

Description

[0001] The invention relates generally to the field of packaging, and in particular to packaging for long rolls of photosensitive web material. More specifically, the invention relates to a light-tight packaging container, which includes features for keeping the container securely closed to ensure light-tightness during shipping and storage.

[0002] Typically, long rolls of photosensitive web material, e.g., photographic film used for surveillance, social/portrait, and commercial imaging are commonly packaged in containers ensuring light-tightness from the manufacturer to the film processor. The rolls of photographic film are wound onto cores with or without flanges. The light-tight containers generally have a film compartment and a closure adapted to fit rather snugly about the film compartment. The containers are often fabricated of metal or plastic.

[0003] It is well known that the closure for such film containers must be securely attached to the film compartment to ensure light-tightness during shipping and handling. An existing practice for securing the closure to the film compartment is by wrapping some sort of opaque or partially opaque adhesive material, such as tape, around the circumference covering the seam between the closure and film compartment. Generally, the manufacturer of photographic film product would apply the adhesive material or tape to the seam between the film compartment and the closure in a dark environment to ensure light-tightness of the product in the package during shipping and handling from the factory to the photographer. When the product is ready to be used, the photographer removes the tape from the seam and disposes of it in the environmental waste stream. The photographer then holds the packaging container in a light-tight closed condition until it has been inserted into a dark, film-changing bag or enters a dark room. While in the dark environment, the photographer then opens the packaging container, removes the film and installs it in the camera. After exposing the film, the photographer uses a dark, film-changing bag or dark room to remove the film from the camera and places the exposed film back into the light-tight packaging container. The photographer then secures the packaging container with the closure in a light-tight closed position about the film compartment and then wraps a tape about the seam to ensure light-tightness during shipping and handling from the photographer to the photo-finishing laboratory. The film processor or photo-finishing laboratory would then have to remove and dispose of the tape securing the seam between the closure and the film compartment in order to access the film.

[0004] It should be appreciated that existing packaging containers for photosensitive film product have numerous shortcomings. For instance, the adhesive material or tape introduces added labor cost (in the form of additional operators) to the film manufacture process.

Operators would then be exposed to the possibility of injuries when cutting the tape in a dark environment suitable for handling photosensitive film. Moreover, the tape introduces an undesirable cost burden to the film manufacturer who applies the tape to the container to protect the photosensitive product. Further, the tape is a waste burden to the photographer who removes the tape and ultimately disposes of it. Still further, the tape is a cost burden to the photographer who re-tapes the film container before shipment to the processing lab. Finally, the tape is a waste burden to the processing lab that removes the tape to access the exposed film. Thus, at some point the removed tape is disposed of by the processing lab.

[0005] Illustrative of existing containers having threaded and lockable closure elements primarily for safety and health is described in U.S. Patent 5,816,422, October 6, 1998, titled, "Package With Safety Lid and Seal" by Roig. According to the '422 patent the container has projections 5, 6 in the closure that mate with recesses 9 and 10 on the body. The integrity of the locking mechanism in the aforementioned patent does not conform to the requirements of light-tightness as does the present invention.

[0006] Therefore, a need persists for a packaging container for photosensitive film product that replaces the need for tape to ensure light-tight protection of the film product, which is simple to use and cost effective to produce.

[0007] It is, therefore, an object of the invention to provide a light-tight packaging container for photosensitive film product that is easy to access in a dark environment.

[0008] Another object of the invention is to provide a light-tight packaging container that can be easily resealed in a dark environment without the need for additional materials.

[0009] Yet another object of the invention is to provide a light-tight packaging container for photosensitive film that resolves the problem of adding product to the environmental waste stream.

[0010] It is a feature of the invention that a first detent feature formed on a flange of the film compartment interlocks with a cooperating second detent feature formed in the closure to secure the film compartment from the penetration of light.

[0011] To solve these and other objects, features and advantages of the invention, there is provided, in one aspect of the invention, a light-tight packaging container, comprising:

a generally cylindrical container compartment having a base, sidewalls surrounding said base, and a central opening opposite said base, said sidewalls having at least one first thread helically arranged thereon and a flange spaced from said thread and extending at least partially around said sidewalls, said flange having a first detent feature extending

axially from said flange; and,

a generally cylindrical closure configured for fitting over at least a portion of said sidewalls, said closure having at least one second thread helically extending from an interior wall for cooperatively engaging said first thread of said container compartment, said closure having a second detent feature formed in a peripheral end edge for interlocking with said first detent feature in said flange thereby securing said closure from axial movement along said flange.

[0012] The present invention has numerous advantageous effects over current developments. First, it eliminates the need for an adhesive tape to secure the seam between the closure and product compartment to ensure a light-tight condition inside the product compartment. Next, it eliminates the cost and waste associated with the adhesive tape. Further, it is simple and cost effective to manufacture. And, the packaging container of the invention is easy to use.

[0013] The above and other objects, features, and advantages of the present invention will become more apparent when taken in conjunction with the following description and drawings, wherein identical reference numerals have been used, where possible, to designate identical features that are common to the figures, and wherein:

Figure 1 is an isometric view of the closed packaging container of the invention;

Figure 2 is an isometric view of the closure showing the detention feature;

Figure 3 is an isometric view of the packaging compartment showing the detention feature;

Figure 4 is an enlarged view of the packaging compartment and closure detention feature interface;

Figure 5 is an isometric view of an alternative light-tight packaging container closure showing the detention and thread features;

Figure 6 is an isometric view of an alternative packaging compartment showing the detention and thread features; and,

Figure 7 is an isometric view of an alternative packaging container having cooperating threads and detent features.

[0014] Turning now to the drawings, and in particular to Figs. 1-4, a packaging container 10 and or components thereof suitable for storing and shipping, under light-tight conditions, an article, e.g., a roll of photosensitive film, is illustrated. In Figs. 1 and 4, the closed packaging container 10 of the invention is depicted having a container compartment 12 and a closure 22 (described below) fitted snugly about the container compartment 12 in a manner that prevents the penetration of light. According to Fig. 2, packaging container 10 has a container compartment 12 having a generally

cylindrical shape. As shown in Fig. 2, container compartment 12 has a substantially circular base 14, sidewalls 16 surrounding the base 14 and an opening 17 opposite the base 14 for accessing the container compartment 12. In a preferred embodiment, the sidewalls 16 have a flange 18 that extends at least partially around the circumference of the container compartment 12. Importantly, the flange 18 includes a first detent feature, preferably a protuberance 20, which extends axially from the flange 18.

[0015] Referring to Fig. 3, a generally cylindrical closure 22 for closing the opening 17 (Fig. 2) of the container compartment 12 is depicted. Closure 22 has at least one second detent feature 24, preferably two spaced notches, configured for interlocking with the first detent feature 20 in the flange 18 of container compartment 12. Second detent feature 24 is preferably at least one notch formed in a peripheral end edge 26 for capturing the protuberance 20 in the flange 18 thereby securing the closure 22 from movement along the flange 18.

[0016] Referring to Figs. 5 and 6, an alternative embodiment of the packaging container 10 (Fig. 1) of the invention is illustrated. According to Fig. 5, sidewalls 30 surrounding base 14 have a flange 18 and a first thread 36 extending helically at least partially around the sidewalls 16. As in the previous embodiment, the flange 18 includes a first detent feature 38 extending axially therefrom.

[0017] Referring to Fig. 6, a generally cylindrical closure 40 is configured for closing the opening 17. Closure 40 has an inside second thread 42 extending helically about an inner wall 43 of closure 40 for cooperatively engaging the outside first thread 36 of container compartment 12. A peripheral edge 44 of the closure 40 includes a second detent feature 46 for engaging the first detent feature 38 in the flange 18 thereby securing the closure 40 from axial movement along the flange 18.

[0018] In this embodiment, closure 40 can tightly close upon container compartment 12 by threadably screwing the first thread 36 into the second thread 42 so that the first detent feature 38 aligns with and then interlocks the second detent feature 46. This prevents light penetration into the container compartment 12 and unintended unscrewing of the closure 40 after the closure 40 has been coupled through axial pressure with the container compartment 12. Closure 40 may have a plurality of ribs 52 along its periphery for ease of engaging and disengaging the second thread 42 from the first thread 36.

[0019] As indicated above, the first detent feature 38 is preferably a protuberance having a generally arcuate shape. Skilled artisans will appreciate that the protuberance and the notch may have practically any shape such as a generally square shape, a generally V-shape, or a generally C-shape. Depicted in Fig. 5, on either end of the generally arcuate shape protuberance 38 is a first

land 54 and an opposed second land 56. The first and second lands 54, 56 guide the protuberance 38 between a light-tight and a light- "loose" position relative to the second detent feature or notch 46 (Fig. 6).

[0020] In another embodiment of the invention, a method of forming a light-tight packaging container 10 for photosensitive film product includes the step of providing a packaging container 10 and a removable closure 22 configured to fit snugly about the container compartment 12, each as described above. A first detent feature 20 is formed in the container compartment 12 by, for instance molding, and a second detent feature 24 configured for interlocking with the first detent feature 20 in a light-tight position is formed in the interior of the closure 22. Once the detents 20, 24 are formed, the removable closure 22 is fitted on the container compartment 12 so that the first detent feature 20 interlocks with the second detent feature 24 in a light-tight relations.

[0021] According to Fig. 7, in another embodiment of the invention, packaging container 10 (Fig. 1) may include a closure 60 having at least one first thread 62 on an interior wall 64 and at least one detent feature 66, as described above. Correspondingly, container compartment 68 may include at least one second thread 70 helically wound at least partially about the sidewall 69 for cooperating with the at least one first thread 62 in the closure 60. Container compartment 68 further has a second detent feature 72, as described above, for interlocking with the first detent feature 66 in the closure 60 when the packaging container 10 is closed. The first and second threads 62, 70 enable the user to tightly screw the closure 60 to the container compartment 68. The first and second detent features 66, 72 enable the closure 60 to resist axial movement thereby preventing the penetration of light into the container compartment 68 during handling and shipping.

[0022] Packaging containers 10, including the container compartment 12 and closure 22, are preferably made of a rigid thermoplastic material, such as high density polyethylene. Those skilled in the art, however, will appreciate that other material compositions may be used, such as polystyrene or polypropylene.

Claims

1. A light-tight packaging container, comprising:

a generally cylindrical container compartment having a base, sidewalls surrounding said base, and a central opening opposite said base, said sidewalls having at least one first thread helically arranged thereon and a flange spaced from said at least one first thread and extending at least partially around said sidewalls, said flange having a first detent feature extending axially from said flange; and, a generally cylindrical closure configured for fit-

ting over at least a portion of said sidewalls, said closure having at least one second thread helically extending from an interior wall for cooperatively engaging said at least one first thread of said container compartment, said closure having a second detent feature formed in a peripheral end edge for interlocking with said first detent feature in said flange thereby securing said closure from axial movement along said flange.

2. The packaging container recited in claim 1 wherein said first detent feature is a protuberance having a generally arcuate shape; and, said second detent feature is a notch.
3. The packaging container recited in claim 2 wherein said notch has a generally arcuate shape having a first land on one side and a second land on an opposite side for guiding said protuberance between an interlocking position and a free position relative to said notch.
4. The packaging container recited in claim 1 wherein said closure and said generally cylindrical container compartment are formed of a high density polyethylene material.

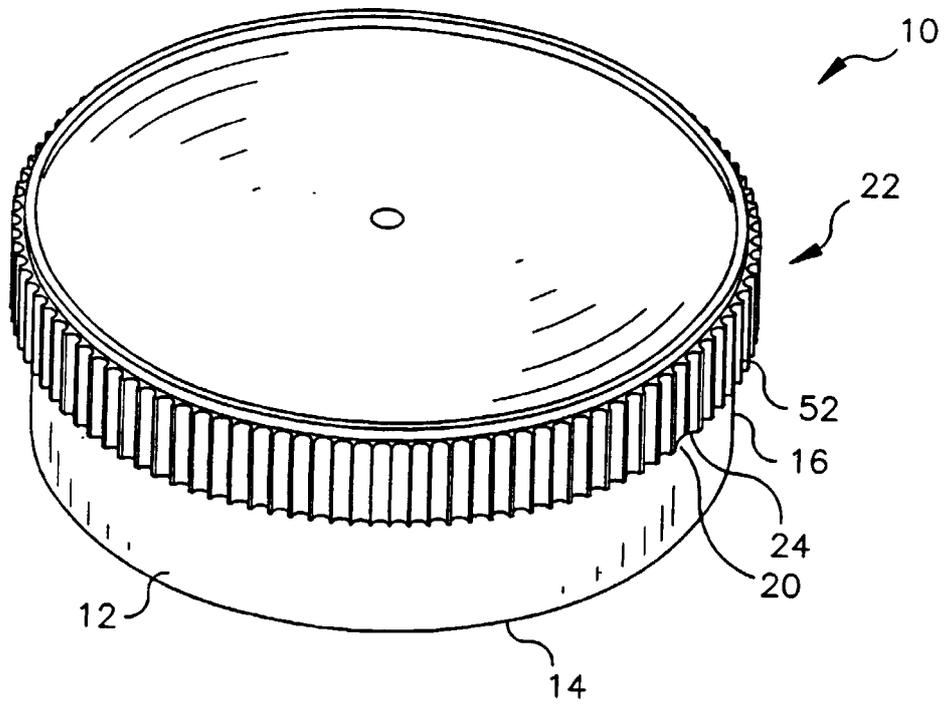


FIG. 1

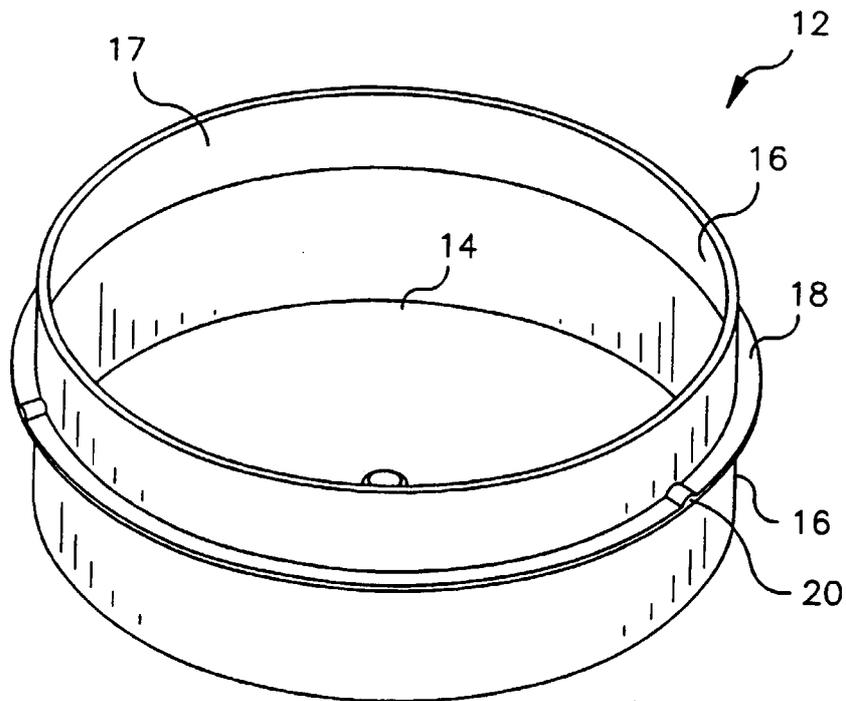


FIG. 2

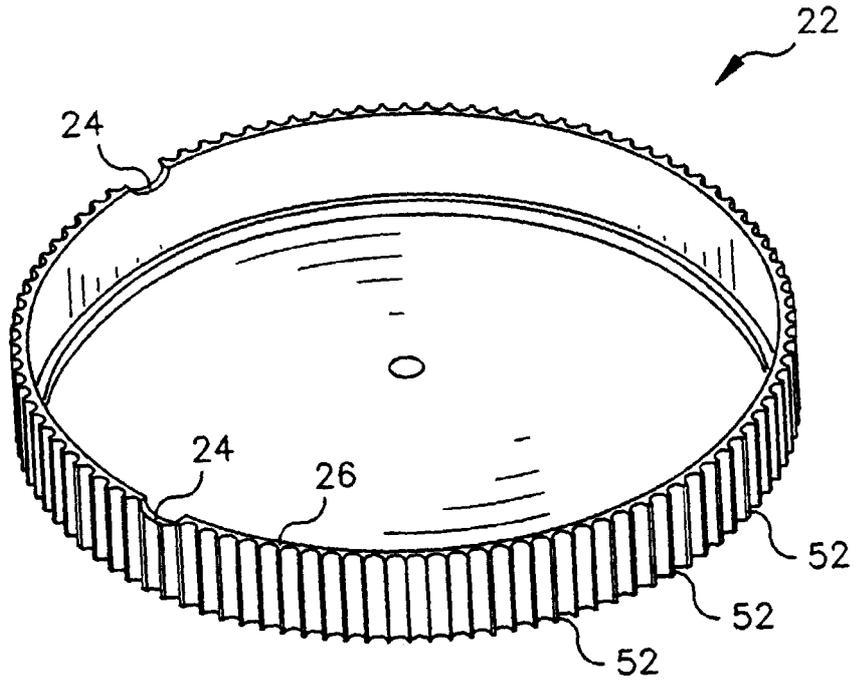


FIG. 3

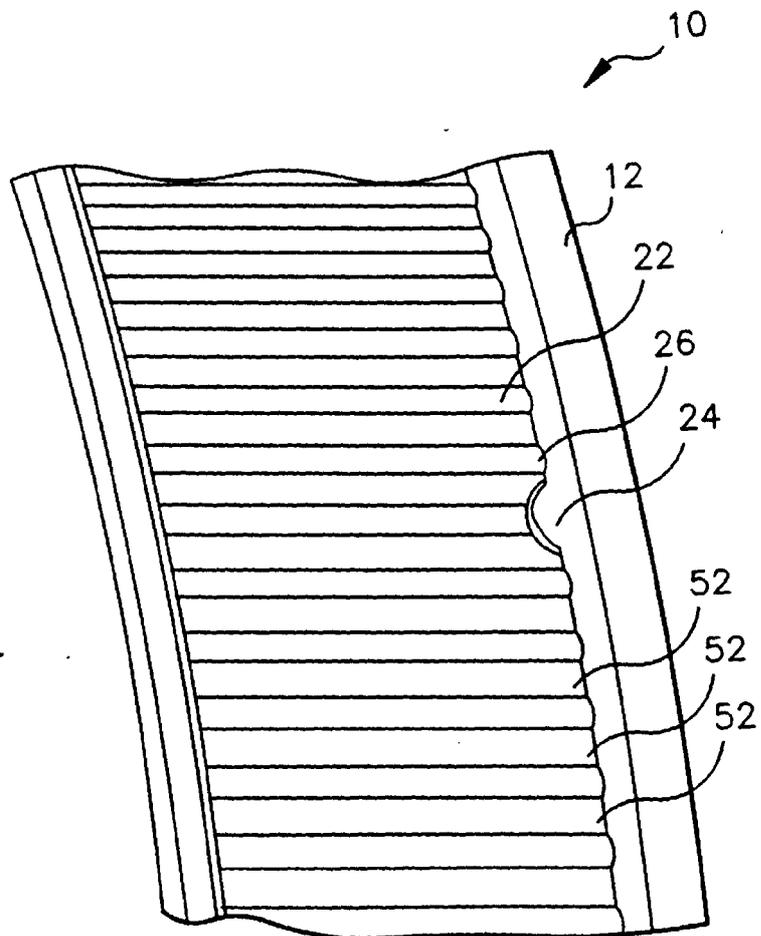


FIG. 4

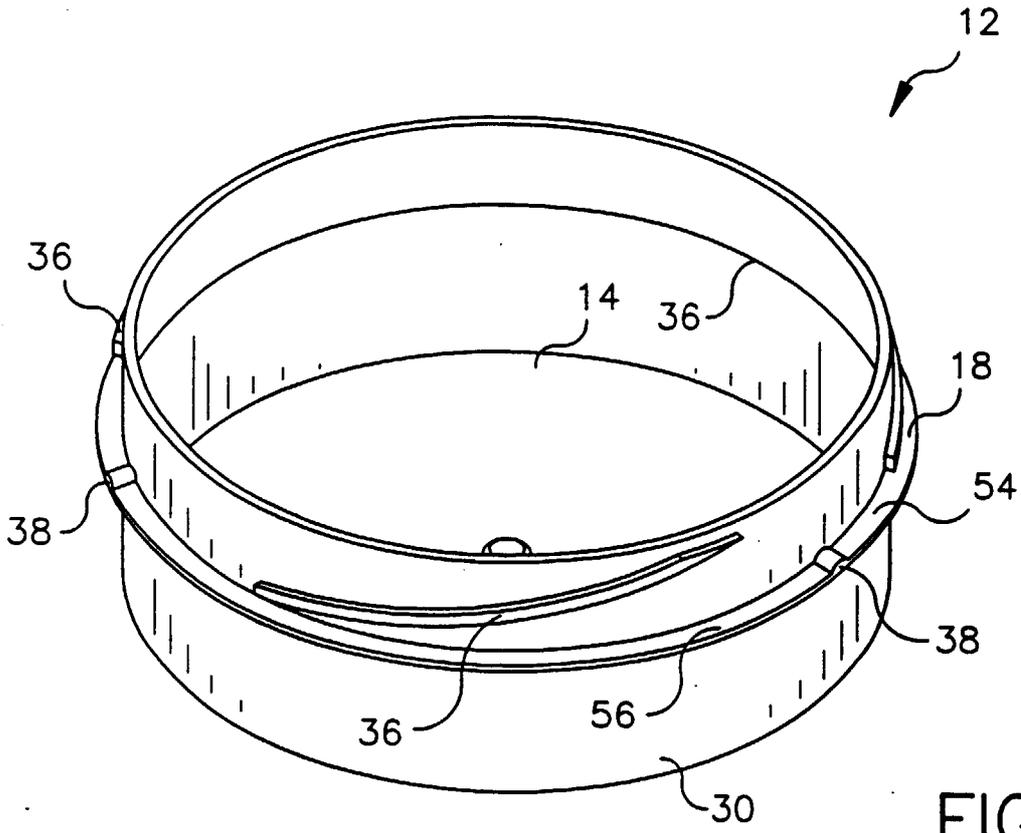


FIG. 5

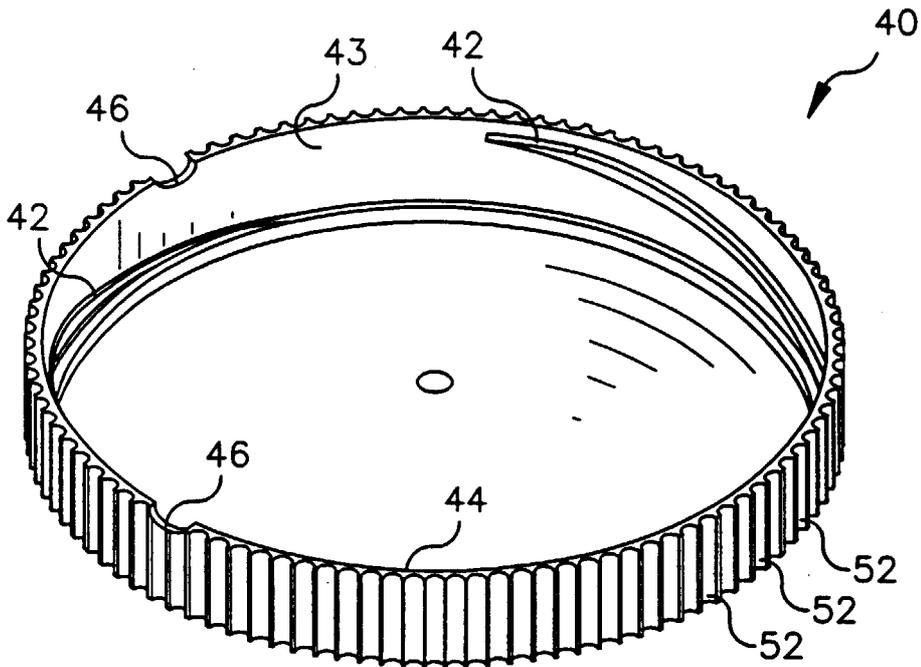
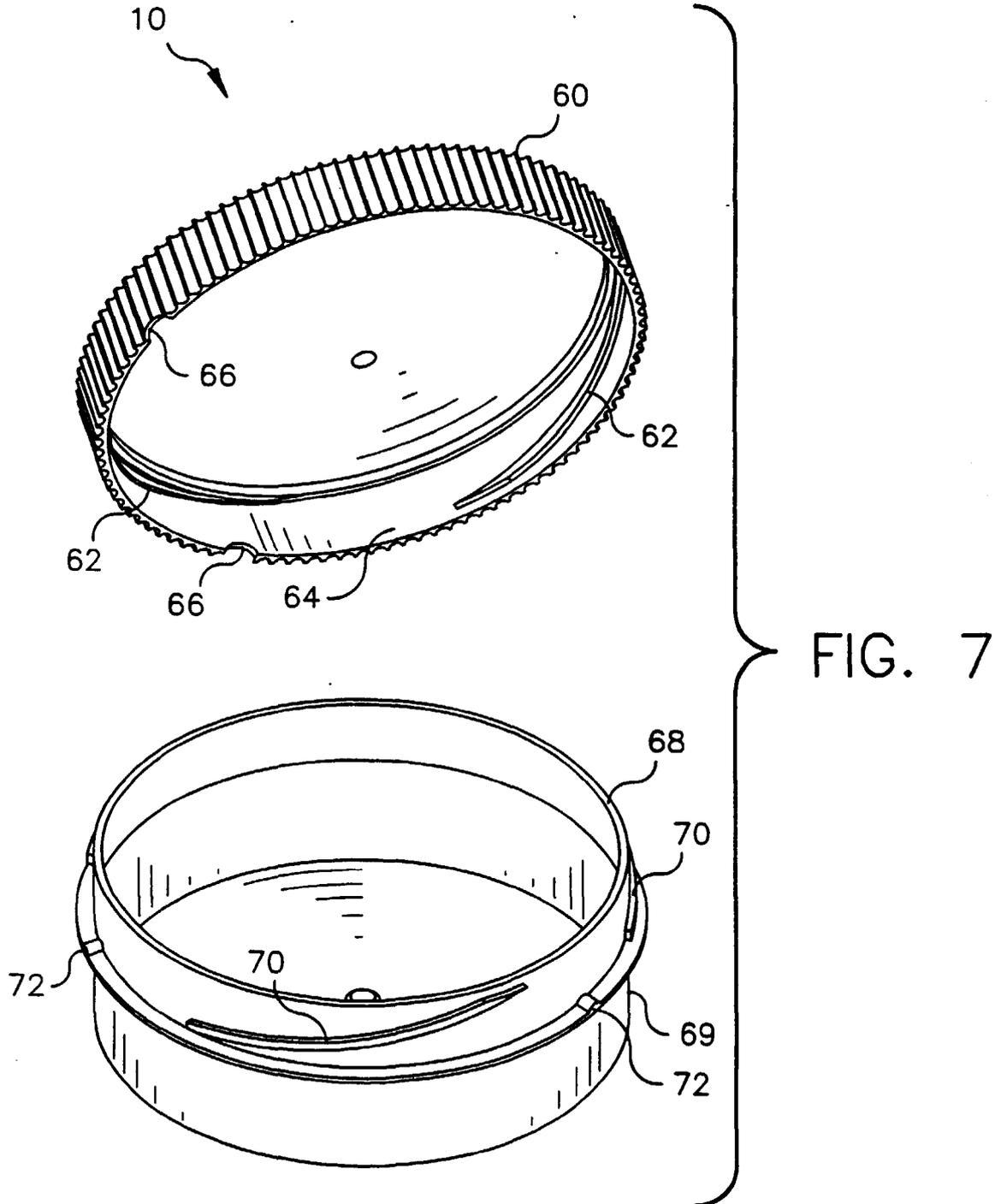


FIG. 6





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 20 3666

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
X	US 4 230 232 A (ATKINS HERBERT A) 28 October 1980 (1980-10-28) * figure 3 *	1-3	B65D41/04 B65D43/02
X	US 4 691 833 A (AHRENS WARREN S) 8 September 1987 (1987-09-08) * column 3, line 10; figure 5 *	1,4	
A		2	
X	EP 0 479 752 A (PROCTER & GAMBLE) 8 April 1992 (1992-04-08) * figure 3 *	1	
A		2	
X	US 4 011 829 A (WACHSMANN DORIS BERYL ET AL) 15 March 1977 (1977-03-15) * figure 5 *	1	
			TECHNICAL FIELDS SEARCHED (Int.CI.7)
			B65D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 5 February 2001	Examiner Sundell, O
CATEGORY OF CITED DOCUMENTS		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	
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			

EPO FORM 1503 03.92 (P04G01)

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

EP 00 20 3666

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.

05-02-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4230232 A	28-10-1980	AU 522680 B	17-06-1982
		AU 4516079 A	20-09-1979
		CA 1142480 A	08-03-1983
		DE 2910422 A	25-10-1979
		DE 7907434 U	20-12-1979
		GB 2017061 A, B	26-09-1979
		HK 94786 A	12-12-1986
		NZ 189913 A	23-02-1982
		ZA 7901177 A	26-03-1980
US 4691833 A	08-09-1987	DE 3604768 A	21-08-1986
		ES 296627 U	01-12-1987
		FR 2577525 A	22-08-1986
		GB 2171087 A, B	20-08-1986
EP 0479752 A	08-04-1992	US 5186344 A	16-02-1993
US 4011829 A	15-03-1977	DE 2543251 A	08-04-1976
		JP 51092278 A	12-08-1976
		AU 8507275 A	31-03-1977

EPO FORM P0458

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82