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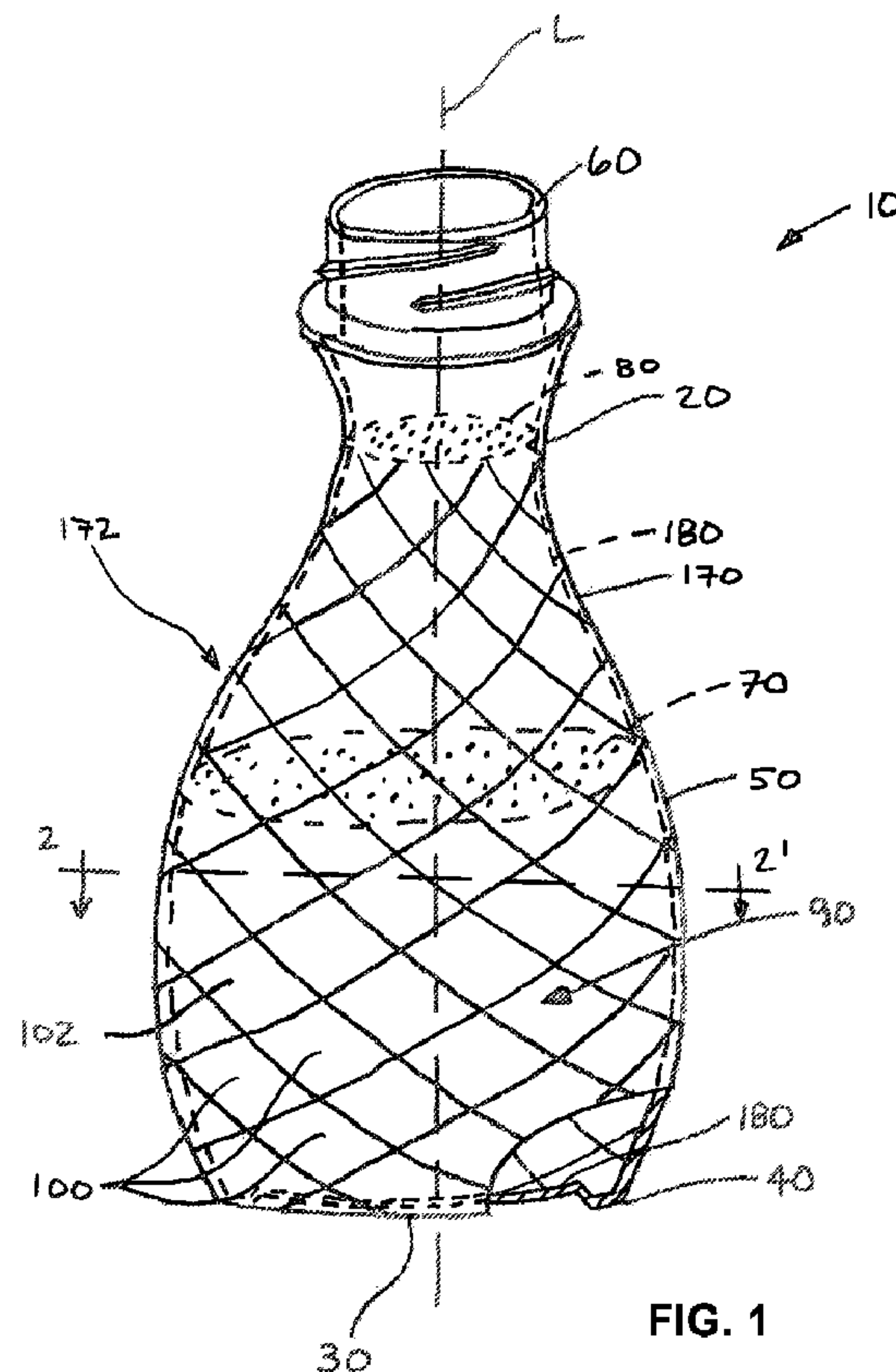


FIG. 1

(57) Abrégé/Abstract:

A container (10) having a peripheral wall (50) and a waist (20), the peripheral wall comprising a faceted region (90), wherein the peripheral wall above the waist is substantially free from facets.

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[Continued on next page]

(54) Title: FACETED CONTAINER

(57) Abstract: A container (10) having a peripheral wall (50) and a waist (20), the peripheral wall comprising a faceted region (90), wherein the peripheral wall above the waist is substantially free from facets.

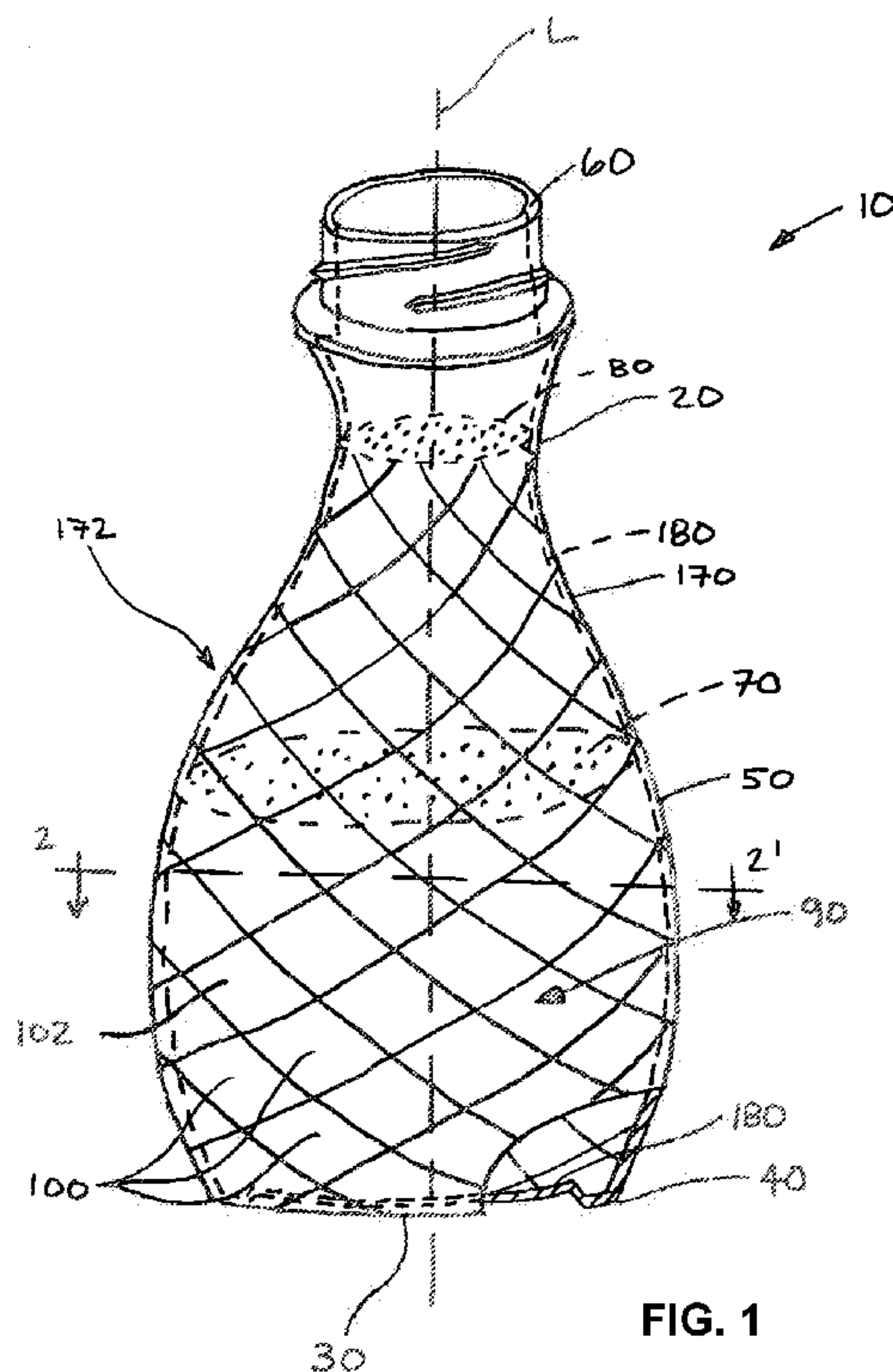


FIG. 1

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FACETED CONTAINER

FIELD OF THE INVENTION

Container for a product.

5

BACKGROUND OF THE INVENTION

Blow molded containers are commonly used for packaging consumer goods such as liquid fabric softeners, liquid detergent, powdered detergent, water, soda, beer, wine, tea, fruit juice, surface cleaning compositions, milk, particulate laundry scent additives, and the like.

10 Marketers of such products must compete with others participants in the market to attract consumers to their brands. One way by which marketers attempt to differentiate their product from the products of others is to use a container shape that is proprietary or unique to their brand.

Blow molding can be used produce containers having a variety of shapes. One constraint on the shape of the container adopted by a marketer is that the container must have sufficient
15 structural stability to endure the stresses applied to the container during the life-cycle of the container. The life-cycle of a container can include steps of production, filling, packing, transfer, storage as inventory, shipping, display, storage in-home, and use in-home.

One of the most stressful conditions imposed on a container during the life-cycle of the container is during storage. In a typical situation, a cardboard carton or tray and cap package is
20 used to store a plurality of containers. For example, ten or more containers of fabric softener or water may be packed together. The cardboard cartons or tray and cap packages may be placed on a pallet and multiple cartons or tray and cap packages may be stacked one on top of another. To provide for economy of handling the containers, marketers desire to stack cartons or tray and cap packages as high as possible so that a single pallet carries as many containers as practical.

25 One limitation to how high cartons or tray and cap packages can be stacked is the top-load buckling strength of the containers since the containers on the bottom of the stack may carry some or all of the weight of the containers above. If the containers do not have sufficient top-load buckling strength, the containers may axially buckle. Marketers can improve the buckling strength of containers by using thicker walled containers or using container shapes that tend to
30 having high top-load buckling strength. Containers having thick walls are more expensive than containers having thin walls. The shapes for containers that tend to have relatively high top-load buckling strength also may not generate the desired visual interest of a consumer when presented on the shelf of a retailer.

A container that is buckled may leak, may cause the overlying stack of cartons or tray and
35 cap packages to become unstable, and may be unattractive to the consumer considering

purchasing the container and contents thereof. A buckled container may be perceived by the consumer as being indicative of inferior goods, especially as compared to another competing brand displaying unmarred containers.

5 In view of the above, marketers face trade-offs between efficiency of handling of the containers, desired shape, and cost of the containers when choosing a particular container to carry their product. With these limitations in mind, there is a continuing unaddressed need for containers having sufficient top-load bucking strength.

SUMMARY OF THE INVENTION

A container comprising: a closed end having a closed end periphery; and a peripheral wall extending from the closed end periphery about a longitudinal axis of the container to an open end, the closed end and the peripheral wall comprising a thermoplastic substrate; wherein the peripheral wall defines a variable open cross-section of the container in a plane orthogonal to the longitudinal axis as a function of distance from the closed end; wherein the container has a waist having a waist open cross-section orthogonal to the longitudinal axis that is less than the open cross-sectional area orthogonal to the longitudinal axis above and below the waist; wherein the peripheral wall comprises a faceted region comprising a plurality of facets arranged edge to edge with one or more adjacent facets, at least a portion of the faceted region being located nearer to the closed end than to the open end; wherein the peripheral wall has a peripheral wall exterior surface oriented away from the longitudinal axis, the peripheral wall exterior surface having a peripheral wall exterior surface area; wherein each of the plurality of facets has a facet exterior surface area oriented away from the longitudinal axis and each of the facets has an exterior surface area that is between about 0.0001% and about 4% of the peripheral wall exterior surface area; wherein the peripheral wall above the waist is free from or substantially free from facets.

10

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is perspective view of a container.

Fig. 2 is a cross sectional view of the container shown in Fig. 1 as marked in Fig. 1, the view being taken towards the closed end.

15 Fig. 3 is cut-out view of a portion of the peripheral wall shown in Fig. 2 as marked in Fig. 2.

Fig. 4 is profile view of a container.

Fig. 5 is a plurality of facets.

Fig. 6 is a plurality of facets.

20 Fig. 7 is a plurality of facets.

Fig. 8 is a plurality of facets.

Fig. 9 is a plurality of facets.

Fig. 10 is a profile view of a container having a sleeve label.

Fig. 11 is a profile view of a container having a bounded label.

5 Fig. 12 is a cross-section of a container 10 taken orthogonal to the longitudinal axis L, the closed end of the container being visible.

Fig. 13 is container having a plug-seal closure.

Fig. 14 is a carton containing a plurality of containers.

10 DETAILED DESCRIPTION OF THE INVENTION

A container 10 having a waist 20 is shown in Fig. 1. The container 10 can be formed by injection stretch blow molding. The container 10 can be formed by injection molding, injection stretch blow molding, extrusion blow molding, or similar process. The container 10 can be a thermoformed container 10.

15 The container 10 can have a closed end 30. The closed end 30 can have a closed end periphery 40. The closed end periphery 40 can define the extent of the closed end away from the longitudinal axis L. The closed end 30 can be shaped to have a structure that can be stably rested on a flat surface such as a table. The closed end 30 can be shaped as shown in Fig. 1. The closed end 30 can be provided with a plurality of feet upon which the closed end 30 can rest on a flat
20 surface such as a table.

A peripheral wall 50 can extend from the closed end periphery 40 about a longitudinal axis L of the container 10 to the open end 60. The longitudinal axis L is an axis of the container 10 that passes through the open end 60 and the closed end 30 about which the peripheral wall 50 extends. The peripheral wall 50 can extend from the open end 60 to the closed end 30. The
25 peripheral wall 50 can be symmetric or asymmetric about the longitudinal axis L. The open end 60 can be about the longitudinal axis L. If the open end is generally circularly shaped, the open end 60 can circumscribe the longitudinal axis L.

The peripheral wall 50 and closed end 30 can have a peripheral wall exterior surface 170 oriented away from the longitudinal axis L and an opposing interior surface 180. The interior
30 surface 180 of the peripheral wall 50 is oriented towards the longitudinal axis L. The interior surface 180 of the closed end 30 is oriented towards the open end 60. The peripheral wall exterior surface 170 can have a peripheral wall exterior surface area 172, which is the total area of the peripheral wall exterior surface's 170 faces and curved surfaces above and below the waist.

The closed end 30 and peripheral wall 50 can comprise a thermoplastic material. The thermoplastic material can be a petroleum based thermoplastic material or a plant based thermoplastic material. The closed end 30 and peripheral wall 50 can be any polymeric material that can be blow molded. The container 10 can comprise a material selected from the group
5 consisting of high density polyethylene, low density polyethylene, polypropylene, biaxially oriented polypropylene polyethylene, polyethylene terephthalate, polyethylene terephthalate glycol, processable polylactic acid, polyvinyl chloride, thermoplastic starch, cellulose bioplastic, aliphatic polyesters, and polylactic acid.

The peripheral wall 50 can define a variable open cross-section 70 of the container 10 in a
10 plane orthogonal to the longitudinal axis L as function of distance from the closed end 30. A variable cross-section 70 of the container 10 at a particular height or location along the longitudinal axis L is stippled and labeled as 70 in Fig. 1. At various locations along the longitudinal axis L, the cross-section orthogonal to the longitudinal axis L can have different shapes and or sizes.

15 The variable open cross-section 70 defines an area within the container 10 within which the contents of the container 10 are held. The container 10 can be a bulbous shaped container 10 having a relatively narrow closed end 30 and a peripheral wall 50 that broadens in relationship to the height of the container 10, the height being taken along the longitudinal axis L moving away from the closed end 30.

20 Starting from the closed end 30 and moving along the longitudinal axis L, the area of the open cross-section 70 can have an initial value that gradually increases with height as measured from the closed end 30 along the longitudinal axis L. The area of the open cross-section 70 can have a maximum at a particular height, above which the area of the open cross-section 70 decreases with increasing height as measured from the closed end 30 along the longitudinal axis
25 L. The maximum can be a global maximum or local maximum.

The container 10 can have a waist 20 having a waist open cross-section 80 orthogonal to the longitudinal axis L that is less than the area of the open cross-section 70 orthogonal to the longitudinal axis L above and below the waist 20. The waist 20 can be a narrowed region of the container 10 that can be generally located proximal the open end 60 of the container 10. The
30 waist open cross-section 80 is marked in Fig. 1 and stippled. The waist 20 can be sized and dimensioned to be able to be gripped by an adult female hand.

The peripheral wall 50 can comprise a faceted region 90. The faceted region 90 can comprise plurality of facets 100. The facets 100 forming the faceted region 90 can be arranged edge to edge with one or more adjacent facets 100. The faceted region 90 can comprise more
35 than about 5 facets 100. The faceted region 90 can comprise more than about 10 facets 100. The

faceted region 90 can comprise more than about 20 facets 100. The faceted region 90 can comprise more than about 40 facets 100. The faceted region 90 can comprise more than about 80 facets 100. The faceted region 90 can comprise more than about 150 facets 100. The faceted region 90 can comprise more than about 300 facets 100. Without being bound by theory, it is thought that the greater the number of facets 100 in the faceted region 90, the more flashes of reflectance that can be generated as the relative position of the container 10 changes with respect to the consumer, e.g. by movement of the container 10 in the consumer's hands or movement of the consumer as she moves in proximity to the container 10. The faceted region can comprise between about 5 and about 15 facets. The faceted region can comprise between about 5 and about 25 facets. The faceted region can comprise between about 5 and about 50 facets. The faceted region can comprise between about 5 and about 100 facets. The faceted region can comprise between about 20 and about 40 facets.

A facet 100 can be a small plane surface. A facet 100 can have a facet exterior surface area 102 oriented away from the longitudinal axis that is less than about 4 cm^2 . A facet 100 can have a facet exterior surface area 102 oriented away from the longitudinal axis that is less than about 2.5 cm^2 . A facet 100 can have a facet exterior surface area 102 oriented away from the longitudinal axis between about 0.1 cm^2 and about 4 cm^2 . A facet 100 can have a facet exterior surface area 102 oriented away from the longitudinal axis between about 0.1 cm^2 and about 2.5 cm^2 .

Each of the plurality of facets 100 can have a facet exterior surface area oriented away from the longitudinal axis L and each of the plurality of facets 100 can have a facet exterior surface area 102 oriented away from the longitudinal axis L that is less than about 2% of the peripheral wall exterior surface area 172. The facet exterior surface area 102 oriented away from the longitudinal axis L can be between about 0.0001% and about 4% of the peripheral wall exterior surface area 172. The facet exterior surface area 102 oriented away from the longitudinal axis L can be between about 0.0001% and about 2% of the peripheral wall exterior surface area 172.

Each of the plurality of facets 100 can have a facet exterior surface area 102 oriented away from the longitudinal axis L and each of the plurality of facets 100 can have a facet exterior surface area 102 oriented away from the longitudinal axis L that is less than about 1% of the peripheral wall exterior surface area 172. The facet exterior surface area 102 oriented away from the longitudinal axis L can be between about 0.0001% and about 1% of the peripheral wall exterior surface area 172.

Each of the plurality of facets 100 can have a facet exterior surface area 102 oriented away from the longitudinal axis L and each of the plurality of facets 100 can have an exterior

surface area 102 oriented away from the longitudinal axis L that is less than about 0.5% of the peripheral wall exterior surface area 172. The facet exterior surface area 102 oriented away from the longitudinal axis L can be between about 0.0001% and about 0.5% of the peripheral wall exterior surface area 172.

5 The facets 100 can be small plane surfaces of individual panels. When a plurality of facets 100 are arranged to form a faceted region 90 on a container 10, individual facets 100 can present surfaces that reflect incident light in different directions. That is, the orthogonal directions away from the surfaces of individual facets 100 are divergent. The differences in intensity of light reflected to an observer's eyes are perceived to give the container 10 luster or
10 make the container 10 look sparkly. Without being bound by theory, it is thought that containers having a faceted region 90 may shimmer as compared containers having the same general container shape that do not have faceted region 90. The shimmer, which can be perceived by consumers as flashes of light draw a consumer's eyes to the container 10 having a faceted region 90. Further, a container 10 formed of a thermoplastic material having a faceted region 90 can
15 appear to be a glass container. As such, a lightweight container 10 can have the appearance of a more substantial glass container. By having a container 10 that shimmers when viewed on the shelf of the store, it is thought that more consumers may be attracted to the container and consider purchasing the container 10 and contents therein.

 At least a portion of the faceted region 90 can be located nearer to the closed end 30 than
20 the open end 60. Without being bound by theory, it is thought that such an arrangement can provide for enhanced luster when the position of the longitudinal axis L is changes front to back relative to an observer's eye and when container 10 is rotated about the longitudinal axis L.

 Figure 2 is an approximate sectional view of the container 10 shown in Fig. 1 to illustrate one configuration of the structure of a section of the container 10. A variety of cross-sections
25 orthogonal to the longitudinal axis are contemplated herein. As shown in Fig. 2, around the peripheral wall 50, at least a portion of the peripheral wall 50 about the longitudinal axis L in a plane orthogonal to the longitudinal axis L below the waist 20 can be defined by a plurality of substantially straight line segments 110. The line segments 110 can be arranged end to end, as shown in Fig. 2. At any particular location along the longitudinal axis L below the waist 20, at
30 least a portion of the peripheral wall 50 about the longitudinal axis L in a plane orthogonal to the longitudinal axis L can be defined by a plurality of substantially straight line segments 110. The peripheral wall 50 about the longitudinal axis L in a plane orthogonal to the longitudinal axis L below the waist 20 can be entirely defined by a plurality of substantially straight line segments 110. Each line segment 100 can have length 120, as shown in Fig. 3 which is a cut-out view of a
35 portion of the peripheral wall shown in Fig. 2 as marked in Fig. 2. The length of the transition

segment 130 between adjacent line segments 100 can have a length less than about 10% of the length of an adjacent line segment 100. The length of the transition segment 130 between adjacent line segments 100 can have a length between about 0.0001% and about 10% of the length of an adjacent line segment 100. Without being bound by theory, it is thought that shorter
 5 transition segments 130 can provide for more visual definition of the facets 100.

As shown in Fig. 1, the peripheral wall 50 about the longitudinal axis L in a plane orthogonal to the longitudinal axis L above the waist 20 can be free from or substantially free from having line segments 110 arranged end to end.

As shown in Figs. 1 and 2, the peripheral wall 50 can be substantially symmetric about
 10 the longitudinal axis L. Containers 10 that are substantially symmetric about the longitudinal axis L can have higher axial and lateral strength than containers that are asymmetric about the longitudinal axis L.

The waist 20 can be nearer to the open end 60 than to the closed end 30. By having the waist 20 located as such, a greater portion of the container 10 can be provided with a faceted
 15 region. Further, since the waist 20 can form a portion of the container 10 designed to be gripped, the center of mass of the container 10 plus the contents therein will tend to be lower than the waist 20. A lower center of gravity may be practical for providing a container from which it is easy to pour contents, is stable in the user's hand, and is stable when resting on a flat surface.

The waist 20 can have a waist open cross-section 80 having an area less than about 80
 20 cm². A waist 20 dimensioned as such can provide for a convenient location at which to grip the container 10. The waist 20 can have a waist open cross-section 80 having an area less than about 60 cm². The waist 20 can have a waist open cross-section 80 having an area less than about 40 cm². The waist 20 can have a waist open cross-section 80 having an area less than about 40 cm². The waist 20 can have a waist open cross-section 80 having an area less than about 20 cm² or
 25 even less than about 10 cm². Having a smaller waist 20 can be practical for containers 10 that designed for used by persons having small hands. The waist 20 can have a waist open cross-section 80 having an area between about 5cm² and about 60 cm². The waist 20 can have a waist open cross-section 80 having an area between about 5cm² and about 40 cm². The waist 20 can have a waist open cross-section 80 having an area between about 5cm² and about 20 cm². The
 30 waist 20 can have a waist open cross-section 80 having an area between about 5cm² and about 10 cm².

The container 10 can have a total volume defined by the closed end 30, the peripheral wall 50, and the open end 60. The total volume can be more than about 300 mL. The total volume can be more than about 500 mL. The total volume can be more than about 1000 mL.

The total volume can be more than about 1500 mL. The total volume can be more than about 2000 mL. The total volume can be between about 300 mL and about 2000 mL.

The container 10 can have a partial volume above the waist 20. The partial volume is defined by the waist open cross-section 80 at the waist, the peripheral wall 50 above the waist 20, and the open end 60. The partial volume can be thought of as the volume of the part of the container 10 above the waist 20. The partial volume above the waist 20 can be less than about 20% of the total volume of the container 10. The partial volume above the waist can be less than about 10% of the total volume of the container 10. By having a lower fraction of the total volume above the waist 20, the container 10 can be more ergonomic for the person gripping the container 10 about the waist 20 since most of the contents within the container 10 are located below the axis about which the container 10 is tipped when dispensing the contents. The partial volume above the waist 20 can be between about 1% and about 50% of the total volume of the container 10. The partial volume above the waist 20 can be between about 1% and about 20% of the total volume of the container 10. The partial volume above the waist 20 can be between about 1% and about 10% of the total volume of the container 10.

The faceted region 90 can comprise more than about 30% of the peripheral wall exterior surface 170 of the peripheral wall 50 below the waist 20. As shown in Fig. 4, faceted region 90 can be on a face 140 of the container 10. A faceted region 90 comprising more than about 30% of the peripheral wall exterior surface 170 of the peripheral wall 50 below the waist 20 can be large enough so that the shimmer emanating there from can be noticeable by a consumer from a distance of about 1 meter under lighting conditions typically found in stores. The peripheral wall exterior surface 170 of the peripheral wall 50 is the surface of the peripheral wall 50 oriented away from the longitudinal axis L. The faceted region 90 can comprise more than about 50% of the peripheral wall exterior surface 170 of the peripheral wall 50 below the waist 20. The faceted region 90 can comprise more than about 60% of the peripheral wall exterior surface 170 of the peripheral wall 50 below the waist 20. The faceted region 90 can comprise more than about 90% of the peripheral wall exterior surface 170 of the peripheral wall 50 below the waist 20. The faceted region 90 can comprise about 100% of the peripheral wall exterior surface 170 of the peripheral wall 50 below the waist 20. The higher the percentage of the peripheral wall exterior surface 170 that the faceted region 90 comprises, the technical effect of flashes of reflection from the faceted region 90 is apparent from a wider viewing angle. The faceted region 90 can comprise between about 30% and about 100% of the peripheral wall exterior surface 170 of the peripheral wall 50 below the waist 20. The faceted region 90 can comprise between about 40% and about 100% of the peripheral wall exterior surface 170 of the peripheral wall 50 below the waist 20. The faceted region 90 can comprise between about 50% and about 100% of the

peripheral wall exterior surface 170 of the peripheral wall 50 below the waist 20. The faceted region 90 can comprise between about 60% and about 100% of the peripheral wall exterior surface 170 of the peripheral wall 50 below the waist 20.

5 The peripheral wall exterior surface 170 below the waist 20 can have a surface area. The faceted region 90 can comprise more than about 30% of the peripheral wall exterior surface area 172 below the waist 20. The faceted region 90 can comprise more than about 50% of the peripheral wall exterior surface area 172 below the waist 20. The faceted region 90 can comprise more than about 70% of the peripheral wall exterior surface area 172 below the waist 20. The faceted region 90 can comprise more than about 80% of the surface area of the peripheral wall exterior surface area 172 below the waist 20. The larger the faceted region 90, the more noticeable the faceted region 90 can be since the technical effect of flashes of reflection from the faceted region 90 is apparent from a wider viewing angle.

10 The peripheral wall exterior surface 170 below the waist 20 can have a surface area. The faceted region 90 can comprise between about 30% and about 100% of the peripheral wall exterior surface area 172 below the waist 20. The faceted region 90 can comprise between about 50% and about 100% of the peripheral wall exterior surface area 172 below the waist 20. The faceted region 90 can comprise between about 70% and about 100% of the peripheral wall exterior surface area 172 below the waist 20. The faceted region 90 can comprise between about 80% and about 100% of the surface area of the peripheral wall exterior surface area 172 below the waist 20. The larger the faceted region 90, the more noticeable the faceted region 90 can be since the technical effect of flashes of reflection from the faceted region 90 is apparent from a wider viewing angle.

15 The faceted region 90 can extend around the peripheral wall 50, as shown in Figs. 1 and 2. By arranging the faceted region 90 as such, as the consumer rotates the container 10 around the longitudinal axis L to view all parts of peripheral wall 50, the movement of the facets 100 relative to her eyes will create flashes of reflection that provide the impression of a sparkly luster from a glass container to the consumer.

20 The area of the faceted region 90 can be greater than about 60 cm². The visibility of the faceted region 90 is thought to increase with increasing size of the faceted region 90. The faceted region 90 can be a discrete portion of peripheral wall 50 that is provided with facets 100. For example, a portion of the peripheral wall 50 can comprise a faceted region 90 and the remainder of the peripheral wall 50 can be free from or substantially free from facets 100. For example, a portion of the peripheral wall 50 can comprise a faceted region 90 and the remainder of the peripheral wall 50 can be smooth and or provided with ribs and or other surface contours that are

decorative and or structural. The area of the faceted region 90 can be between about 60 cm² and about 2000 cm².

The facets 100 can have a facet exterior surface 150 oriented away from the longitudinal axis L. The facet exterior surface 150 of each of the facets 100 can have an opposing facet interior surface that is oriented towards the longitudinal axis L. The facet exterior surfaces 150 of the plurality of facets 100 can be positioned convexly relative to the longitudinal axis L.

For example, as shown in Fig. 1, a plurality of facets 100 can be positioned convexly relative to the longitudinal axis L. In this arrangement, the plurality of facets 100 can be arranged to extend in a direction from towards the closed end 30 towards the open end 60 of the container. This arrangement can be thought of as being generally up and down the container 10 when the container 10 is resting on the closed end 30. By arranging the plurality of facets 100 to be positioned in a direction from towards the closed end 30 towards the open end 60, the container 10 can generate flashes of reflectance when the longitudinal axis L of the container 10 is tipped relative to the observer. This can give the visual impression of a heavy faceted glass or crystal container yet have the weight of light plastic container.

Similarly, the facet exterior surfaces 150 of the plurality of facets 100 can be positioned convexly relative to the longitudinal axis L in a direction about the longitudinal axis L. That is, the plurality of facets 100 can be positioned to at least partially wrap around, or even entirely wrap around, the longitudinal axis L of the container 10 at a particular height of the container along the longitudinal axis L. By arranging the plurality of facets 100 in this manner, the container 10 can have the impression of a sparkly luster when the container 10 is rotated about the longitudinal axis L or when the consumer walks past the container 10 and is progressively exposed to different portions of the peripheral wall 50 as she walks to, in front of, and past the container presented on a shelf in a store.

The convex arrangement of the plurality of facets 100 relative to the longitudinal axis can be up and down the container 10, around the container 10, or both up and down and around the container 10, for example in a helical or spiral arrangement.

Another way of describing the facets 100 forming the faceted region 90 is that the facet exterior surfaces 150 of the facets 100 are divergent from one another. That is, the normal direction away from the facet exterior surface 150 of each of the facets 100 forming the faceted region can be unique for each facet 100. The normal direction away from the facet exterior surface 150 of each facet 100 can be divergent from the normal direction away from the facet exterior surface 150 each adjacent facet 100. Such an arrangement can provide for flashes of reflection with changes in the viewing angle of the faceted region 90.

The facets 100 can have a variety of different shapes. All of the facets 100 on the container 10 can have a substantially similar shape. As the shape of the container 10 can be a function of location along the longitudinal axis L, the facets 100 can be scaled to fit such shape. Optionally, the shape of the facets 100 can be transformed such that the shape of each of the facets 100 is common with each of the other facets 100 when the surface of the peripheral wall 50 is transformed to have a common dimensional scale throughout the peripheral wall 50. Such an arrangement is illustrated in Fig. 1. As shown in Fig. 1, the number of facets 100 around the peripheral wall 50 is the same at all locations along the longitudinal axis L below the waist 20.

The size of the facets at a particular height on the container 10 can be a function of the perimeter of the container 10 which can be in turn a function of the location along the longitudinal axis L. The size of the facets 100 can decrease with decreasing perimeter.

A variety of shapes are suitable for the facets 100. For example, the facets 100 can have a substantially rhomboidal shape, as shown in Fig. 5. As shown in Figs. 5 and 6, each of the facets 100 can have a centroid 160.

The centroid 160 of adjacent facets 100 can be aligned with one another on the peripheral wall exterior surface 170 of the container 10 at positions along the longitudinal axis L, as shown in Figs. 1 and 4. Similarly, the centroids 160 of adjacent facets 100 can be aligned with one another on the peripheral wall exterior surface 170 of the container 10 at positions about the longitudinal axis L, as shown in Figs. 1, 5, 7, 8, and 9.

The facets 100 can have a shape selected from the group consisting of substantially polygonal, substantially triangular, substantially quadrilateral, substantially rhomboidal, substantially hexagonal, and combinations thereof. A faceted region 90 can comprise facets 100 having a plurality of shapes, by way of non-limiting example, as shown in Fig. 8.

Each of the adjacent facets 100 can have a facet exterior surface area 102 that is within about 20% of one another. For each facet 100, the facet exterior surface area 102 is the area of the facet exterior surface 150 of the facet 100. Each of the adjacent facets 100 can have substantially the same shape. The facet exterior surface area 102 of each facet 100 forming the plurality of facets 100 can be less than about 10% of the surface area of the peripheral wall exterior surface 170 of the container 10. The facet exterior surface area 102 of each facet 100 forming the plurality of facets 100 can be between about 0.001 % and about 10% of the surface area of the peripheral wall exterior surface 170 of the container 10. The facet exterior surface area 102 of each facet 100 forming the plurality of facets 100 can be less than about 5% of the surface area of the peripheral wall exterior surface 170 of the container 10. The facet exterior surface area 102 of each facet 100 forming the plurality of facets 100 can be between about 0.001 % and about 5% of the surface area of the peripheral wall exterior surface 170 of the container

10. The facet exterior surface area 102 of each facet 100 forming the plurality of facets 100 can be less than about 3% of the surface area of the peripheral wall exterior surface 170 of the container 10. The facet exterior surface area 102 of each facet 100 forming the plurality of facets 100 can be between about 0.001 % and about 3% of the surface area of the peripheral wall exterior surface 170 of the container 10. The facet exterior surface area 102 of each facet 100 forming the plurality of facets 100 can be less than about 2% of the surface area of the peripheral wall exterior surface 170 of the container 10. The facet exterior surface area 102 of each facet 100 forming the plurality of facets 100 can be between about 0.001 % and about 2% of the surface area of the peripheral wall exterior surface 170 of the container 10. The facet exterior surface area 102 of each facet 100 forming the plurality of facets 100 can be less than about 1% of the surface area of the peripheral wall exterior surface 170 of the container 10. The facet exterior surface area 102 of each facet 100 forming the plurality of facets 100 can be between about 0.001 % and about 1% of the surface area of the peripheral wall exterior surface 170 of the container 10. Without being bound by theory, it is thought that if smaller facets 100 are used, more facets 100 can be provided on the peripheral wall exterior surface 170 of the container 10 which can provide for more flashes of reflectance as incident light is reflected off of the facets 100.

The facets 100 can be substantially flat. The facets 100 can be flat. The flatter the facets 100 the more reflective the facets 100. Substantially flat surfaces are thought to provide for enhanced luster to the faceted region 100. Individual facets 100 can have a radius of curvature of the principal curvatures at the centroid of the facet 100 greater than about 60 mm. Individual facets 100 can have a radius of curvature of the principal curvatures at the centroid of the facet 100 greater than about 70 mm.

Individual facets 100 can have a radius of curvature of the principal curvatures at the centroid of the facet 100 greater than about 90 mm. Individual facets 100 can have a radius of curvature of the principal curvatures at the centroid of the facet 100 greater than about 130 mm. Without being bound by theory, such facets 100 are thought to be flat enough so as to be sufficiently reflective to provide for the desired luster.

The facets 100 forming the faceted region 100 can have a Gaussian curvature between about -0.04 and about 0.04. The facets 100 forming the faceted region 100 can have a Gaussian curvature between about -0.01 and about 0.01. The Gaussian curvature of a facet 100 is the product of the principal curvatures of the facet 100.

To provide for enhanced flashes of reflectance from incident light reflecting off of the container 10, the peripheral wall 50 in the faceted region 90 can comprise an outer skin layer 190. The outer skin layer 190 can be a sleeve 200 disposed about the peripheral wall 50 of the

container, as shown in Fig. 10. The outer skin layer 190 can be provided, by way of non-limiting example, to the container after the container 10 is blow molded or during blow molding of the container 10. For example, the sleeve 200 can be a shrink sleeve that is heat shrunk around the finished container 10. Alternatively, the sleeve 200 can be stretch sleeve into which a pre-form
5 or parison is blown to stretch the stretch sleeve to form the finished container 10.

The outer skin layer 190 can be a bounded label 210, as shown in Fig. 11. A bounded label 190 is a label forming part of the container 10 that only partially extends about the longitudinal axis L. The bounded label 190 can be selected from the group consisting of a heat transfer label, an in-mold label, and an adhesive label.

10 The outer skin layer 190 can be selected from the group consisting of an in-mold label, an adhesive label, a heat transfer label, a stretch sleeve label, wet glue label, and a shrink sleeve label

To enhance the reflective properties of the facets, the outer skin layer 190 can be selected from the group consisting of a biaxially oriented polystyrene, polyethylene terephthalate, and
15 glycol modified polyethylene terephthalate. The outer skin layer 190 can be printed. The outer skin layer 190 can be reverse printed. The outer skin layer 190 can be a metallic ink printed outer skin layer 190. The printing can be a metallic ink or pearlescent ink. A metallic foil can be included in a laminate comprising the outer skin layer 190. A metallic ink comprises small particles of metal, such as aluminum, bronze, copper, zinc, or other metallic element. The labels
20 can be printed by digital printing, flexographic printing, gravure printing, or other suitable printing technology. An outer skin layer 190 that is a metallic ink printed outer skin layer 190 can provide for a reflective surface that that generates more intense perceived flashes of reflectance.

A polyethylene terphthalate, polyethylene terephthalate glycol, or oriented polystyrene
25 label may be used. This method of printing puts the reflective surface on the outside of the package. This can be enhanced by using metallic ink (ink mixed with small particles of aluminum, bronze, copper, zinc, or other elements), pearlescent ink, and metallic foils.

To provide for structural stability of the container 10 above the waist 20, the peripheral wall 50 above the waist 20 the waist 20 can be free from or substantially free from facets 100.
30 The lack of facets 100 above the waist 20 is thought to provide for improved resistance to buckling of the container as compared to container 10 that is not free from or substantially free from facets 100 above the waist 20.

The container 10 can have a local aspect ratio between about 1.3 and about 5 mid-way along the longitudinal axis L, for example as shown in Fig. 12 which is a cross-section of a
35 container 10 taken orthogonal to the longitudinal axis L. Such a local aspect ratio can provide for

a container 10 that has a broad dimension that can be suitable as a primary label face 501 of the container 10. The primary label face 501 of the container can contain the brand name of the product contained within the container 10 in a large enough font so as to be readable by an observer at a distance of between about 0.1 m and about 2 m under typical lighting conditions that occur in a retail environment. The primary label face 501 of the container 10 can be generally in line with a local major axis 201 of the container 10, recognizing that the primary label face 501 may be a curved surface. Optionally, the container 10 can have a local aspect ratio between about 1.4 and about 5 mid-way along the longitudinal axis L. Optionally, the container 10 can have a local aspect ratio greater between about 1.5 and about 5 mid-way along the longitudinal axis L. Optionally, the container 10 can have a local aspect ratio between about 1.7 and about 5 mid-way along the longitudinal axis L. Optionally, the container 10 can have a local aspect ratio between about 2 and about 5 mid-way along the longitudinal axis L.

Without being bound by theory, it is thought that containers 10 having a faceted region 90 can be practical for attracting the attention of consumers from a distance of between about 0.1 m and about 2 m. However, since the faceted region 90 has a plurality of facets 100, each of which reflect in divergent direction, labeling on the container 10 can be difficult for an observer to read at a close distance, such as within about 2 m of the container 10. A container 10 having a local aspect ratio greater than about 1.3 mid-way along the longitudinal axis L can provide for a less rounded portion of the container 10 that can be labeled with brand identifying information. A faceted region 90 provided on such a container can balance the desire to provide for a container 10 having a luster when viewed from a distance yet be legibly labeled on a primary label face 501 of the container 10.

As the consumer approaches the container 10 when walking along an aisle, different portions of the container 10 will be visible depending on her position relative to the container. For instance, if the primary label face 501 is facing the front of the shelf, the consumer will first be exposed to a portion of the side of the container 10 after which she will be exposed to the front of the container 10. The sharper curved surfaces of the container 10 can provide more luster as compared to the less curved surfaces of the container 10 since the surfaces of the individual facets 100 are more divergent for the former as compared to the latter. Facets 100 provided on the primary label face 501 still can provide for luster yet branding information provided in that location can also be readable by the observer from a distance within 2 m under normal lighting conditions.

Along more than about 20% of the longitudinal axis L the container 10 can have a local aspect ratio greater than about 1.3. Along more than about 20% of the longitudinal axis L the container 10 can have a local aspect ratio greater than about 1.5. Along more than about 40% of

the longitudinal axis L the container 10 can have a local aspect ratio greater than about 1.3. Along more than about 40% of the longitudinal axis L the container 10 can have a local aspect ratio greater than about 1.5. Along between about 20% and 95% of the longitudinal axis L the container 10 can have a local aspect ratio greater than about 1.3. Along between about 40% and 5 95% of the longitudinal axis L the container 10 can have a local aspect ratio greater than about 1.3. Along between about 60% and 95% of the longitudinal axis L the container 10 can have a local aspect ratio greater than about 1.3. Along between about 80% and 95% of the longitudinal axis L the container 10 can have a local aspect ratio greater than about 1.3.

The container 10 can further comprise a plug seal closure 62 operatively engaged with the 10 open end 60, as shown in Fig. 13. Together, the container 10 and plug seal closure can provide for an enclosed package 64 that does not leak the contents of the package 64 under stresses that are anticipated to occur during the manufacture, storage, distribution, sale, and use of the package and/or contents of the package 64. The plug seal closure 62 can be a closure that is threaded onto the open end 60 of the container 10 for fit into or over the open end 60 of the container. The 15 open end 60 of the container 10 can be calibrated. For instance the open end 60 of the container 10 can have dimensional tolerance less than about 2% of the diameter of the open end 60.

A plurality of containers 10 can be contained within a carton 600, as shown in Fig. 14. The carton 600 can comprise paper. The carton 600 can comprise corrugated paper. The carton 600 can have an interior height dimension H. The container 10 can be sized and dimensioned to 20 fit upright within the carton 600. The container 10 and plug seal closure 62 can be sized and dimensioned to fit upright within the carton 600. The container 10 can have a container height 11 that is the distance between the open end 60 and closed 30. The container height 11 can be less than or equal to the interior height dimension H of the carton 600. The interior height dimension H can be less than about 5 mm greater than the container height 11. A plurality of 25 cartons 600 containing containers 10 as described herein can be stacked on top of one another. The containers 10 as described herein can have adequate top load strength so that the containers 10 in a carton 600 underneath another carton 600 containing containers 10 do not buckle under the stress applied from above.

The dimensions and values disclosed herein are not to be understood as being strictly 30 limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as “40 mm” is intended to mean “about 40 mm.”

Every document cited herein, including any cross referenced or related patent or 35 application, is hereby incorporated herein by reference in its entirety unless expressly excluded

or otherwise limited. The citation of any document is not an admission that it is prior art with respect to any invention disclosed or claimed herein or that it alone, or in any combination with any other reference or references, teaches, suggests or discloses any such invention. Further, to the extent that any meaning or definition of a term in this document conflicts with any meaning
5 or definition of the same term in a document incorporated by reference, the meaning or definition assigned to that term in this document shall govern.

While particular embodiments of the present invention have been illustrated and described, it would be obvious to those skilled in the art that various other changes and modifications can be made without departing from the spirit and scope of the invention. It is
10 therefore intended to cover in the appended claims all such changes and modifications that are within the scope of this invention.

CLAIMS

What is claimed is:

1. A container (10) comprising:
 - a closed end (30) having a closed end periphery (40); and
 - a peripheral wall (50) extending from said closed end periphery about a longitudinal axis (L) of said container to an open end (60), said closed end and said peripheral wall comprising a thermoplastic material;
 - wherein said peripheral wall defines a variable open cross-section (70) of said container in a plane orthogonal to said longitudinal axis as a function of distance from said closed end;
 - wherein said container has a waist (20) having a waist open cross-section (80) orthogonal to said longitudinal axis that is smaller than said waist open cross-section orthogonal to said longitudinal axis above and below said waist;
 - wherein said peripheral wall comprises a faceted region (90) comprising a plurality of facets (100) arranged edge to edge with one or more adjacent facets, at least a portion of said faceted region being located nearer to said closed end than to said open end;
 - wherein said peripheral wall has a peripheral wall exterior surface (170) oriented away from said longitudinal axis, said peripheral wall exterior surface having a peripheral wall exterior surface area (172);
 - wherein each of said plurality of facets has a facet exterior surface (150) oriented away from said longitudinal axis and each of said facets has a facet exterior surface area (102) that is between 0.0001% and 4% of said peripheral wall exterior surface area; and
 - wherein said peripheral wall above said waist is substantially free from said facets.
2. The container according to Claim 1, wherein said peripheral wall above said waist is free from said facets.
3. The container according to Claim 1 or Claim 2, wherein individual said facets have a radius of curvature of the principal curvatures at a centroid (160) of said facets greater than 60 mm.
4. The container according to any one of the preceding claims, wherein said peripheral wall in said faceted region comprises an outer skin layer (190).
5. The container according to Claim 4, wherein said skin layer is a label selected from the group consisting of a shrink-sleeve label, a stretch-sleeve label, an in-mold label, a heat transfer label, and an adhesive label.
6. The container according to Claim 4 or Claim 5, wherein said skin layer is a metallic ink printed shrink-sleeve label or a metallic ink printed stretch-sleeve label.

7. The container according to any one of the preceding claims, wherein said peripheral wall below said waist has a surface area, wherein said faceted region comprises between 50% and 100% of said surface area.
8. The container according to any one of the preceding claims, wherein said waist is nearer to said open end than said closed end.
9. The container according to any one of the preceding claims, wherein said container has a total volume defined by said closed end, said peripheral wall, and said open end, and a partial volume above said waist, wherein said partial volume is between 1% and 20% of said total volume.
10. The container according to any one of the preceding claims, wherein each of said adjacent facets in said faceted region have a facet exterior surface area within 20% of one another.
11. The container according to any one of the preceding claims, wherein said facet exterior surfaces of said plurality of facets are positioned convexly relative to said longitudinal axis.
12. The container according to any one of the preceding claims, wherein said facets have a shape selected from the group consisting of substantially polygonal, substantially triangular, substantially quadrilateral, substantially rhomboidal, substantially hexagonal, and combinations thereof.
13. The container according to any one of the preceding claims, wherein said waist has a waist open cross-section having an area between 5 cm^2 and 60 cm^2 .
14. The container according to any one of the preceding claims, wherein each of said facets has a centroid (160), wherein said centroids of adjacent facets are aligned with one another on said peripheral wall exterior surface at positions along said longitudinal axis L.
15. The container according to any one of the preceding claims, wherein each of said facets has a centroid (160), wherein said centroids of adjacent facets are aligned with one another on said peripheral wall exterior surface of said container at positions about said longitudinal axis L.

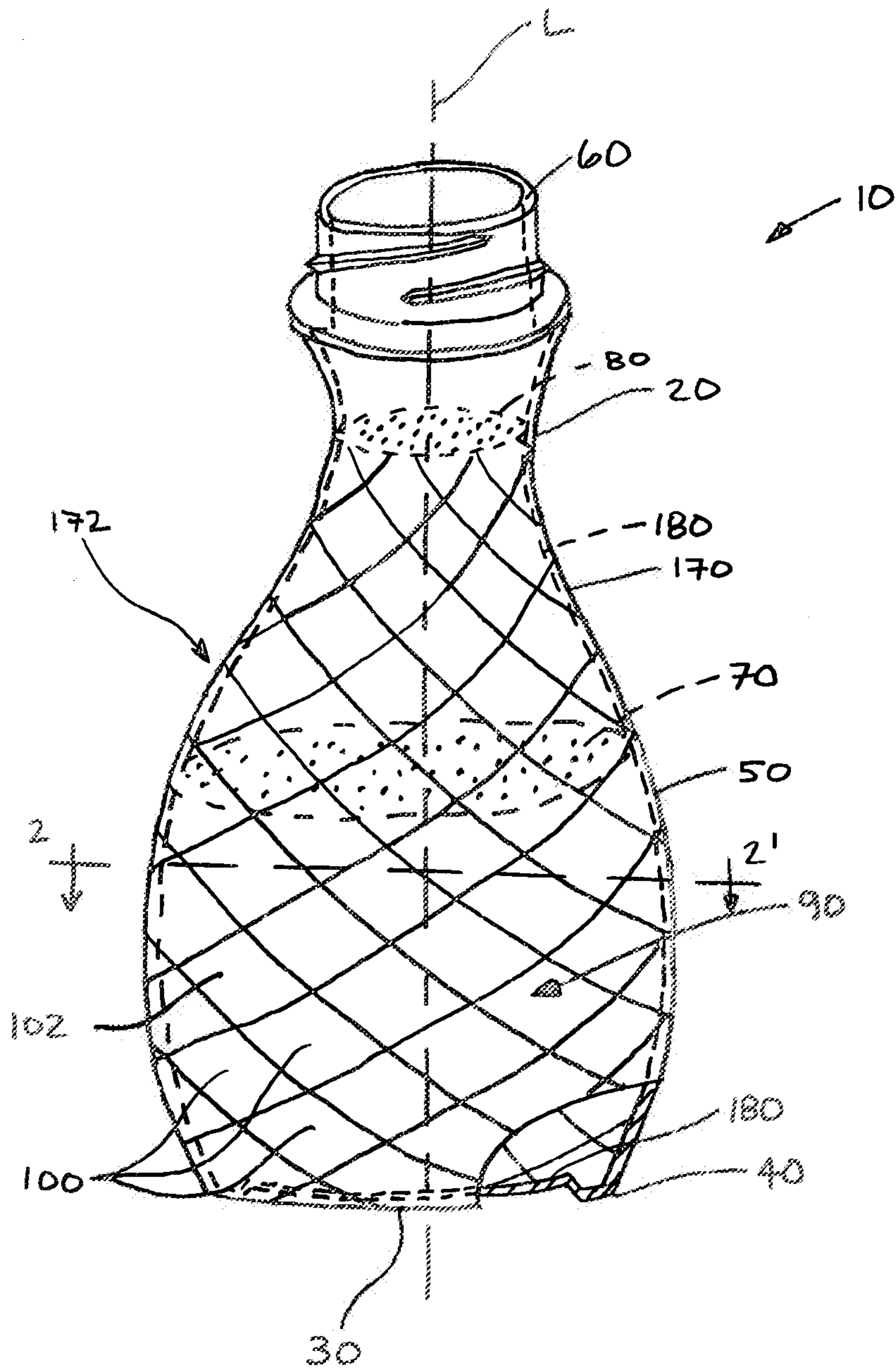
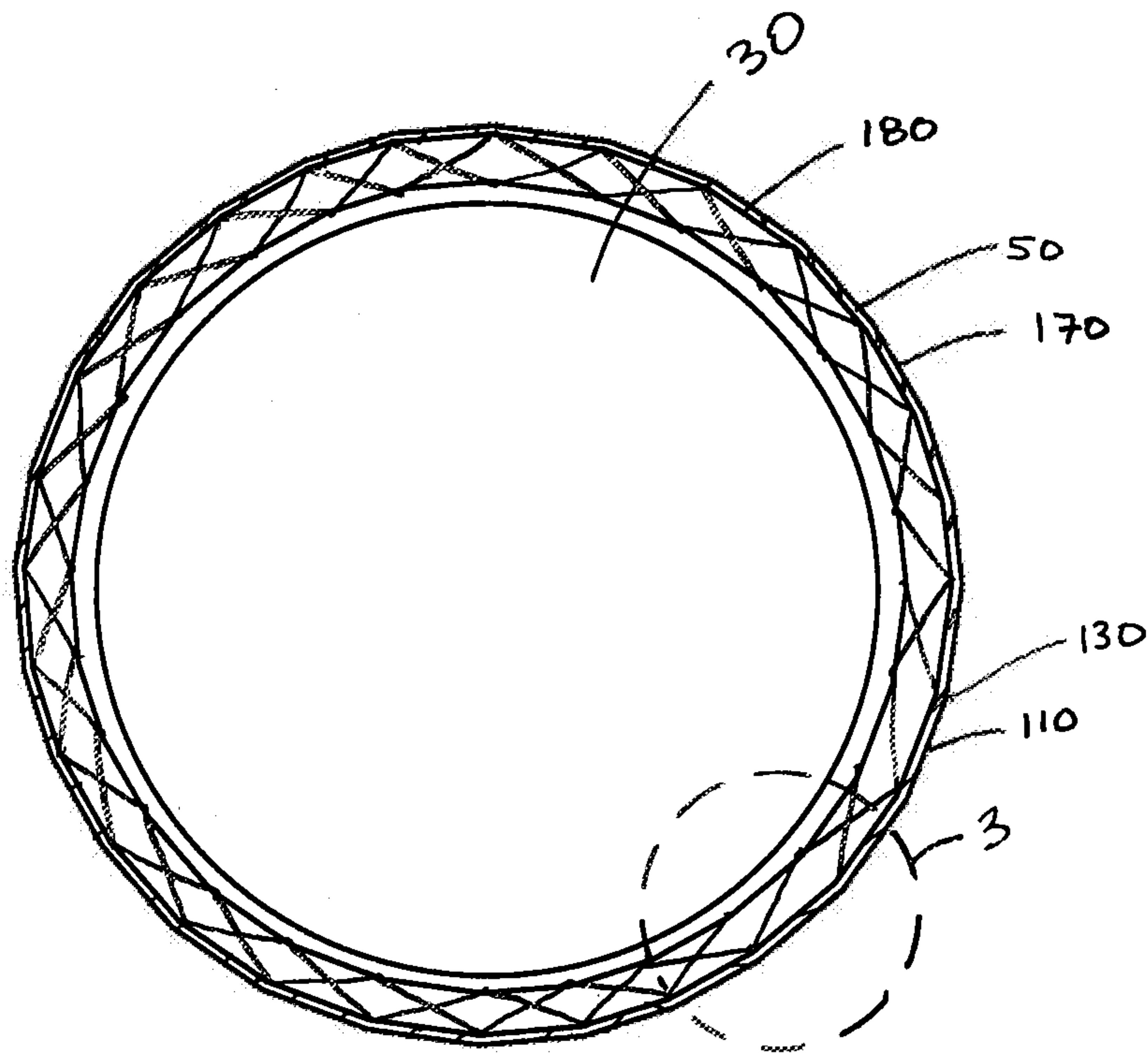


Fig. 1

*Fig. 2*

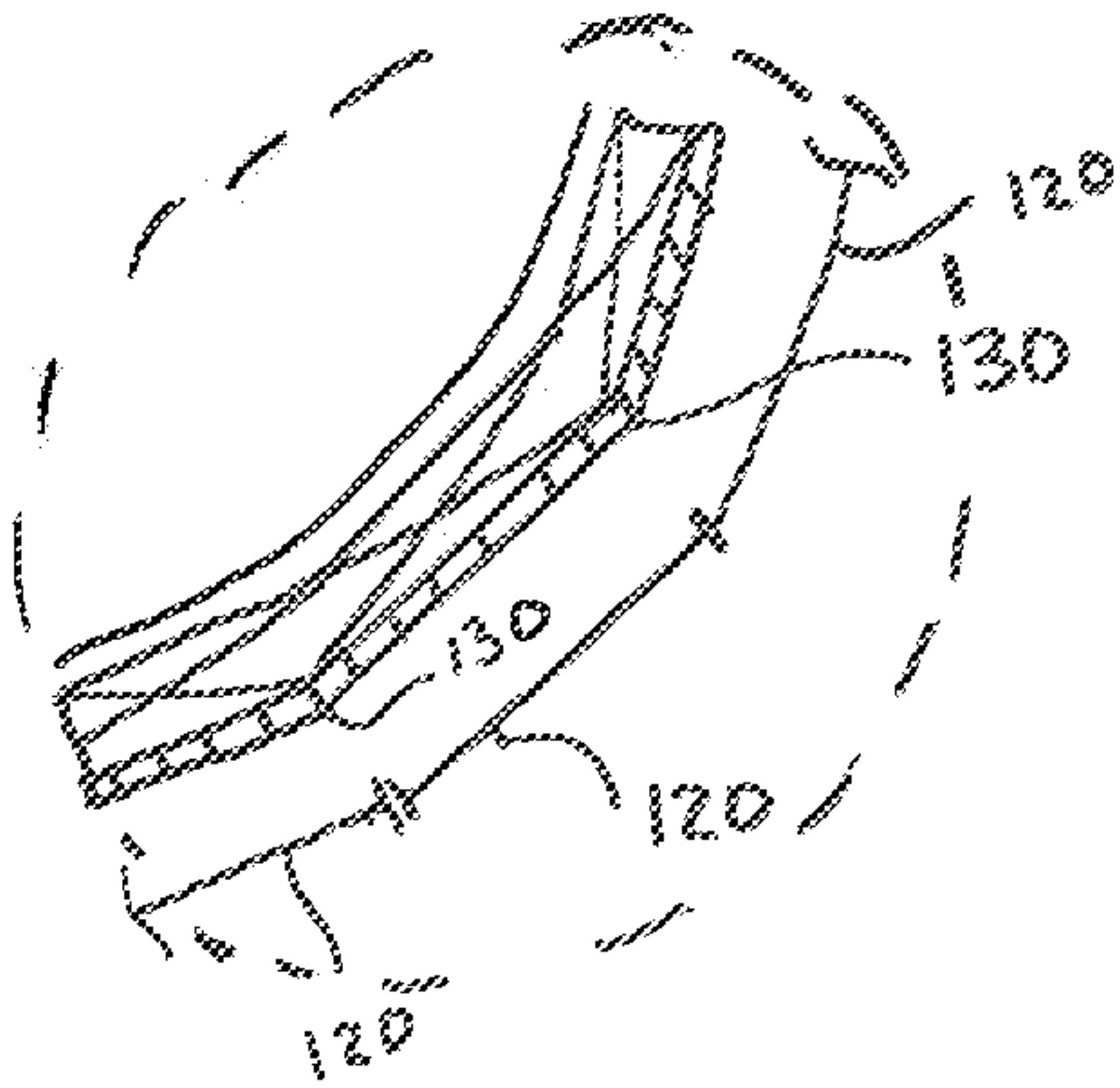


Fig. 3

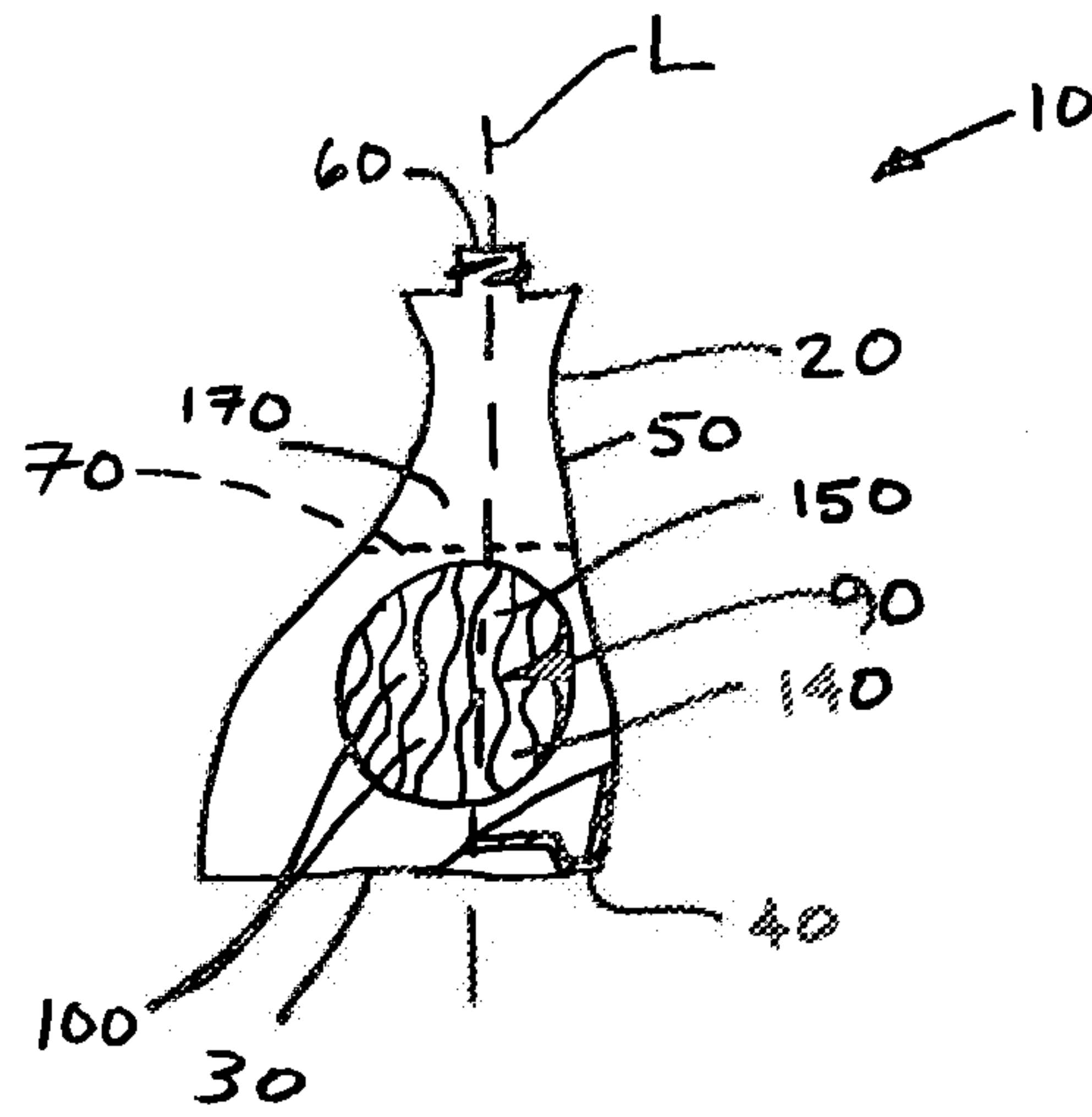
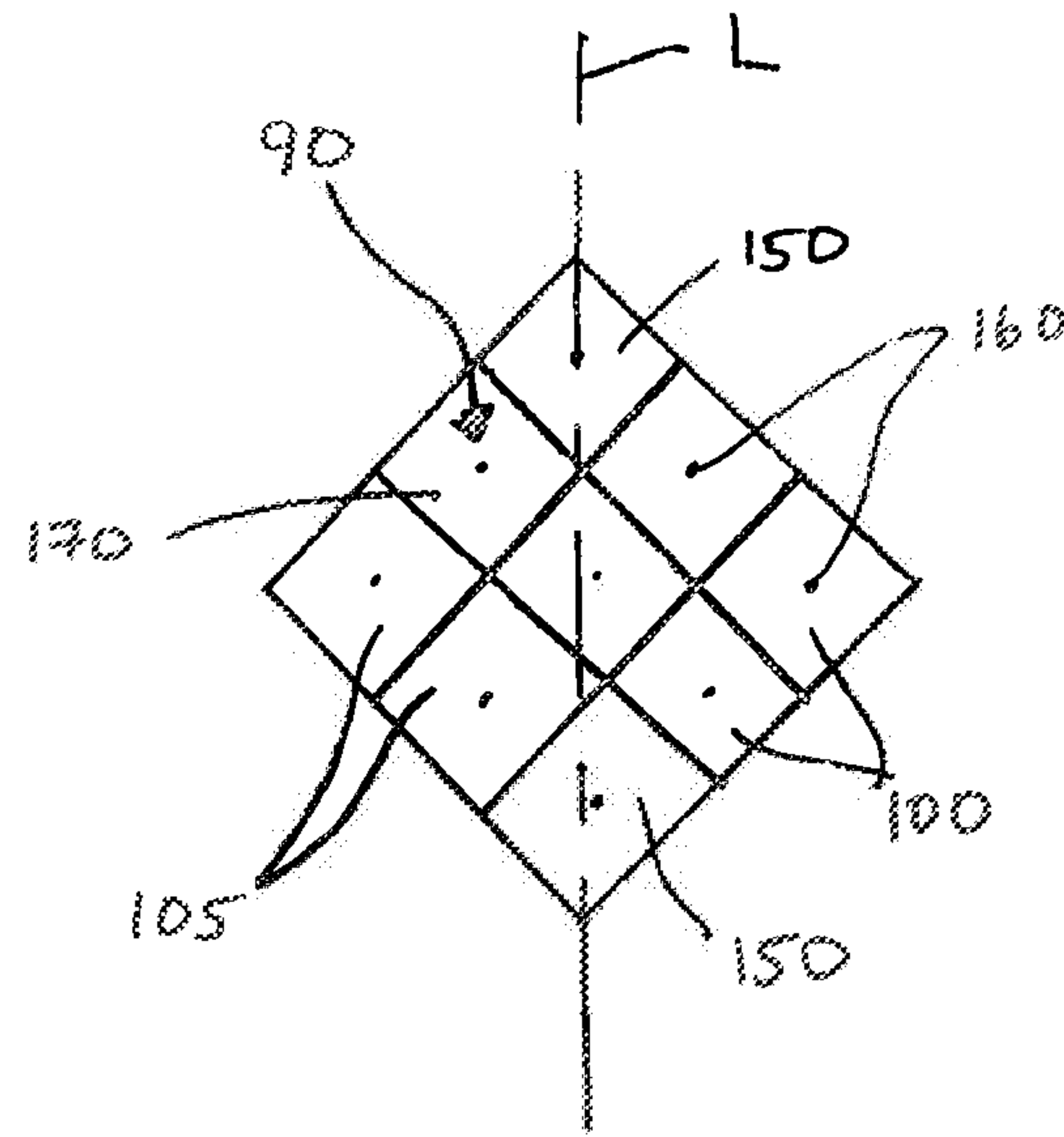


Fig. 4

*Fig. 5*

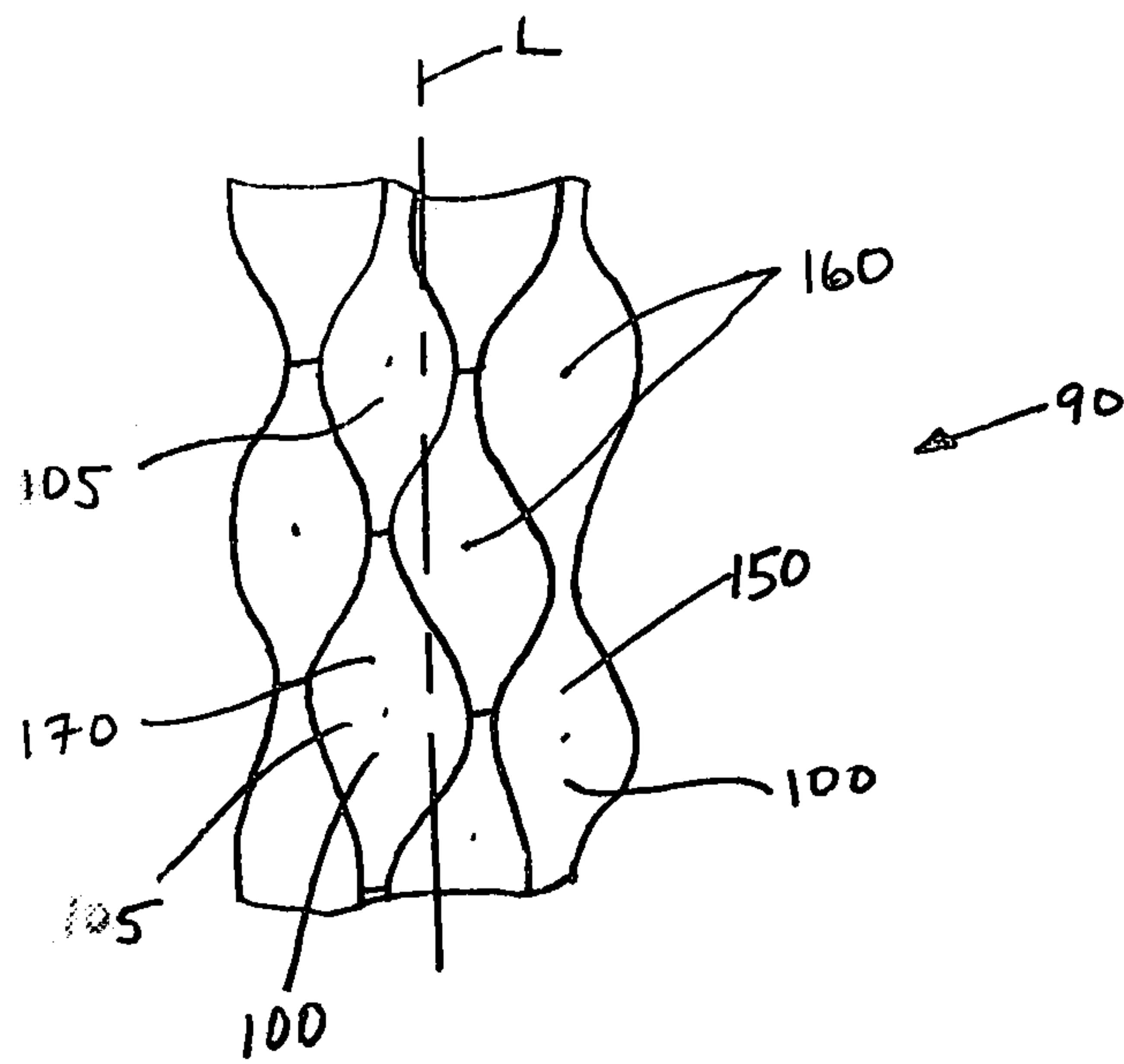


Fig. 6

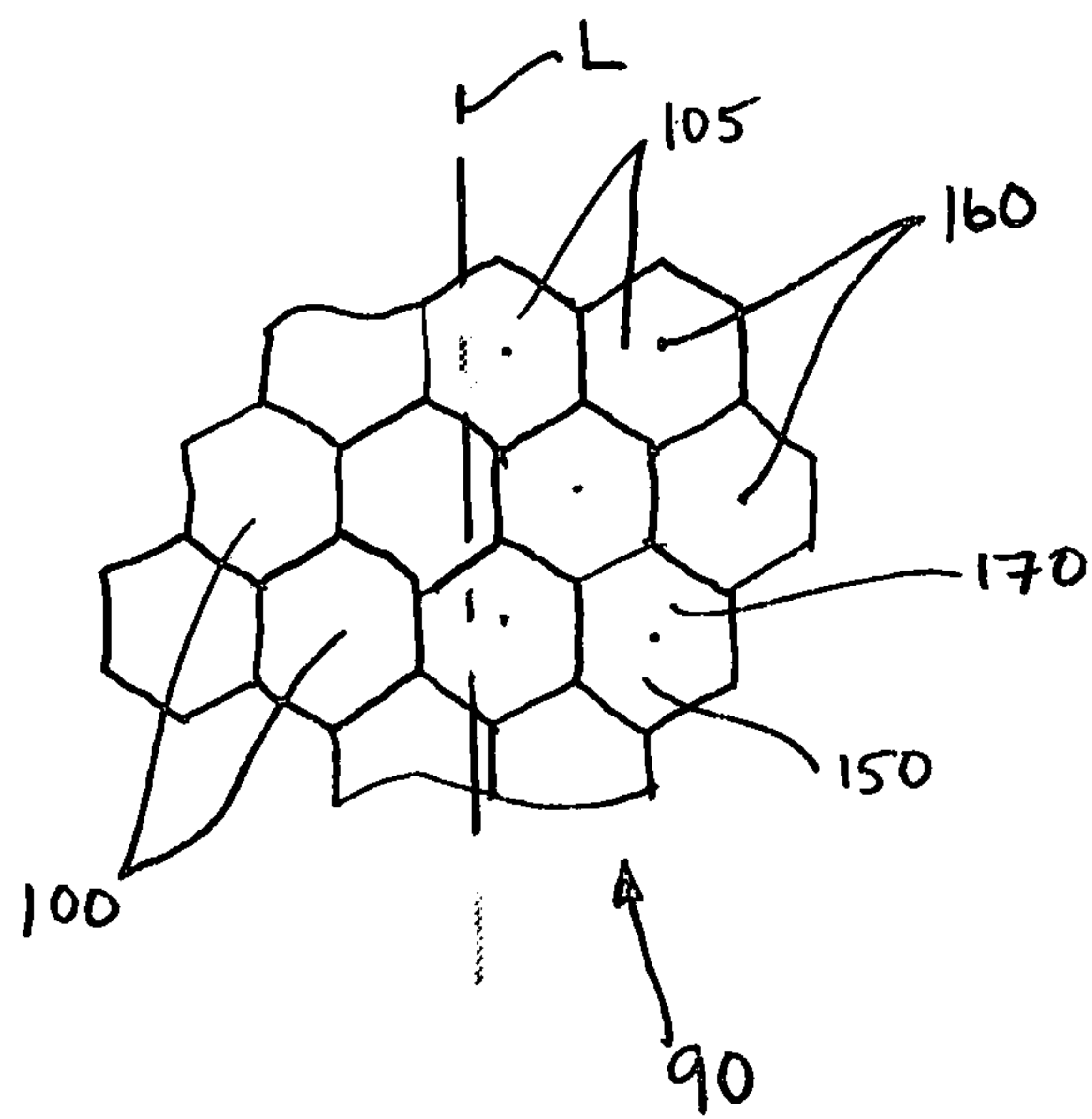


Fig. 7

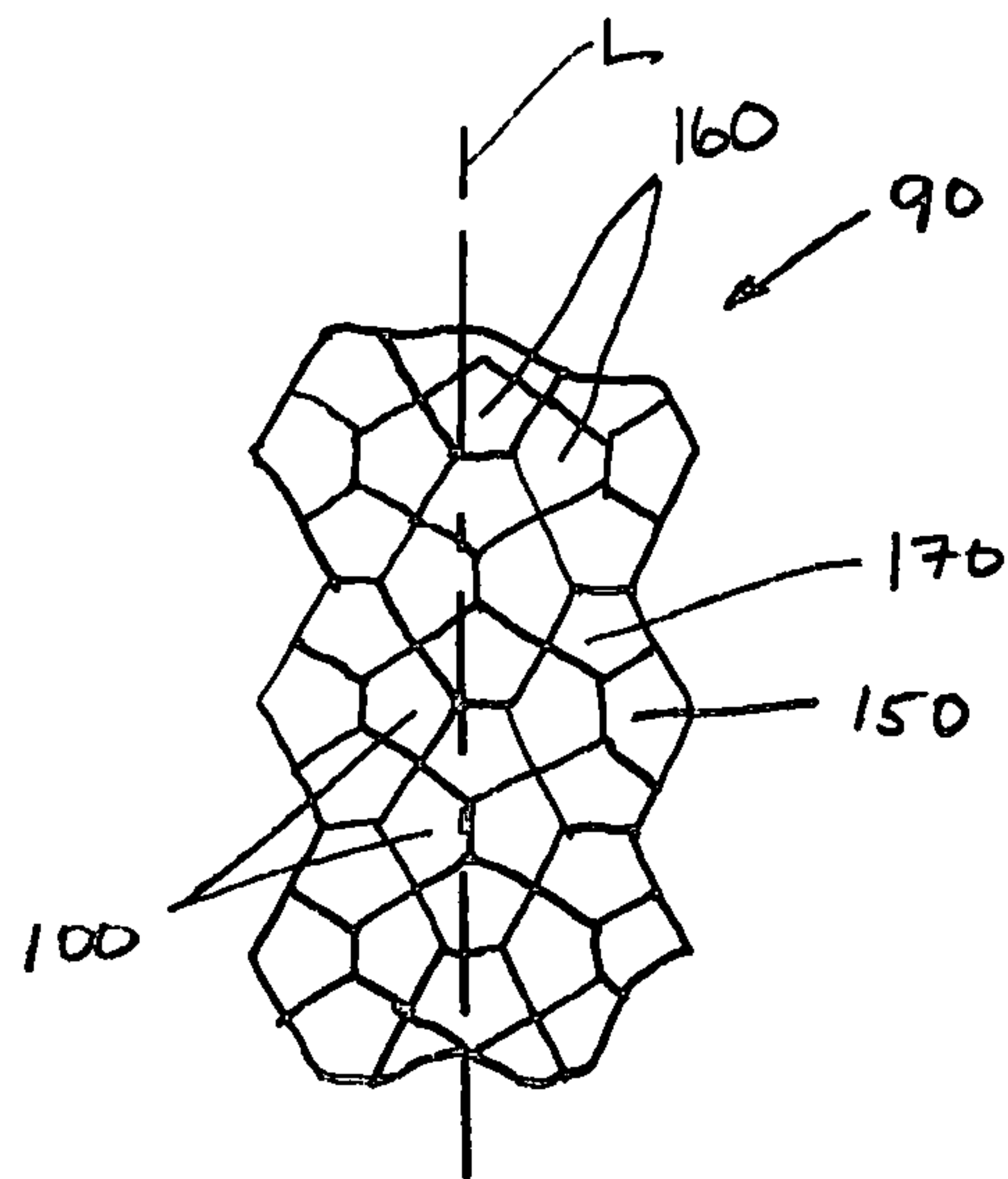


Fig. 8

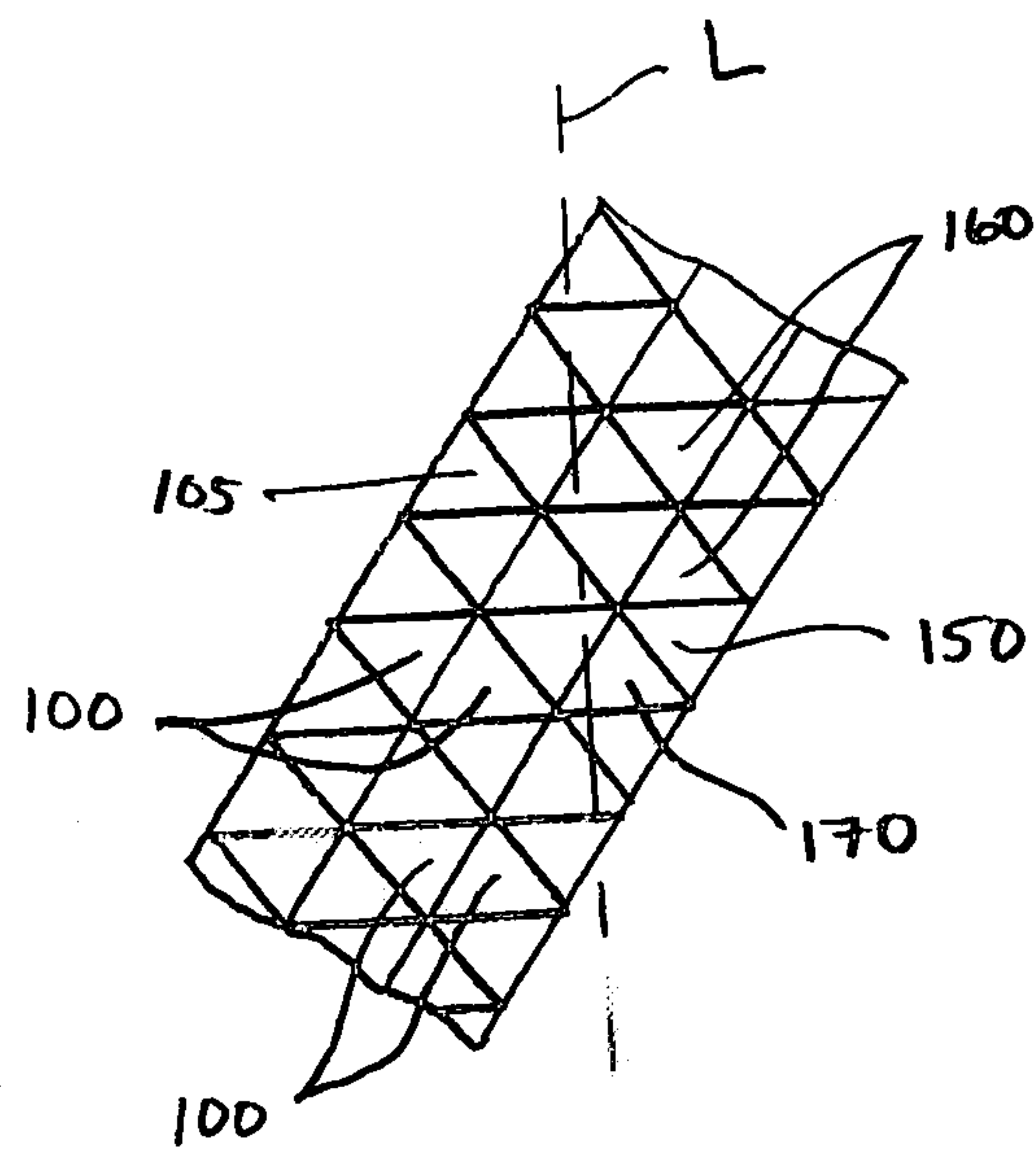


Fig. 9

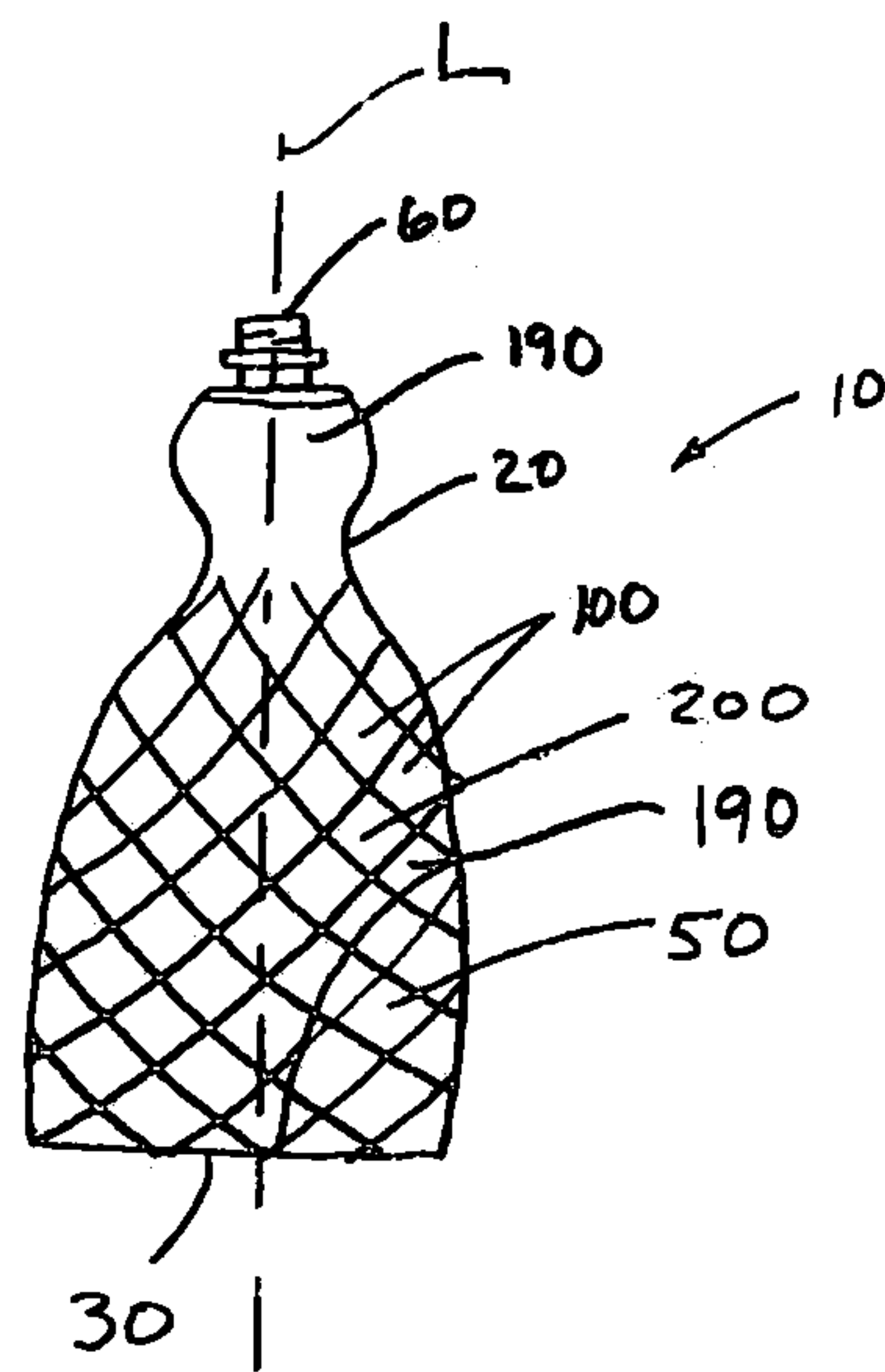


Fig. 10

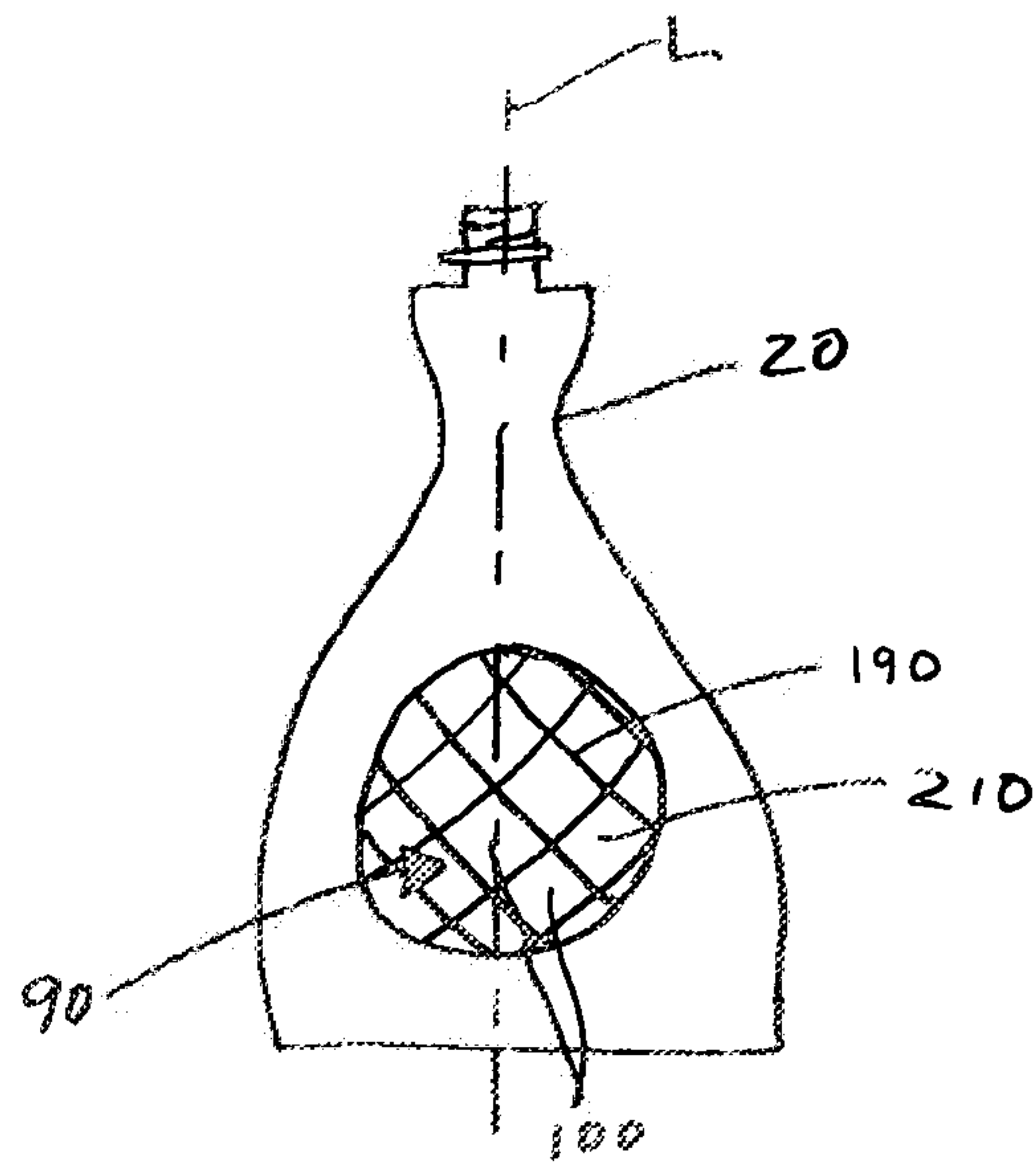


Fig. 11

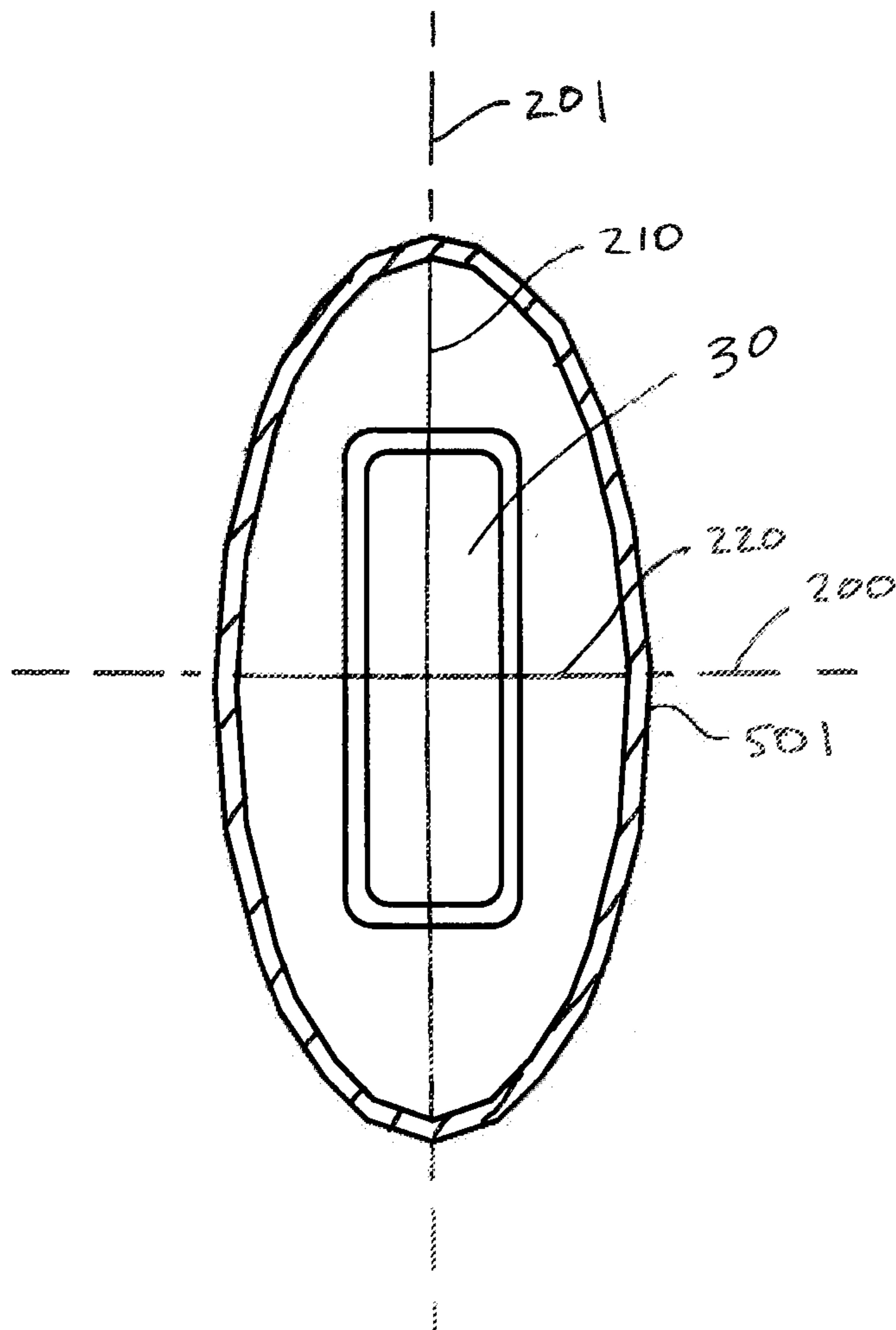


Fig. 12

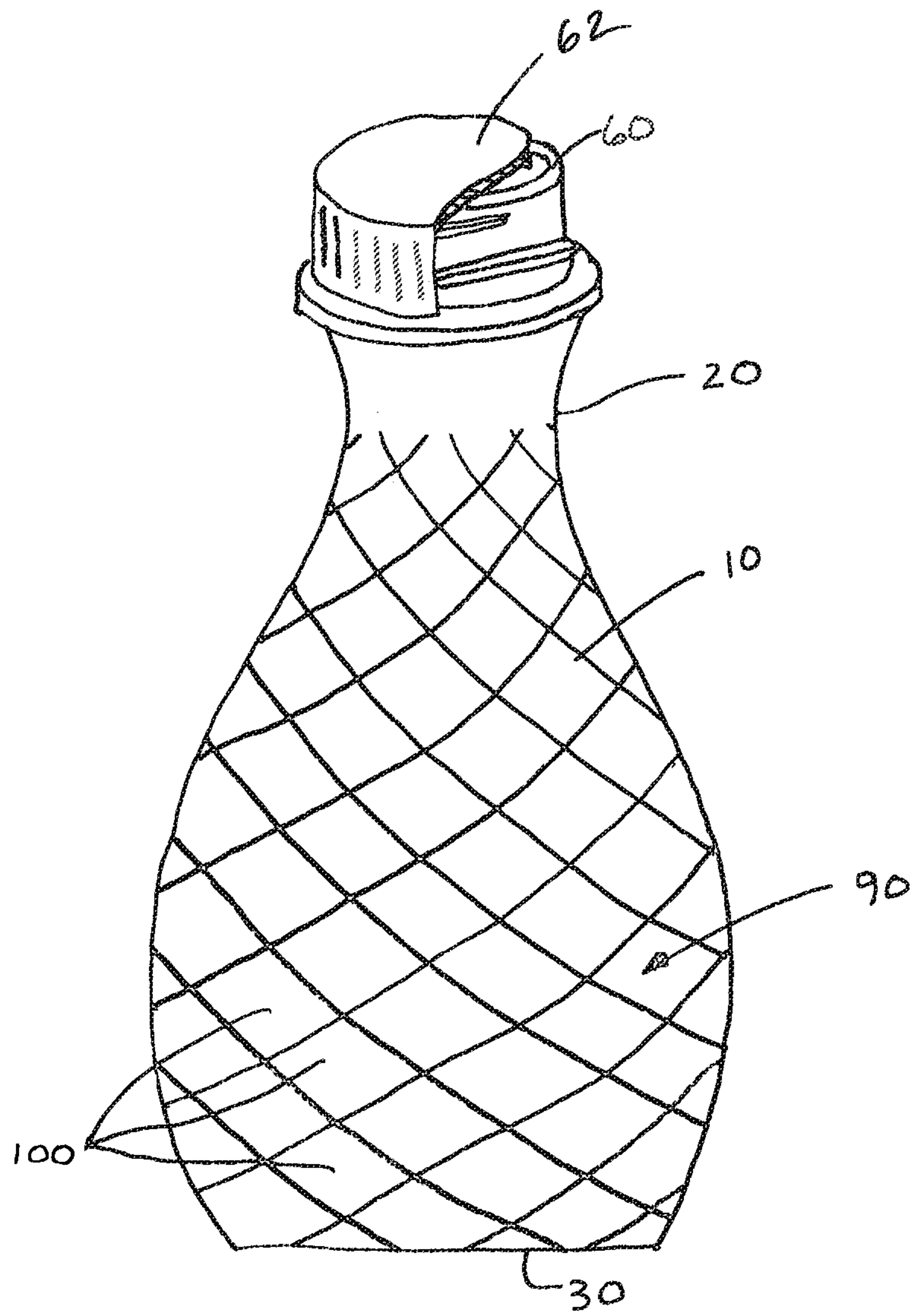


Fig. 13

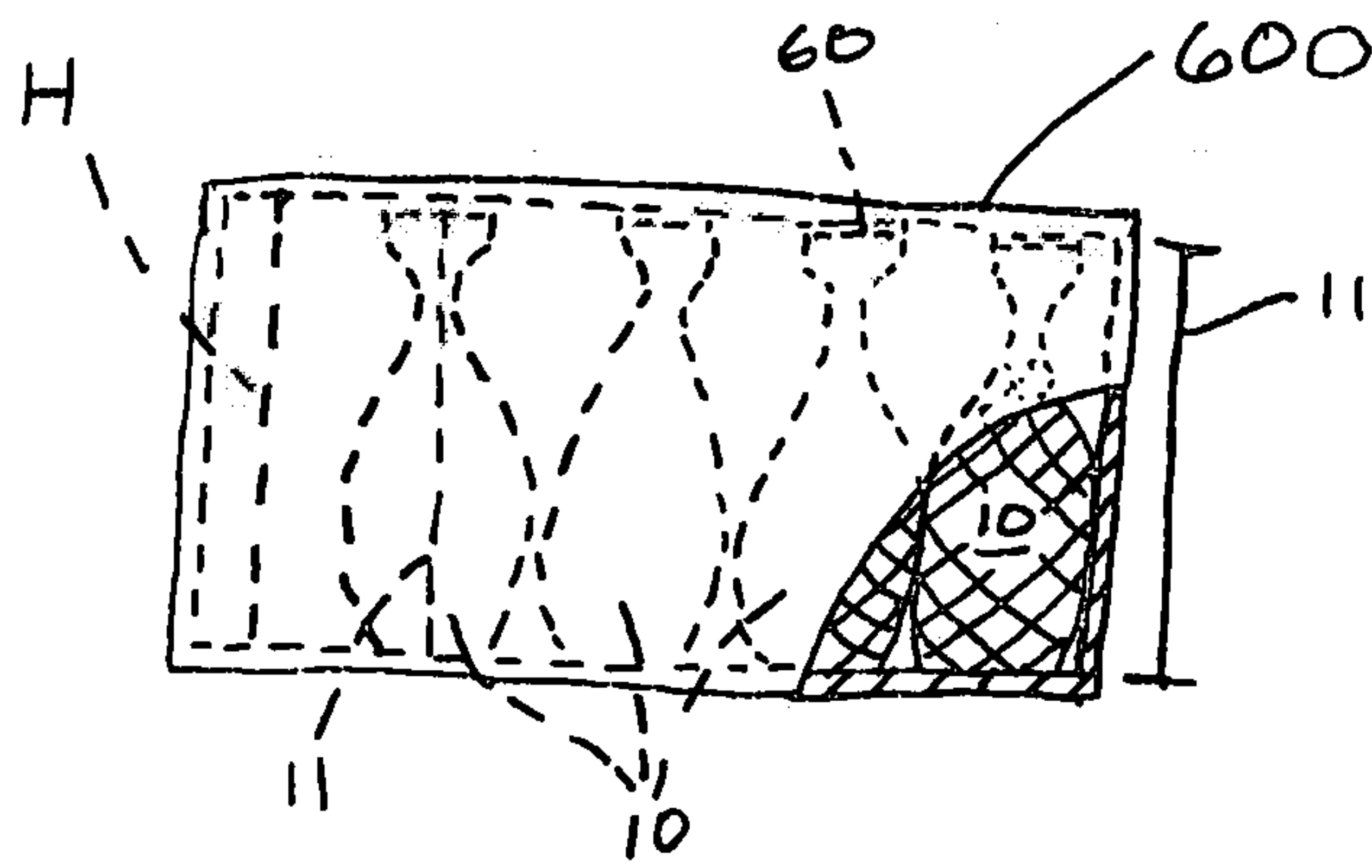


Fig. 14

