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(54) **Easy-open closure and the closure and a container in combination.**

(57) A closure (1) with a large handle member (50) provides easy-opening access to the contents of a container (33). Double-lead threads (25,35) allow a secure attachment of the closure to the container while permitting quick removal of the closure when required. Abutments (29) on the interior of the closure engage slots (30) on the exterior of the container so as to lock the closure, when fully rotated, in one of several prespecified positions on the container neck (32).

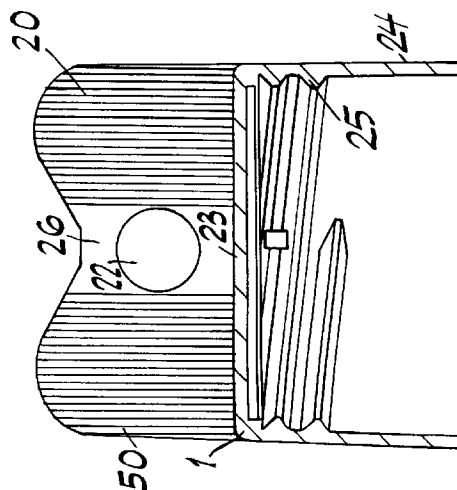


FIG. 1

The present invention relates to a closure which may be screw-threaded onto a container neck. More specifically, the present invention relates to a closure which may be easily removed from a container and which has a positive stop feature. The invention also relates to the closure and a container in combination.

Present closures for containers, especially those intended for use on medicine bottles, are often cumbersome and difficult to open. This difficulty is more prevalent in child-resistant closures. These closures require manual dexterity greater than that possessed by children. However, these closures are also difficult if not impossible to remove for responsible users of the products whose dexterity has been impaired by age or illness. Furthermore, such closures are also difficult to use for consumers with reduced cognitive skills.

There is a need for an alternative closure for responsible users who require an easy-to-open closure due to their reduced dexterity or cognitive skills.

There is also a need for a closure which need not undergo an inordinate number of rotations in order to be removed or replaced. This requirement is also due to the larger amount of dexterity needed to perform such a procedure.

On the other hand, the closure must be adequately secured to the bottle in order to guard against accidental disbursement or spillage of the contents. For example, U.S. Patent No. 5,213,225 ("the '225 patent") describes a closure with a handle which may be disengaged from fully closed to fully open by a rotation of about 90°. Such rotations, however, may accidentally occur during the handling of the bottle. As such, there is a need to prevent such inadvertent openings by providing a more secure attachment of the closure to the bottle. Moreover, as the handle of the '225 patent is not shaped to accommodate the user's fingers the user must generate additional torque to disengage the closure. Thus, there is a need for a handle designed to allow the torque produced by the user to be most efficiently utilized.

The '225 patent also describes stops which arrest the rotation of the closure onto the container at a pre-specified point. In this way, alignment of features on the closures with features on the bottle is achieved. However, due to the fourfold symmetry of the 90° stops disclosed in the embodiment in the '225 patent, combined with the twofold symmetry of the handle portion, the closure may stop in two basic ways. Thus, the configuration of the closure and the container, when the closure is closed, is not unique. Thus, there is a need for a closure which mounts onto a container so that, when in a closed position, the configuration of the closure and the container is unique.

Other differences between the prior art and the present invention will become obvious upon a consideration of the disclosed features of the present closure taken in conjunction with the attached drawings.

According to the invention there is provided an easy-open closure as defined in claim 1, and also said closure and a container in combination.

The invention includes a closure which engages a container neck. The closure is provided with a base wall with a depending first skirt. In the interior of the depending first skirt, first and second closure threads, which start from opposite ends of a diameter, wind upwards. These threads engage corresponding first and second container threads for tightening of the closure onto the container. On top of the closure is provided a planar handle portion with a central tab and two side finger tabs on each side of the central tab. The central tab may have a slot or a hole through its thickness. The side finger tabs may have serrations, and they may extend upwardly from the base wall a greater distance than the central tab.

The container neck according to the present invention depends upwardly from a container shoulder. The shoulder may have a rectangular cross-section. The neck includes first and second container threads encircling its exterior. These threads engage the first and second closure threads when the closure is rotated onto the container.

The interior of the closure is fitted with an abutment, which when rotated onto the container neck engages with a slot on the neck to stop the cap from further rotating under normal operating torque. In a preferred embodiment, the slot is placed on the threads which are integral with the container neck. The abutment also engages a ramp placed on the container neck, which may be placed counterclockwise-adjacent to the slot. If the container shoulder has a rectangular cross-section, the abutment's engagement with the slot allows the planar handle portion to align in a parallel manner to one of the sides of the rectangular cross-section. Alternatively, the planar handle portion may be parallel with a line joining the corners of rectangular cross-section. For other effects, the planar handle portion may be at a prespecified angle to the sides of the rectangular cross-section.

The inside of the closure may be fitted with a liner retention bead. This bead may be used to allow the closure to hold a glued-in liner, a friction liner, or a snap-in liner. Alternatively, the closure may also be designed with an integral linerless feature if desired.

By way of example, specific embodiments according to the invention will be described with reference to the accompanying drawings in which:-

FIG 1 shows a cross-sectional side view of a closure according to an embodiment of the present invention;

FIG 2 shows a cross-sectional side view of the closure of FIG 1, wherein the closure is rotated 90°;

FIG 3 shows a top view of the closure of FIG 1;

FIG 4 shows a cross-sectional top view of the closure of FIG 1;

FIG 5 shows a top view of a container neck which may be utilized with a closure according to the present invention;

FIG 6 is a detail of the container neck of FIG 5 showing the shape of a slot in the container neck; FIG 7 shows a side view of the container neck of FIG 5;

FIG 8 shows a side view of the container neck of FIG 7, wherein the container is rotated 90°; and FIG 9 is a cross-sectional view of the closure of FIG 2 showing the threads and the liner retention bead.

FIG 1 shows a side section of a closure 1 according to an embodiment of the present invention. The closure 1 includes a base wall 23 with a first depending annular skirt 24. On the interior of first skirt 24 are first and second closure threads 25, commonly termed double-lead threads. The first and second closure threads 25 each begin their helical wind upwards from a given point on the first skirt, i.e., a given distance down from the base wall 23 to the edge of the first skirt 24. In the closure according to this embodiment of the invention, the first and second closure threads 25 begin from opposite sides of a diameter of the first skirt 24. If they each extend around one half of a circumference, approximately 180° of rotation will be needed to remove the closure from the container. As shown in FIGs 7 and 8, these first and second closure threads 25 threadingly engage first and second container threads 35 on the container neck when the closure is tightened to the container. Closure threads 25 may each have the same pitch. The use of two closure threads 25 allows the closure 1 to be tightly affixed to the neck 32 of a container 33 (FIGS 5 to 8) while only a small amount of rotation is required to remove the closure. In the embodiment shown, a rotation of approximately half of a complete turn is enough to tighten the closure 1 onto the container neck 32 or, conversely, to unscrew the closure 1 from the container neck 32.

FIG 4 shows ramped abutments 29 which may be located either on a first or second closure thread 25 or on another area of first skirt 24. In a preferred embodiment, ramped abutments 29 are placed on the first or second closure threads 25 near a position at the top of the thread, as indicated by the position of slots 30 one of which is shown in FIG 8. Ramped abutments 29 insertingly engage the slots 30, shown in FIG 5 as voids within the container threads 35, to hold the closure 1 in a prespecified position once the closure 1 is fully rotated onto the container neck 32. To accomplish this, the rotation of the closure 1 onto the container neck 32 proceeds until the ramped abutment 29 is at the point where it engages the slot 30. At this point, the ramped abutment 29 rides up the slant formed by its ramp until the ramped abutment drops into the slot 30. It may be assisted in this regard by the inclusion of a ramp 31 as shown in FIG 5. The

ramp 31 provides an opposing ramp which engages the ramped abutment 29, forcing it outward more gradually. In the preferred embodiment where the ramped abutment is near the top of the thread, the natural taper of the top or beginning of the thread may form ramp 31. In this case, then, a separate ramp 31 need not be formed. The engagement of the abutment 29 in the slot 30 allows the closure 1 to fit onto the container neck 32 only when locked in a prespecified orientation. This may provide a pleasing visual effect, especially if the closure 1 has noncircular symmetry. For example, the closure 1 may be provided with a rectangular cross-section. In this case, the abutment may be designed to drop into the slot when the sides of the closure 1 are parallel with some feature on the container. In this case, the container may likewise have some cross-section which is not circularly symmetric. Then the abutment may be designed to drop into the slot when the sides of the closure 1 are parallel with the line joining two opposing corners of the container. Moreover, the abutment may be designed to drop into the slot when the sides of the closure 1 are at some prespecified angle with the line joining two opposing corners of the container. In another example the container may be provided with a label which advantageously cooperates with some marking, label, or structure on the closure 1. In this case, the coordination of the closure 1 and the container would be essential. As a further example, the closure 1 and container combination may be provided with structures which fit together so as to enable a large number of combinations to be packed closely together. In this case, it may be necessary for the closure 1 to be oriented on the container in a prespecified manner so as to allow close packing. It is easy to see that a disorganized packing of closures and container combinations may lead to wasted space in storage. It would be particularly true in the present case, where the easy-open handle, whose orientation is dependent on the engagement of the abutment 29 with the slot 30, adds considerably to the overall bulk of the item.

The planar handle member 50 of the current embodiment has a familiar "turn-key" shape. It includes a central tab 26 which may have a hole 22 through its thickness. The hole 22 may further aid in the opening of closure 1 by providing a point through which a rod, e.g., a pencil, may be inserted as a lever arm for greater torque. Alternatively, the hole 22 may be replaced by a slot which is open to the top of the central tab. In this embodiment, a pencil or other device need only be placed down into the slot, rather than inserted through the hole, thus enhancing ease of use. The central tab 26 is integral with and flanked by two side finger tabs 20. The central tab 26 may also be serrated, if desired. While opening the closure and container combination, the side finger tabs 20 allow the user to exert less force to obtain greater torque than is usu-

ally needed to rotate the closure. The side finger tabs 20 may generally extend higher from the base wall 23 than does the central tab 26. This forms the "turn-key" shape. The side finger tabs 20 may also have serrated edges 28, for improved gripping by the user's fingers. The combination of the "turn-key" shape and the serrated edges 28 provides improved gripping of the closure 1.

As FIG 3 shows, the orientation of the serrations may be utilized to great effect. In particular, the embodiment shown is of a preferably buttress design, with the design allowing a user, who is removing the closure, to exert a greater force in removing the closure than in replacing the closure. This is because, in this orientation, the buttress design tends to bite into the thumb and forefinger of the user. For greater effect, the serrations may also be placed on the peripheral side edges of the planar handle portion, i.e., on the opposite edges of the diameter formed. The buttress serrations provide a greater amount of torque for the same amount of force. For users with reduced dexterity or cognitive skills, such a feature allows the closure to be even more easily removed.

FIG 9 shows a liner retention bead 27 which is formed in the corner of the base wall 23 and the depending first skirt 24. The liner retention bead 27 works to hold a glued-in liner, or a friction or a snap-in liner.

Those skilled in the art will understand that the various optional features of the disclosed closure may be combined in any number of ways without departing from the scope of the present invention. In addition, while the invention has been described in regard to a closure which may have a circular or rectangular cross-section and which is screwed on to a container, those skilled in the art will recognize that a closure according to the present invention may be any shape and that the scope of the invention is to be limited only by the claims appended hereto.

Claims

1. An easy-open closure (1) for mounting on a container neck (32), the closure comprising:
 - a base wall (23);
 - a first skirt (24) depending downwardly from the base wall;
 - a first closure thread (25) for engaging a corresponding first thread (35) on the container neck, the first closure thread helically encircling the interior of the first skirt from a first starting position;
 - a second closure thread (25) for engaging a corresponding second thread (35) on the container neck, the second closure thread helically encircling the interior of the first skirt and starting from a position diametrically opposite to the first

starting position;

a handle member (50) extending upwardly from the base wall, the handle member extending substantially across a dimension of the base wall and including:

a central portion (26) extending upward from the base wall a first distance;

a pair of gripping portions (20) integral with and extending from each side of the central portion;

a ramped abutment (29) formed on the first skirt for engaging a ramp (31) formed on the container neck so that, as the closure is rotated about the container neck, the ramped abutment gradually engages the ramp formed on the container neck until the ramped abutment reaches the end of the ramp formed on the container neck and enters a slot (30) formed in the container neck, so that when the ramped abutment is received in the slot, the closure is locked in a predetermined closed position on the container neck.

2. The easy-open closure of claim 1, further comprising a liner retention bead (27) formed in the interior of the closure, the liner retention bead being integral with both the base wall (23) and the first skirt (24).
3. The easy-open closure of claim 1, wherein the central portion (26) has a hole (22) penetrating through its thickness.
4. The easy-open closure of claim 1, wherein the ramped abutment (29) engages the slot (30) so as to ensure that the handle portion lies parallel to a side of the container when the closure is locked in the closed position.
5. The easy-open closure of claim 1, wherein the gripping portions (20) depend upwardly from the base wall (23) a second distance, wherein the second distance is greater than the first distance.
6. The easy-open closure of claim 1, wherein the gripping portions (20) depend upwardly from the base wall (23) a second distance, wherein the second distance is greater than the first distance.
7. The easy-open closure of claim 1, wherein the first closure thread (25) and the second closure thread (25) have substantially the same pitch.
8. The easy-open closure of claim 1, wherein the central portion (26) has a substantially smooth surface.
9. The easy-open closure of claim 1, further includ-

ing two ramped abutments (29) for engagement with two slots (30) formed on opposed portions of the container neck (32).

21. The easy-open closure of claim 20, wherein the ramps (31) are coincident with the top of the container threads (35).

- 10.** The easy-open closure of claim 9, wherein two ramps (31) are provided. 5
- 11.** The easy-open closure of claim 9 in combination with a container (33), wherein the two ramped abutments (29) are located at opposite sides of the interior of the closure (1) for engaging two slots (30) located at opposite sides of the container neck (32). 10
- 12.** The easy-open closure and container of claim 11, wherein the plane of the planar handle portion (50) is substantially perpendicular to the line joining the two ramped abutments (29). 15
- 13.** The easy-open closure and container of claim 11, wherein the plane of the planar handle portion (50) is substantially parallel to the line joining the two ramped abutments (29). 20
- 14.** The easy-open closure of claim 1, wherein the central portion (26) has a slot penetrating through its thickness. 25
- 15.** The easy-open closure of claim 1, wherein the ramped abutment (29) engages the slot (30) so as to ensure that the handle portion (50) lies parallel to the line joining two corners of a container (33) when the closure (1) is locked in the closed position. 30
- 35
- 16.** The easy-open closure of claim 1, wherein the ramped abutment (29) engages the slot (30) so as to ensure that the handle portion lies at a pre-specified angle to a feature on a container (33) when the closure is locked in the closed position. 40
- 17.** The easy-open closure of claim 5, wherein the serrations (28) are of a buttress type.
- 18.** The easy-open closure of claim 17, wherein the serrations (28) are formed such that lesser torque is required to remove the closure from a container (33) than to replace the closure on the container. 45
- 19.** The easy-open closure of claim 1, wherein the slot (30) is formed on a container thread. 50
- 20.** The easy-open closure of claim 9, wherein the ramped abutments (29) are formed substantially at the top of the closure threads (25), and slots (30) are formed substantially at the top of the container threads (35). 55

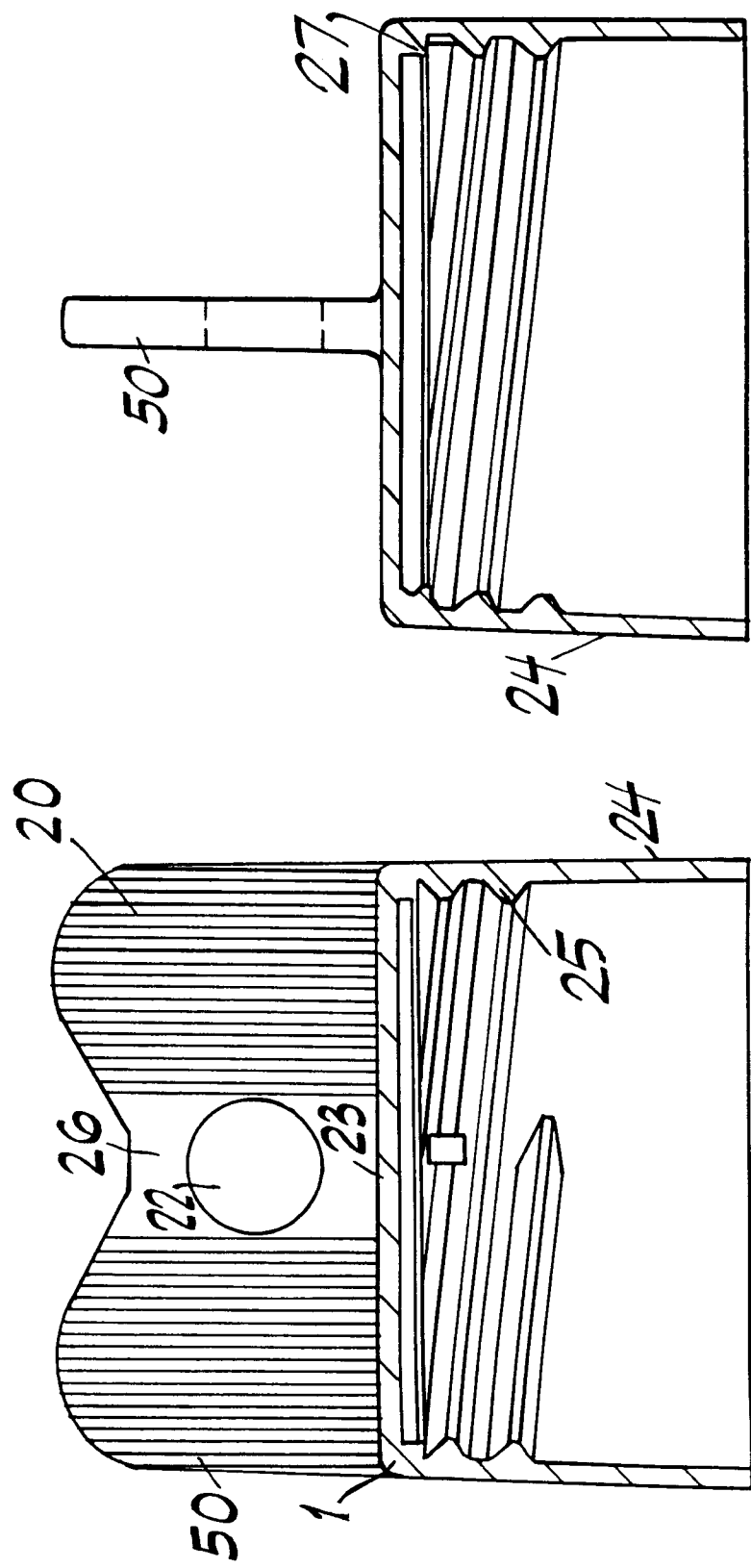


FIG. 2

FIG. 1

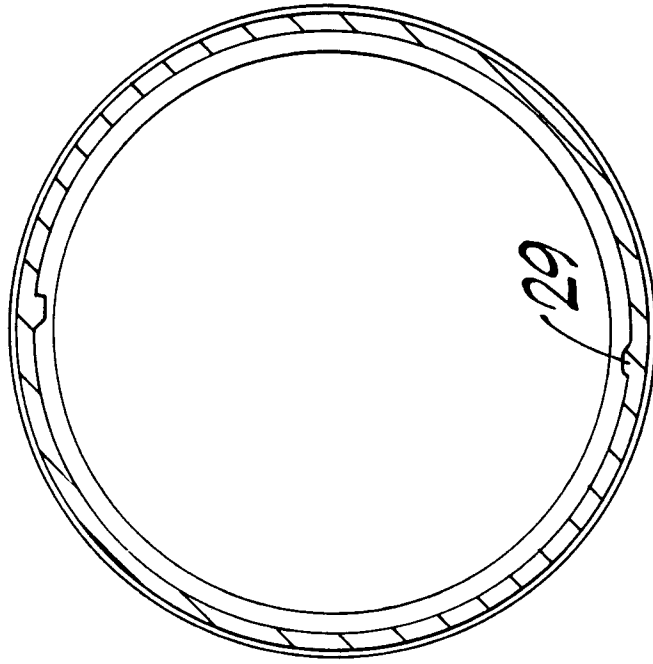


FIG. 4

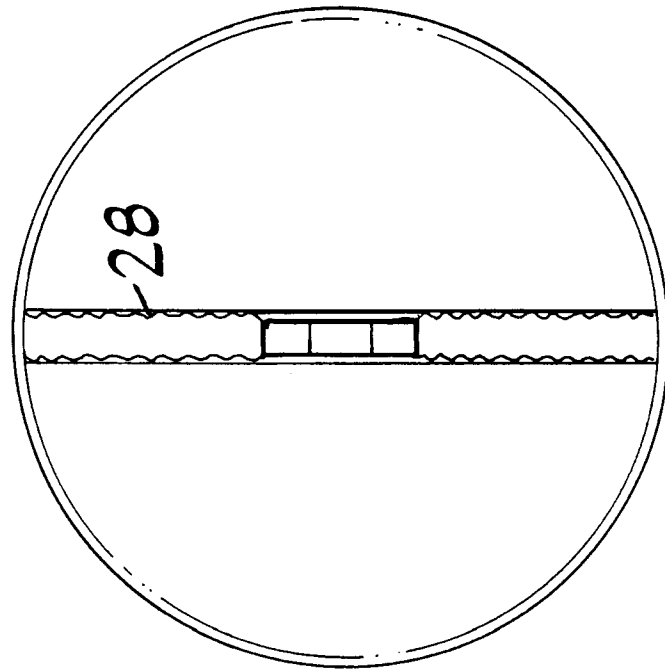


FIG. 3

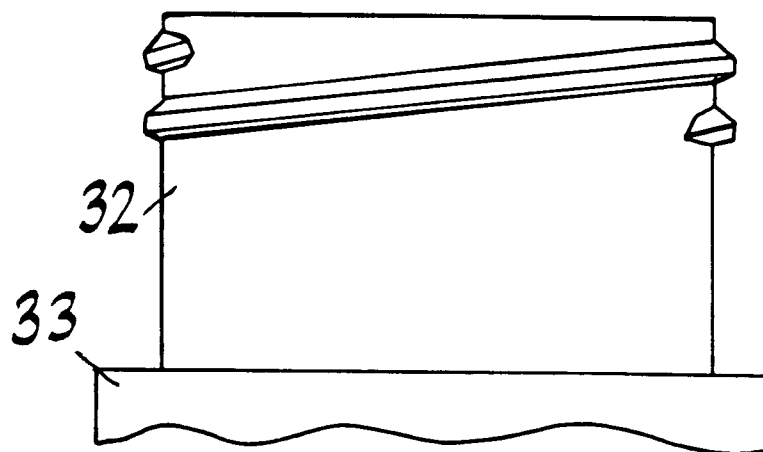


FIG. 7

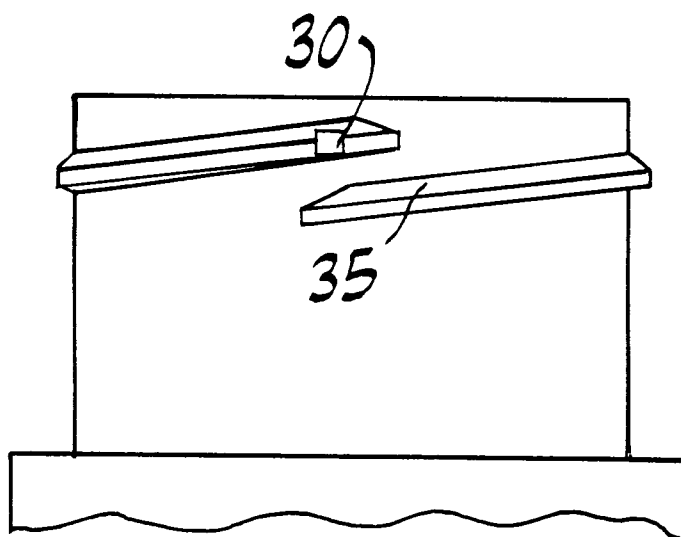


FIG. 8

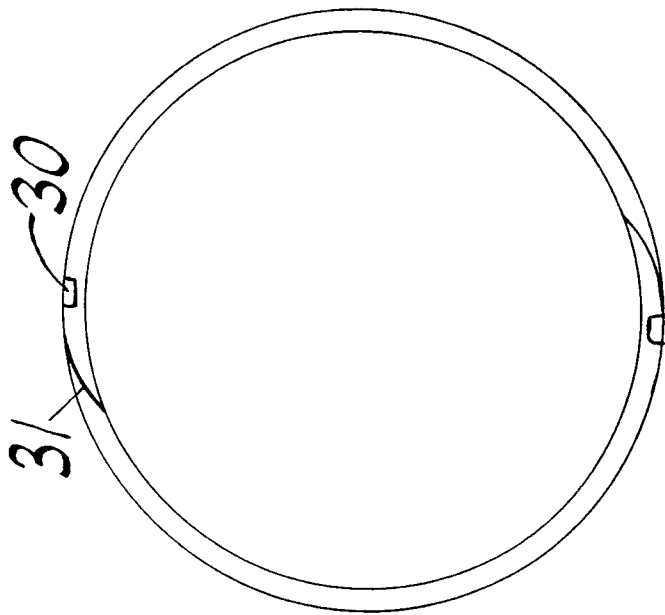


FIG. 5

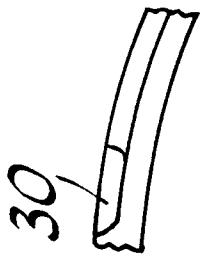


FIG. 6

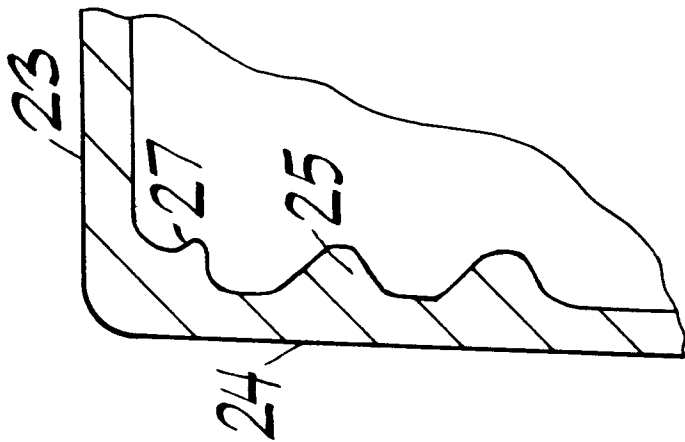


FIG. 9



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 30 2881

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)
D, Y	US-A-5 213 225 (KING ET AL.) * the whole document *	1-4, 7, 14	B65D41/04 B65D51/24
Y	FR-A-2 572 369 (LEFEBURE ISOLANTS REUNIS) * abstract; figures *	1-4, 7, 14	
A	US-A-5 184 740 (MANDRELL II ET AL.) * figures *	1, 5	
A	US-A-4 387 822 (LYNN) * abstract; figures *	1, 9-11, 19	
A	WO-A-93 01098 (BEESON AND SONS LTD.) * abstract; figures 23-29 *	1, 9-11	
A	US-A-3 581 926 (RODER) * abstract; figures *	1	
			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 25 July 1995	Examiner Gino, C
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