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(54) **DEVICE INSERTED IN INVIOLABLE LID FOR BOTTLES**

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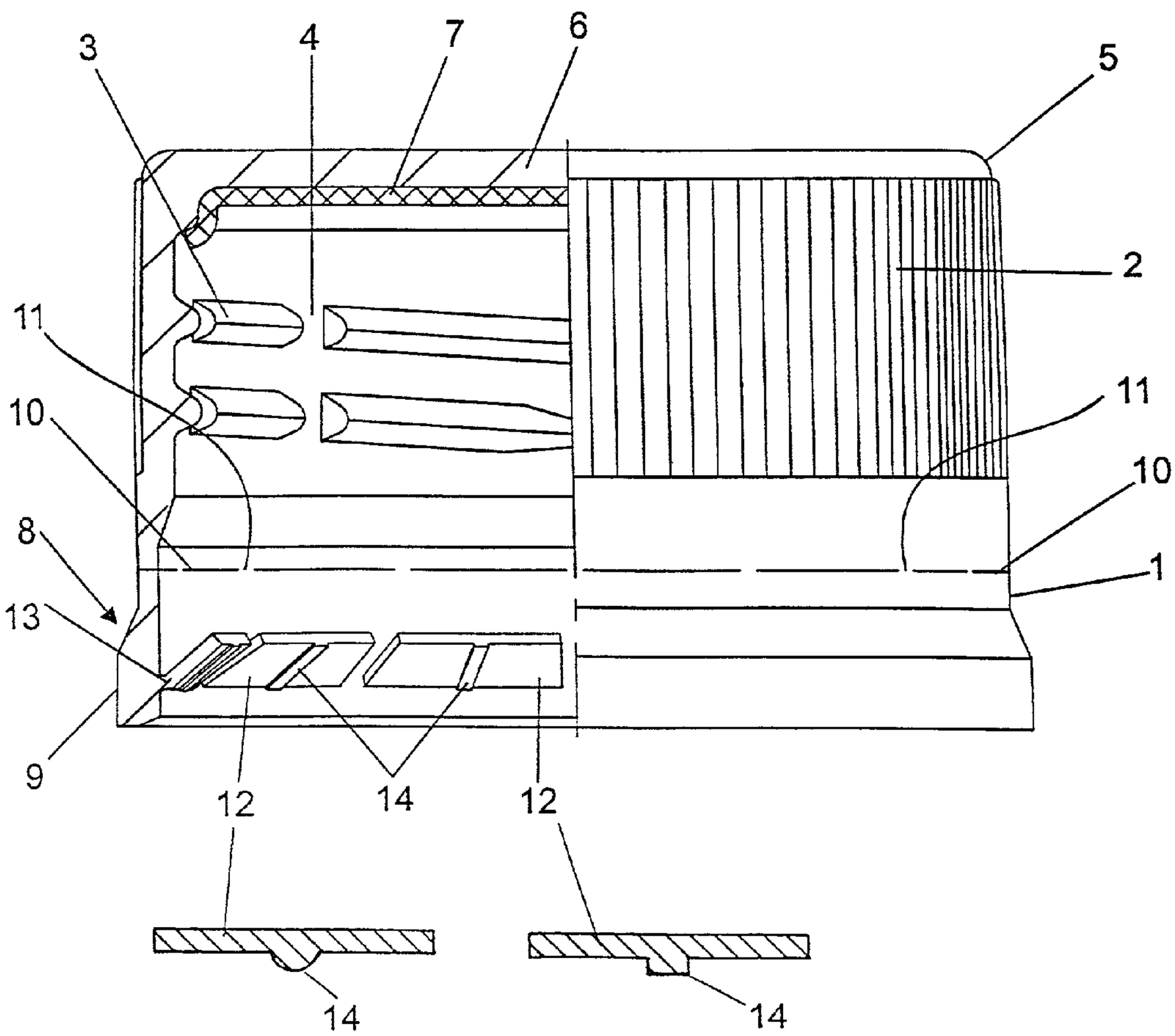
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(57) **ABSTRACT**

A device inserted in an inviolable lid for bottles, comprising a cylindrical skirt and upper closure, as well as an outer nonslippery surface, and an inner thread having interrupted sections. An inner sealing layer is disposed below the upper closure. Its lower end has a seal band with a slight increase in outer wall thickness and a circular cutting line with rupturable portions. The seal band has a plurality of hinged blades just above its lower edge that are projected radially inward. The blades are equidistantly spaced, each configured so that it can hinge upwardly. The blades work as locking components between the lid and the bottle. Each blade has an antifriction rim or bead on its lower face (against the bottle neck). The rim extends centrally from the base of the blade to its distal end.



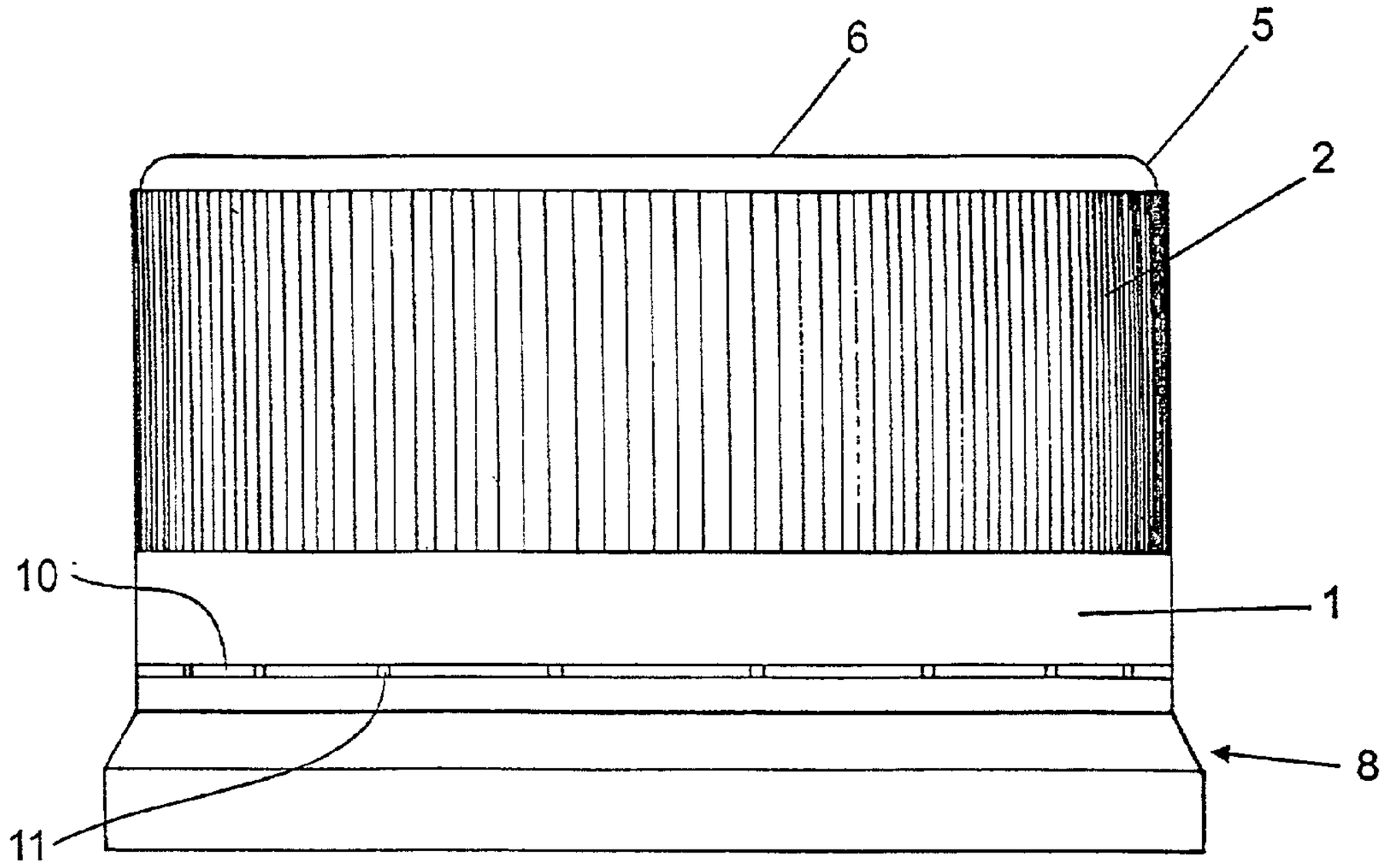


FIG. 1

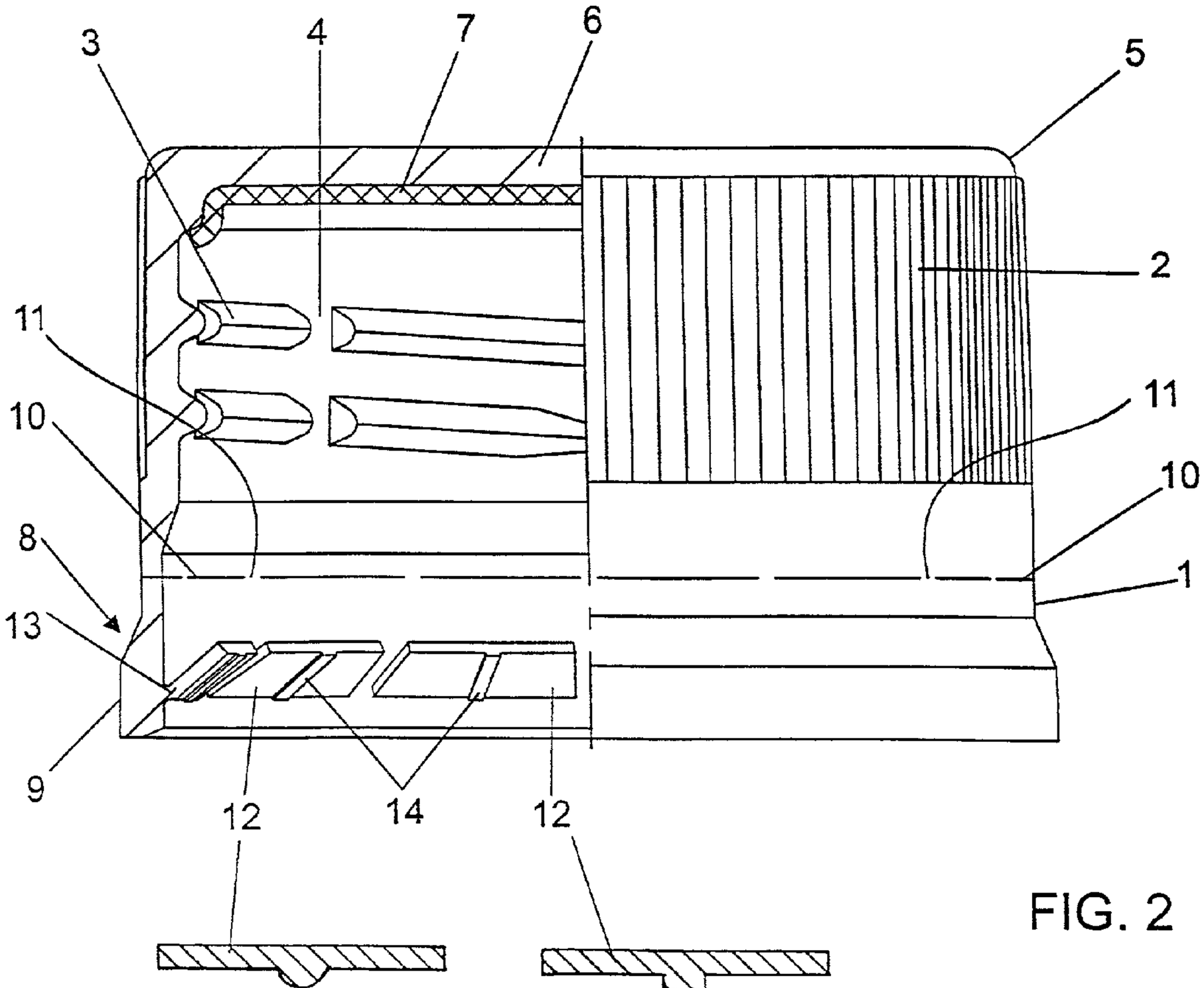


FIG. 2

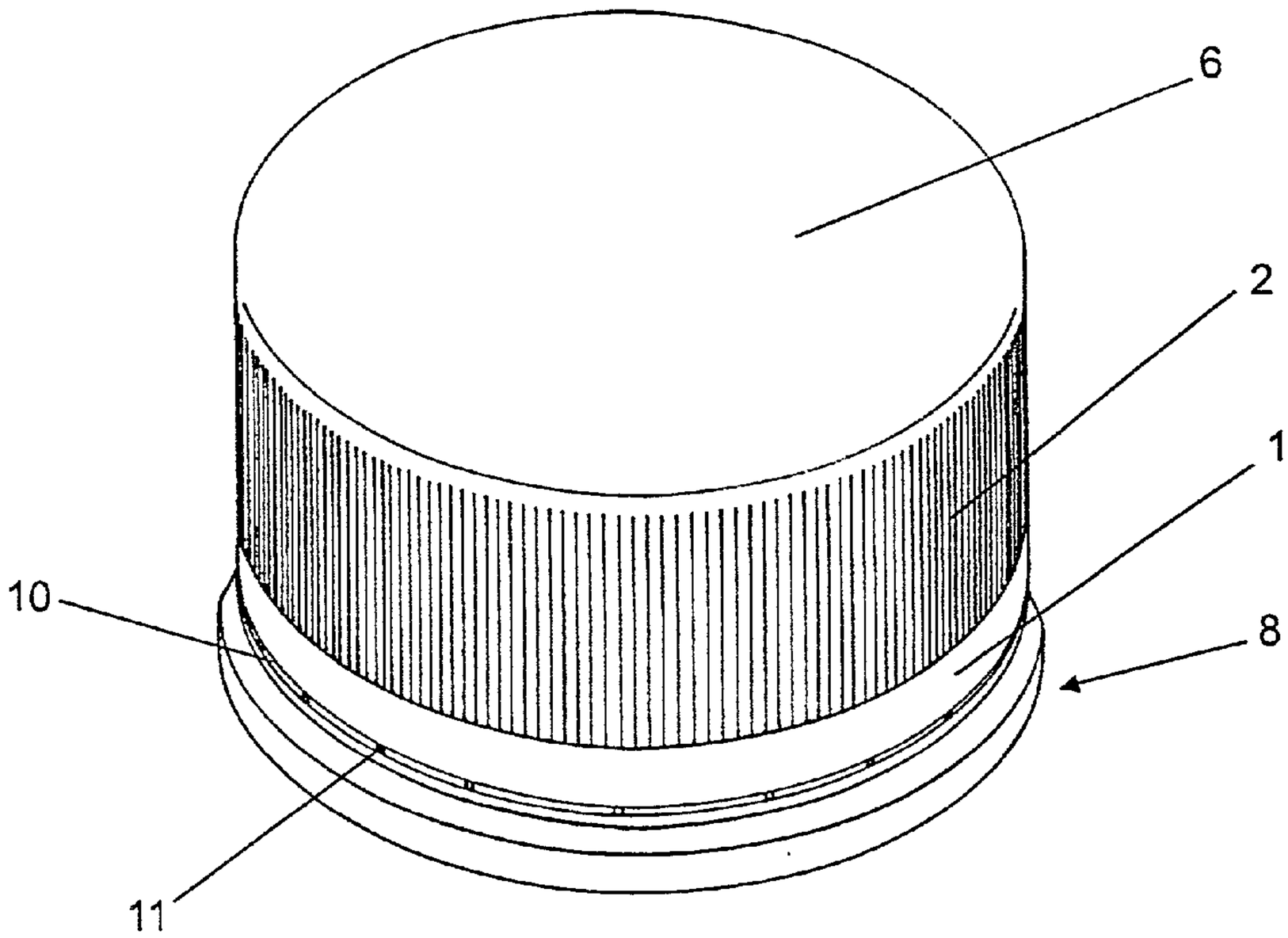


FIG. 3

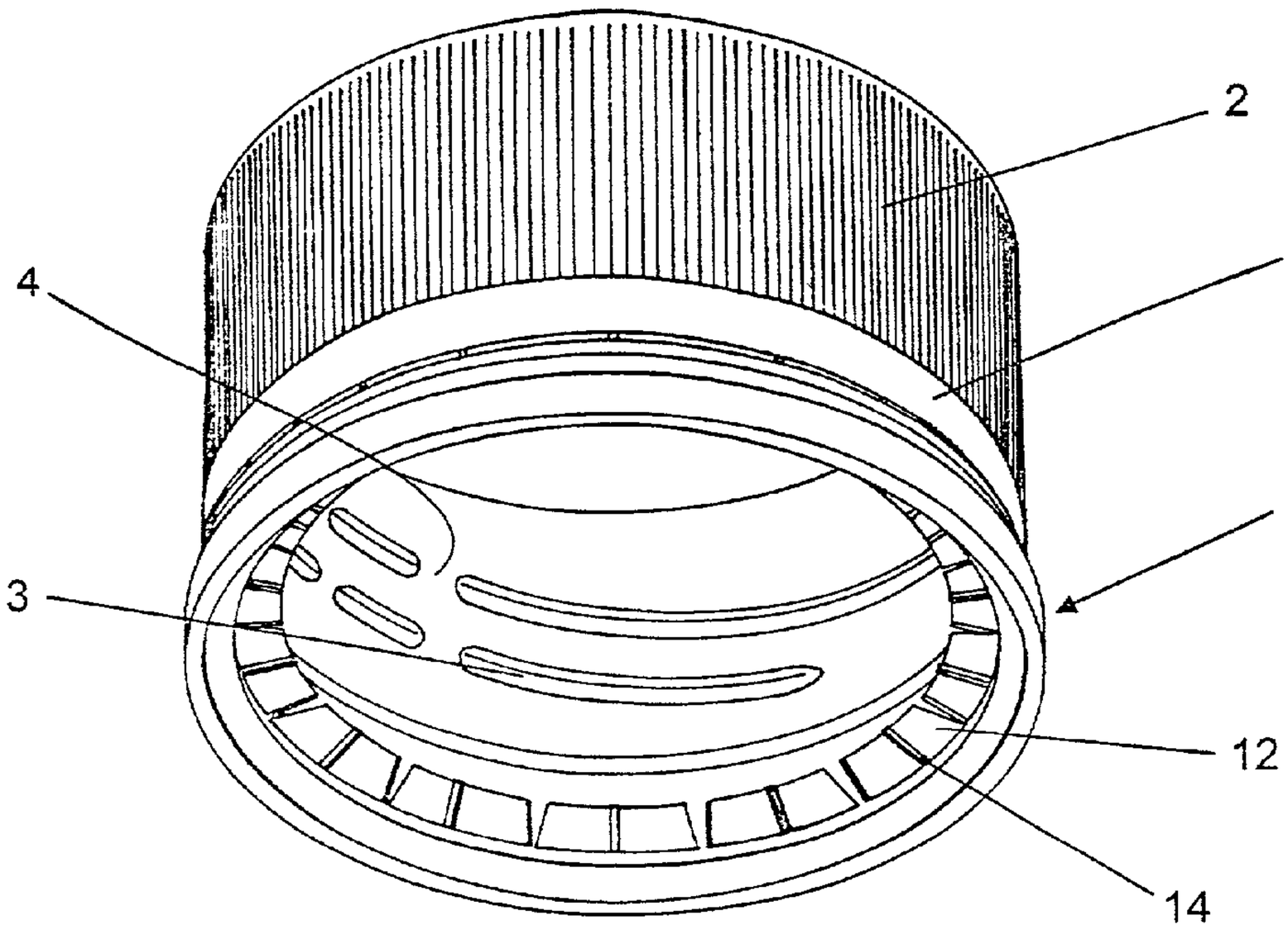


FIG. 4

DEVICE INSERTED IN INVIOLABLE LID FOR BOTTLES

BACKGROUND

[0001] This invention provides specially developed technical and functional improvements to a lid with an attached seal that can be used with different types of bottles. These bottles are mainly disposable, consisting of glass or plastic, and may be for food products, medicines or similar products.

[0002] Currently there are various types of lids having attached seals close to the lower edge of the skirt. This seal is usually a hoop or ring. It is shown as an extension of the cylindrical skirt of the lid body, but it is attached only through rupturable "bridges" or small "bonds." The inner side of the seal has several hinged trapezoidal blades, each of them having its larger side interconnected to the seal in a hinged way. The smaller side is radially directed to the inside and inclined upwards. These blades are located close to the seal's lower edge and are equidistantly distributed, working as a main locking component between the lid and the bottle neck. When screwing the lid to the neck, the blades hinge upward to a near vertical position. This position may only occur when they are passing through a circular locking collar or band present on the bottle neck. After passing through the circular collar, the blades go back to a more horizontal position and each blade remains inclined to the inside, enough to touch the neck wall under the circular band, irreversibly locking the lid and the bottle. When unscrewing the lid, the free ends of the blades rest under the band and the separation of the band and the skirt will unavoidably happen. The seal will break at the bonds allowing the lid to be fully unscrewed and the bottle opened.

[0003] The lids manufactured according to the current technique close the bottle correctly, making it inviolable. However, "placement friction" occurs during bottling or more particularly at the bottle closing phase. The placement of the conventional lid by high speed machines results in "considerable friction" that, though not sufficient to damage the bottling process, causes problems which require the design of mechanical parts taking the friction into account.

[0004] Thus, when applying a conventional lid, it can be screw-topped until the end, so that its blades become locked under the band. The lower surface of each blade slides over the matching parts of the bottle, thus, causing a substantially large friction coefficient in each blade.

SUMMARY

[0005] In a constructive arrangement specially developed for drastically reducing the friction coefficient, each blade has an antifriction band or rim on its lower face (the one turned against the neck wall) from its hinged base to the free edge. The lid coupling is carried out with reduced friction, as the contact area between the blade and the neck or the band edge of the neck is only limited to the rim.

[0006] The rim has been developed in order to reduce friction between the lid and the bottle band, leading to another improvement in the model. With the introduction of the rim the blade itself became better structured. The rim works as a reinforcing web and, even if the blade vane is made with a reduced thickness, its locking effect is maintained with an optimum efficiency.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] Other objects and features of the present invention will become apparent from the following detailed description considered in connection with the accompanying drawings which discloses one embodiment of the present invention. It should be understood, however, that the drawings are designed for the purpose of illustration only and not as a definition of the limits of the invention.

[0008] In the drawing, wherein similar reference characters denote similar elements throughout the several views:

[0009] **FIG. 1** represents a side view of the lid showing its outer details;

[0010] **FIG. 2** shows another side view, though in half section, the inner details being highlighted;

[0011] **FIG. 3** illustrates a perspective of the lid in an upper angle; and

[0012] **FIG. 4** is a perspective of the lid in a lower angle.

DETAILED DESCRIPTION

[0013] Referring now in detail to the drawings, FIGS. **1-4** show a one-piece body injected with plastic material, having a cylindrical shape. The body has a vertical, cylindrical skirt **1**, with a nonslippery external surface **2**. The inside of the body has an adequate thread **3** interrupted by sections **4**. Thread **3** and sections **4** are suited for pressure relief when the bottle to be closed with the present lid is contains gasified liquid.

[0014] The upper end of cylindrical skirt **1**, after a concordant rounding **5** is completely closed by a circular wall **6** and an inner sealing layer **7**. The lower end of skirt **1** has a similarly circular extension, and a seal band **8**. Seal band **8** has a slightly increased thickness **9** of the wall to the outside. Seal band **8** also has a circular cutting line **10** just above thickening **9**, interrupted by rupturable portions **11**.

[0015] Seal band **8** has a plurality of hinged blades **12** just above its lower edge, that are projected radially inward. Blades **12** are equidistantly spaced. Each blade **12** has a base **13** that may hinge upwardly. Blades **12** work as locking components between the lid and the bottle. When screwing the lid to the neck, blades **12** hinge upwardly to a near vertical position. This may only happen when blades **12** are passing through a circular locking band or collar present on the bottle neck. After passing through a circular collar, blades **12** tend to go back to a horizontal position and, resting on the neck wall. The free ends of blades **12** remain engaged under said collar, locking the lid and the bottle. This locking is carried out in an irreversible way. When unscrewing the lid, the separation between seal band **8** and lid **1** will occur, due to the fact that these parts are interconnected to each other through rupturable points **11** which are ruptured at the moment of unscrewing the lid. Seal band **8** is retained under the neck band, while cylindrical skirt **1** or lid is removed, opening the bottle.

[0016] Each blade **12** has at least one antifriction bead or rim **14** on its lower face (the one turned against the bottle neck). Each rim **14** is centrally situated on each blade **12** extending from the blade base until its distal end.

[0017] Antifriction rim **14** may have a cross section having any geometry, preferably rectangular or semi-circular. Blade **12**, depending on its width, may have two or more rims **14**.

[0018] Rim **14** constitutes an important detail in each blade **12**. During the process of applying the lid through high speed machines, the lid coupling is carried out with reduced friction, as the contact area between blade **12** and the neck or collar edge of the neck is limited to bead **14**.

[0019] Further, it causes blade **12** to be better structured. Rim **14** works as a reinforcing web and, thus, even if blade **12** is made with a reduced thickness, its locking effect will be maintained with optimum efficiency.

[0020] Accordingly, while a few embodiments of the present invention have been shown and described, it is to be understood that many changes and modifications may be made thereunto without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. A device inserted in an inviolable lid for bottles comprising:

a one-piece body having a cylindrical shape and injected with plastic material;

a vertical cylindrical skirt having an inner surface, an outer surface, an upper end, and a lower end;

a nonslippery surface on said outer surface of said vertical cylindrical skirt;

a thread on said inner surface of said vertical cylindrical skirt, wherein said thread is interrupted by sections for pressure relief when the bottle contains gasified liquids;

a circular wall having an interior and an exterior, wherein said circular wall completely closes said upper end of said cylindrical skirt after concordant rounding;

an inner sealing layer coupled on said interior of said circular wall;

a seal band on said lower end of said skirt having an upper and lower edge, an increased thickness and a circular cutting line above said increased thickness;

rupturable portions situated above said increased thickness and interrupting said cutting line;

a plurality of hinged blades disposed above said lower edge of said seal band and having an upper face, a lower face, a base and a distal end, wherein said blades project radially inward, are equidistantly spaced and have a base that may hinge upwardly; and

an antifriction rim or bead extending from said base to said distal end of said lower face of each hinged blade;

wherein said plurality of hinged blades act as locking components between the lid and the bottle.

2. The device inserted in an inviolable lid for bottles according to claim 1, wherein one of said blades may have two or more rims depending on its width.

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