fluid channel on the first fluid bladder. The fluid bladder may be formed of rubber, plastic, graphene, or Mylar™. The fluid bladder may be connected to the interior wall of the container using glue, tape, staples, heat, welding or other connection found acceptable by one of skill in the art. An option bleed valve is disposed on the fluid bladder and in fluid communication with the interior of the fluid bladder.

[0008] A fluid inflation valve is disposed on the fluid bladder, on the interior face of a side wall or top wall panel, on the exterior face of a side wall or top wall panel, or in the side wall or top wall, for example attached to the corrugation material. Regardless of how the fluid inflation valve is attached, the valve is in fluid communication with an interior lumen of the fluid inflation bladder. Optional fluid inflation valves include, without limiting the invention, a rubber gasket valve, plastic duckbill valve, a pressure valve, a gas-piston pressure regulated flow valve, a stem valve, a tire valve, a snap-in tire valve, a free flow inflation valve, a non-return inflation valve, a fixed plug inflation valve, a pressure inflation valve, a free flow inflation valve without plug, a non-return no plug inflation valve, a Leafield valve, a Halkey-Roberts valve, a Riken-Achilles military valve, a military valve, a summit valve, a float bag valve, and a balloon valve, as seen in Figure 1. The rubber gasket valve further comprises a rubber sealing member and a septum disposed in the rubber sealing member. The plastic duckbill valve is formed of

a first plastic sheet having a first longitudinal edge, a second longitudinal edge, and a mounting edge fixed to a second plastic sheet having a third longitudinal edge, a fourth longitudinal edge, and a mounting edge along its length or substantially along its length. The attachment of the two plastic sheets forms a valve lumen which inflates to form a tube to permit air flow and collapses flat to seal the valve. The plastic duckbill valve is attached using its mounting edge or optionally using mounting tabs are disposed on the mounting edge of the first plastic sheet and the second plastic sheet of the plastic duckbill valve. The connection of the valve to the packaging, the valve to the fluid bladder, or the valve opening or to the interior or exterior wall of the container can be glued, taped, stapled, heated, welded or connected in any acceptable manner. Further, an inflation tube is optionally disposed adjacent to the mounting edge of the first plastic sheet and the second plastic sheet and in fluid communication with the valve lumen. For example, the inflation tube may extend from the valve, which is attached to the interior face of a package wall or to a fluid bladder, through the packaging to the exterior, thereby facilitating simple inflation of the fluid bladder. The valve may be formed of metal, graphene, rubber, plastic, or Mylar™.

[0009] The packaging is any shape used to ship product, such as dolls or circuit boards, such as round, rectangular or other shape. Optionally the package is a tube container having a bottom wall having an interior face, an exterior face, and a circular edge, with a side tubular wall having an interior face, an exterior face, a bottom edge, and a top edge attached to the bottom wall. A top wall having an interior face, an exterior face, and a circular edge is attached at a least one point to the side tubular wall. The box comprises a bottom wall having an interior face, an exterior face, at least a first edge, a second edge, a third edge, and a fourth edge. A first side wall having an interior face, an exterior face, a bottom edge, a top edge, a first side edge and a second side edge, wherein the bottom edge is in physical communication with the first edge of the bottom wall when assembled. A second side wall having an interior face, an exterior face, a bottom edge, a top edge, a third side edge and a fourth side edge, wherein the bottom edge is in physical communication with the second edge of the bottom wall and the third side edge is in physical communication with the first side edge of the first side wall when assembled. A third side wall having an interior face, an exterior face, a bottom edge, a top edge, a fifth side edge and a sixth side edge, wherein the bottom edge is in physical communication with the third edge of the bottom wall and the fifth side edge is in physical communication with the fourth side edge of the second side wall when assembled. A fourth side wall having an interior face, an exterior face, a bottom edge, a top edge, a seventh side edge and a eighth side edge, wherein the bottom edge is in physical communication with the fourth edge of the bottom wall, the seventh side edge is in physical communication with the sixth edge of the third side wall and the eighth side edge is in physical communication with the second side edge of the first side wall when assembled. At least one top wall panel having an interior face and an exterior face is in physical communication with the top edge of at least one of the first side wall, second side wall, third side wall, or fourth side wall. The packaging is optionally made of cardboard, paper, plastic, wood, corrugated paper, graphene or other suitable materials. Optionally, the packaging includes at least one overlapping top wall panel disposed on the top edge of at least one side wall. In some variations, a fluid bladder is disposed on the interior face of the least one overlapping top wall panel.

[0010] A method is also provides for cushioning a package for an item being shipped using the box or tubular container described above. The box is uniquely designed to allow for a simple one-step process using a box with an integrated inflating tube and bottom liner to expand internally by inflation. An item is introduced into the box or tube container and the box or tube container closed. The fluid inflation valve is then attached to a source of fluid under pressure, such as a gaseous fluid like air, and the fluid flowed into the at least one fluid bladder, such that the fluid inflates the at least one fluid bladder around the item. Optionally, the source of fluid under pressure is then removed from the inflation valve. The inflating tube and bottom liner cushion the article to be shipped three-dimensionally. This completely protects the article and removes the need for peanuts, paper or other fillers in boxes used for shipping goods once the box is closed, thus increasing the safety of using the inflatable devices. This would also lighten the weight of the package considerably. The package may then be shipped, stored or otherwise handled. When the packed item is to be retrieved, the at least one fluid bladder may be deflated the prior to removal of the item from the box or tube container.

[0011] Because the packaging is inflated after the item is inserted into the packaging, the invention increases safety by eliminating the hazard of the inflatable bladder (i.e., air cushion) exploding in the face of the user if over-inflated. Where a bleed valve is provided in the packaging, the packaging further avoids this by releasing air when pressure reaches a certain level. This would allow for automated and manual air filling without worry of over-inflating.

[0012] Other aspects and advantages of the present invention appear more clearly from reading the following detailed description of the preferred embodiment of the invention, given by way of example and made with reference to the accompanying drawings, such as the determination of which end of the box is the bottom or top. This is determined by which end of the box is closest to the inflatable bottom part of the cushion.

[0013] Certain aspects of the present art can be found in the prior art, but the prior art has failed to overcome its deficiencies and has failed to advance the state of the art in the inflatable packaging industry. Specifically, the current invention provides the user with the unexpected

benefits of simplicity, efficiency and safety by placing an article(s) for shipment into a box, closing the box, filling it with air, and shipping it. The prior art appears to teach away from the present invention in that it teaches the use of multiple cushions, multiple steps to closure, inflation of cushions (bladders) before closure of the box, etc. Thus, the current invention advances the state of the art through its novel, useful, and nonobvious apparatus and methodology.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] Other objects, features and advantages of the invention will become obvious from the following detailed description of the invention when taken in conjunction with the accompanying drawings, in which:

Figures 1(A) through (H) are schematics of some exemplary valves. (A) a pressure valve; (B) a gas-piston pressure regulated flow valve, (C) a tire valve; (D) a free flow inflation valve; (E) a non-return inflation valve; (F) a pressure inflation valve; (G) a free flow inflation valve without plug; and (H) a non-return no plug inflation valve.

Figure 2 is a plan view of an embodiment of the inflatable box made in accordance with this invention, shown prior to closure of the bottom and prior to inflation.

Figure 3 is an enlarged plan view of an embodiment of the inflatable box, showing air bladder channels extending from one air bladder to another.

Figure 4 is an isometric view of an embodiment of the inflatable valve made in accordance with this invention.

Figure 5 is a cross sectional side view of an embodiment of the inflatable box made in accordance with this invention, shown with an inflation tube extending from the inflation valve to the exterior of the inflatable box.

Figure 6 is a cross sectional side view of the box in Figure 1 folded into an assembled state, and prior to closure of the top flaps.

Figure 7 is a plan view of another embodiment of the inflatable box made in accordance with this invention, shown prior to closure of the bottom and prior to inflation.

Figure 8 is an isometric view of the assembled box of Figure 1, shown prior to closure of the bottom and prior to inflation.

Figure 9 is a cross sectional side view of the box in Figure 1 folded into an assembled state, exhibiting the bladder being inflated with a needle through the air valve on the side of the box.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0015] The present invention will be described more fully with reference to the accompanying drawings, in which the preferred embodiments of the present invention are shown. It is understood from the embodiments that a person skilled in the art may make variations and modifications without departing from the spirit and scope of the invention. Such variations and modifications may include changing the size or shape of a box, the optional addition of a bleed valve, or the addition of a small hand pump integrated into the sidewall of the box.

[0016] As used herein "substantially along" means that at least a majority of the distance is connected. For example, at least 75%, 80%, or 90% of the distance is connected.

[0017] As used herein "plastic" means any of various organic compounds produced by polymerization, capable of being molded, extruded, cast into various shapes and films, or drawn into filaments. A plastic can either be a thermosetting polymer or a thermoplastic polymer, such as acetals, acrylics, acrylonitrile-butadiene-styrene, alkyds, cellulosics, coumarone-indene, diallyl phthalate, epoxy, fluoropolymer, melamine-formaldehyde, nitrile resins, nylon, petroleum resins, phenolics, polyamide-imide, polyarylates, polybutylene, polycarbonate, polyethylene, polyimides, polyphenylene oxide, polyphenylene sulfide, polypropylene, polystyrene, polyurethanes, polyvinyl acetate, polyvinyl chloride, styrene acrylonitrile, styrene butadiene latexes, sulfone polymers, thermoplastic polyester, unsaturated polyester, urea-formaldehyde, hexachloroethane, or any combination thereof. Useful plastics include acrylonitrile butadiene styrene (ABS), high impact polystyrene (HIPS), acrylic (PMMA), cellulose acetate, cyclic olefin copolymer (COC), ethylene-vinyl acetate (EVA), ethylene vinyl alcohol (EVOH), polyvinylfluoride (PVF), polyvinylidene fluoride (PVDF), polytetrafluoroethylene (PTFE), polychlorotrifluoroethylene (PCTFE), fluorinated ethylene-propylene (FEP), perfluoroalkoxy polymer (PFA), polyethylenechlorotrifluoroethylene (ECTFE), polyethylene-tetrafluoroethylene (ETFE), perfluoropolyether (PCPE), acrylic/PVC polymer, aromatic polyester polymers (liquid crystal polymer), polyoxymethylene (acetal), polyamide (PA, nylon), polyamide-imide (PAI), polyaryletherketone (PAEK), polybutadiene (PBD), polybutylene (PB), polybutylene terephthalate (PBT), polycaprolactone (PCL), polychlorotrifluoroethylene (PCTFE), polyethylene terephthalate (PET), polycyclohexylene dimethylene terephthalate (PCT), polycarbonate (PC), polyhydroxyalkanoate (PHA), polyketone (PK), polyester, polyethylene (PE), polyetheretherketone (PEEK), polyetherimide (PEI), polyethersulfone (PES), chlorinated polyethylene

(CPE), polyimide (PI), polylactic acid (PLA), polymethylpentene (PMP), polyphenylene oxide (PPO), polyphenylene sulfide (PPS), polyphthalamide (PPA), polypropylene (PP), polystyrene (PS), polysulfone (PSU), polytrimethylene terephthalate (PTT), polyurethane (PU), polyvinyl acetate (PVA), polyvinyl chloride (PVC), polyvinylidene chloride (PVDC), styreneacrylonitrile (SAN).

Example 1

[0018] Inflatable box **1**, seen in Figure 2, is shown as a flat, unassembled box composed of five walls, first wall **3a**, second wall **3b**, third wall **3c**, fourth wall **3d**, fifth wall **3e**. In addition, top flaps are attached to the walls such that first top flap **4a** is attached to first wall **3a** and second top flap **4b** is attached to third wall **3c**. In the example, inflatable box **1** also includes first top overlap panel **5a** attached to second wall **3b**, and second top overlap panel **5b** attached to fourth wall **3d**. A plurality of air bladders are attached to the interior wall of the walls and top flaps, with first wall air bladder **6a** attached to first wall **3a**, second wall air bladder **6b** attached to second wall **3b**, third wall air bladder **6c** attached to third wall **3c**, fourth wall air bladder **6d** attached to fourth wall **3d**, and fifth wall air bladder **6e** attached to fifth wall **3e**. The top flaps also include air bladders, with sixth air bladder **6f** attached to first top flap and seventh air bladder **6g** attached to second top flap **4b**.

[0019] The plurality of air bladders are interconnected by bladder channels, as seen in Figure 3. Each air bladder is connected to at least one other air bladder by two bladder channels. For example, in Figure 3, first wall air bladder **6a** is connected to seventh air bladder **6g** by left first bladder air channel $\mathbf{9a_1}$ and right first bladder air channel $\mathbf{9a_2}$.

[0020] Valve **7** comprises first inflation valve half **12** and second inflation valve half **13** heat sealed on longitudinal edges **14**, as seen in Figure 4. This forms collapsible inflation tube **15**. The exterior edges of first inflation valve half **12** and second inflation valve half **13** end in first mounting tab **10** and second mounting tab **11**. In the present example, first inflation valve half **12** and second inflation valve half **13** are strips of plastic heat sealed on longitudinal edges **14** and first mounting tab **10** and second mounting tab **11** heat sealed to an air bladder. Alternatively, valve **7** can be glued, taped, stapled, heated, welded or connected in any other manner which one of skill in the art would find acceptable. To inflate the air bladder, gas is applied inside collapsible inflation tube **15**, thereby inflating the tube into a cylinder. Once gas pressure is reduced, pressure inside the air bladder pushes against the collapsible inflation tube **15**, causing the tube to collapse on itself, i.e. flatten, and push it against the side of the bladder. This seals the valve, preventing gas from escaping from the air bladder.

Example 2

[0021] Valve **7** is in communication with the exterior of inflatable box **1** using tube **30**, seen in Figure 5. Tube **30** is a hollow lumen, long or short tube or tube or tube of any size or shape and may be made of plastic, rubber, or other similar material known in the art. In the present embodiment, valve **7** is connected directly to the interior face of a panel of inflatable box **1** by gluing or otherwise fixing first mounting tab **10** and second mounting tab **11** to the panel face. After assembling inflatable box **1**, as seen in Figure 6, and preparing the box for shipping or storage, gas is applied to tube **30,** thereby inflating collapsible inflation tube **15** into a cylinder as described in Example 1 and inflating the air bladders.

Example 3

[0022] Valve **7** is connected directly to the exterior face of a panel of inflatable box **1** for inflation of the box. An opening is formed in a panel of inflatable box **1** and collapsible inflation tube **15** is inserted into the opening. First mounting tab **10** and second mounting tab **11** were fixed to the exterior panel face using glue, tape, staples, heat sealing, welding, or other means known in the art.

Example 4

[0023] Inflatable box **40** is shown is as a flat, unassembled unit in Figure 7. Box body **41** includes extensions for top flaps **42** and bottom flaps **43,** and have scoring **47** for folds, which run along the bottom and top of box body **41.** Air bladder **44** is connected to inflatable box **40** by means such as adhesive, heat bonding, or other means known in the art. Air valve **7,** shown as a rubber gasket having septum **42** to allow an inflation needle to pass through, is attached to air bladder **44,** such as shown in Figure 7. The air valve may vary from 1 psi to as much as 100 psi, for example a maximum allowable air pressure of 25 psi. The amount of pressure allowed is directly proportional to the strength of the material used in air bladder **44,** inflatable box **40,** and the durability of the shipping item. Hence, the stronger the materials used, the higher the air pressure that can be allowed. This is of course in reference to extreme levels. In most cases, air pressure as little as about 10 psi to about 25 psi will typically be adequate, and a device as simple as a basketball air pump can be used to achieve this pressure. The material used in air bladder **44** can range from rubber to plastic of any types or other suitable material capable of holding air and conforming to the shape of the article(s) shipped in inflatable box **40.**

Example 5

[0024] Inflatable box **1** is assembled by folding first wall **3a,** second wall **3b,** third wall **3c,** and fourth wall **3d,** vertically, i.e. at a 90 degree angle from fifth wall **3e**. The

edges of first wall **3a** are attached to second wall **3b** using method or materials known in the art. Second wall **3b** is then attached to third wall **3c,** and so forth, forming an open box, as seen in Figure 8.

[0025] Inflatable box **1** is shown with top flaps **4a** and **4b** and top overlap panels **5a** and **5b** opened. Inflatable box **1** is assembled and ready for preparing the box for shipping or storage. Item **45** is placed into the interior lumen of inflatable box **1** and top flaps **4a** and **4b** bent over to close over item **45.** Top overlap panels **5a** and **5b** are subsequently folded over top flaps **4a** and **4b,** securing the top of inflatable box **1.** Air inflation needle **40** is then inserted into valve **7** and fluid flow **F1** applied through air inflation needle **40,** as seen in Figure 9. The fluid exits valve 7 as fluid flow **F2,** entering third wall air bladder **6c**. As fluid fills third wall air bladder **6c,** the fluid flows through fifth bladder air channel **9e** and into fifth air bladder **6e.** Fluid continues to flow into subsequent air bladders through the bladder air channels until all the air bladders are filled, thereby securing item **45** in inflatable box **1.**

[0026] The air bladders inflate to provide protection on the bottom, top and sides of item **45** within the interior of inflatable box **1.** After inflation, air inflation needle **40** is withdrawn from valve **7**. Optional bleed valve **8** allows fluid to escape from the air bladders in the instance where inflatable box **1** is overfilled or over-inflated with the fluid.

[0027] The inflatable packing may be shipped. As such, packing of inflatable box **1** and inflation of bladders **6a** through **6f** or bladder **46** can be automated. For example, an assembly line may have boxes traversing a conveyor belt with the bottom of the boxes closed, leaving the top open. Then an article can simply be placed inside of the box through automated means (via a machine) or manual means (via an operator). Then the box would continue traversing the conveyor belt to an air filling station where an automated or manual means could be utilized to inflate the box to the desired pressure. The current invention provides an apparatus and methodology that significantly improves cost efficiency within the packaging industry, for example in shipping time, weight, and labor.

[0028] In the preceding specification, all documents, acts, or information disclosed do not constitute an admission that the document, act, or information of any combination thereof was publicly available, known to the public, part of the general knowledge in the art, or was known to be relevant to solve any problem at the time of priority.

[0029] The disclosures of all publications cited above are expressly incorporated herein by reference, each in its entirety, to the same extent as if each were incorporated by reference individually.

[0030] While there has been described and illustrated specific embodiments of methods for the detection of grouper meat, it will be apparent to those skilled in the art that variations, modifications, and substitution of equivalent means can be effected and still remain within the spirit and scope of the invention and without deviating from the broad spirit and principle of the present invention. It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Claims

1. A shipping package, comprising:

a box (1) or tube container;
wherein the tube container further comprises:

a bottom wall having an interior face, an exterior face, and a circular edge;
a side tubular wall having an interior face, an exterior face, a bottom edge, and a top edge, wherein the bottom edge of the side tubular wall is attached to the circular edge of the bottom wall;
a top wall having an interior face, an exterior face, and a circular edge, wherein the top wall is attached to the side tubular wall at at least one point on the top edge;

wherein the box further comprises:

a bottom wall (3e) having an interior face, an exterior face, at least a first edge, a second edge, a third edge, and a fourth edge;
a first side wall (3a) having an interior face, an exterior face, a bottom edge, a top edge, a first side edge and a second side edge,
wherein the bottom edge is in physical communication with the first edge of the bottom wall when assembled;
a second side wall (3b) having an interior face, an exterior face, a bottom edge, a top edge, a third side edge and a fourth side edge,
wherein the bottom edge is in physical communication with the second edge of the bottom wall and the third side edge is in physical communication with the first side edge of the first side wall when assembled 1;
a third side wall (3c) having an interior face, an exterior face, a bottom edge, a top edge, a fifth side edge and a sixth side edge,
wherein the bottom edge is in physical communication with the third edge of the bottom wall and the fifth side edge is in physical communication with the fourth side edge of the second side wall when assembled;
a fourth side wall (3d) having an interior face, an exterior face, a bottom edge, a top

edge, a seventh side edge and a eighth side edge, wherein the bottom edge is in physical communication with the fourth edge of the bottom wall, the seventh side edge is in physical communication with the sixth edge of the third side wall and the eighth side edge is in physical communication with the second side edge of the first side wall when assembled;

at least one top wall panel (4a, 4b, 5a, 5b) having an interior face and an exterior face, wherein the at least one top wall panel is in physical communication with the top edge of at least one of the first side wall, second side wall, third side wall, or fourth side wall;

at least one fluid bladder (6a, 6b, 6c, 6d, 6e, 6f, 6g) disposed on the interior of the box or tube container,

where for the box, the at least one fluid bladder is disposed on the interior face of the bottom wall, first side wall, second side wall, third side wall, fourth side wall, and at least one top wall panel of the box;

where for the tube container, the at least one fluid bladder is disposed on the interior face of the bottom wall, the side tubular wall, and the top wall; and

a fluid inflation valve (7) in fluid communication with an interior lumen of the fluid inflation bladder, wherein the fluid inflation valve is disposed on the fluid bladder, on the interior face of a side wall, on the interior face of a top wall panel, on the exterior face of a side wall, on the exterior face of a top wall panel, in a side wall, or in a top wall.

2. The shipping package of claim 1, wherein the fluid inflation valve comprises a rubber gasket valve or plastic duckbill valve;

wherein the rubber gasket valve further comprises a rubber sealing member and a septum disposed in the rubber sealing member; and wherein the plastic duckbill valve further comprises:

a first plastic sheet (12) having a first longitudinal edge, a second longitudinal edge, and a mounting edge;

a second plastic sheet (13) having a third longitudinal edge, a fourth longitudinal edge, and a mounting edge;

wherein the first longitudinal edge is fixed along its length or substantially along its length to the third longitudinal edge and the second longitudinal edge is fixed along its length or substantially along its length to the fourth longitudinal edge to form an valve lumen;

wherein the plastic duckbill valve is attached using its mounting edge.

3. The shipping package of claim 2, wherein mounting tabs (10, 11) are disposed on the mounting edge of the first plastic sheet and the second plastic sheet of the plastic duckbill valve.

4. The shipping package of either claim 2 or 3, further comprising an inflation tube (15) disposed adjacent to the mounting edge of the first plastic sheet and the second plastic sheet and in fluid communication with the valve lumen.

5. The shipping package of any preceding claim, wherein the at least one fluid bladder further comprises:

a first fluid bladder (6a) having a plurality of edges and at least one fluid channel disposed on at least one of the plurality of edges;

a second fluid bladder (6f) having a plurality of edges and at least one fluid channel disposed on at least one of the plurality of edges, wherein the at least one fluid channel on the second fluid bladder is in fluid communication with the at least one fluid channel on the first fluid bladder.

6. The shipping package of any preceding claim, further comprising a bleed valve (8) disposed on the fluid bladder and in fluid communication with the interior of the fluid bladder.

7. The shipping package of any preceding claim, further comprising at least one overlapping top wall panel (4a, 4b, 5a, 5b) disposed on the top edge of at least one side wall (3a, 3b, 3c, 3d)

8. The shipping package of claim 7, wherein the fluid bladder is disposed on the interior face of the least one overlapping top wall panel.

9. The shipping package of any preceding claim, wherein the fluid bladder is formed of rubber, plastic, graphene, mylar, or suitable material.

10. The shipping package of any preceding claim, wherein the box or tube container is formed of cardboard, paper, plastic, graphene, wood, corrugated paper, or suitable material.

11. A method for cushioning a package for an item being shipped, comprising the steps of:

providing a shipping package as claimed in any preceding claim;

introducing an item into the box or tube container;

closing the box or tube container;

attaching the fluid inflation valve to a source of fluid under pressure; and
flowing fluid into the at least one fluid bladder, such that the fluid inflates the at least one fluid bladder around the item.

12. The method of claim 11, wherein the fluid under pressure is a gaseous fluid.

13. The method of either claim 11 or 12, further comprising removing the source of fluid under pressure.

14. The method of any of claims 11 to 13, further comprising the deflating the at least one fluid bladder prior to removal of the item from the box or tube container.

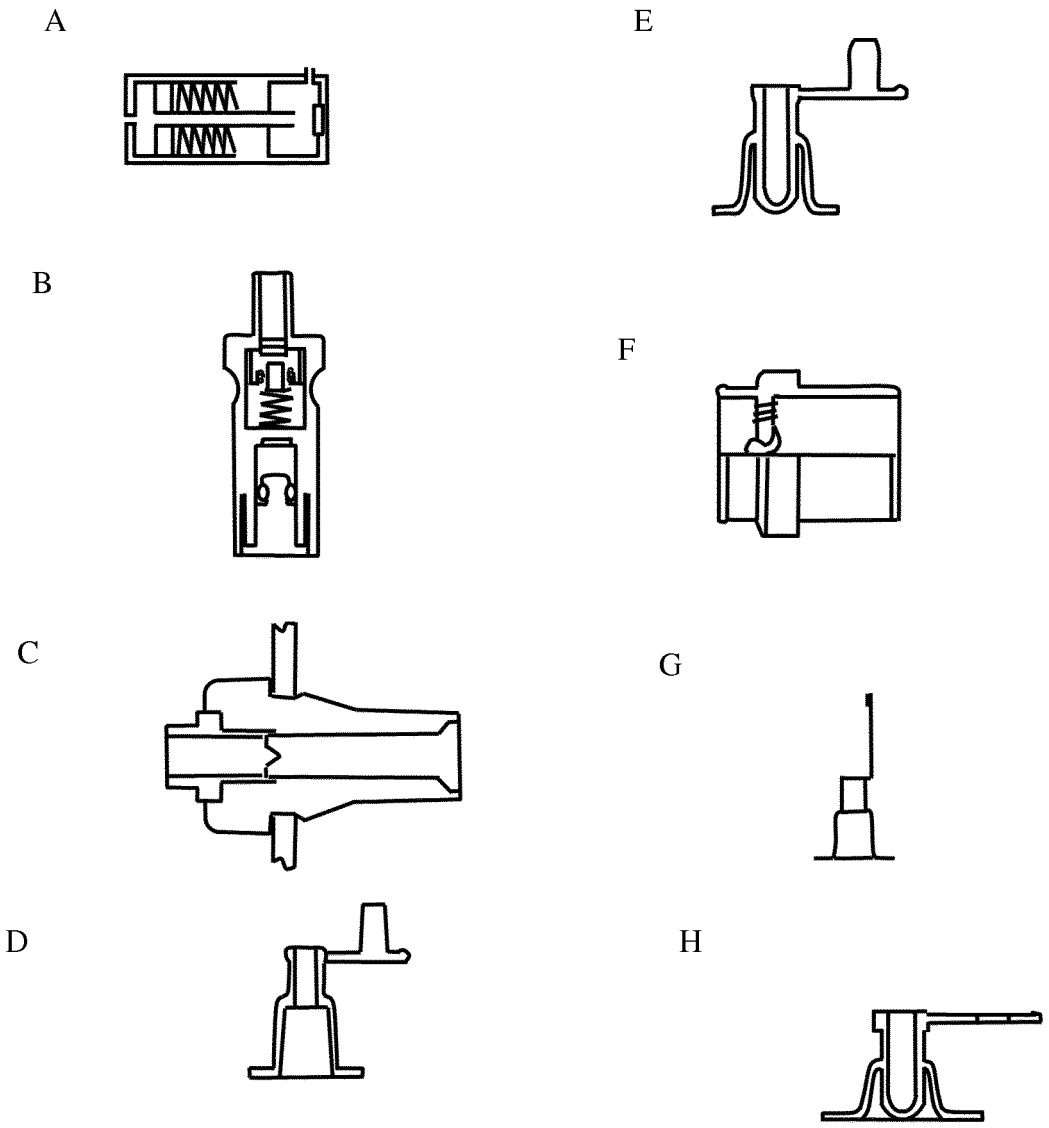


Figure 1.

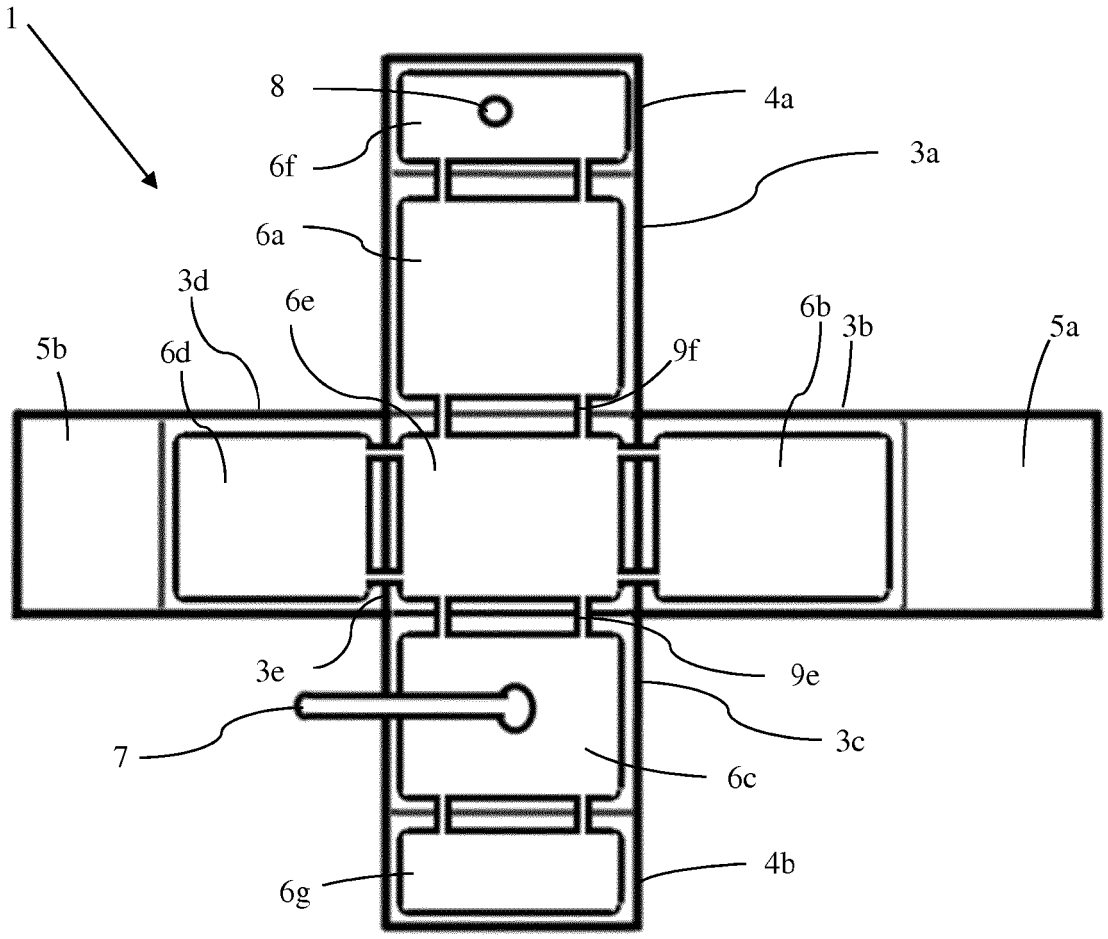
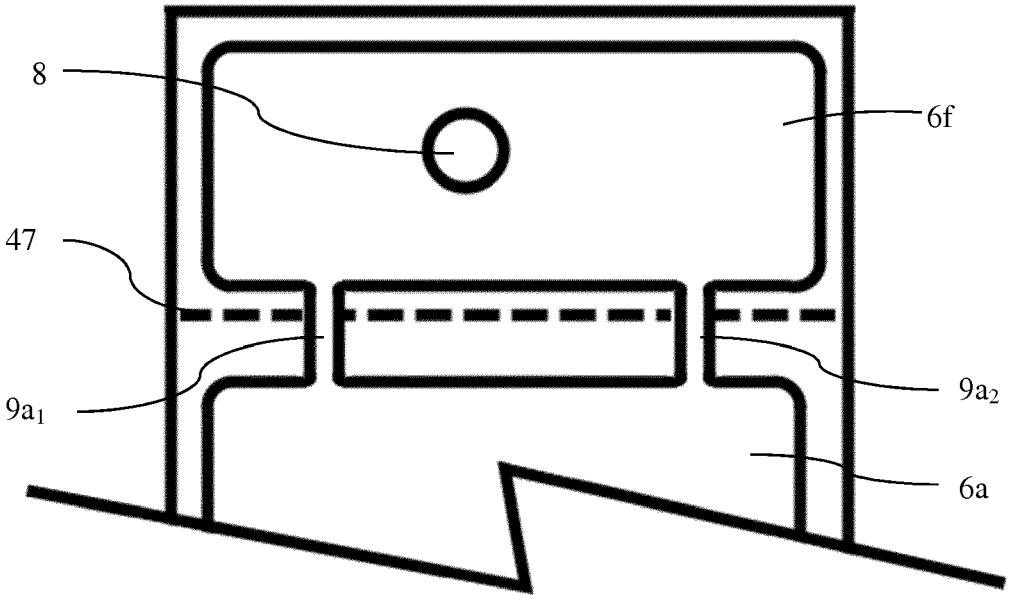


Figure 2.



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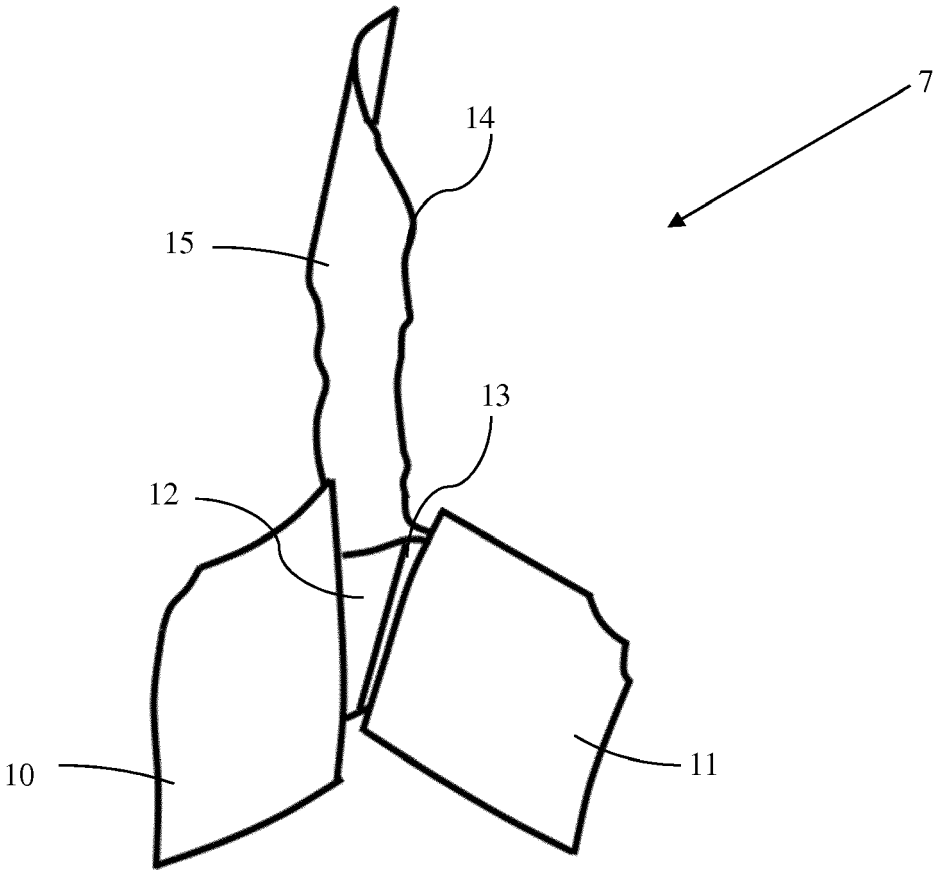
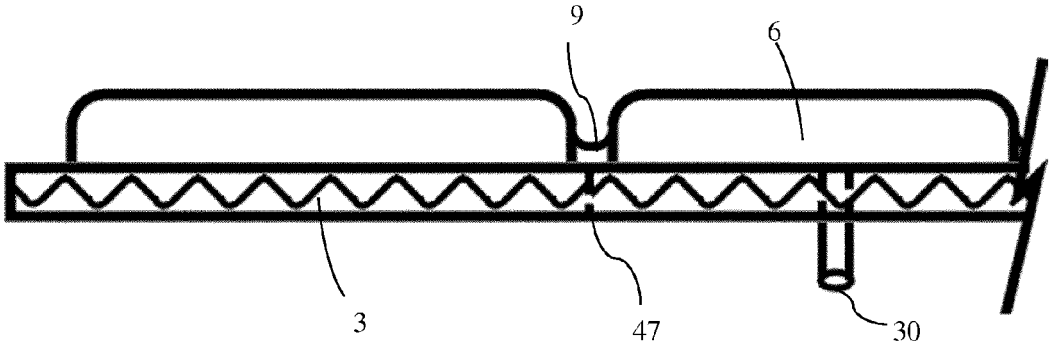


Figure 4.



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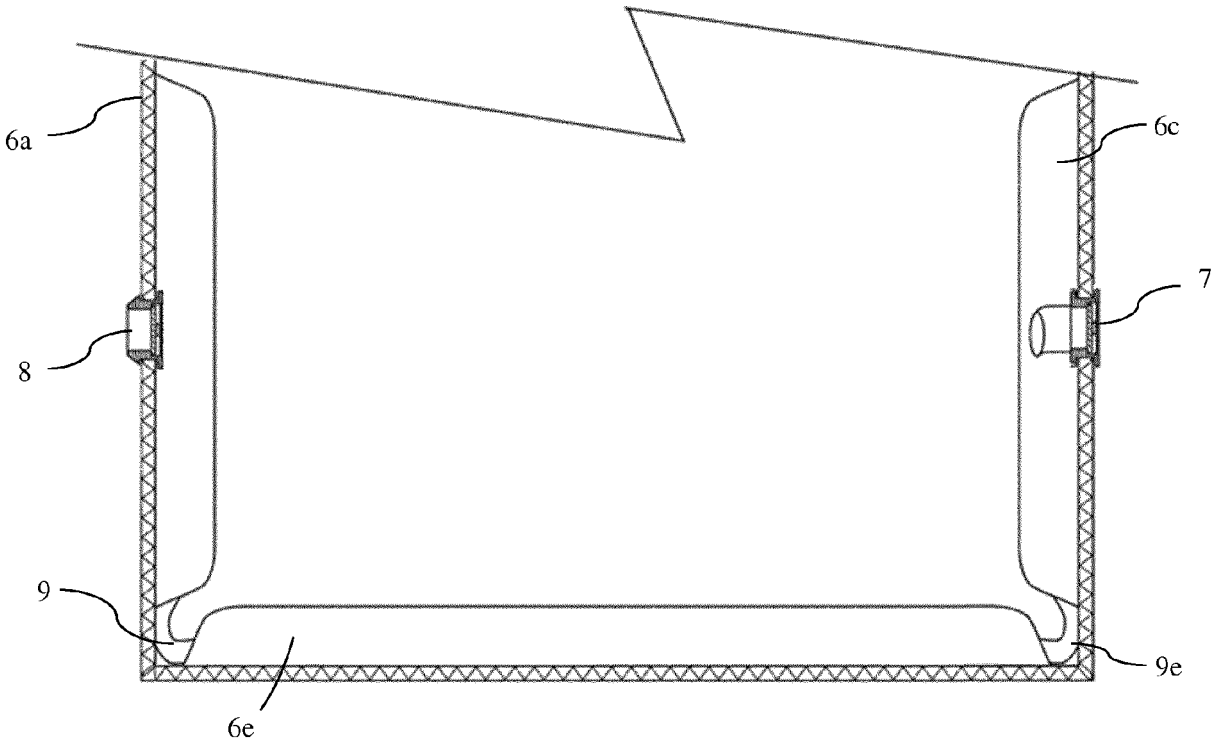

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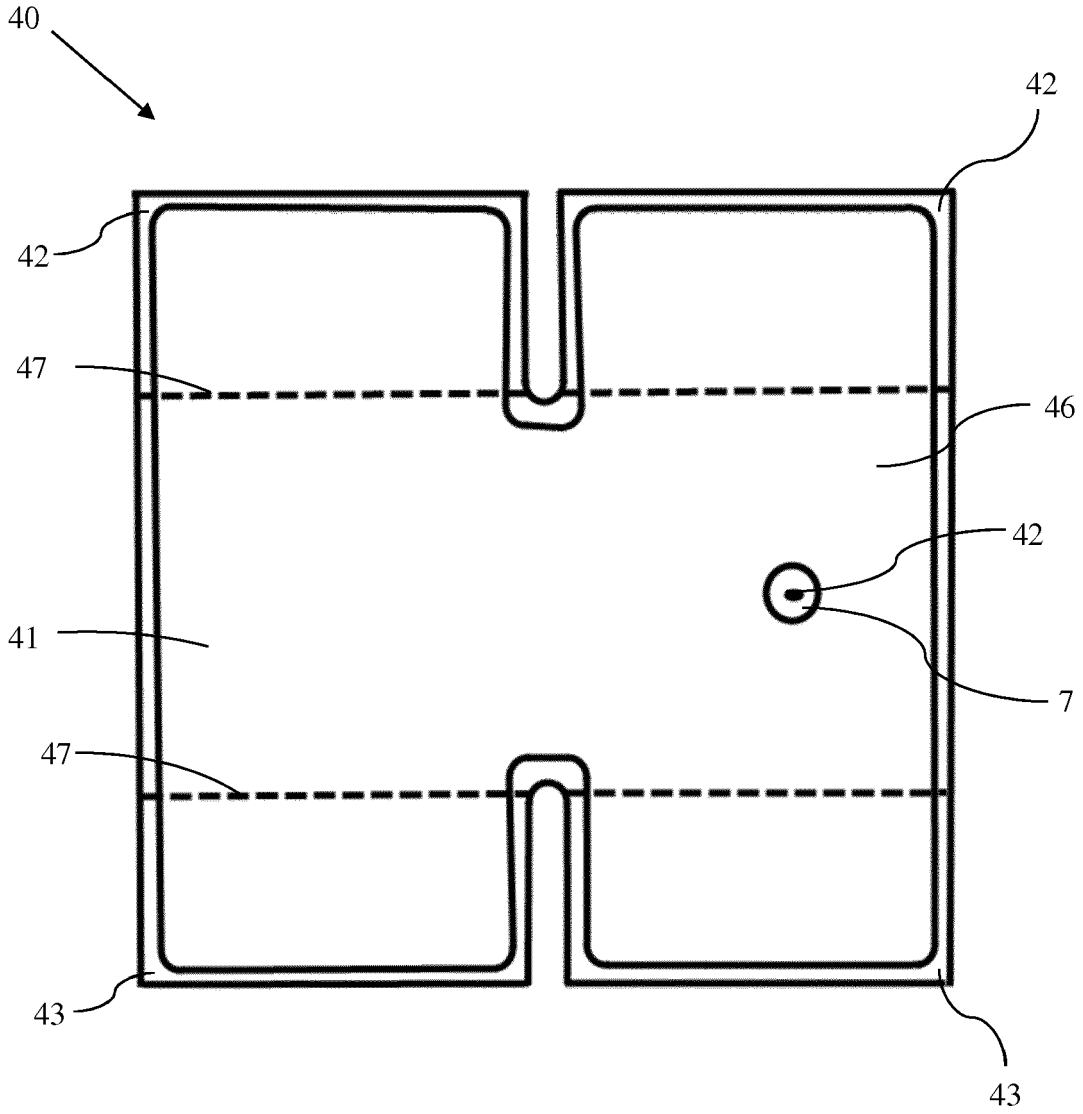

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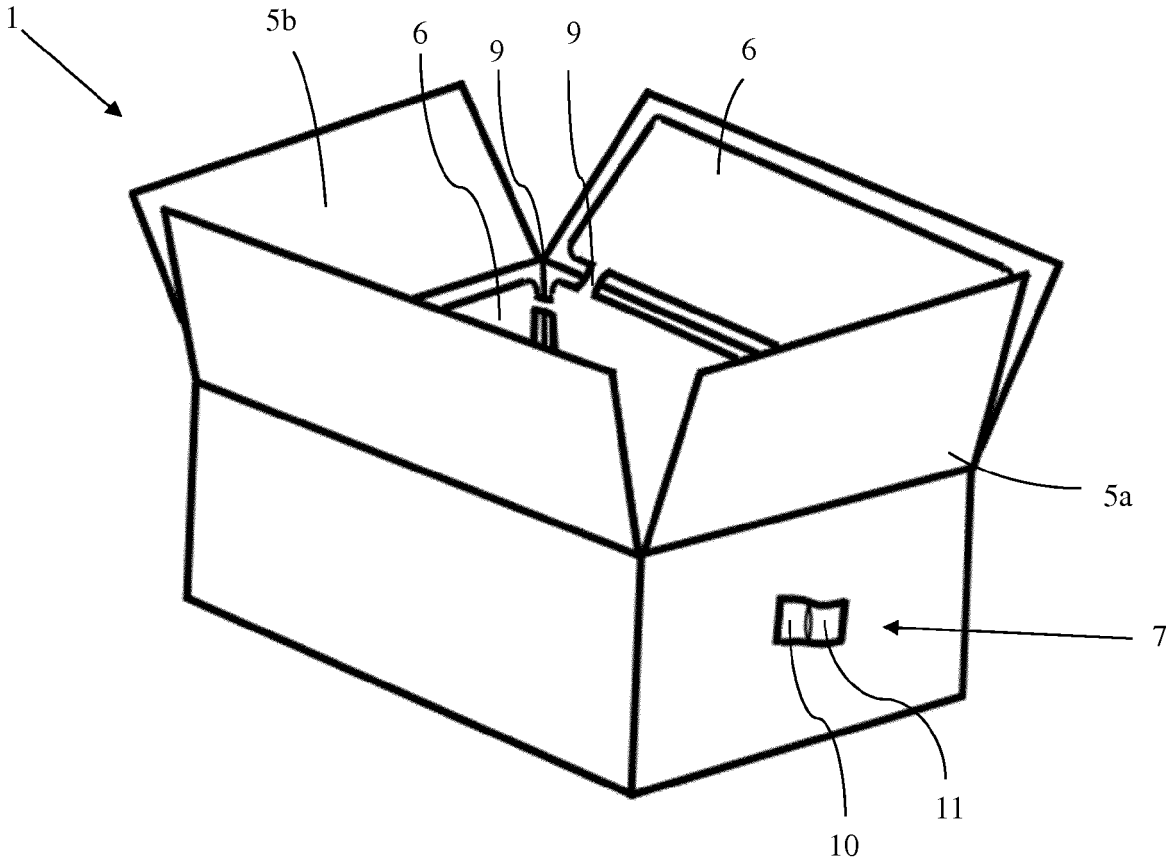

Figure 8.

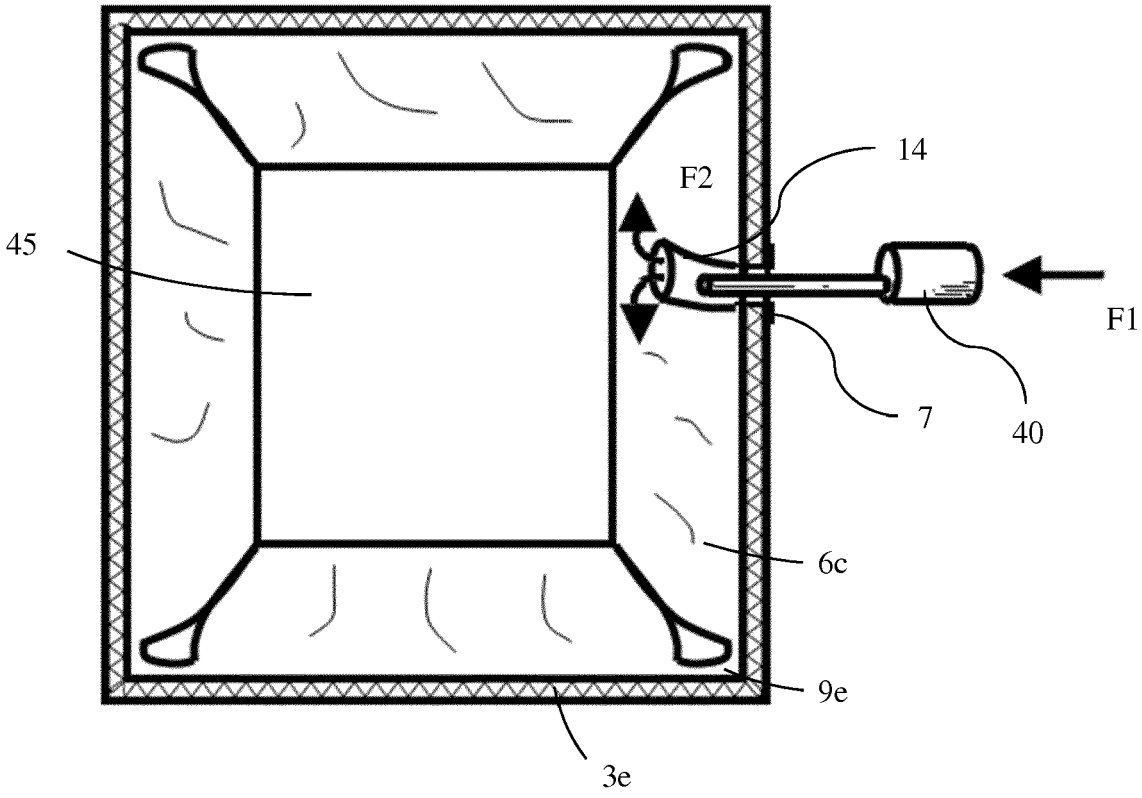

Figure 9.

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Application Number
EP 14 27 5114

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 September 2014	Jervelund, Niels

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