

[54] SCREW-ON CLOSURE CAP

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[57]

ABSTRACT

A screw-on closure cap for closing the filling opening of a container or a tubular spout, the cap comprising relatively rotatable upper and threaded lower cap parts assembled together coaxially and having a resilient drive connection between them capable of transmitting a predetermined maximum torque between the upper and lower cap parts in the closing direction. The resilient drive connection comprises a bowed leaf spring whose arch is engaged in the interior of a pressed-up hand grip portion of the upper cap part, and whose two out-turned ends are resiliently engaged ratchetwise in depressions formed in the upper peripheral portion of the lower cap member. When limiting torque is reached the ends of the spring ride resiliently out of the recesses to allow the upper cap part to turn relatively to the lower cap part without further tightening the closure cap on the neck of the container or spout.

3 Claims, 2 Drawing Figures

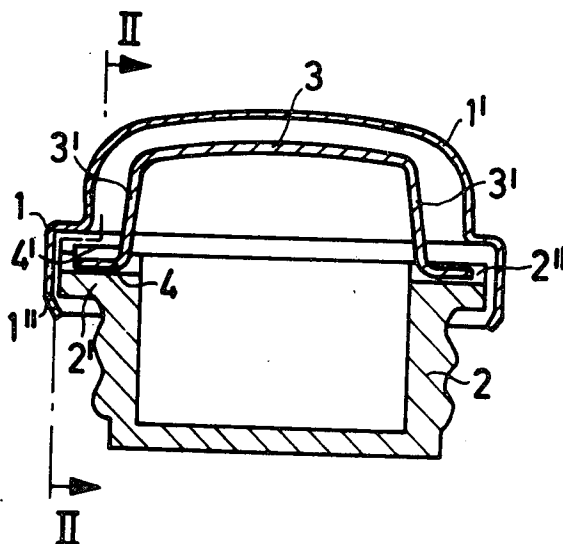


Fig. 1

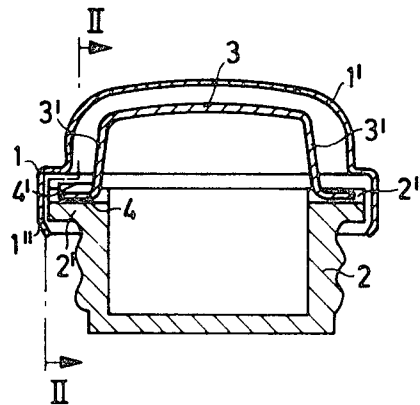
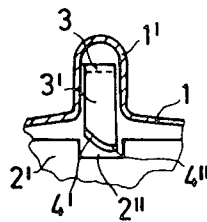


Fig. 2



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SCREW-ON CLOSURE CAP

The present invention relates to a closure cap which is adapted to be screwed on to the neck of a container or a tubular spout and to be tightened against a mouth aperture with the interposition of a seal.

In the case of such screw-on closures, it is a disadvantage that they may be tightened too securely with respect to the periphery which is to be sealed, so that it is difficult to open the closure by hand without using considerable force; usually auxiliary means are required to open the closure. Particularly when screw caps of this type are used for containers or tanks having oily contents or for motor vehicle fuels, they are exposed to such dirt in practice that it is usually impossible to prevent slipping simply by cleaning before opening, and even if a cloth is used it is hardly sufficient and usually a tool has to be used to open the closure. Our copending application Ser. No. 94,410 describes a screw-on closure cap which cannot be tightened excessively with respect to a container edge or spout part after a predetermined cap torque or thread-tightness has been achieved. The characterizing feature of that application is that an upper cap part which transmits the rotary movement has a lower threaded cap part inserted so as to be freely movable therein and the connection therebetween is a spring element of predetermined tension so disposed that resiliently engaging projections providing a mutual connection disengage ratchet-fashion on the attainment of a predetermined cap torque or thread-tightness in the closure direction in order to give freely movable rotatability of the upper cap part in relation to the tightened lower threaded cap part. Consequently, a closure can be tightened only to a predetermined mutual thread-tightness pressure since forces originating from the reaction from such pressure and operative at the tightened lower threaded cap part cause the projections engaging resiliently from above in the form of spring lugs, cams or the like on the part providing the connection to the upper cap part to be disengaged, since their spring tension is so predetermined that on the attainment of a predetermined opposing force from the tightened threaded cap part they disengage and the upper cap part can now only rotate freely since the internally interposed connecting members can now only slip over the lower cap part in the tightened state without providing a coupling therewith. Said connecting members are also so constructed that when the upper cap part is turned in the reverse direction for opening purposes they have the opposite effect and immediately restore the connection to the threaded cap part, for example by means of projecting members of such design directed in opposition to the direction of rotation for opening the cap so that they engage in recesses in the lower threaded cap part so that the latter is automatically entrained and turned back out of its closure position.

According to the present invention, which represents an Addition to the aforesaid copending application, a part engaging in the form of a bowed spring member in the upper rotary cap part and having ends which on both sides are bent away outwardly against the lower threaded cap part is provided between the two cap parts and engages resiliently in recesses at the periphery of the lower threaded cap part to provide a mutually resiliently flexible connection.

The main features of the principle according to the present application for a Patent of Addition will be described with reference to an exemplified embodiment shown in the drawing wherein:

FIG. 1 is a central section through the closure according to the invention, and

FIG. 2 is a partial section on the line II—II in FIG. 1.

The Figures show an upper cap part 1 having a pressed-out hand grip part 1' extending transversely over its outer surface,

and having a downwardly extended cap part 1'' at the peripheral edge. A lower threaded cap part 2 is inserted within the upper cap part so as to be freely movable and is retained by the rim part 1'. A bowed member 3 which engages in the form of a bridge between the two parts 1 and 2 is used as a connecting member and penetrates into the cavity of the grip part 1' and is adapted to the shape thereof and its ends extend downwards on both sides 3' and engage resiliently in depressions 2'' provided at the periphery 2' of the lower cap part 2. When the cap part 1/1' is turned in the clockwise direction, i.e. the closure direction, this bowed member connecting part 3/3' in engagement with respect to the lower threaded cap part 2/2' causes the closure to be tightened as a unit after the style of a screwthread on a container neck or spout (not shown) with the interposition of a washer beneath the flange edge 2' at the threaded cap part 2. When a predetermined cap torque or thread-tightness is achieved depending upon the tension selected for the arm parts 3' engaging at 2'', the ends of the arm parts 3' will disengage and pass over the recesses 2'' in the lower threaded cap part 2 so that the connection between the two cap parts 1 and 2 is broken and the closure cannot be tightened any more. As a result of this ratchet-like disengagement, the top cap part can now only rotate freely and cannot drive the lower cap part.

Depending upon requirements, the ends 3' drawn down on either side may be provided with spring lugs 4 which are bent away laterally so as to project and which engage in the recesses 2'' in the edge flange 2' of the lower threaded cap part 2. The spring lugs 4 may also advantageously have tongue parts 4' bent up in alignment with the direction of closing the closure so that disengagement from the recesses 2'' is possible with less resistance. In the opposite direction for opening the closure, the other side of the spring lugs 4 then engages in the recesses 2'' once again immediately in the opposite way, as shown as 4'' (FIG. 2), so that the lower threaded cap part 2 is entrained for opening purposes.

What we claim as our invention and desire to secure by Letters Patent is:

1. A screw-on closure cap comprising an upper cap part and a separate lower threaded cap part between which rotary movement is transmitted by means of resiliently engaging projections providing a limited-torque-transmitting connection between the said upper cap part and lower threaded cap part, the said lower cap part being unitarily mounted with the upper cap part so as to be rotatable therein, said projections automatically disengaging when a predetermined cap torque or thread-tightness is achieved, said projections comprising the two ends of a bowed member whose intermediate portion is engaged in the upper rotary cap part, said two ends being bent away outwardly and being engaged resiliently in recesses at the periphery of the lower threaded cap part to provide a mutually resiliently flexible ratchet connection capable of transmitting tightening torque up to a limited value, said projections riding out of said recesses under the influence of tightening torque in excess of said limiting value.

2. A screw-on closure cap according to claim 1, in which said bowed member fits in a hand grip part which is pressed out of the rotary upper cap part and extends transversely thereover, said two ends of the bowed member which are bent down on both sides engaging with the lower threaded cap part via spring lugs which are bent out laterally so as to project from the bowed member.

3. A screw-on closure cap according to claim 2, in which the laterally projecting spring lugs of the bowed member have tongue parts which are situated in alignment in the direction of closing the closure and which are bent upwards on one side.

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