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(54) Bottle with safety closure, particularly for pharmaceutical products

(57) The bottle has a safety closure, particularly for pharmaceutical products, which comprises a closure hood (4), provided with an internally threaded region (8) for screwing onto the neck (7) of the bottle (1) and, in a downward region, with a tamper-evident ring (6), and an external cap (3), which is rotatably coupled on the hood (4) and is adapted to prevent its unscrewing from the neck (7) of the bottle (1) without adequate downward axial pressure in contrast with elastic tooth (11) interposed between the cap (3) and the hood (4).

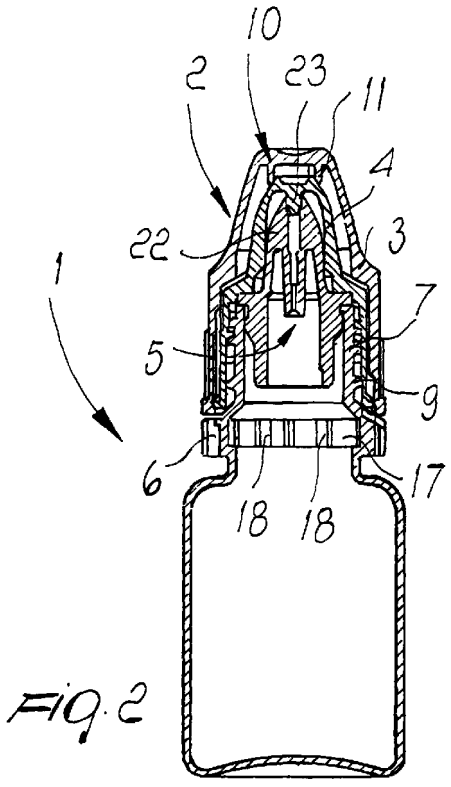

Fig. 2

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Description

[0001] The present invention relates to a bottle with safety closure, particularly for pharmaceutical products.

[0002] Dropper bottles containing medical substances, cosmetics, dietetic products, both in the liquid state and in powder or granule form, and fitted with safety closures against removal by children are known.

[0003] These closures are constituted by a closure element which can be generally screwed onto the neck of the bottle and by a safety cap rotatably coupled to the closure element.

[0004] The cap cannot be removed and can only be turned unless it is forced downwards in order to achieve the engagement of an upper internal set of teeth of the cap with the set of teeth or knurling with which the head of the closure element is peripherally provided.

[0005] The coupling between the two sets of teeth rigidly couples the cap to the closure element and allows to unscrew the closure element by applying an unscrewing action to the cap combined with a downward axial pressure.

[0006] When the pressure ceases, an elastic element, which is interposed between the flat closure surfaces of the cap and of the closure element and is compressed during the unscrewing action, produces between the cap and the closure element a spacing force which is sufficient to disengage the sets of teeth and to return the cap to freely rotating safety position.

[0007] Further conventional bottles have safety closures comprising a third element which can be fitted inside the closure element and is provided, in a downward region, with a tamper-evident collar adapted to snugly fit on the neck of the bottle and to act as a seal.

[0008] In this manner, the closure element is screwed onto the neck of the bottle and is sealed by means of the tamper-evident collar, while the cover or cap can be removed only by firmly pressing downwards, as above-mentioned.

[0009] These dropper bottles are not free from drawbacks, including the fact that most of them do not have a safety closure as well as a tamper-evident collar: when the collar is present, it is an additional element and therefore entails higher production, preparation and assembly costs as well as an increased use of materials. Moreover, in many cases the external sealing collar requires complete removal, is torn off the neck of the bottle and therefore also causes environmental pollution.

[0010] The aim of the present invention is to eliminate the above noted drawbacks of conventional bottles by providing a bottle with safety closure, particularly for pharmaceutical products, which is extremely safe against removal by children and at the same time has a seal against any tampering yet does not require the use of a third supplemental element and allows to reduce production and assembly costs as well as the amount of material employed.

[0011] Within the scope of this technical aim, another object of the present invention is to achieve said aim with a structure which is simple, relatively easy to provide in practice, safe in use, effective in operation and relatively low in cost.

[0012] This aim, object and others are both achieved by the present bottle with safety closure, particularly for pharmaceutical products, characterized in that the closure comprises a closure hood, provided with an internally threaded region for screwing onto the neck of the bottle and, in a downward region, with a tamper-evident ring, and an external cap, which is rotatably coupled on the hood and is adapted to prevent its unscrewing from the neck of the bottle without adequate downward axial pressure in contrast with elastic means interposed between the cap and the hood.

[0013] Further characteristics and advantages of the present invention will become apparent from the following detailed description of a preferred but not exclusive embodiment of a bottle with safety closure, particularly for pharmaceutical products according to the invention, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

Figure 1 is a front view of a bottle with safety closure, particularly for pharmaceutical products, according to the invention;
Figure 2 is a sectional front view of the bottle of Figure 1;
Figure 3 is a front view of the closure hood of the bottle according to the invention;
Figure 4 is a sectional view of the hood of Figure 3;
Figure 5 is a front view of the cap of the bottle according to the invention;
Figure 6 is a sectional view of the cap of Figure 5.

[0014] With reference to the above figures, the reference numeral 1 generally designates a bottle with safety closure, particularly for pharmaceutical products, according to the invention.

[0015] The safety closure 2 comprises an outer cap 3 which is rotatably coupled on a hood 4 for closing the mouth 5 of the bottle 1.

[0016] The hood 4 has a sealing ring 6 in a downward region and has an internal surface which is meant to snugly couple to the outer surface of the neck 7 of the bottle 1.

[0017] The internal surface of the hood 4 has a threaded region 8 which screws onto the outer thread 9 of the neck 7, located proximate to the mouth 5.

[0018] The cap 3 has, in an upward region, elastic means 10 constituted by two flexible internal teeth 11 which engage the inclined surface of the upper end of the hood 4 so as to prevent its unscrewing from the neck 7 without adequate downward axial pressure.

[0019] The hood 4 peripherally comprises multiple first wings 12 directed outwards and the cap 3 has multiple internal second wings 13 which are located in a

position which corresponds to the wings of the hood 4.

[0020] The wings 12 and 13 are inclined with respect to radial planes and do not allow the rotation suitable to unscrew the cap 3 with respect to the hood 4. The sealing ring 6 is joined to the hood 4 by way of preweakened bridges 14 and can be snugly fitted on the neck 7 of the bottle 1.

[0021] The hood 4 is peripherally provided with a series of radial slots 15 which are directed towards the cap 3, engage complementarily shaped protrusions 16 provided inside the cap after pressing the same downwards axially, and produce a rigid coupling which allows to unscrew the hood 4 from the neck 7.

[0022] The neck 7 is provided, in a downward region, with a positioning and support collar 17 having multiple external notches 18 for coupling to the sealing ring 6.

[0023] The ring 6 internally comprises a plurality of longitudinal teeth 19 which cooperate with the corresponding notches 18 formed on the supporting collar 17.

[0024] Advantageously, the hood 4 is provided, in a downward region, with a protruding peripheral rim 20 for interlocking coupling to the lower rim 21 of the cap 3.

[0025] In the several figures, the bottle 1 is provided, at the mouth 5, with a conventional axial tubular element 22 which allows to dispense the product in drops.

[0026] The hood 4 is provided, internally and in an upward region, with flow control means constituted by a plug element 23 adapted to hermetically close the tubular dropper element 22 of the mouth 5.

[0027] Conveniently, the cap 3 is externally provided with a plurality of vertical raised portions 24 in order to facilitate the grip of the operator during unscrewing and simultaneous downward pressure.

[0028] An important characteristic of the hood 4 is its bell-like shape, which facilitates the elastic deformation of the teeth 11 of the cap 3 when the cap is pressed axially downwards; however, alternative embodiments of the hood 4 are also possible.

[0029] It has thus been observed that the invention achieves the intended aim and object, i.e. to provide a bottle, particularly for pharmaceutical products, with a safety closure provided with a seal and constituted by just two mutually associable elements and adapted to ensure a closure which is safe against any tampering and against removal on the part of children.

[0030] The invention thus conceived is susceptible of several modifications and variations, all of which are within the scope of the claims.

[0031] All the details may further be replaced with other technically equivalent ones.

[0032] In practice, the materials employed, as well as the shapes and the dimensions, may be any according to requirements without thereby abandoning the scope of the protection of the appended claims.

[0033] The disclosures in Italian Patent Application No. MO98A000237 from which this application claims priority are incorporated herein by reference.

[0034] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A bottle with safety closure, particularly for pharmaceutical products, characterized in that said closure comprises a closure hood (4), provided with an internally threaded region (8) for screwing onto the neck (7) of the bottle (1) and, in a downward region, with a tamper-evident sealing ring (6), and an external cap (3), rotatably coupled on said hood (4) and adapted to prevent its unscrewing from the neck (7) of the bottle (1) without adequate downward axial pressure in contrast with elastic means (10) interposed between the cap (3) and the hood (4).

2. A closure according to claim 1, characterized in that said hood (4) is peripherally provided with at least one first wing (12) towards the outside and in that said cap (3) is provided with at least one second wing (13) towards the inside which is located so as to match the wing (12) of the hood (4), said wings (12, 13) being inclined with respect to radial planes and being adapted to prevent free rotation of the cap (3) with respect to the hood (4).

3. A closure according to one or more of the preceding claims, characterized in that said sealing ring (6) is rigidly coupled to said hood (4) by way of preweakened regions (14) and can be fitted snugly on the neck (7) of said bottle (1).

4. A closure according to one or more of the preceding claims, characterized in that said hood (4) is peripherally provided with at least one radial slot (15) which is directed towards the cap (3) and is adapted to engage a complementarily shaped internal protrusion (16) of said cap (3), after pressing the cap (3) axially downwards, so as to form a rigid coupling for the unscrewing of the hood (4) from the neck (7) of the bottle (1).

5. A closure according to one or more of the preceding claims, characterized in that said sealing ring (6) internally comprises at least one longitudinal tooth (19) for coupling on the neck (7) of said bottle (1), said tooth (19) being adapted to cooperate with a corresponding external notch (18) of said neck (7).

6. A closure according to one or more of the preceding

claims, characterized in that said elastic means (10) comprise at least one flexible internal tooth (11) of said cap (3) which is adapted to engage the inclined surface of the upper end of said hood (4).

7. A closure according to one or more of the preceding claims, characterized in that said hood (4) comprises flow control means (23) which are adapted to close the mouth (5) of said bottle (1).

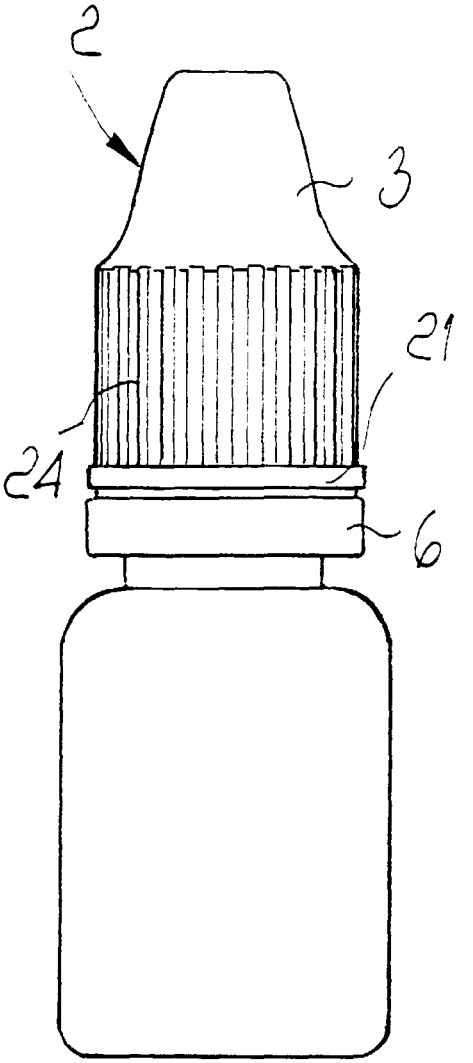

Fig.1

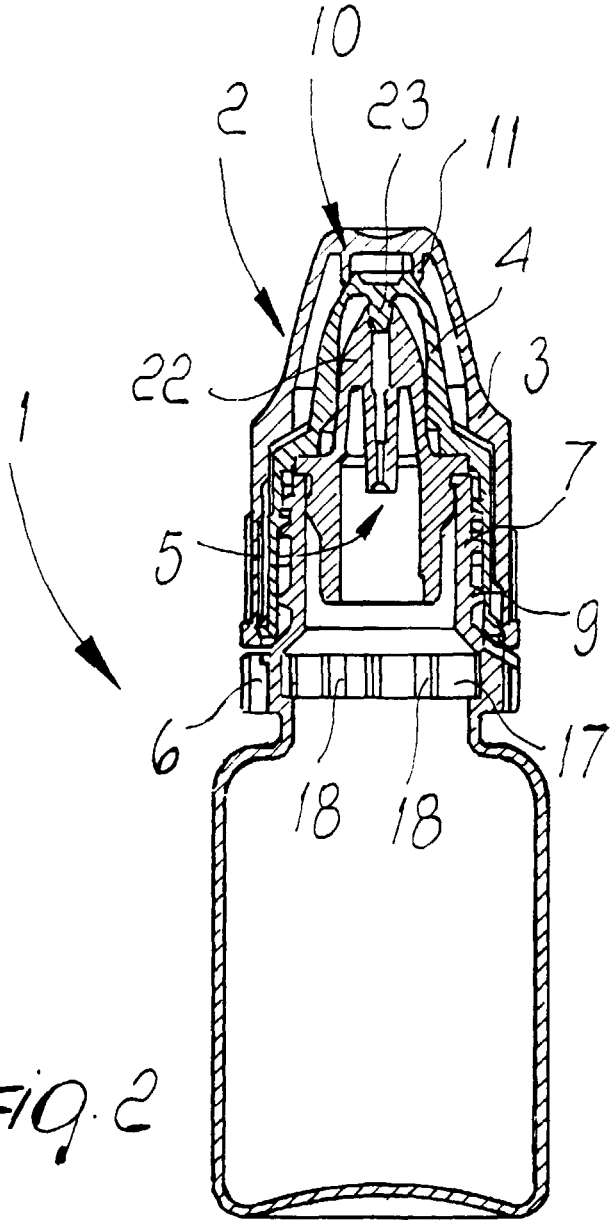

Fig.2

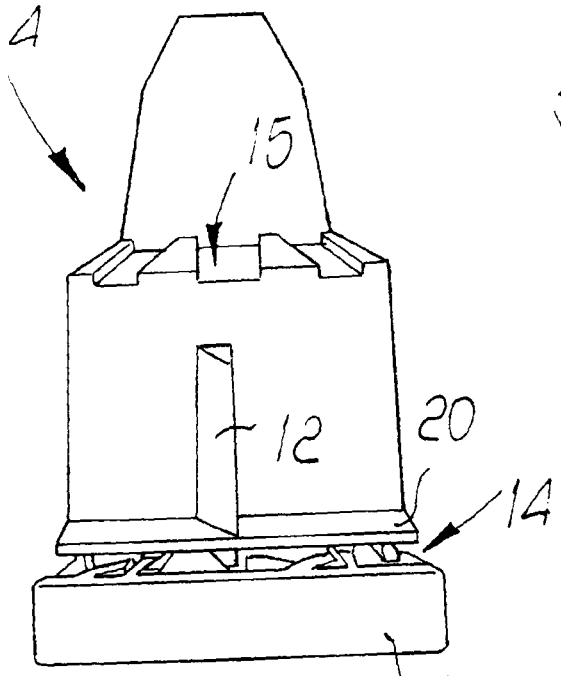

FIG. 3

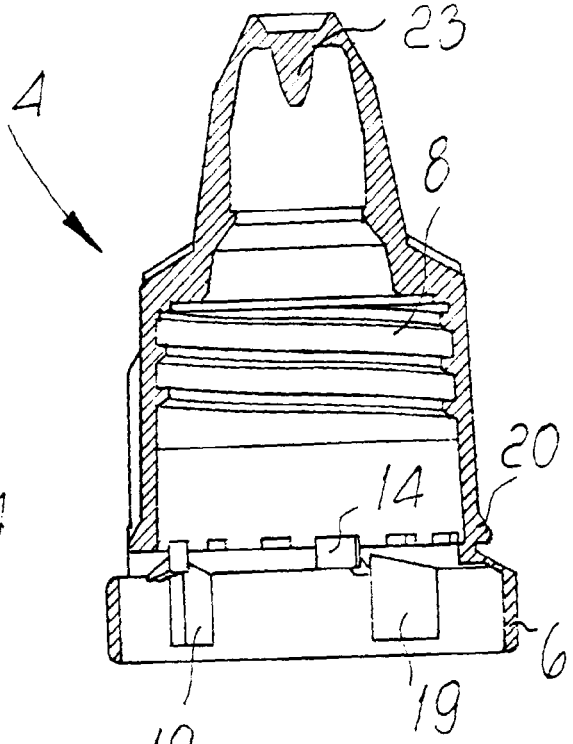

FIG. 4

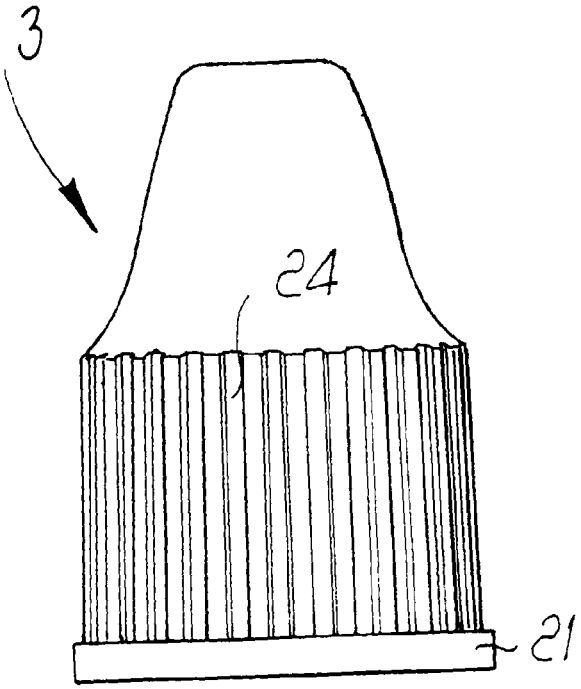

FIG. 5

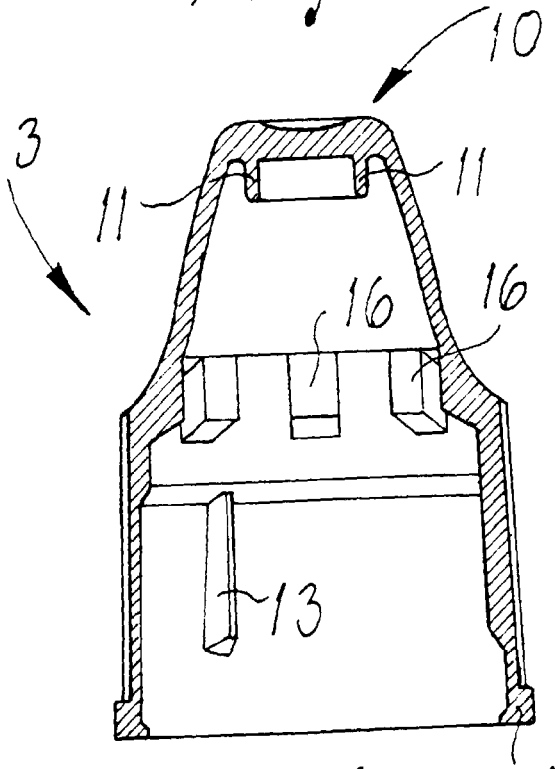

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 99 12 2048

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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	7 February 2000	Zanghi, A

CATEGORY OF CITED DOCUMENTS

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