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CONTAINER WITH CAP-OPERATED STIRRING MECHANISM

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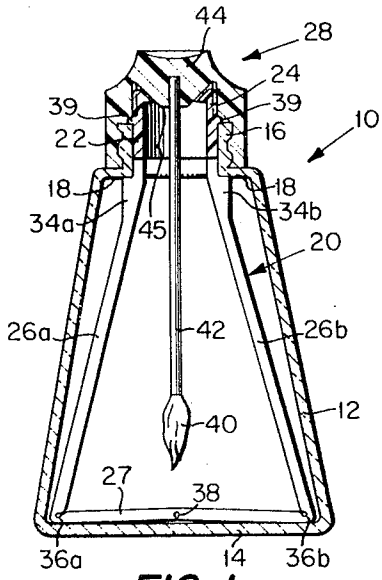


FIG. 1

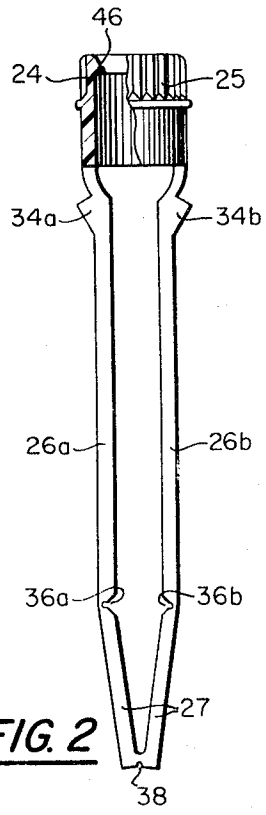


FIG. 2

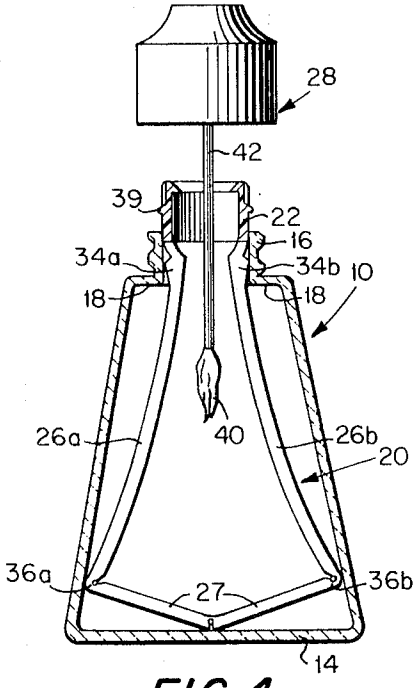


FIG. 4

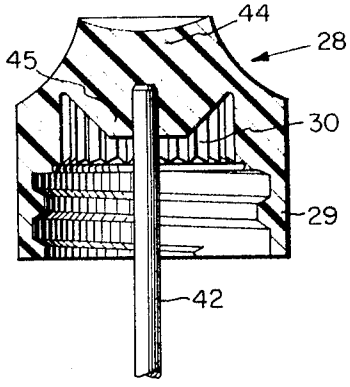


FIG. 3

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CONTAINER WITH CAP-OPERATED STIRRING MECHANISM

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ABSTRACT OF THE DISCLOSURE

A container having a flat bottom and an externally threaded, cylindrical neck at the top, and within said container a stirring mechanism comprising a shell located within and projecting a distance above said neck and having an annular sequence of vertically extending grooves provided in the outer surface of its projecting portion, depending from said shell a pair of side bars extending to the bottom of the container and a cross bar connected between the bottom ends of said side bars and extending adjacent said bottom. For covering the container and for actuating the stirring mechanism an internally threaded cap is provided for engagement over the container neck and formed in the inner surface of its side wall above its threads in a sequence of vertically extending ridges which are adapted to engage the grooves in the upper end of the shell of the stirring mechanism when the cap is applied to the neck of the container. Thus, whenever rotary motion is applied to the cap, the shell and hence the stirring mechanism are forced to participate in the rotary motion.

The present invention relates to containers for liquids in which finely divided solids are suspended, such as nail lacquers and other cosmetic lotions wherein pigment particles are suspended in a suitable carrier liquid. Suspensions of this type tend to separate in time, i.e. the pigment particles drop to and accumulate at the bottom of the container, and it is necesary to shake the container vigorously before the liquid contained therein can be used.

It is an object of the present invention to provide a container with a simple and effective mechanism for agitating its contents.

Another object of the invention is to provide an effective stirring mechanism for use in containers of the type referred to, which is of simple and inexpensive construction and may readily be applied to the container and which may be operated by twirling the cap with which cosmetic containers are usually provided.

These and other objects of the invention will be apparent from the following description of the accompanying drawing which illustrates a preferred embodiment thereof and wherein

FIGURE 1 is a vertical central section through a cosmetic bottle provided with the stirring mechanism of the invention;

FIGURE 2 is a fragmentary side elevation of the stirring mechanism in collapsed condition before it is introduced into the bottle;

FIGURE 3 is an enlarged detail view illustrating an axial vertical section through the closure cap of the bottle; and

FIGURE 4 is a section similar to FIGURE 1 illustrating the manner in which the bottle of the invention is assembled.

The exemplary embodiment **10** of the container of the invention illustrated in FIGURES 1 and 4 may be of glass, metal or plastic material and comprises a frustoconical body portion **12** having a flat bottom **14**. At its upper converged end said body portion is provided with

an externally threaded cylindrical neck **16** that is of a lesser diameter than the converged upper end of the body portion so that an inwardly directed annular shoulder **18** is formed around the upper end of said body portion. Received within the described container is the stirring mechanism of my invention which is collectively identified by the reference numeral **20** and which may be made of metal, wood or hard rubber, but is preferably made of plastic material. It comprises a cylindrical shell or sleeve **22** which is located within the neck **16** of the container, and is arranged to project a limited distance above the upper edge of said neck as indicated at **24**. The inner surface of said upwardly projecting portion **24** of shell **22** is provided with a circular sequence of vertically disposed grooves **25** (FIGURE 2) for reasons that will presently appear. From diametrically opposite points of the bottom edge of said shell or sleeve depend side bars **26***a* and **26***b*, respectively, which extend in a downwardly diverging manner along the conical side wall of the container, and their diverged lower ends carry a cross bar **27** which extends adjacent to and diagonally across the flat bottom **14** of the container. When the container is filled with whatever lotion it is intended to hold, it is hermetically closed by a cap **28** of a suitable material, such as wood, rubber or plastic material. The lower portion of its cylindrical side wall **29** is provided with internal threads which are adapted to engage and coact with the external threads on the neck **16** of the container. Provided in the inner surface of said side wall **29** of cap **28** above the described screw threads is a circular sequence of vertically extending ridges **30** which are adapted to engage the groves **25** in the upper portion of the outer surface of shell **22** at the upper end of the stirring mechanism. Thus, when the cap **28** is applied to the neck **16** of the container and the ridges **30** engage the grooves **25** in the shell **22** of the stirring mechanism, said mechanism is forced to participate in any rotary movement imparted to the cap **28**. To make it impossible for the stirring mechanism to collapse and be accidentally withdrawn from the container when the cap **26** is removed, the upper ends of the side bars **26***a* and **26***b* are provided with outwardly directed projections or shoulders **34***a* and **34***b* respectively, which abut the hereinbefore described annular shoulder **18** between the neck **16** and the upper end of the container body.

The stirring mechanism **22** may be made in such a manner that it is easy to introduce it through the narrow neck **16** of the container, and to position it properly within the container. For this purpose the side bars **26***a* and **26***b* and the cross bar **27** may be made of one piece as illustrated in FIGURE 2, with internally located notches **36***a* and **36***b* provided where the ends of the side bars **24***a* and **24***b* join the ends of the cross bar **25**, and an externally located notch **38** arranged in the center of said cross bar **27**. Hence, the frame formed by the side bars **26***a* and **26***b* and the cross bar **27** may initially be flattened out, as shown in FIGURE 2, and in this condition it may easily be introduced into the container through the neck **16**; and when the point of the V formed by the halves of the cross bar **27** comes, and is pushed, aginst the bottom **14** of the container, the bars of the V spread apart due to the external location of the flexible connections with the bottom ends of side bars **26***a* and **26***b* are established by the internally located notches **36***a* and **36***b* (FIGURE 4), until they lie flat against said bottom, and in the process spread the side bars **26***a* and **26***b* part and place them against the side wall of the container; and as the stirring mechanism is fully pushed down within the container, the projections **34***a* and **34***b* at the upper ends of the side bars **26***a* and **26***b* snap into position below the annular shoulder **18** at the upper end of the container

body, whereupon the stirring mechanism is properly installed within the container. A circular bead **39** may be provided on the outside of shell **22** below the grooves **25** to act as a limit stop against the upper edge of the container neck when the stirring mechanism of the invention is introduced into the container in the above described manner.

The closure cap **28** of the container of my invention may be provided in the conventional manner with a brush **40** for ease in spreading the contents of the container at its place of use. For this purpose the stem **42** of the brush **40** may be mounted in the center of the top wall **44** of the cap, which may be extended downwardly for this purpose, as shown at **45**, and extends through the center of the hollow shell **22** to a suitable level within the container as shown in FIGURE 1.

When using the container of my invention for storing lotions that tend to separate into their components in time, as do many cosmetic liquids such as nail lacquer, it is now no longer necessary to shake the bottles, which is troublesome and may splash the contents of the container on the user's hand and clothes, if the closure cap should happen to be loose. It is merely necessary to unscrew the cap **26** and to twirl it vigorously to and fro before disengaging it fully from the neck of the container; and due to the fact that the ridges **30** of the cap are still interengaged with the grooves in the shell **22**, the stirring mechanism **20** is forced to participate in any rotary motion imparted to the cap **28**; its cross bar **25** therefore agitates the contents of the container as it is turned alternately in opposite directions while rising and descending in an axial direction within the container as the twirling of the threaded screw cap upon the threaded container neck lifts and lowers the cap in quick succession. In this manner ay sediments that may have gathered at the bottom of the container are restored to suspension within the carried liquid, and thus the contents of the container are reconditioned for use.

By bevelling the upper edge of sleeve or shell **22** of the stirring mechanism, so that it forms an inwardly directed slope or incline **46** (FIGURE 2) stirring mechanism of my invention provides means for wiping from the brush **40** any excess of varnish picked up by the brush, without waste because the excess liquid wiped from the brush flows through the shell **22** back into the container body **12**. This has the added advantage of protecting the interengaged threads on the cap and container neck from the influx of excess lotion which may freeze the cap to the neck.

While I have explained my invention with the aid of a particular embodiment thereof, it will be understood that the invention is not limited to the specific constructional details shown and described by way of example, which may be departed from without departing from the

spirit and scope of my invention. Thus, the container may obviously be of a shape different from the frustoconical shape illustrated in the drawing; it may be of cylindrical or even polygonal shape; and while I have shown the stirring mechanism to comprise only one pair of side bars **26***a* and **26***b* and one cross bar **27**, it obviously may be constructed to have two or more cross bars connected between opposite located pairs of side bars.

I claim:

1. A container comprising a body portion having a bottom and a neck at the top of said body portion; and within said body portion a stirring mechanism having a shell located within and projecting above said neck, a number of side bars depending from said shell and a cross bar connected between the bottom ends of said side bars; a cap for engagement over said neck; and coacting means on said cap and said shell for forcing said shell to participate in any rotary motion imparted to said cap.

2. A container according to claim **1**, wherein said means for forcing said shell to participate in my rotary motion imparted to said cap are interengaged ridges and grooves provided on the inner surface of said cap and the outer surface of said shell.

3. Container according to claim **1** wherein said side bars are disposed adjacent the side wall of said body portion at diametrically opposite areas thereof and reach to the bottom of said body portion, and wherein said cross bar extends along said bottom.

4. A container according to claim **1** including an annular shoulder formed between the upper end of said body portion and said neck, and outwardly directed projections formed on the upper ends of said side bars in abutment with said annular shoulder.

5. A container according to claim **1** wherein said stirring mechanism is a unitary structure with flexible areas of reduced thickness arranged between the bottom ends of said bars and the opposite ends of said cross bar, and at amidpoint of said cross bar.

6. A container according to claim **1** wherein the upper edge of said shell is bevelled to form an inwardly directed slope.

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U.S. Cl. X.R.

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