United States Patent

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Kansas City, Mo.

[54] **CONTAINER-DISPENSER FOR MATERIAL IN STICK FORM**
10 Claims, 11 Drawing Figs.

[52] **U.S. Cl.** **401/72**
[51] **Int. Cl.** **A45d 40/06**
[50] **Field of Search** 401/68–78, 87, 172–175

[56] **References Cited**

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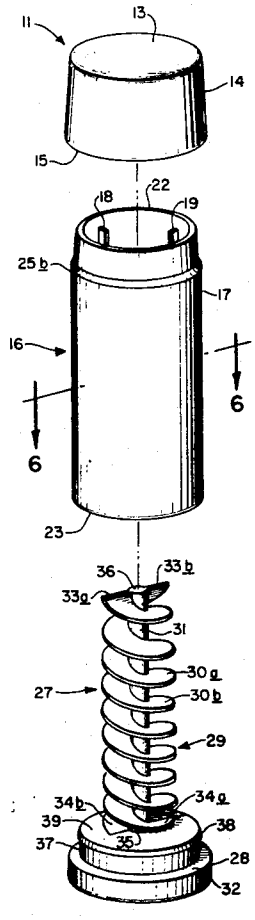
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Primary Examiner—Lawrence Charles
Attorney—Donald L. Johnson

ABSTRACT: A simplified container-dispenser for material in stick form which includes a cap, a tubular body, and a feed screw assembly. The feed screw assembly comprises a knob and a screw, the screw being integrally molded with the knob and projecting into the stick. Upon rotation of the knob of the feed screw assembly, the screw rotates to push the stick upwardly and out of the tubular body.



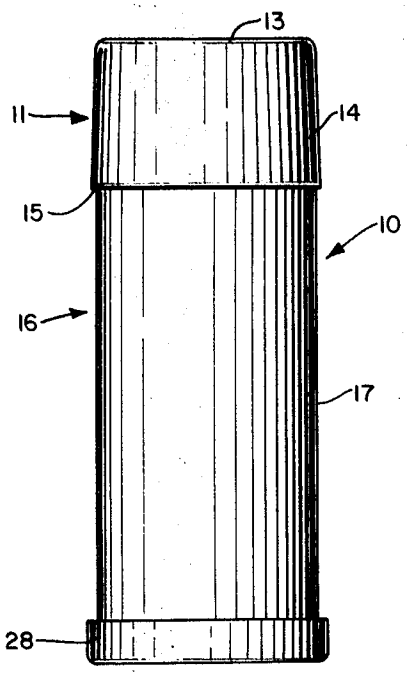


FIG. 1.

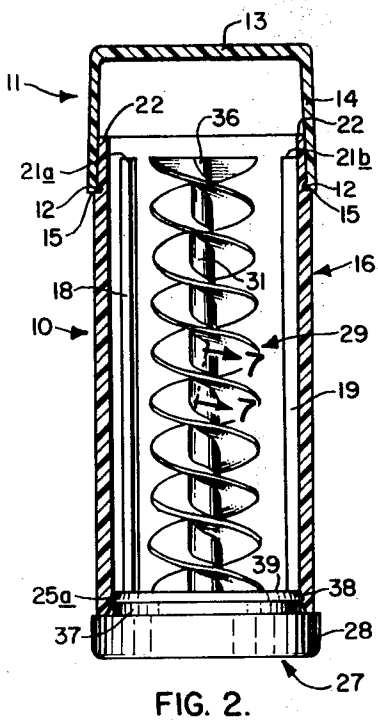


FIG. 2.

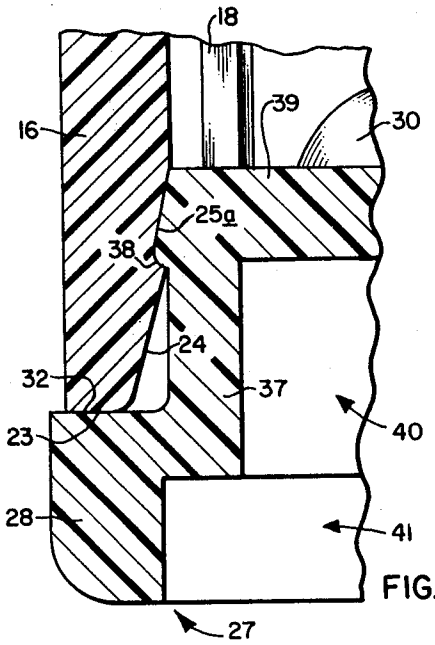


FIG. 3.

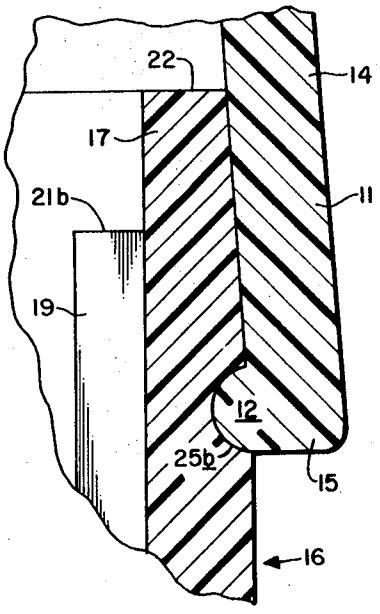


FIG. 4.

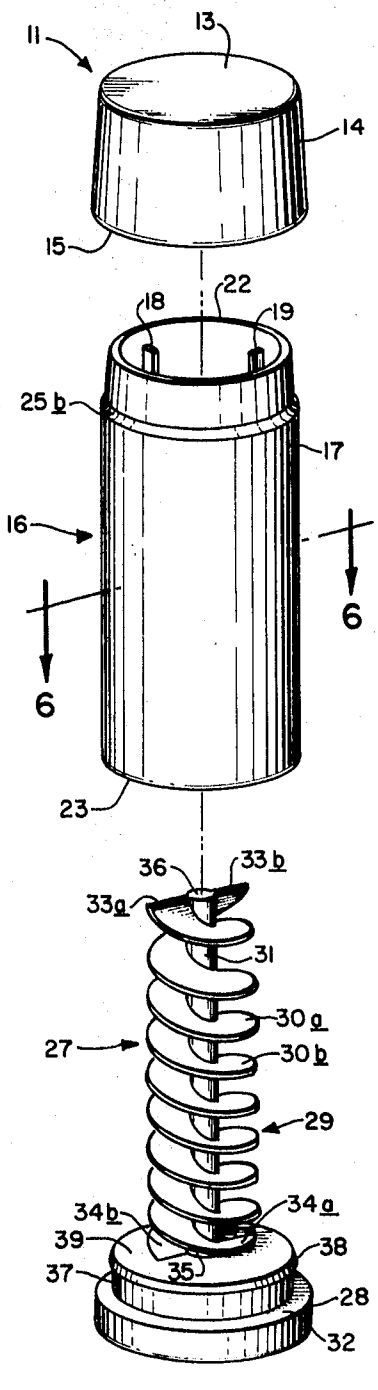


FIG. 5.

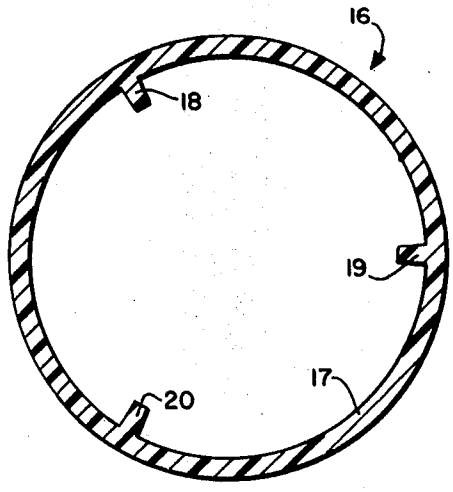


FIG. 6.

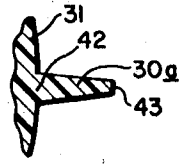


FIG. 7.

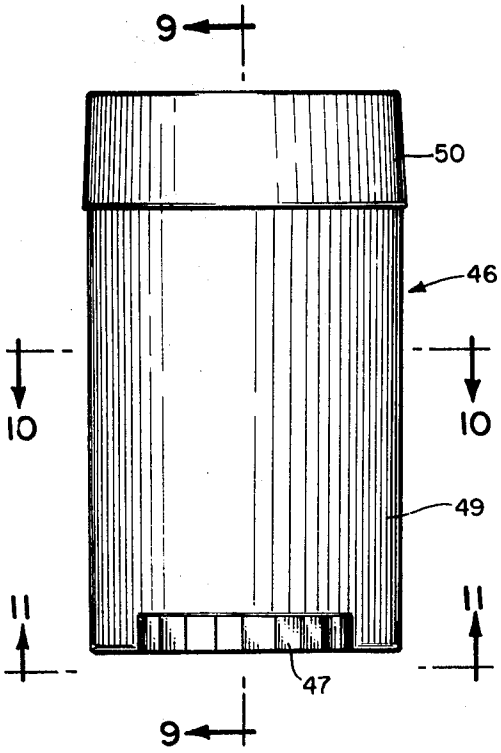


FIG. 8.

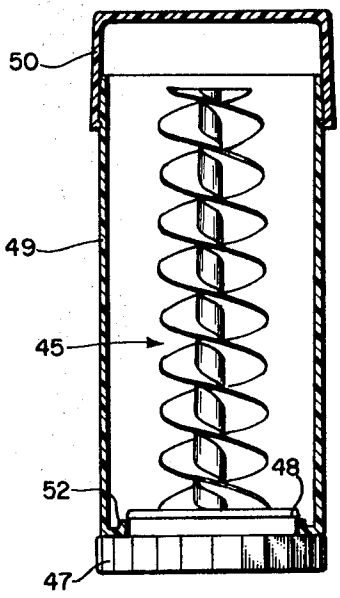


FIG. 9.

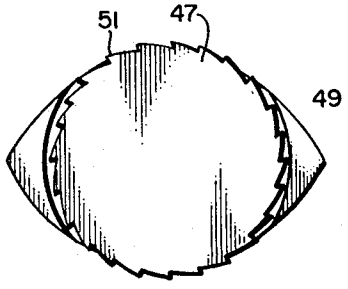


FIG. 11.

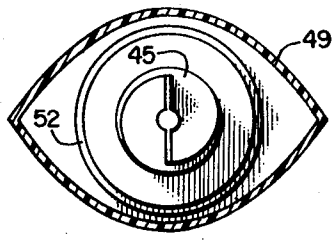


FIG. 10.

CONTAINER-DISPENSER FOR MATERIAL IN STICK FORM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a simplified container-dispenser for material in stick form.

2. Description of the Prior Art

Devices for containing and dispensing stick cosmetics, medicants, and other semisolid sticks have been in use for some time. Tubular containers utilizing a feed screw to project a stick of semisolid substance are commonly used for dispensing stick deodorants and other similar type materials. Such containers and dispensers commonly consist of at least the following four components: (a) a cap, (b) a tubular body, (c) a feed screw assembly, and (d) a follower. The follower commonly has a threaded hole in its center to engage the threads of the screw and is restrained from rotational movement by sliding engagement with the body. Upon rotation of the knob of the feed screw assembly, the follower travels up the feed screw, thereby forcing the stick upwards out of the tubular body.

A disadvantage of the prior art dispensers is that the inclusion of a follower in the stick dispenser greatly increases the cost and complexity of the device. The screw threads and follower threads must be molded to a very narrow tolerance so that the two sets of threads will mesh smoothly. Also, it is necessary to carefully mold the follower so that the radius thereof does not vary, since the follower must fit snugly against the sides of the tubular body. If the follower does not conform perfectly to the walls of the tubular body, the molten material with which the tube is filled will seep through the space between the follower and the tube resulting in a wastage of material. If the follower is slightly larger than the interior of the tubular body, the follower will fit tightly against the tubular body and will not feed upward when the screw knob is turned. A further disadvantage resulting from the use of a follower is that during assembly of the dispenser, the follower must be placed on the screw and rotated until the follower has travelled down the screw to the base of the screw.

A number of containers and dispensers for semisolid sticks have been developed which employ a cap, a tubular body, and a feed screw assembly (see U.S. Pats. Nos. 3,333,740, 2,980,246, and 2,818,167). All these devices employ a follower and therefore suffer the disadvantages as outlined above.

The advantages of the container-dispenser of the present invention over the conventional type of container-dispenser are several. First, the omission of the follower results in a simplified container-dispenser. One less part need be manufactured than in conventional container dispensers.

Second, assembly of the container-dispenser is greatly simplified since the step of placing a follower onto a feed screw and rotating the follower until the follower has traveled down the length of the screw is eliminated. Additional time is saved since all three components of the dispenser snap together to complete the unit assembly.

Third, the dispenser consists of only three plastic components, each of which can be molded in conventional straight injection molds with relatively wide tolerances.

Fourth, the threads of the feed screw are relatively large in diameter to prevent the feed screw from shearing the portion of the stick material lying between the threads from the remainder of the stick material.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a simplified container-dispenser for stick material consisting of three components.

It is another object of this invention to provide a container-dispenser for stick material which does not utilize a follower.

It is also another object of the present invention to provide a container-dispenser for stick material which prevents rotation of the stick material.

It is still another object of the present invention to provide a stick material dispenser which may be completely assembled by snapping the three components of the dispenser together.

A further object of the present invention is to provide a container-dispenser having components which can be formed by conventional injection molding of a plastic material.

The foregoing and additional objects are realized in a container-dispenser which includes only the minimum number of separate components. These components include a snap-on cap, a tubular body, and a feed screw assembly. When the snap-on cap is forced downward over the top of the tubular body, an annular groove on the outside of the tubular body engages an annular ridge on the inside of the snap-on cap to secure the snap-on cap to the tubular body. In one embodiment of the present invention, the tubular body is of circular cross section and contains three longitudinally extending, spaced apart ribs projecting from the interior sidewalls of the tubular body to prevent rotation of the stick material as the stick is forced upward out of the tubular body by rotation of the feed screw assembly. In another embodiment of the present invention, the tubular body is generally elliptical in cross section and rotation of the stick material is prevented by the interior sidewalls of the tubular body. Upon insertion of the feed screw assembly into the bottom opening of the tubular body, an annular ridge thereon loosely engages an annular groove provided in the inner wall adjacent to the bottom of the tubular body to assembly these two components. The loose fit between the ridge and groove allows rotation of the feed screw assembly within the tubular body. The screw portion of the feed screw assembly is axially aligned with the projects upward into the tubular body. When the molten stick material is poured into the body, it envelopes the screw and upon cooling shrinks away from the screw surface and from the inner wall of the container whereby it can be pushed up and out of the container by rotation of the screw.

BRIEF DESCRIPTION OF THE DRAWINGS

Exemplary embodiments of the invention are shown in the accompanying drawings in which:

FIG. 1 is an elevational view of an assembled stick container-dispenser of circular cross section;

FIG. 2 is a partly sectional view of FIG. 1;

FIG. 3 is an enlarged sectional view of a portion of the bottom of FIG. 2;

FIG. 4 is an enlarged sectional view of a portion of the top of FIG. 2;

FIG. 5 is an exploded perspective view of the three components of the stick container-dispenser of FIG. 1;

FIG. 6 is a cross-sectional view taken along lines 6—6 of FIG. 5;

FIG. 7 is a cross-sectional view taken along lines 7—7 of FIG. 2;

FIG. 8 is a front elevational view of an assembled stick container-dispenser of elliptical cross section;

FIG. 9 is a partly sectional side view taken along lines 9—9 of FIG. 8;

FIG. 10 is a partly sectional top view taken along lines 10—10 of FIG. 8; and

FIG. 11 is a bottom view taken along lines 11—11 of FIG. 8.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Like reference characters are used to designate similar parts in the drawings and in the description of the invention which follows.

As shown in FIGS. 1–7 one embodiment of the stick container-dispenser of the present invention includes a snap-on cap designated generally by the numeral 11, a tubular body of circular cross section designated generally by the numeral 16, and a feed screw assembly designated generally by the numeral 27. The assembled stick container-dispenser is shown in FIG. 1 and is designated generally by the numeral 10. In the assembled view seen in FIG. 1 the visible components of the stick container-dispenser are the cap 11, the tubular body 16, and the feed knob 28.

As is shown in FIGS. 1, 2, 4, and 5, the cap 11 is generally cylindrical in shape, having a solid top wall portion 13, a depending sidewall 14, and an open lower end portion 15. As shown in FIGS. 2 and 4, the cap 11 has an annular ridge 12 on the inside wall of the cap near the lower end 15. As seen in FIG. 4, this ridge 12 is adapted to be received in the groove 25*b* provided in the outer wall of the tubular body 16.

As can be seen in FIGS. 1–6 the tubular body 16 has a circular cross section with three spaced apart, longitudinally extending ribs 18, 19, and 20 projecting from the interior sidewall 17 of the tubular body. The three ribs are shown as being equally spaced around the interior of the tubular body and parallel to each other. However, the ribs may be unequally spaced and may be fewer or greater than three, if desired. As seen in FIG. 2, the upper ends 21*a* and 21*b* of the ribs 18 and 19 are on the same plane as the top 36 of the screw, generally designated by the numeral 29, as is the upper end (not shown) of rib 20. The ribs extend downward to the top 39 of the reduced diameter part 37 of the feed screw assembly designated generally by the numeral 27.

The tubular body is open at both the top end 22 and the bottom end 23. Near the bottom end of the tubular body there is an annular groove 25*a* extending completely around the inside of the tubular body. Near the top end of the tubular body there is another annular groove 25*b* extending around the outside of the tubular body.

The outside portion of the sidewall 17 of the tubular body 16 lying above the annular groove 25*b* is slightly beveled so that the cap 11 may be easily fitted over the top end 22 of the tubular body. As shown in FIG. 3, the only portion of the interior of sidewall 17 which is not vertical is the portion 24 lying below the annular groove 25*a*. This portion is beveled for ease of insertion of the feed screw assembly 27 into the lower end of the body.

As seen in FIGS. 2, 3, and 5, the feed screw assembly is designated generally by the number 27. The feed screw assembly includes a knob 28, a reduced diameter part 37 extending upward from the knob which has a solid top 39 from which extends upwardly a feed screw generally designated by the number 29.

The knob 28 is generally cylindrical in shape and has a diameter slightly larger than the tubular body 16. As seen in FIG. 3, the interior portion 41 of the knob is made hollow to save unnecessary material. As seen in FIG. 1, the knob extends downward from the tubular body when the dispenser 10 is assembled, so that the knob can be easily rotated to project the stick material. The knob 28 may be provided with teeth similar to teeth 51 in FIG. 11 to prevent the knob from slipping in the fingers when gripped and rotated. The knob is of greater diameter than the tubular body so that the flat bottom surface 23 of the body 16 rests against the shoulder 32 of the knob 28.

Extending upward from the knob 28 is reduced diameter part 37 which is of smaller diameter than the lower portion of the knob so that the reduced diameter part may be inserted into the lower end of the tubular body. The reduced diameter part has an annular rib 38 which extends completely around the part. The rib 38 is molded to be received loosely in annular groove 25*a*, as seen in FIG. 3, when the feed screw assembly 27 is inserted into the lower end of the tubular body. Upon engagement of rib 38 and groove 25*a*, the feed screw assembly is locked into position in the tubular body so that the feed screw assembly can only be withdrawn from the tubular body by forcing the feed screw assembly downward. However, because of the loose fit the feed screw assembly is free to rotate within slot 25*a*.

Integrally molded to the top 39 of reduced diameter part 37 is the feed screw designated generally by the numeral 29, as seen in FIGS. 2 and 5. The feed screw is provided with two sets of left-hand threads, 30*a* and 30*b*, which are integrally molded with shank 31. The two sets of threads have top portions 33*a* and 33*b* and bottom portions 34*a* and 34*b* which are disposed 180° from each other. The bottom 35 of the shank 31 and the bottoms 34*a* and 34*b* of the threads are integrally molded into the top 39 of the reduced diameter part 37 of the knob 28. When the feed screw assembly 27 is fully inserted into the tubular body 16, the top 36 of the feed screw shank 31 and the tops 33*a* and 33*b* of threads 30*a* and 30*b* are on the same plane with the tops of ribs 18, 19, and 20 to thus assure complete dispensing of all the stick material surrounding the screw.

To prevent the screw from shearing the stick material lying between the screw threads from the remainder of the stick, the screw threads must be relatively large in diameter as compared to the prior art feed screws. It was discovered that the container-dispenser smoothly dispensed the stick material without shearing when the diameter of the screw threads was at least one-half as large as the inside diameter of the tubular body, and the diameter of the screw shank was less than one-half the diameter of the threads.

The stick material container-dispenser is assembled by forcing the feed screw assembly 27 upward into the tubular body 16 until the rib 38 of the feed screw assembly engages the groove 25*a*. Molten material adapted to solidify in stick form, for example, deodorant, is then poured into the top end 22 of the tubular body to completely fill the tubular body up to the level of the top. The molten material when cooled will shrink away from the feed screw 29 and the inner wall 17 of the tubular body. The stick material (not shown) is then free to be propelled upward by rotation of the screw 27. Ribs 18, 19, and 20 will restrain the stick material from rotation and allow the threads 30*a* and 30*b* to elevate the stick out of the body of the container-dispenser. The cap 11 is fastened onto the tubular body by simply placing the bottom of the cap 15 over the top 22 of the tubular body and forcing the cap downwards until ridge 12 of the cap engages groove 25*b* of the tubular body.

To dispense the deodorant stick, the cap 11 is lifted vertically upward from the tubular body and placed aside. The tubular body is then grasped with the fingers of one hand, and knob 28 is grasped with the fingers of the other hand and rotated. This rotation of the knob rotates feed screw 29 relative to tubular body 16. The deodorant stick is prevented from rotating relative to the tubular body 16 by ribs 18, 19, and 20. The rotation of the feed screw 29 causes an upward force to be exerted by the threads 30*a* and 30*b* on the deodorant stick which causes the deodorant stick to slide upwardly in the tubular body.

The diameter of both the shank 31 and the threads 30*a* and 30*b* may be slightly larger at their base than at their upper ends. This variance in diameter decreases friction between the deodorant stick and the threads 30*a* and 30*b* and shank 31, by providing a clearance therebetween. To provide a further clearance between the deodorant stick and the threads, the threads may be tapered from the base 42 toward the top 43 of the thread as seen in FIG. 7.

In another embodiment of the present invention, shown in FIGS. 8–11, the tubular body 49 of the container-dispenser generally designated by the numeral 46, has a generally elliptical cross section. The elliptical cross section of tubular body 49 prevents rotation of the stick material therein. Therefore, the need for longitudinal ribs, such as ribs 18, 19, and 20 shown in FIG. 6, is eliminated.

Feed screw assembly 45 in FIG. 9 can be seen to be identical to feed screw assembly 27 as shown in FIG. 5, with the exception of knob 47. Knob 47 differs from knob 28 only in the provision thereon of teeth 51, which enable the knob to be more easily gripped by the fingers for rotation. Knob 47 can suitably be constructed identically to knob 28.

As shown in FIGS. 9 and 10, the tubular body 49 has a circular raised edge 52 in the bottom thereof for engagement with ridge 48 of feed screw assembly 45. Raised edge 52 fits loosely against ridge 48 to enable feed screw assembly 45 to be easily rotated. The raised edge is not required if the bottom of the dispenser is sufficiently thick to hold feed screw assembly 49 firmly in place during rotation.

The snap-on cap 50 shown in FIGS. 8 and 9 is similar to cap 11 shown in FIGS. 1, 2, 4, and 5, with the exception that the cap is of generally elliptical cross section. A ridge similar to

ridge 12 on cap 11 shown in FIG. 4 is provided on cap 50, and a groove similar to groove 25*b* shown in FIG. 4 for receipt of the ridge is provided in tubular body 49.

Both assembly and operation of container-dispensers 10 and 46 are substantially the same.

The cap, tubular body, and feed screw assembly may be constructed from any suitable material, such as a plastic material. Polyethylene or polypropylene are particularly preferred. The components may also be made of suitable metals, if desired.

While there has been described what are at present considered the preferred embodiments of the present invention, it will be apparent to those skilled in the art that various modifications and changes may be made without departing from the essence of the invention. The tubular body is particularly susceptible to variation. The tubular body can suitably be of oval or polygonal cross section.

What is claimed is:

1. In an appliance adapted to contain a projectable stick, the combination comprising:
   a. a tubular body initially open at both ends thereof;
   b. a cap for sealing one end of said body; and
   c. a combination end closure—feed screw assembly rotatably mounted in the other end of said body,
      i. said assembly including a rotatable knob projecting from said other end of said body and an axially aligned feed screw attached to the top of said knob and extending substantially the full length of said body,
      ii. said feed screw including an elongated shank having two separate sets of axially spaced apart, large diameter threads integrally formed on and projecting transversely from said shank,
      iii. said feed screw being axially received in said stick and adapted to project said stick out of said body upon rotation of said knob.

2. The combination of claim 1 wherein said tubular body is generally elliptical in cross section.

3. The combination of claim 1 wherein said tubular body is circular in cross section.

4. The combination of claim 3 wherein said tubular body has at least one rib extending longitudinally on the inner wall of said body, which rib terminates short of the top of said body.

5. The combination of claim 1 wherein the diameter of the threads on said screw is at least one-half as large as the inside diameter of said tubular body, and the diameter of the shank of said screw is less than one-half the diameter of said threads.

6. The combination of claim 1 wherein said combination end closure—feed screw assembly is integrally formed from one material.

7. The combination of claim 6 wherein said combination is formed by injection molding a plastic material.

8. The combination of claim 6 wherein the base of each of said two separate sets of threads are attached to the top of said knob at positions spaced about 180° apart.

9. The combination of claim 6 wherein said two separate sets of threads have a diameter which is slightly larger at their base than at their upper ends.

10. The combination of claim 6 wherein said two separate sets of threads have a diameter which is at least one-half the inside diameter of said body but less than the diameter of said body whereby said stick remains integral when it is projected out of said body by rotation of said knob.