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(54) **BOTTLE CLOSURE**

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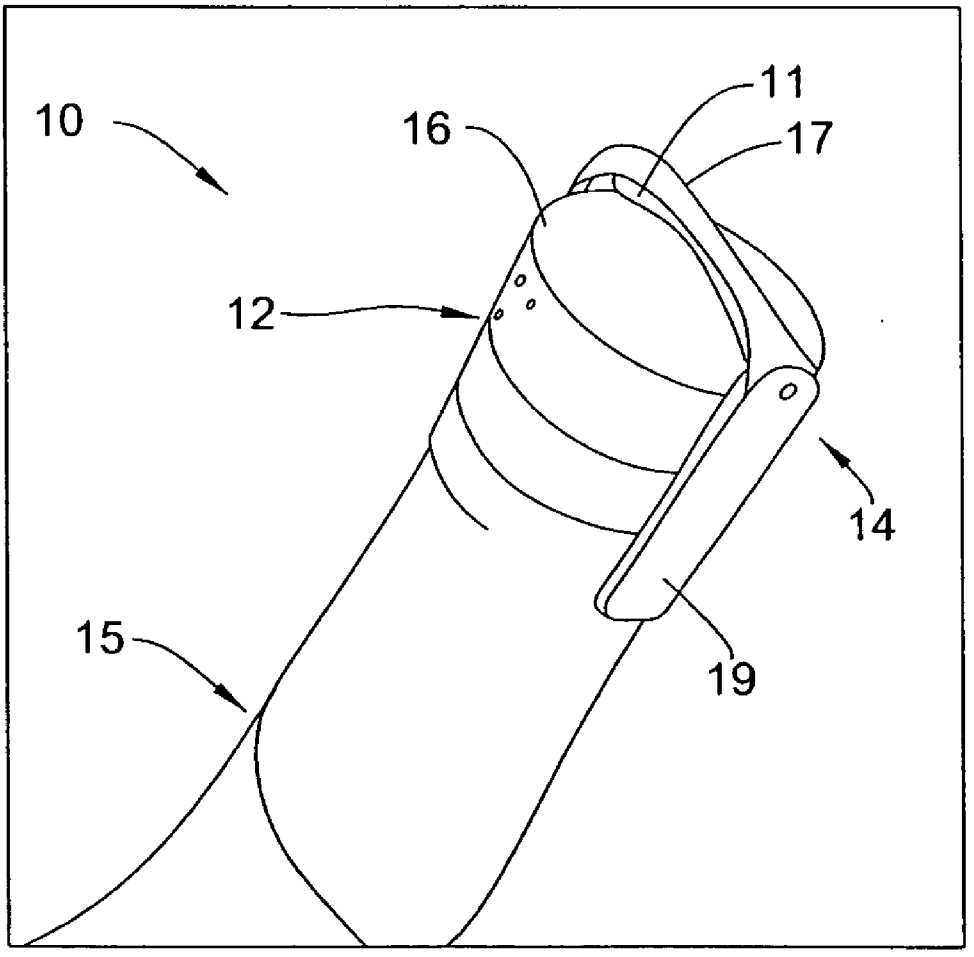
(57) **ABSTRACT**

Closure means for providing a resealable closure for a bottle containing champagne, sparkling wines, or the like comprises a stopper for insertion into the neck of a bottle to close it; and retainer means secured to the neck of the bottle to be closed. The retainer means is pivotable between an open position in which the it does not engage the stopper and an operative position in which the retainer positively engages with the stopper so as to retain the stopper in the neck of the bottle. The stopper is preferably provided with engagement means such as a groove on at least one surface thereof external to the closed bottle. The retainer means in its operative position positively engages with the engagement means of the stopper so as resist movement of the retainer means relative to the stopper away from the operative position. The stopper, the retainer means or both are resilient so that it is necessary to deform the stopper, the retainer means or both in order to bring the retainer means into the operative position.



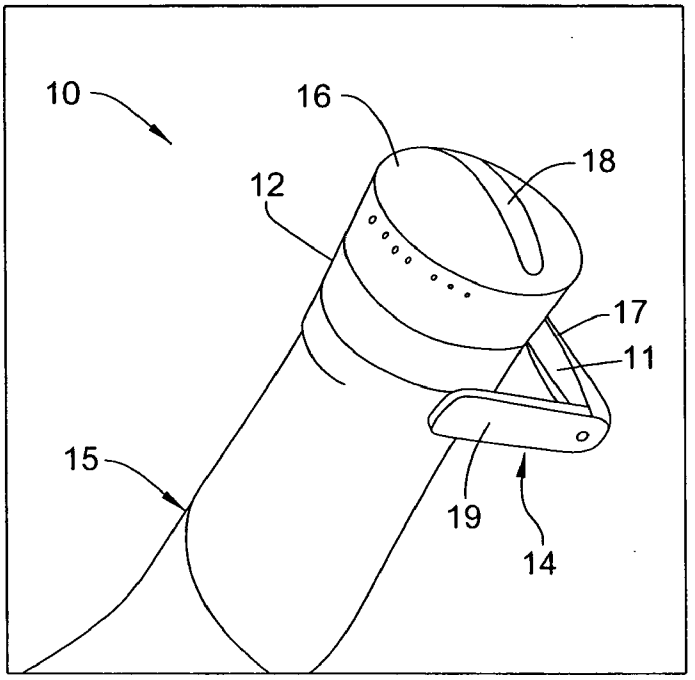


Figure 1

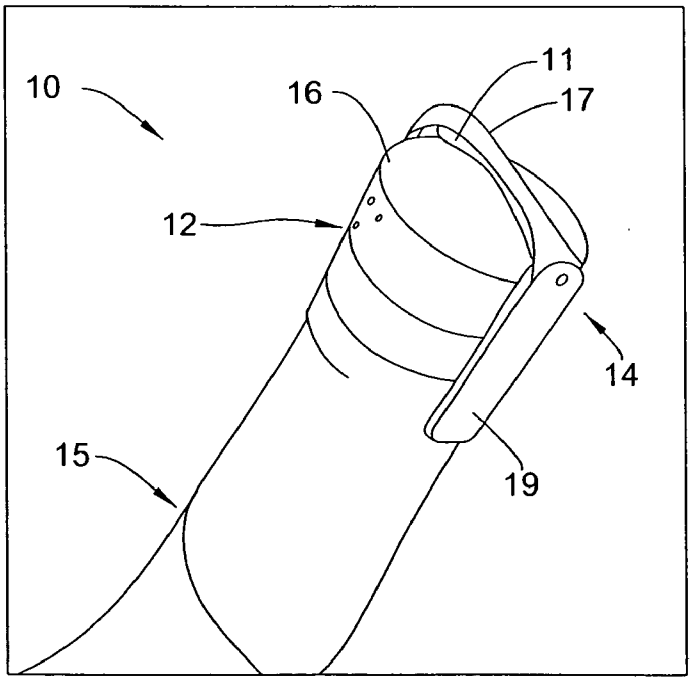


Figure 2

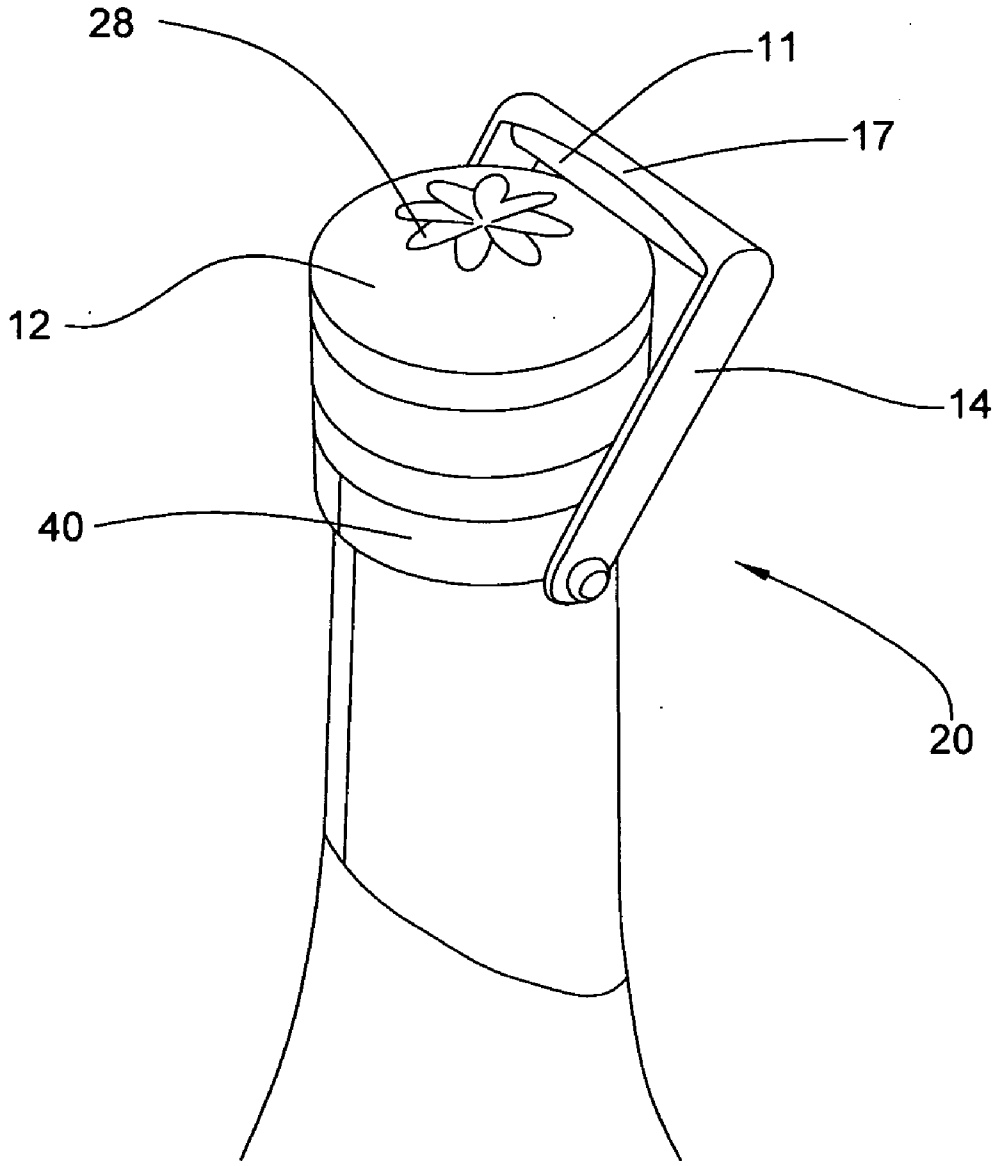


Figure 3

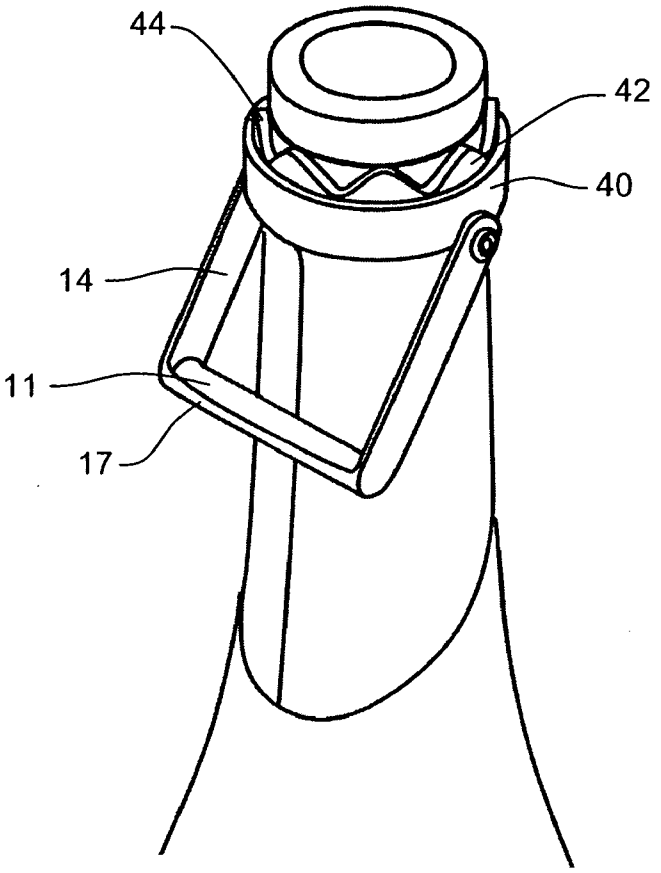


Figure 4

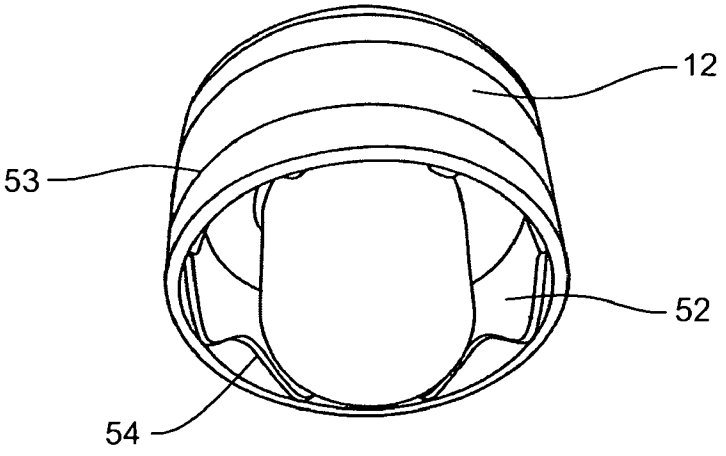


Figure 5

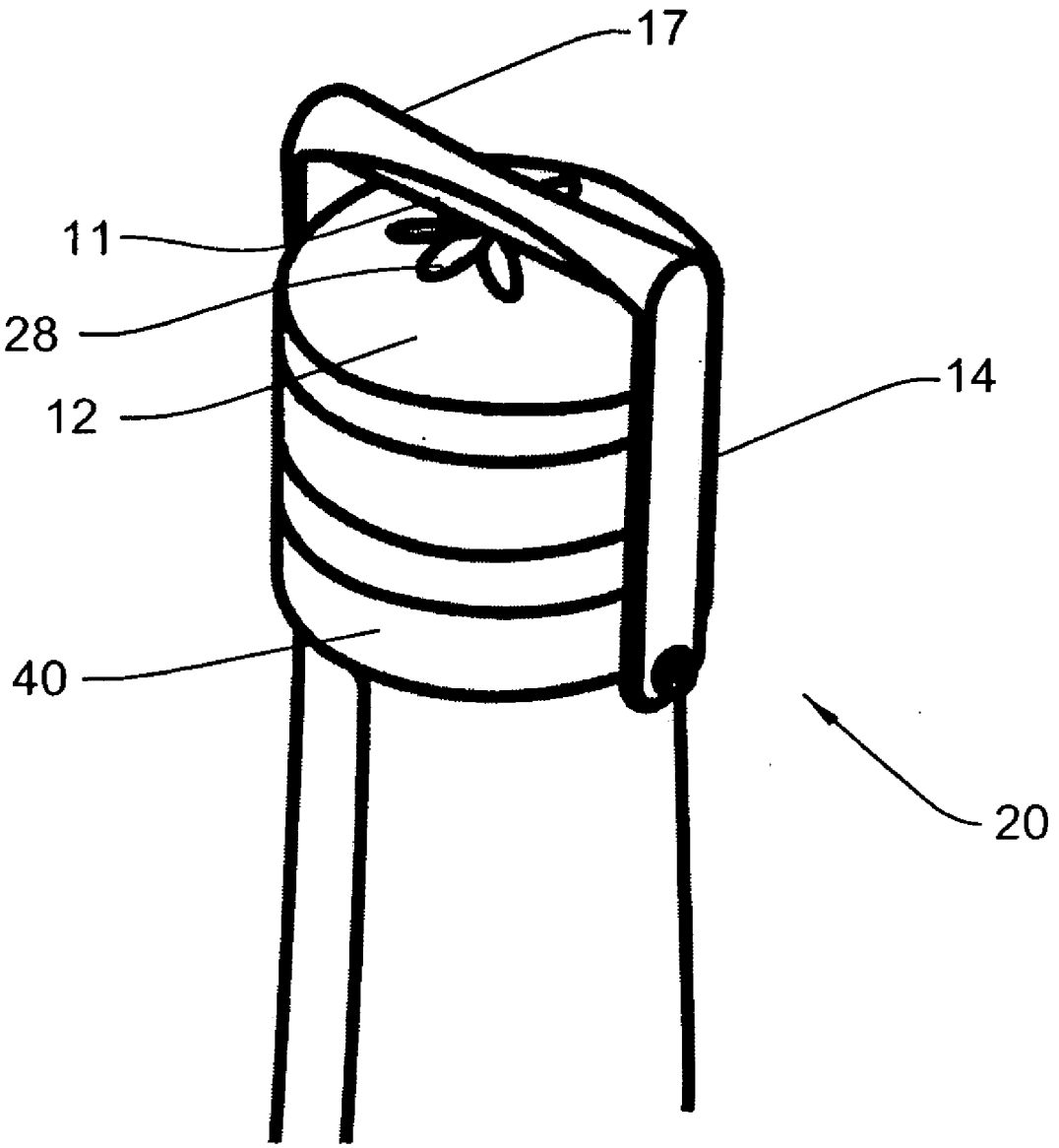


Figure 6

BOTTLE CLOSURE

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation-in-part of prior U.S. application Ser. No. 11/901,723, filed Sep. 18, 2007, the entire contents of which are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] The present invention relates to an improved closure for bottles, in particular, to an improved closure for bottles intended to contain champagne, sparkling wines, or the like.

[0003] In conventional champagne bottles, the pressure exerted by the gas bubbles in the liquid means that the bottle cannot simply be closed by means of a conventional cork; rather, the cork must be retained by fixing it securely to the neck of the bottle. Traditionally, this has been achieved by means of a wire cage which fits over the cork and engages under an abutment molded onto the neck of the bottle. The traditional wire cage/cork arrangement makes the opening of champagne bottles tricky and, more importantly, makes it impossible for a bottle to be re-sealed. Simply reinserting the cork is not possible because of the pressure within the bottle and so a variety of complex bottle closures which can be substituted for the cork have been proposed.

[0004] Generally, these have been used in place of the cork which originally closed the bottle and have been designed to cooperate with the abutment formed on the neck of the bottle. This has meant that where it has been necessary to re-seal a champagne bottle or the like it has been necessary to plan ahead to the extent necessary to make sure that an alternative closure is available when needed. Also, because many of the designs require a wedging action to engage the closure under the abutment, usually a molded ring, on the neck of the bottle, a degree of manual strength and dexterity has been required when using many of the alternative closures previously proposed.

SUMMARY OF THE INVENTION

[0005] In accordance with a first aspect of the invention there is provided closure means for providing a resealable closure for a bottle containing champagne, sparkling wines, beers, carbonated drinks or other liquids under pressure; the closure means comprising a stopper for insertion into the neck of a bottle to close it; and retainer means secured, in use, to the neck of the bottle to be closed so as to be pivotable between an open position in which the retainer does not engage the stopper and an operative position in which the retainer positively engages with the stopper so as to retain the stopper in the neck of the bottle. In a preferred embodiment, the stopper is provided with engagement means on at least one surface thereof external to the closed bottle, the retainer means in its operative position positively engaging with the engagement means of the stopper so as resist movement of the retainer means relative to the stopper away from the operative position. Further, the stopper, the retainer means or both may be resilient so that it is necessary to deform the stopper, the retainer means or both in order to bring the retainer means into the operative position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Embodiments of a bottle closure in accordance with the invention will now be described in detail, by way of example, with reference to the drawings, in which:

[0007] FIG. **1** is a schematic perspective view of a bottle fitted with a first closure in accordance with the invention;

[0008] FIG. **2** shows the bottle and closure of FIG. **1** with a retainer thereof in an operative position;

[0009] FIG. **3** is a schematic perspective view of a bottle fitted with a second modified closure in accordance with the invention;

[0010] FIG. **4** shows the closure of FIG. **3** with the cork thereof removed;

[0011] FIG. **5** is a perspective view, from below the closure of FIG. **3**; and

[0012] FIG. **6** shows the closure of FIG. **3** with the retainer thereof in an operative position.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0013] FIGS. **1** and **2** of the drawings show a first embodiment of a bottle closure **10** in accordance with the invention which comprises a stopper or cork **12** and a retainer **14**.

[0014] The stopper **12** may be formed at least in part of cork or of rubber so that the portion of the stopper which engages in the bottle neck **15** makes a good, gastight seal. However, the crown **16** of the stopper **12**, that is, the face of the stopper **12** remote from the bottle neck **15**, must be of material sufficiently robust to engage with the retainer **14** without damage. For this reason, it is preferable to make the crown of **16** of the stopper, at least, of molded plastic material.

[0015] The crown **16** of the stopper **12** is shaped to form engagement means **18**; as shown in the drawings, the engagement means is a groove formed in a convex end surface at the crown **16** of the stopper. However, provided that the engagement means **18** is able to provide a positive engagement between the stopper **12** and retainer **14**, in use, other shapes and configurations are possible. For example, the engagement means **18** on the stopper **12** might be in the form of one or more depressions or recesses or, alternatively, the engagement means might be formed by one or more projections from the surface of the stopper **12**. Similarly, although the engagement means shown in the figures is formed on the end, crown surface of the stopper, it will be appreciated that one or more engagement means might be formed on a circumferential surface of the portion of the stopper **12** which protrudes from the end of the bottle when the stopper is in place to close the bottle.

[0016] The retainer **14** is permanently fixed to the neck **15** of the bottle. For these purposes, it will be understood that 'permanently' means at all times during use rather than indicating that it cannot be removed if a user chooses to do so.

[0017] The retainer **14** is in the form of a U-shaped strap of metal or other material sufficiently rigid to maintain its shape and strong enough not to tear or break when pressure is exerted on it by the gas contained within the liquid in the bottle. The retainer **14** is secured to the bottle neck **15** by mounting means in the form of a ring or collar which is securely fixed around the neck **15** of the bottle.

Alternatively, the retainer means **14** may be provided with pins or stub axles which project inwardly from the ends of the U-shaped strap and engage in recesses molded into the neck **15** of the bottle. The retainer **14** can pivot freely about the axis defined by the straight line joining the points at which it is secured to the ring or collar.

[0018] The retainer **14** may be of uniform cross-section and unitary construction or, alternatively, as shown in the drawings, the crosspiece **17** may include a roller **11** which extends

between the two arms **19** of the 'U' shape and which is pivotally mounted between the arms **19**, so as to facilitate operation of the device. In either case, the crosspiece **17** forming the bottom of the 'U' is configured to make a positive engagement with the engagement means **18** on the stopper **12**. As shown in the drawings, the crosspiece **17** is relatively narrow so that it can engage firmly in the groove formed in the crown **16** of the stopper **12**. The crosspiece **17** may be made of resilient material so that it can deform to permit engagement with the stopper **12**.

[0019] In use, the bottle is sealed initially by inserting the stopper **12** into the neck **15** of the bottle. The retainer **14**, which may be snap-fitted onto the bottle neck **15** as part of the sealing process or which may have been assembled around the neck **15** of the bottle before it is filled, is then pivoted from the position shown in FIG. **1**, in which it does not engage the stopper **12**, into the operative position of FIG. **2**. As the retainer **14** is pivoted about the pins or stub shafts which secure it to the bottle neck **15**, the crosspiece **17** comes into contact with the crown **16** of the stopper and then into positive engagement with the groove or engagement means **18** of the stopper **12**. The closure construction and the materials of which the stopper **12** and retainer **14** are made are such that one or both can deform sufficiently to allow the crosspiece **17** of the retainer **14** to engage firmly with the engagement means **18** of the stopper **12**. Thus the retainer **14**, in its operative position, positively engages with the stopper **12** so as to resist relative movement between the two. Preferably, the retainer **14** is arranged symmetrically with regard to the stopper **12** when in the operative position so that the force exerted on it by the liquid in the bottle through the stopper **12** is distributed evenly and there is no tendency for the retainer **14** to twist in such a way as to dislodge the retainer **14** from engagement with the bottle neck **15**.

[0020] When the stopper **12** is to be removed, the retainer **14** is simply pivoted out of the operative position, into the position shown in FIG. **1**, the resilience of the closure elements allowing the retainer **14** to be disengaged from the stopper **12**. This operation may be assisted by pivoting of the crosspiece **17** relative to the arms **19** of the retainer **14** so that the roller **11** rolls over the crown **16** of the stopper **12**, reducing the friction between the crosspiece **17** and the stopper **12**. If the bottle is to be resealed, the original stopper **12** is simply reinserted and the retainer **14** is moved back to the operative position in which it engages with the stopper **12**.

[0021] It will be appreciated that many variations on the particular construction shown in the drawings are possible.

[0022] For example, rather than being provided with pivot mountings in the form of pins/stub shafts which directly engage the neck **15** of the bottle, the retainer **14** may be pivotably mounted on a collar or ring which is secured to the neck of the bottle, perhaps by engagement under the traditional ring-shaped abutment formed on the bottle neck **15**. As mentioned above, many different forms of engagement means on the stopper **12** are possible and their location may be such that they engage with the arms **19** rather than the crosspiece **17** of the retainer **14**. It might also be possible or desirable in some circumstances to provide more than one retainer, each of which pivots over an edge of the stopper **12** rather than extending across it fully, as does the U-shaped retainer **14** in the drawings.

[0023] Whilst the closure described with reference to and shown in FIGS. **1** and **2** is satisfactory in many circumstances, FIGS. **3** to **6** show a second embodiment which may, in some cases, be easier to use.

[0024] It will be appreciated that, in order to ensure a good engagement or interaction between the retainer **14** and stopper **12** of the closure of FIGS. **1** and **2**, it is preferred to align the crosspiece **17** of the retainer with the engagement means or groove in the crown **16** of the stopper **12**. If the two are not aligned, the crosspiece **17** is likely to lie diagonally across the groove **18** rather than lodging securely in it. As described above, the retainer **14** may be secured to the neck **15** of the bottle in such a way that it is fixed against rotation around the bottle and any adjustment to align the crosspiece **17** of the retainer **14** with the groove **18** in the crown **16** of the stopper **12** must be effected by rotating the stopper **12**. Given that, in order to provide a gastight seal, the stopper **12** must be a tight fit in the neck **15** of the bottle, this can be difficult.

[0025] The second embodiment shown in FIGS. **3** to **6** of the drawings has additional features intended to facilitate the proper alignment of the crosspiece **17** of the retainer **14** in the engagement means provided on the stopper **12**. In the following description of the embodiment of FIGS. **3** to **6**, components of a closure **20** which are the same as those of the closure **10** of FIGS. **1** and **2** will be identified by means of the same reference numerals.

[0026] It will be noted, firstly, that the stopper **12** in the closure of FIG. **3** is provided with modified engagement means **28**. Rather than a single groove, the engagement means **28** take the form of a plurality of grooves arranged at an angle to one another and intersecting in the centre of the crown **16** of the stopper **12** so as to form a flower-like configuration. As shown in FIG. **3**, there are four intersecting grooves arranged regularly at an angle of 45 degrees to adjacent grooves so as to form a flower-like configuration having eight 'petals'. As a result, there are eight angular positions in which the engagement means **28** can be aligned with the crosspiece **17** of the retainer **14**. This means that any angular or rotational adjustment of the stopper which needs to be made to bring the engagement means **28** into proper alignment with the crosspiece **17** is likely to be smaller than adjustments required when there are only two angular positions in which proper engagement can be made, as is the case in the embodiment of FIGS. **1** and **2**.

[0027] However, whilst the engagement means **28** of FIGS. **3** to **6** somewhat facilitates proper alignment of the stopper **12** and retainer **14**, the closure **20** is provided with additional features which act with the engagement means **28** to improve the operation of the closure **20** yet further.

[0028] As can be seen from FIG. **4**, the retainer **14** is, in this preferred embodiment, secured to the neck of the bottle by means of an annular collar **40**. The collar **40** is secured to the bottle either by snap-fitting or by welding or gluing to form a closed ring. The customary molded ring formed in the glass around the neck of the bottle prevents the collar **40** being removed axially of the bottle neck. The retainer **14** is secured, as described above, by means of pins or stub axles which may either penetrate the material of the collar **40** to lodge in suitable openings or recesses (not shown) formed in the material of the bottle or may simply lodge in openings or recesses formed at diametrically opposite locations on the collar **40** itself. If the retainer **14** engages with the neck of the bottle itself, then the collar **40** will be fixed against rotation. If the retainer **14** is mounted on the collar **40** alone then the whole

assembly may rotate around the neck of the bottle. This does not, however, prevent the proper operation of the features which will be described below.

[0029] The collar **40** is of finite thickness and is shaped to form a plurality of generally triangular teeth **42** which together define a cam surface **44**. The cam surface **44**, when viewed from an axial direction, looking into the neck of the bottle, is annular and faces in the same direction as the open end of the neck of the bottle. When viewed from the side, the cam surface **44** forms a zig-zag path around the periphery of the collar **40**. To ensure proper alignment, the number of teeth **42** is chosen to correlate with the number of intersecting grooves of the engagement means **28** on the stopper **12**; in the embodiment shown there are four intersecting grooves in the engagement means **28**, forming eight petals in the flower-like configuration shown in FIG. **3**. There are, accordingly, eight triangular teeth **42** defining the zig-zag cam surface **44** on the collar **40**.

[0030] The stopper **12** of the closure **20**, shown most clearly in FIG. **5**, is provided with a similar cam surface **54** defined by a plurality of triangular teeth **52** molded around the inside of a sleeve portion **53** of the stopper **12** which, in use, overlies the collar **40**. The cam surface **54** is, like the cam surface **44** on the collar **40**, annular when viewed from an axial direction but faces towards the open neck of the bottle as the stopper **12** is being pushed into it. The teeth **52** on the inside of the sleeve portion **53** of the stopper **12** are so shaped as to fit closely between the teeth **42** on the collar **40**. There may, as shown in the drawings, be the same number of teeth **42** and **52** on the collar **40** and on the stopper **12**. Alternatively, the number of teeth **42** or **52** on one component may be a whole multiple of the number of teeth on the other.

[0031] The teeth **42** and **52** on the collar **40** and stopper **12** act as location means to align the stopper **12** and collar **40**. Further, in the preferred embodiment shown, the location means or teeth **42** and **52** define cam surfaces **44** and **54**, respectively, such that, as the stopper **12** is inserted into the neck **15** of the bottle to close it, the cam surface **54** on the inside of the stopper **12** comes into engagement with the cam surface **44** on the collar **40**. Further axial movement of the stopper **12** into the neck **15** of the bottle and, hence, through the collar **40**, causes the cam surfaces **44** and **54** to slide over one another, rotating the stopper **12** relative to the collar **40** until the stopper **12** is fully inserted and the teeth **52** on the stopper **12** lie snugly between the teeth **42** on the collar. This engagement between the cam surfaces **44** and **54** as the stopper **12** is inserted ensures that the stopper **12** takes up only one of a limited number of rotational positions relative to the collar **40** (eight in the embodiment shown in the Figures) and to the retainer **14** it carries. Thus, by aligning the retainer **14** with the teeth **42** on collar **40** during the manufacturing process, it is possible to ensure that the retainer crosspiece **17** is always properly aligned with the engagement means **28** on the stopper **12** when the stopper **12** is fully inserted in the neck **15** of the bottle, as shown in FIG. **6**.

[0032] While the preferred embodiment shown in the drawings uses generally triangular teeth **42** and **52**, it will be understood that other shapes may be used and that the teeth **42** on the collar **40** need not be the same shape as the teeth **52** on the stopper **12**, provided that the two sets of teeth interengage to fit snugly with one another and are of a suitable shape to define a cam surface which serves to urge the stopper **12** into the correct angular position relative to the collar **40** as the stopper **12** is inserted.

[0033] The bottle closures of the invention may, thus, provide a neat, convenient means for closing and re-closing a bottle of the kind used to contain champagne, sparkling wines, beers and carbonated soft drinks. They avoid the need to provide a separate, alternative closure in cases where bottles are to be resealed.

What is claimed is:

1. Closure means for providing a resealable closure for a bottle containing champagne, sparkling wines, or the like, said closure means comprising:
- a stopper for insertion into the neck of a bottle to close it; and
- retainer means secured, in use, to the neck of said bottle to be closed;
- said retainer means being pivotable between an open position in which said retainer does not engage said stopper and an operative position in which said retainer positively engages with said stopper so as to retain said stopper in the neck of the bottle.

2. The closure means set forth in claim **1** wherein:
- said stopper is provided with engagement means on at least one surface thereof external to said bottle when closed;
- said retainer means in its operative position positively engaging with said engagement means of said stopper so as to resist movement of said retainer means relative to said stopper away from said operative position.

3. The closure means set forth in claim **1** wherein:
- said stopper, said retainer means or both are resilient so that it is necessary to deform said stopper, said retainer means or both in order to bring said retainer means into said operative position.

4. The closure means set forth in claim **2** wherein:
- said stopper has an end surface which is remote from said bottle when said bottle is closed; and
- said engagement means comprises a groove formed in and extending across said end surface of said stopper.

5. The closure means set forth in claim **4** wherein:
- said retainer means is of generally U-shaped configuration having a pair of arms which extend from the neck of said bottle and a crosspiece extending between the ends of the arms at a location remote from said bottle so that, in use, said crosspiece engages with said stopper when said retainer means is in said operative position.

6. The closure means set forth in claim **5** wherein said crosspiece is rotatably mounted to said arms of said retainer means.

7. The closure means set forth in claim **6** wherein said crosspiece is a roller.

8. The closure means set forth in claim **1** wherein said closure means further comprises:
- a mounting means for securing to the neck of a bottle; and
- said retainer means is pivotably fixed to said mounting means.

9. The closure means set forth in claim **8** wherein said mounting means is annular in shape so as to extend, in use, wholly or partially around the neck of said bottle.

10. The closure means set forth in claim **2** wherein said engagement means is configured to positively engage with said retainer means in its operative position with said retainer means in one of a plurality of angular orientations of said retainer means relative to said stopper.

11. The closure means set forth in claim **10** wherein said engagement means comprises a plurality of grooves formed in and extending across said end surface of said stopper, said

plurality of grooves being arranged so as to intersect one another at an angle to each other.

12. Closure means for providing a resealable closure for a bottle containing champagne, sparkling wines, or the like, said closure means comprising:

a stopper for insertion into the neck of a bottle to close it, said stopper comprising first location means;

retainer means secured, in use, to the neck of said bottle to be closed; said retainer means comprising a second location means; and

said retainer means being pivotable between an open position in which said retainer does not engage said stopper and an operative position in which said retainer positively engages with said stopper so as to retain said stopper in the neck of the bottle;

wherein said first location means on said stopper and said second location means on said retainer are interengageable with one another so that the stopper can only be fully inserted into the neck of said bottle in one or more predetermined angular positions relative to one another.

13. Closure means according to claim **12** wherein said first location means on said stopper defines a first cam surface and said second location means on said retainer define a second cam surface; the first and second cam surfaces being so configured that, as the stopper is inserted into the neck of said bottle, said first and second cam surfaces are brought into contact with one another so that further insertion of the stopper into said bottle causes said first and second cam surfaces to slide over one another to rotate said stopper and said retainer relative to one another to bring the stopper into one of said predetermined angular positions.

14. Closure means as set forth in claim **12** wherein:

said stopper is provided with engagement means on at least one surface thereof external to said bottle when closed; and

said retainer means in its operative position positively engaging with said engagement means of said stopper so as to resist movement of said retainer means relative to said stopper away from said operative position;

said engagement means is configured to positively engage with said retainer means in its operative position with said retainer means in one of a plurality of angular orientations of said retainer means relative to said stopper.

15. The closure means set forth in claim **14** wherein said engagement means comprises a plurality of grooves formed in and extending across said end surface of said stopper, said plurality of grooves being arranged so as to intersect one another at an angle to each other.

16. The closure means set forth in claim **12** where in said first and second location means each comprise a plurality of teeth arranged around the circumference of said stopper and said retainer respectively.

17. The closure means set forth in claim **15** wherein said first and second location means each comprise a plurality of teeth arranged around the circumference of said stopper and said retainer respectively, the number of teeth in each of the first and second location means being an exact multiple or an exact divisor of the number of grooves forming the engagement means on said stopper.

18. Closure means for providing a resealable closure for a bottle containing champagne, sparkling wines, or the like, said closure means comprising:

a stopper for insertion into the neck of a bottle to close it, said stopper comprising a first cam surface;

retainer means secured, in use, to the neck of said bottle to be closed; said retainer means comprising a second cam surface; and

said retainer means being pivotable between an open position in which said retainer does not engage said stopper and an operative position in which said retainer positively engages with said stopper so as to retain said stopper in the neck of the bottle;

wherein the first and second cam surfaces are so configured that, as the stopper is inserted into the neck of said bottle, said first and second cam surfaces are brought into contact with one another so that further insertion of the stopper into said bottle causes said first and second cam surfaces to slide over one another to rotate the stopper and retainer relative to one another to bring the stopper into one of one or more predetermined angular positions relative to the retainer.

19. Closure means as set forth in claim **18** wherein:

said stopper is provided with engagement means on at least one surface thereof external to said bottle when closed; and

said retainer means in its operative position positively engaging with said engagement means of said stopper so as to resist movement of said retainer means relative to said stopper away from said operative position;

said engagement means is configured to positively engage with said retainer means in its operative position with said retainer means in one of one or more angular orientations of said retainer means relative to said stopper.

20. The closure means set forth in claim **19** wherein said engagement means comprises a plurality of grooves formed in and extending across said end surface of said stopper, said plurality of grooves being arranged so as to intersect one another at an angle to each other.

21. The closure means set forth in claim **19** where in said first and second cam surfaces are each defined by a plurality of teeth arranged around the circumference of said stopper and said retainer respectively.

22. The closure means set forth in claim **20** wherein said first and second cam surfaces are each defined by a plurality of teeth arranged around the circumference of said stopper and said retainer respectively, the number of teeth in each of the first and second location means being an exact multiple or an exact divisor of the number of grooves forming the engagement means on said stopper.

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