Aug. 10, 1965 A. FISCHBACH 3,199,702

TAMPER-PROOF SCREW CAPS

Filed April 11, 1963

Fig. 2

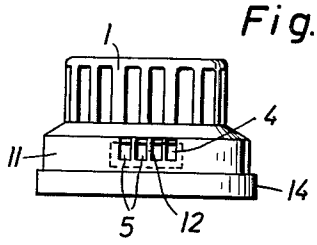


Fig. 1

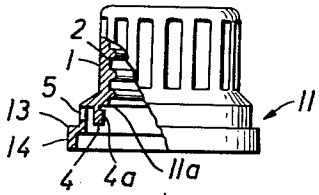


Fig. 3

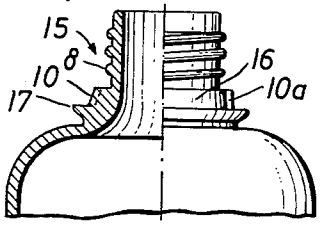
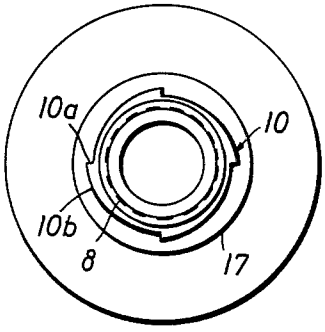


Fig. 4



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TAMPER-PROOF SCREW CAPS

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3 Claims. (Cl. 215—42)

This invention relates to improvements in tamper-proof screw caps of the type which are provided at the inner side with at least one strap. This strap cooperates with a tooth arranged at the bottle neck. Either the tooth or the strap will be broken or torn away when a relative movement takes place between cap and neck. It is one disadvantage of prior art caps that they may be, by appropriate tools, quite easily lifted at the straps. The relative movement between the cap and the neck of the bottle can then be effected without breaking either the strap or the tooth. Such type of screw caps are not really tamper-proof.

It is one object of the invention to improve these screw caps and to prevent the cap from being opened and the contents of the bottle or another receptacle poured out and the bottle then closed again without the cap not being damaged. Therefore, according to this invention, the cap device will be provided with a protective collar, and the collar will be provided at the location of the strap with a window-type opening. Now, it is apparent that the cap cannot be unscrewed without producing permanent marks, spots, etc., which show that the original sealing device has been unscrewed. By means of this opening, it is, at any time, possible to check whether the straps are present or not. When the straps are broken away, it is immediately possible to detect whether or not the cap has been handled in an unauthorized way. When using a hard synthetic resin or other such material for the cap, the protective collar affords a sufficient protection against lifting from the bottom and against unscrewing without damage, since the collar or the strap will break when handled in this unauthorized way.

It is another object of the invention to avoid this unscrewing of the cap without damage even when soft, tough material such as polyethylene is used. Accordingly, the lower part of the collar will be provided with a bigger diameter than the part containing the openings and the protective collar extends to the chest of the bottle. It is another object of the invention to provide the neck, beneath the plane of the teeth, with a projecting circular shoulder which acts upon the collar part with the bigger diameter. The lower part of the collar should have a thin structure, preferably thinner than the upper part.

It is another object of this invention to provide the opening with thin ribs which are arranged comparatively close to each other. In this way, the possibility of checking the strap will be unimpaired. When the opening is tampered with, one or a number of ribs will be broken away, and the unauthorized handling or opening of the cap can be recognized.

In order better to understand the invention some embodiments thereof will be described by way of example, with reference to the accompanying drawings in which:

FIG. 1 is an illustration of the screw cap, partly in elevation, partly in section;

FIG. 2 shows a side elevation of the screw cap of FIG. 1;

FIG. 3 shows an embodiment of the bottle neck, corresponding to the cap of FIG. 1; and

FIG. 4 is a top view of FIG. 3.

The screw cap **1**, which is provided with an internal thread **2**, has a collar **11** which is provided with a shoulder **11***a* and projects outwardly from the body of the cap. Inwards of the shoulder there are one or more straps **4** having tooth-like projections **4***a*. At the straps **4**, **4***a* there is an opening **5** in the collar **11**. By means of this opening it is possible to detect whether the strap **4** is mutilated or not and whether the sealing device is a tamper-proof device or not. The protective collar **11** has a considerable height which is preferably at least twice the height of the opening **5**. Therefore, when even making use of a soft and not brittle material for the screw cap, it is extremely difficult, when unscrewing the cap, to lift the straps **4**, as well as projections **4***a*, from the teeth **10** at the bottle neck **15**, when one tries to lift the protective collar. In order to make it more difficult to operate through the openings **5**, the said opening may be provided with thin ribs which are arranged close to each other. When the cap is handled by an unauthorized person, the thin ribs can be broken away at one or both ends and, therefore, the unauthorized use will be immediately revealed.

It is even more advantageous to provide the lower part **14** of the protecting collar **11** with a diameter which is bigger than the diameter of the upper part of said collar so that another shoulder **13** is provided, the lower part **14** of the collar starting at this shoulder. Accordingly, the bottle neck of the part **16** having teeth **10** will be provided with a third projecting shoulder **17**, this third shoulder being gripped by the lower part **14** of the protective collar. In this way it is virtually impossible to reach the ribs **4**, **4***a* from the bottom of the collar device **11**, **14**. When trying to do so, the protective cap will be expanded or damaged in every case. Preferably, the lower part of the protective collar **11** will have a specially thin structure.

Teeth **10** are provided on the bottle, as known per se, with a first part having a sharp angle or shoulder (sharp projecting chest) **10***a* and a second, continuously sloping back part **10***b*. The bottle neck, however, is provided with a meshing external thread **8** for the internal thread **2** of the cap **1**.

What is claimed is:

1. A tamper-proof sealing cap comprising a generally cylindrical shell, said shell including an internally threaded portion, at least one extended frangible member positioned inside of said shell below said internally threaded portion, said frangible member projecting into the path of a bottle neck having external tooth portions below the threaded portion of the shell, said tooth portions having a sloping cam surface terminating in a sharp angle, said frangible member and said tooth portions cooperating so that said frangible member is broken by said tooth portions when said cap is removed from a bottle on which it is placed, a protective collar means extending axially along said shell and externally of said frangible member, said collar means being provided with an opening located adjacent said frangible member, said collar having a lower portion of a larger external diameter than an upper portion of said shell to prevent the insertion of thin instruments between the cap and the bottle upon which it is placed.

2. A tamper-proof sealing cap for bottles as in claim **1**, wherein the larger diameter portion of said collar means is formed with a thinner wall structure than the remainder of said shell.

3. A tamper-proof sealing cap comprising a generally cylindrical shell having an internally threaded portion for cooperation with external threads of a bottle upon which said cap is to be used, said bottle also including

a generally cylindrical neck portion for supporting said cap and outwardly extending shoulders below said neck portion, said neck portion including radial teeth having outwardly sloping cam surfaces which end in sharp angles, said cap including a protective collar at one end of said shell, the end of said collar being adapted to cooperate with the shoulders of said bottle, said collar having a perforation therethrough, and extended frangible members supported at one end within said shell below said threaded portion adjacent said perforation, said extended frangible members sliding over said cam surfaces when the cap is threaded onto the bottle but being broken by said sharp angles on said teeth when said cap is removed from said bottle.

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