

Sept. 2, 1958

M. K. DRESDEN
SEALING NITROCELLULOSE CEMENT

2,849,739

Filed Nov. 4, 1952

Fig. 1.

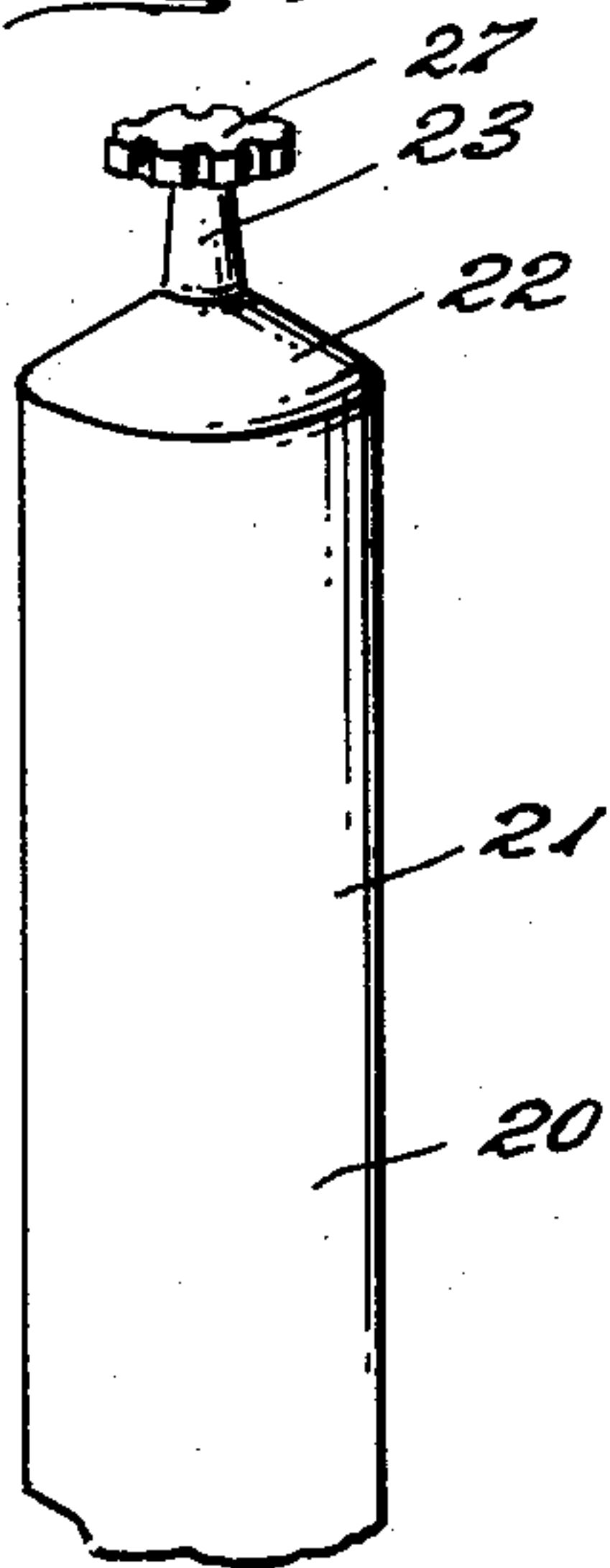


Fig. 3.

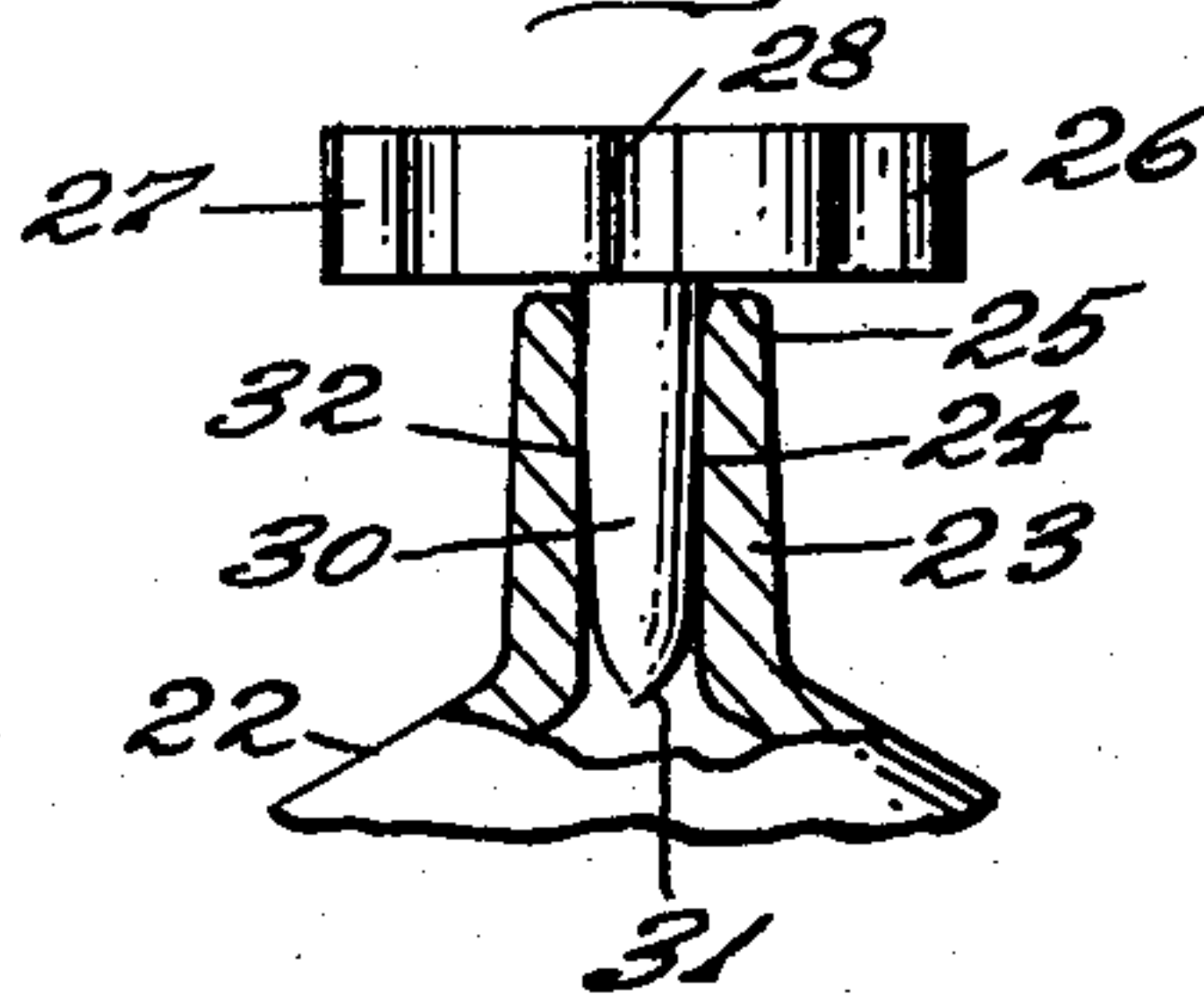


Fig. 2.

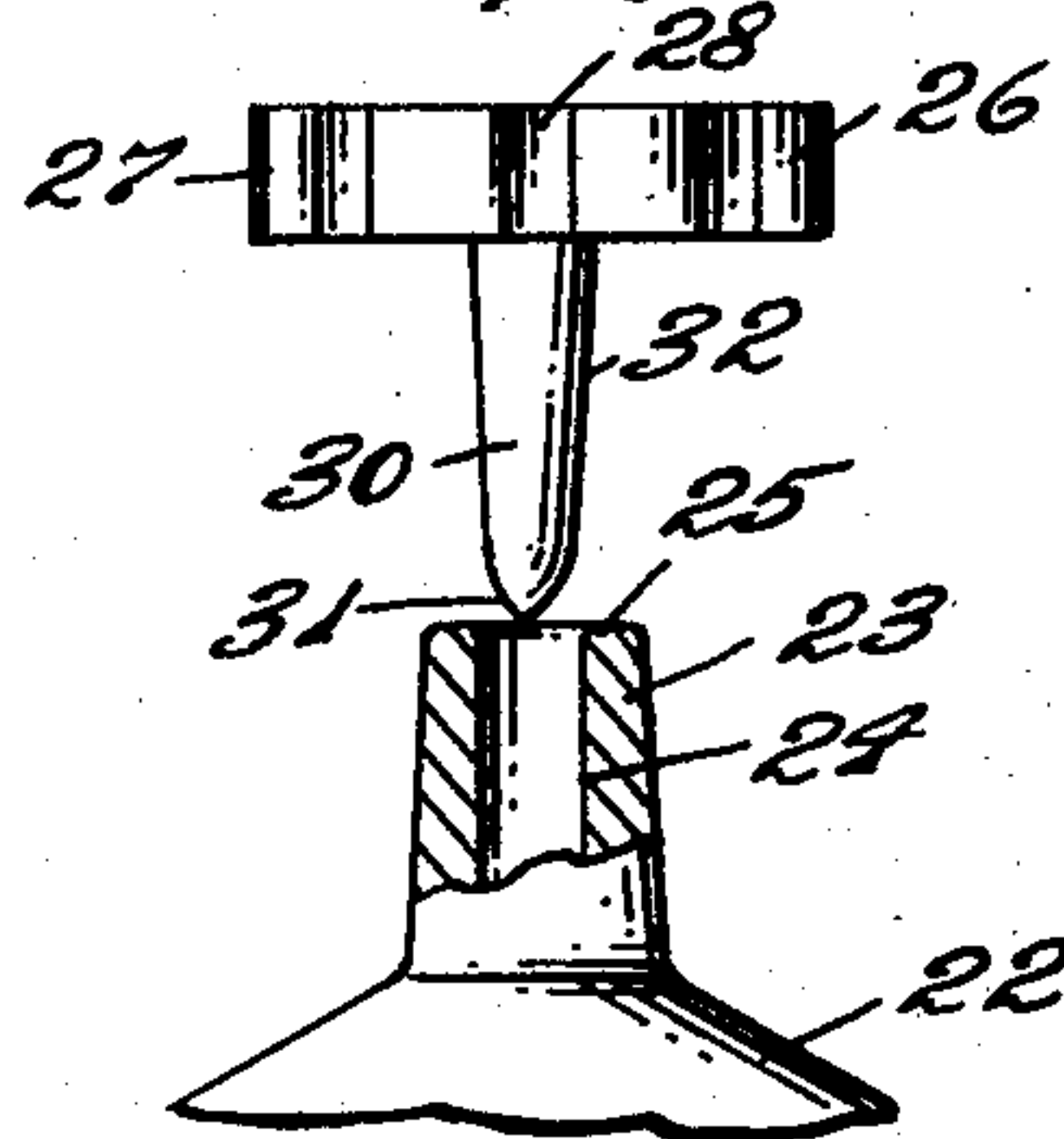


Fig. 4.

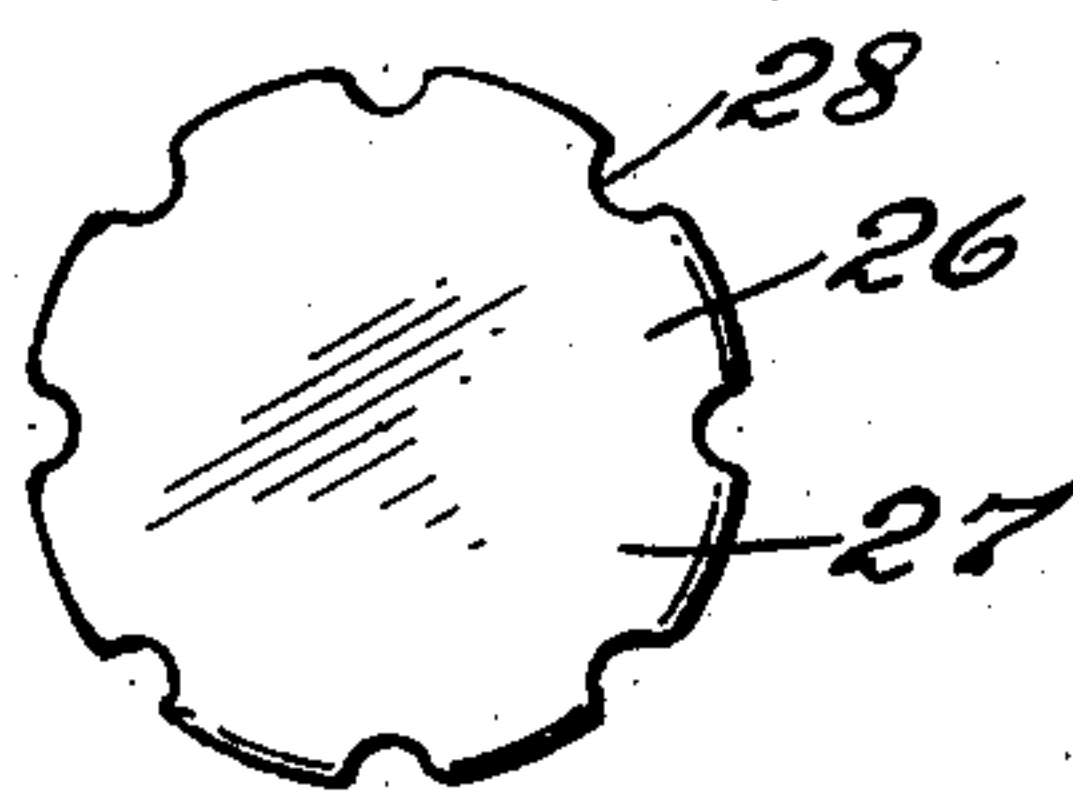


Fig. 8.

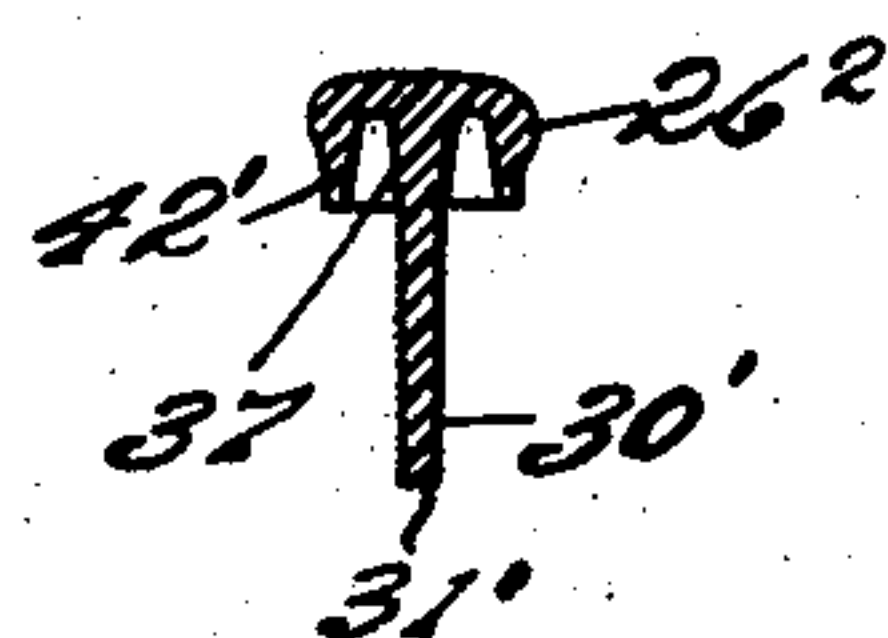


Fig. 6.

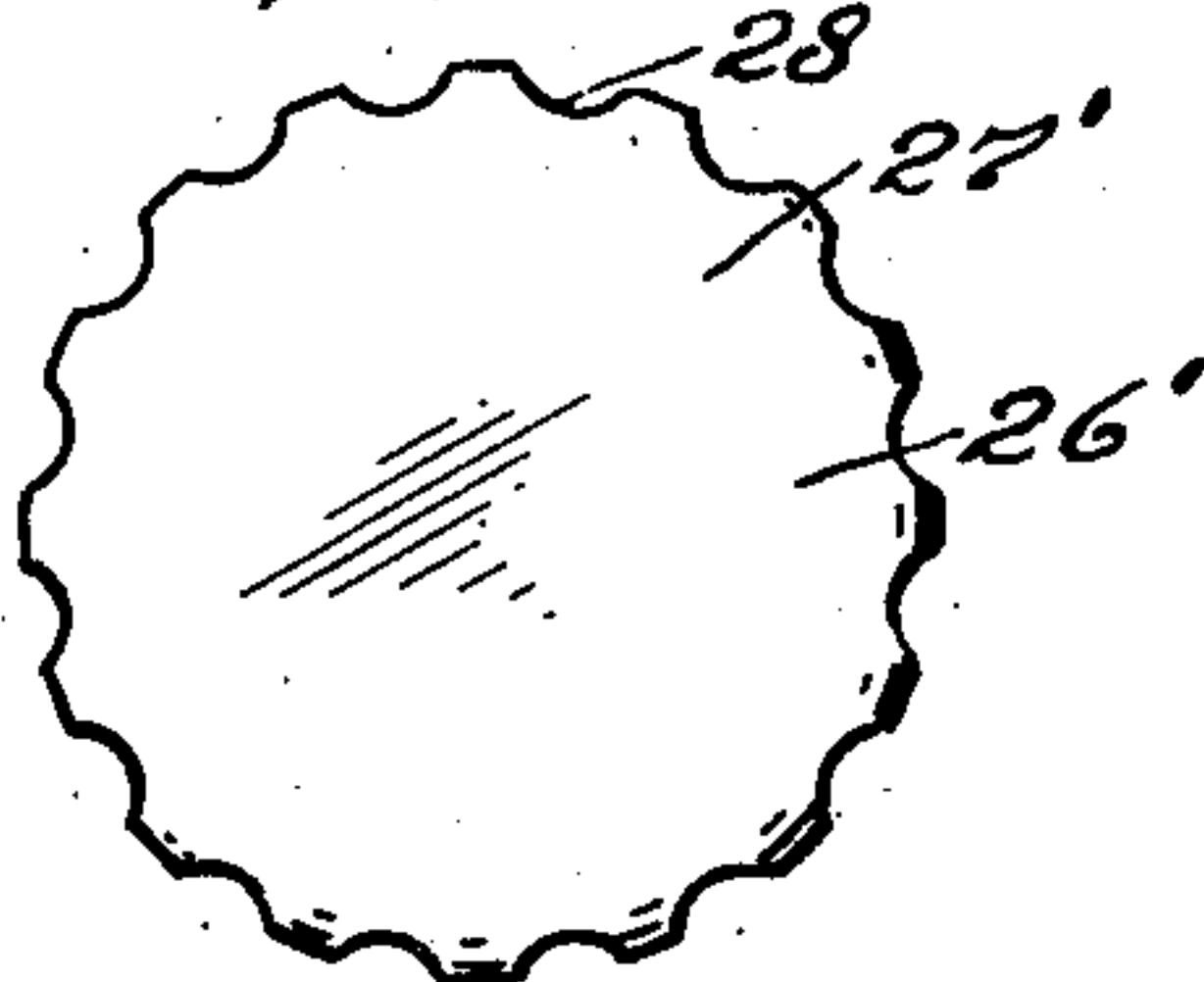


Fig. 5.

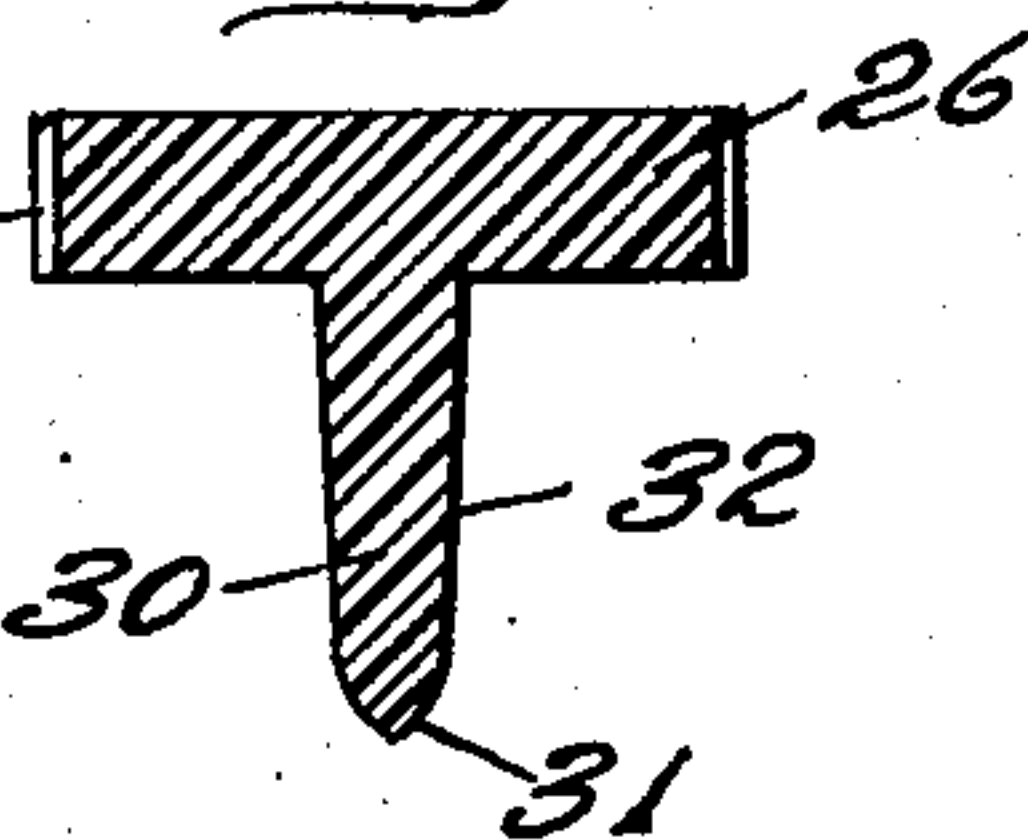


Fig. 7.

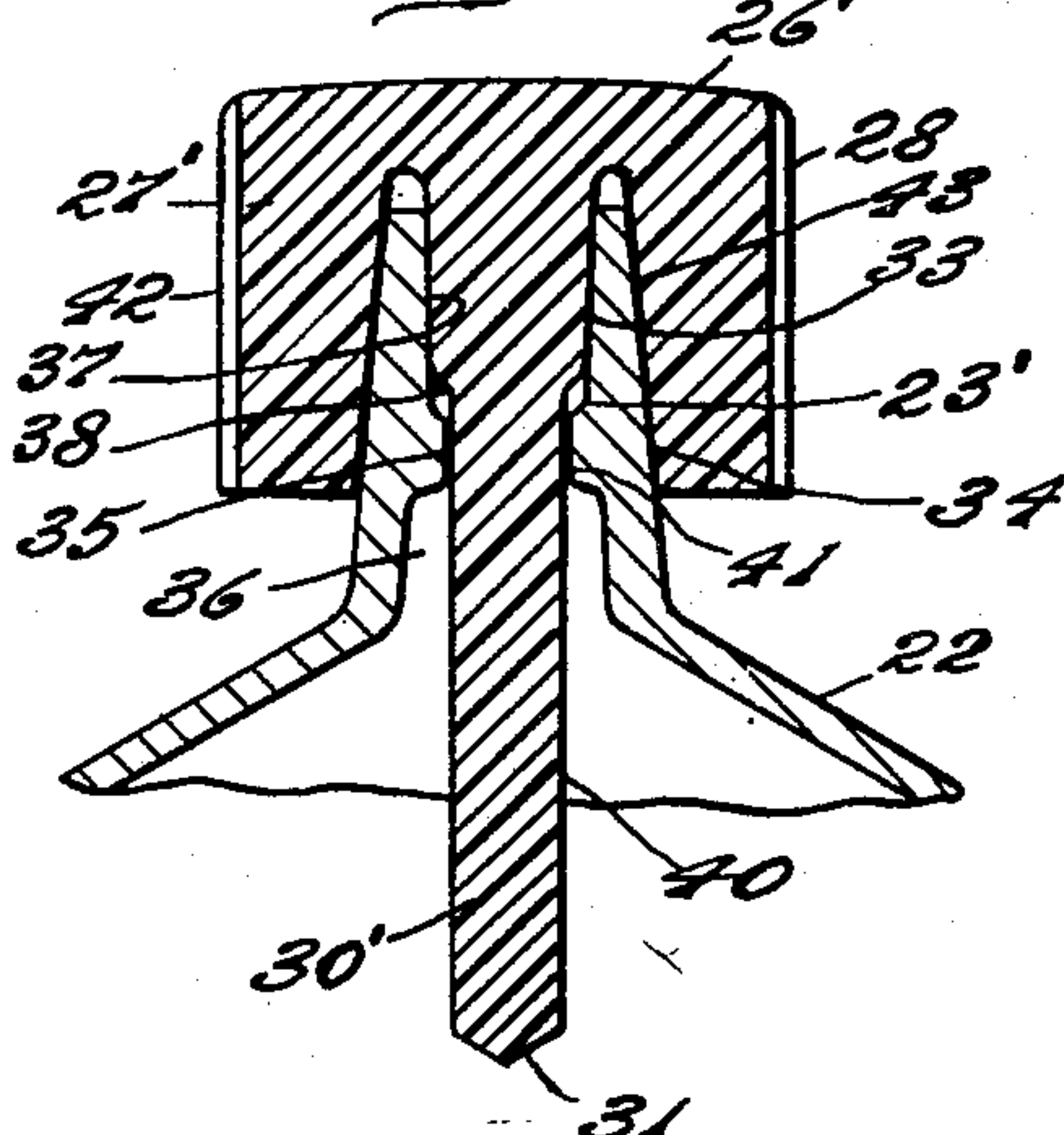
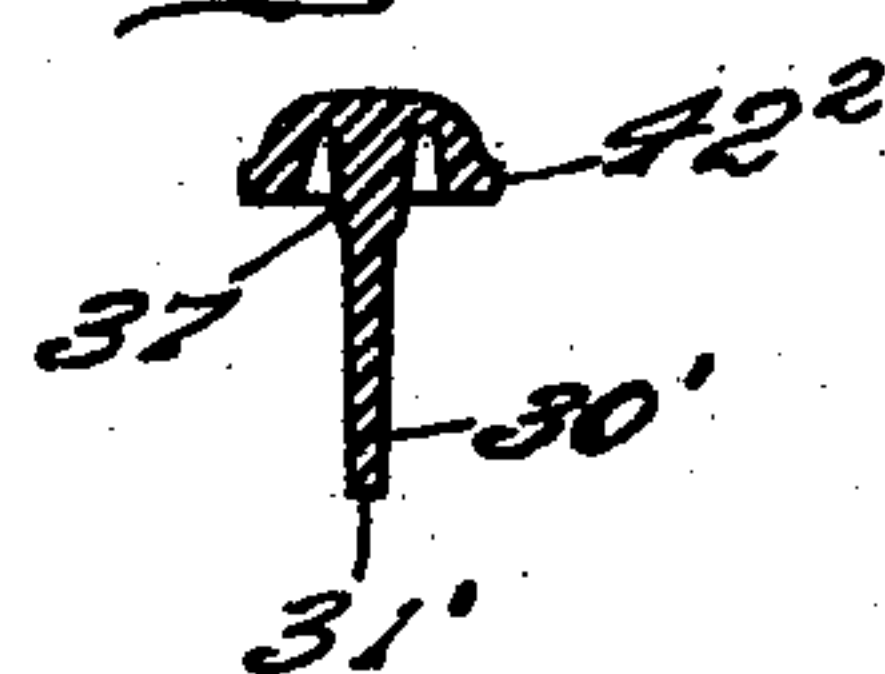


Fig. 9.



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1

2,849,739

SEALING NITROCELLULOSE CEMENT

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Application November 4, 1952, Serial No. 318,636

5 Claims. (Cl. 15—140.3)

The present invention relates to sealing of containers for nitrocellulose cement or similar materials.

A purpose of the invention is to produce a closure for a container of nitrocellulose cement or the like which will not be held closed by hardening of the cement.

A further purpose is to avoid the necessity of drilling out the tip of a container of nitrocellulose cement or the like each time the cement is used.

A further purpose is to reduce the waste of nitrocellulose cement or the like incident to hardening of quantities around the tip which cannot be usefully employed.

A further purpose is to provide a tip having a reduced discharge orifice and a tapered internal portion toward the outer end thereof and to insert a polyethylene or other elastomer closure having a tapered portion which engages the tapered portion of the tip, then a reduced portion passing through the orifice, and then an applicator.

A further purpose is to provide a recessed flange on the closure and to wipe the outside of the tip by the flange.

Further purposes appear in the specification and in the claims.

In the drawings I have chosen to illustrate a few only of the numerous embodiments in which my invention may appear, selecting the forms shown from the standpoints of convenience in illustration, satisfactory operation and clear demonstration of the principles involved.

Figure 1 is a fragmentary perspective of a container in accordance with the invention.

Figure 2 and 3 are fragmentary side elevations, partly in axial section, Figure 2 showing the closure lined up with the tip preparatory for insertion and Figure 3 showing the closure inserted.

Figure 4 is a top plan view of the closure.

Figure 5 is an axial section of the closure.

Figures 6 and 7 show the preferred embodiment.

Figure 6 illustrates the embodiment in top plan.

Figure 7 is an axial section of the embodiment.

Figures 8 and 9 are axial sections of further variations in the closure.

Describing in illustration but not in limitation and referring to the drawings:

Nitrocellulose cement, composed of nitrocellulose dissolved in a suitable solvent such as butyl acetate, amyl acetate, ether-alcohol, acetone, or amyl alcohol, is widely used in industry and in the household as an adhesive, one brand being known as Duco cement. The problem of suitably closing the collapsible tube or other container in which the cement is contained is a difficult one because if allowed to dry the cement forms a hard plug in the tip of the container and prevents discharge of further cement. Extensive use has been made in the past of a metallic screw-eye as a closure, the screw-eye threading into the opening usually by making a driving thread in a closed end of the tip and on each insertion drilling

2

through any plug of solidified nitrocellulose. This, however, has resulted in forming new threads on successive insertions, and damaging the aluminum, lead alloy or other metal of the neck of the collapsible tube, making it inconvenient to use the tube in the old way. Where the tip is not formed with the closed end, the screw-eye has a tendency to leak.

I have discovered that polyethylene is not wet by and does not bond to nitrocellulose cement, so that a plug closure of polyethylene is not cemented in place by solidification of nitrocellulose in the tip, but remains readily removable even after any thin film of nitrocellulose cement between the closure and the metal wall solidifies.

Thus it is no longer necessary to provide a container with a closed end on the tip and drill out the end by the screw-eye closure, nor is it necessary to exert considerable force to loosen the screw-eye and remove it when the cement solidifies. Since there is no wetting of the plug closure by the cement, and the polyethylene is resilient, the plug closure turns just as freely after the cement film between the metal of the neck and the plug closure has solidified, as before.

While the invention has its widest application on nitrocellulose cement, it is applicable to containers for similar materials.

In accordance with the invention, the nitrocellulose cement is merchandised in a suitable container, such as an aluminum, lead alloy or other suitable collapsible tube 20 having a side wall 21, a shoulder 22, and a tip 23 having a suitably elongated tip opening 24. The tip 23 is desirably tubular as shown, and ends in a suitably slightly rounded straight end 25 in the preferred embodiment.

The closure 26 of the invention is composed of polyethylene, a resilient elastomer, having a handle 27 desirably in the form of a disc having externally knurled edges 28 and a closure plug 30 which suitably extends transversely from the handle and desirably from the middle thereof.

The plug 30 is large enough to fill the tip opening 24 and suitably sufficiently larger so that the resilient elastomer will be squeezed and held in the opening. This is preferably accomplished by providing a pointed forward end 31 of the plug, and an intermediate elongated tapering or conical side wall 32 having a diameter less than that of the tip opening near the forward end and a diameter larger than that of the tip opening at the end near the handle so that in the closed position in Figure 3 the tapered portion jams in the tip opening without permitting the handle quite to engage the end 25 of the tip.

Figures 6 and 7 show the preferred embodiment. The tip 23' has from the outer end first a tapered bore 33 converging inwardly, then an annular shoulder 34 forming a reduced orifice 35 and then an enlarged bore 36. The closure 26' has a handle 27' knurled at 28 and a plug 30' in the bore of the tip. The plug has, starting at the handle, a forwardly converging tapered portion 37 sealing with the tapered bore 33, and then a reduced diameter at 38 with a forward end applicator 40 of uniform diameter having a pointed end at 31. The applicator preferably slightly clears at 41 from the orifice. The handle 27' is a disc extended at 42 toward the shoulder 22, hugging the outside of the tip at 43 where the handle is annularly recessed and overlaps the tip.

This serves to push any excess of nitrocellulose cement or the like away from the end of the tip before the cement hardens, keeping the tip clean. This forms a double seal, inside and outside the tip.

The plug 30' is very desirably of polyethylene, although

3

in some cases where contents other than nitrocellulose adhesive are to be used, any suitable elastomer such as rubber or synthetic rubber or polyvinyl chloride or polyvinyl chloride-acetate may be used for the plug.

In Figure 8 the closure 26² is similar to that of Figures 6 and 7 except that the knurling at the outside is eliminated, a flange 42' extends over the outside of the tip, and the applicator is blunt at 31' at the end.

In Figure 9 the flange extends outward at 42², to form a rim. Both these forms tend to push excess of cement away from the end of the tip.

It will be evident that the device of the invention is peculiarly adapted to provide a readily re-opened closure for nitrocellulose cement, since, unlike metal, glass, wood, and a wide variety of other materials, nitrocellulose does not bond to polyethylene.

In view of my invention and disclosure variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art, to obtain all or part of the benefits of my invention without copying the process and structure shown, and I, therefore, claim all such insofar as they fall within the reasonable spirit and scope of my claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a package, a metallic collapsible tube having a tip, nitrocellulose cement in the collapsible tube, and a unitary closure for the collapsible tube consisting of polyethylene and comprising a handle beyond the end of the tip, a solid plug element extending from the handle and having walls which engage the interior of the tip effecting a seal and an applicator portion on the end of the plug element remote from the handle, the polyethylene having the property of maintaining a non-adhering condition with respect to the nitrocellulose cement as it may solidify around the tip when the closure is removed.

2. In a package, a metallic vessel having a tip provided with an orifice, a content of nitrocellulose adhesive in the vessel, and a unitary closure for the orifice consisting of polyethylene and comprising a handle beyond and around the tip, the handle extending over the outside of the tip adjacent the tip, a solid plug element extending from the handle tapering toward the end remote from the handle, the tapered portion engaging the interior of the orifice and effecting a seal, and the portion of the plug beyond the sealing portion of the orifice being of reduced diameter and adapted on removal of the closure to withdraw adhesive and function as an applicator.

3. In a package, a metallic collapsible tube having an elongated tip and an elongated opening through said tip, nitrocellulose cement in said collapsible tube, and a unitary closure for the collapsible tube consisting of polyethylene and comprising a handle beyond the end of the tip, a solid elongated plug element extending from said handle and substantially filling said opening, said plug in the removed condition having a forward taper and being larger at the handle end than the outside end of the tip opening so that a substantial length of the plug is squeezed and held in the opening giving a thorough seal and said plug having at the forward end a portion smaller than the handle end of said tip opening for ready

4

insertion, the polyethylene having the property of maintaining a non-adhering resilient relation with respect to the tube whether adhesive has set regularly or irregularly or is still liquid on the inside and outside surfaces of the tip as the result of removing said plug, dispensing adhesive and thereafter inserting said plug.

4. In a package, a metallic collapsible tube having an elongated tip and an elongated opening through said tip, nitrocellulose cement in said collapsible tube, and a unitary closure for the collapsible tube consisting of polyethylene and comprising a handle beyond the end of the tip, a solid elongated plug element extending from said handle and substantially filling said opening and having a pointed end approximately at the inner end of said opening, said plug in the removed condition having a forward taper and being larger at the handle end than the outside end of the tip opening so that a substantial length of the plug is squeezed and held in the opening giving a thorough seal and said pointed end enabling ready insertion, the polyethylene having the property of maintaining a non-adhering resilient relation with respect to the tube whether adhesive has set regularly or irregularly or is still liquid on the inside and outside surfaces of the tip as the result of removing said plug, dispensing adhesive and thereafter inserting said plug.

5. In a package, a metallic collapsible tube having an elongated tip and an elongated opening through said tip, said tip having an inside shoulder locally constricting said opening substantially inside the external end of said opening, nitrocellulose cement in said collapsible tube, and a unitary closure for said collapsible tube consisting of polyethylene and comprising a handle beyond the end of said tip, a solid elongated plug element extending from said handle and substantially filling said opening, said plug being larger at the handle end than the external end of the tip opening so that a substantial length of the plug is squeezed and held in the opening in advance of said shoulder giving a thorough seal and said plug having an applicator at the forward end smaller than the external end of said tip opening for ready insertion and extending past said shoulder with clearance into the adhesive, the polyethylene having the property of maintaining a non-adhering resilient sealing relation with respect to the tube whether adhesive has set regularly or irregularly or is still liquid on the inside and outside surfaces of the tip as the result of removing said plug, dispensing adhesive and thereafter inserting said plug.

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