April 1, 1952 W. S. HARRIS 2,591,354

MEANS FOR HOLDING AND EXTRUDING PASTE AND LIQUID MATERIALS

Filed May 22, 1948

Fig.1.

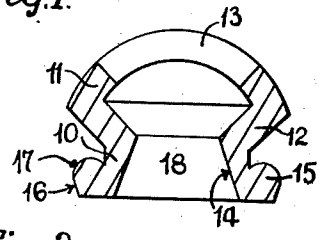


Fig.2.

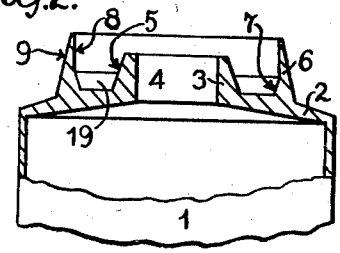


Fig.3.

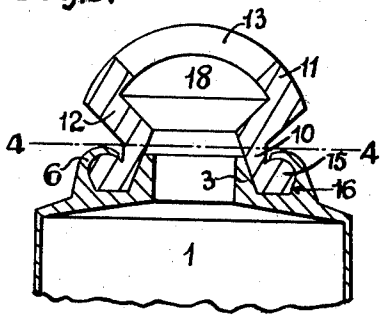


Fig.4.

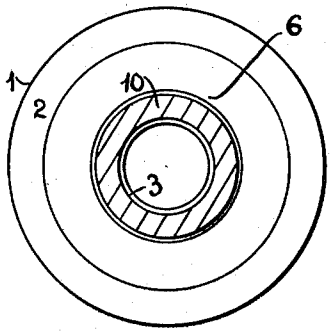


Fig.5.

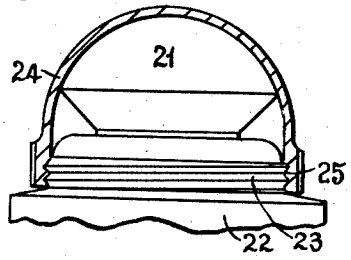


Fig.6.

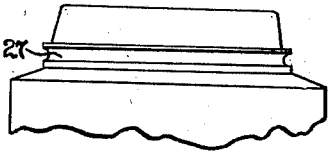


Fig.7.

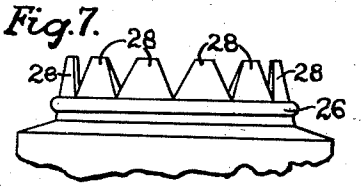


Fig.8.

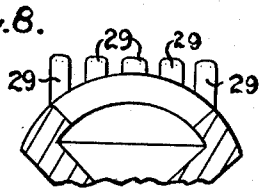
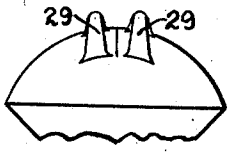


Fig.9.



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UNITED STATES PATENT OFFICE

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MEANS FOR HOLDING AND EXTRUDING PASTE AND LIQUID MATERIALS

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5 Claims. (Cl. 222—92)

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This invention retates to means for holding and extruding paste and liquid materials, and has for its main object to provide between a container for the material and a separate member having a self-closing extrusion aperture, a simple and uncostly connection which cannot easily be undone and discourages attempts to use the separate member on another container after disconnection from the first container. A further object is to provide a device for sealing the aperture until use of the means is commenced. A still further object is to provide a means of spreading the material as it is extruded.

According to my invention, means for holding and extruding paste and liquid materials and comprising a collapsible container in combination with a self closing extrusion aperture provided in a separate member, has the separate member permanently affixed to the exterior of the collapsible container by a device adapted to discourage or prevent ready detachment of the said member from the container.

One device consists in clenching means provided externally on the collapsible container to clench the said member to the collapsible container.

The clenching means preferably consists of or comprises an annular flange or claws provided on the exterior of the collapsible container round a neck provided on the container.

The said member preferably is of rubber or the like resilient material and has a neck which is supported internally by an externally conical neck containing the outlet from the container.

The neck of the member may have an annular bead which assists in obstructing removal of the said member from the container.

I attain this object by the means illustrated in the accompanying drawings and hereinafter claimed.

In the accompanying drawings—

Figure 1 is a side view in vertical section of a member having a self-closing extrusion slit.

Figure 2 is a fragmentary side view, partly in section of the front end of a collapsible container.

Figure 3 is a side view in vertical section of the said member assembled on and secured to the said container.

Figure 4 is a plan view in section taken on a line corresponding with line 4—4 of Figure 3.

Figure 5 is a fragmentary side view, partly in section and illustrates another construction.

Figures 6 and 7 are fragmentary side views of the front ends of two containers and illustrate different modifications of details.

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Figure 8 is a fragmentary side view in section of a part of a member having a self-closing extrusion slit and illustrates another construction.

Figure 9 is a fragmentary side elevation drawn at right angles to Figure 8.

Referring to the drawings, in the construction shown in Figures 1 to 4, I provide a collapsible tube 1, Figure 2, of metal having at its front end, an integral annular shoulder 2 on which there is an integral neck 3 having an outlet hole 4 through it. The neck 3 has an external surface 5 of marked conicity and having its largest external diameter where it joins the shoulder 2. Surrounding and concentric with the neck 3 there is an annular flange 6 formed integral with the shoulder and extending in axial direction, the flange 6 preferably being somewhat longer than the neck 3. The portion 7 of the inner surface of the flange 6 which is nearest the shoulder 2 is of marked conical form with the smallest diameter of the said portion nearest the shoulder 2. The remaining portion 8 of the said surface is cylindrical or slightly conical with the smallest diameter of the said remaining portion 8 nearest the portion 7. The external surface 9 of the flange 6 is also wholly or partly conical with the largest diameter nearest the shoulder 2.

I also provide a hollow nipple 18, Figures 1, 3 and 4 composed of rubber or the like resilient material and comprising a head and a neck 10. The head has a domed front part 11 springing from a conical part 12 which tapers inwards from the front part to join the neck 10. The neck 10 projects rearwardly from the conical part 12. The domed part 11 has an extrusion cut 13 or slit in it. The interior surface 14 of the neck 10 is conical to fit on the exterior surface 5 of the tube neck 3. The neck 10 has an annular external bead 15 or thickened portion at its rear end, the portion 16 of the peripheral surface of the bead being conical to suit the conicity of the lower portion 7 of the inner surface of the flange 6. Measured from the front to the rear, the dimension of the bead 15 or thickened portion is less than the length of the flange. The remaining portion 17 of the peripheral surface of the bead 15 or thickened portion is curved.

The nipple 18 and the tube 1 are assembled by pushing the nipple neck 10 into the annular space between the tube neck 3 and the flange 6, whereupon the relatively thin rim of the flange 6 is forced inwards or inwards and rearwards, for example by spinning, to clench the nipple neck 10 against the tube neck 3 and the bead 15 tightly in the lower portion of the space 19 existing between the neck 3 and the flange 6. Figures 3

and 4 show the parts assembled and the rim portion of the flange clenched over on to the bead 15. Preferably the lengths of the tube neck 3 and the nipple neck 10 are substantially no greater than is essential for the tube neck 3 to support the nipple neck 10 internally at the place where it is clenched. Preferably the length of the nipple neck 10 is substantially no greater than is necessary to allow the rim portion of the flange 6 to be bent inwards into its clenching position without damage to the nipple head.

The conical form of the surfaces 5, 7, 14 and 16 causes the rear portion of the nipple neck 10 to be wedged on the tube neck 3 and between the neck 3 and the rear portion 7 of the flange by the rearward pressure exerted by the rim of the flange 6 when the said rim is bent into the clenching state.

The resulting connection between the nipple 16 and the tube 1 is liquid and paste tight and is neat. It discourages the idea of detaching the nipple 16 for use on some other collapsible tube. The internal shape of the nipple neck 10 unfits it for use on a tube not furnished with clenching means, because pressure exerted on the nipple by the contents of the collapsible tube when the tube is squeezed would be assisted by the conicity of the surface 14 to force the nipple off the neck of the tube.

When the collapsible tube is squeezed the consequent pressure on the paste or liquid, for example tooth paste, boot polish, adhesive and so forth, contained therein, is transferred by the paste or liquid to the interior of the nipple head and acts outwardly thereon to force the sides of the cut 13 or slit apart and permit a ribbon of liquid or paste to be extruded through it. When squeezing ceases, the elasticity of the material of which the said head is composed is sufficient to squeeze from between the sides of the cut 13 or slit, any remnant of the paste or liquid left in the cut or slit and press the sides sufficiently close together to prevent leakage of paste or liquid through the cut or slit.

Instead of the flange having a continuous annular rim portion, the flange may have a rim portion in the form of claws 28, see Figure 7, to clench over on to the bead or thickened portion of the nipple neck.

In the construction shown in Figure 5, the exterior of the rear portion of the annular flange employed to secure the nipple 21 to the collapsible tube 22 is cylindrical and provided with a screw-thread 23 for connection of a removable sealing cover or cap 24 having a female screw-thread 25 and employed to prevent loss of paste or liquid due to accidental undue pressure before the tube 22 comes into use for extrusion. Alternatively the exterior of the flange may be provided with a rib 26, Figure 7, or ribs or a groove 27, Figure 6, or grooves which assist in securing a nipple cap or covering not shown shrunk or stuck on the flange or a coat or skin or the like produced by dipping the nipple and flange, and serving the purpose of preventing unwanted escape of paste or liquid due to accidental undue pressure until torn off by the user.

The nipple may be provided with integral fingers, such as fingers 29, Figures 8 and 9, at one or both sides of the extrusion aperture to serve to spread the paste or liquid after extrusion in a manner similar to brush bristles.

I claim:

1. Means for holding and extruding paste and liquid materials, comprising in combination, a collapsible container, a short externally tapered neck on the container containing an outlet orifice, a flange on the container having an internal annular surface opposed to the neck and tapering in opposite direction therefrom, a separate member of resilient material having an extrusion slit, a neck on the said member, an internal conical surface in the neck of the separate member supported internally by the tapered neck, an external bead on the neck of the separate member, and an external conical surface on the bead complementary to and supported by the tapering internal annular surface of the flange, the flange being bent over the bead and pressing it into tight contact with the tapered neck and the tapering internal annular surface of the flange.

2. Means for holding and extruding paste and liquid materials, comprising in combination, a collapsible container, a short externally tapered neck on the container containing an outlet orifice, a flange on the container having an internal annular surface opposed to the neck and tapering in opposite direction therefrom, a separate member of resilient material having an extrusion slit, a neck on the said member, an internal conical surface in the neck of the separate member supported internally by the tapered neck, an external bead on the neck of the separate member, and an external conical surface on the bead complementary to and supported by the tapering internal annular surface of the flange, and means on the flange which project inwards above the tapering internal annular surface of the flange and non-releasably connect the separate member to the collapsible container and furthermore press the bead into tight contact with both the tapered neck and the tapering internal annular surface of the flange.

3. Means for holding and extruding paste and liquid materials, comprising in combination, a collapsible container, a short neck on the container containing an outlet orifice, an annular surface which is provided on the exterior of the said neck and extends from the base of said neck to its outer end and is tapered with its broadest portion at said base, a flange on the container having an internal annular surface opposed to the neck, an annular tapering surface provided on the rear portion of the interior of the flange and tapering in reverse direction from that of the taper on the said neck, a separate member of resilient material consisting of a hollow domed upper portion having an extrusion slit, a conical intermediate portion with its broadest part coextensive with and joined to the base of said domed portion, and a lower portion with its narrowest portion joined to and coextensive with the narrowest end of said intermediate portion, an internal conical surface in the lower portion and supported by the tapered neck of the collapsible container, an external bead on said lower portion of the separate member for producing an annular lateral thickening at the base of said lower portion, an external conical surface on the bead complementary to and supported by the tapering internal annular surface of the flange and extending from the base of the bead upwards with a reverse conicity from that of said internal surface of said lower portion and means on the flange which project inwards and are in front of the annular tapering surface on the base of the interior of the flange and non-releasably connect the separate member to the collapsible container and furthermore press the bead into tight

contact with the tapering surface of the container neck from the base to the outer end of the said neck and also with the annular tapering surface on the base of the interior of the flange.

4. Means for holding and extruding paste and liquid materials, comprising in combination, a collapsible container, a short neck on the container containing an outlet orifice, an annular surface which is provided on the exterior of the said neck and extends from the base of the said neck to its outer end and is tapered with its broadest portion at said base, a flange on the container having an internal annular surface opposed to the neck, an annular tapering surface provided on the rear portion of the interior of the flange and tapering in reverse direction from that of the taper on the said neck, a separate member of resilient material consisting of a hollow domed upper portion having an extrusion slit, a conical intermediate portion with its broadest part coextensive with and joined to the base of the domed portion, and a lower portion with its narrowest portion joined to and coextensive with the narrowest end of said intermediate portion, an internal conical surface in the lower portion and supported by the tapered neck of the collapsible container, an external bead on the lower portion of the separate member for producing an annular lateral thickening at the base of said lower portion, an external conical surface on the bead complementary to and supported by the tapering internal annular surface of the flange and extending from the base of the bead upwards with a reverse conicity from that of said internal surface of said lower portion, and an inwardly extending rim on the flange above the annular tapering surface for pressing said lower portion and its bead inwards against the neck of the container and downwards between the oppositely tapering surfaces of the neck of the container and flange and thereby wedging the same between the said surfaces.

5. Means for holding and extruding paste and liquid materials, comprising in combination, a collapsible container, a short neck on the container containing an outlet orifice, an annular surface which is provided on the exterior of the said neck and extends from the base of said neck to its outer end and is tapered with its broadest

portion at said base, a flange on the container having an internal annular surface opposed to the neck, an annular tapering surface provided on the rear portion of the interior of the flange and tapering in reverse direction from that of the taper on the said neck, a separate member of resilient material consisting of a hollow domed upper portion having an extrusion slit, a conical intermediate portion with its broadest part coextensive with and joined to the base of the domed portion, and a lower portion with its narrowest portion joined to and coextensive with the narrowest end of said intermediate portion, an internal conical surface in said lower portion and supported by the tapered neck of the collapsible container, an external bead on said lower portion for producing an annular lateral thickening at the base of said lower portion, an external conical surface on the bead complementary to and supported by the tapering internal annular surface of the flange and extending from the base of the bead upwards with a reverse conicity from that of the internal surface of said lower portion, and inwardly extending claws on the flange above the annular tapering surface for pressing said lower portion and its bead inwards against the neck of the container and downwards between the oppositely tapering surfaces of the neck of the container and the flange and thereby wedging the same between the said surfaces.

WALTER SIM HARRIS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,524,594	Stout	Jan. 27, 1925
1,531,245	Ozanne	Mar. 24, 1925
1,592,584	Viegelmann	July 13, 1926
1,622,526	Lewis	Mar. 29, 1927
1,739,871	Smith	Dec. 17, 1929
1,826,096	Smith	Oct. 6, 1931
1,862,662	Costello	June 14, 1932
2,084,529	Landau	June 22, 1937
2,197,052	Lowen	Apr. 16, 1940