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N. M. HOPKINS

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APPARATUS FOR FILLING MULTICOMPARTMENT CONTAINERS

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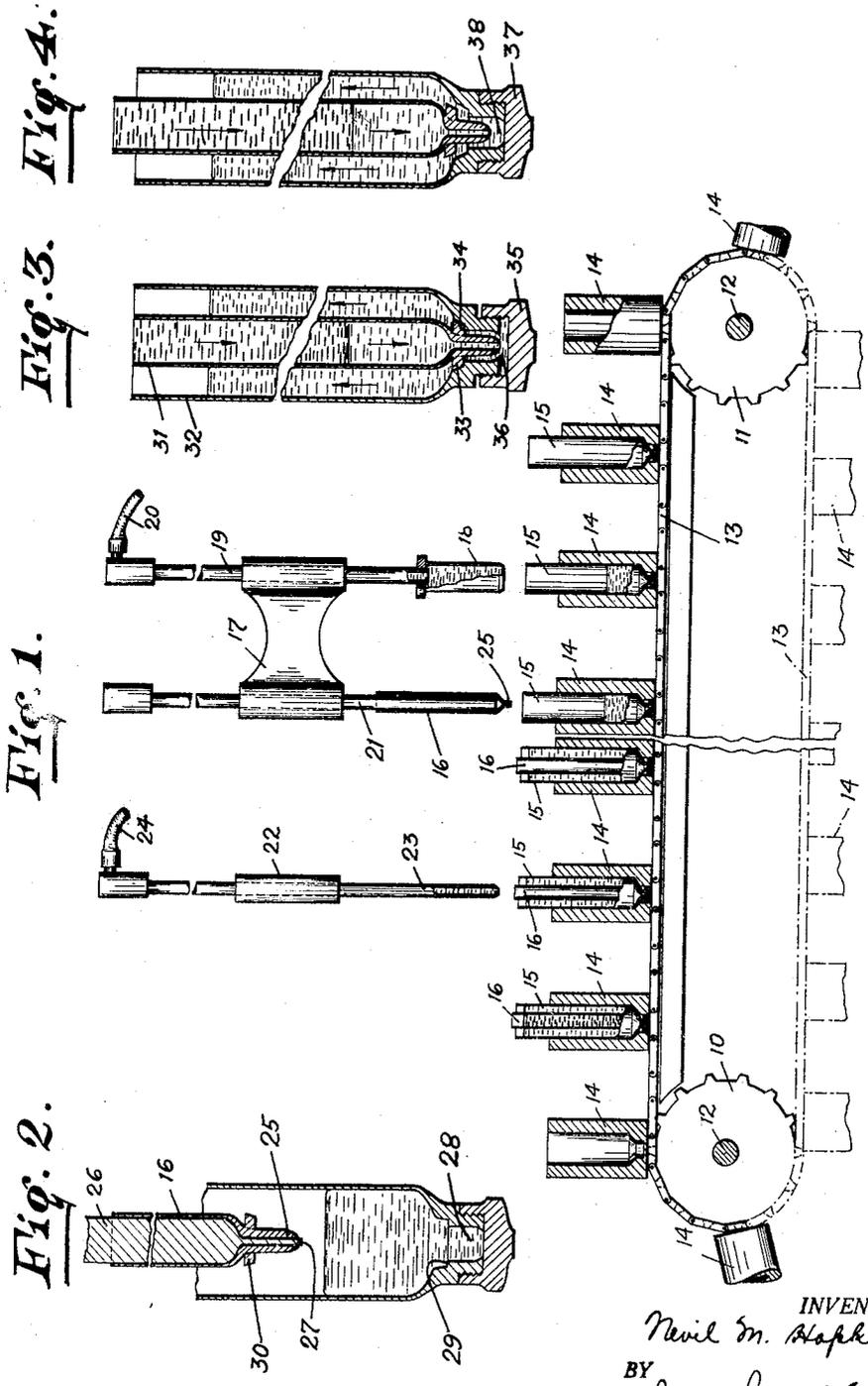


Fig. 4.

Fig. 3.

Fig. 1.

Fig. 2.

INVENTOR.
Neil M. Hopkins
BY
Russell Dunn & Anderson
ATTORNEYS.

UNITED STATES PATENT OFFICE

NEVIL MONROE HOPKINS, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO
GILMONT PRODUCTS CORPORATION

APPARATUS FOR FILLING MULTICOMPARTMENT CONTAINERS

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September 22, 1928. Serial No. 307,763.

This invention relates to improvements in methods of and apparatus for assembling and filling multi-compartment containers and with reference to its more particular features, it relates to improvements in methods and apparatus for assembling and filling multi-compartment collapsible tubes where-
in a plurality of concentrically arranged collapsible tubes are provided.

It is a general object of the invention to provide an improved apparatus which is capable of assisting in carrying out an improved procedure for the more efficient filling of multi-compartment containers with a plurality of different substances which are preferably maintained in isolated condition in the container.

A further and more particular object of the invention is the provision of an improved apparatus for assembling and filling multi-compartment containers and which includes an improved arrangement for supporting one of the containers and preventing its collapse, while it is inserted into another container which may be partially filled with a substance.

A further object is to provide an improved method of assembling and filling multi-compartment containers with paste or similar material, which method can be simply carried out by means of simple apparatus.

A further object of the invention is the provision of an improved method of filling multi-compartment collapsible containers which includes filling one of the containers by inserting the material thereinto through another container.

Other objects of the invention will be in part pointed out in the following detailed description of certain illustrative but preferred embodiment of the invention and will be in part obvious in connection with said description.

The invention accordingly comprises the several steps and the relation and order of one or more of such steps with respect to each of the others, and the apparatus embodying features of construction, combinations of elements and arrangement of parts which are adapted to effect such steps, all as

exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the claims.

For a complete understanding of the nature and objects of the invention reference is had to the following detailed disclosure and to the accompanying drawings, in which:

Figure 1 is a partially diagrammatic view of an apparatus embodying the invention, the parts being in section for clearness of disclosure;

Fig. 2 is a central sectional view of a modified form of one of the mandrels for supporting the inner collapsible tube;

Fig. 3 illustrates a modified procedure for filling a multi-compartment collapsible tube; and

Fig. 4 illustrates a still further modified form of procedure for filling a multi-compartment collapsible tube.

Since the subject matter of this application is disclosed in applicant's prior filed pending application for method of filling bi-compartment collapsible tubes, Serial Number 620,284 filed February 20, 1923, the present application is a division of the prior filed application.

Referring more particularly to the drawings for a detailed disclosure of the embodiment of the invention shown in Figure 1, the sprocket wheels 10 and 11 are shown carried by rotary shafts 12 and provided a mounting for a sprocket chain 13 which may be driven through power applied in any desired manner to the sprocket wheels. Holders 14, which may be of any desired form to provide supports for the containers are mounted upon and carried by the sprocket chain 13. There may be as many of these holders 14 as desired, depending upon the size and capacity of the apparatus.

The apparatus disclosed is designed for the assembling and filling of bi-compartment collapsible tubes, which may include the outer collapsible tube part 15 and the inner collapsible tube part 16. The holders 14 are adapted for the support of the outer tube part 15, while the inner tube part 16 is inserted directly through the bottom of the

outer tube part by operation of the apparatus as more fully described below.

The apparatus may be provided with a filling head 17 and this head is provided with a filling nozzle 18 communicating with a filling tube 19 to which the material may be fed as, for example, through a flexible pipe 20 leading from a reservoir or other source of supply. The filling nozzle 18 is adapted to enter and partially fill each of the outer collapsible tubes 15 as they are carried by the conveyor underneath said nozzle in a manner which will be understood in the art. The amount of paste or other material delivered to each tube 15 will ordinarily be governed by mechanism carried by the apparatus.

As shown, the filling head 17 may also carry a mandrel or plunger 21 spaced a fixed distance from the filling nozzle 18 corresponding to the spacing of the holders 14. This mandrel 21 provides a support for the smaller inner tubes 16, and is proportioned to enter through the bottom of said inner tube and to provide a support for said tube to resist collapse or deformation of the latter as it descends into the material which has already been placed in the outer tube 15. In this construction the mandrel 21, as it descends, centers and accurately locates the inner tubes 16 inside the outer tubes 15, whereupon the conveyor carries the bi-compartment collapsible tube thus assembled forwardly underneath and in alignment with a second filling head 22 which may be mounted on the apparatus either upon the filling head 17, or separately therefrom as shown. The filling head 22 is provided with a filling tube or nozzle 23 which is positioned and proportioned to readily enter the inner tubes and which communicates with a flexible supply tube 24 which may lead to a reservoir or other source of supply, different from that to which the flexible tube 20 leads. It will be understood that the filling mechanism for the inner tubes may be regulated so as to insert a predetermined amount of material into the inner tube so as to fill it to a predetermined height. Ordinarily, when the two materials are thus inserted respectively into the outer and inner tubes and the tubes are assembled as described, both tubes will be filled nearly full, but sufficient tube material will be left extending above the tube contents so that the tube walls can be readily rolled up by the usual mechanism and the assembled double tube thus closed.

It will be clear from the above disclosure that, in the operation of the present apparatus, the nozzle 18 will be caused to enter the successive outer tubes 15 supported by the holders 14 as the latter are moved forwardly by the conveyor. The nozzle is then operated to deposit in each outer tube a predetermined amount of paste or other material, the respective tubes ordinarily being thus about 40% filled.

The inner tubes 16 formed substantially as shown in Fig. 1 may be slipped on the mandrel or plunger 21 by hand or by suitable apparatus (not shown), the neck 25 of the tube being disposed downwardly, as shown. It will be understood that the mandrel may be shaped and proportioned to fit rather snugly within the inner tube so as to support the latter and prevent its collapse or deformation when it is being inserted into the paste or other material already inserted into the outer tube.

In the construction disclosed, the mandrel 23 as it descends with the inner tube carried thereby centers and accurately positions the respective tubes inside the outer tubes 15. For aiding in centering the two tubes and maintaining them in position, the inner and outer tubes may be formed with complementary formations as more fully described below and shown in Fig. 2. When the outer and inner tubes have been assembled as described, the conveyor carries the bi-compartment assembled tube underneath the filling head 22 and its filling nozzle 23, which latter then readily enters the inner tube 16. Paste or other material, which is ordinarily different from that inserted in the outer tube, will thus be inserted through the nozzle 23 into the inner tube to fill the same to the desired predetermined amount. The adjacent ends of the tube constituting the bottom of the bi-compartment collapsible tube will then be rolled together or otherwise sealed in any preferred manner.

According to the modified form of the invention shown in Fig. 2, the mandrel 26 corresponding to the mandrel 21, above described, is provided at its leading end with a depending pin or projection 27 relatively positioned so as to enter the neck or nozzle 25 of the inner tube 16. In this manner, the said neck is maintained in accurately centered position and the extension 27 prevents the paste in the outer tube from being forced backwardly into the opening of the neck as the mandrel and inner tube descend into the paste contained in the outer tube. The neck 25 preferably descends into the internal cavity 28 formed in the neck of the outer tube. The neck of the outer tube may also be formed adjacent said cavity 28 with an annular shoulder or seat 29 onto which fits the supports 30 carried adjacent the neck of the inner tube. These supports may be in the form of radial spaced arms or projections.

According to the disclosure of Fig. 3, a bi-compartment collapsible tube of the nature hereinbefore described may be filled by means of a modified procedure. As shown, this tube may comprise an inner tube 31, and an outer tube 32 may be concentrically assembled with the centering arms 33 engaging the shoulders 34 in a manner similar to

that described in connection with Fig. 2. In carrying out the procedure of filling this tube, the cap 35 of the outer tube may be partially unscrewed as shown so as to provide a passage 36 around the end of the nozzle of the inner tube. Paste or material of a given nature is then filled down through the inner tube 31 by any suitable means as, for example, by means of the filling nozzle 23.

After a predetermined amount of material has thus passed down into the inner tube and out through its nozzle and through the passageway 36 into the inside of the outer tube, then a material which may be of a different nature is inserted into the inner tube either through the same filling nozzle 23 or through a different nozzle as may be desired. Part or all of the first material may be displaced from the inner tube into the outer by insertion into the inner tube of the second material. It will be understood that the first kind of material will preferably be entirely forced and displaced from the inner tube as described whereby, when the filling of the tube is completed, the outer compartment will contain only the first material and the inner compartment will contain only the second material. Thereafter when the bi-compartment tube is collapsed the two different materials will be extruded together through the neck or nozzle.

In the further modified form of the invention shown in Fig. 4, which is generally similar to that described in connection with that of Fig. 3, but in this case the cap 37 is left screwed up into place on the outer tube, while the inner tube is lifted somewhat from its final position in the outer tube. This displacement of the inner tube may be either accomplished by hand or by a suitable means not shown, so as to provide a passage 38 between the end of the inner tube neck and the cap 37. While this passage exists the material is fed down through the inner tube, through the neck thereof, and through said passage 38 into the inside of the outer tube. In this manner a predetermined amount of material of a given nature may be inserted into the outer tube, whereupon a second material of a different nature may be inserted into the inner tube.

It will be understood that as described in connection with Fig. 3, the first material may be entirely forced from the inner tube, and it may be displaced therefrom by insertion of the second material so that the inner tube contains only the second material when the filling operation is completed. The material may in this case as in that previously described be inserted into the inner tube in any desired manner.

Since certain changes in carrying out the above process and in the constructions set forth, which embody the invention may be made without departing from its scope, it is

intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

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

1. The process of filling material into a multi-compartment collapsible tube including an inner collapsible container and an outer collapsible container which includes temporarily providing said inner container with a rigid core member while separated from said outer container; partially filling to a predetermined degree said outer container; inserting into the contents of said partially filled outer container said inner container supported by its temporary rigid core; withdrawing said core from said inner container; and filling said inner container.

2. The process of filling material into a multi-compartment collapsible tube including an inner container and an outer container which includes temporarily providing said inner container with a rigid core having a centering member while separated from said outer container; partially filling to a predetermined degree said outer container; inserting into and centering in said partially filled outer container and in the contents thereof said inner container and its temporary rigid core; withdrawing said core from said inner container; and filling said inner container.

3. In an apparatus for filling bi-compartment collapsible tubes comprising inner and outer containers the combination of a holding means for the outer containers; a mandrel core adapted to receive said inner containers and to insert them into said outer containers; a filling means for the outer containers; a filling means for the inner containers; and means for moving said inner and outer containers into registry with their respective filling means.

4. In an apparatus for filling bi-compartment collapsible tubes including inner and outer containers the combination of a holding means for the outer containers; a mandrel core provided with a depending projection adapted to receive said inner containers and to insert them into said outer containers; a filling means for the outer containers; a filling means for the inner containers; and means for moving said inner and outer containers into registry with their respective filling means.

In testimony whereof I affix my signature.

NEVIL MONROE HOPKINS.

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