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(71) Applicant: **Finke, Stephan J.**
542 Avenue Del Oro
Sonoma, CA 95476(US)

(72) Inventor: **Finke, Stephan J.**
542 Avenue Del Oro
Sonoma, CA 95476(US)

(74) Representative: **Keil, Rainer A., Dipl.-Phys. Dr. et al**
KEIL & SCHAAFHAUSEN Patentanwälte
Eyssenecksstrasse 31
W-6000 Frankfurt am Main 1 (DE)

(54) Methods and combinations for sealing corked bottles.

(57) A disc (10,30) made of thermoplastic material is inserted into the neck of a corked bottle and placed upon the top of the cork so that when the disc is partially melted, it forms a water resistant seal with the interior surface of the bottle neck and the cork. In forming the seal, the entire disc (10,30) remains inside the bottle neck leaving the exterior of the bottle free from messy or harmful residue. The interior surface of the bottle neck may be straight (12) or beveled (50) at an obtuse angle. If the interior surface of the bottle neck is beveled, a disc with a frusto conical configuration (30) is used in the method. A cover layer can be adhered to the top of the wax disc for ornamentation and labeling purposes.

A liquified thermoplastic material (130) is injected into the neck of a corked bottle and placed upon the top of the cork (114) so that when the thermoplastic material hardens, it forms a water resistant seal with the interior surface of the bottle neck and the cork. In forming the seal, the entire thermoplastic material remains inside the bottle neck leaving the exterior of the bottle free from messy or harmful residue. The bottle neck further comprises a groove (124) around the interior surface near the mouth. A cover layer (132) can be snapped into the groove such that it lays on top of the thermoplastic material for ornamentation and labeling purposes and to further secure the cork in place within the bottle neck.

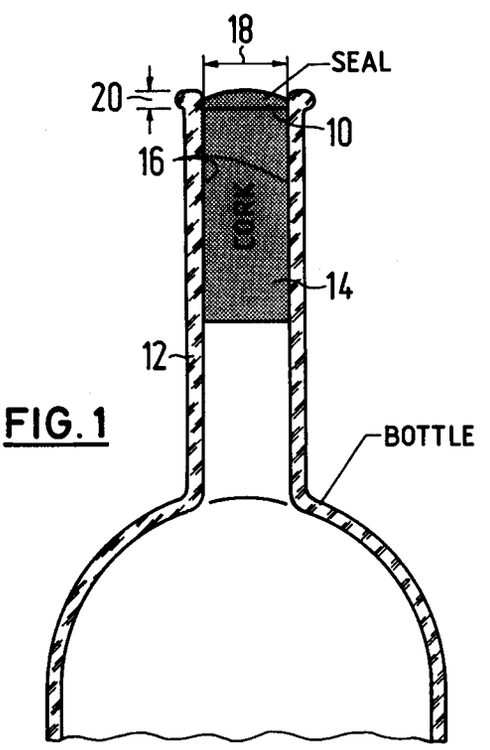

FIG. 1

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Technical Field of the Invention

The present invention relates to methods for sealing corked bottles, and in particular for sealing corked bottles containing beverages including wines.

Background of the Invention

Existing methods of sealing corked bottles have several disadvantages. One current method of sealing corked bottles requires the use of thin metal foils containing lead, which are now widely believed to leave traces of harmful lead particles on the glass surface of the bottle after removal. In view of the recent bans in many states on the use of lead, this method is undesirable.

Another conventional method utilizes seals made of plastic. This is undesirable for many products because plastic seals are not considered suitable for premium beverages, including higher-priced wines.

Current methods have also attempted to employ wax seals. However, the current method involves forming wax seals by dipping the opening and neck of the bottle in wax. This method has the disadvantages of requiring the bottle to be inverted during the sealing process and of leaving a messy residue of wax when the bottle is opened.

All of the conventional sealing methods described above result in seals which cover all or most of the exterior of the glass neck of the bottle with the sealing material.

In contrast to the existing sealing methods, this invention will not leave any harmful or messy residue on the exterior of the bottle neck, will produce an elegant seal suitable for use on premium beverage bottles, including higher-priced wines, and will leave the entire exterior surface of the glass neck of the bottle exposed. It will also allow for the use of embossing on the wax seal.

It will also allow for the use of embossing on the paper or plastic cover.

Summary of the Invention

One object of the present invention is to provide a method for sealing a corked bottle which utilizes a cylindrical wax disc which is inserted into the mouth of the neck of a corked bottle and placed on top of the cork. The bottle neck is heated so that the disc partially melts and forms a seal with the interior surface of the bottle neck and the cork. In the preferred embodiment, this is accomplished by heating the bottle neck prior to the insertion of the wax disc.

Another object of the present invention utilizes a frusto conical disc which is inserted into the mouth of the neck of a corked bottle where the interior surface of the mouth is beveled. The bottle neck is heated so that the disc melts and forms a seal with the beveled interior surface of the bottle neck and the cork. In the preferred practice of the is method, the bottle neck is heated prior to the insertion of the wax disc.

Yet another object of the present invention is to provide a cover layer on top of the disc which has the ability to accept fine print or embossed designs.

One further object of the present invention is to provide a method for sealing a corked bottle which utilizes a thermoplastic material injected in liquified form into the mouth of the neck of a corked bottle and placed on top of the cork wherein it hardens and forms a seal with the interior surface of the bottle neck and the cork.

Another object of the present invention is to provide a plastic or paper cover on top of the thermoplastic seal layer such that the cover snaps into a groove around the inside of the bottle neck.

Objects and advantages other than those set forth above will be apparent from the following description when read in conjunction with the accompanying drawings.

Brief Description of the Drawings

FIG. 1 is a cross-sectional view of a neck of a conventional corked bottle showing a cork and the disc positioned therein according to the first embodiment.

FIG. 2 is a top view of the disc of the first embodiment.

FIG. 3 is a cross-sectional view of the disc of the first embodiment.

In FIGS. 1-3, the same reference numerals are being used to refer to the same elements shown in different views.

FIG. 4 is a cross-sectional view of a neck of a corked bottle showing a cork and the disc positioned therein according to a second embodiment.

FIG. 5 is a perspective view of a disc having a frusto conical configuration in accordance with the second embodiment. The same reference numerals used in FIG. 4 are used in FIG. 5 to refer to the same elements.

FIG. 6 is a cross-sectional view of a neck of a corked bottle showing a cork, the disc and a cover layer positioned therein according to one embodiment. The same reference numerals used in FIG. 4 are used in FIG. 6 to refer to the same elements.

FIG. is a cross-sectional view of a neck of a corked bottle showing a cork and the thermoplastic seal layer positioned therein and further showing a groove for receiving the cover.

Detailed Description of the Invention

The present invention is directed to a method for sealing a corked bottle. As shown in FIGS. 1 & 2, this sealing method utilizes a cylindrical disc 10 of a slightly smaller diameter than the inside diameter of the bottle neck 12 into which it will be placed, measured at the point in the bottle neck at which the top of the cork 14 lies. The disc 10, according to FIG. 3, is flat on the bottom and may be crowned or flat on the top, with a total height 20. As shown in FIG. 1, the height 20 of the disc is selected so that when the disc 10 is partially melted and removably secured to the top of the cork 14 and the interior surface 16 of the bottle neck, all of the disc material is contained entirely within the bottle neck. This alleviates the messy or harmful residue on the exterior of the bottle that occurs when bottles are sealed according to the current methods. The preferred embodiment of the claimed method utilizes a disc with a total height 20 of 2 to 3 mm. In this preferred embodiment, the disc 10 resides entirely below the mouth of the bottle neck 12. This permits shipping of the bottles upside down without damaging the top of the wax chip.

The disc is made of a thermoplastic material, which will melt and seal inside of the bottle neck under temperature conditions compatible with beverage manufacture and handling. A suitable melting point is between 80° and 180° F. The thermoplastic material should also be chosen in light of prevailing standards for the contact of materials by foods and beverage products. Non-toxic, substantially inert materials are preferred for this application. The disc should also be made of a thermoplastic material which will cleanly release its seal when it is removed from the bottle neck with the cork. Ideally, the thermoplastic material will not crumble or substantially fracture when pierced with a cork screw.

In a particularly preferred embodiment, the disc is comprised of a material which can accept and hold an embossed design on the top of the disc, for example, a logo or design embossed on the disc.

There is a large number of thermoplastic materials, both natural and organically synthesized, which will fit the above-noted criteria for the disc. Natural beeswax is a preferred material because of its demonstrated compatibility with food and beverage products. One disadvantage, however, of beeswax is its low melting point which make handling and storage difficult. Another preferred wax is granulate which would be suitable for high speed assembly line use of the disc.

In the selection of a thermoplastic material for the disc, the ability of the disc to retain an embossed design after heating to create the seal should be considered. In other words, a material should be selected which can be sealed by contact with a heated bottle neck but which will not lose the pre-embossed design under these temperature conditions. For this reason, it is conceived that an aggregation or combination or mixture of materials may provide a suitable disc construction.

The selection of thermoplastic materials suitable for the disc from among organic polymer thermoplastic materials and from among naturally occurring wax materials is within the skill of the ordinary artisan.

One potential disadvantage of this method using a bottle with a straight interior neck surface 16, as seen in FIG. 1, is that when the disc 10 is inserted into the mouth 18 of the bottle by hand or by automatic dispenser, the disc 10 may get hung up on the interior neck surface 16 so that the disc 10 is oriented at an angle to the cork 14 top surface. This misplacement may prevent the disc from forming a moisture resistant seal with the interior surface 16 of the bottle neck 12. To avoid this potential problem, the sealing method of the present invention, according to a second embodiment, utilizes a bottle as shown in FIG. 4, in which the interior neck surface 36 near the mouth 38, is beveled at an obtuse angle 44 measured from the horizontal axis of the neck 32. As shown in FIG. 4, the disc 30 utilized in this embodiment has a frusto conical configuration where the obtuse angle 44 is substantially equivalent to the obtuse angle 44 of the beveled interior neck surface 36. This is so the disc 30 will tend to center itself above the cork 34 when inserted into the bottle mouth 38 by hand or by automatic dispenser. The frusto conical disc 30 has a flat bottom with either a flat top, a crowned top or any shape desired by the bottle sealer. The disc 30 is fabricated from a thermoplastic material such as those described above the reference to the first embodiment.

In FIG. 4, the length 46 of the beveled interior neck surface 36, measured from the mouth 38 of the bottle to the top of the cork 34, may vary depending upon the obtuse angle 44 of the beveled interior neck surface 36. For example, the interior neck surface 36 may be beveled at an obtuse angle 44 of 100 degrees with the length of the beveled surface 46 approximately 4 millimeters. The selection of the bevel angle is determined by the overall bottle design. The magnitude of this angle is not critical to the practice of the present invention.

In practicing a preferred embodiment of the claimed method, as seen in FIG. 4, the cork 34 is inserted into the bottle neck 38 so that the distance 40 from the top of the cork 34 to the top edge of the mouth 38 of the bottle is at least 1 millimeter

greater than the height 42 of the disc 30. The advantages of this are twofold. First, this prevents any of the disc material from melting over the mouth 38 of the bottle and onto the exterior of the bottle neck during the sealing process. Second, this permits the bottles to be stored and shipped upside down with each bottle supported on the edge of the opening of the bottle neck without putting pressure on the disc 30.

There are two ways of performing the claimed method. One way is to insert the disc into the bottle neck so it rests upon the cork top surface before heating the bottle neck. The bottle neck is then heated for a period of time so that the interior surface of the bottle neck and the top surface of the cork are hot enough to partially melt the outer surface of the disc, causing it to adhere to the interior neck surface of the bottle neck and the top surface of the cork. This method may require the use of a disc with a composite structure so that the application of heat after the insertion of the disc will not cause the embossed design to melt and to obscure. This method, however, may be used when no embossing is present.

Alternatively, and preferably, the bottle neck is heated before the disc is inserted therein, so that any brand identification embossed on the top of the disc is preserved without damage.

In another embodiment of the present invention as shown in FIG. 6, an additional cover layer 48 may be used to cover the top of the disc 30 in both cylindrical and frusto conical disc embodiments. This additional cover layer 48 protects the disc 30 inside the bottle neck. The cover layer 48 also presents unlimited opportunity for design and decoration since the top of the cover layer 48 may be plain, embossed, printed or otherwise. The cover layer 48 may be made of paper of various weights or plastic.

There are various ways of securing the cover layer 48 to the top of the disc 30. If a hard wax is used, the cover layer 48 may be adhered to the disc 30, partially melted according to either of the heating methods described above. Thus, while the disc 30 is partially melted, the cover layer 48 may be placed upon the top surface of the disc 30 by hand or automatic dispenser so that when the disc 30 hardens, the cover layer 48 will be adhered to the top surface of the disc 30. Alternatively, a non-toxic adhesive can be used after the disc 30 is inserted into the bottle neck, heated and cooled.

If a soft, sticky wax is used, no partial melting of the disc or use of adhesives will be necessary. The cover layer 48 may simply be pressed onto the top surface of the disc 30 by hand or machine.

The selection of methods of adhering the cover layer to the top of the disc is within the skill of the ordinary artisan.

In practicing a preferred embodiment of the claimed invention, as seen in FIG. 6, the height 50 of the cover layer 48 may be selected so that the cover layer 48 is displaced entirely within the bottle neck. Ideally, the height 50 of the cover layer 48 is less than 1 mm. This permits the bottles to be stored and shipped upside down with each bottle suppported on the edge of the opening of the bottle neck without putting pressure on the cover layer 48. Although this is a preferred embodiment of the present invention, the height of the cover layer 48 may also be selected such that the cover layer 48 extends beyond the edge of the bottle opening.

The present invention is directed to a method and apparatus for sealing a corked bottle. As shown in FIG.7, this sealing method utilizes a thermoplastic material which is injected into the mouth of a corked bottle neck 110 to form a thermoplastic layer 112 on top of the cork 114.

In carrying out the method of the present invention, the thermoplastic material in liquified form is injected into the mouth of a corked bottle to form a layer on top of the cork 114. When the thermoplastic material hardens, the outer surface of the layer 112 forms a moisture resistant seal with the interior surface 116 of the bottle neck 110 and the bottom surface of the layer 112 forms a moisture resistant seal with the top surface of the cork 114. The amount of the liquified thermoplastic material to be injected is selected so that when the thermoplastic layer 112 is formed and removably secured to the top of the cork 114 and to the interior surface 116 of the bottle neck, all of the thermoplastic material is contained entirely within the bottle neck. This alleviates the messy or harmful residue on the exterior of the bottle that occurs when bottles are sealed according to the current methods.

The preferred embodiment of the claimed method utilizes 0.05 to 0.15g (approximately 1 to 3 drops) of liquified thermoplastic material. In this preferred embodiment, the thermoplastic layer 112 resides entirely below the mouth of the bottle neck 110. This permits shipping of the bottles upside down without damaging the top of the thermoplastic layer.

The thermoplastic material is selected such that it will melt and seal the inside of the bottle neck under temperature conditions compatible with beverage manufacture and handling. A suitable melting point is between 80° and 180° F. The thermoplastic material should also be chosen in light of prevailing standards for the contact of materials by foods and beverage products. Non-toxic, substantially inert materials are preferred for this application. The thermoplastic material should also be able to cleanly release its seal when it is re-

moved from the bottle neck with the cork. Ideally, the thermoplastic material will not crumble or substantially fracture when pierced with a cork screw.

There is a large number of thermoplastic materials, both natural and organically synthesized, as well as aggregations or combinations or mixtures of materials, which will fit the above-noted criteria. Natural beeswax is a preferred material because of its demonstrated compatibility with food and beverage products. One disadvantage, however, of beeswax is its low melting point which make handling and storage difficult. Another preferred wax is granulate which would be suitable for high speed assembly line use of the thermoplastic layer.

The selection of thermoplastic materials suitable for the thermoplastic layer from among organic polymer thermoplastic materials and from among naturally occurring wax materials is within the skill of the ordinary artisan.

As further seen in FIG. 7, the present invention utilizes a circular cover 122 over the thermoplastic layer 112, which is removably secured in a groove 124 around the interior surface 116 of the bottle neck 110. The groove 124 is positioned above and adjacent to the thermoplastic layer 112 and has a depth 126 for receiving the outer edge 132 of the cover 122. This holds the cover 122 tightly in place on top of and adjacent to the thermoplastic layer 112 which in turn, helps to retain the cork in place.

The diameter of the cover 122 is slightly larger than the diameter of the interior surface 116 of the bottle neck. Thus, when the cover 122 is inserted into the mouth 120 of the bottle neck and pressed down into place on top of the thermoplastic layer 112, the outer edge 132 of the cover 122 snaps into the groove 124 around the inside of the bottle neck 110. The width 130 of the groove will vary depending upon the thickness of the cover 122 used. The advantage of using the groove 124 for securing the cover 122 is that it avoids the use of adhesives.

In a preferred embodiment, the inside diameter of the bottle neck is approximately 12/32 of an inch and the diameter of the cover 122 is approximately 13/32 of an inch, with the groove 124 having a depth 126 of approximately 1/64 of an inch and a width 130 of approximately 1/64 of an inch. The preferred thickness 128 of the cover 122 is approximately 1/32 to 1/64 of an inch.

The cover 122 may be made of plastic or rigid paper of various weights and must be capable of being pierced by a cork screw. The cover layer 122 presents unlimited opportunity for design and decoration since the top of the cover layer 122 may be plain, embossed, printed or otherwise.

In practicing a preferred embodiment of the claimed method, as seen in FIG.7, the cork 114 is inserted into the bottle neck 110 so that when the thermoplastic layer 112 and cover 122 are positioned therein, the distance 118 from the top of the cover 122 to the top edge of the mouth 120 of the bottle is at least 1/64 of an inch. The advantages of this are twofold. First, this prevents any of the disc material from melting over the mouth 120 of the bottle and onto the exterior of the bottle neck during the sealing process. Second, this permits the bottles to be stored and shipped upside down with each bottle supported on the edge of the opening of the bottle neck without putting pressure on the thermoplastic layer 112 or the cover 122.

Once the cork is in place in the bottle neck, thermoplastic material in liquid form is injected on to the top surface of the cork 114 where it hardens to form a moisture resistant seal with the interior surface 116 of the bottle neck 110 and the top surface of the cork 114. Once the thermoplastic layer 112 is formed, a cover 122 is inserted into the mouth 120 of the bottle on to the top of the thermoplastic layer 112. By pressing down on the center of the cover 122, the outer edge of the cover 122 will move radially outward from the center of the cover until snapping into place in the groove 124. When properly snapped into place in the groove 124, the cover 122 will lay flat on top of the thermoplastic layer 112.

In practicing a preferred embodiment of the claimed invention, as seen in FIG.7, the thickness 128 of the cover layer 122 may be selected so that the cover layer 122 is displaced entirely within the bottle neck. This permits the bottles to be stored and shipped upside down with each bottle supported on the edge of the opening of the bottle neck without putting pressure on the cover layer 122. Although this is a preferred embodiment of the present invention, the height of the cover layer 122 may also be selected such that the cover layer 122 extends beyond the edge of the bottle opening.

While the present invention has been described in detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and the scope of the appended claims.

Claims

1. A method of sealing a corked bottle comprising the steps of:

a) providing a corked bottle having:

i) a cylindrical neck terminating in a mouth having a top edge, said neck having a cylindrical interior surface which is partially beveled near said mouth to form an obtuse angle measured from a horizontal axis of said neck;

ii) a cylindrical cork, having a top flat surface and a bottom surface, displaced entirely within said neck below said beveled interior surface;

b) inserting a frusto conical disc having a top surface, a flat bottom surface, and a beveled outer surface, into said beveled interior bottle neck surface, wherein said disc bottom surface rests on said cork top surface, wherein said disc beveled outer surface is adjacent to but does not substantially contact said beveled interior neck surface and wherein said disc outer surface is beveled at an obtuse angle measured from the horizontal plane of the said disc bottom surface which angle is substantially equivalent to said beveled interior surface obtuse angle; and

c) heating said neck so that said beveled interior surface and said cork top surface reach a temperature sufficient to partially melt said outer and bottom surfaces of said disc so as to form a moisture resistant seal between said cork, said interior neck surface and said disc.

2. A method of sealing a corked bottle, comprising the steps of:

a) providing a corked bottle comprising:

i) an cylindrical neck terminating in a mouth having a top edge, said neck having a cylindrical interior surface and an inside diameter;

ii) a cylindrical cork, having a top flat surface and a bottom surface, displaced entirely within said neck;

b) inserting a cylindrical disc having an outside diameter less than said inside diameter of said neck, an outer surface, a top surface, and a flat bottom surface, into said neck such that said disc bottom surface rests on said cork top surface such that said disc outer surface is adjacent to but does not substantially contact said interior neck surface; and

c) heating said mouth so that said neck interior surface and said cork top surface reach a temperature sufficient to partially melt said outer and bottom surfaces of said disc so as to form a moisture resistant seal between said cork, said interior neck surface and said disc.

3. A method of sealing a corked bottle, comprising the steps of:

a) proficing a corked bottle comprising:

i) a cylindrical neck terminating in a mouth having a top edge, said neck having a cylindrical interior surface and an inside diameter and a groove near said top edge, said groove having a depth;

ii) a cylindrical cork, having a top flat surface and a bottom surface, displaced entirely within said neck;

b) injecting a liquified thermoplastic material into said neck on top of said cork top surface such that when said thermoplastic material hardens, it forms a moisture resistant seal with said cork top surface and said interior neck surface; and

c) inserting a circular cover having a diameter and an outer edge, on top of said thermoplastic layer such that said edge snaps into said groove.

4. The method of claim 1 to 3 further comprising the step of adhering a cover layer on said disc top surface.

5. The method of claims 1 to 4 wherein said heating step (c) is performed before said inserting step (b).

6. The method of claims 1 to 5 wherein said cork is displaced in said neck such that the distance from said cork top surface to said top edge of said mouth is at least 1 mm greater than the height of said disc.

7. The method of claim 1 to 6 wherin the height of said disc is between 2 and 3 mm.

8. The method of claim 1 or 7 wherein said beveled interior surface obtuse angle is 100 degrees.

9. The method of claim 1 to 8 wherein the length of said beveled interior surface is 4 mm measured from said mouth of the bottle.

10. The method of claim 1 to 9 wherein said disc is made of a thermoplastic material capable of melting at a temperature between 80 and 180 degrees Fahrenheit.

11. The method of claim 1 to 19 wherein said disc is fabricated from a thermoplastic material selected from the group consisting of beeswax, granulate wax and mixtures thereof.

12. The method of claim 3 to 11 wherein said cover layer is made of paper or plastic.

13. The method of claim 4 to 12 wherein the height of said cover layer is less than 1 mm.

14. The method of claim 2 to 13 wherein said disc is made of a thermoplastic material capable of melting at a temperature between 80 and 180 degrees Fahrenheit.

15. The method of claim 2 to 14 wherein said disc is made of thermoplastic material selected from the group consisting of beeswax, granulate wax and mixtures therof.

16. The method of claim 3 to 15 wherein said thermoplastic material is capable of melting at a temperature between 80 and 180 degrees Fahrenheit.

17. The method of claim 3 to 16 wherein said cover diameter is approximately 13/32 of an inch.

18. The method of claim 3 to 17 wherein said neck inside diameter is approximately 12/32 of an inch.

19. The method of claim 3 to 18 wherein said depth of said groove is approximately 1/64 of an inch.

20. The method of claim 3 to 19 wherein said cover is positioned in said neck at a distance from said neck top surface of at least 1/64 of an inch.

21. A combination comprising:

a) a corked bottle having a cylindrical neck terminating in a mouth having a top edge, said neck having a cylindrical interior surface;

b) a cylindrical cork having a top flat surface, said cork being displaced entirely within said neck; and

c) a cylindrical disc having a top surface, a flat bottom surface and an outer surface, said disc being displaced entirely within said neck above said cork, wherein said disc bottom surface is partially melted and removably secured to said cork top surface and wherein said disc outer surface is partially melted an removably secured to said interior neck surface, to create a seal to retain moisture within said cork and said bottle.

22. A combination comprising:

a) a corked bottle having a cylindrical neck terminating in a mouth having a top edge, said neck having a cylindrical interior surface which is partially beveled near said mouth to form an obtuse angle measured from a horizontal axis of said neck;

b) a cylindrical cork having a top flat surface, said cork being displaced entirely within said neck below said beveled interior surface; and

c) a frusto conical disc having a top surface, a flat bottom surface and a beveled outer surface beveled at an obtuse angle measured from plane of said flat bottom surface which is substantially equivalent to said beveled interior surface obtuse angle, said disc being displaced entirely within said neck above said cork such that said disc bottom surface is partially melted an removably secured to said cork top surface and wherein said disc beveled outer surface is partially melted and removably secured to said beveled interior neck surface, to create a seal to retain moisture within said cork and said bottle.

23. A combination comprising:

a) a corked bottle having a cylindrical neck terminating in a mouth having a top edge, said neck having a cylindrical interior surface and a groove near said top edge, said groove having a depth;

b) a cylindrical cork having a top flat surface, said cork being displaced entirely within said neck;

c) a thermoplastic layer having a top, bottom and outer surface, said thermoplastic layer being displaced entirely within said neck above siad cork, wherein said bottom surface of said thermoplastic layer is removably secured to said cork top surface and wherein said thermoplastic outer surface is removably secured to said interior neck surface, to create a seal to retain moisture within said cork and said neck; and

d) a cover having an outer edge wherein said outer edge is secured in said groove.

24. The combination of claim 21 to 23 further comprising a cover layer being displaced entirely within said neck above said disc, wherein said cover layer is adhered to said disc top surface.

25. the combination of claim 21 to 24 wherein said cork is displaced in said neck such that the distance from said cork top surface to said top edge of said mouth is at least 1 mm greater than the height of said disc.

26. The combination of claim 21 to 25 wherein the height of said disc is between 2 and 3 mm.

27. The combination of claim 21 to 26 wherein said disc is made of a thermoplastic material capable of melting at a temperature between 80 and 180 degrees Fahrenheit.

28. The combination of claim 21 to 27 wherein said disc is made of thermoplastic material selected from the group consisting of beeswax, granulate wax and mixtures thereof.

29. The combination of claim 21 to 28 wherein said cover layer is made of paper or plastic.

30. The combination of claim 21 to 29 wherein the height of said cover layer is less than 1 mm.

31. The combination of claim 22 to 30 wherein said beveled interior surface obtuse angle is 100 degrees.

32. The combination of claim 22 to 31 wherein the length of said beveled interior surface is 4 mm measured from said opening of the bottle.

33. The combination of claim 23 to 32 wherein said thermoplastic material is capable of melting at a temperature between 80 and 180 degrees Fahrenheit.

34. The combination of claim 23 to 33 wherein said cover diameter is approximately 13/32 of an inch.

35. The combination of claim 23 to 34 wherein said neck inside diameter is approximately 12/32 of an inch.

36. The combination of claim 23 to 35 wherein said depth of said groove is approximately 1/64 of an inch.

37. The combination of claim 23 to 36 wherein said cover is positioned in said neck at a distance from said neck top edge of at least 1/64 of an inch.

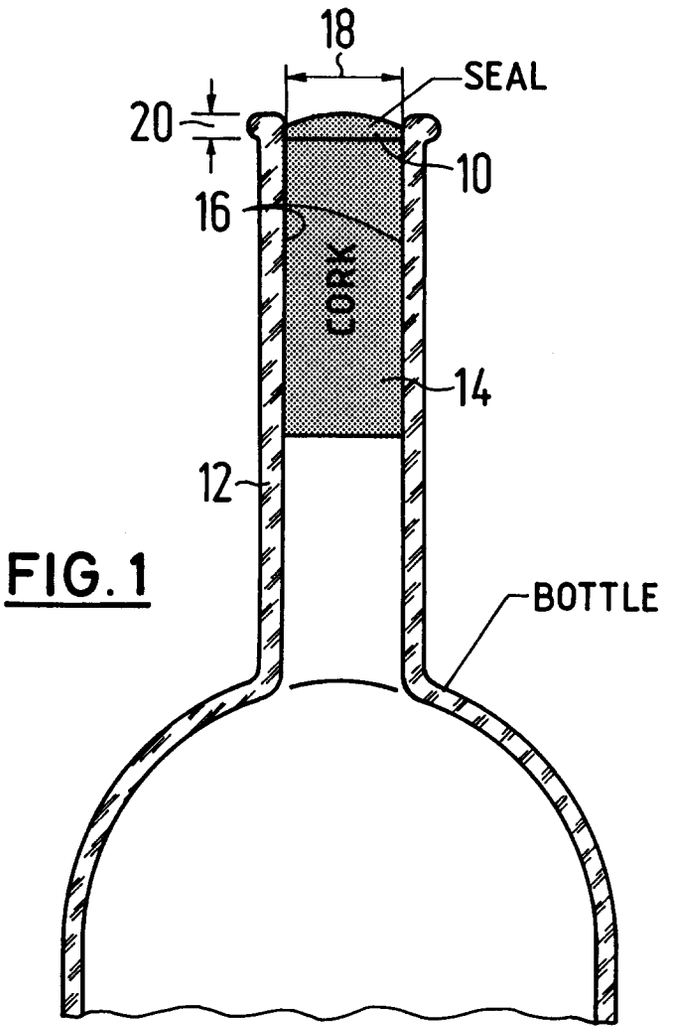
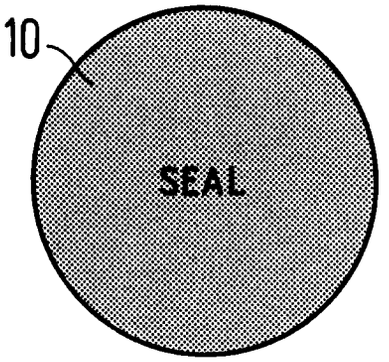
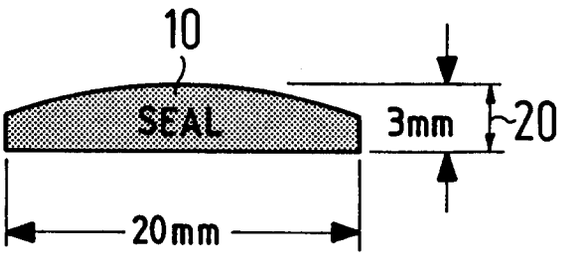


FIG. 1



TOP VIEW

FIG. 2



SIDE VIEW

FIG. 3

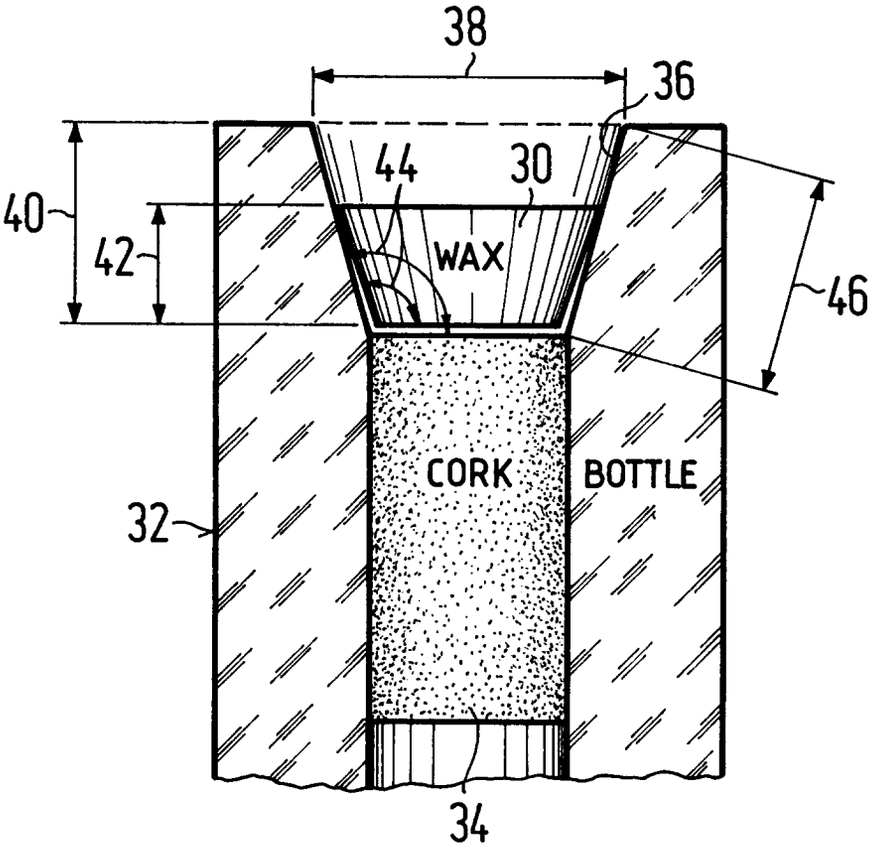

38
36
44
30
40
42
WAX
46
CORK
BOTTLE
32
34

FIG.4

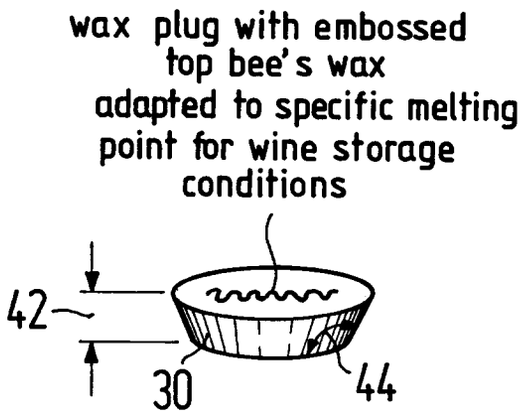

wax plug with embossed top bee's wax adapted to specific melting point for wine storage conditions
42
30
44

FIG.5

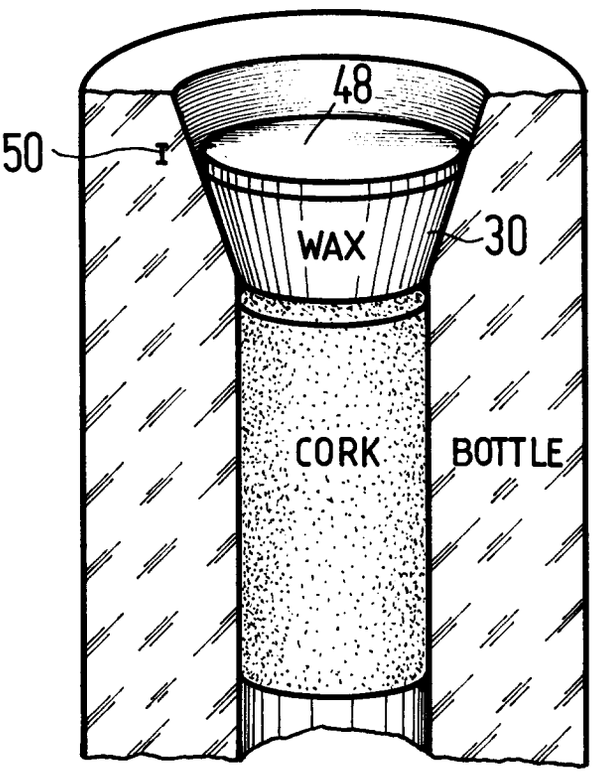


FIG. 6

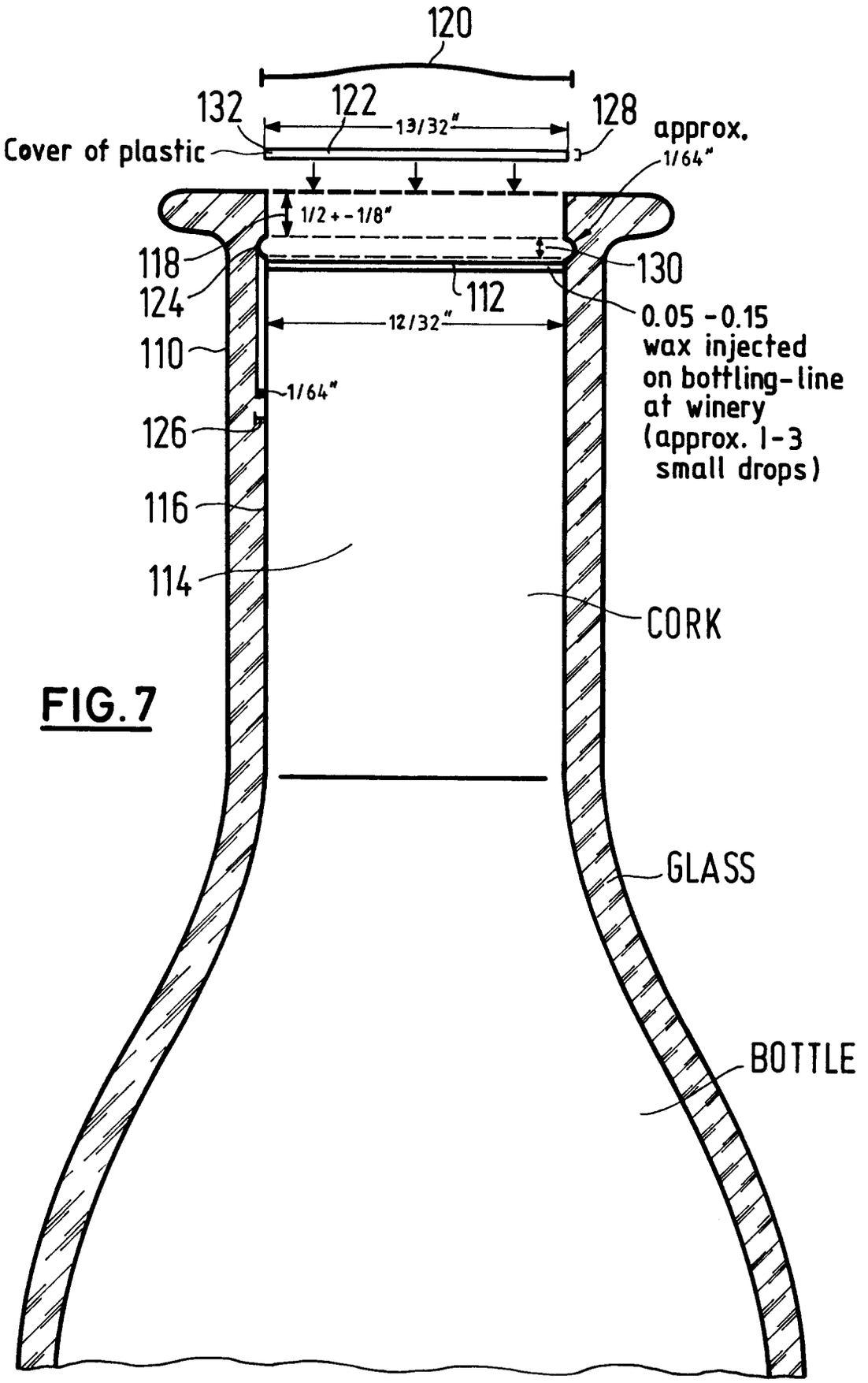

120
132
122
128
13/32"
Cover of plastic
approx.
1/64"
1/2 + - 1/8"
118
124
130
112
12/32"
110
0.05 - 0.15
wax injected
on bottling-line
at winery
(approx. 1-3
small drops)
1/64"
126
116
114
CORK
GLASS
BOTTLE

FIG. 7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 92 12 1964

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	FR-A-1 094 743 (DELON) * page 1, column 2, line 15 - line 43 *	1-3, 21-23	B67B5/00 B67B5/05
A	DE-A-3 500 269 (HUF)		

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B67B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	24 MARCH 1993	DEUTSCH J.P.M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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