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(54) Method of forming a light-tight packaging container

(57) A method of forming a packaging container (10) for photosensitive film has a detent locking and unlocking feature that provides lighttight closure of the container to protect the product from light. A protuberance (20) formed in a portion of the film compartment (12) interlocks with a notch (24) formed in the closure (22).

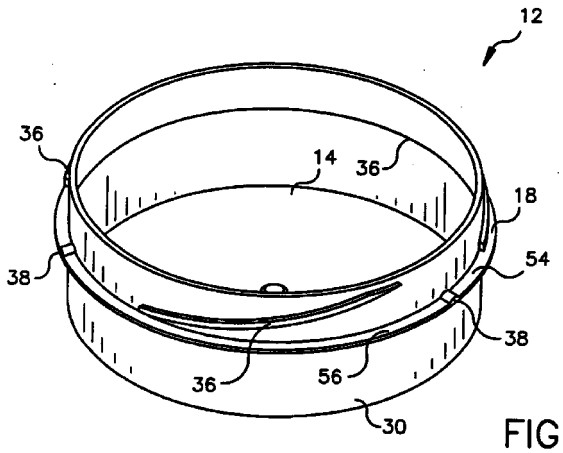

FIG. 5

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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 method of forming 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 entered 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 enters a 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 lighttight 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 for safety and health is the 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 problem of adding product to the environmental waste stream.

[0010] It is a feature of the invention that a first detent feature formed in the flange of the container compartment interlocks with a cooperating second detent feature formed in the closure for preventing axial movement of the closure when the container compartment is closed for handling and shipping.

[0011] To solve these and other objects, features and advantages of the invention, there is provided, in one aspect of the invention, a method of forming a light-tight packaging container for photosensitive film product, said method comprising the steps of:

providing a packaging container having a container compartment and a removable closure configured to fit snugly about the container compartment;

forming a first detent feature in said container com-

partment and a second detent feature configured for interlocking with the first detent feature; and.

fitting the removable closure on said container compartmetn so that said first detent feature interlocks said second detent feature in a light-tight relations.

[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 article compartment showing the detention feature;

Figure 4 is an enlarged view of the film 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; and,

Figure 6 is an isometric view of an alternative article compartment showing the detention and thread features.

[0014] Turning now to the drawings, and in particular to Figs. 1 - 3, a closed packaging container 10 of the invention suitable for storing and shipping under light-tight conditions, an article, e.g., a roll of photosensitive film, is illustrated. 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, side walls 16 surrounding the base 14 and an opening 17 opposite the base 14 for accessing the container compartment 12. In a preferred embodiment, the side walls 16 has 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 engaging the first detent feature 20 in the flange 18 of container compartment 12. Second detent feature 24 is preferably a 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 of the invention is illustrated. According to Fig. 5, sidewalls 30 surrounding base 14 have a first portion 32 and an adjacent second portion 34. The first portion 32 has a flange 18 and a first thread 36 extending at least partially around the first portion 32. 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 for cooperatively engaging the outside first thread 36 in the first portion 32 of sidewall 30 of the 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 12 by threadably screwing the first thread 36 into the second thread 42 so that the first detent feature 38 aligns with and locks into the second detent feature 46. This prevents light penetration into the interior compartment and unintended unscrewing of the closure 40 after the closure 40 has been coupled through axial pressure with the container compartment 12. Closure 22 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. Depicted in Fig. 5, on either end of the generally arcuate shape protuberance is a first land 54 and an opposed second land 56. The first and second lands 54, 56 guide the protuberance between a light-tight and a light- "loose" position relative to the second detent feature or notch 46.

[0020] In another embodiment of the invention, a method of forming a lighttight 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 engaging 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 engages the second detent feature 24 in a light-tight relations.

[0021] Packaging containers 10, including the con-

tainer 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 method of forming a light-tight packaging container for photosensitive film product, said method comprising the steps of:

   providing a packaging container having a container compartment and a removable closure configured to fit snugly about said container compartment;
   forming a first detent feature in said container compartment and a second detent feature configured for interlocking with said first detent feature; and.
   fitting said removable closure on said container compartment so that said first detent feature interlocks said second detent feature in a light-tight relations.

2. The method recited in claim 1 wherein said step of forming a first detent feature further includes the step of providing a plurality of spaced first detent features arranged in a common plane in a flange at least partially surrounding said packaging container.

3. The method recited in claim 2 further including the step of forming at least one first thread in said container compartment and at least one second, cooperating thread in said removable closure for engaging said at least one first thread.

4. The method recited in claim 3 further including twisting said removable closure about said container compartment so that said at least one first thread engages said at least one second thread.

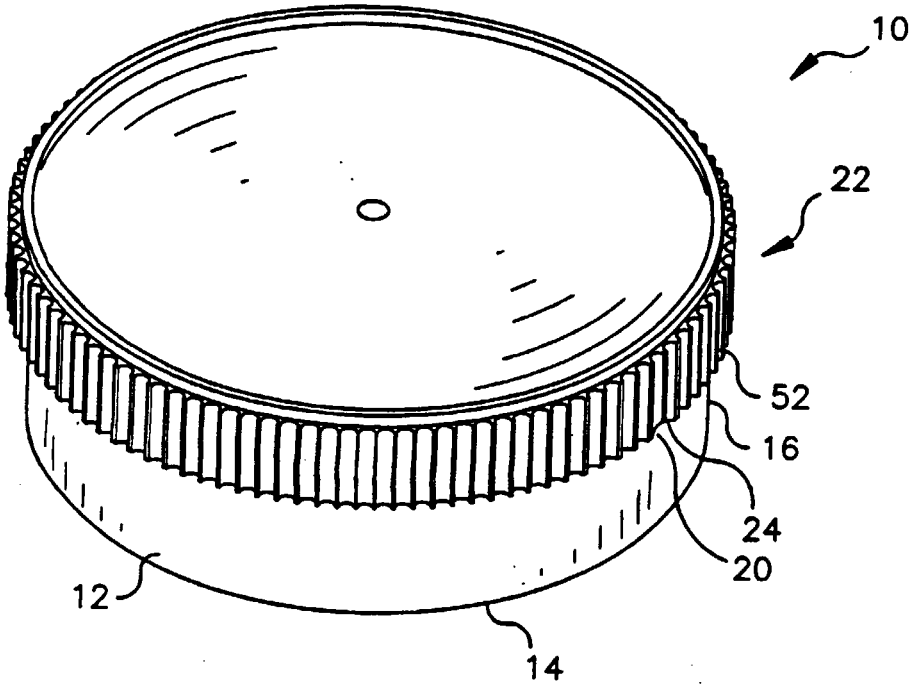

FIG. 1

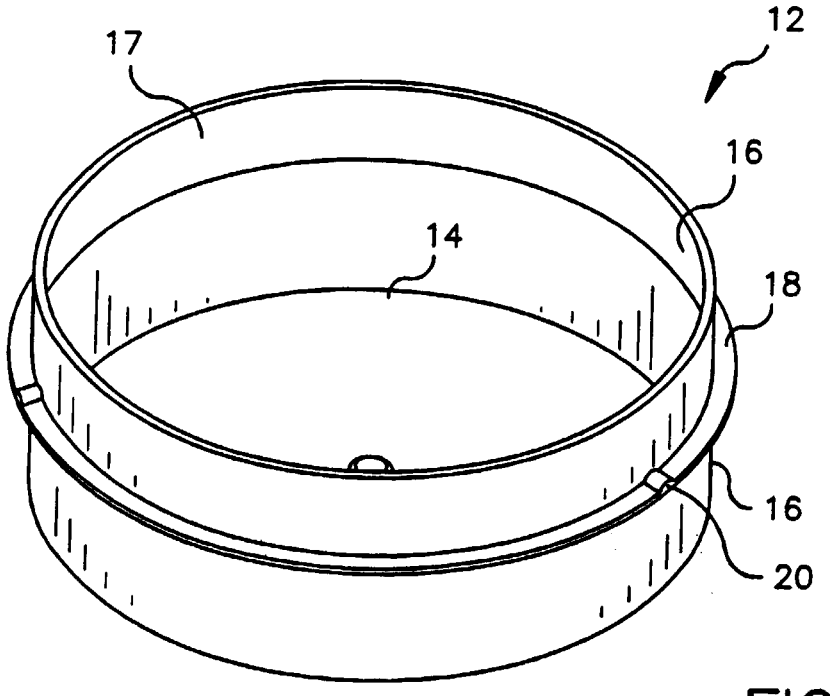

FIG. 2

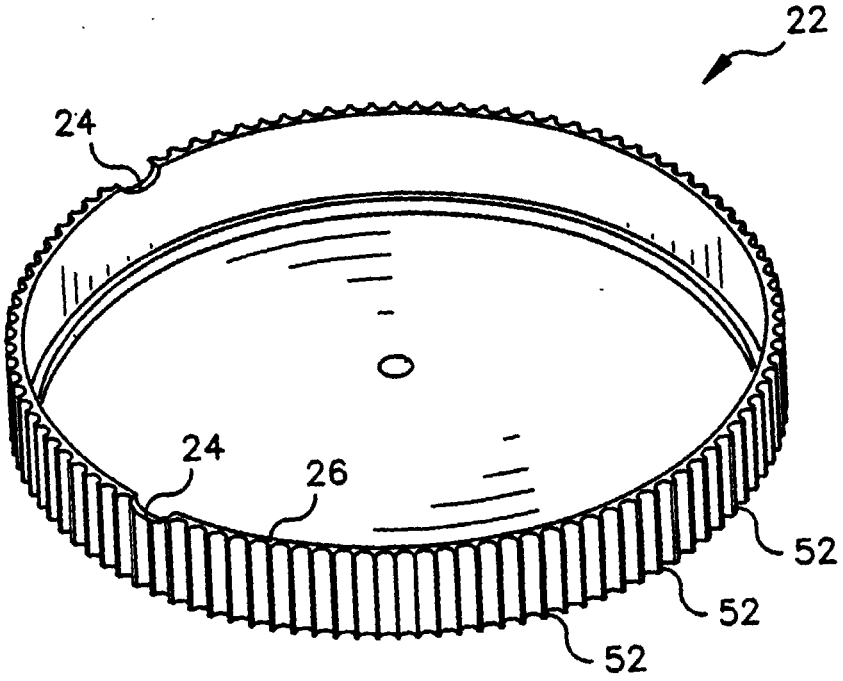

FIG. 3

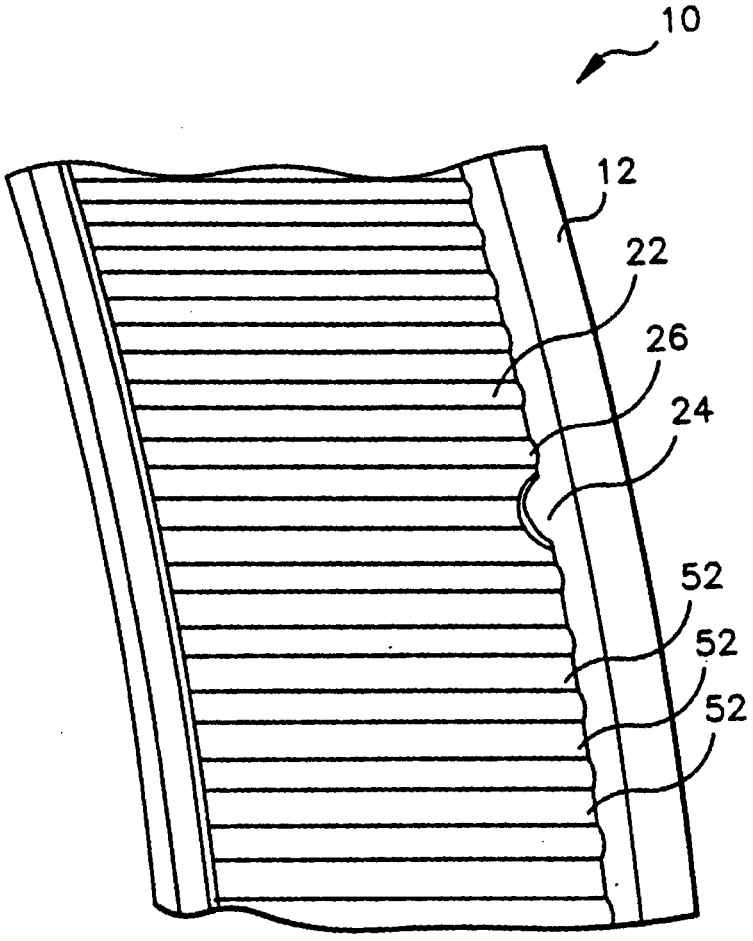

FIG. 4

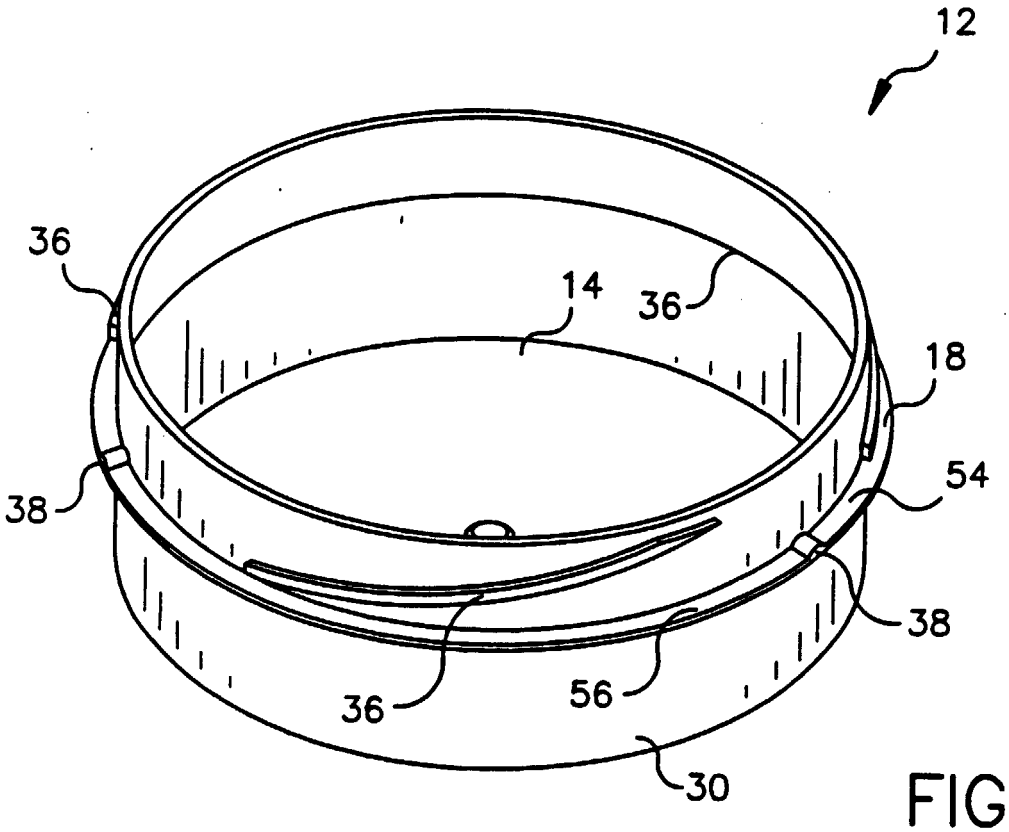

FIG. 5

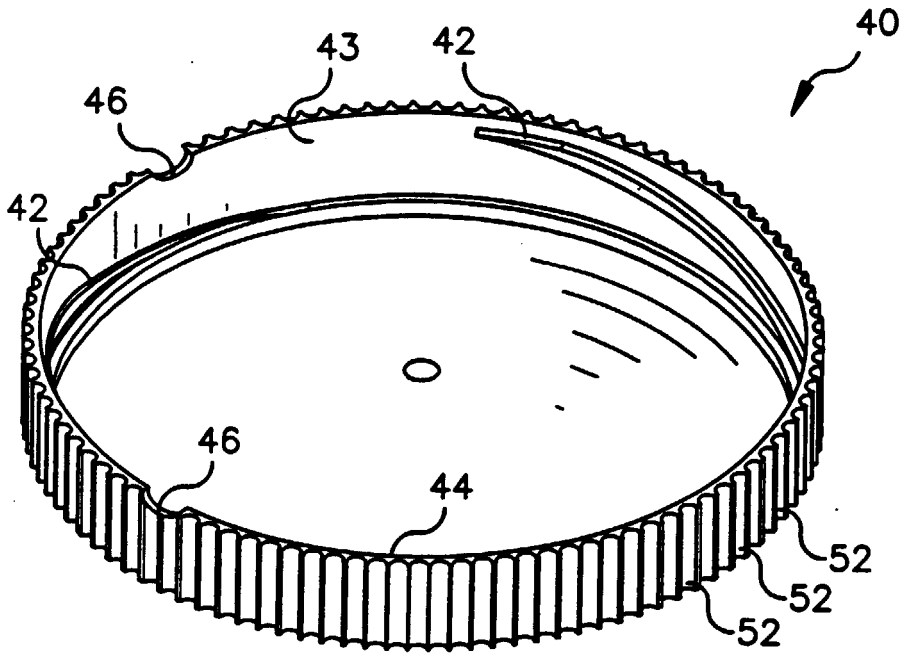

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 00 20 3736

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.7)
X	US 4 230 232 A (ATKINS HERBERT A) 28 October 1980 (1980-10-28) * figure 3 *	1-4	B65D41/04 B65D43/02
X	US 3 891 110 A (GACH PETER P) 24 June 1975 (1975-06-24) * figure 6 *	1-4	
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	5 February 2001	Sundell, O

CATEGORY OF CITED DOCUMENTS

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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
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05-02-2001

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