

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 911 273 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.04.1999 Bulletin 1999/17

(51) Int Cl.⁶: **B65D 43/16**

(21) Application number: **98308708.1**

(22) Date of filing: **23.10.1998**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
 MC NL PT SE**
 Designated Extension States:
AL LT LV MK RO SI

(72) Inventors:
 • **Theis, Gregory A.**
Houlton, Wisconsin 54082 (US)
 • **van Keuren, Dick E.**
River Falls, Wisconsin 54022 (US)

(30) Priority: **24.10.1997 US 957508**

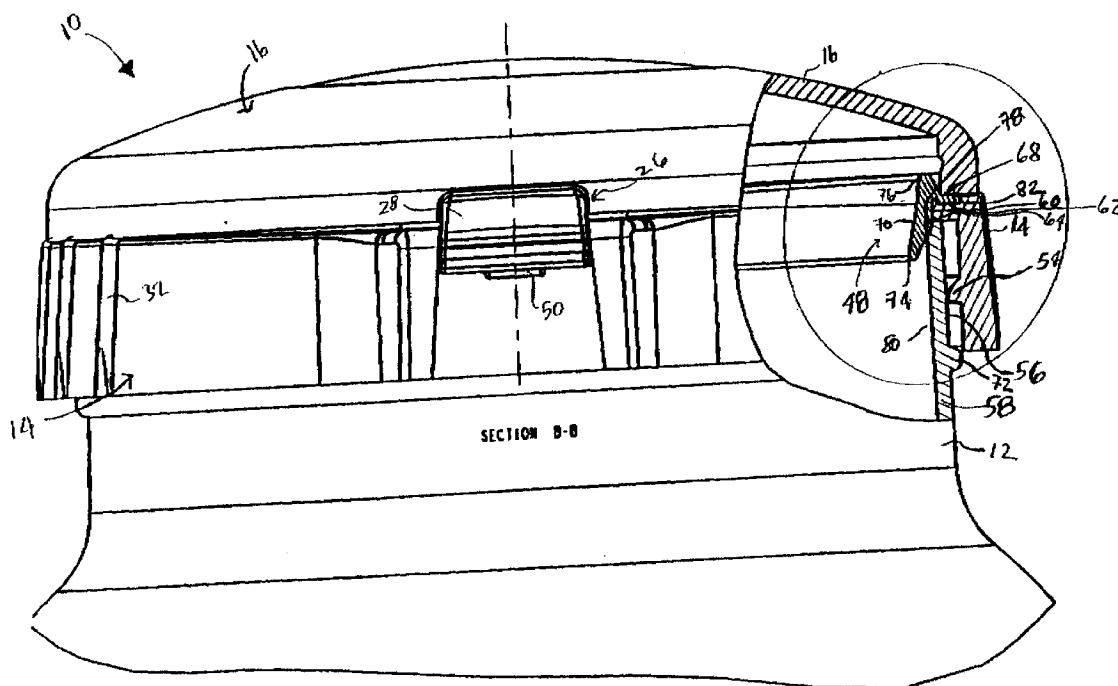
(74) Representative: **Lyons, Andrew John et al**
ROYSTONS,
Tower Building,
Water Street
Liverpool L3 1BA, Merseyside (GB)

(71) Applicant: **Plastics Inc.**
St. Paul, Minnesota 55102-0830 (US)

(54) Hinged closure with co-injection moulded gasket

(57) The present invention relates to a screw-top/flip-top lid assembly (10) for use in storage applications. The lid assembly is configured for attaching to a container (12) having a threaded container opening. The lid assembly includes a screw cap (14) that is pivotally coupled to flip cap (16) by a hinge (18). A clasp (26) is in-

cluded to secure closure of the lid assembly. The screw cap includes a comolded gasket (48) generally disposed along the periphery of the screw cap opening. In the closed configuration of the lid assembly, the flip cap covers the screw cap opening and engages the comolded gasket.

**FIGURE 6****EP 0 911 273 A1**

Description

FIELD OF THE INVENTION

[0001] The present invention relates generally to a container system. More particularly, the present invention relates to a screw-top/flip-top lid assembly for use in storage applications.

BACKGROUND OF THE INVENTION

[0002] Conventional screw-top/flip-top lids are utilized to cover a container that has a threaded opening. The lids typically consist of three components; the screw cap, the flip cap, and a gasket. Generally, the screw cap of the screw-top/flip-top lid threadably engages the container opening, and the flip cap opens and closes about a hinge that is coupled to the flip cap and to the screw cap. The flip cap allows easy access to the container opening once the screw cap is attached.

[0003] The gasket included in conventional screw-top/flip-top lids is hand-assembled onto either the screw cap or the flip cap. This configuration provides a seal between the screw cap-flip cap interface, the screw cap-container interface, or both. However, this is generally not a stable seal because the gasket remains mobile on the screw cap or on the flip cap. Not surprisingly, the gasket can even fall off completely.

[0004] Additionally, conventional screw-top/flip-top lid assemblies require three separate pieces. The production and the assembly of three separate pieces result in increased assembly time and manufacturing costs. In particular, a gasket must be formed in a separate molding process that is distinct from the molding of the screw cap and the flip cap. Moreover, the additional step of hand-assembling the gasket onto the flip cap or the screw cap is labor-intensive, which further increases production costs. Even post-production costs are increased, since there are at least three pieces to inventory for the conventional screw-top/flip-top lid.

[0005] The screw caps of most conventional screw-top/flip-top lids generally have a smooth plastic surface that can be difficult to handle when screwing the lid either onto or off a container opening. Some screw caps currently include hand grips made of hardened plastic. Nonetheless, these plastic grips often do not provide adequate traction for obtaining a firm hold.

[0006] Thus, there is a need for a low-cost screw-top/flip-top lid assembly. Further, there is a need for a screw-top/flip-top lid with rubber-like grips that enable a firmer hold of the plastic screw cap when screwing the lid either onto or off a container opening. Further still, there is a need for a manufacturing method by which to produce a screw-top/flip-top lid with a reduced parts count, thereby minimizing production and inventory costs.

SUMMARY OF INVENTION

[0007] The present invention relates to a lid assembly for attaching to a container having a threaded container opening. The lid assembly includes a first member and a second member. The first member is configured to threadably engage the threaded container opening. The first member is comprised of plastic and includes a comolded gasket. The second member is coupled to the first member by a hinge. The second member engages the comolded gasket when in a closed position.

[0008] The present invention further relates to a screw/flip-top lid that includes a plastic base and a flip cover. The plastic base has a base opening that is defined by a rim. The rim has a top surface that is at least partially covered by a comolded gasket. The flip cover is coupled to the plastic base and engages the comolded gasket when in a closed position.

[0009] The present invention still further relates to a method of manufacturing a lid assembly. The method includes molding a flip-top cover and a base that has an opening. The method further includes coinjection molding a gasket about a periphery of the opening.

[0010] According to one exemplary aspect of the present invention, the lid assembly is a screw/flip-top lid that includes a plastic base coupled to a plastic flip cover and a rubber-like gasket. The gasket is comolded about the top surface of the base. The gasket provides a seal between the plastic base and a corresponding container. When the lid assembly is in the closed position, the flip cover engages the comolded gasket on the plastic base, thereby providing an additional seal along the flip cover-plastic base interface of the lid assembly.

[0011] According to another exemplary aspect of the present invention, part of the comolded rubber-like plastic extends vertically downward from the exterior of the bottom surface of the gasket, forming hand grips along the exterior surface of the plastic base. The grips allow for a firmer hold of the plastic base when screwing the lid assembly either onto or off a container opening.

[0012] According to yet another exemplary aspect of the present invention, the method of manufacturing the lid assembly utilizes two-shot molding technology, thereby allowing for two different types of materials to be molded in one part. The two comolded materials can be polypropylene (e.g., the plastic flip-top cover and base) and a thermal plastic elastomer (e.g., the rubber-like gasket and grips). The comolded materials can be of different colors, which adds to the decorative versatility of the lid assembly. This process advantageously eliminates the labor-intensive need to hand-assemble a gasket piece onto the plastic base. As a result, manufacturing costs are lowered since fewer separate parts are required and less assembly is involved. Moreover, post-production cost is also minimized since there are fewer parts to inventory.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The invention will be described with further reference to the accompanying drawings, wherein like numerals denote like elements:

Figure 1 is a perspective view of a screw-top/flip-top lid assembly attached to a container, with the flip cap in a closed configuration, in accordance with an exemplary embodiment of the present invention; Figure 2 is a top view of the flip cap used in the screw-top/flip-top lid assembly illustrated in Figure 1;

Figure 3 is a perspective view of the screw cap of the screw-top/flip-top lid assembly illustrated in Figure 1, including hand grips and a comolded gasket; Figure 4 is a partial bottom view of the screw cap illustrated in Figure 3;

Figure 5 is a perspective view of the gasket and hand grips that are comolded with the screw cap illustrated in Figures 3 and 4;

Figure 6 is a side view of the screw-top/flip-top lid assembly illustrated in Figure 1, with a partial cross-sectional view showing the gasket disposed between the screw cap and the flip cap; and

Figure 7 is a side view of the screw-top/flip-top lid assembly illustrated in Figure 1, showing partial cross-sectional views of a clasp area and of a hinge area.

DETAILED DESCRIPTION

[0014] With reference to Figure 1, a lid assembly 10 is shown attached to a container 12 which has a threaded opening (Figures 6 and 7). Lid assembly 10 is preferably a screw-top/flip-top lid that includes a base or a screw cap 14 pivotally coupled to a flip cover or a flip cap 16 by a hinge 18. Hinge 18 of lid assembly 10 includes a pair of bearing members 20 and 22 (Figures 3 and 4) disposed on screw cap 14 and a rod member 24 (Figure 2) disposed on flip cap 16. Lid assembly 10 further includes a fastener or a clasp 26 that engages screw cap 14 when lid assembly 10 is in a closed configuration, as shown in Figure 1. In particular, clasp 26 includes an elongated tab member 28 disposed on flip cap 16 and a receiving area 30 disposed on screw cap 14 of lid assembly 10 (Figures 3 and 7).

[0015] Screw cap 14 of lid assembly 10 further includes vertical grips 32 disposed on an exterior surface 34. Screw cap 14 is preferably configured to threadably engage (e.g., screw onto) the opening of container 12 (Figures 3 and 4). Both screw cap 14 and flip cap 16 of lid assembly 10 are preferably made of a plastic, such as, polypropylene, whereas container 12 can be made of plastic, glass, metal, or other material.

[0016] A top view of flip cap 16 of lid assembly 10 is shown in Figure 2, including rod member 24 of hinge 18 and elongated tab member 28 of clasp 26. Member 24

of hinge 18 includes rod ends 36. Rod ends 36 are disposed within a corresponding slot 38 (Figures 3 and 4) on each of bearing members 20 and 22 of hinge 18 on screw cap 14 of lid assembly 10. In particular, each slot 38 on each of members 20 and 22 ends with a round terminus 40. Round terminus 40 on each of first members 20 and 22 of screw cap 14 is appropriately sized to fit and to maintain rod ends 36 on member 24 of hinge 18 on flip cap 16 (e.g., ends 36 snap fit into slots 38). In particular, hinge 18 allows flip cap 16 of lid assembly 10 to pivot or to flip either away or toward screw cap 14 when either opening or closing, respectively, lid assembly 10. Round terminus 40 of slot 38 in one of members 20 and 22 of hinge 18 is partially visible in Figure 3, while each slot 38 on each of members 20 and 22 is shown in Figure 4.

[0017] Figures 3 and 4 further illustrate screw cap 14 of lid assembly 10. Screw cap 14 has an opening 44 defined by a periphery or rim 46, and a gasket 48. Area 30 of clasp 26 includes a ridge 50. Grooves 42 are circumferentially disposed on an internal surface 52 of screw cap 14 to engage a plurality of threads 54 disposed on an external surface 56 of a rim 58 on container 12 (Figures 6 and 7).

[0018] Rim 46, which defines screw cap opening 44, has a top surface 60 (Figure 7), an interior surface 62, and a bottom surface 64. Gasket 48 is disposed about the periphery of screw cap opening 44. In particular, gasket 48 of screw cap 14 includes a short member 68 and an elongated member 70 (Figures 6 and 7), which define a groove 66. Groove 66 on gasket 48 is preferably circumferentially disposed about rim 46 of screw cap 14. Gasket 48 preferably covers at least portions of top surface 60 and interior surface 62 of rim 46 on screw cap 14. Furthermore, portions of gasket 48 extend beyond top surface 60 of rim 46 and meld into vertical grips 32. Grips 32 preferably extend the height of screw cap 14 and are spaced at regular intervals from each other along exterior surface 34 of screw cap 14.

[0019] With reference to Figure 5, a perspective view of gasket 48 and grips 32 is shown. Grips 32 are configured to be vertical ribs that are integral with gasket 48 of screw cap 14. Gasket 48 and grips 32 are preferably made of a rubber-like thermal plastic elastomer (TPE) that is comolded with plastic screw cap 14 of lid assembly 10. Rubber-like grips 32 allow for a firmer hold of plastic screw cap 14 when screwing lid assembly 10 either onto or off the threaded opening of container 12.

[0020] Coinjection molding (also called comolding, sandwich construction, two-shot, double-shot injection, multiple-shot injection, two-color molding, inmolding, and so forth) generally refers to laminating or disposing two or more different plastics together to take advantage of the different properties contributed by each type. The comolding process is not limited to different plastic types only: differently-colored material made of the same plastic can also be comolded. Different plastics that are comolded in the same process usually have similar phys-

ical properties, such as, melting point. Furthermore, the comolding process typically involves two or more injection units, one for each plastic type (or color, if using the same plastic type).

[0021] In particular, the method for manufacturing lid assembly 10 allows for two different types of materials to be comolded in one part. In one preferred embodiment, the two comolded materials are a polypropylene plastic (e.g., flip cap 16 and screw cap 14) and a thermal plastic elastomer (e.g., rubber-like gasket 48 and grips 32). More specifically, the method for manufacturing lid assembly 10 comprises molding screw cap 14 (Figures 1 and 3) and flip cap 16 (Figures 1 and 2) from the polypropylene plastic and coinjection molding gasket 48 and grips 32 from the thermal plastic elastomer about the periphery of screw cap opening 44 and on exterior surface 34 of screw cap 14, respectively (Figure 3). Preferably, screw cap 14 is formed in a mold, followed by the formation of gasket 48 in the same mold around screw cap 14. Alternatively, the molding process can be conducted in reverse sequence, e.g., gasket 48 is first formed in a mold, followed by the formation of screw cap 14 in the same mold.

[0022] The comolding process used in the manufacturing of lid assembly 10 also adds decorative versatility to the screw-top/flip-top lid, since the polypropylene plastic and the thermal plastic elastomer can be of different colors. Color-matching schemes can be used for seasonal or holiday themes. For example, a Halloween motif can be achieved by using an orange-colored polypropylene plastic (e.g., screw cap 14 and flip cap 16) with a black-colored thermal plastic elastomer (e.g., gasket 48 and grips 32). Even sports enthusiasts can enjoy color combinations representative of their favorite professional sports team.

[0023] With reference to Figure 6, a side view of lid assembly 10 is shown. In particular, lid assembly 10 is shown attached to container 12. More specifically, to attach lid assembly 10 to container 12, grooves 42 on internal surface 52 of screw cap 14 (Figure 3) complementarily engage threads 54 circumferentially disposed on external surface 56 of rim 58 on container 12 (also shown in Figure 7). A ridge 72, also disposed on external surface 56, limits the extent to which screw cap 14 of lid assembly 10 engages rim 58 of container 12.

[0024] Figure 6 also shows a partial cross-sectional view of lid assembly 10 in a closed configuration, wherein gasket 48 is disposed between screw cap 14 and flip cap 16. In the closed configuration of lid assembly 10, flip cap 16 covers screw cap opening 44 (Figure 3). In a cross-sectional view, gasket 48 generally appears in an inverted L-shaped configuration, where elongated member 70 extends along interior surface 62 and beyond bottom surface 64 of rim 46 on screw cap 14 and where short member 68 extends along top surface 60 of rim 46. Elongated member 70 of gasket 68 includes a first end 74, a second end 76, and a midportion 78.

[0025] When lid assembly 10 is in the closed config-

uration, first end 74 on elongated member 70 of gasket 48 on screw cap 14 is engaged by, and in contact with, flip cap 16. In contrast, second end 76 on elongated member 70 of gasket 48 is freely circumferentially disposed along an internal surface 80 of rim 58 of container 12. Midportion 78 on elongated member 70 of gasket 48 simultaneously engages interior surface 62 of rim 46 on screw cap 14 and a superior portion of internal surface 80 of rim 58 on container 12, thereby effecting a seal along the interface between screw cap 14 of lid assembly 10 and rim 58 of container 12. Moreover, when lid assembly 10 is still in the closed configuration, ridge 82 of short member 68 on gasket 48 is preferably disposed between a bottom portion of flip cap 16 and top surface 60 of rim 46 on screw cap 14, thereby effecting a seal along the interface between screw cap 14 and flip cap 16 of lid assembly 10.

[0026] With reference to Figure 7, a side view of lid assembly 10 in the closed configuration, while attached to container 12, is shown. Grips 32 on exterior surface 34 of screw cap 14 are prominently featured. Similar to Figure 6, Figure 7 also includes a partial cross-sectional view of lid assembly 10 in the closed configuration. However, Figure 7 demonstrates a section of lid assembly 10 that includes hinge 18. In particular, rod ends 36 on member 24 of hinge 18 is shown disposed within round terminus 40 at the end of slot 38 on one of members 20 and 22.

[0027] Figure 7 further includes a partial cross-sectional view of a portion of lid assembly 10 that includes clasp 26. In particular, Figure 7 illustrates that clasp 26 includes elongated tab member 28 disposed on flip cap 16 and receiving area 30 disposed on screw cap 14 of lid assembly 10. Elongated tab member 28 of clasp 26 melds into or is contiguous with an outwardly-extending lifting flange 88. Lifting flange 88 includes an indentation 90 disposed on the interior aspect of elongated tab member 28, facing area 30 of clasp 26. Indentation 90 on tab member 28 of clasp 26 is preferably sized to receive a ridge 92 disposed on area 30 to secure closure of lid assembly 10.

[0028] The closing and opening of lid assembly 10 will be discussed with reference to Figures 6 and 7. To close lid assembly 10, an external downward force is supplied, such as, by hand, to flip cap 16 to effect a pivotal motion of flip cap 16 toward screw cap 14. More specifically, as a result of the applied downward force on flip cap 16, rod ends 36 on member 24 of hinge 18 pivot within round terminus 40 at the end of slot 38 on each of members 20 and 22, thereby pivotally moving flip cap 16 towards screw cap 14. Once flip cap 16 is in close proximity to screw cap 14, a sufficient downward force is applied to clasp 26, which allows flange 88 to overcome ridge 92 on area 30.

[0029] Clasp 26 effects closure of lid assembly 10 once ridge 92 on area 30 of screw cap 14 is received within indentation 90 of elongated tab member 28 on flip cap 16. As a result, flip cap 16 covers screw cap opening

44 and engages comolded gasket 48 on screw cap 14. Gasket 48 then effects a seal along the interface between screw cap 14 and flip cap 16 (in addition to the seal already present along the interface between screw cap 14 and container 12).

[0030] To open lid assembly 10, lifting flange 88 of clasp 26 is pulled away from screw cap 14 to clear or to separate indentation 90 on elongated tab member 28 from ridge 92 on area 30. Flip cap 16 is then lifted in a direction away from screw cap 14. In particular, hinge 18 on lid assembly 10 allows flip cap 16 to pivotally move away from screw cap 14, thereby exposing screw cap opening 44. More specifically, rod ends 36 on member 24 of hinge 18 pivot within round terminus 40 at the end of slot 38 on each of members 20 and 22. Furthermore, lid assembly 10 is preferably configured such that, once flip cap 16 has been pulled away from screw cap 14, gravitational force (e.g., the weight) of flip cap 16 enables it to remain stationary in an upright position, without having to maintain a hold on it. An end 65 of rod member 24 engages a surface 67 of screw cap 14 to prevent flip cap 16 from completely flipping over, e.g., over-extending to a planar position. In this way, when lid assembly 10 is in the open configuration, flip cap 16 can be maintained in a more than vertical position. Once lid assembly 10 is open, a hand can reach through screw cap opening 44 to retrieve contents stored in container 12. Lid assembly 10 is preferably configured to be used in dry food storage applications, e.g., to store pasta, pretzels, cereal, candy, and the like.

[0031] It is understood that the above description is of preferred exemplary embodiments of the present invention. The apparatus and method of the invention is not limited to the precise details and conditions disclosed. For example, while the lid assembly described herein is preferably configured for dry food storage, alternative applications can be employed, such as, hardware storage of nails, bolts, screws, and liquid storage of juices, water, soups, oils, or other fluids. Various modifications may be made to the details of the disclosure without departing from the spirit of the invention, which is defined in the appended claims.

Claims

1. A lid assembly for attaching to a container having a threaded container opening, the lid assembly comprising;

a first member configured to threadably engage the threaded container opening, the first member being comprised of plastic and including a comolded gasket; and

a second member coupled to the first member by a hinge, the second member engaging the comolded gasket when in a closed position.

2. The lid assembly of claim 1, wherein the first member has a member opening defined by a rim, the second member covering the member opening when in the closed position.

3. The lid assembly of claim 2, wherein the rim has a top surface and an interior surface, wherein the comolded gasket cover at least a portion of the top surface and the interior surface.

4. The lid assembly of claim 3, wherein the first member includes comolded gripping structures on an exterior surface of the first member.

5. The lid assembly of claim 2, wherein the comolded gasket has a groove defined by a thin exterior wall and a thick interior wall, the groove being disposed about the member opening.

6. The lid assembly of claim 1, wherein the second member includes a fastener.

7. A screw/flip top lid, comprising:

a plastic base having a base opening, the base opening being defined by a rim having a top surface, the top surface being at least partially covered by a comolded gasket opening; and a flip cover coupled to the plastic base, engaging the comolded gasket when in a closed position.

8. The screw/flip top lid of claim 7, wherein the flip cover is plastic.

9. The screw/flip top lid of claim 8, wherein the rim has an interior surface, wherein the comolded gasket covers at least a portion of the interior surface.

10. The screw/flip top lid of claim 7, wherein the base includes comolded gripping structures on an exterior surface.

11. The screw/flip top lid of claim 10, wherein the gripping structures are vertical ribs.

12. The screw/flip top lid of claim 10, wherein the gripping structures are integral with the comolded gasket.

13. The screw/flip top lid of claim 9, wherein the comolded gasket has a first portion extending along the interior surface, and a second portion extending along the interior surface, and a second portion extending along the top surface.

14. The screw/flip top lid of claim 13, wherein the comolded gasket has a groove defined by a thin wall

and the first portion.

15. The screw/flip top lid of claim 14, wherein the first portion extends beyond a bottom surface of the rim.

5

16. A method of manufacturing a lid assembly, comprising:

molding a flip top cover and a base, the base having an opening; and
coinjection molding a gasket about a periphery of the opening.

10

17. The method of claim 16, wherein the flip top cover, the base, and the gasket are plastic.

15

18. The method of claim 16, wherein the coinjection molding step includes forming gripping structures on an outside surface of the base.

20

19. The method of claim 18, wherein the gasket is rubber-like thermal elastomer plastic.

20. The method of claim 16, wherein the gasket is a different color than the base.

25

30

35

40

45

50

55

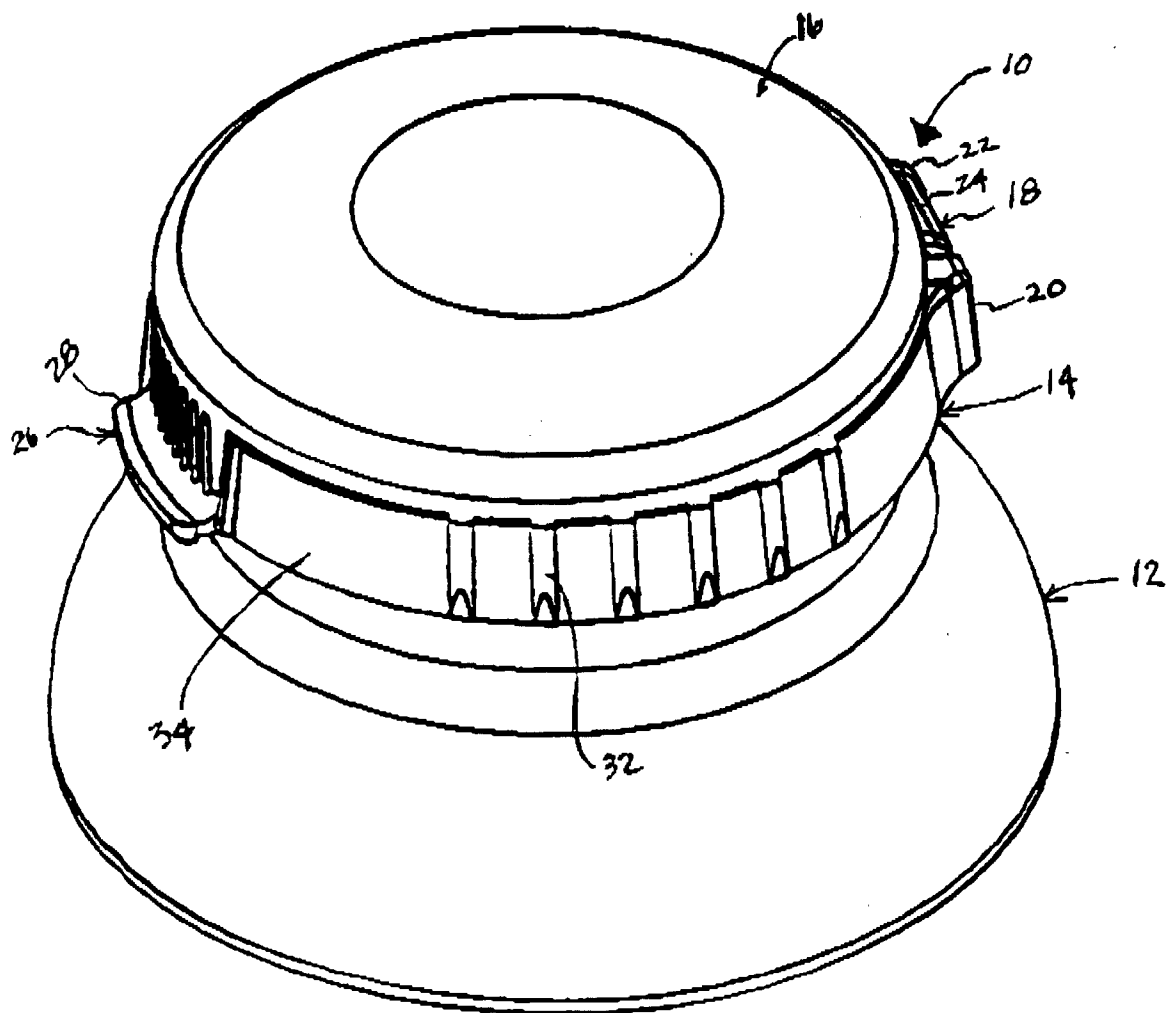


FIGURE 1

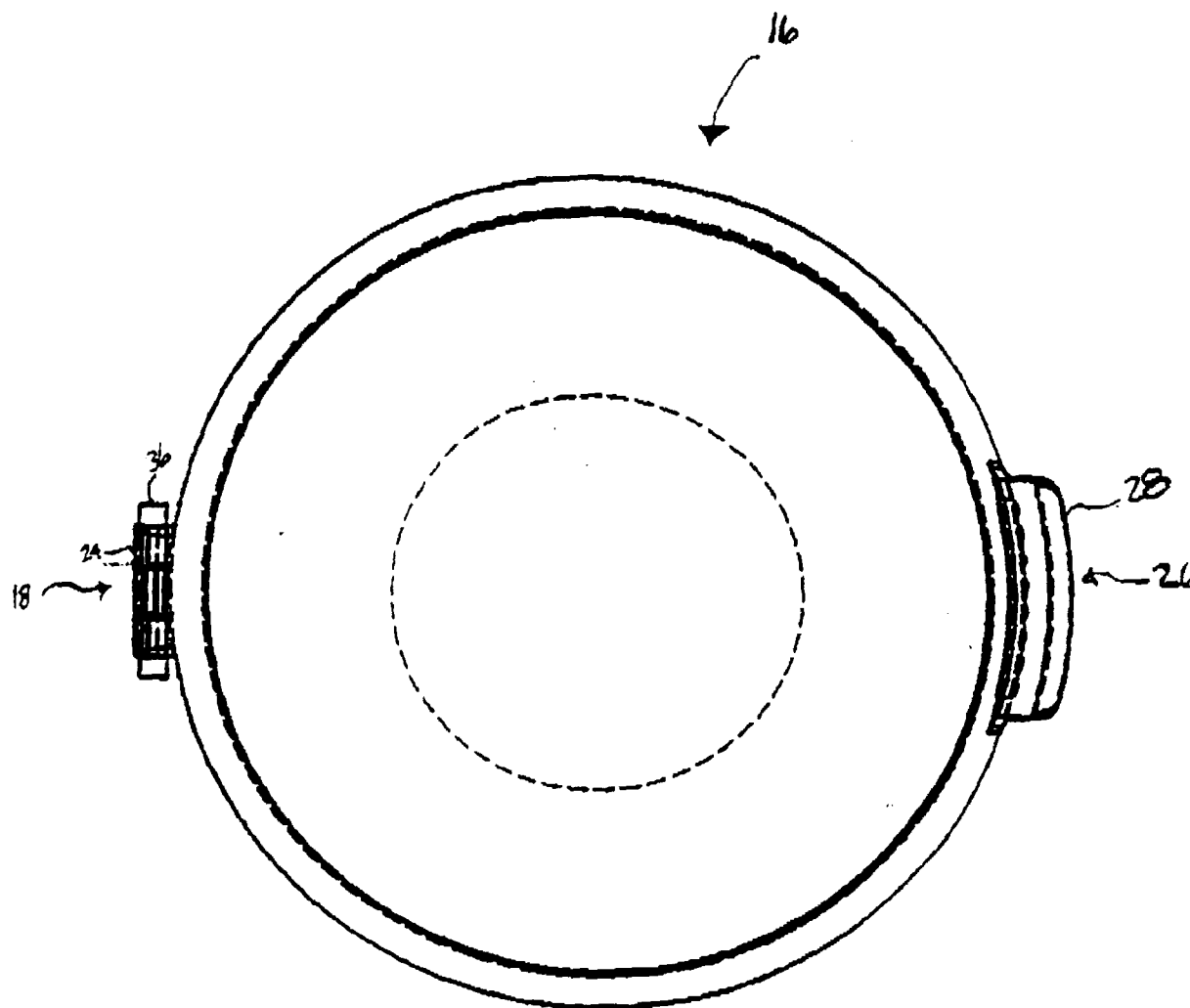


FIGURE 2

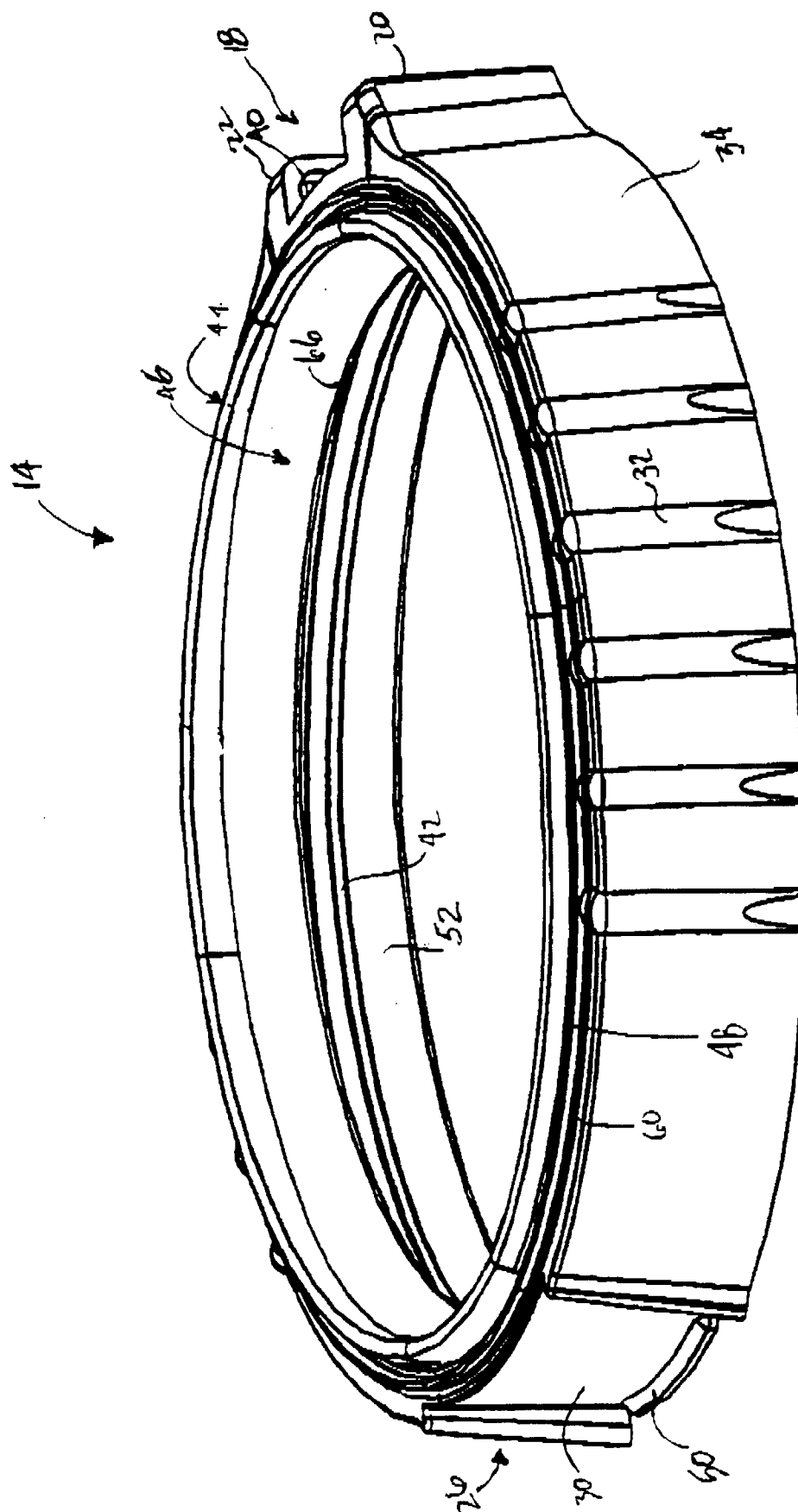


FIGURE 3

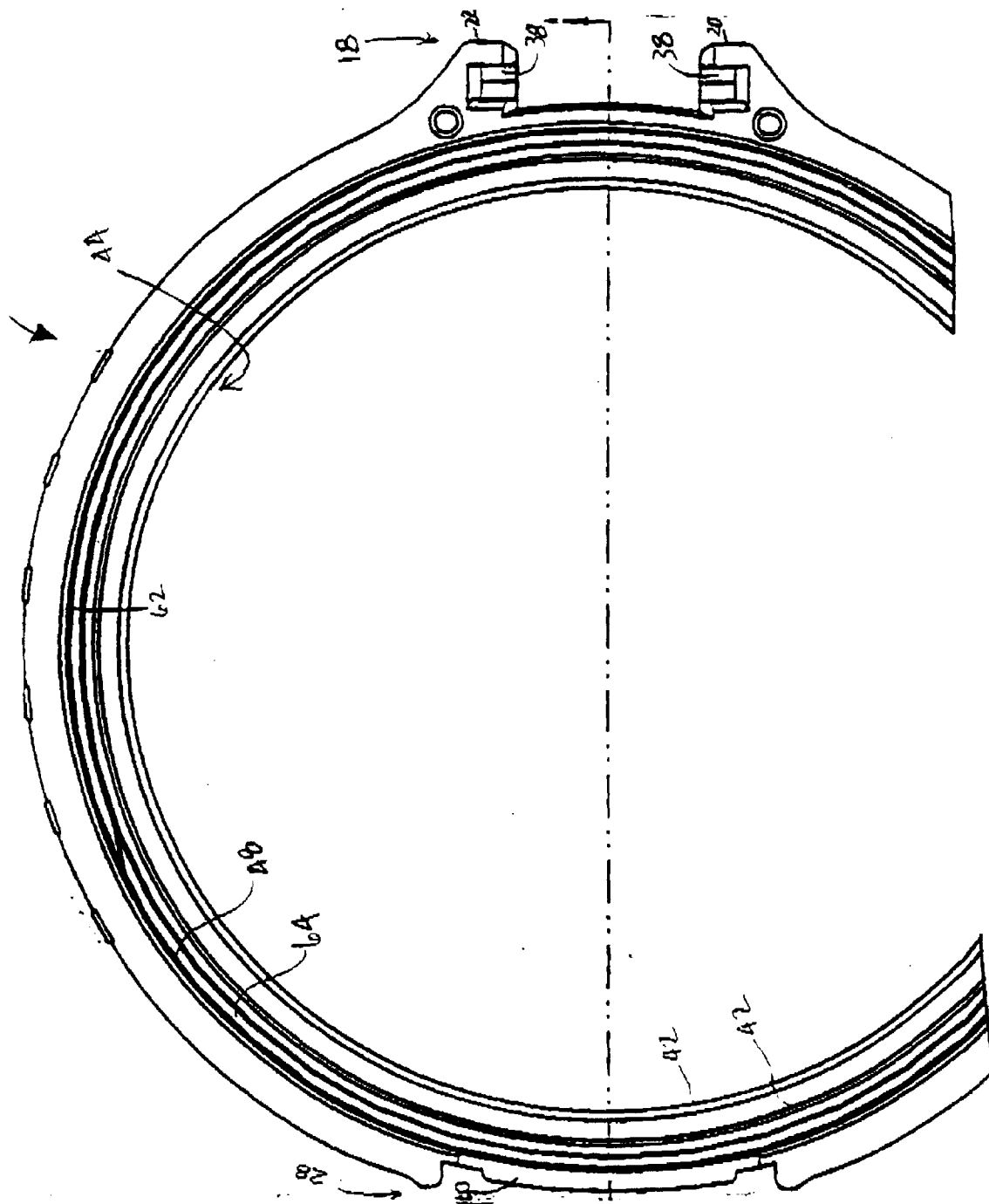


FIGURE 4

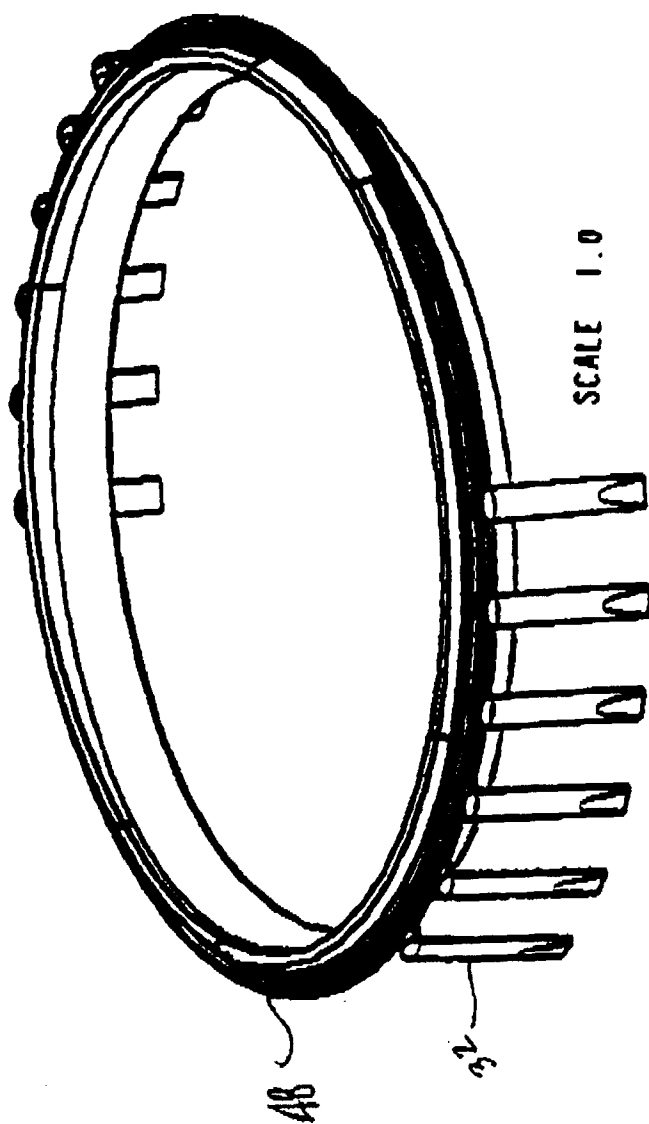
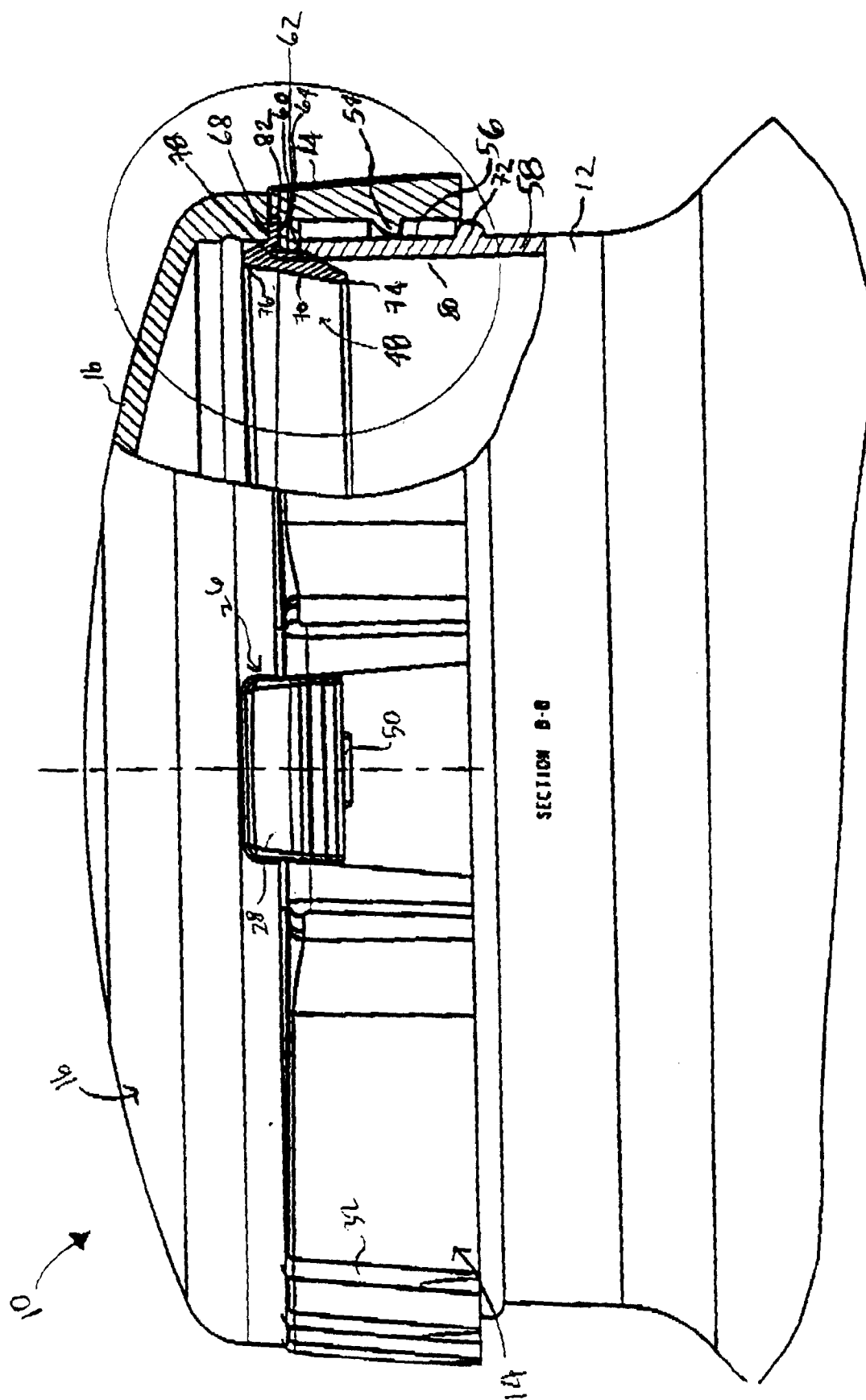


FIGURE 5



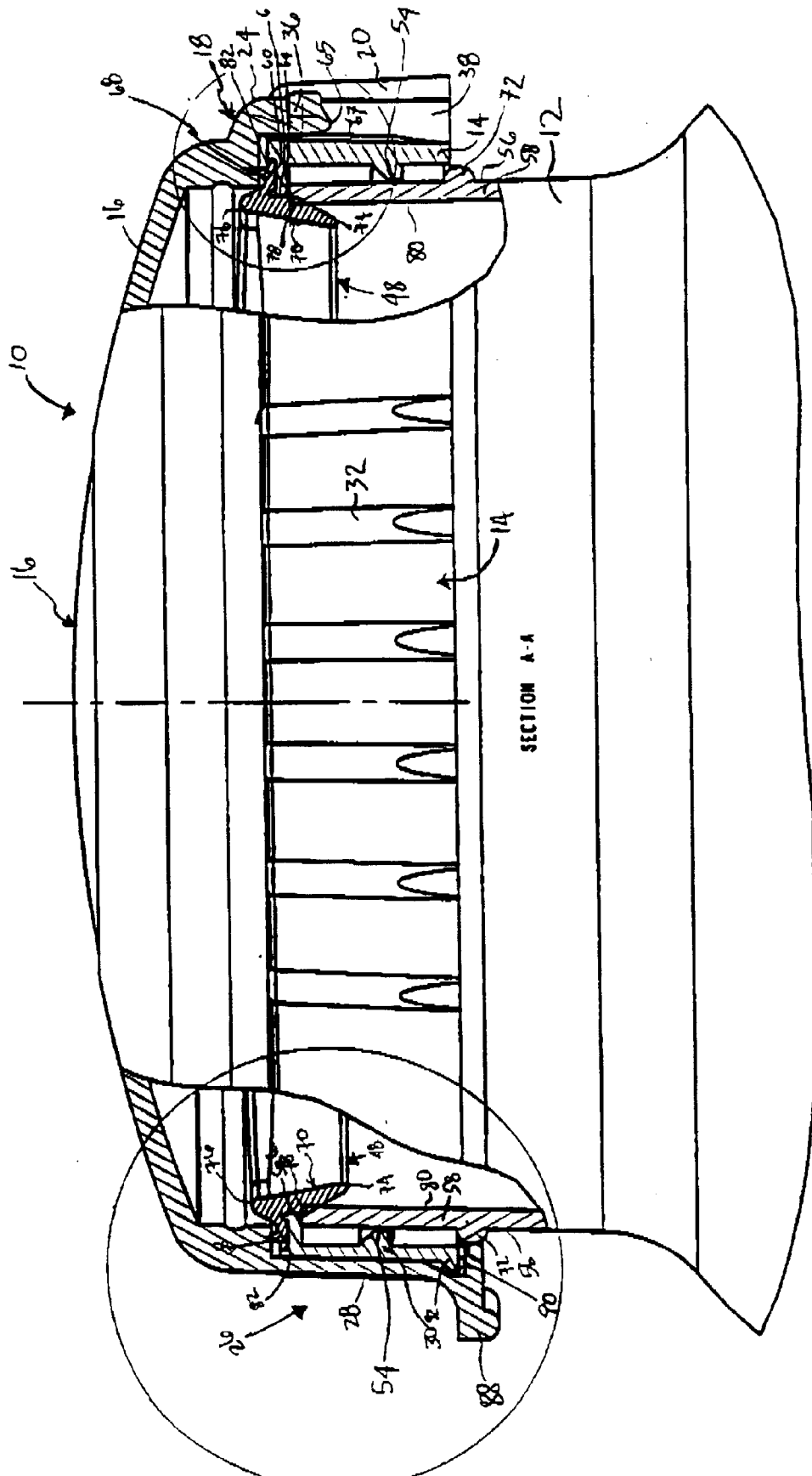


FIGURE 7



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 30 8708

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
P, A	FR 2 752 818 A (L'OREAL) 6 March 1998 * page 4, line 25 - page 7, line 10; figures *	1,7,16	B65D43/16
A	GB 2 193 196 A (SUNBEAM) 3 February 1988 * abstract; figure 1 *	1,7,16	
A	US 5 582 314 A (QUINN) 10 December 1996 * column 3, line 45 - column 4, line 12; figures 1-5 *	1,7,16	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26 January 1999	Examiner Newell, P
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 30 8708

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

26-01-1999

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
FR 2752818	A	06-03-1998	EP	0839735 A	06-05-1998
GB 2193196	A	03-02-1988	US	4727999 A	01-03-1988
			US	4682702 A	28-07-1987
			AU	586390 B	06-07-1989
			AU	7425087 A	08-09-1988
			FR	2612159 A	16-09-1988
			JP	63232156 A	28-09-1988
			AU	586772 B	20-07-1989
			AU	6817187 A	07-01-1988
			DE	3715965 A	14-01-1988
			FR	2600630 A	31-12-1987
			GB	2192179 A	06-01-1988
			JP	63012462 A	19-01-1988
			US	4747498 A	31-05-1988
US 5582314	A	10-12-1996	NONE		