July 5, 1955

G. A. RICE

2,712,315

DISPOSABLE APPLICATOR

Filed March 26, 1954

FIG. 1

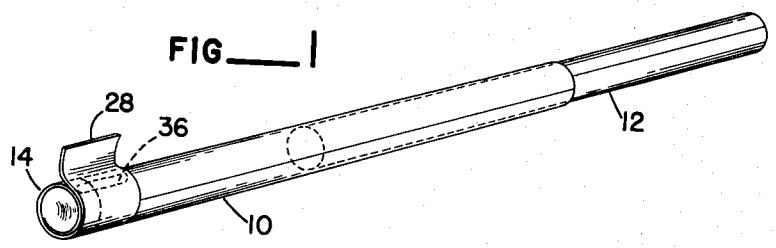


FIG. 2

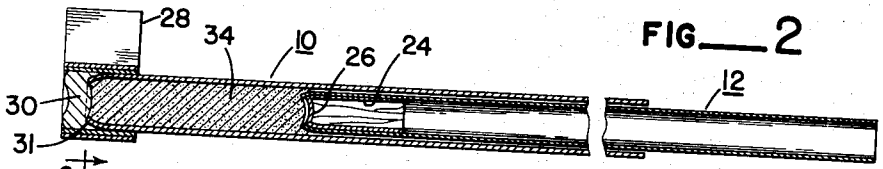
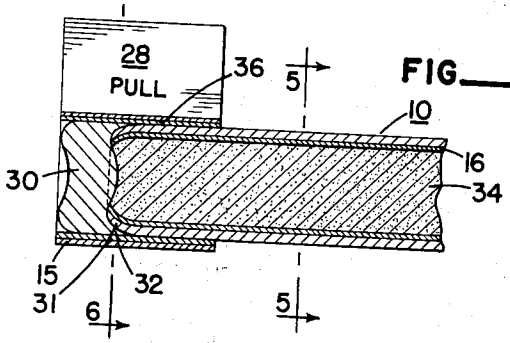


FIG. 3



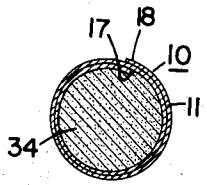


FIG. 5

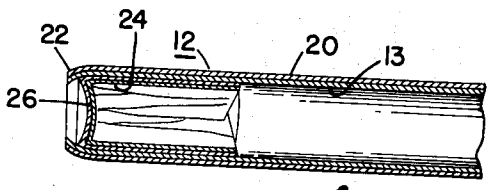


FIG. 4

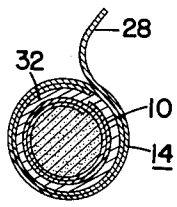


FIG. 6

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DISPOSABLE APPLICATOR

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Application March 26, 1954, Serial No. 418,874

4 Claims. (Cl. 128—261)

This invention relates to a disposable applicator and, more particularly, to a combined package and applicator for introducing paste or gel-like materials into body orifices and which is disposable for hygienic and medicinal purposes.

It is among the most important objects of this invention to provide an applicator of the type described which is inexpensive and simple to construct; which can be charged with a measured amount of material for a single application or treatment for introduction into a body orifice of a prescribed amount of material; which is simple and ready for use without contamination of the contents by the user; and, in the case of staining materials, without undesirable marking of the user's fingers or coating of them by the applicator content; and which, while of an improved and simplified construction, provides reliable and positive injective application of a hygienic or medicinal material at a desired point of application remote from the point at which pressure is applied. These and other objects of the invention will be more apparent during the course of the following specification and in the claims.

A preferred form of the invention is set forth in the accompanying drawings, in which like reference characters refer to like parts throughout the same, wherein:

Figure 1 is a perspective view of my improved applicator;

Figure 2 is a longitudinal sectional view of the applicator of Figure 1;

Figure 3 is an enlarged fragmentary view of the discharge end of the device shown in Figure 2;

Figure 4 is an enlarged longitudinal sectional view of the plunger device employed in the applicator; and

Figures 5 and 6 are cross sections taken in the plane 5—5 and 6—6 respectively of Figure 3.

The applicator of this invention comprises the container cylinder **10**, the cylindrical piston **12**, and the end closure cap **14**. It is preferable that these elements be formed of paper or paper-like sheets rolled into shape, both for the purposes of insuring that the device be inexpensive and to permit production by more or less conventional tools with great rapidity through the employment of relatively unskilled labor.

The container cylinder **10** is an elongated tube formed as shown in Figure 5, of a sheet of paper that has been spirally wrapped around a mandrel at least a couple of turns and suitably bonded to avoid unwrapping. In a preferable form, the paper sheet **11** has one face coated with a very thin film **16** of thermoplastic nature whereby the juxtaposed longitudinal edges **17** and **18** of sheet **11** may be secured against unwinding. This is accomplished by heating the same to fuse the thermoplastic material to an adjacent surface. The thermoplastic film on the inner surface of sheet **11** is selected from those materials which are waterproof and inert to chemical and medicinal substances that are to be contained and dispensed by this device, and forms a barrier to prevent undesirable

wetting or staining or weakening of the paper body sheet which is the main structural portion of tube **10**.

The piston or plunger tube **12**, shown in enlarged detail in Figure 4, likewise is formed of a spirally wrapped sheet of paper **13**, having an outer thermoplastic film or coating **20**, similarly inert to the chemical components of the substance to be dispensed, and to water, which film serves to protect the paper body sheet **13** forming the tube.

While the rear or outward end of tube **12** may be left open as shown, its inner or plunger end is closed by a plugging device which permits tube **12** to function as a piston. The forward end **22** of tube **12** is curved over and slightly restricted. An internal cup shaped paper thimble **24**, preferably formed of wax paper folded double, is thermally sealed in place. The pressure end **26** of thimble **24** has a concave face and closes the forward end of tube **12** slightly inside its rounded end **22**.

Concave face **26** means that pressures of materials in tube **10** during dispensing presses thimble **24** more tightly to the interior walls of tube **12** and this makes the seal of thimble **24** more secure.

The ejection end of tube **10** is closed by means of cap **14** which is likewise formed of a spirally wrapped strip of paper **15** coiled to a size to closely slip over the tube end. This paper strip **15** is also internally coated with a chemically inert, moisture-proof film that may be thermally fused to form the cylindrical cap and retain it against uncoiling. An end **28** of the strip is allowed to stand outward in a curved manner to form a thumb tab whereby the fused area is disrupted and strip **14** may be uncoiled and stripped off the end of tube **10**.

It should be noted that cap **14** encompasses and covers only a portion of the end of tube **10** and extends thereby beyond but a short distance. This provides a cup within the cap at the mouth of tube **10** in which a wax plug **30** may be formed or placed. The forward, or orifice, end of tube **10** is also rolled over and slightly restricted at **31** so that, as may be seen in Figure 3, its outer surface diverges slightly from the inner surface of cap **14**. Thus, the closure plug **30**, which is usually formed by pouring molten wax into the cup-like recess, tends to flow down and around the outer surface of the curved end **31** of tube **10**, and form a pointed, annular sealing fillet **32** to insure that the material **34** to be dispensed by the device is securely sealed in and may not escape, except when desired.

The material **34** to be dispensed lies between the plug **30** and the cupped or concave face **26** of thimble **24**. By varying the distance between plug **30** and thimble **24**, one can vary the amount of dispensable material contained within this applicator.

When it is desired that such a device be put to use, the user grasps the tab **28**, labeled "Pull," between the thumb and forefinger and applies a slight pull to sever the thermally obtained fusion **36** between the layers forming cap **14** and between cap **14** and tube **10**. This permits the unwrapping of the cap **14**. The poured-in-place plug **30** tends to have a greater attachment or affinity to the inner surface of the cap **14** than it does to the orifice end of tube **10** due to its greater area of contact with the former, and the stripping off of the cap results in the dislodgement or displacement of plug **30** and the complete exposure of the end of tube **10**. The applicator may then be inserted into a body orifice or cavity while the parts are in the relation shown in Figure 2 by applying the principal inserting pressure upon tube **10**. Thereupon tube **12** may be pressed inward, causing an ejection of material **34** from tube **10**.

In prior devices, which have been noted, it has always been considered important that there be a close sealing relation between the element forming the cylinder

and the pressure end of the plunger. For this reason, prior devices have employed a sealing cap having an annular flange that serves as a sealing ring between the plunger and the cylinder wall. Contrary to this prior practice, I find it undesirable and unnecessary to obtain such a tight seal and instead use generous tolerances. With clearances of between three and four thousandths of an inch between the plunger and the cylinder wall, my device provides a clean ejection of material 34 in its gel-like or paste state, and such of the material as remains on the inner walls of tube 10 and passes restricted edge 22 of inner tube 12 serves to lubricate the forward movement of plunger 12 rather than to impede this motion. This of course greatly facilitates manufacture as the tolerances are quite liberal. Even tubes out of round work very satisfactorily.

My applicator is made of inexpensive materials so that one can dispose of it after use without economic sacrifice. Preferably, the cap, the cylinder tube, and the plunger, are formed of a prelaminated body paper having a filmed surface of vinyl or wax or polyethylene nature that is resistant to moisture and inert to the chemical ingredients of the material 34 to be dispensed. It is preferable that the laminating film be of a nature that, upon the application of heat, will soften; and, when cool, will fuse to an adjacent surface to insure that the spirally wrapped, tubular elements do not come apart in an undesirable manner. However the cylinder and plunger could be of extruded plastic tube construction.

The rounding over of tubes 10 and 12 is provided by inserting the same, after they have been formed, into a heated female or cup-shaped die, and then applying slight longitudinal pressure. This causes a softening of the material laminated to the paper sheet and a fusion in annular form around the ends of the cylindrical members as they are rounded over. The thimble 24 is most practically formed from a relatively narrow strip of waxed or thermally softenable paper which is folded to double thickness and disposed over the end of an insert plunger. This assembly is then pressed into the rear or open end of tube 12 to position the thimble as shown in Figure 4. The gathering or puckering of the material from which the thimble 24 is formed, rather than being undesirable, adds body to the plunger end and tends to strengthen it against collapse.

It will be seen that the device that has been described will dispense a correct and pre-determined quantity of material to be administered. This device forms a package in which a charge of medicine or the like may be placed in a factory or laboratory, used quickly and easily, and then discarded after use without requiring sterilizing, cleansing, or storage for re-use.

Having thus described a preferred form of my invention, I do not wish to be limited to the exact details shown but wish to cover those modifications within the scope of my invention, which will occur to those skilled in the art, as defined in the appended claims.

I claim:

1. An applicator for administering a semi-solid material into a body orifice, comprising: an outer tube and an inner tube extending partway into said outer tube and slidable telescopically therein and closure means closing the inner end of said inner tube and the corresponding end of said outer tube and semi-solid material to be administered filling the space in the outer tube between the closure means, the closure means for said inner end of said inner tube being a strip of waxed paper having a cup shape with the cavity of the cup facing the other end of the inner tube forming an internal thimble closing said inner end and bonded in place, the closure means for said outer tube including a spirally wrapped strip forming an annular collar partially lapping the closure end of the outer tube and bonded thereto and a wax plug filling said annular collar and closing said outer tube and bonded to the spiral strip and to the outer tube with greater area of contact with the former whereby when the spiral strip is unwound the plug will remain adhered to the strip and clear the outer tube for dispensing of the material.

2. An applicator for administering a semi-solid material into a body orifice, comprising: an outer tube and an inner tube extending partway into said outer tube and slidable telescopically therein and closure means closing the inner end of said inner tube and the corresponding end of said outer tube and semi-solid material to be administered filling the space in the outer tube between the closure means, said corresponding end of said outer tube being curved over and slightly restricted, the closure means for said outer tube including a spirally wrapped strip forming an annular collar partially lapping the closure end of the outer tube, the strip having an outstanding free outer end forming a tab to be grasped for unwinding, and a wax plug filling said annular collar and closing said outer tube and bonded to the spiral strip and to the outer tube with greater area of contact with the former whereby when the spiral strip is unwound the plug will remain adhered to the strip and clear the outer tube for the dispensing of the material.

3. An applicator for administering a semi-solid material into a body orifice, comprising: an outer tube and an inner tube extending partway into said outer tube and slidable telescopically therein with generous tolerances and closure means closing the inner end of said inner tube and the corresponding end of said outer tube and semi-solid material to be administered filling the space in the outer tube between the closure means, the inner end edge of said inner tube being curved over and slightly restricted and permitting some of said material to pass said inner end for lubrication between the tubes during the dispensing stroke of the inner tube and the closure means for the inner tube being internal of said tube and inside of the restricted inner end edge thereof and being formed by a cup shaped strip of waxed paper forming an internal thimble closing said inner end and bonded in place and the thimble having a concave face on its side toward said material whereby pressure from the material during dispensing will tend to press the thimble more tightly against the inner surfaces of said inner tube it abuts, and the closure means for said outer tube being manually removable.

4. An applicator for administering a semi-solid material into a body orifice, comprising: an outer tube and an inner plunger tube extending partway into said outer tube and slidable telescopically therein with generous tolerances and closure means closing the inner end of said inner tube and the corresponding end of said outer tube and semi-solid material to be administered filling the space in said outer tube between the closure means; said outer and inner tubes each being formed from a paper sheet rolled at least twice forming a cylindrical body and the sheet forming the outer tube having a thermoplastic coating on its inner surface and the longitudinal edges of the sheets being bonded to adjacent surfaces of the sheets, the thermoplastic coating being waterproof and chemically inert to said semi-solid material, the inner end edge of said inner tube being curved over and slightly restricted and permitting some of said material to pass said inner end for lubrication between the tubes during the dispensing stroke of the inner tube and the closure means for the inner tube being internal of said tube and inside of the restricted inner end edge thereof, and the edge of said corresponding end of said outer tube being curved over and slightly restricted and the closure means for said outer tube being manually removable.

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