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(54) **BOTTLE, METHOD FOR THE PRODUCTION THEREOF, METHOD FOR FILLING A BOTTLE, AND METHOD FOR OPENING A BOTTLE**

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ABSTRACT

The present invention relates to a method for producing a beverage bottle, wherein not only the basic bottle body 1, but also the closure body 6, consists of glass. The closure body 6 is connected in a monolithic manner to the basic body via a predetermined breaking point.

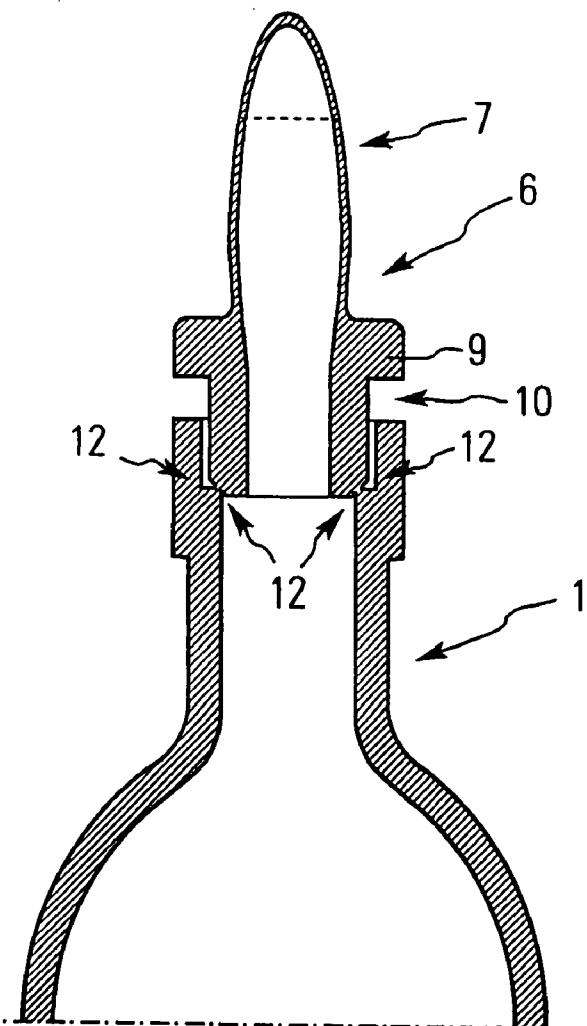


FIG. 3

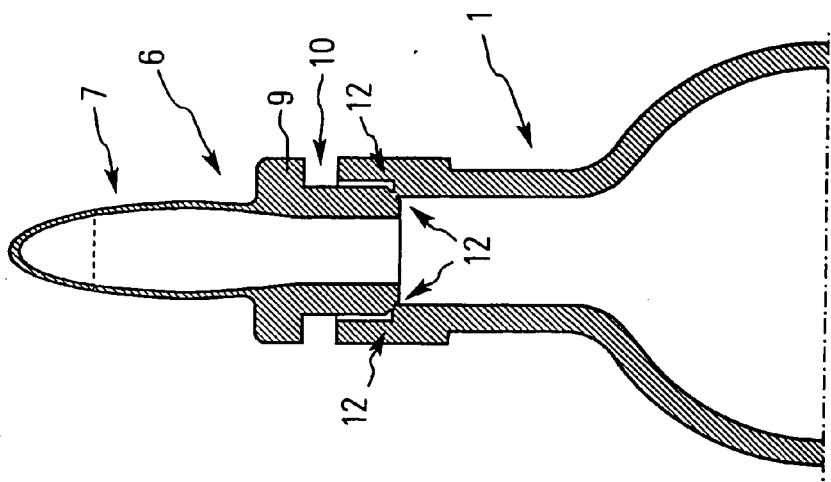


FIG. 2

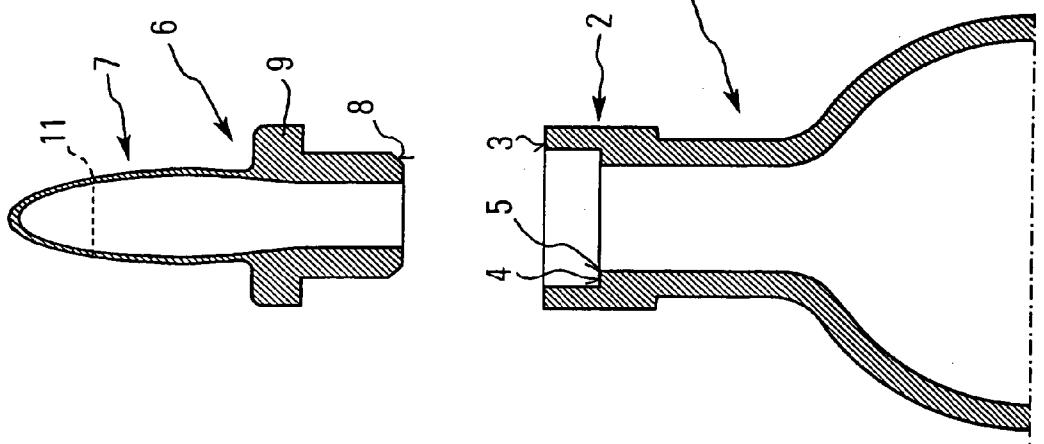
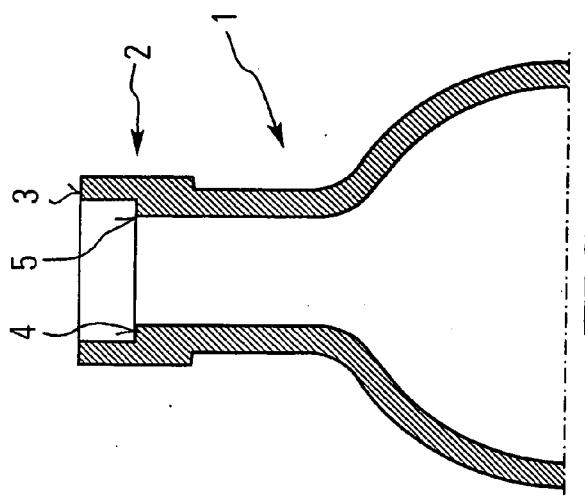


FIG. 1



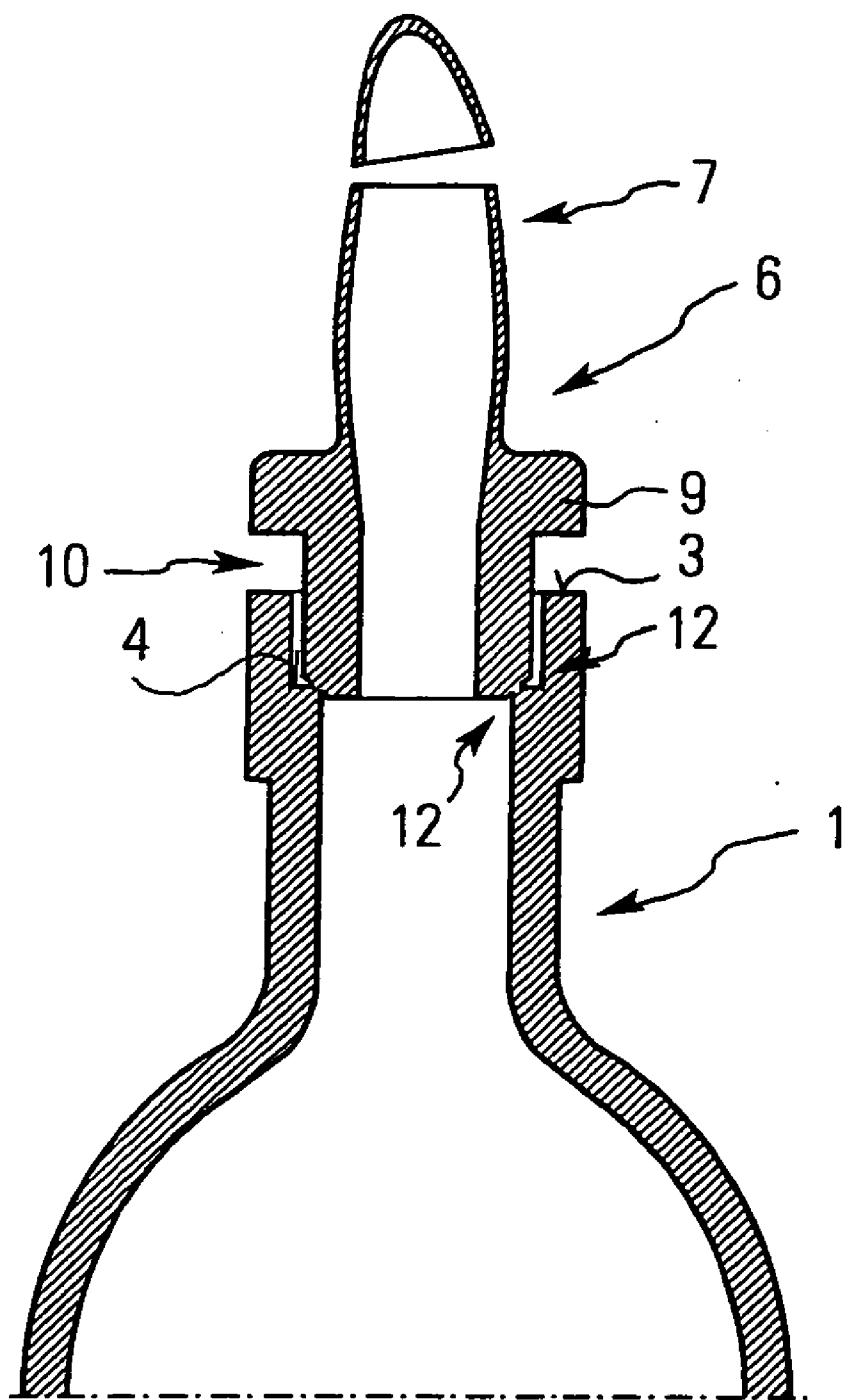


FIG. 4

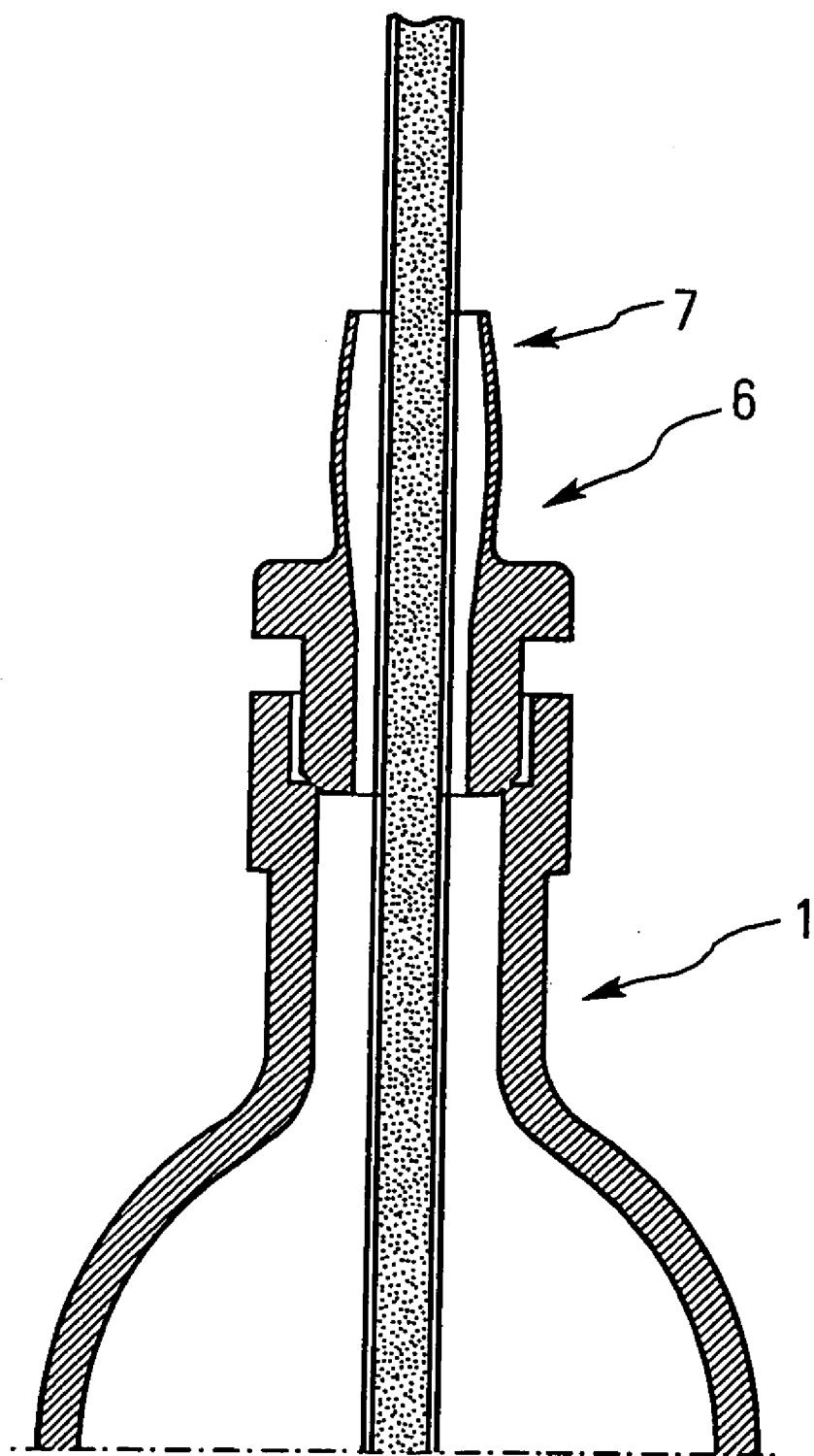


FIG. 5

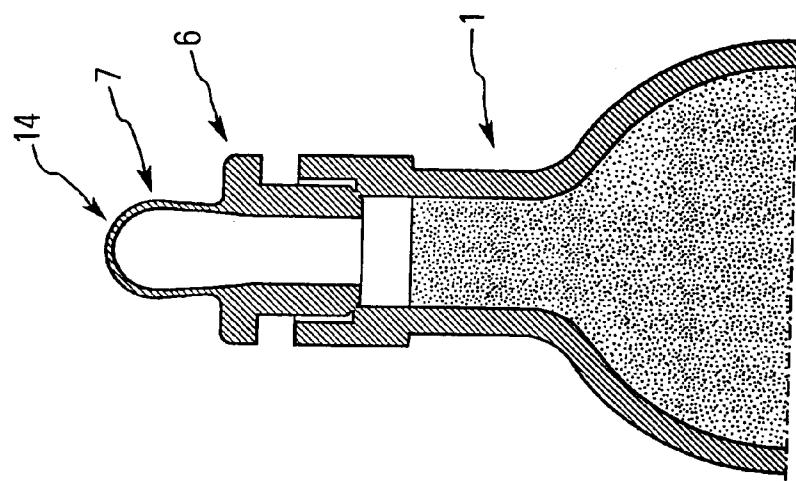


FIG. 8

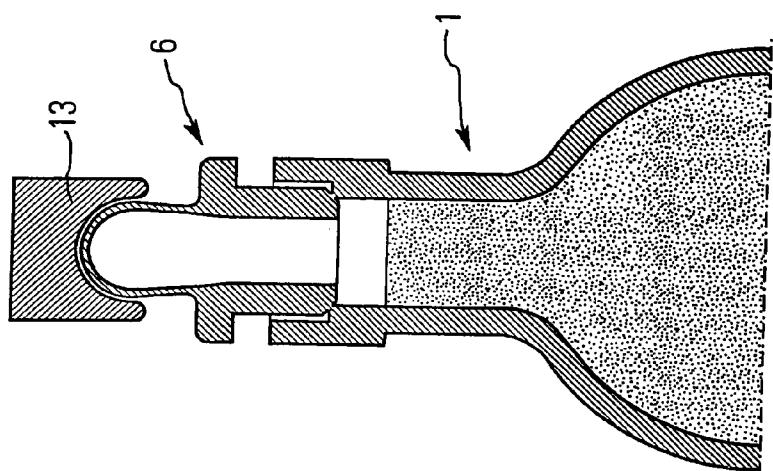


FIG. 7

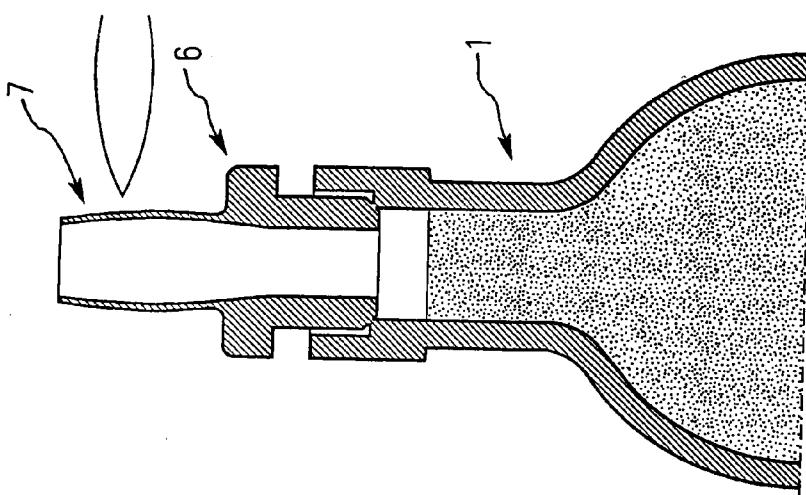


FIG. 6

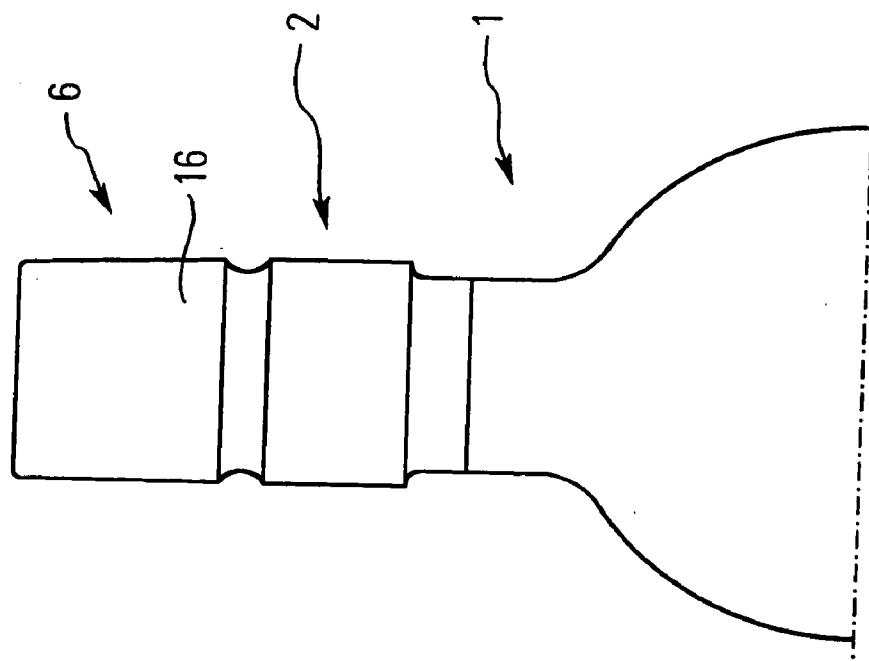


FIG.10

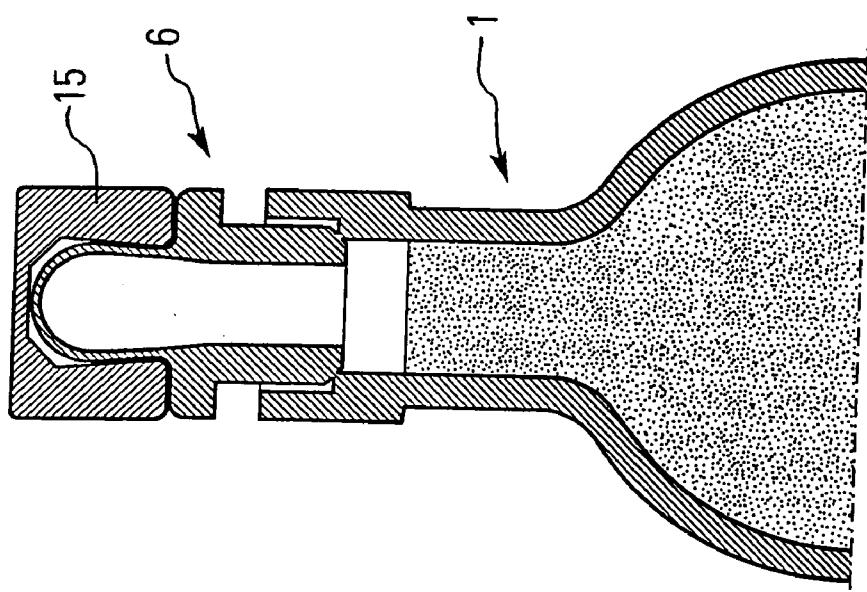


FIG.9

BOTTLE, METHOD FOR THE PRODUCTION THEREOF, METHOD FOR FILLING A BOTTLE, AND METHOD FOR OPENING A BOTTLE

[0001] The present invention relates to a method for producing bottles, especially beverage bottles, comprising a basic bottle body and a closure body, the basic bottle body being made from glass. Moreover, the invention relates to such a bottle, and to a method for filling beverages into such a bottle.

[0002] Such glass bottles have been used for the storage of beverages for many years. So-called crown caps, screw caps, or the like, serve to close such bottles. Cork is normally used for closing wine or champagne bottles. Natural corks are especially used with expensive red wines, white wines and champagne of a high quality. Cork as a natural product may contain bacteria and fungus spores that even with a chemical treatment of the cork cannot always be killed off for sure. Especially in the case of long-term storage, bacteria and fungus spores may lead to putrefaction processes affecting the taste of wine.

[0003] A further problem is that expensive wines, in particular, are nowadays copied, i.e. empty original bottles are filled with a more inexpensive wine and re-closed again with an "original cork".

[0004] It is the object of the present invention to provide a bottle in which the above-mentioned drawbacks do not arise and which, moreover, can be closed particularly tightly and is substantially tamperproof.

[0005] According to the invention this object is achieved in that the closure body is also made from glass and is monolithically connected to the basic bottle body with formation of a predetermined breaking point.

[0006] The beverage bottle closed in this way consists 100% of chemically neutral glass. The monolithic connection between closure body and basic bottle body creates an amorphous gas-tight connection, whereby the use of any sealing materials can be omitted. After the bottle has been opened, i.e. after destruction of the predetermined breaking point, the bottle can no longer be closed by the consumer, which ensures a high degree of tamperproofness.

[0007] According to a preferred variant the monolithic connection is established through a fusion process.

[0008] The basic bottle body itself preferably comprises a bottle neck which is provided at its open end with a stepped hole for receiving the closure body, in such a manner that the predetermined breaking point is formed between the inwardly projecting step of the basic bottle body and the closure body. The bottle neck thereby protects the predetermined breaking point so that even in the case of inappropriate use a potential risk of injury, e.g. when the bottle is put on the lips, is eliminated. It is also advantageous when for the formation of the predetermined breaking point the connection area between the basic bottle body and the closure body is formed by an edge standing on a surface, the wall thickness of the basic bottle body being relatively great in the area of the bottle neck, just like the wall thickness of the closure body, whereas the wall thickness of the predetermined breaking point is small in comparison therewith. This configuration of the predetermined breaking points can meet basically opposing demands, namely that the bottle neck

should have an adequate mechanical strength, which is achieved through the relatively great wall thickness, and that, on the other hand, the predetermined breaking point should be thin-walled to make it easier to tear off the closure body from the basic bottle body when the bottle is opened.

[0009] Moreover, due to the configuration of an edge/surface connection it is achieved that at the predetermined breaking point a notch is provided at both sides, which notch upon the application of forces onto the closure body leads to a stress concentration in the predetermined breaking point, which facilitates a defined and neat tearing off of the closure body at the predetermined breaking point.

[0010] Preferably, the wall thickness of the bottle neck and the closure body is at least 4 mm in the area of the predetermined breaking point.

[0011] For opening the bottle it is advantageous when the closure body comprises a radially projecting surrounding flange at a distance from the free end of the bottle neck of the basic bottle body. A tool which serves to lift off the closure body can be introduced between the free end of the bottle neck and the surrounding flange of the closure body.

[0012] According to a preferred embodiment of the invention the closure body is provided in its portion above the flange with a thin-walled filling and closing section that is open at the front side for filling the bottle and that, after the bottle has been filled, can be closed in the manner of an ampoule by the action of heat to obtain a calotte. It is thereby possible to connect the closure body to the basic bottle body already prior to the filling of the bottle. As a result, a fusion process can be employed, whereby the basic bottle body is heated without a negative impact on the contents of the bottle. In the preferred embodiment, a thin-walled section of the closure body must just be closed, the section being moreover largely spaced apart from the contents of the bottle. The processes needed therefor are known from ampoule technology. Since the section is thin-walled, like in the case of an ampoule, the action of heat on the product is almost negligible.

[0013] According to a development of the invention, the filling and closing section of the closure body has the shape of a closed torpedo prior to connection to the basic bottle body. The closure body can thus be produced by blow molding, where apart from the relatively thick-walled part facing the bottle neck of the basic bottle body, including the flange, the thin-walled filling and closing section can also be produced in the blow molding process. The advantage with this type of manufacture is that the closure body, if connected in a monolithic manner to the basic bottle body, has the effect that the bottle is sealed hermetically. When the bottles are supplied in this state by the bottle producer to the vineyard or the filler, they are protected against environmental influences. It is therefore not possible that, as has so far been the case, rain water, insects or dust can penetrate. A rinsing operation which itself would again leave residues of cleaning agents in the bottles is thus not required.

[0014] Prior to the filling of the bottles in the vineyard or at the bottler's place, the filling and closing section must be opened. This is possible in a particularly simple way if the torpedo-shaped filling and closing section of the closure body is formed with a surrounding weakening line with the help of which the tip of the torpedo can be broken off for filling the bottle.

[0015] The bottle can then be filled with conventional methods by introducing a filling lance, whereupon according to a preferred embodiment the filling and closing section of the closure body is then closed in the manner of an ampoule by the action of heat. The bottle is now sealed in a gas-tight manner, it consists of a uniform material that does not react chemically with the contents of the bottle.

[0016] For opening purposes a tool may be inserted between the free front-side end of the bottle neck of the basic body and the radially projecting flange of the closure body, the tool tearing off the closure body from the inwardly oriented step of the bottle neck through application of an axial force onto the closure body.

[0017] An embodiment of the invention will now be explained in more detail with reference to a drawing, in which:

[0018] FIG. 1 shows the upper part of the basic bottle body of a glass bottle of the invention;

[0019] FIG. 2 the basic body of FIG. 1 with a closure body, prior to the mounting thereof;

[0020] FIG. 3 the basic bottle body of FIG. 2 with fused closure body of FIG. 2;

[0021] FIG. 4 the bottle of FIG. 3 with removed tip of the filling and closing portion of the closure body;

[0022] FIG. 5 the bottle of FIG. 4 with introduced filling lance, during filling;

[0023] FIG. 6 the bottle filled in the meantime, in which the filling and closing section is heated;

[0024] FIG. 7 the bottle of FIG. 6 with mounted form tool for closing the filling and closing section;

[0025] FIG. 8 the closed bottle;

[0026] FIG. 9 the bottle of FIG. 8 with a mounted protective cap; and

[0027] FIG. 10 a side view of the closing portion of the bottle with a mounted collar.

[0028] The sectional views of FIGS. 1 to 9 show that the basic bottle body 1 substantially corresponds to a commercial bottle, e.g. a wine bottle. In the area of the bottle neck 2, an inwardly oriented step 4 is provided at a distance from the open front-side end 3 of the bottle neck, the step 4 forming a surrounding edge 5. The basic bottle body has a wall thickness of about 4 mm in the area of the bottle neck. Like in the case of commercial wine bottles, the basic bottle body is made from amorphous glass.

[0029] FIG. 2 shows the closure body 6 which, like the bottle, is a rotationally symmetrical member. Said closure body 5 is produced by blowing, wherein the relatively thick-walled part facing the bottle neck of the basic bottle body 1 is formed in one operation, and a torpedo-shaped thin-walled filling and closing section 7 in addition.

[0030] In its lower portion the closure body 6 comprises a portion having an outer diameter smaller than the inner diameter of the stepped hole of the bottle neck. At its front side end, the closure body comprises a surrounding conical outer sectional surface 8 matching with the edge 5 of the step 4 (cf. FIG. 3).

[0031] At a distance from the lower front-side end of the closure body 6, a radially projecting surrounding flange 9 is integrally molded thereon, the flange having an outer diameter substantially corresponding to the outer diameter of the bottle neck 2.

[0032] The distance of the bottom side of the flange 9 up to the lower front-side end of the closure body 6 is here chosen to be larger than the distance between step 4 and the upper front-side end 3 of the bottle neck 2. This creates a gap 10 between the flange 9 and the end 3 of the bottle neck that is open at the front side, the significance of the gap being explained later.

[0033] A weakening line 11 which makes it easier to break off the tip of the filling and closing section (cf. FIG. 4) is also formed at the upper end of the filling and closing section 7 of the closure body 6.

[0034] Operation and function of the invention will now be explained in more detail with reference to the manufacturing and filling process.

[0035] The basic bottle body 1 and the closure body that have just been described are already interconnected at the bottle manufacturer's place. This is done by a fusion step used in glass engineering, the edge 5 of the step 4 of the basic bottle body being sealed or welded to the surrounding conical outer sectional surface 8 of the closure body. This creates a predetermined breaking point 12 which is enclosed at both sides by respectively surrounding notches ensuring a concentration of stress peaks at the predetermined breaking point. As can be seen in FIG. 3, the empty bottle is now hermetically sealed and is transported in this state to the vineyard or bottler.

[0036] The tip of the filling and closing section 7 of the closure body 6 is there separated by mechanical action. This is easily possible by virtue of the weakening line 11. The molding of such weakening lines is known from ampoule technology. The bottle opened in this way need not be cleaned because its interior is free from any environmental influences by being supplied in the closed state. As can be seen in FIG. 5, the bottle is filled in the conventional way.

[0037] After the bottle has been filled (cf. FIG. 6), the filling and closing section 7 that is now open is heated and, as can be seen in FIG. 7, is closed with the help of a form tool 13 to form a calotte or spherical cap 14 (cf. FIG. 8). Due to the material thickness chosen for the closure body 6, heating the thin-walled filling and closing section 7 and closing the same to obtain the calotte 14 will not effect a heating up of the contents. The reason is that the thick-walled flange 9 forms a kind of thermal barrier.

[0038] The bottle shown in FIG. 8 is now closed in a final way and suited to store the contents for many years, without the contents being subjected to any chemical processes or environmental influences.

[0039] FIG. 9 additionally shows that the relatively thin-walled calotte 14 may be covered by a mounted protective cap 15. FIG. 10 shows the bottle with a mounted collar 16. It is evident that the outer appearance of the bottle hardly differs from a conventional wine bottle.

[0040] If one wishes to open the bottle, it is possible to introduce a tool into the gap and to apply an axial force with said tool onto the closure body to lift the latter from the basic

body 1. The stresses produced thereby are concentrated in the predetermined breaking point 12, thereby ensuring a defined tearing off of the closure body 6 from the step 4 of the bottle neck 2.

1. A method for producing bottles, especially beverage bottles, comprising a basic bottle body (1) and a closure body (6), the basic bottle body consisting of glass, the closure body (6) being also made from glass, characterized in that said closure body (6) is connected in a monolithic manner to the basic bottle body (1) to produce a predetermined breaking point.

2. The method according to claim 1, characterized in that the monolithic connection is established by a fusion process.

3. A bottle, especially beverage bottle, comprising a basic bottle body (1) and a closure body (6), the basic bottle body consisting of glass, the closure body (6) also consisting of glass, characterized in that the closure body (6) is connectable in a monolithic manner to the basic bottle body (1) to produce a predetermined breaking point (12).

4. The bottle according to claim 3, characterized in that the basic bottle body (1) comprises a bottle neck (2) which comprises a stepped hole at the open end thereof for receiving the closure body, in such a manner that the predetermined breaking point is formed between the inwardly projecting step (4) of the basic bottle body (1) and the closure body (6).

5. The bottle according to claim 4, characterized in that for the formation of the predetermined breaking point (12) the connection portion between the basic bottle body (1) and the closure body (6) is formed by an edge (5) standing on a surface (8), the wall thickness of the basic bottle body (1) in the area of the bottle neck (2), just like the wall thickness of the closure body (6), being relatively great whereas in comparison therewith the wall thickness of the predetermined breaking point (12) is small.

6. The bottle according to claim 5, characterized in that the wall thickness of the bottle neck (2) and the closure body (6) is at least 4 mm.

7. The bottle according to any one of claims 3 to 6, characterized in that the closure body (6) comprises a radially projecting surrounding flange (9) at a distance from the free end (3) of the bottle neck (2) of the basic bottle body (1).

8. The bottle according to any one of claims 3 to 7, characterized in that the closure body (6) in its area above the flange (9) terminates in a thin-walled filling and closing section (7) which is open at the front side for filling the bottle and, after the bottle has been filled, is closable in the manner of an ampoule by the action of heat to obtain a calotte (14).

9. The bottle according to any one of claims 3 to 8, characterized in that the filling and closing section (7) of the closure body (6) has the shape of a closed torpedo before connection to the basic bottle body (1).

10. The bottle according to any one of claims 3 to 9, characterized in that the torpedo-shaped filling and closing section (7) of the closure body (6) is formed with a surrounding weakening line (11) with the help of which the tip of the filling and closing section (7) can be broken off for filling the bottle.

11. A method for filling beverages into a bottle according to any one of claims 3 to 10, characterized in that the bottle is supplied with basic bottle body (1) and monolithically connected closure body (6), whereupon a tip of the filling and closing section (7) is removed, the beverage is filled into the bottle via the filling and closing portion of the closure body, whereupon the filling and closing portion is sealed in the manner of an ampoule by the action of heat.

12. The method for opening a bottle according to any one of claims 3 to 11, characterized in that a tool is used for gripping between the free front-side end (3) of the bottle neck (2), the basic bottle body (1) and below the radially projecting flange (9) of the closure body (6) and an axial force is thereby applied to the closure body (6), whereby the closure body (6) is torn off from the inwardly oriented step (4) of the bottle neck (2) of the basic bottle body (1).

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