(54) Titre : OBTURATEUR DE SORTIE A DOUILLE TRAVERSANTE PERMETTANT LA FIXATION SUR UN RÉCIPIENT

(57) Abrégé/Abstract: The invention relates to a container, in particular a plastic ampule which is produced using a blow-moulding process and is filled and closed in the mould, having a neck part (12) which adjoins a container body (10) and onto which a first cap part (14) can be
(57) Abrégé(suite)/Abstract(continued):
screwed, and having a second cap part (16) which extends at least partly between the first cap part (14) and the neck part (12) and which is provided with an opening device (20), which has at least one opening (22), for opening the container body (10), which opening device can be closed by means of the first cap part (14), with the first cap part (14) carrying along the second cap part (16) by means of the screwing-on process of the said first cap part in such a way that the opening device (20) causes the container body (10) to be opened, with a closure part (closure pin 26) of the first cap part (14) unblocking the opening (22) in the opening device (20) after the said first cap part is unscrewed, and with the second cap part (16) remaining on the neck part (12).
Title: DISPENSING CLOSURE WITH A PLUG-THROUGH SLEEVE FOR FIXING IT TO A CONTAINER

Bezeichnung: AUSGABEVERSCHLUSS MIT DURCHSTECKTULLE ZUR BEFESTIGUNG AUF EINEM BEHALTER

Abstract: The invention relates to a container, in particular a plastic ampule which is produced using a blow-moulding process and is filled and closed in the mould, having a neck part (12) which adjoins a container body (10) and onto which a first cap part (14) can be screwed, and having a second cap part (16) which extends at least partly between the first cap part (14) and the neck part (12) and which is provided with an opening device (20), which has at least one opening (22), for opening the container body (10), which opening device can be closed by means of the first cap part (14), with the first cap part (14) carrying along the second cap part (16) by means of the screwing-on process of the said first cap part in such a way that the opening device (20) causes the container body (10) to be opened, with a closure part (closure pin 26) of the first cap part (14) unblocking the opening (22) in the opening device (20) after the said first cap part is unscrewed, and with the second cap part (16) remaining on the neck part (12).

Zusammenfassung: Die Erfindung betrifft ein Behältnis, insbesondere im Blasformverfahren hergestellt und in der Form gefüllte sowie verschlossene Kunststoff-Ampulle, mit einem an einen Behältniskörper (10) sich anschließenden Halsteil (12), auf das ein erstes Kappen teil (14) aufschaubar ist und mit einem zweiten Kappen teil (16), das sich zumindest teilweise zwischen dem ersten Kappen teil (14) und dem Halsteil (12) erstreckt und das mit einem mindestens eine Öffnung (22) aufweisenden Öffnungseinrichtung (20) zum Öffnen des Behältniskörpers (10) versehen ist, die mittels des ersten Kappen teils (14) verschließbar ist, wobei mittels des Aufschaubaurvorganges des ersten Kappen teils (14) dieses das zweite Kappen teil (16) derart minimiert, dass die Öffnungseinrichtung (20) die Öffnung des Behältniskörpers (10) veranlasst, wobei nach Abschrauben des ersten Kappen teils (14) ein Verschlusssteil (Verschlusszapfen 26) dessen die Öffnung (22) der Öffnungseinrichtung (20) freitügt und wobei das zweite Kappen teil (16) am Halsteil (14) verbleibt.
Veröffentlicht:
— mit internationalem Recherchenbericht

Zur Erklärung der Zweisehastaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.
DISPENSING CLOSURE WITH A PLUG-THROUGH SLEEVE
FOR FIXING IT TO A CONTAINER

The invention relates to a container, in particular a plastic ampule, having a neck part which adjoins the container body and onto which a first cap part can be screwed, and with a second cap part which extends at least partially between the first cap part and the neck part and which is provided with an opening device which has at least one opening for opening the container body which can be closed by means of the first cap part.

DE 42 32 305 C1 discloses a cap for containers, especially bottles which are produced from plastic in a blow molding process and filled and sealed in the mold, also in ampule form, with a neck on which a cap can be placed, the cap following the section which holds the neck having a section which is made integrally with the latter and which is made as a dropper. The indicated patent specification describes as known solutions bottles of this type, with an externally threaded neck being closed on their free end by a closure part which is made integrally with the neck, a cap
which has been screwed onto the neck being provided inside with a centrally arranged mandrel, with which the closure part can be punctured. If after puncturing the closure part the cap is removed, the liquid present in the bottle can be discharged through the opening formed in the closure part. In this connection, however, it has been shown that for a thread of the bottle neck and/or of the cap, which has not been optimally formed or also for a mandrel which has not been optimally formed, it is possible that the opening which has been punctured with the mandrel runs obliquely with respect to the longitudinal axis or that after removing a partial amount and subsequently screwing the cap on, a second opening is punctured; this may result in the liquid emerging at several locations in a direction which deviates from the longitudinal axis and this presenting a high degree of interference for the appropriate use of the solution. Accordingly, this patent solution proposes, due to the section of the cap made as a dropper, proportioning in the dispensing of the liquid contents of the bottle, not by means of an opening formed by the bottle neck, but by means of the dropper of the cap; this allows trouble-free use.

DE 195 80 104 T1 discloses a generic container solution with a container which is sealed airtight and which is provided with a cover cap, a mandrel attached in the cap being used to puncture a membrane on the neck part of the container. The hollow mandrel forms a type of top which defines a discharge passage path in order in this way to ensure controlled liquid removal. For this purpose the mandrel punctures the membrane and, after removing a first cap part, the mandrel is retained in the membrane by way of the second cap part in order in this way to make available a controlled dispenser opening or delivery opening for the container. The first cap part can then be reused to close the dispenser opening or delivery opening for the container body. The production of the known container solutions can be regarded at least to some extent as complicated and therefore costly.
On the basis of this prior art, therefore an object of the invention is to further improve the prior art such that practical handling is improved with simultaneously facilitated production. This object is achieved by a container, in particular a plastic ampule produced in a blow molding process and filled and sealed in the mold, having a neck part which adjoins the container body and onto which a first cap part can be screwed, and with a second cap part which extends at least partially between the first cap part and the neck part and which is provided with an opening device which has at least one opening for opening the container body which can be closed by means of the first cap part, characterized in that by means of the process of screwing on the first cap part it entrains the second cap part such that the opening device induces the opening of the container body, that after unscrewing the first cap part a closure part (closure pin) thereof clears the opening of the opening device, and that the second cap part remains on the neck part.

As specified above, by means of the process of screwing on the first cap part, said first cap part entrains the second cap part such that the opening device induces the opening of the container body, that after unscrewing the first cap part a closure part thereof clears the opening of the opening device, and that the second cap part remains on the neck part, the so-called dropper part, formed by the second cap part, can be positively connected to the neck part and fixed on it, and the first cap part can be removed from the container body for clearing the opening thereof, in particular can be unscrewed.

Depending on the respective application and the customer's specifications, in this way two different opening versions can be implemented with only one container. Thus, on the one hand there is the possibility of delivering the container according to the invention with a so-called open cap arrangement, i.e., the first cap part is only partially, for example a half thread turn, screwed onto the assigned thread of the container body so that the user first of all must turn the first cap part farther down along the thread, in order in this way to then open the container body by means of the opening
device usually in the form of a mandrel. In this connection the second cap part remains on the neck part and the upper cap in the form of the first cap part can be turned in the opposite direction to the previous screwing direction in order to clear the opening for removing the stored medium from the container. On the other hand, the container can be delivered already opened, i.e., the first cap part is completely screwed on; the second cap part is fixed in a defined manner on the neck part and the opening device (mandrel) has already pierced the container opening to clear its opening. The user of the container need now only unscrew or twist off the upper first cap part, in order to be able to use the container contents for example in the form of stored eye drops. Accordingly two different types
of removal possibilities can be implemented with only one arrangement, in a manner specific to the customer.

As a result of the respective plausible application arrangement for the two application solutions, incorrect application is largely precluded and even if the container solution according to the invention optionally has more functional components, especially in the form of two cap parts, than the known solutions, the second cap part being an integral component of the first cap part and being overlapped by the latter in the uncleared positions for the opening, the container according to the invention overall can be easily and economically produced, the container body being produced especially within the framework of a so-called blow-fill-seal process, as has become known in the trade under the trademark "bottelpack®", and the cap parts being produced preferably in an injection molding process.

In one especially preferred embodiment of the container according to the invention, provision is made such that driver elements of the first cap part which act on the second cap part induce an entraining motion and that after the second cap part on the neck part engages, the fixing part is interlocked in the other direction of action and releases the first cap part as it is being unscrewed. This ensures reliable use and the axial distance of travel of the cap parts to one another are in any case dimensioned such that reliable locking of the second cap part to the container body takes place, so that the first cap part can clear the container opening without hindrance. By preference, it is furthermore provided here that to interlock the second cap part on the neck part of the container body it has an engagement region which tapers by one step to the inside and which is engaged by at least one engagement part, preferably in the form of an engagement clip, of the second cap part, after crossing the step.

In another especially preferred embodiment of the container according to the invention, provision is made such that the first cap part has a fixing part which in one direction of action
enables the process of screwing on the first cap part and in the other direction of action remains on the container and releases the first cap part for an unscrewing process so that in this way a further defined connection to the parts of the container body is formed by way of the fixing part; this in any case helps prevent the penetration of foreign media. The fixing part allows the operator reliable use of the cap part arrangement.

In this connection it is preferable that the fixing part is a ring-shaped fixing body which has elastic catch means which project to the inside and which in one direction of action extend over the corresponding catch means on the container and interlock with them in the other direction of action. Here it is furthermore preferably provided that the first cap part on its free side facing the container body has a fixing part and is connected to the fixing part via an easily detachable separation site. In this way, in the process of clearing the container opening via the first cap part, the ring-shaped fixing part remains on the container body and the first cap part can be separated from the fixing part with low actuating forces.

With the container solution according to embodiments of the invention, two applications are possible with only one mechanical configuration, specifically on the one hand a delivery form in which the opening device of one cap part has already induced opening of the container body, or as another delivery form to provide that this opening has not yet been effected.

In some embodiments driver elements of the first cap part which act on the second cap part induce an entraining motion and wherein after the second cap part on the neck part engages, the first cap part as it is being unscrewed clears the opening.

In some embodiments to interlock the second cap part on the neck part it has an engagement region which tapers by one step to the inside and which is engaged by at least one engagement part of the second cap part, after crossing the step.

In some embodiments the first cap part has a fixing part which in one direction of action enables the process of screwing on the first cap part and in the other direction of action remains on the container and releases the first cap part for an unscrewing process.
In some embodiments the fixing part is a ring-shaped fixing body which has elastic catch means which project to the inside and which in one direction of action extend over the corresponding catch means on the container and interlock with them in the other direction of action.

In some embodiments the first cap part on its free side facing the container body has a fixing part and is connected to the fixing part via an easily detachable separation site.

In some embodiments the neck part can be opened from its free end (free face side) by means of the opening device and wherein between the free end and a threaded segment on the neck part there is an engagement site for engaging parts of the second cap part.

In some embodiments in the delivery state the opening device is already active or inactive and the first cap part is already completely or partially screwed on.

In some embodiments the second cap part in terms of its outer contour is made essentially tapering and along its outer periphery has a closed jacket or a jacket provided with recesses.

In some embodiments the opening device has a mandrel-like prolongation which is penetrated by at least two through openings.

In some embodiments the first cap part along its outer periphery is provided at least partially with a handling device, preferably in the form of ribbing.

According to an aspect of the present invention there is provided a container, comprising:

- a container body;
- a neck part adjoining said container body and having an external thread;
a first cap part with an internal thread engaged with said external thread and with a closure part;

a second cap part extending at least partially between said first cap part and said neck part and having an opening device with at least one device opening for forming a container opening in said container body, said at least one device opening and said container opening being closable by said first cap part; and

at least one nose-shaped projecting driver element on said first cap part releasably engageable with a recess on said second cap part for simultaneous rotational and axial motion of said first and second cap parts upon rotation of said first cap part in a first rotational direction, said driver element and said recess being triangular in cross section, said driver element and said recess being disengageable for independent motion of said first and second cap parts upon rotation of said first cap part in a second rotational direction opposite the first rotational direction;

whereby, rotation of said first and second cap parts in the first rotational direction causes movement of said second cap part to cause said opening device to form said container opening, and rotation of said first cap part in the second rotational direction removes said closure part from said device opening while said second cap part remains on said neck part to clear said device opening and said container opening.

The container according to the invention will be detailed below using embodiments as shown in the drawings. The figures are schematic and not to scale.
FIG. 1 to 3 show partially in a section, partially in a front view, the upper part of the container solution according to an embodiment of the invention in different operating states;

FIG. 4 shows in a perspective bottom view the first cap part with the fixing part according to the application as shown in FIGS. 1 to 3;

FIGS. 5 and 6 show in a perspective view two different embodiments of the second cap part, one with the outer jacket closed, one with openings provided.

The container shown in FIG. 1 in its upper region is to have been produced especially in a blow molding process and placed in the mold and sealed. In particular, the container made in the form of an ampule is produced from plastic material, the opening device shown below also being usable for container solutions which are produced differently. The container body referred to as a whole as 10 is followed to the top by the neck part 12 onto which the first cap part 14 can be screwed. This cap part 14 is shown in FIG. 4 in a perspective bottom view. The container body 10 can store a fluid which will not be detailed, for example in the form of a medicinally acting liquid in the form of eye drops or the like. Instead of liquids, also pasty or gaseous active substances can be placed in the container body, for example with the initially mentioned blow molding process, which has become known in the trade under the trade name "bottelpack®".

In addition to the first cap part 14, there is a second cap part 16 which extends in the axial longitudinal direction 18 of the container at least partially between the first cap part 14 and the neck part 12. On its side facing the neck part 12 the second cap part 16 has an opening device 20, with a channel-like opening 22 which in the coaxial direction to the longitudinal axis 18 extends completely through the second cap part 16 and discharges to the outside via a funnel-shaped widening 24 into the exterior (compare FIG. 3). This opening 22, as is to be seen in FIG. 1, can be closed by the first cap part 14, a tapering closure pin 26 which is located coaxially to the
longitudinal axis 18 of the container in the closed position as shown in FIG. 1 closing the channel-like opening 22 by the closure pin 26 engaging the funnel-shaped widening 24 of the second cap part 16. On its side opposite the widening 24, the channel-like opening 22 discharges into the ambient space 28 which is bordered on the one hand by the free face side 30 of the neck part 12 and by the inside jacket surface of the second cap part 16. In this respect the opening device 20 with a conical, mandrel-like prolongation 32 meshes with the ambient space 28. The free face side 30 of the neck part 12 is a component of an at least partially convexly shaped dome 34 which in this respect borders the ambient space 29 to the bottom, the dome 34 viewed in the direction of looking at FIG. 1 flaring down and discharging into a cylindrical overlapping region 36 which undergoes transition by tapering to the inside by one step into a cylindrical engagement region 38 which in turn discharges in the direction of a threaded segment 40 on the neck part 12 by way of a flaring connecting piece.

In the initial position, as shown in FIG. 1, which may correspond to the delivery state of the container solution and which reproduces the container before a first use, the first cap part 14 with an inside thread 42, at least to some extent, acts along the threaded segment 40. This thread engagement is such that, in the initial position shown in FIG. 1 and in one type of the illustrated embodiments, the tip of the prolongation 32 is not yet engaged with the closed face side 30 of the neck part 12. This face-side closure of the container neck 12 can be produced by the plastic material of the container itself or in the form of a closure membrane which will not be detailed and which in this context forms the end side 30 of the container neck 12.

As is to be seen in particular in FIG. 4 as well, on its opposite end the first cap part 14 discharges into a ring-shaped fixing part 44 which in one direction of action 46 (see arrow in FIG. 4) enables the process of screwing the first cap part 14 onto the outside thread of the neck part 12 along the threaded segment 40 and in the other, opposite direction of action 48 (compare arrow in FIG. 4) remains locking on the container body 10, and the first cap part 14 can be released from the
fixing part 44 with a defined actuating force along a separation site 50 made as a line. As FIG. 4 furthermore shows, the separation site 50 consists of a meandering line structure to which the bordering wall thickness between the fixing part 44 and the first cap part 14 is reduced. The fixing part 44 is therefore designed as a ring-shaped fixing body which has elastic catch means 52 which project to the inside (compare FIG. 4) and which extend in one direction of action 46 over the corresponding catch means 54 on the container body 10 (compare FIG. 1) and interlock with them in the other direction of action 48. For this purpose the elastic catch means 52 consist of tongue-like and elastically yielding leaf parts on the inner peripheral side of the fixing part 44 and the corresponding catch means 54 on the container itself are formed from bridge-like flank parts which on the neck part 12 project in the transition region to the top of the container body 10. The respective catch means 54 can be present in a smaller number than the catch means 52, for example in a single arrangement diametrically opposite one another in pairs, comparable to FIG. 1.

If at this point the first cap part 14 is screwed on in the direction of action 46 and clockwise, it moves into the open position as shown in FIG. 2, the first cap part 14 entraining the second cap part 16 such that the mandrel-like prolongation 32 extends through the free face side 30 of the neck part 12 so that in this way a fluid-carrying path is formed between the interior of the container body 10 and the first cap part 14 which is still in place. In this process of screwing on the first cap part 14 the free path of the threaded segment 40 is used up and the first cap part 14 is completely screwed on the outside thread of the neck part 12 and the ring-shaped fixing part 44 as shown in FIG. 2 is engaged with the corresponding catch parts 54 on the neck part 12 around the entire periphery.

For this driving motion the first cap part 14 has at least one pair of driver elements 56 which are diametrically opposite one another (compare FIG. 2) and which act on the assigned triangular recesses 58 on the second cap part 16 and in this way induce the driving motion. Both the nose-like projection of each driver element 56 and also the assigned shape of the recess 58 which is triangular viewed in cross section are selected such that a turning driving motion down for a screw-on process
is possible; that, however, in the opposite unscrewing movement the first cap part 14 can be released from the second cap part 16 by the driver element 56 being able to slide out of the assigned recesses 58 without hindrance. Accordingly, the flank angles in the screw-on direction are steeper than the adjacent flank angles which can be assigned to the unscrewing movement of the first cap part 14.

If at this point the first cap part 14 is unscrewed in the other direction of action 48 and consequently counterclockwise over the threaded segment 40, the fixing part 44 interlocks on the container neck 12 and the thin-walled separation site 50 yields with the result that the first cap part 14 can be completely separated from the container so that a situation as shown in FIG. 3 arises in which the second cap part 16 and the fixing part 44 remain on the container body 10 and the first cap part 14 which is no longer detailed is at a distance. To ensure that the second cap part 16 remains on the neck part 12, in the screwing-on process proceeding from FIG. 1 to FIG. 2, with the engagement clips 60 attached to the bottom of the second cap part 16, this bottom is engaged with the engagement part 38 which is reduced in diameter on the neck part 12. Based on the clip-like engagement configuration this allows a certain spring-elastic resilience of the second cap part 16 in its lower region so that due to the conical widening of the neck part 12 in this region the engagement clip 60 can cross the overlapping region 36 on the neck part 12 for a subsequently locking process in the subjacent engagement region as the engagement site 38. With unscrewing of the first cap part 14 then also the funnel-shaped widening 24 is cleared and the medium stored in the container body 10 is available for a removal process. Then, by respectively screwing on the first cap part 14 again, a situation as shown in FIG. 2 can be established in which the interior of the container body 10 is sealed media-tight.

As is to be seen in FIGS. 5 and 6, the second cap part 16 is shown in different perspective views. As shown in FIG. 5, the cap part 16 has a closed outside peripheral surface and on the bottom the individual engagement clips 60 are apparent. In the configuration as shown in FIG. 6, the
outside jacket of the second cap part 16 is shown broken through, with individual rectangular recesses 62. This has the advantage that the engagement elasticity for the clips 60 is improved so that they can travel into the engagement region 38 with lower actuating forces during the process of screwing-on for the first cap part 14. As is further to be seen in the right-hand representation viewed in the direction of looking at FIG. 5, the prolongation 32 has several individual through openings 64 which ensure an improved removal behavior. But preferably the mandrel-like opening device 20 has several holes which are not located in the middle and which clear the passage between the container and exit opening 22. Preferably three such holes on the indicated engagement mandrel are provided in an eccentric arrangement in order to not weaken the mandrel in its penetration region for opening the container body 10. In particular, with a plurality of passage opening 64 spray-like delivery is possible if the container body 10 is elastically resilient such that a manually applied outside pressure moves the stored medium on to the spray region in the form of the second cap part 16. In order to be able to more easily induce the different screwing processes in the two directions 46, 48 of action by hand and in order especially to also achieve separation at the separation site 50 with low actuation forces, the outer cylindrical periphery of the first cap part 14 has a handling device in the form of ribbing 66 (compare FIG. 4).

In the delivery form as shown in FIG. 1, engagement with the container interior has not yet taken place. It is also fundamentally conceivable to select a delivery form as shown in FIG. 2 in which the second cap part 16 has already effected an opening process for the container. Based on the already explained threaded segment 40 and with respect to the fixing region of the fixing part 44 on the shoulder transition site between the neck part 12 and the container body 10, media-tight separation relative to the exterior is thus achieved such that in this respect increased sterility requirements are met.
The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A container, comprising:
   a container body;
   a neck part adjoining said container body and having an external thread;
   a first cap part with an internal thread engaged with said external thread and with a closure part;
   a second cap part extending at least partially between said first cap part and said neck part and having an opening device with at least one device opening for forming a container opening in said container body, said at least one device opening and said container opening being closable by said first cap part; and
   at least one nose-shaped projecting driver element on said first cap part releasably engageable with a recess on said second cap part for simultaneous rotational and axial motion of said first and second cap parts upon rotation of said first cap part in a first rotational direction, said driver element and said recess being triangular in cross section, said driver element and said recess being disengageable for independent motion of said first and second cap parts upon rotation of said first cap part in a second rotational direction opposite the first rotational direction;
   whereby, rotation of said first and second cap parts in the first rotational direction causes movement of said second cap part to cause said opening device to form said container opening, and rotation of said first cap part in the second rotational direction removes said closure part from said device opening while said second cap part remains on said neck part to clear said device opening and said container opening.

2. A container according to claim 1 wherein
   said container body and said neck part are parts of a blow molded ampule filled and sealed in a mold.

3. A container according to claim 1 or 2 wherein
   said neck comprises an engagement region adjacent a step tapering radially toward a free end thereof; and
said second cap part comprises at least one engagement part engageable with said engagement region after crossing said step.

4. A container according to any one of claims 1 to 3 wherein
   said first cap part comprises a fixing part enabling said rotation of said first cap part in the first rotational direction and remaining on said neck part and releasing said first cap part for said rotation in the second rotational direction and unthreading from said neck part when separated from said first cap part.

5. A container according to claim 4 wherein
   said fixing part is a ring-shaped fixing body having elastic catches projecting radially inwardly; and
   said neck part comprises neck catches allowing said elastic catches to pass thereover in the first rotational direction and interlocking with said elastic catches in the second rotational direction.

6. A container according to claim 5 wherein
   said fixing part is connected on a free side of said first cap part facing said container body via an easily detachable separation site.

7. A container according to claim 1 wherein
   said neck part comprises a free end openly by said opening device, and comprises an engagement site releasably engageable with parts of said second cap part and located between said free end and said external thread.

8. A container according to any one of claims 1 to 7 wherein
   in a delivery state, said opening device is inactive in being spaced from said neck part, and said first cap part is only partially threaded on said neck part.

9. A container according to any one of claims 1 to 7 wherein
   in a delivery state, the opening device is active in being engaged with said neck part, and said first cap part is completely threaded on said neck part.
10. A container according to any one of claims 1 to 9 wherein
    said second cap part tapers along a length thereof and has a closed jacket along a
    periphery thereof.

11. A container according to any one of claims 1 to 9 wherein
    said second cap part tapers along a length thereof and has a jacket with recesses
    along an outer periphery thereof.

12. A container according to any one of claims 1 to 11 wherein
    said opening device comprises a mandrel-shaped prolongation penetrated by at
    least two through openings.

13. A container according to any one of claims 1 to 9 wherein
    said first cap part comprises a handling device on an outer periphery thereof.

14. A container according to claim 13 wherein
    said handling device comprises ribbing extending at least partially about said
    outer periphery of said first cap part.