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FORMING AND FILLING BAGS

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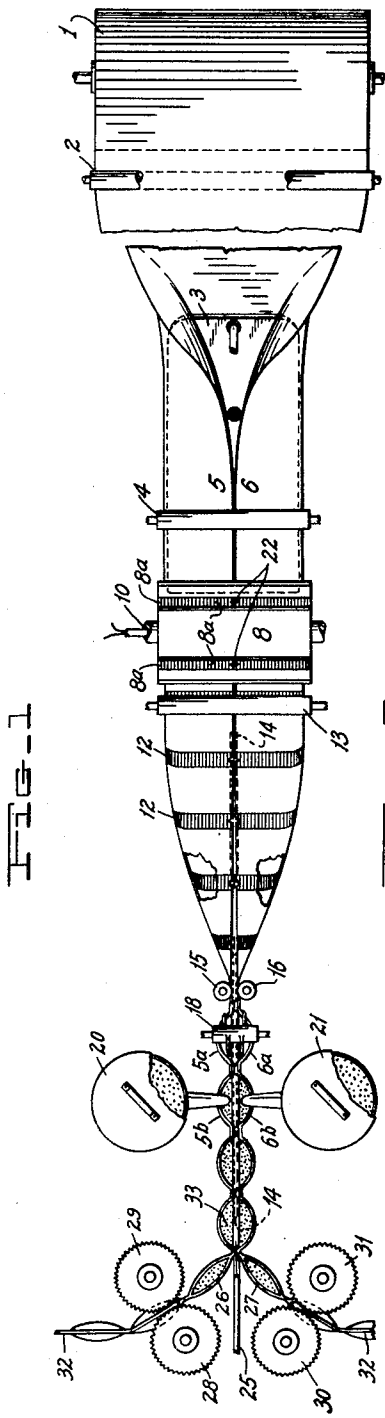


Fig-1

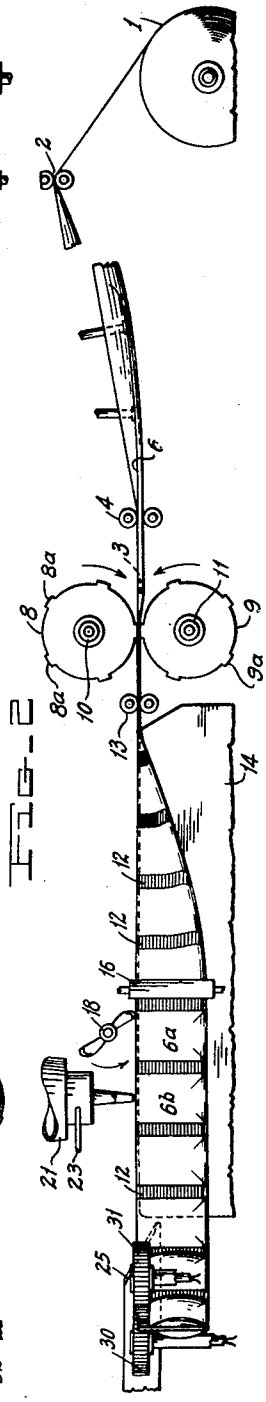


Fig-2

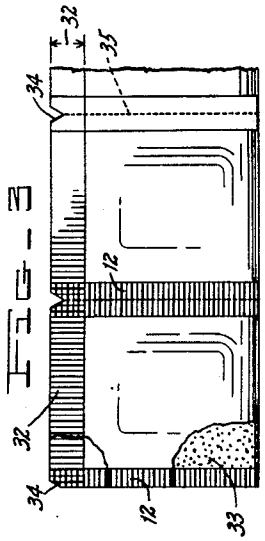


Fig-3

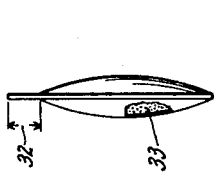


Fig-4

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FORMING AND FILLING BAGS

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6 Claims. (Cl. 93—3)

This invention relates in general to the fabrication of bags and specifically relates to a system and method of manufacturing bags by a heat sealing process, this being a divisional of my Patent No. 2,139,039, issued December 6, 1938.

The principal object of the invention comprises providing a simplified arrangement for forming and filling commodity containing bags and the like.

A further object of the invention comprises providing an automatic system and method for fabricating plural bags in contiguous chain formation.

A still further object of the invention comprises providing a system for feeding heat sealable packaging material to form multiple bag formations in transversely and longitudinally extending rows.

A still further object comprises providing an automatic bag making, filling and sealing machine for producing individual commodity containing bags.

These and other objects will be apparent from the following, reference being had to the accompanying drawing in which like reference numerals designate corresponding parts and in which:

Figure 1 is a top plan view of one embodiment of the bag fabricating system of the invention.

Figure 2 is a side view of the representation of Figure 1.

Figure 3 is a view of a bag fabrication in accordance with the invention, and

Figure 4 is an end view of the fabrication depicted in Figure 3.

The invention contemplates providing a system for feeding strip-like packaging material, such as transparent regenerated cellulose with a thermoplastic coating thereon, through apparatus for forming, filling and sealing plural bag formations. In accordance with the invention, the strip of packaging material is folded and sealed to produce parallel rows of bag formations which are subsequently filled with the desired commodity. The parallel rows of filled bags are then sealed and separated to produce independent chain bag formations. These chain bag formations may be individually packed for subsequent individual separation and use of the enclosed commodities.

Referring to the drawing in detail, a roll of packaging material 1 is fed over idler rollers 2. The packaging material 1 is preferably of transparent regenerated cellulose having a thermoplastic coating on the upper or outer surface thereof, although other sealable materials may be used in accordance with the invention. The packaging material is fed over folding shoe 3 and between folding rollers 4 so that opposed portions 5 and 6 of the packaging material are folded around the upper surface of the shoe 3 so that the edges thereof meet along a longitudinally extending line in the center of the shoe 3.

Rollers 8 and 9 are provided with peripherally disposed transverse crimping bars 8a and 9a. The rollers 8 and 9 are mechanically mounted for rotation so that these transverse bars coincide with each other in complementary engagement when rotated through the plane inercepting the axes of the rollers 8 and 9. The rollers 8 and 9 are provided with electrical heating elements 10 and 11 so that the bars 8a and 9a are heated to a desired and predetermined temperature. Notching knives 22 are provided in the crimping bars 8a and engage with corresponding depressed portions of the crimping bars 9a.

The rollers 8 and 9 are rotated by suitable motor driven driving means to draw the packaging material including the folded over portions 5 and 6 so as to make space-transversed crimped and sealed areas 12 extending across the packaging structure. It will be noted that during the sealing process, notches are provided in the center of the sealing areas 12 and in alignment with the longitudinal center line of the packaging construction. After leaving the rollers 8 and 9, and after passing between stripper idler elements 13, the package structure is folded over a folding shoe 14 aligned with the center of the packaging structure, and extending perpendicular to the plane of the shoe 3. As the packaging structure is now moved, it is pulled over the shoe 14 so that the folded over portions 5 and 6 pass through rollers 15 and 16, respectively. In this last folding operation, the portions 5 and 6 produce, in effect, a plurality of bag pockets 5a, 5b, and 6a, 6b, et cetera. These bags or pockets are formed by virtue of the now vertically extending sealing areas 12, the bottom of the bags being formed by the folding of the packaging material and the upper portion of the bag being opened to form a mouth. It will be noted that this folding operation, in transferring the packaging structure from a horizontal plane to a vertical plane, tends to cause the mouth of the bags so formed to distend. However, a motor driven opener 18 is provided for further distending the mouths of these bags, including elements for insertion into the upper part of the bag structure

in time relation with the movement of the bags along the shoe 14.

The bag structure passes under filling units 20 and 21 disposed above and on opposite sides of the shoe 14. Filling units 20 and 21 are connected with a supply of the commodity to be inserted in the bag, such as coffee, tea, chocolate, pharmaceutical elements, and the like. Each of the filling units 20 and 21 is provided with a closure member for regulating the flow of the commodity. These closure members are operated by rods 23 suitably connected with the driving mechanism for filling each of the bags with the desired amount of the commodity as the bags pass under the filler units 20 and 21.

After being filled, the packaging structure passes against a knife element 25 which splits the packaging structure into two half portions 26 and 27, as shown in Figures 1 and 2. The chain of open bags comprising the half portion 26 then passes through crimping rollers 28 and 29 and the chain of open bags comprising the half portion of 27 extends through rollers 30 and 31. These rollers are electrically heated and put crimped edge seal 32 along the top of the packaging structure to close the bags or pockets. All of the sealing and crimping operations are attended by sufficient heat to fuse the thermoplastic material on the regenerated cellulose or other packaging material, while the crimping operation interdigitates opposed layers of packaging material to lock the same in a secure bond.

Figure 3 represents more clearly the exact details of the completed packaging chain unit. It will be seen that individual bags are formed between the sealing areas 12 and that the top sealing area 32 completely seals the bags, after the bags have been filled by the commodity 33. The notches 34 in the center of the sealing areas 12 permit the individual bags to be separated from the chain unit. When desired, the sealing area 12 may be provided with a centrally disposed row of perforations 35 to assist in the separation of the individual bag units, one from the other. These perforations may be provided by teeth centrally disposed on the crimping bars 8a of the roller 8, meshing with complementary recesses or resilient section in the roller 9.

Although a preferred arrangement for forming and filling bags has been disclosed, it will be recognized that various changes and equivalent forms can be made without departing from the intended scope of the invention. Therefore, no limitations are intended except as pointed out by the scope of the appended claims.

Having thus described my invention, what I claim is:

1. A method of producing a package formation which comprises feeding in a horizontal direction two opposed layers of packaging material that are connected together along a longitudinal zone throughout their length, sealing together said layers transversely at areas spaced longitudinally thereof to form a chain of contiguous bag pockets having mouths opening between said layers at points opposite said longitudinal zone, moving said chain of open-mouth bag pockets along a horizontal path with the pockets opening upwardly, depositing a commodity into each of said pockets, and then sealing together said layers along a second longitudinal zone to close the mouths of the pockets.

2. A method of producing a package formation which comprises folding a strip of heat-sealable packaging material along a longitudinal line, periodically applying heat and pressure upon opposite sides of the superposed layers of the material along spaced, transversely extending zones to seal the said layers together and produce a continuous chain of contiguous, approximately rectangular bag pockets each closed on three sides and with the other side constituting an open mouth, moving the chain of open-mouth pockets along a horizontal path with the pockets opening upwardly, filling the said pockets with a commodity and subsequently sealing the superposed layers together along the longitudinal edges thereof to close the mouths of the pockets.

3. A method of producing a package formation which comprises feeding in a horizontal direction two opposed layers of packaging material that are connected together along a longitudinal zone throughout their length, sealing together said layers transversely at areas spaced longitudinally thereof to form a chain of contiguous bag pockets having mouths opening between said layers at points opposite said longitudinal zone moving said chain of open-mouth bag pockets along a horizontal path with the pockets opening upwardly, distending the open mouths of the pockets, depositing a commodity into each of said pockets, and then sealing together said layers along a second longitudinal zone to close the mouths of the pockets.

4. A method of producing a package formation which comprises folding inwardly toward each other the longitudinal edge portions of a strip of packaging material with their free longitudinal edges in spaced relation to each other, periodically sealing the superposed layers together at transversely extending zones spaced longitudinally of the layers to produce two adjacent continuous chains of contiguous approximately rectangular bag pockets each closed on three sides with the other side constituting an open mouth, moving said chains of open-mouth pockets along a horizontal path with said pockets opening upwardly, filling the said pockets with a commodity and subsequently sealing the superposed layers together along said longitudinal edges thereof to close the mouths of the pockets.

5. A method of producing a package formation which comprises folding inwardly toward each other the longitudinal edge portions of a strip of packaging material with their free longitudinal edges spaced from each other, periodically sealing the superposed layers together at transversely extending zones spaced longitudinally of the layers to produce two adjacent continuous chains of contiguous approximately rectangular bag pockets each closed on three sides with the other side constituting an open mouth, folding said strip longitudinally between said chains of pockets to turn said chains into a position with their pockets opening upwardly, moving said chains of upwardly opening pockets along a horizontal path, filling the said pockets with a commodity and subsequently sealing the superposed layers together along said longitudinal edges thereof to close the mouths of the pockets.

6. The method set forth in claim 5 with the additional step of slitting said strip along the last-mentioned longitudinal fold to separate said chains of pockets.

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