This invention relates to roll-on type applicators. The invention is particularly useful in connection with the application of liquid or somewhat viscous cosmetic material which is flowable.

Roll-on applicators of the type mentioned have been known in the art. It has also been known to employ a helical spring which serves to actuate a cup or piston for feeding the liquid or viscous cosmetic material toward the dispensing ball. However, such constructions have embodied serious defects. For example, when the device is new and completely filled with the cosmetic material, whether liquid or perfume or the like, the cup is in a retracted position and the spring is compressed so that it provides adequate pressure against the material. However, as the material becomes consumed, the spring expands and tends to lose its power. Significantly enough, this is most apt to happen when the cosmetic material may have hardened somewhat, probably due to slight evaporation or the like. In a situation such as this, the piston may easily stick in the barrel and the spring will have insufficient tension to urge it forwardly. The device is then substantially useless because the material will not be properly fed to the ball.

With the foregoing in mind I have devised a structure of the type above outlined but wherein I employ means whereby the spring can be caused to bodily follow the movement of the piston. In other words, when the cup is advanced as above described, the spring may be compressed to its original tension and may resume or even exceed its original pressure. Thus the spring may be compressed independently of the position of the piston.

An important aspect of this invention is illustrated by the following situation. Assume that the piston or cup has advanced forwardly and is then obstructed by a somewhat set or hardened cosmetic material so that it will not operate properly. By employing my improved mechanism the spring can then be compressed to such a degree that it may even serve as a fixed transmission element, transmitting considerable manual forces directly to the cup. This will loosen the cup so that the material will then be adequately fed.

Another feature of this invention is the provision of a longitudinal, axial rod within the body of the applicator, which rod supports the spring and the cup. This, in and of itself, is not new. However, I have formed the free end of the rod in flattened form so that it performs a whipping or agitating action when rotated. By this means, if the cosmetic material has hardened somewhat, it may be loosened by the whipping action of the rod end.

The invention will be further understood from the following description and drawings in which:

FIGURE 1 is a perspective view of an applicator made according to the instant invention, the cover thereof not being shown.

FIGURE 2 is an enlarged longitudinal cross-sectional view of the device;

FIGURE 3 is a cross-sectional view as taken along the line 3—3 of FIGURE 2;

FIGURE 4 is a cross-sectional view as taken along the line 4—4 of FIGURE 2; and

FIGURE 5 is a view similar to FIGURE 2 but showing both the cup and the spring in an advanced position when a considerable quantity of the material has been used up.

The outer form of the device 10 is largely conventional. The device includes a rotatable head 11 and a plastic ball 12 which may be retained as is conventional in a metal ball holder 13, the ball being rollable in the usual fashion. Referring to FIGURE 2, the outer barrel 14 converges at its forward end where it locks ball holder 13 in place. The inner barrel 15 encloses the operating mechanism. These elements are known in the art per se.

The viscous cosmetic or other flowable material to be dispensed is contained in the forward portion 16 of the inner barrel 15. A disc 17 closes the rear end of both barrels. A longitudinal rotatable shaft or rod 18 extends substantially throughout the length of the device, its reduced rear end 19 being fixed in rotatable head 11, and its neck 20 being journalled in disc 17.

Approximately the rear half of shaft 18 may be threaded as at 21 although such threading may be continued further up the rod if desired. A collar-like screw follower or nut 22 serves as a terminal for helical spring 23. Follower 22 is axially driven by rotation of the shaft 18. The other end or terminal of spring 23 is seated in a rear well formed in plastic cup or piston 24. The forward end of cup 24 is formed with a deep cup formation 25. Cup 24 is preferably but not necessarily of a deformable flexible plastic such as polyethylene.

Inner barrel 15 converges conically at its forward end. Shift 18 extends into this converging portion, the forward end 26 of shaft 18 being flattened and serving as a whip or agitator when the shaft is rotated.

In the normal operation of the device, the cup 24 will gradually move forward under the influence of spring 23. Eventually the spring will be considerably extended. This will occur after a period of use when the cosmetic material may have hardened somewhat. This condition may cause the cup 24 to bind or stick or, in any event, to discontinue adequate forward pressure on the cosmetic material. At this point, the user will rotate head 11 so as to correspondingly rotate shaft 18. This will cause threaded follower 22 to move axially along the shaft so as to again compress the spring 23. Only an approach or a return of the spring to its original compressive tension may satisfactorily dislodge the cup 24 and restore satisfactory operation. On the other hand, follower 22 may be so far actuated forwardly as to compress spring 23 to its maximum extent whereby spring 23 becomes, in effect, a fixed solid element capable of transmitting considerable manual forces to the cup so as to dislodge it when necessary.

In order to prevent rotation of follower 22 as head 11 is rotated, the substantially annular collar-like follower is formed with a flat side or peripheral portion 27, the corresponding side of inner barrel 15 being likewise flattened to restrain the follower against rotation. An important feature is the like flattening of the side wall portion 28 of the cup 24 which is in axial alignment with said flat portion 27. This insures proper sliding action of the cup without excessive friction.

At the same time that follower 22 is actuated forwardly to compress the spring 23, the rotation of the shaft 18 will rotate its flattened whip 24, so as to agitate the viscous cosmetic material. This will provide better homogeneity and will also assist the cup in its dislodging action.

There has been shown what is now considered a preferred embodiment of the invention but it is obvious that changes and omissions may be made without departing from its spirit.
What is claimed is:

1. A roll-on applicator comprising a rollable ball, a ball holder, an elongated cylindrical body on one end of which said ball holder is mounted, said body housing a quantity of flowable material, a longitudinal cylindrical shaft extending through said body, said shaft comprising a smooth cylindrical portion, a head secured to said shaft at the other end of said body for rotating said shaft, a flattened front end formed on said shaft disposed adjacent to said ball holder and adapted to agitate said material when said shaft is rotated, a piston slidably mounted on said smooth portion of said shaft for bearing against said material and urging it toward said ball, a helical spring rearwardly of said piston for urging said piston forwardly against said material, said shaft being threaded at its rear portion, and a screw-threaded follower mounted on said rear portion of said shaft behind said spring for compressing said spring independently of the position of said piston in said body.

2. A roll-on applicator comprising a rollable ball, a ball holder, an elongated cylindrical body on one end of which said ball holder is mounted, said body housing a quantity of flowable material, a longitudinal cylindrical shaft extending through said body, said shaft comprising a smooth cylindrical portion, a head secured to said shaft at the other end of said body for rotating said shaft, means on said shaft adapted to agitate said material when said shaft is rotated, a piston slidably mounted on said smooth portion of said shaft for bearing against said material and urging it toward said ball, a helical spring rearwardly of said piston for urging said piston forwardly against said material, said shaft being threaded at its rear portion, and a screw-threaded follower mounted on said rear portion of said shaft for compressing said spring independently of the position of said piston in said body.

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