

Closure for infusion bottles or the like

The invention relates to a cover formed as a closure for infusion bottles or the like in the form of a cap to be clipped by its lower
5 edge to the neck of the bottle, which cap consists of an inner cap and an outer cap such that, because both caps extend to the lower edge and are bonded together, both can be clipped, also with a hole serving to form a piercing region, which is sealed by the top of one of the caps.

10 From DIN 58363, page 2, item B2, it is known that two clippable caps may be nested in one another to form a closure-cover such that the top of the outer cap seals the hole of the inner cap. On the sleeve wall of the outer cap, a tear strip is then provided, achieved by partial external displacement of the cap wall. For ease of gripping access, a
15 tear lug-forming opening is provided at the ends of the encircling strip-shaped ridge thus formed.

A closure-cover in cap form is also provided by CH-PS 501 528. The cap in that case is, however, a one-piece unit. It comprises a stopper. The
20 stopper sits on an end edge of the bottle neck and a centrally-hollowed stopper section of the stopper projects into the mouth of the bottle neck. The cap has a hole. A cannula or injection needle can, for example, be inserted by penetrating the hole and passing through the stopper. The stopper consists of appropriately soft-elastic material,
25 thus capable of being penetrated.

It is the task of the invention is to provide a closure-cover of this kind in a manner which is structurally simpler and more advantageous in
use.

30 This problem is solved by Claim 1.

Claims subsidiary to Claim 1 relate to further embodiment details.

35 As a result of such a construction, a closure-cover is achieved which

is simpler from a manufacturing viewpoint and is more advantageous in use. On the one hand, there is no longer an uncovered hole, and on the other hand, there is no need for the opening grip design which was found to be complicated. In practical terms, this is provided by the

5 outer cap, the top of which seals a hole in the inner cap, having mutually opposed gripping cut-outs which are formed by tunnel-arch-shaped, encircling edges of a deep-drawn strip, the width of which is equal to or greater than the diameter of the cap top. Here not only is the advantageous construction adopted in order to seal the

10 hole in a protective fashion by means of a single all-encompassing element; rather a further, even surprising advantage reveals itself, in that a strip which just about covers or slightly overlaps the top "emerges" as lateral gripping cut-outs when the strip is deep drawn for cap bodies which are generally cylindrical. A specific cutting free of

15 the strip to create an access opening is no longer required. This is particularly important, especially for mass-produced articles. In addition, the tunnel-arched shape avoids any trace of notch effect, so that the straddle arrangement of the outer cap is not impaired in any way during the clipping operation. Rather, notch effect is included in

20 the tensile stress compressing the stopper even more, by means of edge-forming flanging. In contrast, the wall displacement forming the tear strip may according to the precursor mentioned, decrease over time, leading to a loosening of the cap seat. The slightly greater width of the strip when compared with the diameter of the cap top

25 creates a welcome "roof" near the top in the region of the gripping cut-outs, so that for removal there is a good under-grip facility here, for example, for the thumb. Furthermore, a real roof-type function arises here, as sterilisation fluids run off to the outside and not into the cap joint, as a result of the slight overlap realised by the

30 edge zone. This is an additional important detail of the invented solution. Furthermore, the cap may, even in a single deep-draw step, attain the double-walled feature and finished configuration, in that the deep-drawing of the outer cap strip is implemented together with that of a perforated strip for the inner cap, positioned at a distance

35 below it. This gives rise to a surprisingly effective bond between the

two parts. Only the bowl-forming trimming is now required, creating a lower edge exactly suited to the subsequent clipping. The separation from the waste material may take place during the cyclically-controlled deep-drawing and perforation process and produces an additional bond in the region of the lower edge of both caps. Finally another advantageous feature of the invention lies in the fact that, in the tunnel-arched region, ends of a diametrically extending tear strip or appropriately aligned tear lines are provided. These means of opening may be used as desired and handled in known manner.

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The subject of the invention is explained in more detail below with reference to an embodiment shown in drawings.

Fig. 1 shows a cap formed in accordance with the invention in perspective view, illustrating a gripping cut-out provided in the sleeve wall,

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Fig. 2 shows an enlargement of the detail marked A in Figure 1,

20 Fig. 3 shows the cap in side view,

Fig. 4 shows the cap in plan view,

Fig. 5 shows the cross-section in accordance with line V-V in Figure 3,

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Fig. 6 shows a portion of the cap wall, as seen from outside,

Fig. 7 shows the cross-section in accordance with line VII-VII in Figure 6,

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Fig. 8 shows a vertical cross-section through an infusion bottle fitted with the cap as closure-cover,

Fig. 9 shows a cross-section through the deep-draw tool with cap after the waste strip is trimmed off,

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Fig. 10 shows a first variant of the cap with pull tab,

Fig. 11 shows an internal view into one portion of the outer cap only,

5 Fig. 12 shows a second variant of the cap with pull tab,

Fig. 13 shows again the associated internal view of the outer cap alone,

Fig. 14 shows a third variant of the cap with pull tab, and

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Fig. 15 shows the associated internal view of the outer cap alone.

The closure forms a cover, designated in its totality as cap 1. The latter is clippable and consists, for example, of aluminium. Despite
15 prescribed thin walls, the plastic deformation in question is sufficient to hold the cap 1 on a container-type object.

The container-type object is in this case a bottle 2. The latter tapers to a neck 3, onto which a rim 4 is moulded. The radially outwardly
20 directed rim 4 is located near the mouth 5 of the bottle 2 and is substantially cylindrical on the annular wall side as also is the cap 1.

In the mouth 5, there is inserted a stopper 6 made of rubber or the like. There is in question a hollow stopper-type closure body, which
25 may be penetrated by a cannula of an infusion instrument or the like. To enable the penetration of such a cannula, there is a hole 7 in the cap 1. It is positioned centrally. Its diameter corresponds approximately to the radius of the cap 1. Said hole 7 is located in the
top 8 of an inner cap 9. The piercing region DB formed in this way is
30 protectively engaged from above by the top 10 of an outer cap 11. The diameter of the hole 7 is kept slightly smaller than the diameter of the mouth 5.

As can be seen from the illustrated representation, the two caps are
35 nested into one another with top 10 engaging against the inner side of the other top 8, thus inner cap 9 and outer cap 11 are substantially

the same length in respect of their cylindrical cap walls 12 and 13 respectively.

5 The cap walls 12 and 13 thus define a common lower edge 14. In the mounted state of the cap 1, the edge 14 becomes a clipped edge designated as 15 (see Figure 8). The latter engages, from beneath, an annular step 16 of the rim 4, which is underneath the rim 4 and projects horizontally to correspond to the annular surface of the bottle neck 3. In this state, a sealing collar 17 moulded onto the
10 stopper 6 is pressed tightly against the end face 18 of the mouth 5 and of the bottle neck 3 respectively.

Inner cap 9 and outer may 11 may be deep-drawn together. This produces a static friction-type bond between the two parts. Thus the inner cap 9
15 does not fall out of the outer cap 11.

To support this effect, another retaining layer, for example an adhesive film, may be positioned between the upper side of the top 8 of the inner cap 9 and the underside of the top 10 of the outer cap 11.

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Both of these types of bond are supplemented by an additional bond which is formed in the region of the lower edge 14 by the separation of the formed double cap from its waste material. This is shown in Figures 5 to 7 and 9. From Figure 9, it follows that the edge-related bond
25 occurs during the trimming operation as a result of the outward pinching of the edge arising from the trimming. Hereby the edge-forming end of the cap wall 12 of the inner cap 9 lies, in an outward curvature 19 shaped like the edge of a bell, beneath the underside 20 of the cap wall 13 of the outer cap 11, which is domed in the same direction. The
30 sleeve wall of the double-layered cap thus becomes smooth in the outward direction, but is not exceeded. The pinching of the lower edge 14 in question produces a substantially crimped engagement between the parts 9 and 11 in the region of the underside 20.

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The common deep-draw operation takes place using two strips B1 and B2 which cross over one another. The strip B1, which forms the inner cap 9, has a width x , which takes account of the diameter D of the top 8 and the axial length of the cap wall 12 on each side, including
5 moreover the length which is required for the clipped edge 15.

By contrast, the strip B2 of the outer cap 11 has a width y , which is the same as or slightly greater than the diameter D of the cap top 8 of the inner cap 9. In the embodiment, this width is in fact chosen so
10 that the transversely convex, rotationally symmetrical, encircling transition curve 21 between top 8 and cap wall 12 covered by the material of the strip B2 is covered snugly, gripping cut-outs 22 being formed by the straddle-type association of the outer cap 11 formed during symmetrical overlaying by the strip material, which can be seen
15 to be clearly narrower. These cut-outs lie diametrically opposite each other and have a tunnel-arched shape 23, formed by edge sections or edges 24 of the strip B2. The tunnel-arched shape 23 is especially clear from Figure 1 and extends to the edge 14 of the cap 1. In order for the projecting sections of the edges 24 in the region of the
20 gripping cut-outs 22 to follow the same shape as the corresponding transition curve 21, there is a high-quality, positive connection between both parts of the cap 1, the sections 25 of the cap wall 13, which are located to the side of the gripping cut-outs 22 and are considerably larger than these in area, remaining as wall-connecting
25 zones with suitable adhesive bonding at edge 14. These operate in the same way as excess-width holding tabs for clipping, known for preserving jars.

During downwardly-directed deep-drawing of the outer cap strip B2
30 together with that of B1, which forms the inner cap 9, this strip B1 is simultaneously perforated, more specifically in a pre-station. There thus results a highly economical manufacturing process. It is based on a crossing-over feed of B1 and B2.

35 Although release of the outer cap 9, where required, using the edges 24 provided by the overhanging arrangement in the region of the gripping

cut-outs 22, is considerably simplified - the gripping edge 26 near the top can here form the lip in question - still further means may also be realised, in that in the upper tunnel-arched region, ends 27' of a diametrically extending tear strip 27 or correspondingly aligned tear lines are provided. These optionally extend freely into the gripping cut-outs 22 defined by the edges 24 (see Figure 1).

Such tear strips 27 or the like are arranged to extend on the inner side of the outer cap 11. They are also included in the deep-draw processing.

Simple, i.e. single-layer strips, may also be in question, for example adhesive strips.

According to the variant of Figures 10 and 11, even tear threads 28 will suffice. They are arranged to extend parallel on the inner side of the outer cap 11, but in this case turn into a pull tab 30 extending in the direction of the edge 14. This is rooted in the upper arched section of the gripping cut-out 22. Such a pull tab 30 may be situated at both ends of the tear threads 28, which are provided in pairs. The pull tabs 30 are to be taken into consideration accordingly on the strip B2, in the form of projections from a notched strip extending beyond the parallel longitudinal edges of the notched strip. The projections are aligned in the deep-draw process in relation to the extent of the cap wall 13 and are not included in the clipping because of their short length.

The second variant in accordance with Figures 12 and 13 has a tear strip 31 folded into both of its edge regions in an S-shape, and likewise realised as an adhesive strip. Otherwise the structure is the same as that explained in the first variant. The reference numbers are transferred accordingly.

The third variant (Figs. 14 and 15) shows a proposal for a solution which proceeds conceptually from that according to Figure 1, except

that here the ends 27' of the tear strip 27 are continued further into the back of the pull tabs 30 provided in Figure 14.

5 The inner cap 9 has a greater wall thickness than the outer cap 11 covering it.

10 Instead of an inner cap having only one hole 7, this cap can have a pull ring in its top 8. This pull rings extends in freely projecting manner within the hole. In its root area, the pull ring turns into nominal tear lines, which continue over the top 8 into the cap wall 12 of the inner cap 9, preferably up to just before the edge 14 of the cap 1 (not shown in the drawings). In practical terms, this may involve a construction, in relation to this inner cap, such as that of the outer cap of the initially mentioned literature reference, but from Item B3 of 15 DIN 58363 in question. Thus both caps can be released easily at will and disposed of as per this type of cap.

20 This pull-ring solution may also be realised on the band strip B2 during the course of pre-perforation or pre-stamping. Even the simultaneous deep-drawing detailed in the description does not preclude this.

25 All disclosed features are relevant to the invention. The disclosure content of the associated/accompanying priority documents (copy of the previous application) is hereby also included in its totality in the disclosure of the application, for the additional purpose of taking features of these documents into consideration in claims of the present application.

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Claims



1. A cover formed as a closure for infusion bottles or the like in the form of a cap (1) to be clipped by its lower edge (14) to the neck (3) of the bottle, which cap consists of an inner cap (9) and an outer cap (11) such that, because both caps (9, 11) extend to the lower edge (14) and are bonded together, both can be clipped, the cap also having a hole (7) serving to form a piercing region (DB), which hole is sealed by the top (10) of the one cap (11), characterised in that the top (10) of the outer cap (11), which seals a hole (7) of the inner cap (9), has mutually opposed gripping cut-outs (22) which are formed by tunnel-arched outwardly-curving edges (24) of a deep-drawn strip (B2), the width (y) of which is the same as or greater than the diameter (D) of the cap top (8).

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2. A cap according to Claim 1 or especially in accordance therewith, characterised in that the deep-drawing of the outer cap strip (B2) is implemented together with that of a perforated strip (B1) for the inner cap (9), positioned at a distance below it.

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3. A cap according to one or more of the preceding claims or especially in accordance therewith, characterised in that, in the tunnel-arched region, ends (27') of a diametrically extending tear strip (27) or appropriately aligned tear lines (tear threads (28)) are provided.

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