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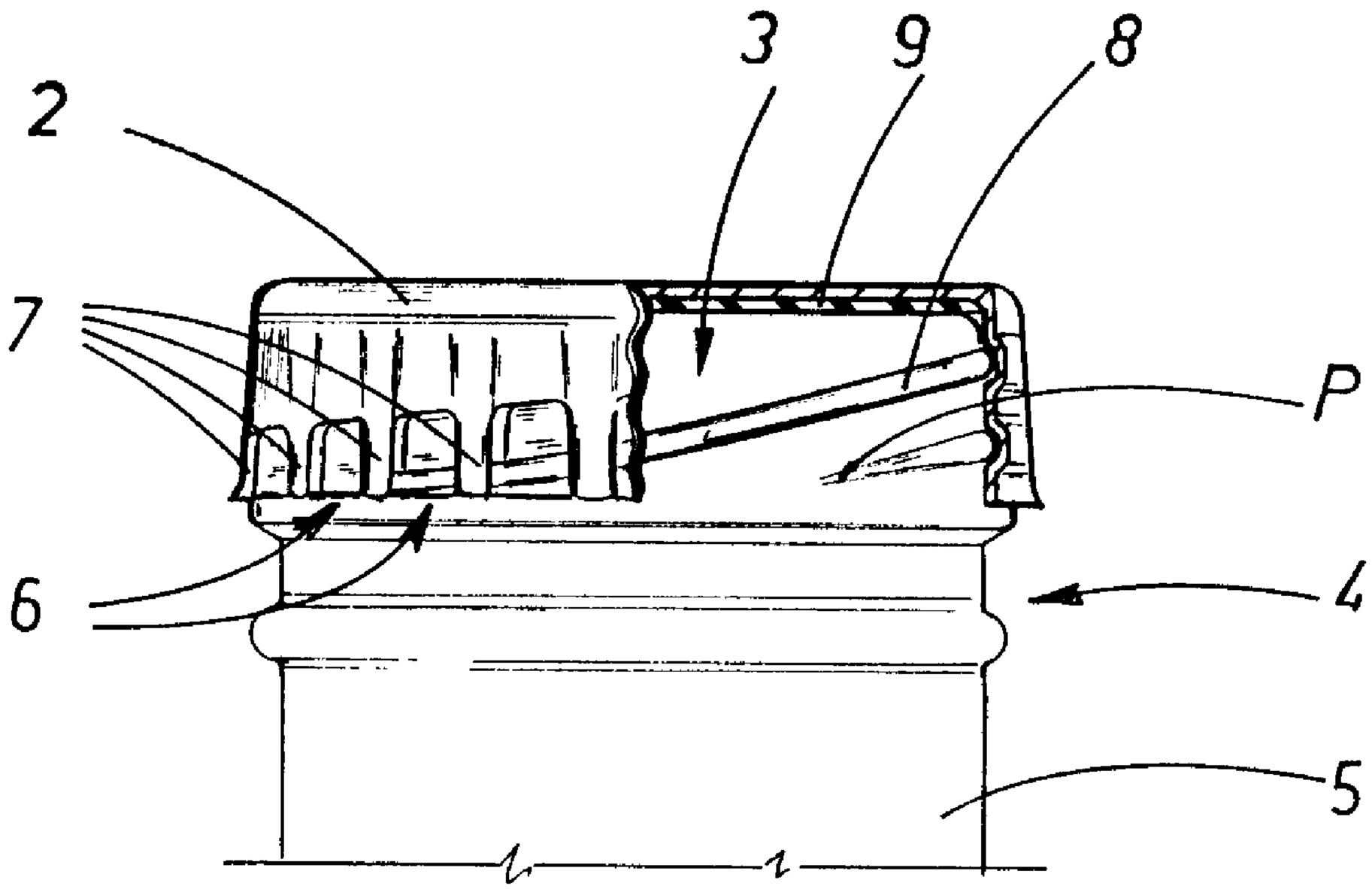
(54) Title: METAL BOTTLE CAP



(57) Abrégé/Abstract:
A metal bottle cap (1) consisting of a central body (2) to close off an opening (3) at the neck (4) of the bottle (5) and an outer crown (6) which is integral with the central body (2) and is made up of a uninterrupted plurality of teeth (7) which may be bent and fixed around the rim (4) over a thread (8) which has a number of starts (P) on a bottleneck, the number of teeth (7) on the outer crown (6) must be different to a whole multiple of the number of starts (P) on the rim (4) of the bottle (5); and should be between twenty-five and thirty-three.

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Abstract

A metal bottle cap (1) consisting of a central body (2) to close off an opening (3) at the neck (4) of the bottle (5) and an outer crown (6) which is integral with the central body (2) and is made up of a uninterrupted plurality of teeth (7) which may be bent and fixed around the rim (4) over a thread (8) which has a number of starts (P) on a bottleneck, the number of teeth (7) on the outer crown (6) must be different to a whole multiple of the number of starts (P) on the rim (4) of the bottle (5); and should be between twenty-five and thirty-three.

Metal Bottle Cap

The present invention relates to a metal cap which hermetically seals bottles, and is particularly aimed at glass bottles containing liquid foodstuffs under pressure.

This crown-cap is already well known and has been used for some time by bottling companies to seal many types of glass bottles, above all for drinks bottled under pressure, such as beer, Coca-Cola, lemonade, etc.

The circular central body of the cap has a suitable pressure-tight lining (usually made of synthetic, thermoplastic material for example PVC, polyethylene derivatives, or natural material such as cork) on the internal surface which is placed against the bottleneck opening. The outer crown is made up of corrugations which may be bent down to form a plurality of teeth which hold the cap firmly onto the rim of the bottleneck.

It is also well known that you need a bottle-opener always to hand in order to open a bottle sealed with the classical crown-cap.

This particular "problem" with opening has led some drinks manufacturers to produce a so-called "hybrid" solution; by closing the bottle with a screw-off crown-cap. In practice this particular type of cap (in commercial jargon "twist off") is made up of a normal crown-cap with twenty one teeth which is firmly placed around the rim of the bottle, which is obviously fitted with the necessary thread for unscrewing the cap. So, the twist off cap has basically the same structure as the crown-cap but the teeth are fixed over the external thread which protrudes from the bottleneck.

The main problem with this solution is that it is not very comfortable to open by hand. The cap must be fixed very firmly to the bottle to maintain the pressure of the liquid inside the bottle and to avoid the risk of leakage during normal handling. So a certain amount of force which not everyone may have, is needed to rotate the cap in order to open the bottle. This operation also carries the risk of injuring or

cutting the hands due to the "sharp edges" of the teeth on the crown.

With this in mind several devices have been suggested to allow swift opening by "twist off" users (see also the Canadian patent N. 1.252.431), but these are obviously considered as accessories and must be on hand for the user to unscrew the cap.

To this end the Applicant has, after numerous experiments, produced a metal "twist off" cap to seal glass bottles which can be comfortably and safely unscrewed by hand without altering the standards of safety and stability of the pressurised seal of this cap.

In a first broad aspect, the present invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising thirty-three uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

In a second broad aspect, the invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start

end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-nine uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

In a third broad aspect, the present invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising thirty-one uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the

other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

In a fourth broad aspect, the present invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has three thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-eight uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other two thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

In a fifth broad aspect, the present invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has three thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-nine uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other two thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

In a sixth broad aspect, the present invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has three thread starts

thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising thirty-one uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other two thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

In a seventh broad aspect, the present invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has three thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising thirty-two uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for

at least one of the thread starts with respect to the other two thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

In an eighth broad aspect, the present invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has three thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-five uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other two thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew

itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

In a ninth broad aspect, the present invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has three thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-six uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other two thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

In a tenth broad aspect, the present invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink

content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-five uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

In an eleventh broad aspect, the present invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-six uninterrupted teeth bent around

and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

In a twelfth broad aspect, the present invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-seven uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends,

thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

In a thirteenth broad aspect, the present invention seeks to provide a steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising thirty uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

The technical characteristics of the invention are laid out in the claims below and the advantages of the disclosure are apparent from the detailed description which follows, with reference to the accompanying drawings, which illustrate a preferred embodiment of the invention by way of example and in which:

- figure 1 is a plan-view disclosed by the present invention;

- figure 2 is an enlarged front view partially in cross-section of the cap in figure 1 applied to a bottleneck;

- figure 3 is a graph where the number of weeks the cap maintained the seal are plotted against the number of teeth on the cap.

According to the accompanying drawings, with particular reference to figures 1 and 2, the metal bottle cap in discussion (1) is the type of bottle top known as "twist off" and is used for bottles containing liquid foodstuffs.

This cap (1) consists of a central body (2) which covers the opening (3) of the rim (4) of a bottle (5) and an outer crown (6) which is integral with the central body (2). The central body (2) also has a lining (9) on the internal side which faces the bottle opening (5) and enhances closing of the bottle.

The outer crown (6) is an uninterrupted plurality of teeth (7) which may be bent and fixed onto the rim (4) over a thread (8) on the rim ; the number (P) of starts of this thread (8) is variable and depends on the type of bottle to be closed. In this case the number four has been chosen purely as an example (it is the most frequently used):

in this way the cap (1) is firmly fixed to the rim (4), or rather with the teeth (7) closed gripping the thread (8) a perfect seal is obtained, but at the same time it is possible to open the bottle simply by unscrewing the cap (1) by hand.

The traditional number of teeth (7) for the crown-cap is twenty one. The Applicant found through research and many trials that raising this number facilitates opening and reduces the possible risk of cuts or injury to the user's hands when rotating the cap (1).

Many possible alternatives were studied to find the number of teeth (7) that permits comfortable and safe manual opening and holds the cap (1) firmly onto the bottle. Eventually a correlation was found between the number of teeth (7) and the number of starts (P) of the thread (8) on the rim (4) of the bottle (5). In fact it was ascertained that the cap (1) became less stable over time if the number of teeth (7) was equal and corresponded to a multiple of the number of starts (P) of the thread (8).

This correlation is clearly visible on the graph in figure 3, where several caps with different

numbers of teeth (7) (from twenty five to thirty three to be exact, which is clearly labelled on the graph) and relative linings (9) made of different material (that is with high 9a, medium 9b and low 9c grip) are on the horizontal axis. The number of weeks the cap (1) maintained a correct and stable hold on the bottle (5) is plotted on the vertical axis. As can be seen from the graph in figure 3 the caps with twenty eight and thirty two teeth have short seal-life irrespective of the material used for the lining (9), while the caps (1) with a number of teeth (7) which is not a multiple of the number of starts (P) of the thread (8) maintain their hold for a considerable number of weeks.

In particular the optimal "range" for the number of teeth (7) on the outer crown (6) proved to be from twenty nine to thirty three. If the rim (4) of the bottle (5) has four starts (P) of the thread (8) the best solution is for the cap (1) to have thirty one teeth (7) (which is in fact a prime number).

With this invention the objects have been achieved in that the greater number of teeth makes fast and safe opening possible by rotation

of the cap around the rim while ensuring the bottle is sealed as securely as bottles sealed with the traditional crown-cap system.

During the experiments it was found that the above mentioned ideal number of teeth is thirty one, which is also perfectly suitable for bottles with threads with three starts, as thirty one is a prime number it is not divisible by three.

The invention described can be subject to modifications and variations without thereby departing from the scope of the inventive concept. Moreover, all details of the invention may be substituted by technical equivalent elements.

What is claimed is:

1. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising thirty-three uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

2. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start

end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-nine uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

3. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising thirty-one uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is

different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

4. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has three thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-eight uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other two thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

5. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has three thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-nine uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other two thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

6. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has three thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the

bottle, and having an outer crown integral with the central body, said outer crown comprising thirty-one uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other two thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

7. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has three thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising thirty-two uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other two thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap

is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

8. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has three thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-five uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other two thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

9. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an

opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has three thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-six uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other two thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

10. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-five uninterrupted teeth bent around and fixed onto the

rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

11. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-six uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a

propensity for said content to leak from said bottle before said cap is removed therefrom.

12. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon, each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising twenty-seven uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

13. A steel twist-off bottle cap in a combination with a bottle, said bottle containing a pressurized drink content and including a neck which has an opening therein for dispensing said drink content from within said bottle, said opening in said neck defining a rim that has four thread starts thereon,

each of said thread starts having a respective start end and a finish end, said cap having a central body, for closing off the opening at the neck of the bottle, and having an outer crown integral with the central body, said outer crown comprising thirty uninterrupted teeth bent around and fixed onto the rim, wherein the number of teeth crimped on each of the thread starts is different for at least one of the thread starts with respect to the other three thread starts, whereby the number of teeth is different to a whole multiple of the number of thread starts such that at most only one tooth of said cap is ever located at and aligned with one of said thread start and finish ends, thereby reducing a tendency of the cap to unscrew itself and a propensity for said content to leak from said bottle before said cap is removed therefrom.

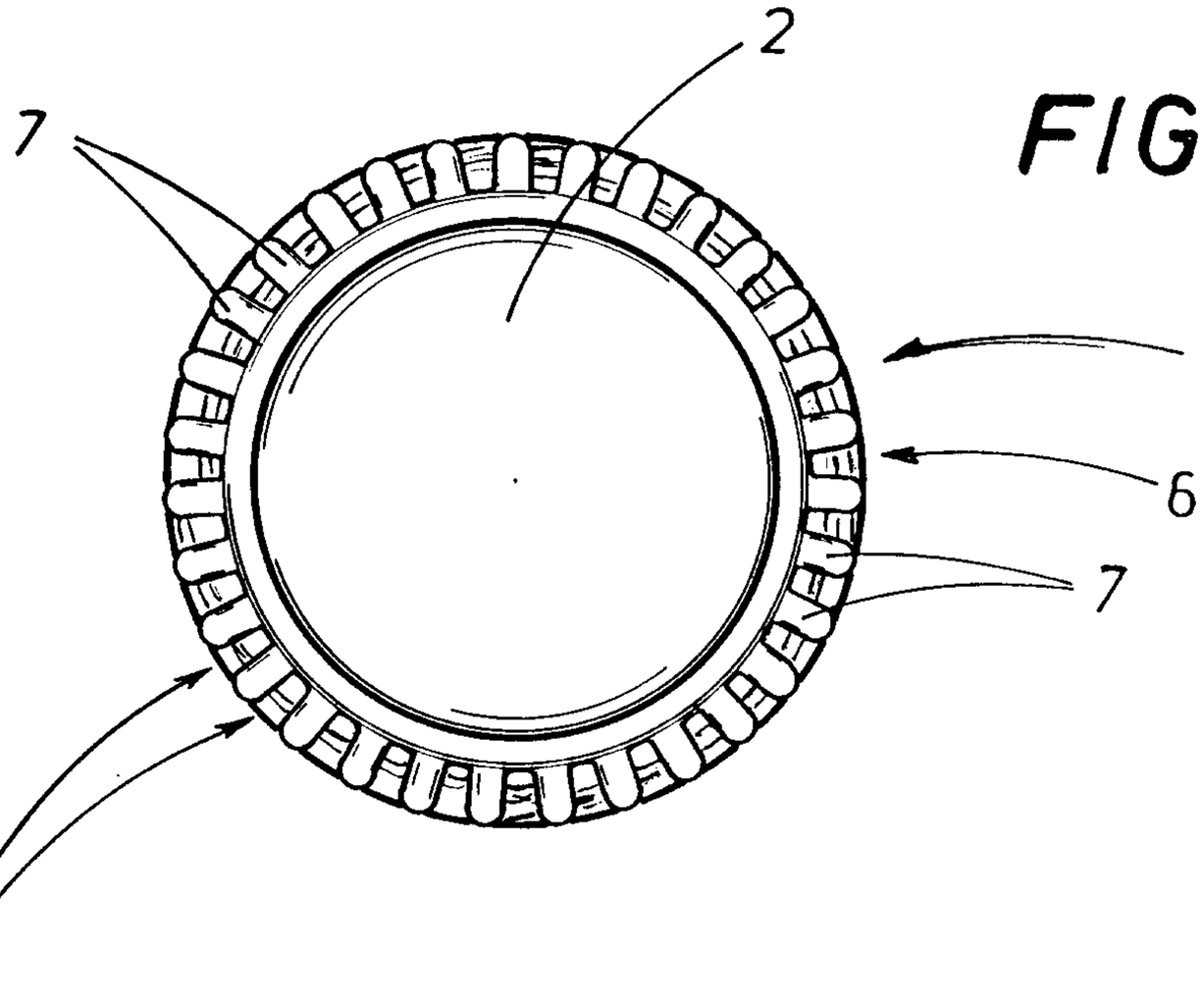


FIG 1

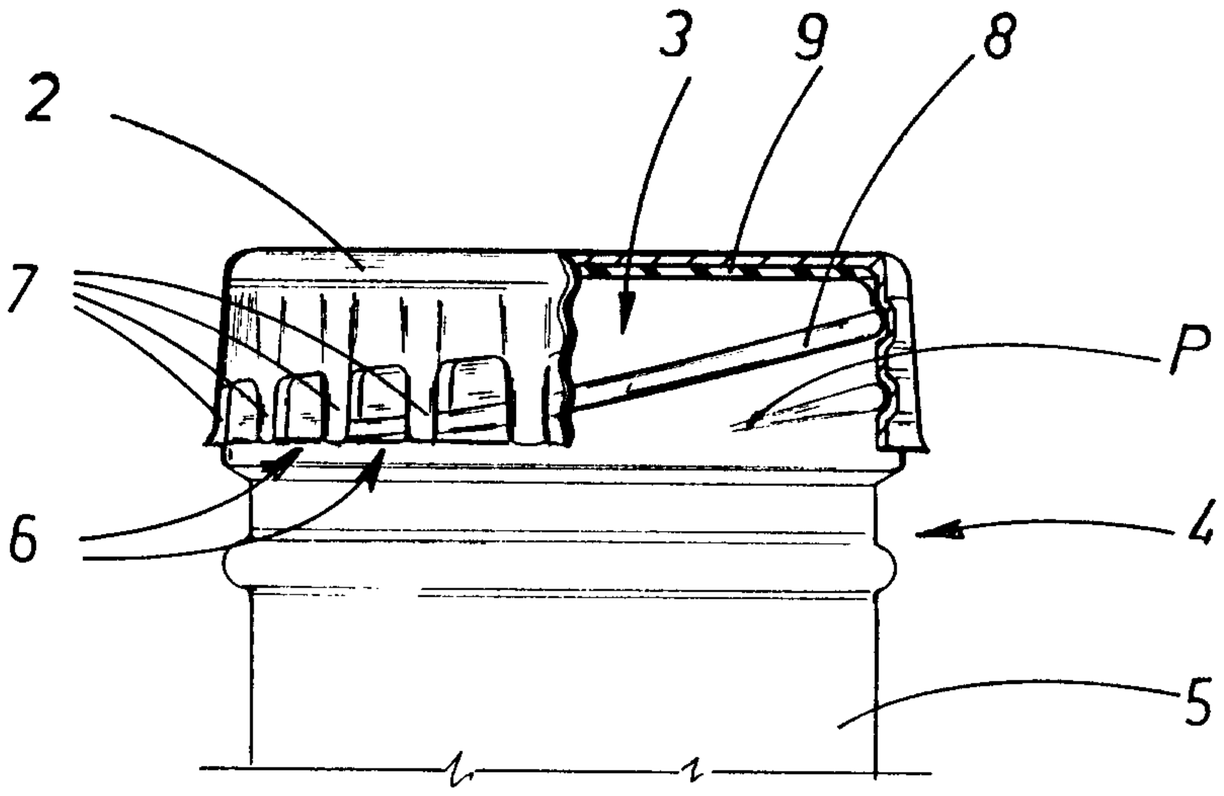


FIG 2

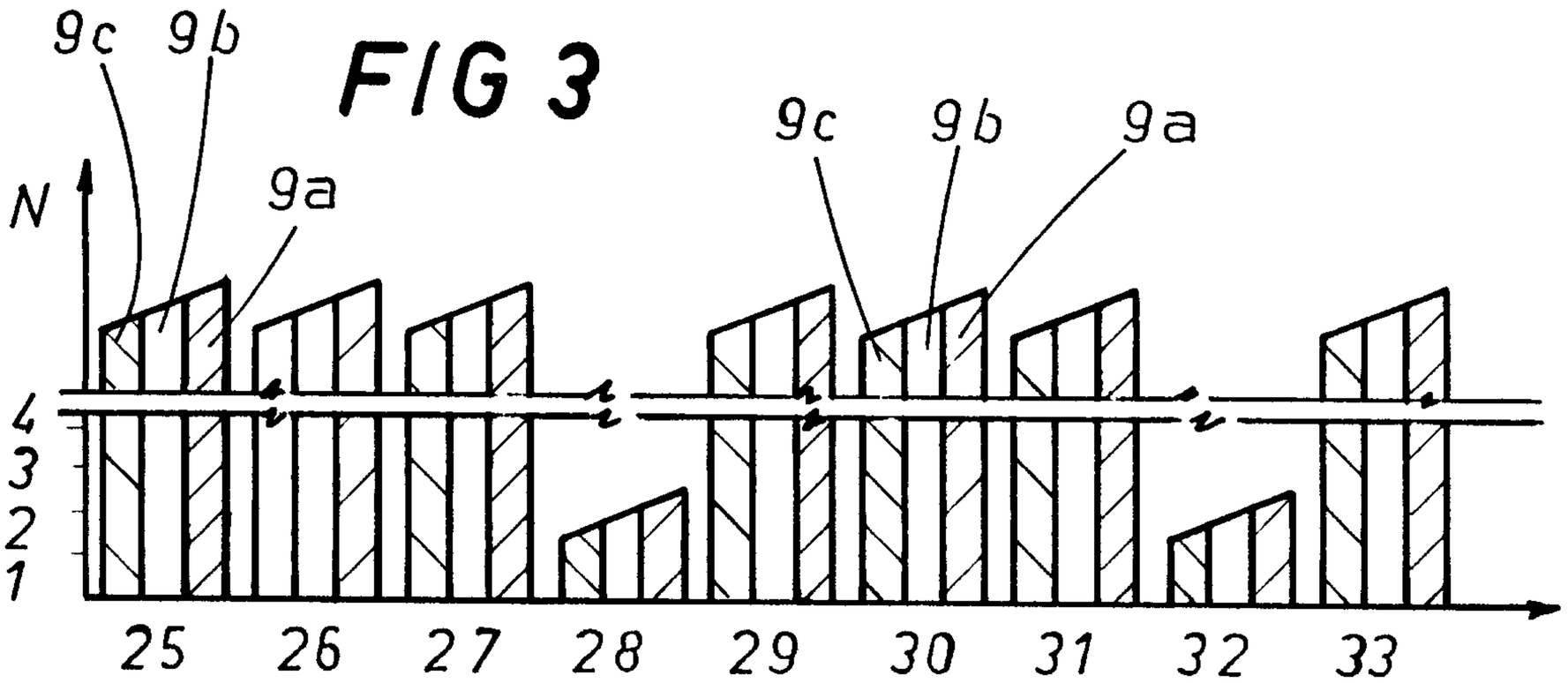
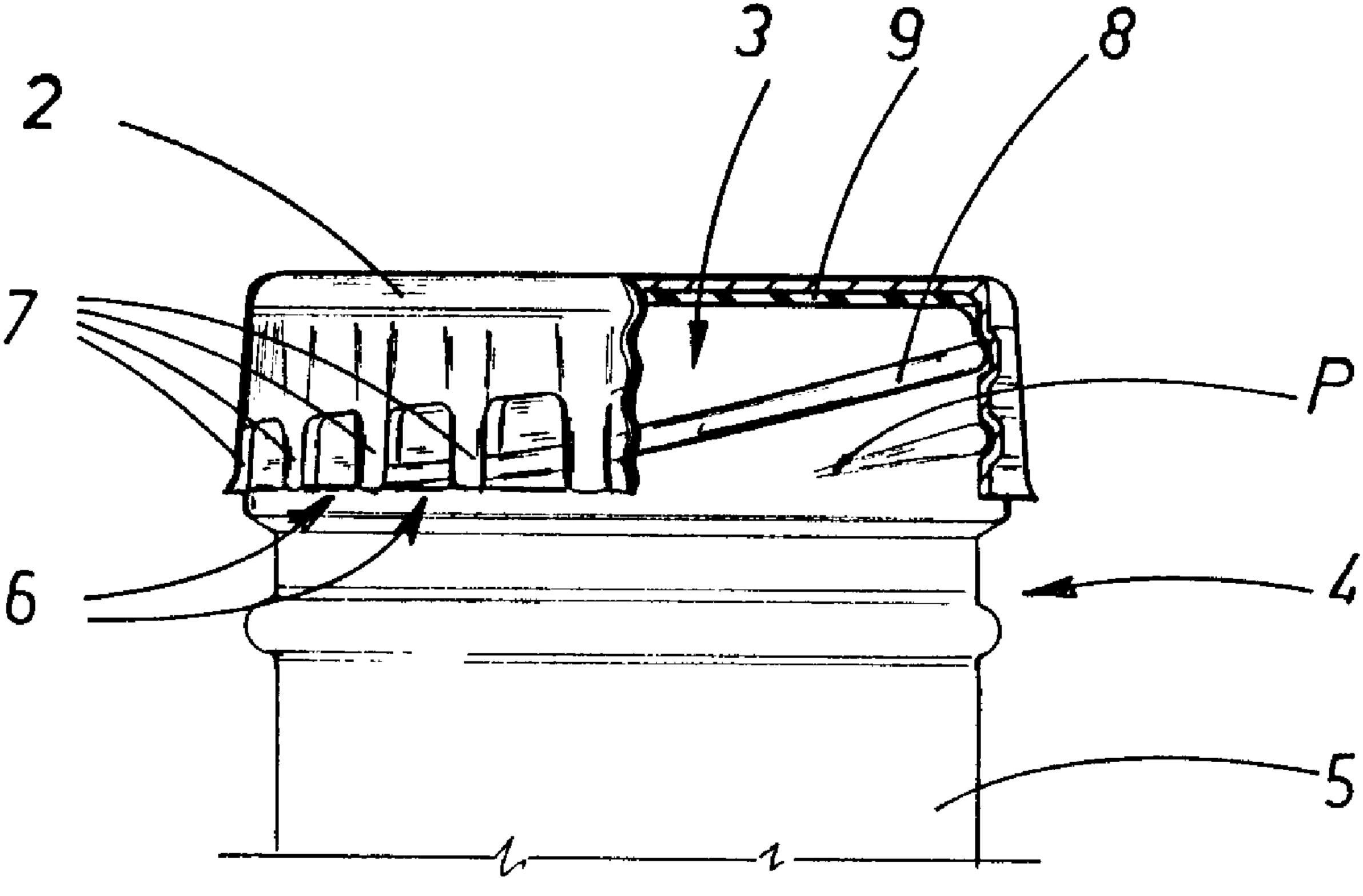


FIG 3

Pascal & Associates
Agents for Applicant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