

July 4, 1944.

A. G. LIEBMANN

2,352,645

CONTAINER MAKING AND FILLING MACHINE

Filed Jan. 16, 1943

7 Sheets-Sheet 1

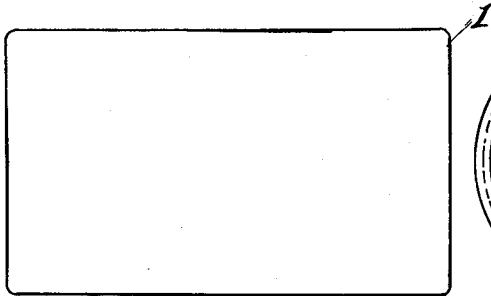


Fig. 1

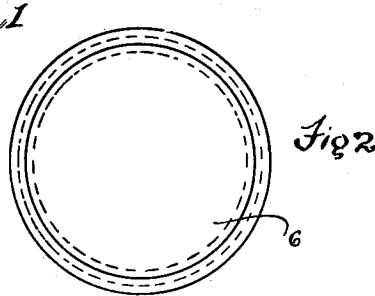


Fig. 2

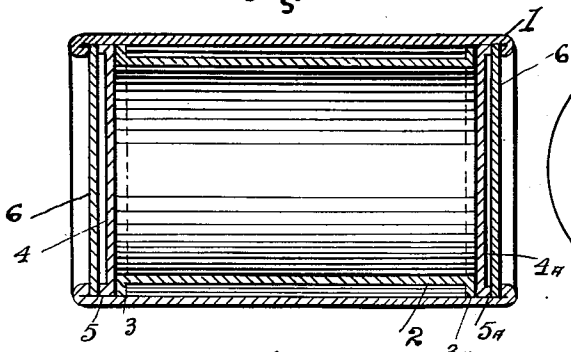


Fig. 3

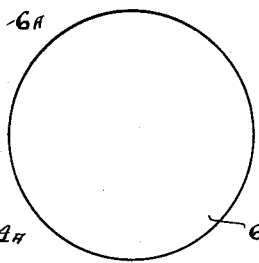


Fig. 4

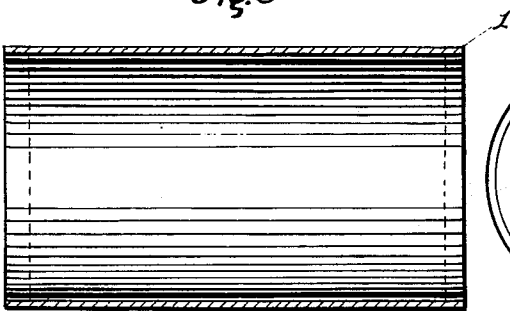


Fig. 5

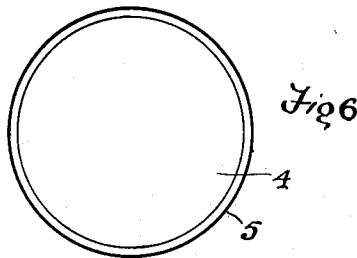


Fig. 6

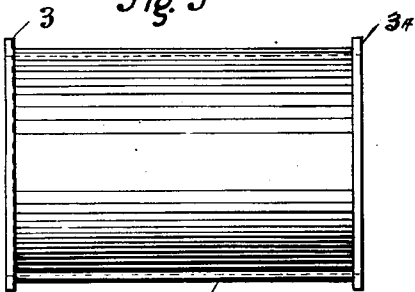


Fig. 7

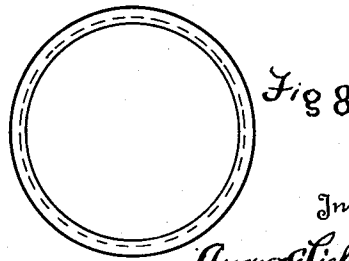


Fig. 8

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Fig 9

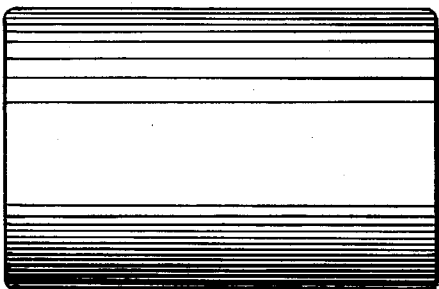


Fig 10

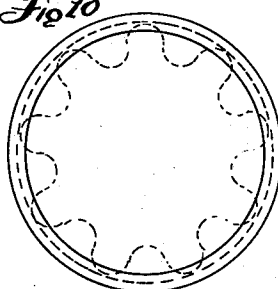


Fig 11

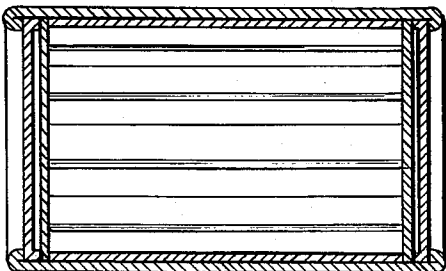


Fig 12

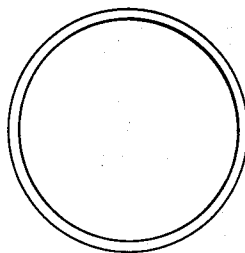


Fig 13

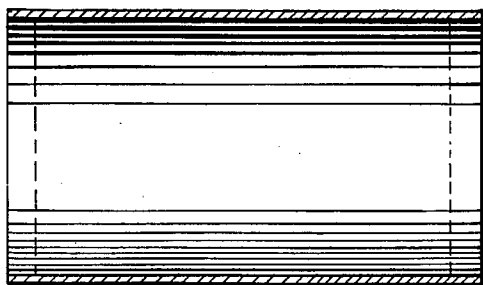


Fig 14

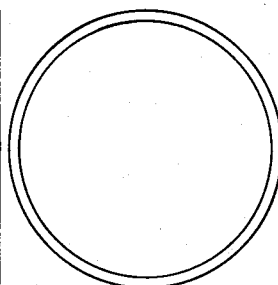


Fig 15

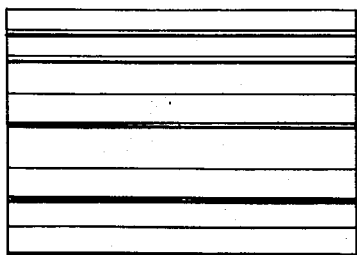
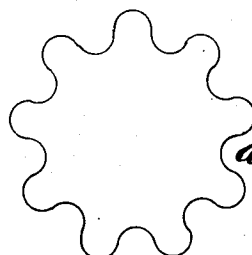


Fig 16



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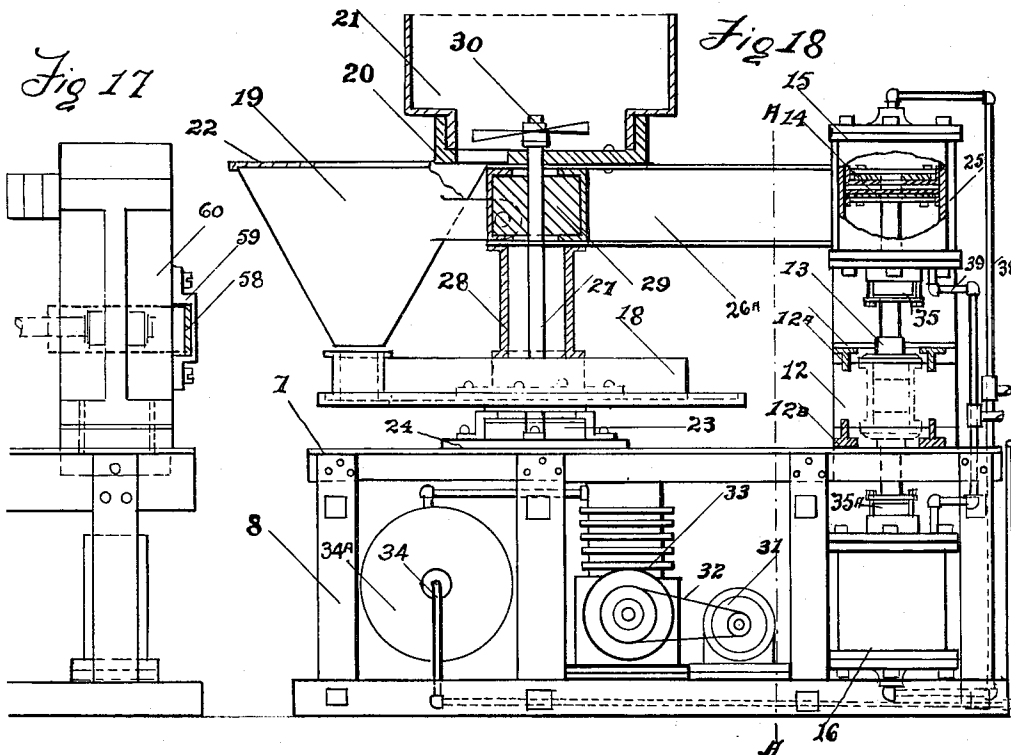
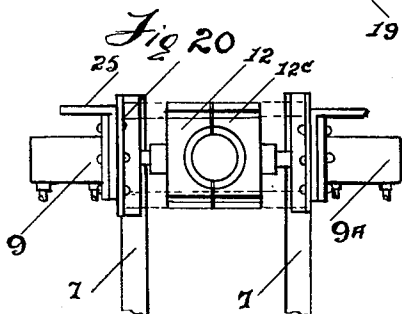
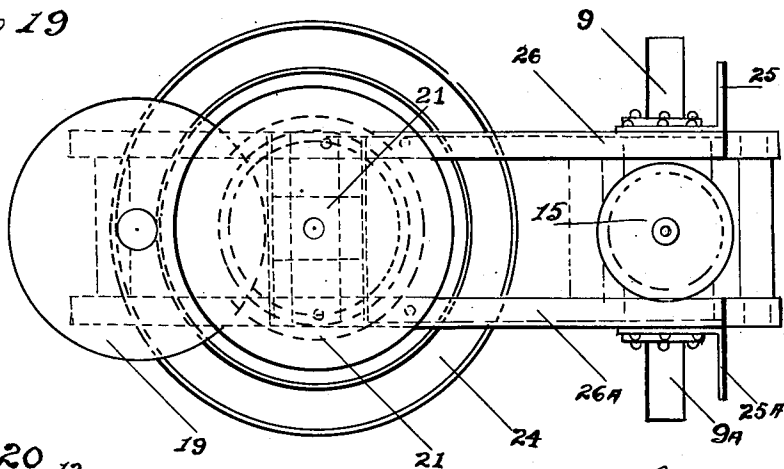


Fig 19



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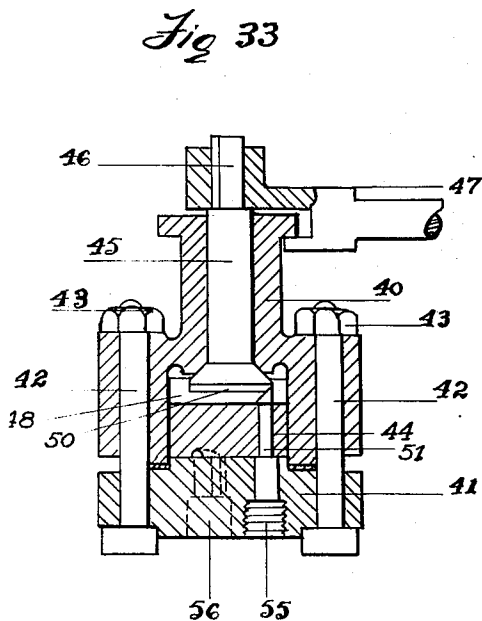
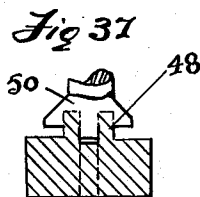
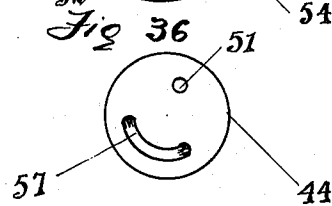
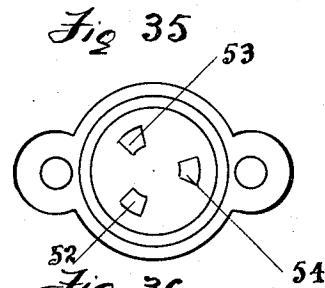
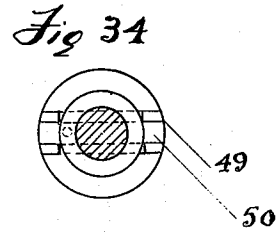
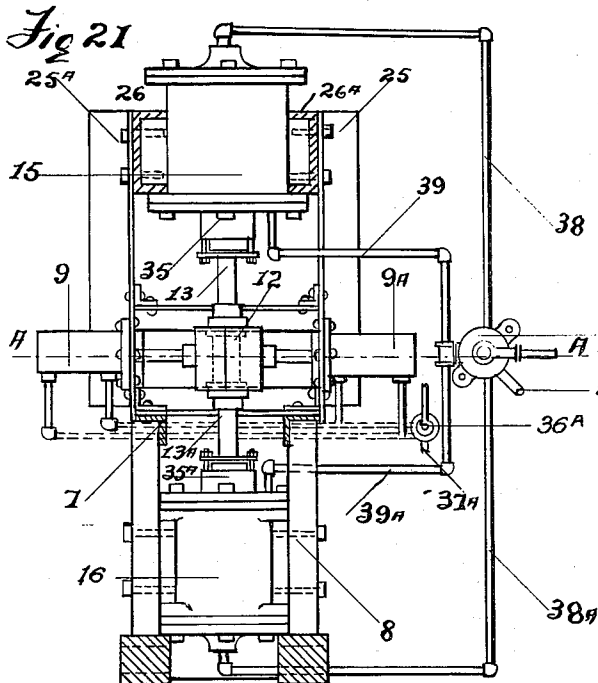
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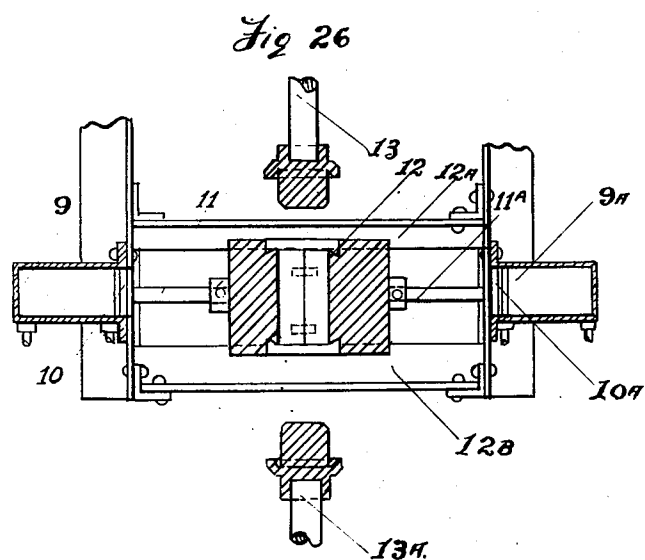
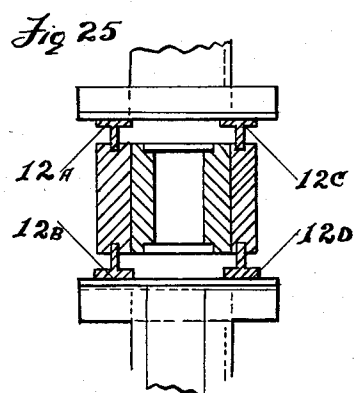
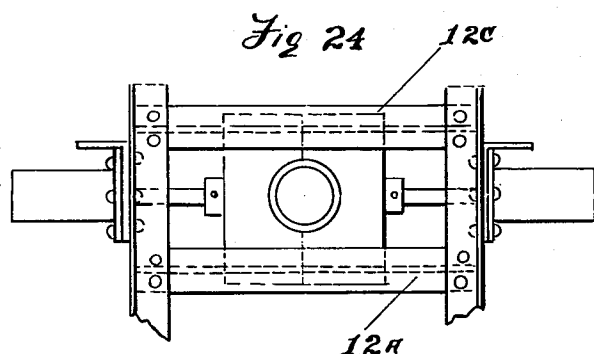
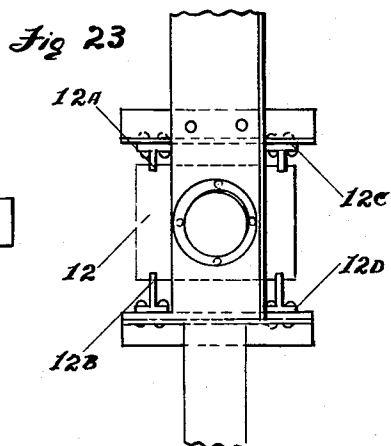
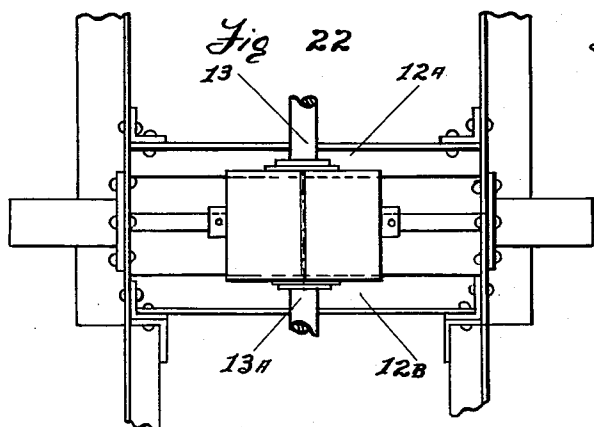
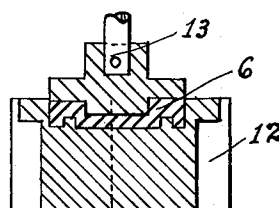


Fig 26A



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Fig 26B



Fig 26c

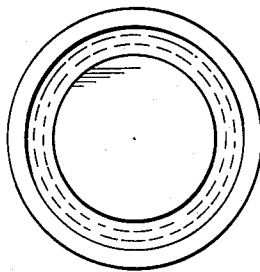


Fig 26D

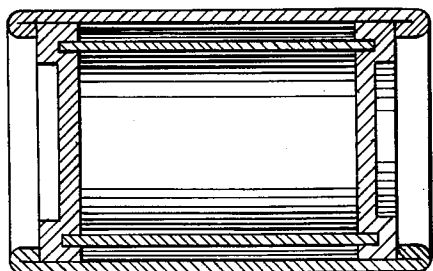


Fig 26E

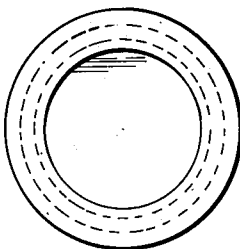


Fig 26F

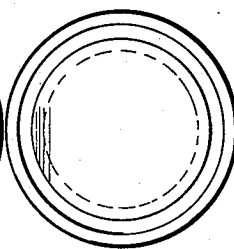


Fig 26G

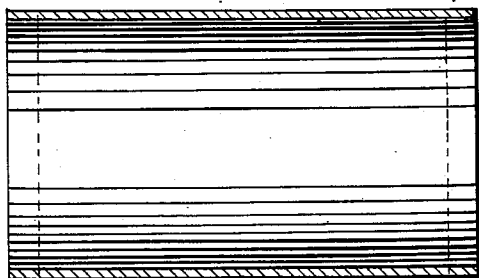


Fig 26H

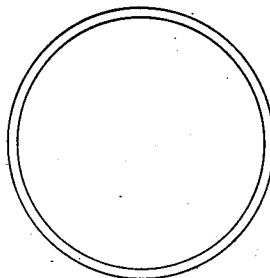


Fig 26I

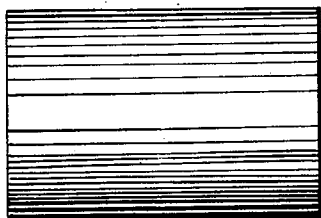
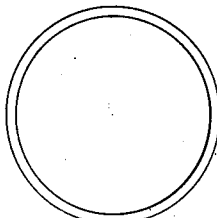


Fig 26J



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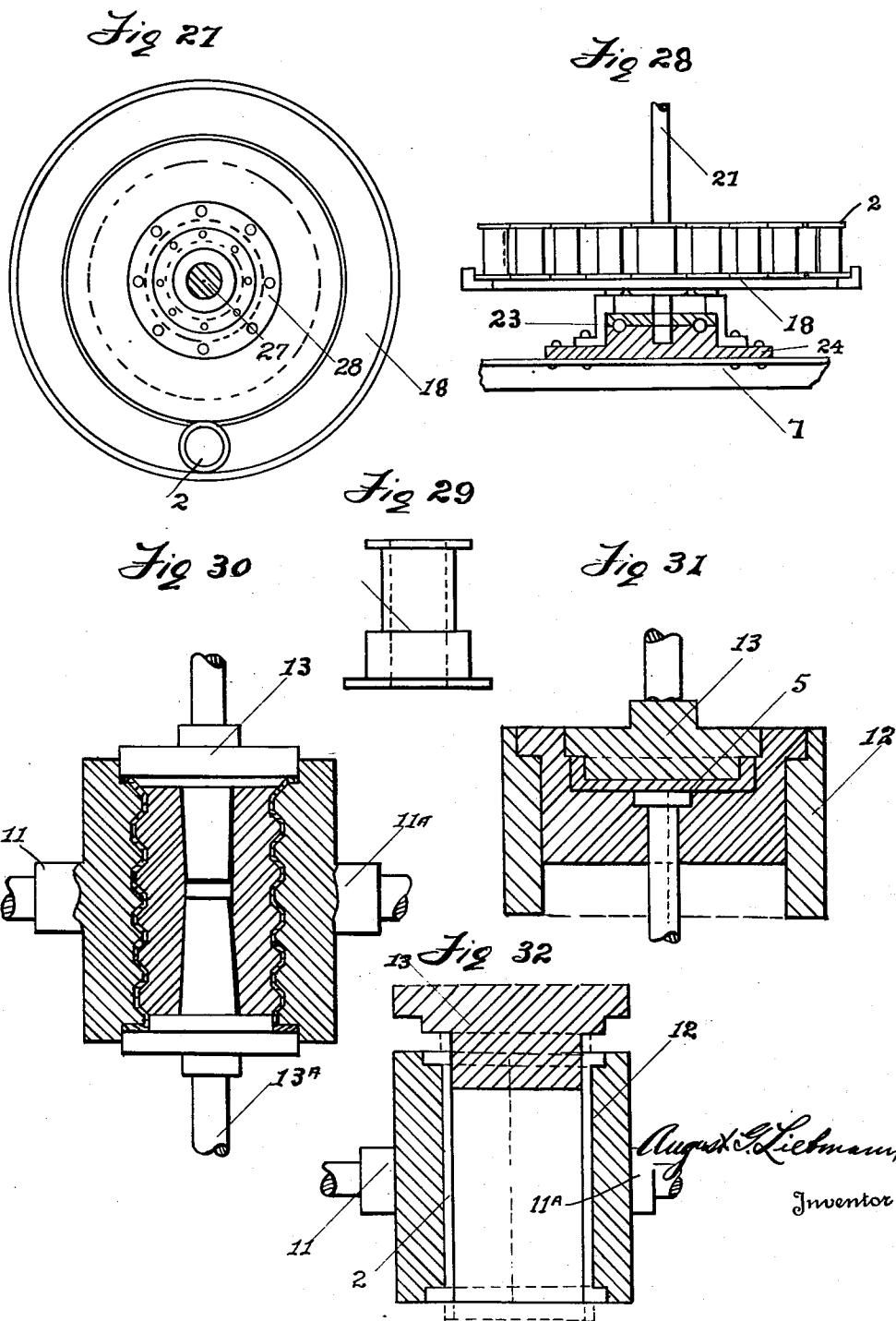
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UNITED STATES PATENT OFFICE

2,352,645

CONTAINER MAKING AND FILLING
MACHINE

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of one-half to Harry A. Blessing, Washington,
D. C.

Application January 16, 1943, Serial No. 472,640

7 Claims. (Cl. 93—3)

The present invention relates to improvements in cartridge containers and methods of making and packing the same.

Reference being had to my copending application, Serial Number 449,949, filed July 6, 1942.

The objects of the present invention is the fabricating and packing and sealing of food products in paper, fibre or cellulose material; requiring special moistureproof packages for dehydrated foods, which must resist moisture absorption and prevent such absorption to not exceed one percentum per month, by weight or volume.

With these fixed limits in mind together with the fact that tubes of substantial material thickness must be employed to form the side walls, as well as closures for the end walls, and that paper stock being extremely hygroscopic as well as the food contents, thus a primary object is to form containers, of pint, quart, gallon or other volumes, approximately; having an inner and outer receptacle with intervening dead air space between the walls.

In the pending application, Serial Number 449,949, filed July 6, 1942, an invention therein disclosed for the means to cut tubes, stuff the loaded inner tube into an outer tube and crimping mechanism of the required mechanical powers to crimp and iron inwardly the ends of the outer tube.

The present invention relates to the container and the methods of fabricating the inner walls and end walls and various closures and forms, whereby both paper stock or heated cellulose plastic material may be shaped for the uses and purposes intended.

The annexed drawings illustrate the invention:

Figure 1 is a side elevation of a cartridge container of paper stock in completed form.

Figure 2 is an end elevation of the same.

Figure 3 is a longitudinal cross section of Fig. 1.

Figure 4 is the outer end wall closure of the cartridge container.

Figure 5 is a longitudinal cross section of the outer wall, cut from tubular stock, and Figure 6 is an end elevation of the same.

Figure 7 is a longitudinal elevation of the inner wall with bosses upset at its ends.

Figure 8 is an end elevation of the same.

By way of furthering the disclosure, it is proper to note that these elements, Figures 5—6—7—8, are cut on the machine as disclosed in the copending application referred to in the foregoing.

Furthermore the placement of the inner tube within the outer tube and crimping the same is performed by the same aforesaid mechanism.

The bosses shown on the tube in Figures 7 and 8 and the end closures for said tubes shown in Figure 3 are fabricated by the mechanism in this invention.

Figures 9 to 16 inclusive show modified forms of elements with a corrugated inner tube of a cartridge container.

Figure 17 is a fragment of the mechanical assemblage of the elements disclosed in the foregoing named copending application, and wherein this invention is repeatedly mentioned.

Figure 18 is a side elevation of the mechanical assemblage of the invention; comprising a bed plate, a turntable mounted thereon for holding containers for packing products therein, a moistureproof hopper superimposed thereon and a feeder mechanism in conjunction therewith, whereby receptacles of product to be packed may be inverted and contents fed into the hopper and packaged into the containers under the most approved moistureproof and sanitary conditions.

Also mounted upon the bed plate and in conjunction therewith is the fluid pressure press for forming the inner tube of the container and the end closures as noted with electro-pneumatic fluid pressure system for the operation of the same.

Figure 19 is a top plan view of the mechanism shown in Figure 18.

Figure 20 is a top plan view of the matrix for forming the bosses on the inner tube of the container.

Figure 21 is a cross section of the assemblage taken at A—A, Fig. 18.

Figure 22 is a detail of the elevation of the matrix, showing the matrix and horizontal, or lateral and vertical pistons, the lateral or horizontal pistons fixed to the matrix, open the same, and the vertical pistons deform the ends of material projecting from the matrix. Figure 23 is an end view of Figure 22.

Figure 24 is a top plan view of the matrix showing the pistons and cylinders for laterally shifting, thus opening and closing the same.

Figure 25 is an end view in section of Figures 23 and 24.

Figure 26 is a cross section of Figure 22. Taken on line A—A, Figure 26A is a cross section of modified form of mold to form plastic end closures in the matrix.

Figures 26B, C, D, E, F, G, H, I, J show elements for a modified form of container to be pressed from plastic, when heated to the boiling point of water, the entire container may thus be formed of plastic such as cellulose material, or

end closures of this same material in conjunction with side walls.

In this event, such containers are adapted for the packing of jams, jellies, etc., and the walls thereof coated with non-poisonous "Bakelite" varnishes, well known in the prior arts for this purpose.

Figure 27 is a top plan view of the turntable conveyor, with one of the inner tube sections reposing thereon.

Figure 28 is a side elevation partly in section of Fig. 27 showing the turntable loaded with empty inner tubes to be swung under hopper and filled with food product. This turntable is manually operated.

Figure 29 is the thimble that holds the turntable upright and centered upon its ball bearings.

Figure 30 is a matrix with a form of inner molds for pressing corrugations upon the inner tubular paper stock, being a modification of above preferred forms.

Figure 31 shows the molds for forming end closures or disc blanks for end closures.

Figure 32 is the mold in detail for upsetting the ends of tubular paper stock for forming the ends of the inner tube as disclosed in the foregoing.

Figure 33 is a cross section of the fluid pressure remote control valve. Figures 34, 35, 36, 37 are details of the said valve. Reference now being had to the numerals, the outer barrel 1 of the container is adapted to receive an interfitting barrel 2 provided with upset or deformed ends 3 and 3A, in effect collars, a closure 4 and 4A, having upset portions 5 and 5A, are adapted to register with the said collars and interfit within the bore of the element 1; the disc end closures 6 and 6A are adapted to register with the upset portions and are held in place by the crimping of the ends of the tubular stock or barrel 1.

In packing a dummy closure is inserted at the lower end of the inner tube, when dry materials are fed through the hopper hereinafter fully described.

Analogous numerals may be applied to Figures 9 to 16, which is a modified form of cartridge container and applicable to certain dehydrated vegetables, of very light weight such as spinach, weighing less than 3 lbs. per gallon. Analogous numerals may be applied to Figures 26B to 26J, the form modified for fabrication of cellulose plastic as hereinbefore noted.

Reference now being had to the mechanical assemblage per se: It must be borne in mind that cementing or gluing the end or side walls of the container with the incidental moisture of these binders tends to defeat the object of the invention, thus the fabrication packing and closing and crimping of the invention per se and the co-pending invention is with the idea primarily of introducing no moisture from any source, to defeat the object of dehydration. Thus the double walled container must be made of sturdy stock and when fabricated and packed is then dipped in paraffin.

The inner seal is by pressure of end closures, the outer seal by the same method plus crimping and the wax sealing on the outside, such containers may be opened by any suitable sturdy method applicable to opening of metal containers.

The bed plate 7 is supported by a series of legs, designated 8; mounted upon the bed plate is a series of fluid pressure cylinders 9 and 9A having pistons working therein 10 and 10A and connected by rods 11 and 11A and connected to the matrix

12, which is mounted in guides 12A, 12B, 12C, and 12D; the said matrix adapted to grip a cylindrical piece of tubular paper stock. The plungers 13 and 13A activated by pistons 14 and 14A not shown working in cylinders 15 and 16.

The remote control of the said piston and cylinder assemblage is hereinafter fully described.

Thus pieces of tubular stock taken from the head block, of the unit Figure 17 are placed in the matrix 12 and the ends thereof deformed by the plungers 13 and 13A, then removed and placed upon the rotary conveyor 18; a false end disk is placed in the bottom portion of the barrel 2, see Fig. 7; the conveyor in its rotation accumulates these similar elements which pass under the hopper 19 fixed to the feeder 20 adapted to hold the vessel 21 loaded with the product to be packed. This is preferably a transparent glass jar adapted to carry the product from dehydrating apparatus to the packing location.

The hopper 19 may be provided with an appropriate slide valve to control the flow of product, but not shown; the cover 22 of the hopper insures against dust and moisture, entering and contaminating the food.

The rotary conveyor 18 mounted on the bed plate 7 is provided with a step type of ball bearing 23 and a platform 24; stanchions 25 and 25A are fastened to the bed plate and form the carrying frame and housing for the press, and cylinders 15 and 16 thereof. At right angles to the stanchions and fixed thereto and parallel to the bed plate, are the head frame beams 26 and 26A which serve to form a bearing for the turntable shaft 27, the thimble 28; the turntable shaft bearing 29 and the divider feeding means 30.

An electric motor 31 carried by the frame, is connected by a belt 32 to an air compressor 33 which is coupled to an air receiver 34, this being the main reservoir for fluid pressure operation.

The control of the position of the pistons and cylinders 9 and 9A and 15 and 16 is effected by admitting fluid, such as compressed air either to one or the other side of the pistons in said respective cylinders. In this way the pistons may be moved from one end of the cylinders to the other or retained in any intermediate position if so desired. In order that the cylinders may function properly they must be made leakproof and this is effected by properly securing the heads thereof. Air tight glands 35 and 35A; for permitting the piston rods corresponding thereto to be properly packed against leakage. In order to control the admission of the fluid to the respective cylinders, a control valve 36 and 36A is provided to which is connected the inlet pipes 37 and 37A; and from which lead pipes 38 and 38A; 39 and 39A. These pipes lead to opposite sides of the pistons and are connected in the ends of the cylinders.

The details of one of the control valves, both similar, is shown in Figures 33, 34, 35, 36, 37. The movable valve parts are enclosed in a housing formed of a top member 40 and a bottom member 41. The contacting surfaces here are accurately finished and are appropriately held together so as to form an airtight chamber, as by means of bolts 42 and nuts 43; the inlet pipe 37 and 37A serves to supply the valve chamber with fluid under pressure. This valve chamber is cylindrical and so arranged as to accommodate the movable valve member 44 seated on the inner surface of the bottom member 41, these contacting surfaces are also accurately finished so as to provide a proper air-tight running fit valve seat. The member 44

is adapted to be rotated by a valve stem 45 which extends down through a necklike extension of the housing member 40. This stem has an upper portion 46 which is engaged by a handle 47 for turning the stem.

The mechanical connection between the stem 45 and the valve member 44 is effected by a grooved boss or projection 48 preferably integral with the member 44. This is most clearly shown in Figure 37; the groove 49 extends diametrically across the valve member 44, and into this groove extends the boss or projection 50 formed integrally with the valve stem 45.

The boss 48 has its central portion depressed slightly as shown in the cross section Figure 37, and upon this depressed portion rests the enlarged end 50 of the valve stem 45.

This end is conical as shown in Fig. 33, a part of this bottom portion is cut away so as to leave the port 51 uncovered. This port pierces the valve member 44 and serves to allow the fluid under pressure to pass either into pipe 38 and 39 and 38A and 39A; or to prevent passage into either depending upon the relative position of the valve with respect to the housing member 41. To bring about these results, the bottom member 41 has a plurality of apertures, 52, 53, and 54, which extend into the enclosed chamber formed by the housing.

Two of these ports 52 and 53 communicate with the pipes 38 and 39, previously noted; and for this purpose they are connected from the ports 55 and 56. The other port 54 opens to the atmosphere and serves to allow the fluid under pressure to escape from either side of the respective cylinders of the press and/or matrix.

In order to provide for this exhaust the under side of the valve 44 is provided as shown in Figure 36 with a circular sector of a groove 57 which is of sufficient length to connect the ports 52 or 53 with the exhaust port 54; in this manner as the valve is turned fluid is supplied to one end of the series of the cylinders while the opposite ends are exhausting.

Thus in operation upon turning the handle of the valve in one direction as far as it will go, the fluid is allowed to escape from one side of the series of the pistons and fluid under pressure is fed to the opposite side, thus a movement of the valve handle in the opposite direction results in movement of the pistons in reverse direction. This fluid pressure system is not part of the present invention, being an old remote control not patentable per se; but precisely applicable to the present invention, to manipulate the matrix and press in the present manner and so far as I am aware this is thus applied to a new method of operating cylinders and pistons in reciprocal series of the present invention.

The operation of the method and assemblage to fabricate and package the cartridge container, is as follows; see Figures 17 and 18:

Pieces of tubing are cut on the machine, Fig. 17, of the copending application mentioned in the preamble, as they are cut on the head block of that invention, in a lower aperture, each piece cut away is forced through the aperture in the headblock of that machine and then placed on (Figure 18) the rotary conveyor 18, passed to the press, and the ends of the tube upset, replaced on the conveyor with a dummy disk closure and as the conveyor rotates eventually the partly finished inner tube is filled and another dummy disk inserted, then passed back to the first assemblage 17 where this inner tube is forced into

an outer tube within the head block and prevented from slipping out of the same by the shackle bar 58, slidably mounted in stirrup guides 59 on the headblock guides 60. As the head block 5 is raised the inner closures are affixed and the outer wall is crimped, and the operation is thus complete, ready for dipping the container in hot paraffin.

These materials may be rendered internally moistureproof, as well as waterproof in their interiors by coating the insides of the tubes with "Baekeland's" coatings of infusible, insoluble condensation product of phenols and formaldehyde, which are acid resisting and non-contaminating.

This of course is essential to the packing of preserves, jams, jelly etc., etc.

In the packaging of dehydrated products for tropical use, this is also necessary to prevent absorption of moisture, but not so imperative in temperate climates.

What is claimed as new:

1. A packaging machine, for making insulated cartridge containers, comprising a frame, a series of cylinders mounted at one end of the said frame, a bipartite head block mounted in guides upon said frame, dies for the bipartite head block, pistons connected to the parts of the head block, and working in cylinders to move the same, plungers mounted for registry with the dies of the bipartite head-block, pistons connected to the plungers, cylinders for the said pistons and fluid pressure means for operating the same in synchronism.

2. A packaging machine, for making insulated cartridge containers, comprising a frame, a base, and an upper stage and a lower stage upon the frame, a press mounted at one end of the frame and secured to the base and staging, stanchions supporting the staging at one end and a column mounted upon the lower stage and supporting the upper stage disposed at the opposite end of the frame, guides carried by the stanchions, a movable bipartite headblock carried by the guides, cylinders carried by the stanchions, pistons therein secured to the parts of the headblock and fluid pressure means to open and close the parts of the headblock.

3. A packaging machine, for making cartridge containers of the insulated type; comprising a frame, a series of cylinders mounted at one end of the frame, a movable bipartite headblock mounted in guides at one end of the frame, dies for the bipartite headblock, pistons connected to the parts of the headblock, cylinders for the pistons adapted to shift the parts of the headblock laterally, plungers having dies adapted to register with the closed parts of the headblock, pistons connected to the plungers, cylinders for said pistons adapted to shift said plungers vertically, and fluid pressure means to selectively operate the pistons in the lateral travel of the parts of the headblock and in the vertical travel of the plungers.

4. A packaging machine, for making insulated cartridge containers, comprising a frame, a deforming press mounted at one end thereof having a laterally movable bipartite headblock, and vertically movable plungers, and fluid pressure means in connection therewith whereby the advance and retraction of the parts of the headblock and plungers is controlled by balanced pressure within the fluid pressure means, thereby permitting the parts of the headblock to be closed with a minimum of impact and the plungers

register with the closed parts of the headblock with a minimum of impact.

5. A packaging machine, for making insulated cartridge containers, having a movable bipartite headblock, and plungers adapted to register with the bipartite headblock and fluid pressure means adapted to cooperate with the said bipartite headblock and plungers whereby the said registry may be selective or synchronized, with either a maximum or minimum of impact.

6. In a packaging machine, for making insulated cartridge containers, a frame, having a base and upper and lower stages supported thereon, a series of stanchions at one end of the frame, secured to the base and staging, a fluid press carried by the stanchions, and means for operating the same, a column mounted upon the lower stage and supporting the upper stage at the end

of the frame opposite to the press, a turntable conveyor carried by the column, and a hopper and dispensing reservoir integrally connected and carried by the upper staging.

7. In a packaging machine, for making insulated cartridge containers, having a frame provided with a base and stages, a press mounted at one end of the frame and secured to the stages, a column superimposed on the lower stage and carried by the same, and supporting the upper stage at the opposite end of the frame, a turntable carried by the column, a hopper and dispensing means supported by the column, the press having a separable bipartite headblock, and vertically shiftable dies in registry therewith, and fluid pressure means to operate the same.

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