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(54) **Molded containers for storing lubricating oils**

(57) A molded plastic container including at least one frontal wall (2), a top wall having at one end thereof a capped neck (6) extending upwardly therefrom and which meets the at least one frontal wall (2) at a vertex portion (3) at an end opposite to the neck (6), a bottom wall, and

a generally horseshoe-shaped, concave recess (1) in the vertex portion (3). The recess (1) has dimensions sufficient to receive an inverted capped neck (6) of an adjacent molded plastic container, thereby enabling nesting of the containers.

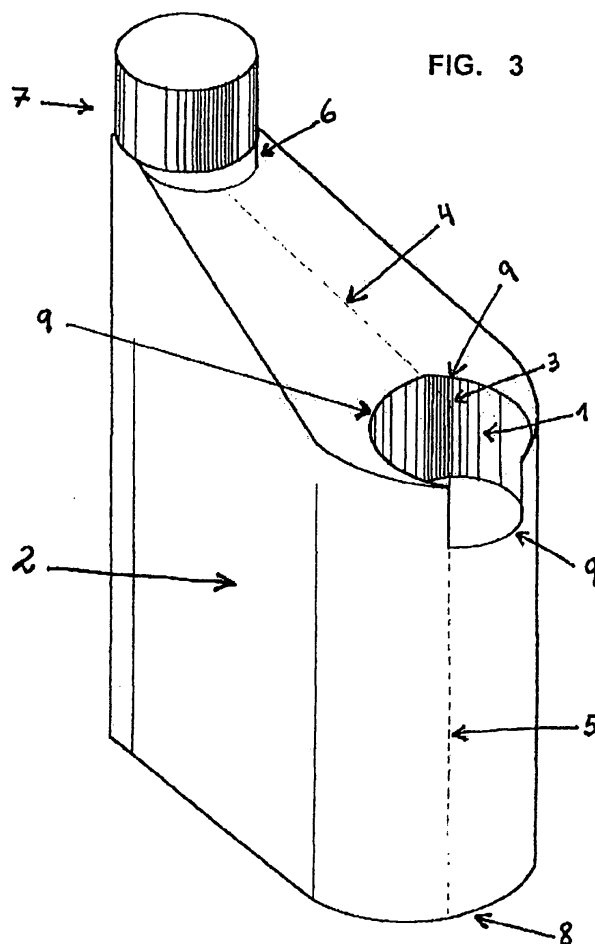


FIG. 3

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Description

Background of the Invention

[0001] The invention relates to the field of packaging liquids, particularly lubricating oils.

[0002] The traditional manner of packaging lubricating oils of general and other liquids in plastic containers with a flat frontal face and the neck to one side is broadly practiced and standardized worldwide. Traditionally, all such containers have been manufactured with all sides, namely the vertical, horizontal and inclined sides, respectively, smooth.

[0003] Traditionally, these plastic containers hold 1 liter and, once filled they are packaged in cardboard cartons in batches of 12. These containers are always packaged in cardboard cartons - with the neck upwards and side by side - in vertical position and, in this way, they occupied a given cubic space.

Summary of the Invention

[0004] It is an object of the invention to reduce packaging, handling, transportation and storage costs associated with plastic containers.

[0005] It is a further object of the invention to provide a container with a visual presentation similar to that of prior art containers.

[0006] To achieve these and other objects, the invention is directed to a molded plastic container comprising at least one frontal wall, a top wall having at one end thereof a capped neck extending upwardly therefrom and which top wall meets the at least one frontal wall at a vertex portion at an end opposite to the neck, a bottom wall, and a generally horseshoe-shaped concave recess in the vertex portion, the recess having dimensions sufficient to receive an inverted capped neck of an adjacent molded plastic container, thereby enabling nesting of the containers.

[0007] As is customary in the art, the top wall typically has a downward slope from the neck to the vertex portion, and the recess typically has the shape of an incomplete circle, about 300°.

Brief Description of the Drawings

[0008]

Figure 1 is a frontal view of a container according to the invention;

Figure 2 is a frontal view, with associated top view and bottom view of a container according to the invention;

Figure 3 is a perspective view of a container according to the invention from the top and front side;

Figure 4 is a rear side view of a container according to the invention;

Figure 5 is a front side view of a container according

to the invention;

Figure 6 is a frontal view of two containers approaching each other for nesting; and

Figure 7 is a frontal view of two nested containers.

Description of the Preferred Embodiments

[0009] The scope the invention is a futuristic model featuring a concave cavity - the edge of which is horseshoe-shaped - molded into plastic containers currently used for storing lubricating oils in general and other liquids - shown from a frontal angle in Fig. 1.

[0010] This concave cavity **1** - the edge of which is horseshoe-shaped - will be molded in the upper section of the plastic container, which has an irregular vertical frontal profile **2**, being formed starting from the center of vertex portion **3**, which is formed at the point at which the lower part of angled edge **4** meets peak of the vertical edge **5**, which starts at the base of the container. From the upper border of the same angled edge, there emerges circular neck **6** with a circular screw-top lid **7**, such that the internal body of the container and the base are irregular, as shown in a pear shape **8** in Fig. 2.

[0011] This concave cavity is shown clearly in Fig. 3. The edge of the cavity is horseshoe-shaped, and molded in the plastic container in the shape of an incomplete circle **9**, of approximately 300°, with a diameter a few millimeters larger than the diameter of the circular screw-top lid, and its depth a few millimeters greater than the sum of the width of the circular neck and the height of the circular lid screwed down onto the neck. This concave cavity, when molded into a 1-liter plastic container, occupies a volume of approximately 40 milliliters.

[0012] Despite its simplicity, the application of the recess to the sides of the many vertical-structured plastic containers currently being manufactured, can meet the requirements of globalization. First, this embodiment would minimize packaging costs, because the cardboard cartons which hold the containers, would be smaller in size, as well as the transportation costs, since a greater number of cartons per vehicle could be transported and therefore, proportionately, a greater number of containers per vehicle, and storage costs, since there would be considerable savings in terms of physical space. All these benefits would be achieved by the insertion of a concave cavity in the plastic containers, and this would be obtained without any substantial alteration in the former visual presentation. The old product image in terms of marketing would be totally preserved.

[0013] The reduction of costs in the end product achieved by the insertion of a horseshoe-shaped concave cavity in the side of the plastic containers, is significant and will be obtained as follows.

[0014] By utilizing the containers of the invention, a differentiated and economic manner of packaging of the filled containers in cardboard cartons is made possible. Thanks to this differentiated and economic manner of packaging, the cubic area of a cardboard carton, which

currently holds 12 containers, will be reduced to a far smaller size. The reduction of the cubic area of the cardboard carton is achieved by the innovative way of packaging the same batch of 12 containers, made possible by the concave cavity inserted to the side of the plastic containers.

[0015] The batch of 12 containers is currently packaged in cardboard cartons with the neck upwards and side by side in vertical position. With the insertion of a concave cavity in the side of the 12 containers, these same containers can be arranged in a differentiated manner in another cardboard carton, with a volume reduced by approximately 30%. This reduction in volume, shown in Figs. 6 and 7, will be achieved thanks to the innovative way in which the 12 containers will be laid out in the cardboard carton. There will be 6 batches with 2 containers in each batch, as seen in Fig. 7, arranged side by side. Each batch of 2 containers will be arranged - in vertical position - in an inverse and anatomic way, as follows: one container will be placed with the neck upwards, and this neck will nest in the concave cavity of the other container placed, in inverted position, with the neck facing downwards; the other container will be placed with the neck facing downwards, and this neck will fit in an anatomic way into the concave cavity of the other container placed, in inverted position, with the neck facing upwards.

[0016] It is important to stress of this modern manner of packaging, which will be achieved by the utilization of a concave cavity of the invention, will serve to reduce costs of packaging, handling, transportation and storage and may also be used in similar fashion in all plastic containers of all volumes, for being filled with lubricating oils in general and other liquids.

[0017] The reduction in costs of packaging, handling, transportation and storage added to other items of scale, could result in savings of approximately 35%. In order that such savings may be demonstrated and fully understood, an example is set forth using 1-liter plastic lubricating oil containers. A comparison is made between the traditional containers used for packaging lubricating oils and the containers of the invention, produced with a concave cavity incorporated.

[0018] The cost survey was extremely conservative, using as a basis a pallet measuring 120 cm in length by 100 cm in width and cardboard cartons containing 12 1-liter containers of lubricating oil piled up and based on a height limit of 140 cm. In this pallet, 2 cardboard carton piling exercises were conducted using different carton volumes, albeit each one containing 12 1-liter lubricating oil containers.

- The 1st exercise was conducted with cardboard cartons of the traditional volume, containing 12 old 1-liter lubricating oil containers. This carton measures 37.2 cm in length by 27 cm in width and 22 cm in height. Since the pallet has an area of 12,000 cm², 12 cardboard cartons can be placed in each horizontal layer. Vertical piling of 6 layers was carried out

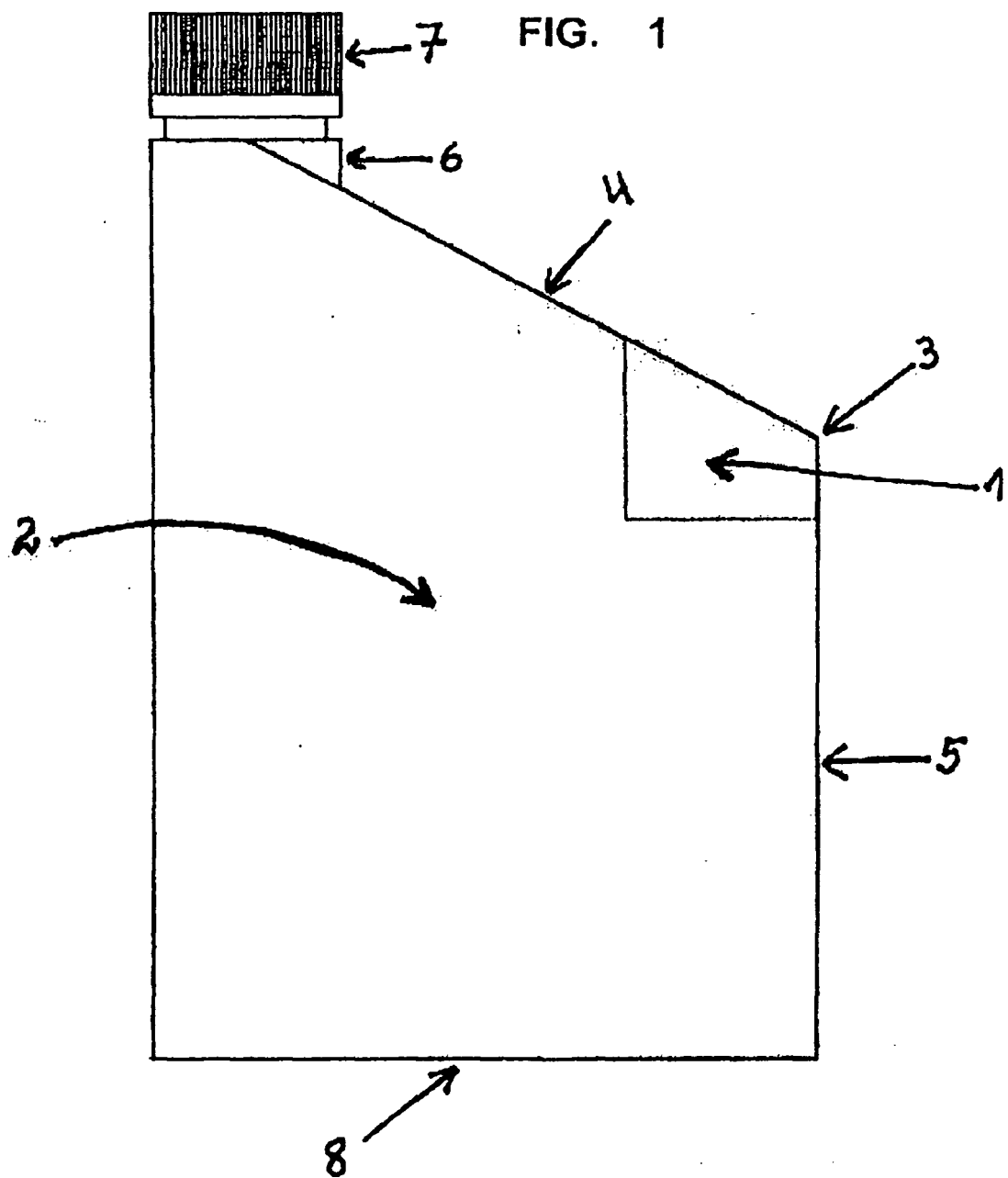
with a total height of 132 cm, resulting in the arrangement of 72 cardboard cartons per pallet.

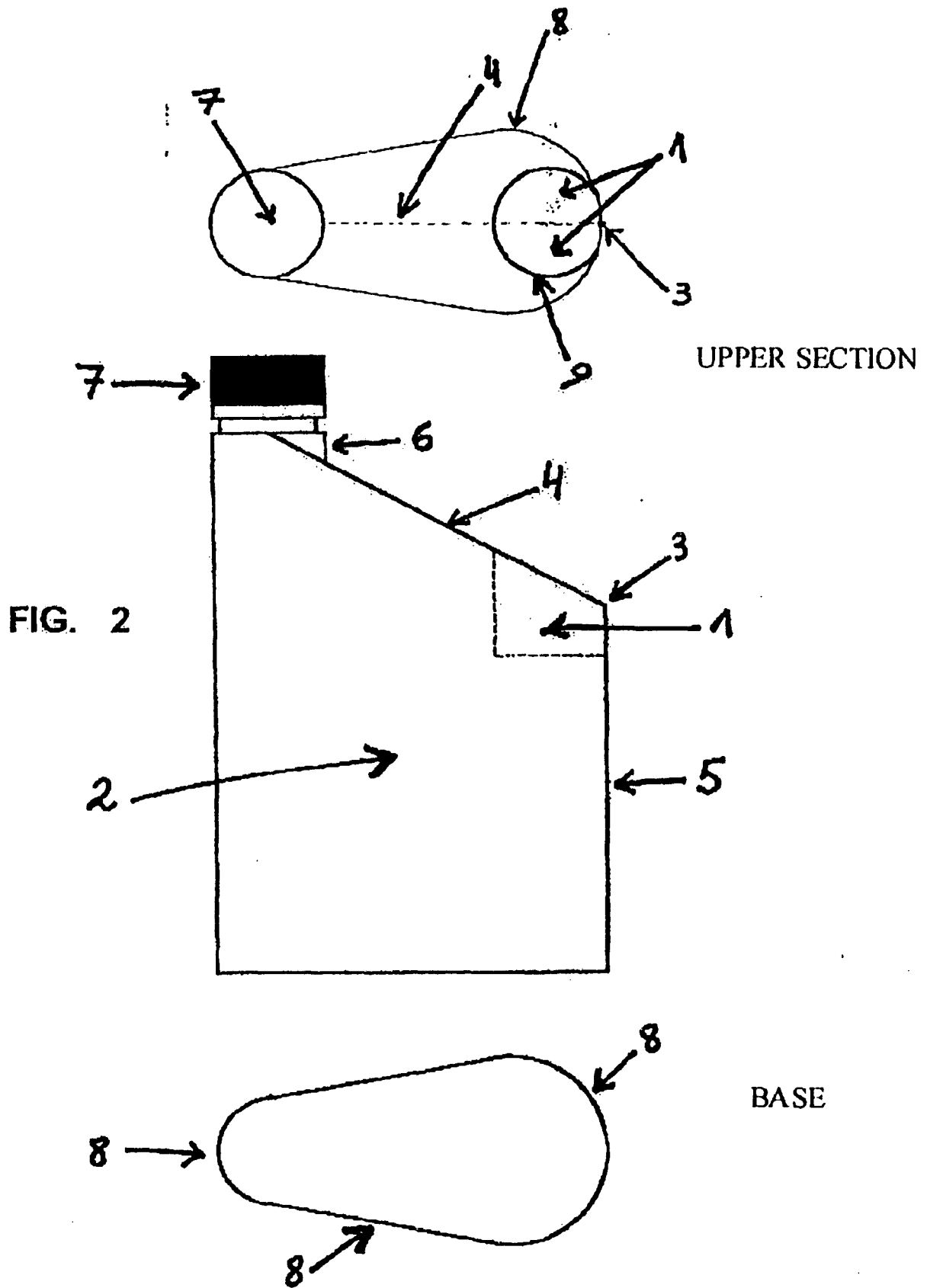
- The 2nd exercise was conducted with cardboard cartons of reduced volume containing 12 1-liter containers of lubricating oil according to the invention. The reduced volume carton measures 37.2 cm in length by 13.5 cm in width and 34 cm in height. Since the pallet has an area of 12,000 cm², 24 cardboard cartons can be placed in each horizontal layer. Vertical piling of 4 layers was carried out with a total height of 136 cm, resulting in the arrangement of 96 cardboard cartons per pallet, for an increase of one third in the number of 1-liter containers per pallet, from 864 to 1152.

[0019] It has thus been shown that with the use of the invention, manufacturers of the products, transporting companies, traders and even end users, will certainly benefit by the reduction in costs of packaging, handling, transportation and storage.

Claims

1. A molded plastic container comprising at least one frontal wall, a top wall having at one end thereof a capped neck extending upwardly therefrom and which top wall meets the at least one frontal wall at a vertex portion at an end opposite to the neck, a bottom wall, and a concave recess in the vertex portion, the recess having dimensions sufficient to receive an inverted capped neck of an adjacent molded plastic container, thereby enabling nesting of said containers.
2. The container of claim 1, wherein the top wall has a downward slope from the neck to the vertex portion.
3. The container of claim 1, wherein the recess has the shape of an incomplete circle, of about 300°.
4. The container of claim 1, which has a volume of about 1 liter.
5. The container of claim 1, containing lubricating oil.
6. A carton containing a plurality of molded plastic containers of claim 1, wherein the capped neck of each of the containers is nested in a recess of an adjacent container in inverted relationship thereto.
7. The carton of claim 6, containing 12 molded plastic containers.





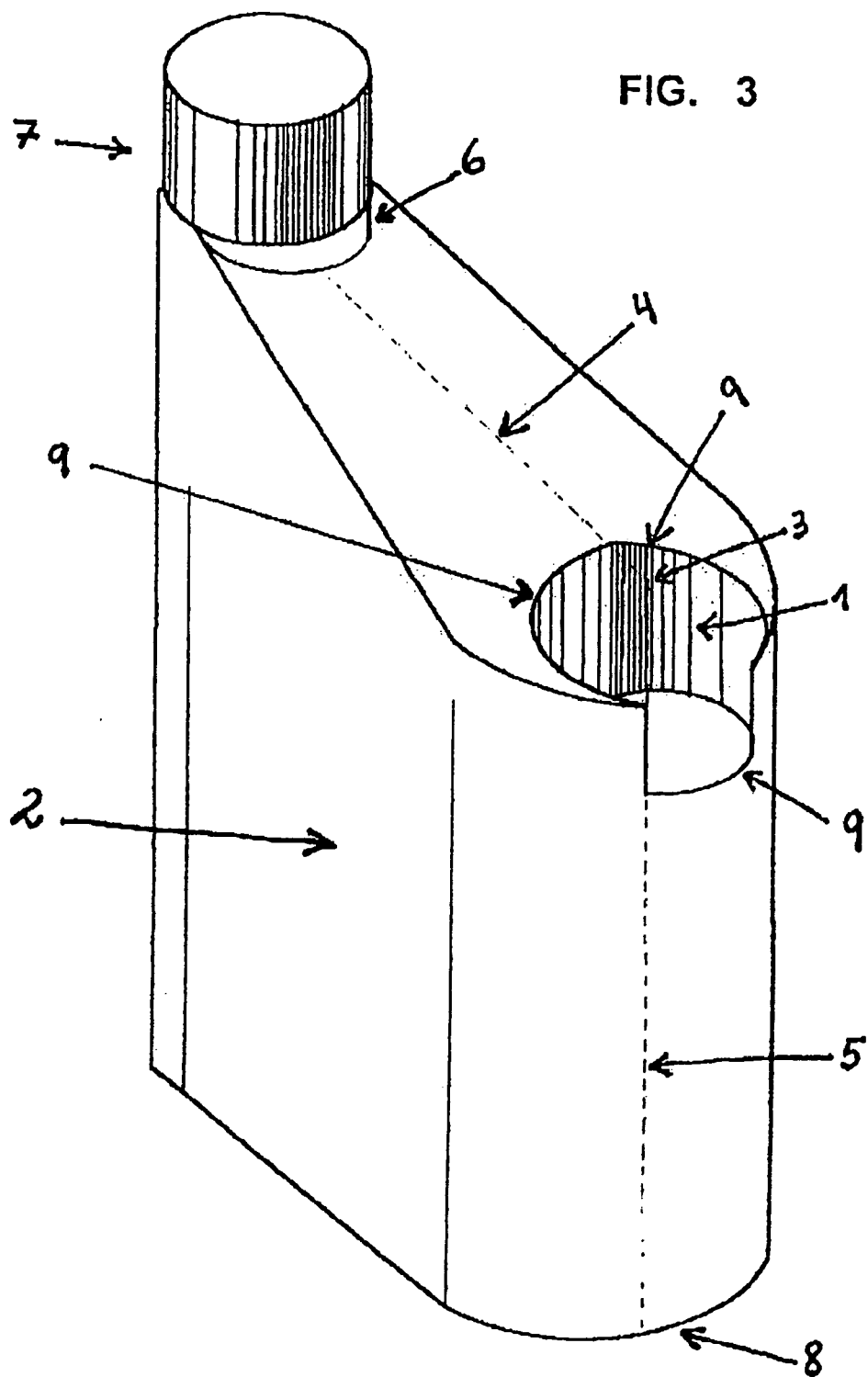


FIG. 5

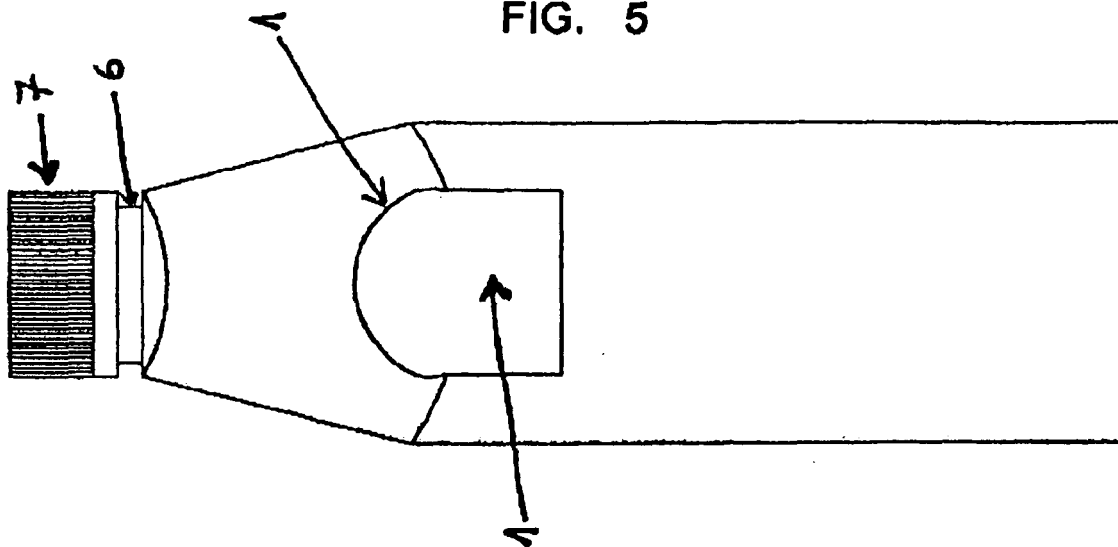


FIG. 4

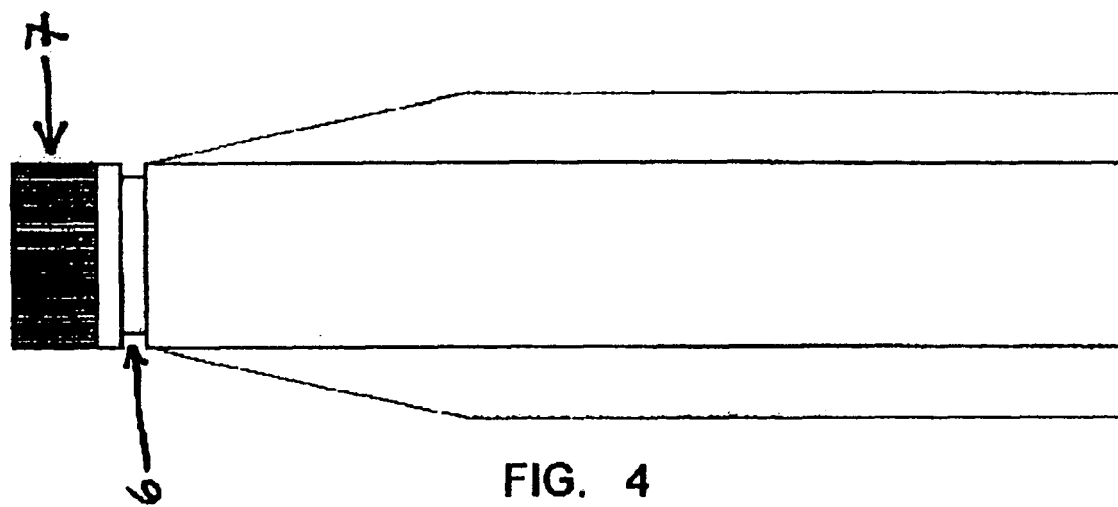


FIG. 6

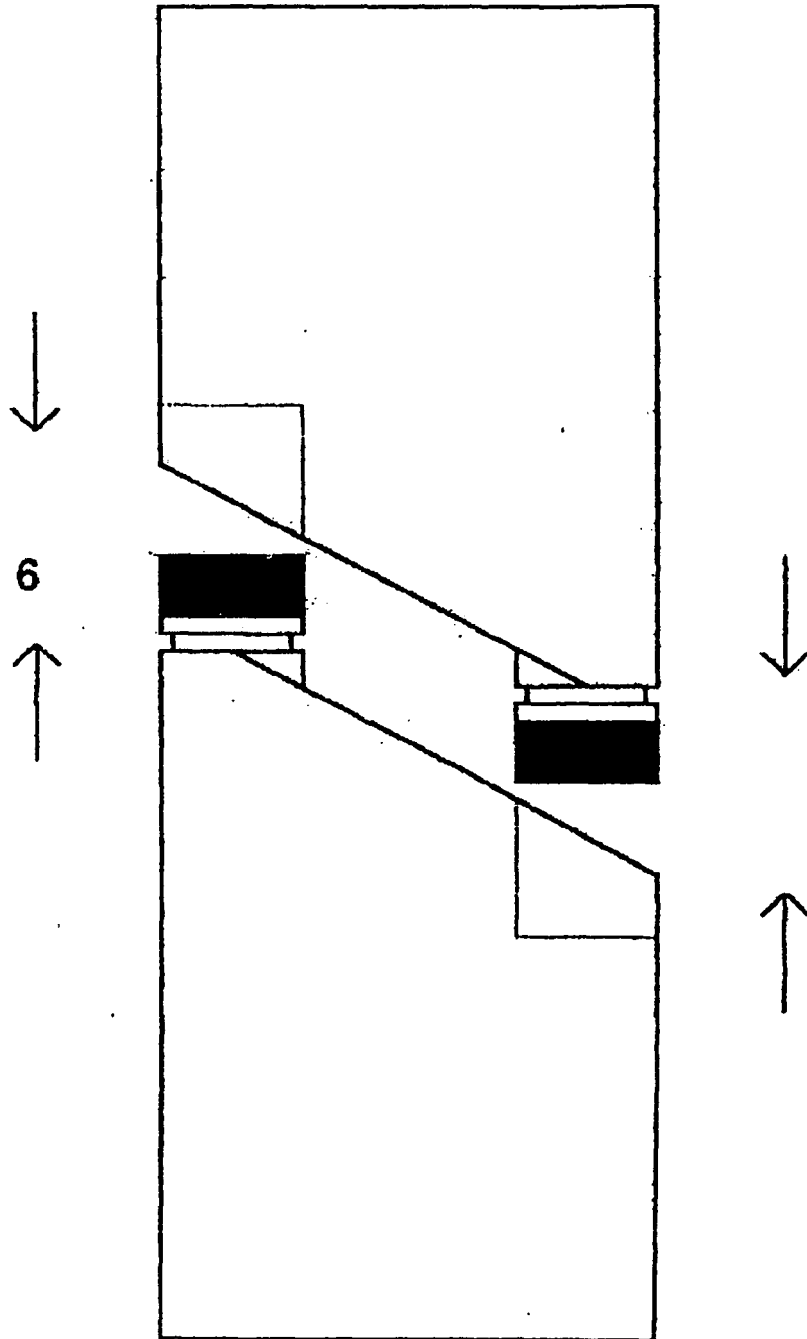
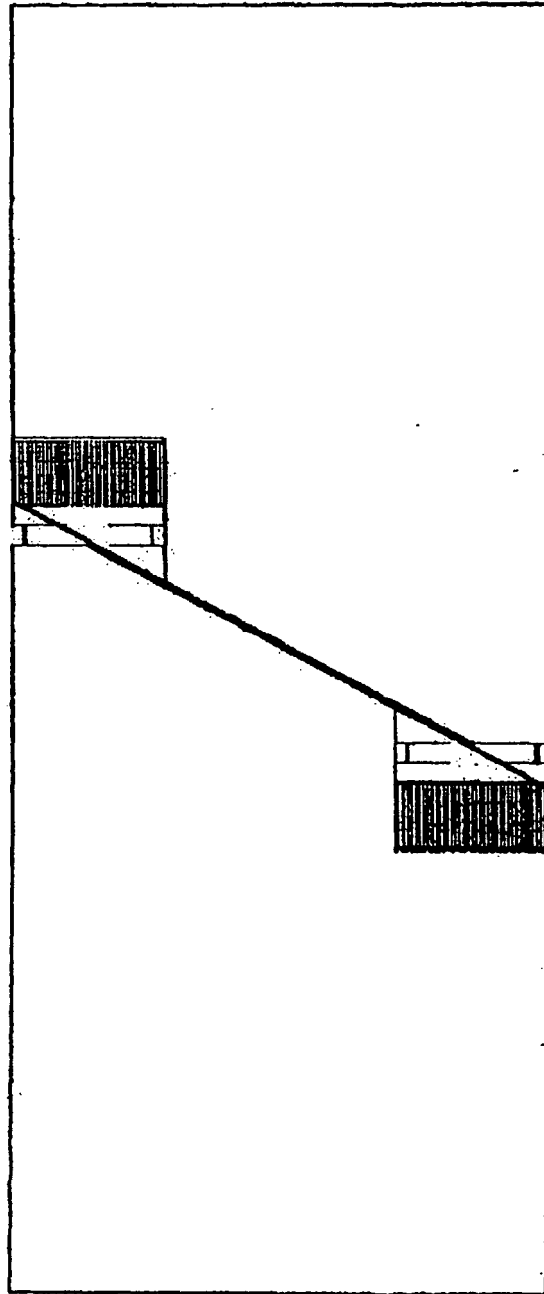


FIG. 7





DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 4 573 595 A (MEDNIS ET AL) 4 March 1986 (1986-03-04) * column 4, line 36 - column 5, line 19 * * column 11, line 27 - column 12, line 30; figures 2,3 *	1-7	B65D21/02
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B65D
Place of search		Date of completion of the search	Examiner
Munich		17 November 2005	Vesterholm, M
CATEGORY OF CITED DOCUMENTS 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 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			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 05 29 1206

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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