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P. H. CLARK

2,603,928

PACKAGING DEVICE

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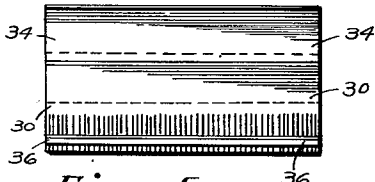


Fig. 5

Fig. 2

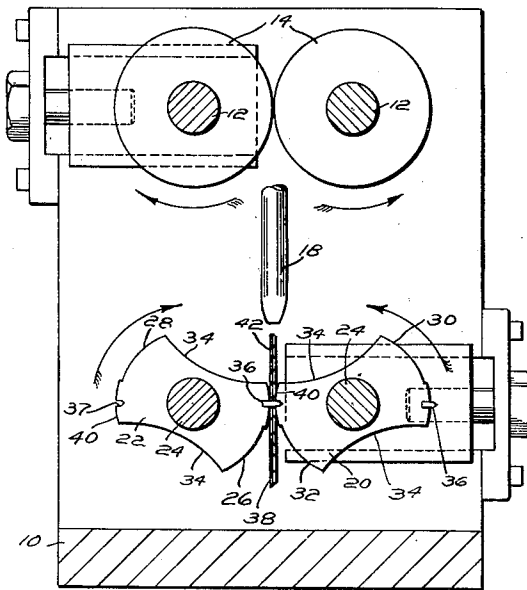
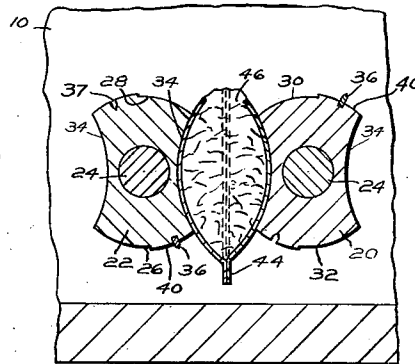


Fig. 1

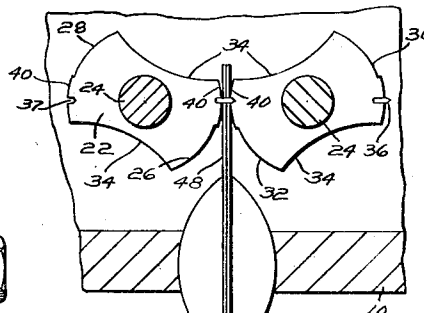


Fig. 4

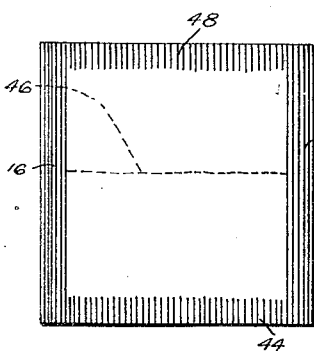
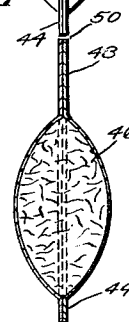
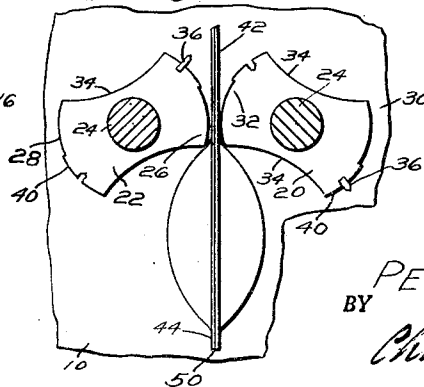


Fig. 6

Fig. 3



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PACKAGING DEVICE

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6 Claims. (Cl. 53—86)

1

This invention relates primarily to the packaging of materials in dry comminuted form in containers similar to the packaging of tea in bags, but the present case is not limited to such bags, but encompasses packaging of all types of similar matter, pastes, liquids, etc.

The principal object of the present invention resides in the provision of filling means in tube form for inserting measured quantities of the material desired in a traveling tube of any material which is heat sealable under pressure, cross sealing the tube at spaced intervals for forming the bottoms of the bags or containers, said cross sealing means comprising dies which are cut out at certain points so as to encompass and in some degree form or shape the package, said means having surfaces thereon for lightly pressing the package in all areas where the contents are not located so as to express all the excess air from the package; after which the same is again cross-sealed to form the top or final closure of the package completing the same so that the package is hermetically sealed to prevent the entrance of any air or moisture and the escape of liquids therefrom.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a view in side elevation of an apparatus for carrying out the present invention, parts being in section;

Fig. 2 is a view illustrating the pertinent mechanism of Fig. 1 in another position;

Fig. 3 is a view similar to Fig. 2 showing the forming dies in still another position;

Fig. 4 is a view similar to Fig. 3 showing the dies even more advanced;

Fig. 5 is a front view in elevation of one of the dies; and

Fig. 6 illustrates a filled package or bag manufactured according to the invention.

In the packaging of dry materials in small containers, it has been customary, due to mechanical limitations, to place a comparatively small amount of material in a foil or paper container, usually rectangular or square in shape, and sealed about its four edges; and then press the package to expell air in it, the sealing having been completed. This practice, of course, forces air out and ruptures the packages, allowing air and moisture to enter the packages so as to spoil or at least cause deterioration of the contents. This invention does away with this disadvantage of the prior art.

2

This case is a continuation in part of my pending application, Serial No. 60,218, filed November 16, 1948.

In the present case as seen in Fig. 1 there is shown a framework 10 in which is mounted a pair of parallel, horizontal shafts 12 mounting longitudinal edge sealing and feeding rollers 14 which may seal together the corresponding edges of a pair of strips of heat sealable film, or laminated and/or coated paper or foil as indicated at 16 in Fig. 6, forming a tube progressing downwardly and in which a filling tube or spout 18 is placed for disposing material in the tube at the bottom thereof.

The bottom of the tube is formed by cross sealing by means of a pair of roller dies 20 and 22 mounted on shafts 24 and rotating in the directions of the arrows to cross seal as described and also to separate the filled and completed packages.

Each of these roller dies is provided with diametrically opposed cylindrical surfaces 26 and 28, 30 and 32; and intermediate of these surfaces respectively there are provided concaved, hollowed-out portions 34. The roller dies are also provided with cutting knives or similar means 36 for separating the bags or packages one from the next. At each side of knives 36 and the corresponding shearing notches 37, the roller dies are raised as at 40 to cross seal the tube. The portions 40 are also cylindrical in form.

As shown in Fig. 1, a knife 36 has just severed a preceding package which is indicated at 38 and, of course, the same will drop down out of the machine. It will be seen that the knives 36 are located in the cylindrical surfaces 40 adjacent corresponding ends thereof to press the oncoming tube 42 and cross sealing the same forming the closed bottom 44. When the bottom 44 has been formed, mechanism not shown causes a measured amount of material to be deposited in the tube 42. This material naturally accumulates on the bottom 44 and tends to bulge out the side walls of the tube.

This invention contemplates that the concavities 34 will form the package and compact the material 46 just above the closed bottom 44, see particularly Fig. 2, the surfaces 34 forming and making each package exactly uniform in size and shape.

As the roller dies rotate, the surfaces 28 and 30 press the two side walls of the tube against each other. At this area, however, the package is empty and thus the surfaces 26 and 32 or 28 and 30 serve to compact and flatten the part of

3

the package indicated at 48 thus expressing the excess air therefrom. Thereafter, of course, the knives cut off the package as at 50, see Fig. 3 and the portions 40 cross seal the succeeding bottom 44. Then the operation repeats itself.

It will be seen that this invention provides a machine for producing packages which may be completely hermetically sealed and free of air; each package will be exactly uniform in size and shape, rendering it easier to place the same in cartons, and the contents will be kept free of moisture and avoid deterioration. Any heat sealable package material may be used, such as cellophane, synthetic plastic and/or rubber films, foils, etc., and they may be inherently heat sealable and impervious, or they may be coated and/or laminated to these ends.

It will also be seen that this invention provides the clear function of expressing air in the case of impervious material; but also at the same time the device is applicable to pervious material; and has the advantageous function of positioning or conforming the sides of the container among other things including making flat surfaces eliminating the bulge or oval shape of the container usually caused by the feeding device for the container material and also by the product contents. The invention also allows the horizontal sealers or crimpers to intermittently laminate both sides of the material enclosing the container and form the same without pleats or tucks. It has been found that it is very necessary to eliminate pleats or tucks at the heat sealed areas of the container or bag of impervious material as well as pervious material, as it has been shown that pleats and tucks cause a weakness or even an opening in the sealing area which defeats the purpose of the container and also cause distortion as to the shape of the bag of the container whether it is made of pervious or impervious material.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. Packaging machine comprising means to form and advance a tube, cross-sealing means to seal the tube forming a container, means to deposit material in the container, means shaping the container at the filled area thereof, means pressing the container for a distance therebeyond in the unfilled area thereof to express excess air, and means to cross seal the container forming a top closure spaced from the deposited contained material.

2. The packaging machine of claim 1 wherein the two cross-sealing means, the shaping means, and the pressing means are all arranged in sequence on a pair of cooperating roller dies, the latter being arranged to bring the cross-sealing, shaping, and pressing means of each roller die into cooperative relation with the respective portions of the other roller die.

3. The packaging machine of claim 1 wherein the two cross-sealing means, the shaping means, and the pressing means are all arranged in se-

4

quence on a pair of cooperating roller dies, the latter being arranged to bring the cross-sealing, shaping, and pressing means of each roller die into cooperative relation with the respective portions of the other roller die, said shaping means comprising corresponding concavities and the pressing and sealing means comprising cylindrical surfaces of the roller dies, the sealing cylindrical surfaces being radially outwardly a greater distance from the central axes of the roller dies than the pressing cylindrical surfaces thereof.

4. The packaging machine of claim 1 wherein the two cross-sealing means, the shaping means, and the pressing means are all arranged in sequence on a pair of cooperating roller dies, the latter being arranged to bring the cross-sealing, shaping, and pressing means of each roller die into cooperative relation with the respective portions of the other roller die, said shaping means comprising concavities and the pressing and sealing means comprising cylindrical surfaces of the roller dies, said cylindrical surfaces being located at different radial distances to provide greater pressure at the sealing means than at the pressing means.

5. In a machine for forming filled packages, means to form and travel a tube between a pair of roller dies, means on the latter at certain areas thereof to cross seal the tube, said roller dies having areas formed to shape and compact the contents of the package adjacent said cross seal and said roller dies having other areas effective to compress the tube in the region of the package which is empty so as to express the excess air therefrom, means to cross seal the end of the package completing the same, the last named means comprising a radially stepped area on each roller die, and means to rotate the roller dies in unison with the sealing, pressing, and shaping areas of each in cooperative relation.

6. A method of filling packages comprising the steps of forming and advancing a tube, cross sealing said tube, depositing a quantity of material in the tube at the cross seal, shaping and compacting the tube and the material adjacent the cross seal, expelling the excess air in said tube beyond the area of material therein by pressing the tube sides inwardly where empty, and cross sealing beyond the pressed area to finish the package, said cross sealing being accomplished under greater pressure than the air expression step.

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