

W. C. HUNTOON.
ART OF EXTRUDING COLLAPSIBLE TUBES.
APPLICATION FILED MAY 8, 1920.

1,376,376.

Patented Apr. 26, 1921.
2 SHEETS—SHEET 1.

Fig. 1

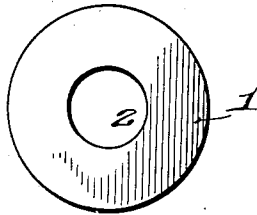


Fig. 2



Fig. 4

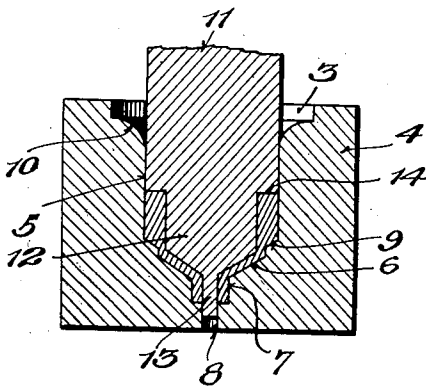


Fig. 3

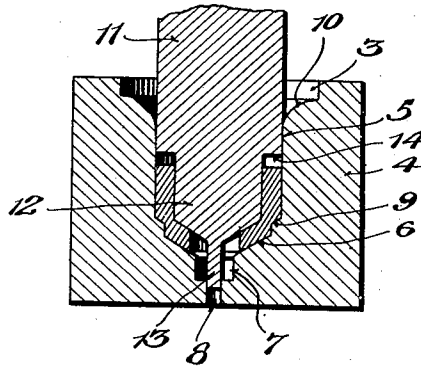
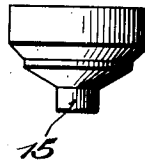


Fig. 5



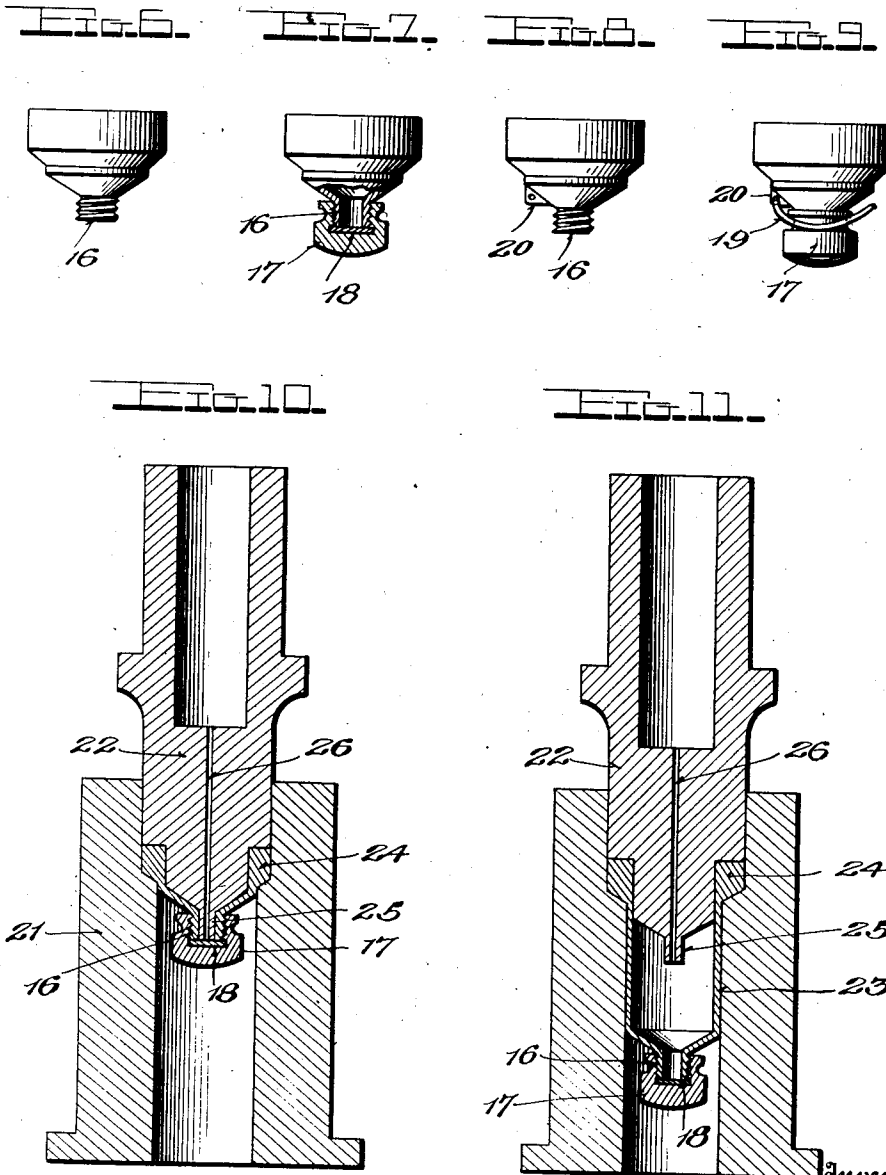
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UNITED STATES PATENT OFFICE.

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ART OF EXTRUDING COLLAPSIBLE TUBES.

1,376,376.

Specification of Letters Patent. Patented Apr. 26, 1921.

Application filed May 8, 1920. Serial No. 379,758.

To all whom it may concern:

Be it known that I, WILLIAM C. HUNTOON, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in the Art of Extruding Collapsible Tubes, of which the following is a specification.

This invention relates to certain new and useful improvements in the art of extruding collapsible tubes, and more especially to my copending application filed July 24, 1919, under Serial No. 313,024.

The primary object of the invention resides in screw threading of the nozzle and applying the cap prior to the step of extruding the thin collapsible body portion of the tube.

The invention further resides in the step of admitting air to the interior of the tube through the expressing die and also in the steps and the arrangement of steps herein-after described and claimed, reference being had to the accompanying drawings wherein:—

Figure 1 is a plan view and Fig. 2 is an edge elevation of the initial blank or disk from which the tube is extruded;

Fig. 3 is a vertical sectional view showing the initial step in the act of forming the top;

Fig. 4 is a similar view showing the completion of the formed top;

Fig. 5 is a detailed elevation of the formed top;

Fig. 6 is a similar view with the nozzle of the top screw threaded;

Fig. 7 is a vertical section through the nozzle and cap applied thereto;

Figs. 8 and 9 are elevations of modified forms of tops;

Fig. 10 is a vertical sectional view of a step; and

Fig. 11 is a similar view of the blank during the process of extrusion.

As stated in my aforesaid application, the original blank 1 consists of a ring-like or disk-shaped piece of material having a central aperture 2, resembling a washer body. This blank is disposed in the recess or seat 3 of the female part 4 of the forming and shaping die, and from the bottom of this recess 3 leads an axial cylindrical bore 5 having an inverted conical bottom 6 which leads to a central, depending bore 7 axially related to

the main bore 5 and having a reduced bore 8 extending axially from the bottom bore 7. The conical bottom 6 is formed with an annular shoulder 9 designed to gage or define that portion of the formed blank which will constitute the top of the finished tube.

The upper end of the cylindrical main bore 5 merges into the flat bottom of the recess 3 by means of the rounded guiding face 10 whereby when the plunger part 11 of the forming die is forced down into the main bore the originally flat blank will be drawn down therein forming a cup-shaped body. The male or plunger part consists of a body portion fitting the main bore and provided with a reduced portion 12 having a conical lower end and a small axial extension 13 fitting and closing the bore 8 to the extrusion of metal therethrough. The diameter of the die portion 12 is less than the annular shoulder 9 by the thickness of the opposite walls of the extruded tube.

After the disk blank has been drawn into the cup shape of Fig. 3, it will be noted that the square shoulder 14, formed by reducing the die to form the portion 12, is spaced above the upper edge of the now cup-shaped blank and the center aperture 2 is substantially of the same diameter as in the original blank although the center portion of the blank is given a conical form.

At this point of the process the plunger is subjected to additional pressure to extrude the complete top of the tube with the discharge nozzle 15. The additional pressure on the plunger forces the metal from the conical portion of the partly formed cup-shaped blank in Fig. 3 down into the bore 7 and about the stem 13 which latter maintains an open passage through the top. The process of extrusion is limited by the shoulder 14 coming into contact with the cylindrical bulk or side of the formed blank from which the side of the collapsible tube is to be extruded.

At this stage of the method the nozzle 15 is screw threaded, as indicated at 16, and then the cap 17, with its cork insert 18, is attached thereto prior to the extrusion of the flexible tube body. This not only secures the cap to the nozzle 15 of the cup but it also preserves the threads of the nozzle and aids in maintaining the top in true form. Where the type of tube embodies a cap-retaining bail 19, the raised part or ear

20 is formed with the apertures in which the ends of the bail enter, in addition to having the nozzle screw threaded.

5 All such manipulations of the cup are the more easily performed as the cup is in practically a rigid condition and there is no danger of injuring the same whereas it is a very delicate operation to form the screw-thread on the nozzle after the tube has been
10 extruded.

The cupped top with the attached cap is then placed in the body-extruding die 21 and the expressing die 22 is lowered onto the modified blank as indicated in Fig. 10. 15 Operative pressure is then applied to the expressing die which forces or extrudes the body 23 from the surplus stock 24. In this connection it will be noted that the expressing die is formed on its lower end with an
20 axial projection 25 which enters the nozzle and thereby serves to correct or true the work. This projection and die are formed with a longitudinal air relief passage 26 through which air is admitted to the interior of the tube during the extrusion
25 thereof.

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

30 1. The art of extruding collapsible tubes from flat stock, consisting in first forming the top, screw threading the nozzle of the top, attaching the cap to the nozzle, and finally extruding the collapsible body of the
35 tube.

2. The art of extruding collapsible tubes

from flat stock, consisting in first forming the top, attaching a cap to the nozzle thereof, and then extruding the collapsible body of the tube.

3. The art of drawing formed blanks for 40 collapsible tubes, consisting in forcing the central portion of a ring-like flat blank into the shape of the finished top of the tube and leaving the remainder of the body material 45 in its original thickness for subsequently being drawn out to form the sides of the tube, screw threading the nozzle of the top, attaching a cap to the nozzle, and finally extruding the collapsible body of the tube 50 from said remainder of the material.

4. The art of drawing formed blanks for 55 collapsible tubes, consisting in forcing the central portion of a ring-like flat blank into the shape of the finished top of the tube and leaving the remainder of the body material in its original thickness for subsequently being drawn out to form the sides 60 of the tube, screw threading the nozzle of the top, attaching a cap to the nozzle, extruding the tube body from the remainder of the material by die-expressing it, and admitting air to the interior of the tube through the die during the act of extrusion.

In testimony whereof I have signed my 65 name to this specification in the presence of two subscribing witnesses.

WILLIAM C. HUNTOON.

Witnesses:

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