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(54) **VESSEL CLOSURE-SEALABLE POURING SPOUT ASSEMBLY**

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(57) **ABSTRACT**

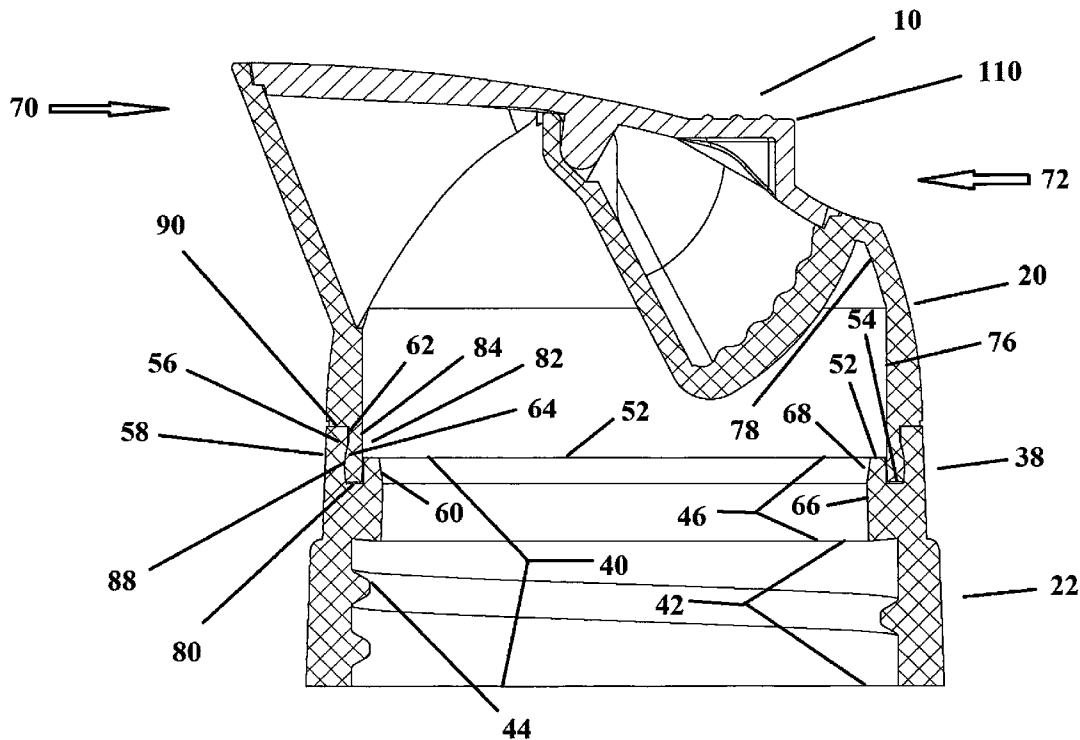
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A closure assembly for a bottle, such as a milk bottle, having a sealable pouring spout is comprised of a lower portion for attachment to the bottle and an upper portion that is rotatably fixed to the lower portion. The upper portion comprises a spout and a spout closure assembly mounted on a pivot hinge and comprising a closing member having one end for sealing the spout and an opposite end for finger pressure. A detent device operates in a working relationship with the closing member so the size of the opening can be controlled.

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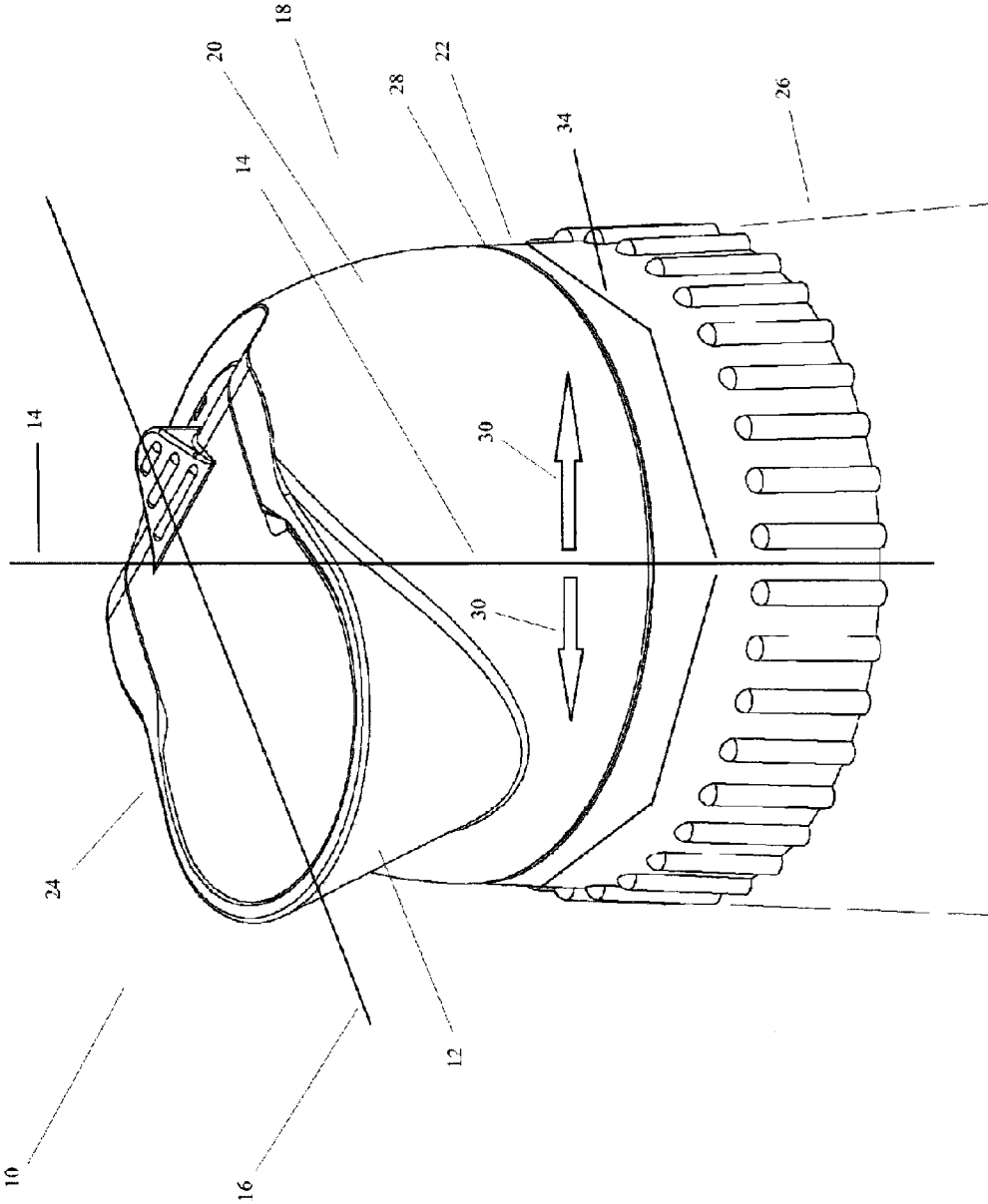
Related U.S. Application Data

(60) Provisional application No. 61/244,722, filed on Sep. 22, 2009.



SECTION A-A

FIGURE I



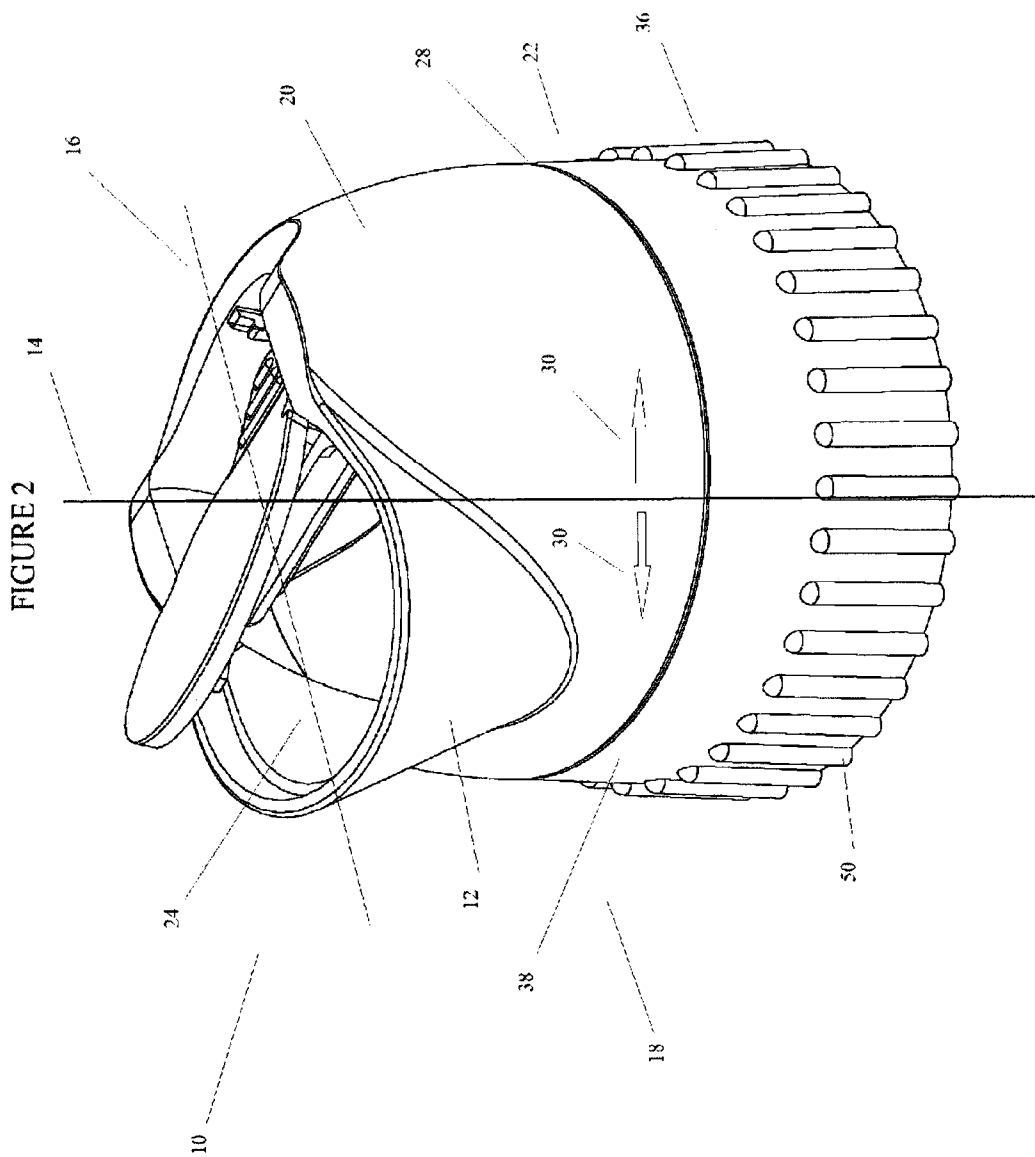
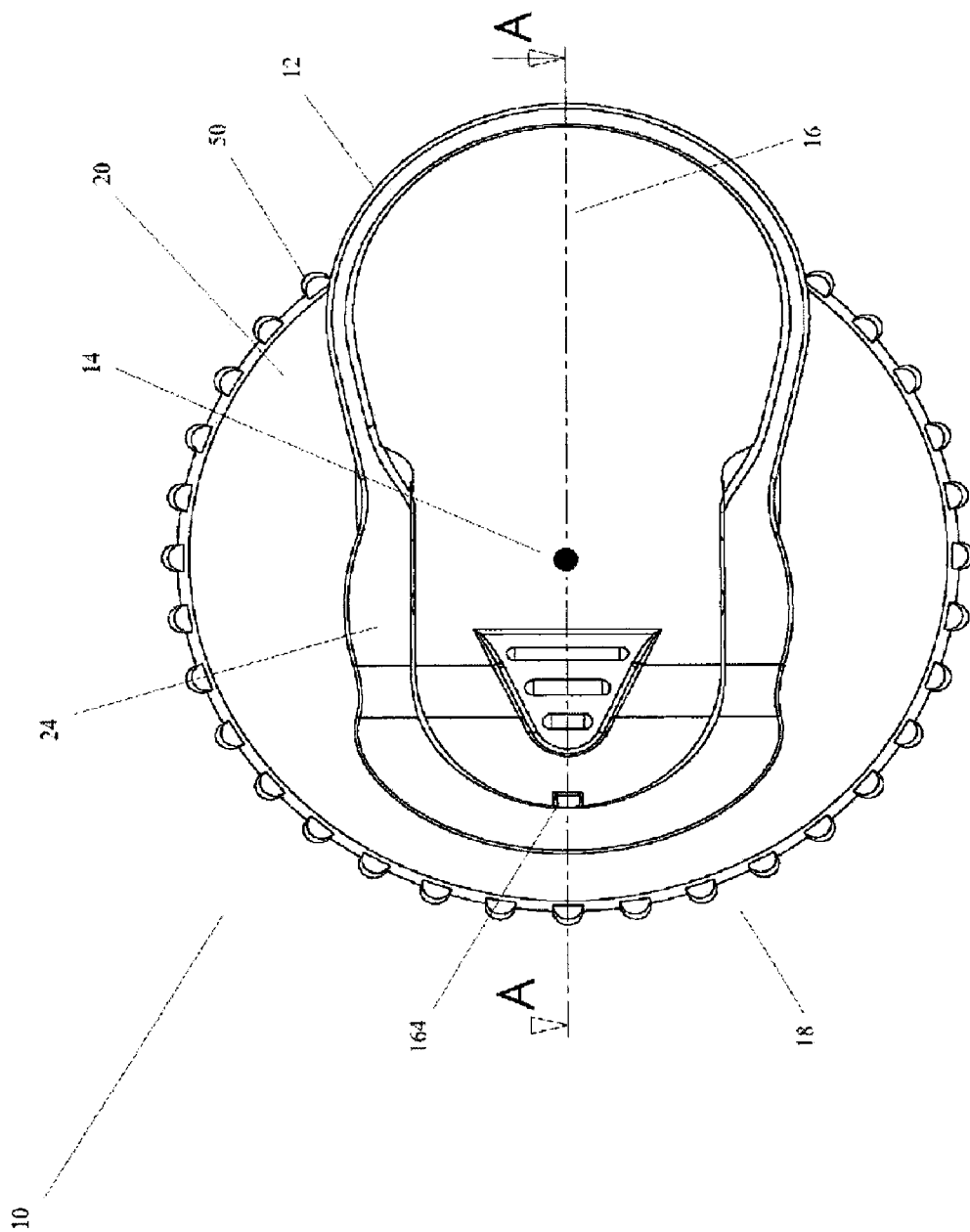


FIGURE 3



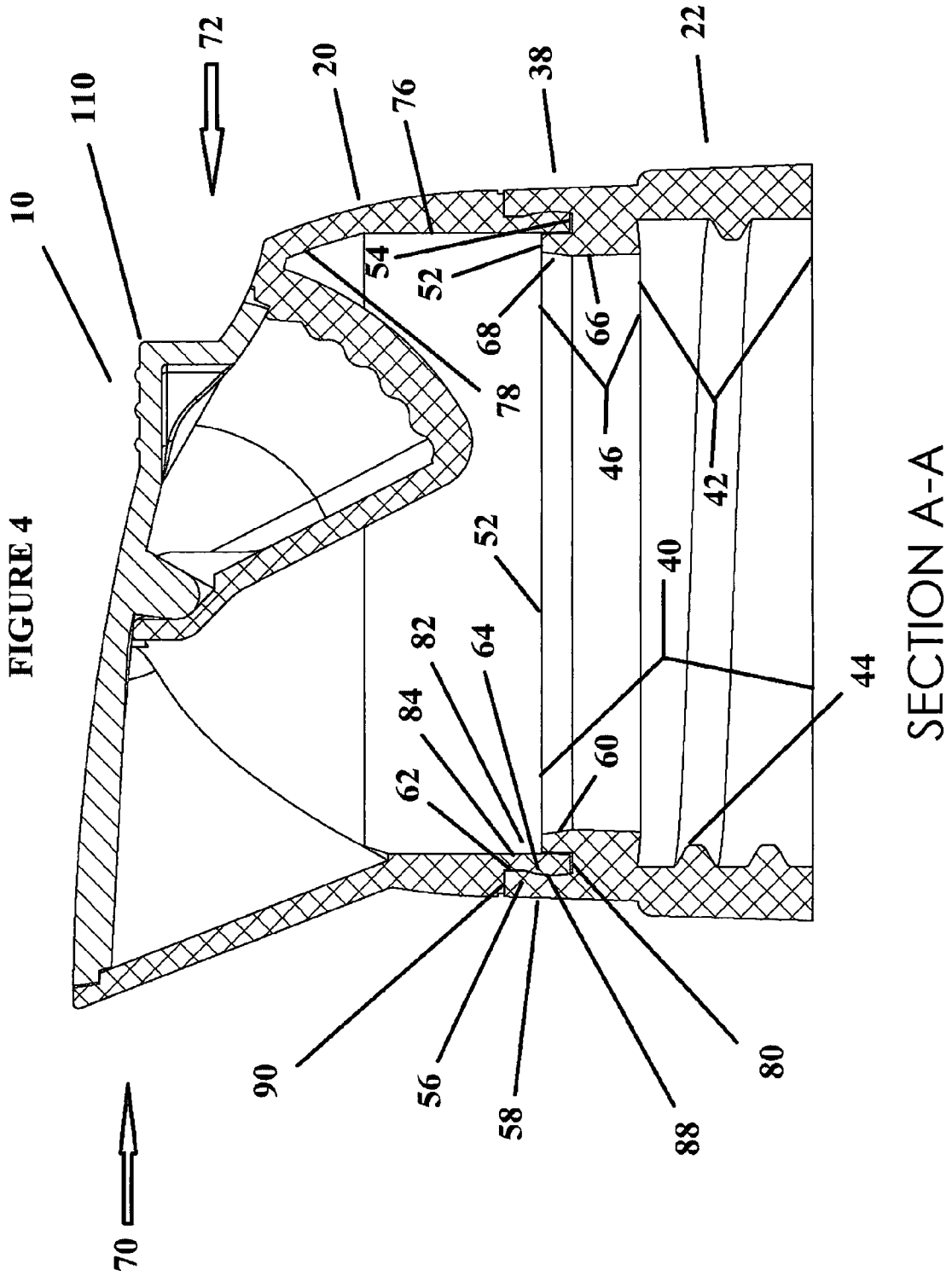


FIGURE 5

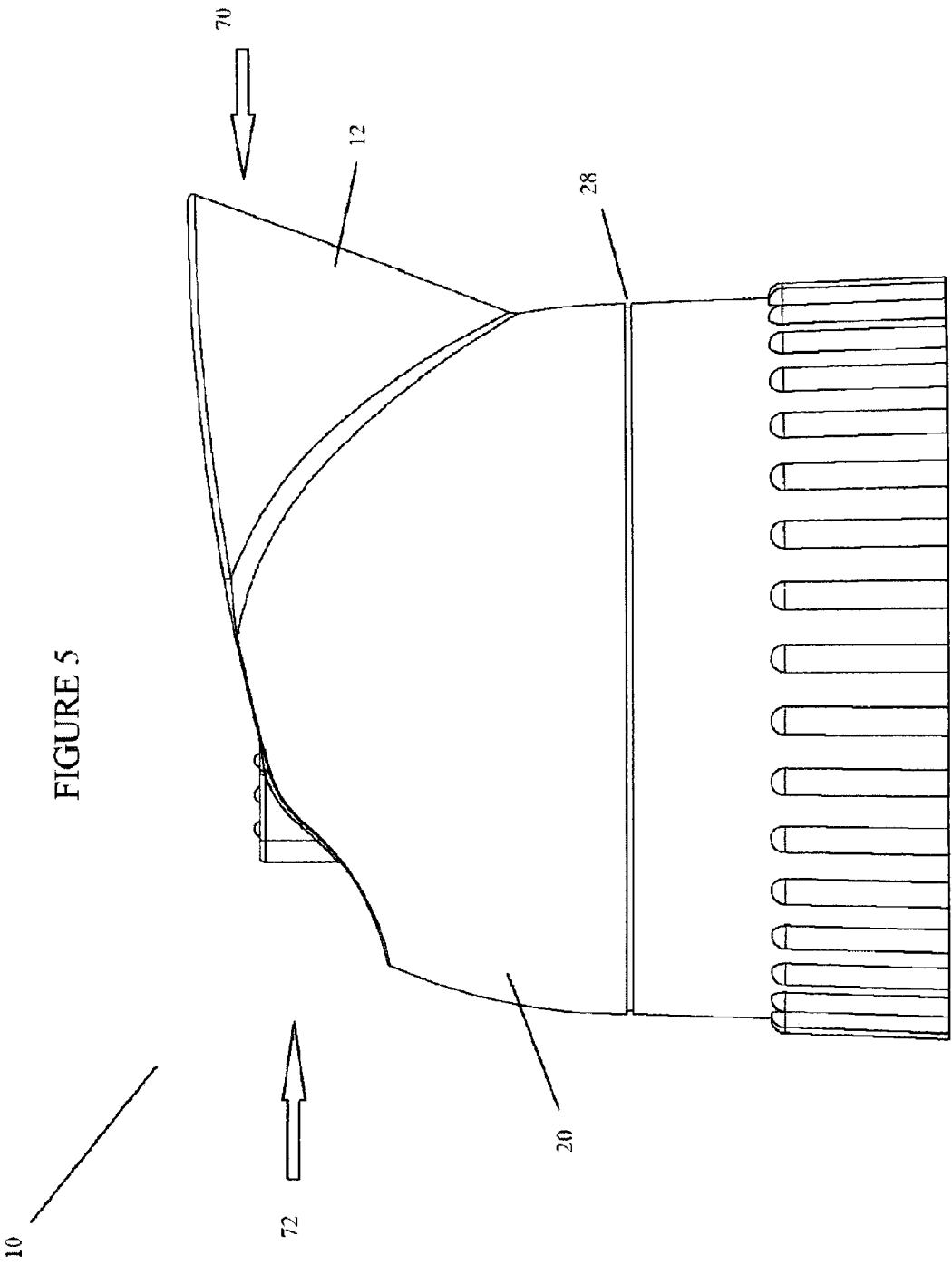
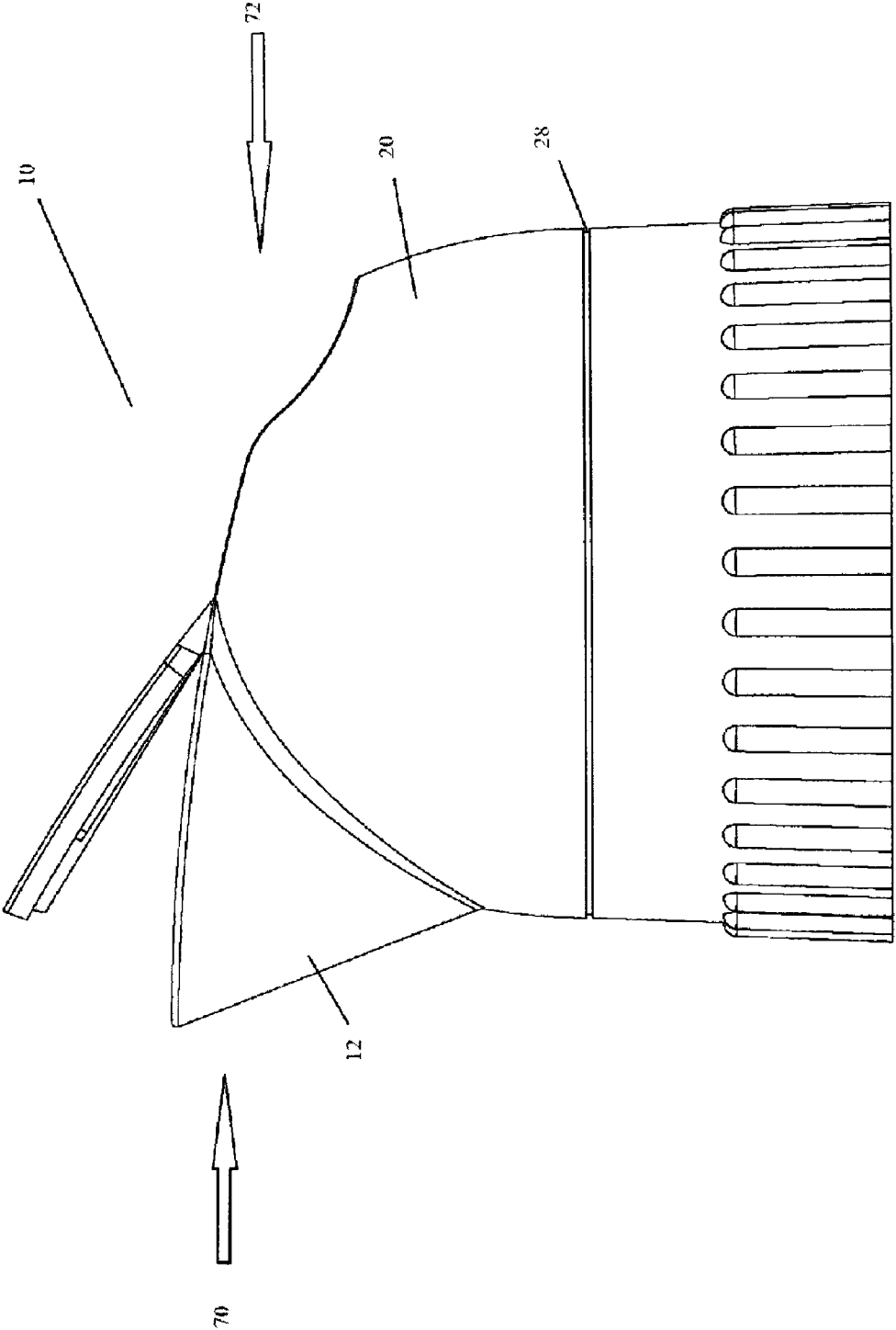


FIGURE 6



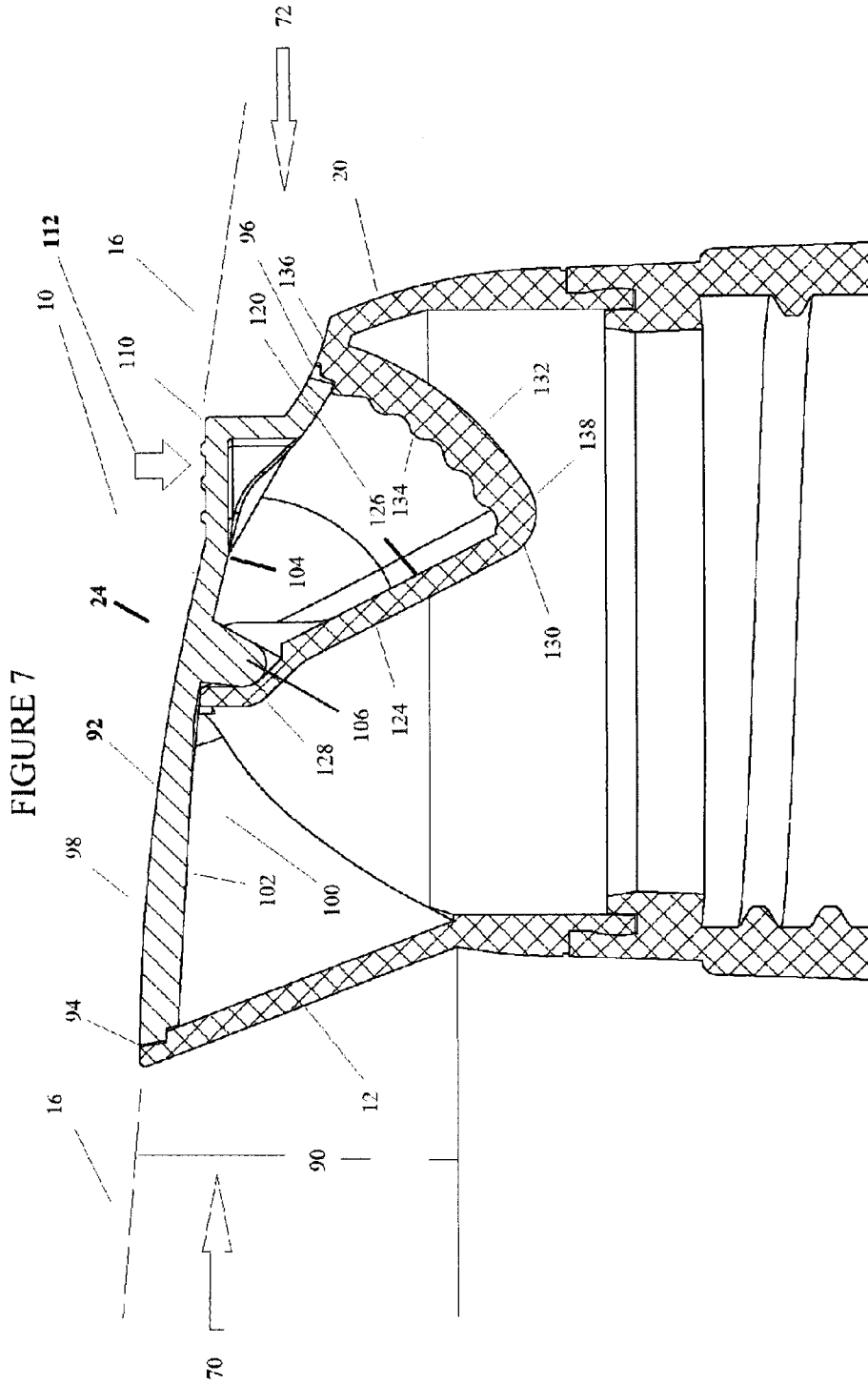
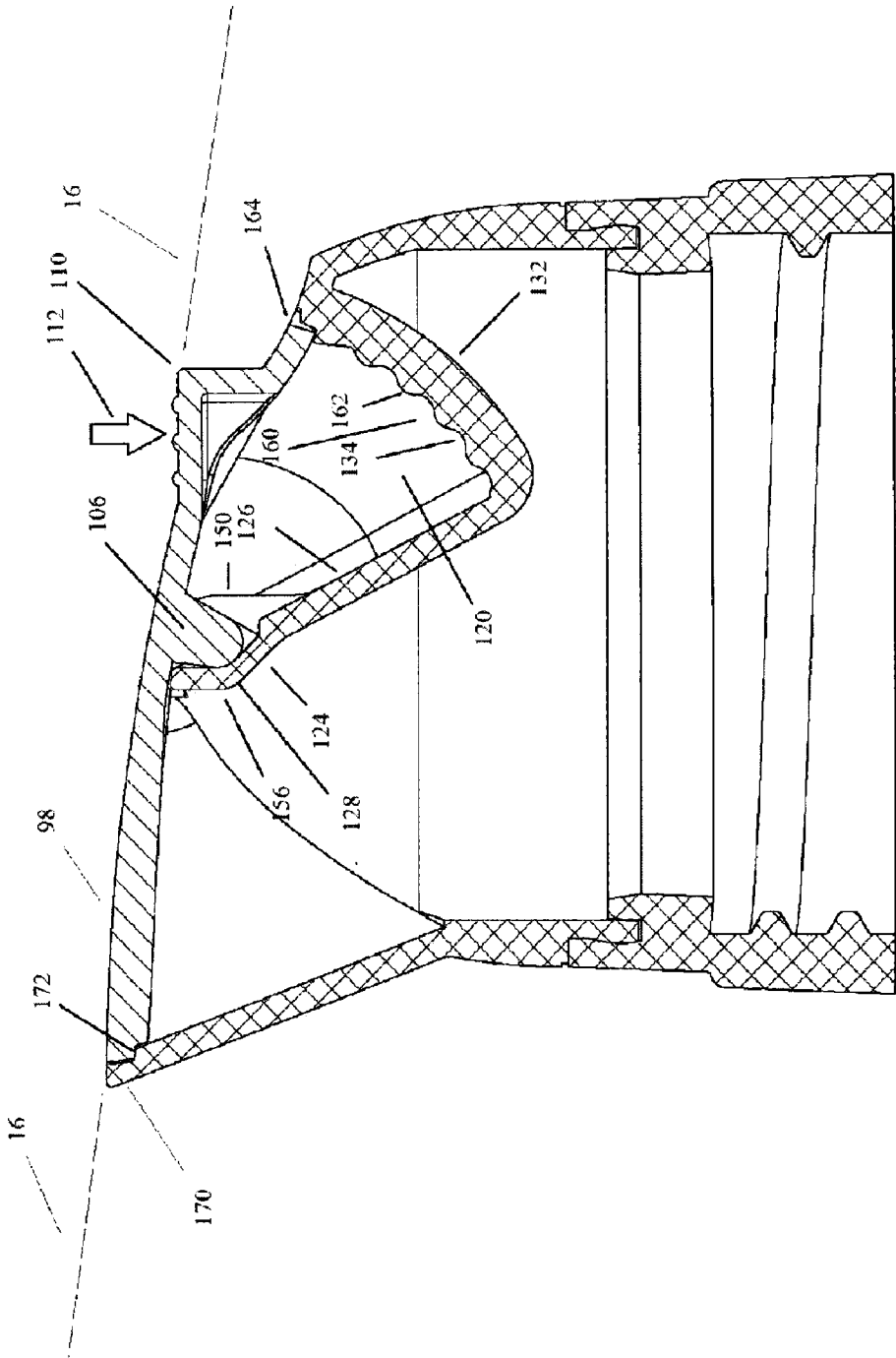


FIGURE 7

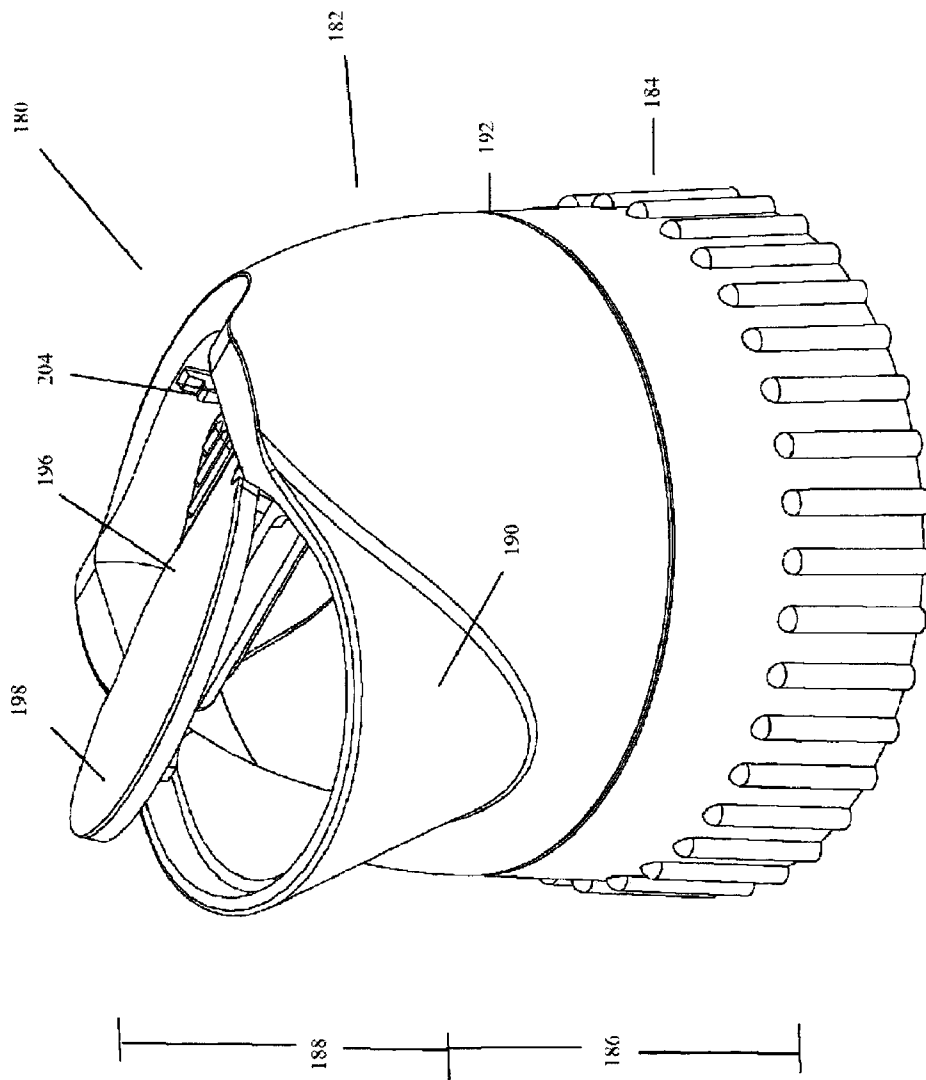
SECTION A-A

FIGURE 8



SECTION A-A

FIGURE 9



VESSEL CLOSURE-SEALABLE POURING SPOUT ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Patent Application No. 61/244,722 filed on Sep. 22, 2009.

STATEMENT REGARDING FEDERAL FUNDING

[0002] N/A

FIELD OF THE INVENTION

[0003] The present invention relates to bottle seals and liquid dispensing apparatus and particularly to a vessel closure-sealable pour spout.

BACKGROUND OF THE INVENTION

[0004] Bottle closures are well known in the art. They are designed and manufactured to seal bottles containing liquid to prevent wastage, preserve freshness of the product or for safety reasons to prevent access by children in the case of medicinal products. They can be designed according to the bottle neck type, closure type, closure size or by application.

[0005] These types of bottle closures have an inherent disadvantage in that once the bottle is opened the neck of the bottle may not be well suited for easy pouring. Alternatively, the bottle may not be re-sealable with the original bottle cap necessitating a variety of unsatisfactory ad-hoc closures.

[0006] Therefore it is desirable to have a bottle closure that can seal a bottle of liquid while providing a sealable pouring spout that facilitates pouring of the liquid and re-sealing for freshness.

OBJECTS OF THE INVENTION

[0007] Therefore it is an object of the present invention to provide a vessel closure-sealable pouring spout to simultaneously facilitate sealing of a vessel with a liquid in it and the pouring of the liquid.

[0008] It is another object of the invention to provide a vessel closure-sealable pouring spout that is rotatable 360 degrees to facilitate pouring in different orientations.

[0009] Another object of the invention is to provide a sealable pouring spout to seal the liquid in the bottle against contaminants.

[0010] It is yet another objective of the invention to provide a sealable pouring spout that is adjustable to a desirable pouring volume.

SUMMARY OF THE INVENTION

[0011] The vessel closure-sealable pouring spout of the invention is adapted to be removeably fixed to a bottle such as a milk bottle containing a liquid. In one embodiment of the invention the vessel closure-sealable pouring spout assembly comprises a top portion having a spout, a bottom portion adapted for removeable attachment to a bottle and a sealable pouring spout assembly attached to the top portion. The bottom portion attaches to the bottle by a threaded collar. The top portion is fixed to the bottom portion by a sealing joint that permits 360° rotation of the top portion with respect to the bottom portion.

[0012] In one embodiment of the invention the bottom portion comprises a lower gripping portion for hand twisting the bottom section onto the bottle threads.

[0013] In another embodiment of the invention the upper sealing portion of the bottom portion comprises a circular top surface having a groove.

[0014] In one embodiment of the invention the top portion comprises a front, a rear, an inside surface comprising an inside vertical surface depending a predetermined distance below an outside inwardly curved surface thereby forming a lower sealing tab having a vertical inside surface, a flat bottom surface and an outside surface having a convex lower portion and a vertical top portion.

[0015] In yet another embodiment of the invention the sealing joint between the top and bottom portions is formed when the lower tab is snap-fit engaged into the groove so that the concave lower portion of the groove meshes in a sealing relationship with the convex lower portion of said lower sealing tab while permitting hand-forced rotation of the top portion about the bottom portion.

[0016] In still another embodiment of the invention the sealable pouring spout assembly comprises a pouring spout having a height and is integral to the top portion. The spout projects from the front of the top portion. A controllable spout sealing member is mounted in a working and sealing relationship with the pouring spout.

[0017] In another embodiment of the invention the movement of the spout sealing member is controlled by detent means.

[0018] The foregoing and additional objects and features of the invention will become apparent from the following description in which the preferred embodiments have been set forth in detail in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] FIG. 1 is a front perspective view of one embodiment of the invention with the spout closed.

[0020] FIG. 2 is a front perspective view of one embodiment of the invention with the spout open.

[0021] FIG. 3 is a top view of one embodiment of the invention.

[0022] FIG. 4 is a cross-sectional side view of the embodiment shown in FIG. 3 along section A-A.

[0023] FIG. 5 is one side view of one embodiment of the invention with the spout closed.

[0024] FIG. 6 is another side view of one embodiment of the invention with the spout open.

[0025] FIG. 7 is the same cross-sectional side view of FIG. 4.

[0026] FIG. 8 is the same cross-sectional side view of FIG. 4 and FIG. 7.

[0027] FIG. 9 is a front perspective view of one embodiment of the invention with the spout open.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0028] A general perspective view of the vessel closure-sealable pouring spout assembly 10 made in accordance with the present invention is shown in FIG. 1. In this view, the spout 12 is shown in a closed position. In FIG. 2 of this same embodiment the spout 12 is shown in an open position. It is to be understood that the assembly is attached to a bottle, such as

a milk bottle, and therefore the bottle need not be displayed to obtain a complete understanding of the invention.

[0029] Referring to FIG. 1 and FIG. 2 there is shown a top front perspective view of the vessel closure-sealable pouring spout assembly 10 of this embodiment of the invention comprises a vertical axis 14 and a horizontal axis 16, a housing 18 comprising a top portion 20, a bottom portion 22 and a sealable pouring spout assembly 24. The bottom portion 22 is adapted for attachment to a vessel 26 by attachment means further described below. The top portion 20 is fixed to the bottom portion 22 by a sealing joint 28 that permits rotation 30 of the top portion 20 with respect to the bottom portion 22 around the vertical axis 14. The sealable pouring spout 12 is in fluid communication with the vessel 26 by liquid channel means further described herein.

[0030] Referring to FIG. 3 there is shown a top view of one embodiment of the invention 10. In this figure, the spout 12 is closed. The invention comprises a vertical axis 14 and a horizontal axis 16, a housing 18 comprising a top portion 20, a bottom portion 22 and a sealable pouring spout assembly 24.

[0031] Referring to FIGS. 1, 2 and 3 the bottom portion 22 comprises an outside surface 32 comprising a circumference 34, a lower gripping portion 36 for hand twisting about the vertical axis 14 and an upper smooth portion 38.

[0032] Referring to FIG. 4, there is shown a cross-sectional side view along line A-A in FIG. 4. The bottom portion 22 further comprises an inside surface 40 comprising a lower threaded portion 42 having threads 44 for threaded engagement with the vessel and an upper sealing portion 46 for sealing engagement with the top portion 20.

[0033] Referring to FIGS. 1 to 3 the lower gripping portion 36 comprises a series of vertical embossments 50 equally spaced about the circumference 34 of the lower portion 22.

[0034] Referring to FIGS. 1 to 4, the upper sealing portion 46 comprises a circular top surface 52 having a groove 54 formed between an outside vertical projection 56 having an outside wall 58 forming a length of the upper smooth portion 38 and an inside wall 60, shorter than the outside wall 56, having a vertical top portion 62 and a concave lower portion 64. The inside vertical projection 52 has a vertical outside wall 66 and an outwardly sloped inside wall 68.

[0035] FIG. 5 is a first side view of the assembly 10 having the spout 12 in a closed position. FIG. 6 is a second side view of the assembly 10 having the spout 12 in an open position.

[0036] Referring to FIG. 4-6 the top portion 20 comprises a front 70, a rear 72, an inside surface 74 comprising an inside vertical surface 76 depending a predetermined distance below an outside inwardly curved surface 80 and forming a lower sealing tab 82 having a vertical inside surface 84, a flat bottom surface 86 and an outside surface having a convex lower portion 88 and a vertical top portion 90. The sealing joint 28 is formed when the lower tab 82 is snap-fit engaged into the groove 54 so that the concave lower portion 64 of the groove meshes in a sealing relationship with the convex lower portion 88 of the lower sealing tab 82 while permitting hand-forced rotation 30 of the top portion 20 about the bottom portion 22 around the vertical axis 14.

[0037] FIG. 7 is identical to FIG. 4. Referring to FIG. 7, the assembly 10 sealable pouring spout assembly 24 comprises a pouring spout 12 having a height 90. The pouring spout 12 is integral to the top portion 20 and projects from the front 70 thereof. The sealable pouring spout assembly 24 comprises a controllable spout sealing member 92 mounted in a working

relationship sealing relationship with the pouring spout 12. The controllable spout sealing member 92 comprises a front end 94, a rear end 96, a length-wise axis 16, a top surface 98, a bottom surface 100, a lid portion 102 for sealing placement over the pouring spout 12, an opposite control portion 104 for opening and closing the lid portion 102, a pivot bearing member 106 integral to the controllable spout sealing member 92 and disposed on the bottom surface 100 and perpendicular to the length-wise axis 16. The controllable spout sealing member further comprises a finger tab 110 integral to the controllable spout sealing member 92 and disposed on the top surface 98 thereof for receiving downward forces 112 from the finger of an operator.

[0038] Still referring to FIG. 7, the assembly 10 further comprises a well 120 integral to the top portion 20 and disposed in the rear 72 thereof. The well comprises a depth 122 generally equal to the height 90 of the pouring spout 12. The well includes a front wall 124 having rear surface 126, a top end 128 and a bottom end 130. The well also includes a rear wall 132 having a front surface 134, a top end 136 and a bottom end 138 and an open top surface. The well 120 is adapted for receiving the spout sealing member control portion 104. The front wall bottom end 130 and said rear wall bottom end 138 are joined to form a generally V-shaped well.

[0039] Now referring to FIG. 8 which is identical to FIG. 7, the assembly well 120 further comprises a first pivot bearing 150 and a second pivot bearing 152 (not shown) adjacent to the first pivot bearing. The first and second pivot bearings are disposed at the top end 128 of the rear surface 126 of the front wall 124. They are adapted to receive the pivot bearing member 106 thereby forming a pivot hinge 156 about which the spout sealing member 98 pivots. The well 120 further comprises a detent device 160 integral to the front surface of the rear wall 132 of the well 120 and disposed vertically from the length-wise axis 16 of the spout sealing member 98. The detent device 160 further comprises a series of catches 162 adapted to interact with a notch 164 [See FIG. 1 and FIG. 3] disposed in the rear end of the spout sealing member 98 and on the longitudinal axis 16 thereof. When a finger force 112 is exerted downwards on the finger tab 110 the spout sealing member 98 will rotate about the pivot hinge 156 and the notch 164 will move down over the series of catches 162 to a desired position on the detent device 160. When the finger force 112 is removed the notch 164 will remain caught on the detent device 160 thereby maintaining the lid portion 102 at a desired position.

[0040] Still referring to FIG. 8, the pouring spout 12 further comprises a lip portion 170 extending from a ledge portion 172 so that when the lid 98 portion is in a closed position it rests upon the ledge portion and behind the lip portion.

[0041] Referring to FIG. 9, and in another embodiment of the invention 180 there is illustrated a three piece plastic closure assembly for a bottle containing a fluid. The closure assembly 180 comprises a hollow plastic body comprising a first piece 184 comprising a neck 186 for attachment to a bottle, a second piece 188 comprising a pouring spout 190 in fluid communication with the bottle and disposed above the first piece 184 and joined 192 at a seal that is liquid sealed and rotatable so that the pouring spout 190 can be conveniently rotationally oriented around the first piece for pouring a fluid. The third 196 piece comprises a pouring spout closure 198 in a sealing relationship with the pouring spout 190. The neck comprises 186 an inside surface 200 comprises a thread 202 for threaded attachment to the bottle. The pouring spout clo-

sure is pivotally attached to the second piece. The pouring spout closure further comprises a detent apparatus **204** for selectively positioning and maintaining the pouring spout in a desired position.

[0042] In yet another embodiment of the invention there is a combination of a bottle and a four piece plastic closure assembly for a the bottle containing a fluid. The closure assembly comprises a hollow plastic body comprising a first piece comprising a neck for attachment to the bottle; a second piece comprising a pouring spout in fluid communication with the bottle and disposed above the first piece and joined thereto in a liquid sealed and rotatable manner so that the pouring spout can be conveniently rotationally oriented around the first piece for pouring the fluid; a third piece comprising a pouring spout closure in a sealing relationship with the pouring spout; and, a fourth piece comprising a hermitical seal around the closure assembly for maintaining the combination in a sterile condition until opened by a consumer.

[0043] While the foregoing embodiments are considered to be preferred, it will be understood by a person skilled in the art that numerous variations and modifications may be made to the invention and to this specification. The claims herein are intended to cover all such variations and modifications that may fall within the scope of the invention.

What is claimed is:

1. A vessel closure-sealable pouring spout assembly comprising:

- a. a vertical axis;
- b. a housing comprising a top portion, a bottom portion and a sealable pouring spout assembly;
- c. wherein, said bottom portion is adapted for attachment to said vessel by attachment means;
- d. wherein, said top portion is fixed to the bottom portion by a sealing joint permitting rotation of the top portion with respect to the bottom portion around said vertical axis; and,
- e. wherein said sealable pouring spout assembly is in communication with the vessel by liquid channel means.

2. The assembly of claim **1** wherein the bottom portion comprises an outside surface comprising a perimeter, a lower gripping portion for hand twisting about the vertical axis and an upper smooth portion.

3. The assembly of claim **2** wherein the bottom portion further comprises an inside surface comprising a lower threaded portion for threaded engagement with the vessel and an upper sealing portion for sealing engagement with the top portion.

4. The assembly of claim **3** wherein said lower gripping portion comprises a series of vertical embossments equally spaced about said perimeter.

5. The assembly of claim **4** wherein said upper sealing portion comprises a circular top surface having a groove formed from an outside vertical projection having an outside wall forming a length of said upper smooth portion and an inside wall, shorter than said outside wall, having a vertical top portion and a concave lower portion; and, an inside vertical projection having a vertical outside wall and an outwardly sloped inside wall.

6. The assembly of claim **5** wherein the top portion comprises a front, a rear, an inside surface comprising an inside vertical surface depending a predetermined distance below an outside inwardly curved surface thereby forming a lower

sealing tab having a vertical inside surface, a flat bottom surface and an outside surface having a convex lower portion and a vertical top portion.

7. The assembly of claim **6** wherein said sealing joint is formed when said lower tab is snap-fit engaged into said groove so that said concave lower portion of said groove meshes in a sealing relationship with said convex lower portion of said lower sealing tab while permitting hand-forced rotation of the top portion about the bottom portion around the vertical axis.

8. The assembly of claim **1** wherein the sealable pouring spout assembly comprises a pouring spout having a height and integral to the top portion and projecting from said front thereof and a controllable spout sealing member mounted in a working relationship sealing relationship with said pouring spout.

9. The assembly of claim **9** wherein said controllable spout sealing member comprises a front end, a rear end, a length-wise axis, a top surface, a bottom surface, a lid portion for sealing placement over the pouring spout, an opposite control portion for opening and closing said lid portion, a pivot bearing member integral to the controllable spout sealing member and disposed on said bottom surface perpendicular to said length-wise axis and a finger tab integral to the controllable spout sealing member and disposed on said top surface of said opposite control portion for receiving downward forces from the finger of an operator.

10. The assembly of claim **9** further comprising a well integral to the top portion and disposed in the rear thereof, said well comprising a depth generally equal to said height of the pouring spout, a front wall having rear surface, a top end and a bottom end, a rear wall having a front surface, a top end and a bottom end and an open top surface, wherein the well is adapted for receiving the spout sealing member control portion.

11. The assembly of claim **10** wherein said front wall bottom end and said rear wall bottom end are joined.

12. The assembly of claim **11** wherein the well further comprises a first pivot bearing and a second pivot bearing adjacent to said first pivot bearing wherein the first pivot bearing and said second pivot bearing are disposed at the top end of said rear surface the front wall and are adapted to receive said pivot bearing member thereby forming a pivot hinge about which the spout sealing member pivots.

13. The assembly of claim **12** wherein the well further comprises a detent device integral to said front surface of the rear wall of the well and disposed vertically from the length-wise axis of the spout sealing member.

14. The assembly of claim **13** wherein said detent device further comprises a series of catches adapted to interact with a notch disposed in said rear end of the spout sealing member and on the longitudinal axis thereof so that when a finger force is exerted downwards on said finger tab the spout sealing member will rotate about said pivot hinge and said notch will move down over said series of catches to a desired position on the detent device and when said finger force is removed the notch will remain caught on the detent device thereby maintaining said lid portion at a desired position.

15. The assembly of claim **14** wherein the pouring spout further comprises a lip portion extending from a ledge portion so that when the lid portion is in a closed position it rests upon said ledge portion and behind said lip portion.

16. A three piece plastic closure assembly for a bottle containing a fluid, said closure assembly comprising a hollow plastic body comprising:

- a. a first piece comprising a neck for attachment to said bottle;
- b. a second piece comprising a pouring spout in fluid communication with the bottle and disposed above said first piece and joined thereto in a liquid sealed and rotatable manner so that said pouring spout can be conveniently rotationally oriented around the first piece for pouring said fluid;
- c. a third piece comprising a pouring spout closure in a sealing relationship with the pouring spout.

17. The closure of claim **16** wherein said neck comprises an inside surface comprises a thread for threaded attachment to the bottle.

18. The closure assembly of claim **17** wherein said pouring spout closure is pivotally attached to said second piece.

19. The closure assembly of claim **18** wherein the pouring spout closure further comprises a detent apparatus for selectively positioning and maintaining the pouring spout in a desired position.

20. A combination of a bottle and a four piece plastic closure assembly for a said bottle containing a fluid, said closure assembly comprising:

- a. a hollow plastic body comprising:
 - i. a first piece comprising a neck for attachment to said bottle;
 - ii. a second piece comprising a pouring spout in fluid communication with the bottle and disposed above said first piece and joined thereto in a liquid sealed and rotatable manner so that said pouring spout can be conveniently rotationally oriented around the first piece for pouring said fluid;
 - iii. a third piece comprising a pouring spout closure in a sealing relationship with the pouring spout;
- b. a fourth piece comprising a hermitical seal around the closure assembly for maintaining said combination in a sterile condition until opened by a consumer.

* * * * *