

June 10, 1969

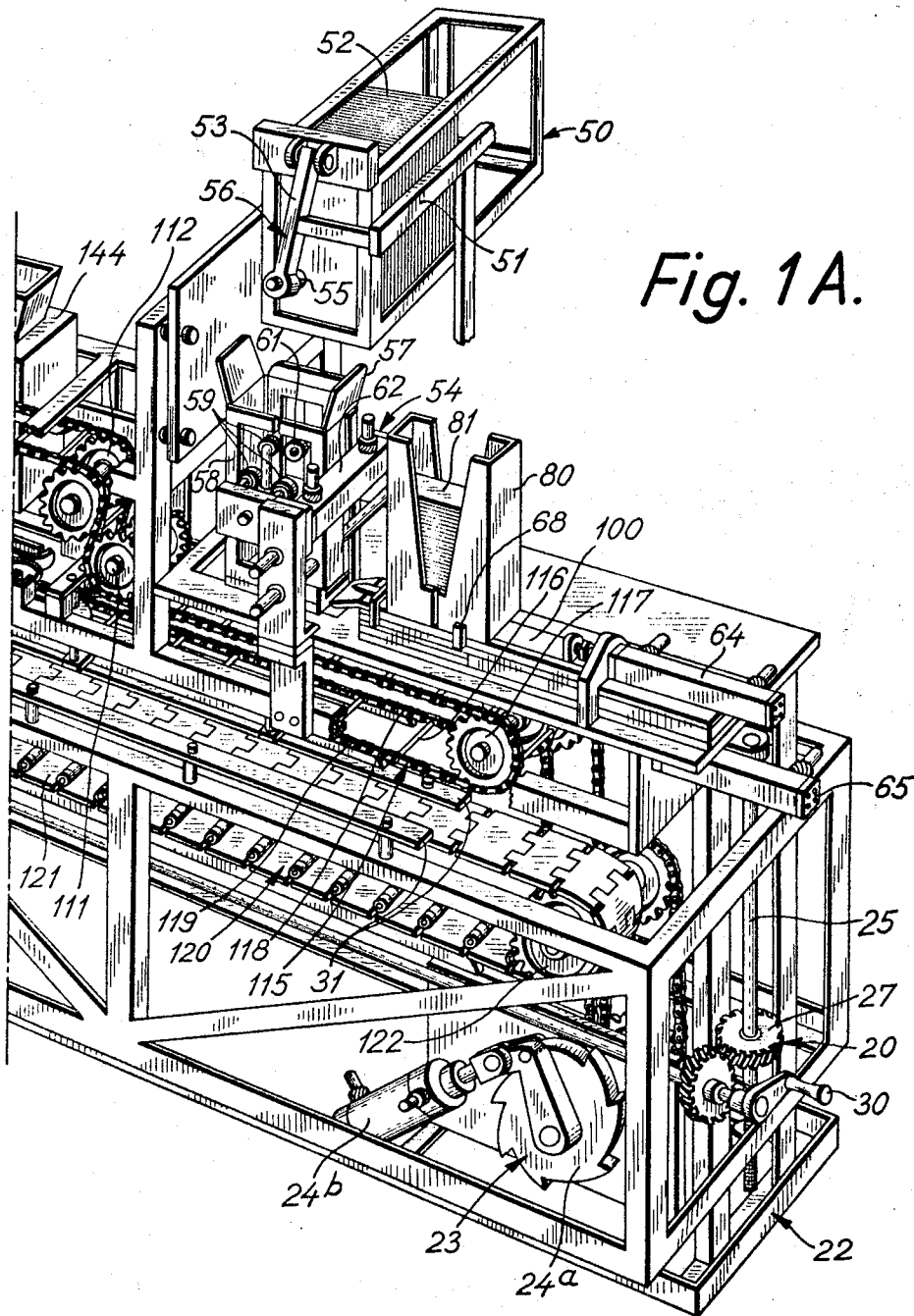
K. M. H. BJARNO

3,448,559

FILLING MACHINES FOR COMPOSITE CONTAINERS

Filed Aug. 9, 1965

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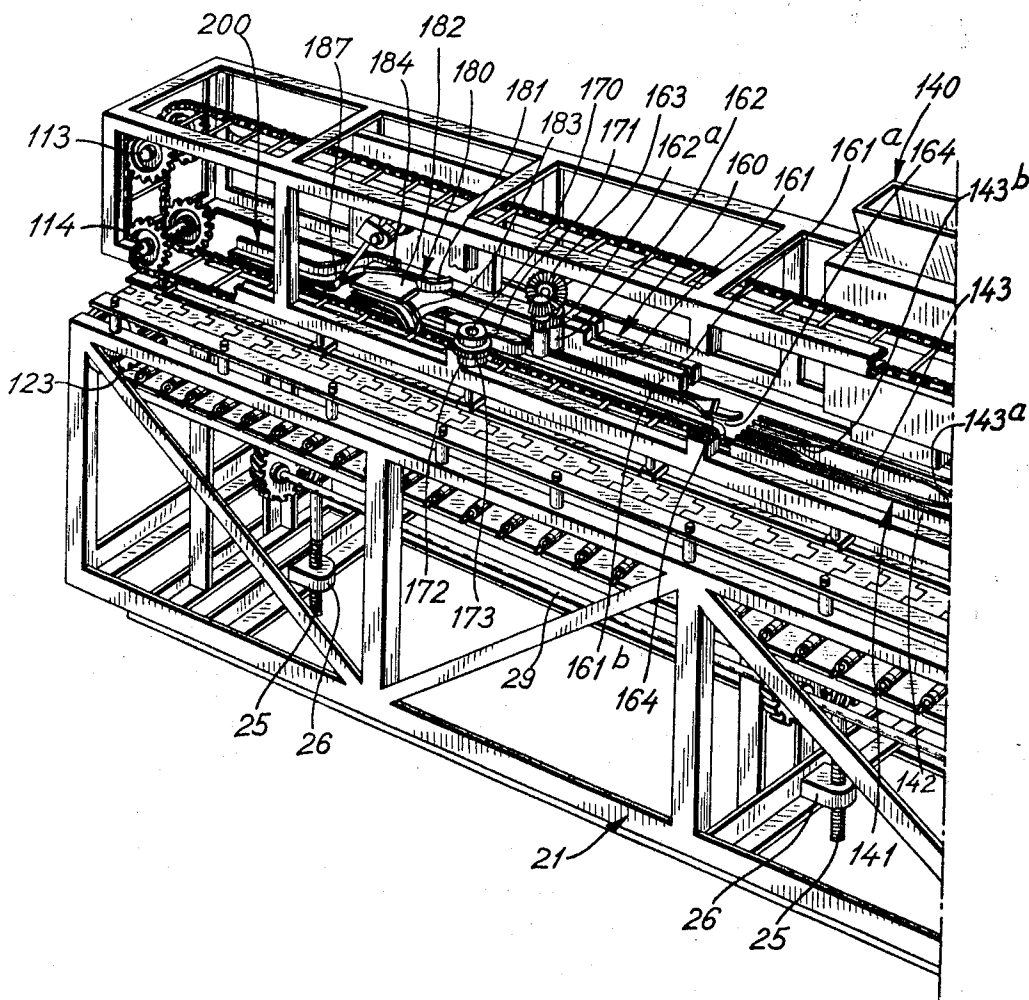
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Fig. 1B.



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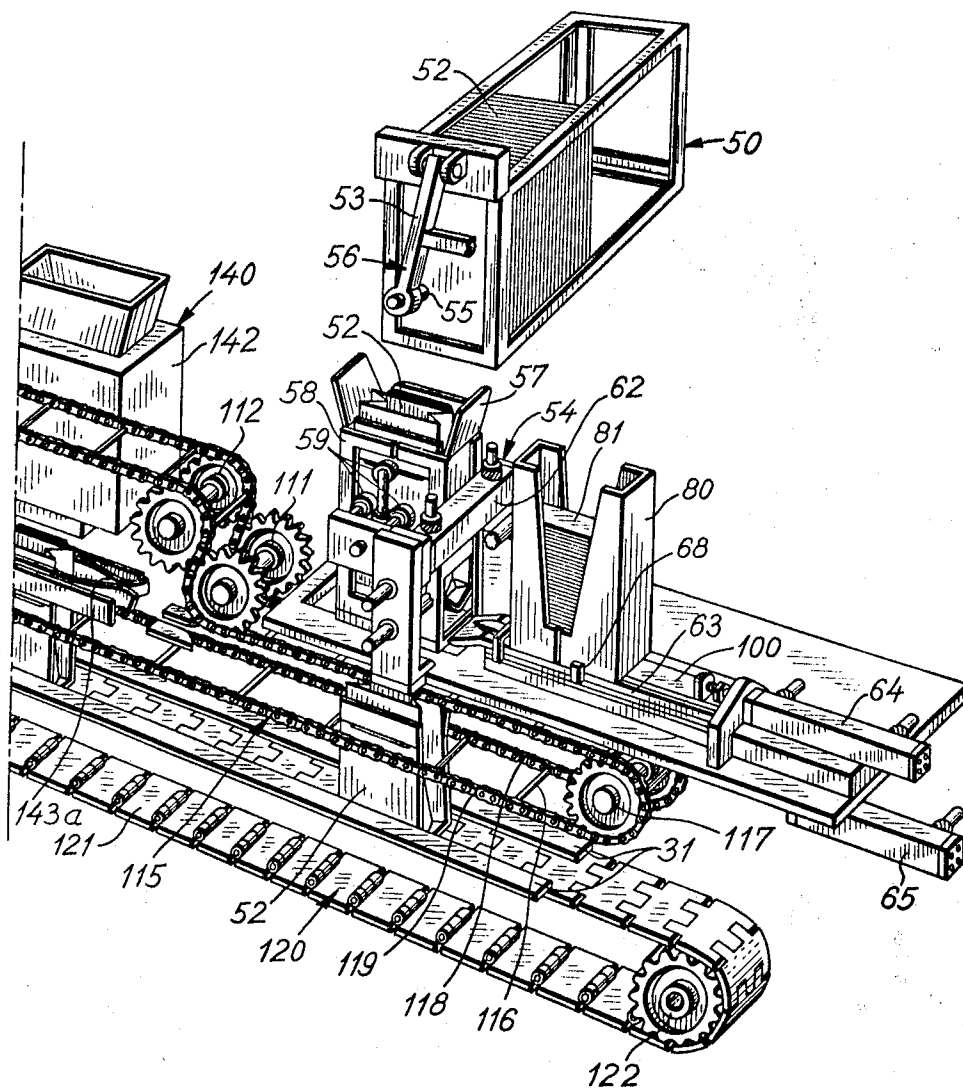
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Fig. 2A.



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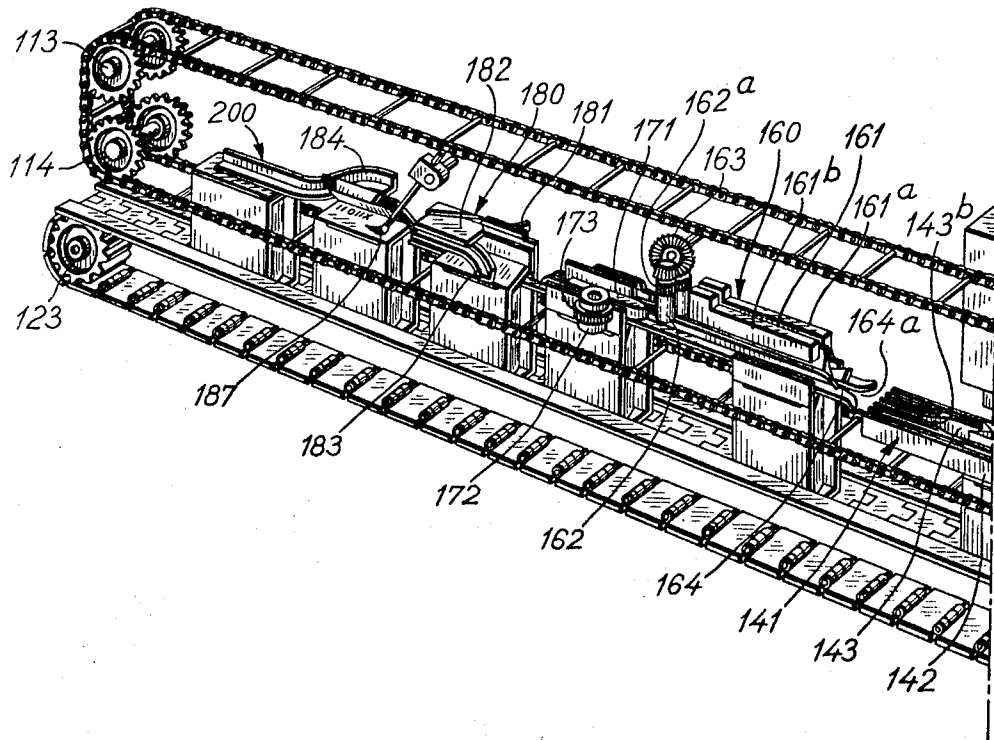
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Fig. 2B.



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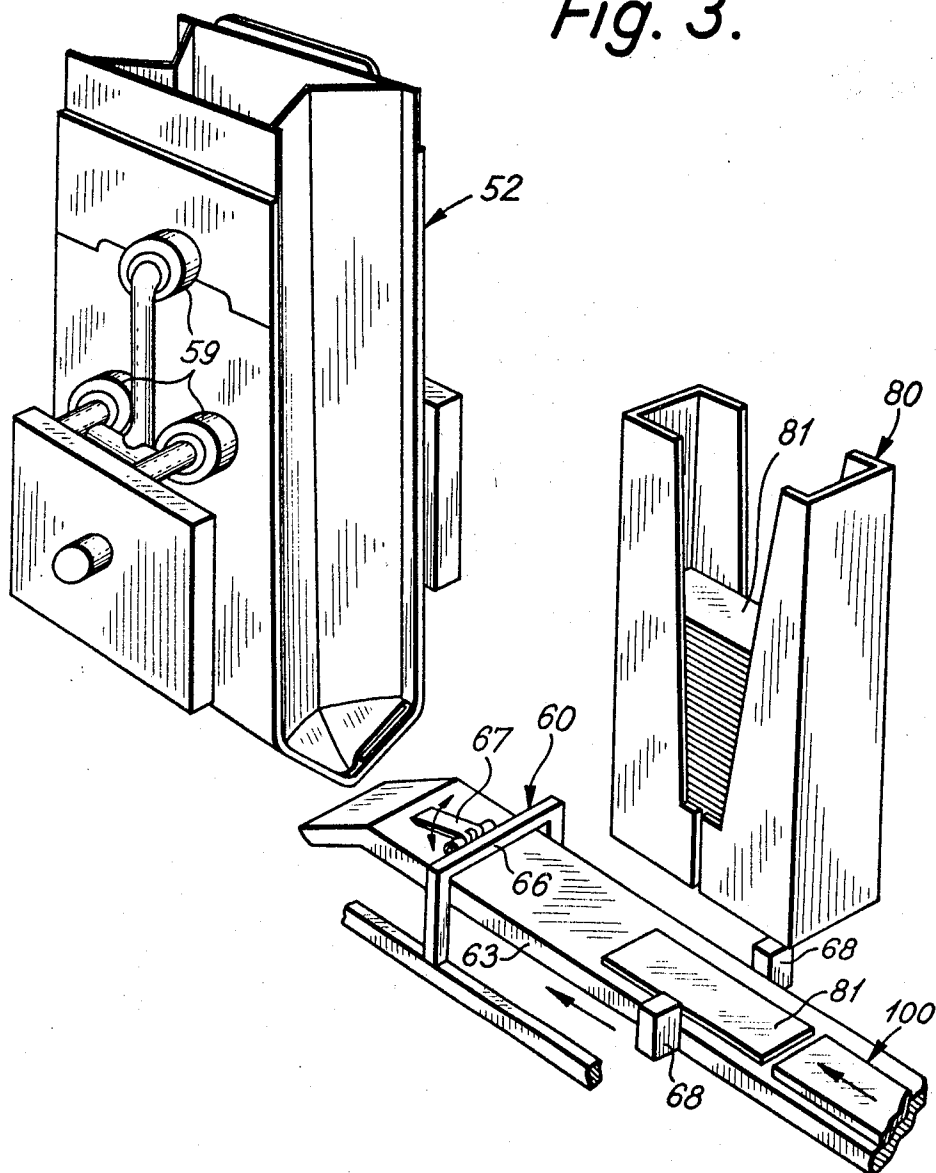
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Fig. 3.



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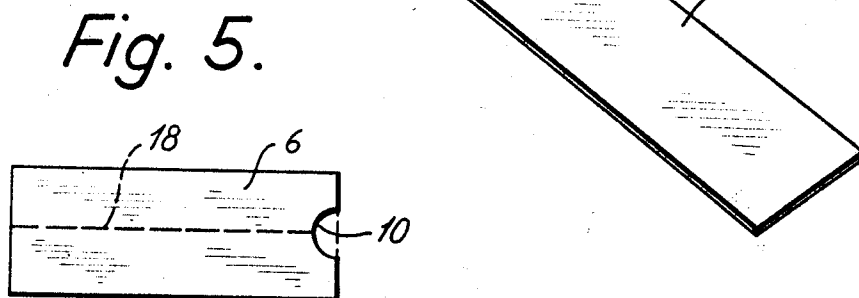
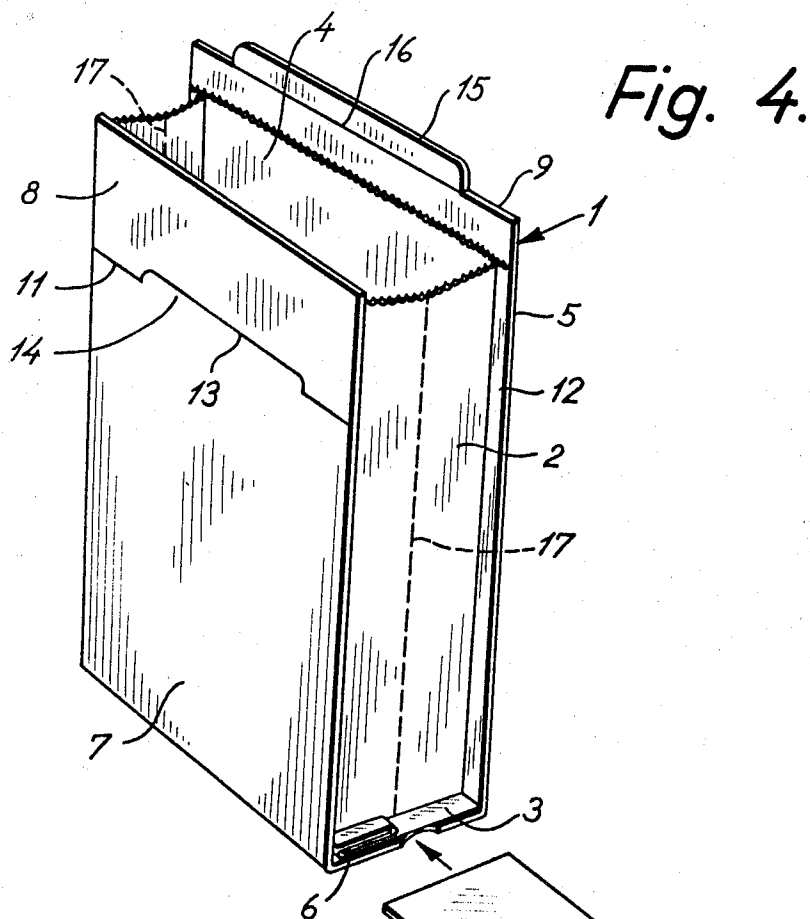
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FILLING MACHINES FOR COMPOSITE CONTAINERS

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Claims priority, application Great Britain, Aug. 10, 1964, 32,492/64

Int. Cl. B65b 5/02, 1/02, 3/02

U.S. Cl. 53—188

18 Claims

ABSTRACT OF THE DISCLOSURE

A sequentially operated filling machine for processing collapsed composite containers having an interior bag with a closed bottom and open top supported by relatively stiff external side walls and top and bottom flaps; said machine opening the flat bags, reinforcing the bottom flaps of the composite container to enable the container to stand upright, filling and subsequently sealing the open bag and thereafter closing the top flaps of the composite container.

The present invention relates to a filling machine for composite containers which comprises a collapsible bag which has a pair of substantially flat side walls, a pair of inwardly foldable side walls, a closed bottom and an open top and an exterior reinforcement structure in the form of a continuous strip of substantially self-sustaining material with side portions which are secured to and cover the flat side walls of the interior bag between the bottom to a point remote from the top end of the bag with the bottom edges of the side portions connected by means of flaps which are adapted to be folded inwardly into engagement with the bottom of the bag when the latter is opened up and with flaps at the top edges of the side portions adapted to after filling and closing of the interior bag be folded inwardly against the closed top end of the bag.

A composite container structure substantially as hereinbefore referred to is subject matter of application Ser. No. 401,285 filed Sept. 22, 1964, now abandoned, by Knud Bjarno.

It is a purpose of the invention to provide a filling machine for containers of the type here referred to in which means is provided to enable the container to stand upright on the inwardly folded bottom flaps.

It is a further purpose of the invention to provide a filling machine for composite containers as hereinbefore referred to in which the difference in rigidity of the interior bag and its exterior reinforcement is used for further purposes.

Still a further purpose of the invention is to provide a filling machine for containers as referred to in which the rigidity of the exterior reinforcement is utilized to open the top of the container in the filling station of the machine.

Still a further purpose of the invention is to provide a filling machine for composite containers of the type referred to in which the rigidity of the exterior reinforcement is utilized in a station of the machine at which the interior bag is closed.

Still further purposes and advantages of the machine will appear from the following specification in connection with the accompanying drawing, in which—

FIGURE 1a is a front and top perspective view of the right hand half or end of a machine made according to the invention,

FIGURE 1b is a similar front and top perspective view of the left hand half or end of the machine shown in FIGURE 1a,

FIGURE 2a is another front and top perspective view showing the innards of the right hand half or end of the machine shown in FIGURE 1a, most of the supporting members and framing having been removed in order to more clearly illustrate the construction and operation of said machine,

FIGURE 2b is another front and top perspective view showing the innards of the left end half or end of the machine shown in FIGURE 1b, most of the supporting members and framing having been removed in order to more clearly illustrate the construction and operation of said machine,

FIGURE 3 schematically shows a perspective view of a container and details of the machine at the stage of operation just prior to insertion of a cardboard blank in the bottom of the container,

FIGURE 4 is a perspective view of a container to be filled and closed in the machine according to FIGURE 1, and

FIGURE 5 is a container according to FIGURE 4 seen in bottom view.

In the drawing a machine is shown which has a first magazine 50 for collapsed containers 52 of the type referred to, a device 54 which is operable to successively open the containers by spreading their substantially flat side walls apart and means 56 which are operable to deliver consecutive bags 52 from the first magazine 50 to the device 54.

The machine furthermore comprises means 60 which are operable to provide a space or gap between the bottom end of the interior bag of the composite container and the adjacent part of its exterior structure. This space serves to admit a strip of relatively stiff material delivered from a second magazine 80 to be inserted by means of suitable supply means 100.

From the opening device 54 the container is after insertion of the strip delivered to conveyor means generally designated by 120 by means of which it is transported to a plurality of stations for further processing.

A first station 140 comprises means for conditioning the top end of the container for filling and means for filling a predetermined amount of material into the container.

A second station 160 comprises means which are operable to close the interior bag of the container.

A third station 180 has means which are operable to bend the closed top end of the interior bag down and to fold one of the closing flaps of the exterior structure down over the filled bag, and a fourth station 200 comprises means for folding the other closing flap down over the first flap.

Furthermore the machine comprises means 20 which are operable to adjust the relative height of the stations and the surface of the conveying means 120, and driving means 23 for the conveying means, etc.

The container with which the machine according to the invention is intended to work is shown in FIGURE 4 where it is generally designated by 1. This container comprises a collapsible bag 2 of a material of relatively small rigidity having a closed bottom end 3 and an open top end 4. This bag is combined with a structure 5 of substantially self-sustaining material which comprises a bottom portion 6, two side-wall portions 7 and two closing flaps 8 and 9. Only the side-wall portions 7 are secured to the flap exterior sides of the bag 2.

The bottom end 3 of the bag 2 is closed and bent against one of the side walls of the bag 2 as disclosed in United States Patent No. 3,272,423, referred to hereinbefore. Thereby, the bottom end of the interior bag 2 has on one side of the middle a plurality of layers and on the other side of the middle only one layer. The bottom portion 6

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is at one end provided with a crescent-shaped recess 10, see FIGURE 5.

The top flaps 8 and 9 are connected with the respective side-wall portions 7 along folding lines 11 and 12. The middle of the folding line 11 of the one flap is cut to provide a slot 13 substantially of the shape shown in FIGURE 4. When the corresponding flap 8 is bent down, a relatively wide slot will thereby be provided between the flap 8 and the side wall 7 with an upwardly extending portion 14 at the top of the side wall 7.

The other flap 9 is at its upper end provided with a closure flap 15 connected with the flap 9 along a folding line 16.

Those sides of the interior bag 2 which are not embraced by the exterior structure 5 are foldable inwardly along vertical folding lines 17 and the bottom portion 6 of the exterior structure 5 is provided with a folding line 18.

As will be appreciated the collapsed containers which are stacked in face-to-face relationship in the magazine 50 are substantially flat because the interior bags 2 are folded inwardly along the folding lines 17, and the bottom portions of the exterior structures 6 are folded along the folding line 18.

As will be appreciated this container is a composite container structure which comprises the foldable interior bag with exterior reinforcements only on the opposite flat side walls of the interior bag. This composite container structure has the character of a foldable bag which can be delivered folded flat to the customers and which can be opened up for the purpose of filling in the same manner as any other foldable bag by spreading the flat side walls from each other. While a traditional foldable bag without an exterior reinforcement is opened up with a substantially flat bottom, the exterior reinforcement of the composite container is, due to its rigidity, inclined to resist the opening at the bottom with the result that the bottom flaps of the container when its flat side walls have been spread from each other form an acute angle such as illustrated in FIGURE 3.

The machine according to the invention includes means for completing this opening of the container so as to provide a substantially flat bottom surface on which the container can stand upright during its further transport through the machine to the filling and closing stations.

More specifically with reference to the drawing, the machine according to the invention comprises the first magazine 50 in which collapsed containers 52 are stacked in face-to-face relationship. The magazine 50 is in the form of an open frame structure which is slightly sloping so that the bags 52 will automatically pile up against the lower end of the magazine. Adjacent this lower end the device 56 is provided for sequentially feeding the containers 52 from the magazine to the opening device.

The feeding device 56 comprises a pivotably mounted arm 53 which at its lower end is provided with a suction cup 55. The device 56 furthermore comprises means 51 for controlling the pivoting movement of the arm 53, and vacuum operated means (not shown) for rendering the suction of the suction cup 55 effective and ineffective.

A container is supplied from the magazine 50 in the following manner:

The suction cup 55 is brought into engagement with the lowermost container 52 whereafter the suction is rendered effective and the arm 53 is swung out from the magazine whereby a container 52 is pulled out through the open end of the magazine 50. The arm 53 is pivoted to a position in which the container is substantially vertical above a funnel 57 which leads to the opening device 54 whereafter the suction is rendered ineffective and the container is released to fall down into the funnel 57.

The device 54 which effectively provides a station operable to receive and open the containers is in the form of a wall structure 58 with an interior cross section which

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substantially corresponds to the cross section of an opened container having apertures in the two opposite side walls which correspond to the flat side walls of the container. Outside the apertures of the structure 58 two groups of suction cups 59 and 61 are mounted for reciprocation in a direction perpendicular to the side walls of a collapsed container which is supported in the station 54. The reciprocation of the suction cups 59 and 61 is controlled by means of pneumatic or hydraulic cylinders 62. When a collapsed container has been received in the structure 58, the suction cups 59 and 61 are moved together so as to engage the opposite side walls of the container. The suction is thereafter rendered effective and the suction cups moved away from each other, whereby the opposite flat side walls of the container structure are moved away from each other so as to partly open the container. The opening of the container is, however, only completed at the top end, because the rigidity of the material of the exterior structure of the container will keep the flaps of the bottom portion 6 at an acute angle with a shape of the bottom substantially as shown in FIGURE 3.

In order to flatten the bottom 6 of the container so much that the empty container can stand upright on the bottom, a flattening device which is most clearly illustrated in the exploded view of FIGURE 3 is provided comprising a reciprocable member 63 having a downwardly sloping front portion the front edge of which extends to below the underside of the bottom before it is flattened completely. The reciprocable member 63 is in the form of an elongate substantially flat member, the top surface of which is in the level of the bottom when it is flattened. As obvious from FIGURE 3, forward reciprocation of the member 63 in the direction of the arrow shown will initially cause the sloping front portion of the member 63 to engage the bottom flaps of the opened container which is firmly held in position by means of the suction cups 59 whereby the bottom flaps of the container will be flattened. When the member 63 is further reciprocated, the flattened bottom will stand on the top surface of the member 63.

In addition to the reciprocable member 63, a further reciprocable structure generally referred to by 60 is provided. This structure comprises a transverse member 66 which extends over the surface of the member 63 in spaced relationship thereto. The transverse member 66 is mounted on a suitable reciprocable structure which can be constructed in different ways and as schematically illustrated in FIGURE 3 comprises a pair of elongate members guided for reciprocation in guide means (not shown). A pair of abutments 68 is provided on the reciprocable member 63 operable to engage the structure 60 during forward reciprocation of the member 63 so as to thereby enable the structure 60 to participate in the forward reciprocation in the direction of the arrow shown in FIGURE 3.

On the transverse member 66 a member 67 is provided operable to provide a slot between the bottom of the interior bag and the exterior reinforcement. The member 67 is in the form of a finger-like member which is pivotably mounted on the transverse member 66 and adapted to enter the space between the bottom of the interior bag and the exterior reinforcement so as to provide a space therebetween in order to facilitate the subsequent introduction of a strip of rigid material which serves the purpose of providing a flat bottom.

The magazine 80 contains blanks 81 of a relatively rigid material, for example cardboard. The width of these blanks corresponds substantially to the width of the bottom portion 6 of the container.

The magazine 80 is mounted with its lower end at a distance from the upper surface of the member 63, substantially corresponding to the thickness of one blank 81. By means of a reciprocable flat feed member 100 with substantially the same thickness as the blanks 81, the lowest blank in the magazine 80 which rests on the

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upper surface of the member 63 can be pushed forward on the top surface of the member 63 and pass under the finger 67 into the space between the bottom end 3 of the bag and the bottom portion 6 of the exterior structure. During the forwarding of the blank, the finger 67 will pivot slightly upwards thereby providing a further space between the bottom end 3 and the bottom portion 6. Obviously, the thickness of the blank 81 causes the finger 67 to lift slightly upward off the bottom portion 6.

When a blank 81 has been fully inserted in the bottom end of a container 52, the member 63, the device 60 and the flat feed member 100 are withdrawn out of engagement with the container, and the suction action of the suction cup 61 is released, whereafter the suction cups 61, the adjacent side of the frame structure 58 and the bottom of the frame structure are moved in a direction away from the container. When the bottom of the frame structure 58 is fully withdrawn, the suction action of the suction cups 59 is released so that the container falls freely down on the supporting surface of the conveyor 120.

The conveyor means comprise a lower conveyor 120, and an upper conveyor 115.

The conveyor 120 comprises an endless belt 121 which is supported on and driven by rollers or sprocket wheels 122 and 123 at each end of the machine in such a way that the upper run of the belt moves horizontally in the direction from the input end of the machine towards the output end of the machine.

The upper conveyor 115 is driven in synchronism with the lower conveyor 120 with its operative or lower run spaced a predetermined distance above the upper run of the lower conveyor 120.

The conveyor 115 is in the form of a pair of spaced laterally disposed members such as chains 118 and 119 which are transversely connected by means of a plurality of transverse rod members 116. The chains 118 and 119 are supported on and driven by a plurality of pairs of sprockets 111, 112, 113, 114 and 117. The horizontal distance between the transverse members 116 corresponds substantially to the width of the flat sides of the containers 52, and the vertical distance between the lower run of the conveyor 115 and the upper run of the conveyor 120 is somewhat smaller than the height of the side walls of the containers 52 between the bottom portion 6 and the folding line 11. The conveyor 115 is furthermore synchronised with the control means which open the bottom of the frame structure 58 upon completion of the insertion of a strip 81 in the bottom of the container and subsequent withdrawal of the push-in device so as to ensure that the released container will fall down between two subsequent transverse rods 116.

As apparent from FIGURE 2, the sprockets 111, 112 and 113 for the upper conveyor are spaced vertically from the sprockets 114 and 117 in such a manner that the vertical distance between the upper and the lower run of the conveyor 115 underneath the opening station 54 is smaller than the height of the container so as to ensure that when a container is released from the opening station, it is received by the frame structure formed by the transverse members 116 of the conveyor 115 and guided safely down to stand on the lower conveyor 120.

The vertical distance between the lower and the upper run of the rest of the conveyor 115 is larger at the remaining part of the machine so as to provide space for the various equipment which belongs to the filling, sealing and closing stations to be described in more detail in the following.

As will be appreciated the containers will hereby be forwarded by means of the two conveyors 115 and 120 in such a manner that they will stand upright during their passage through the various stations 140, 160, 180, 200, etc.

The station 140 comprises means 141 for opening the top end of a container 52 when it enters the station and means for filling a predetermined amount of goods into the opened container.

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The opening means 141 comprise in broad terms means operable to selectively engage the top flaps of the exterior reinforcement of the composite container structure and spread the top flaps away from each other so as to thereby open the top of the interior bag. Obviously, hereby the rigidity of the exterior structure is utilized.

More specifically the opening means comprise a pair of laterally spaced substantially flat elongate members 142 disposed in parallel relationship and a pair of guide members 143 disposed between the members 142.

The distance between the exterior guide members 142 corresponds substantially to the width of the container when opened. The middle portions of the guide members 143 are spaced a distance which is slightly less than the width of the opened container and are arranged so close to the interior surfaces of the members 142 that narrow slots are provided between the members 142 and the middle portions of the members 143 operable to receive each one of the top flaps 8 and 9 of the exterior reinforcement of the composite container structure.

The interior members 143 are merging towards the entrance end of the station 140 and are at the entrance end provided with curved lips operable to engage the top of the interior bag and guide it into the space between the members 143 while the top flaps 8 and 9 of the exterior reinforcement structure are guided into the space between the members 142 and 143.

When the container moves into the station 140, the top flaps 8 and 9 of the exterior reinforcement are guided into the space between the exterior rail 142 and the merging rail members 143a and 143b. This action will partly close the top of the interior bag 2. When, however, the bag 2 has entered the station completely, the interior bag 2 will be opened automatically due to the specific structure of the bag and because the exterior reinforcement has been spread outwardly by the suction cups 59 and 61.

It will hereby be appreciated that when the opened up container is conveyed towards the filling station 140, the top of the interior bag will be guided into the space between the members 143 while the top flaps of the exterior structure will be spread apart so that when the container is at the middle of the station, it will be opened up thereby that the exterior top flaps are spread away from each other.

At the outlet end of the station 140, the interior members 143 are duplicated so as to form a narrow exit for the top of the interior bag whereby the latter is folded to be at least partly closed while still keeping the top flaps spread out.

The filling device 144 which may comprise any suitable out-portioning device including a weighing device is disposed laterally adjacent the device 141 and the delivery of a portion is synchronised with the conveyor means 120 in such a manner that a portion of the goods to be filled into the containers is delivered from the device 142 into the container by means of a suitable guide spout extending inwardly to a position directly above the bag (not shown) each time a container is placed below the device 142.

The subsequent station 160 in the transport direction comprises means for closing and if desired sealing the top end of the interior bag 2. In cases where the interior bags are made from a laminated material such as plastic-laminated paper, the sealing of the bag is preferably made by welding of the interior coating. In this case the closing means comprises a heating device 161, for example a pair of electrically heated elements 161a and 161b.

As in the case of the station 140 also the station 160 includes guide means operable to retain the top flaps 8 and 9 of the exterior structure spaced from each other and spaced from the top of the interior bag which comes out partly folded from the station 140.

To this purpose the station 160 includes a pair of spaced guide members 164 between which a relatively narrow slot is provided. The entrance of this slot is at 164a funnel-like with two curved lips of the guide members

164. The entrance to the station 160 is provided so close to the outlet end of the station 140 that the top flaps of the container will come into engagement with the exterior of the guide members 164 before the remaining part of the container has left the station 140.

In the embodiment of the station 160, the heating members 161a and 161b are supposed only to condition the interior bag for sealing by heating the interior coating of synthetic resin on the laminated paper sufficiently to enable the sealing to be effected by the subsequent passage of the top end of the interior bag through a sealing device which comprises a pair of rollers 162a having toothed portions operable to engage the top end of the bag. These rollers are driven from a suitable gear 163.

After leaving the station 160, the container has been thus filled and the interior bag 2 has been sealed while the closing flaps 8 and 9 of the container are still standing upright.

After the closing station 160 in the transport direction a printing device 170 is arranged. This printing device comprises a supporting rail 171 and an idling printing roller 172 having a printing surface 173 which is provided with a composition of relief letters or figures representing a code which for example may indicate the day and year of the packing operation. The printing surface 173 is pressed against the opposite side of the rail 171 by means of a spring-loaded device which is not shown in the drawing. When the closed and filled container passes the device 170, the rail 171 guides the flap 8 into the contact area between printing surface 173 and the rail 171 so that the movement of the flap will rotate the roller 172 and thereby cause printing of the code on the flap 8.

The station 180 comprises an arrangement of guiding rails 181, 182, 183 and 184. The rail 183 is curved in such a manner that its receiving end will catch the upstanding flap 8 and guide it under the rail 183 so that the flap 8 is folded down over the contents of the container. Thereby the upstanding closed end of the interior bag 2 will also be folded over the contents of the container and as this upstanding end is longer than half of the distance between the flat side walls 7 of the package, the upper edge of the flap will cause the upper end of the bag 2 to be folded upwards against the other flap 9, thereby giving thus upper end a sharp bend which secures a tight closing of the bag, if the latter is not welded. Simultaneously, the rail 181 which is also curved will catch the flap 9 and guide the upper portion 15 of the flap in such a manner that this upper portion is folded into a horizontal position in a narrow space provided between the rail 181 and the rail 182.

When the container leaves the station 180 is thus in the following condition:

The flap 8 is closed over the contents of the container together with the upper end of the bag 2 of which the uppermost portion is standing upright in engagement with the still vertically disposed flap 9.

The extreme portion 15 of the flap 9 is folded to a horizontal position.

Further in the transport direction a glueing device 187 is arranged in such a manner that the upper surface of the flap 8 is provided with a longitudinal glue band. The rail 184 guides the flap 9 in such a manner that it is folded over the flap 8 where the inside of the flap 9 is secured to the outside of the flap 8 by the adhesive applied by the device 187. Hereby also the extreme portion of the upper end of the interior bag 2 is folded over the flap 8. Due to the configuration of the slot 13 in the flap 8, the upstanding portion 14 will catch the portion 15 of the flap 9 when this last mentioned flap is folded over the flap 8. It should be noted that when the flap 8 has been bent down, the portion 14 extends above the bent-down flap 8 and when the flap 9 is bent down the upstanding flap 15 will engage that side of the flap 14 which faces the interior of the bag 2 and thereby provide a "catching action." The flap 15 is not necessary in containers such

as for frozen food which are discarded after having been opened but is of advantage in containers which are stored by the user because it enables reclosing.

When the containers leaves the station 180 at the output end 200 it is thus in the following condition:

The flap 8 is folded over the contents of the container and the flap 9 is folded over the flap 8 together with the extreme portion of the upper end of the interior bag 2 in a sharp bend. The flap 9 is secured to the flap 8 and the portion 15 extends downward through the slot 13 into the container.

The container is now ready for storing, further processing, such as freezing, or shipping and can be conveyed further from the machine in any suitable manner.

Those parts of the machine described in the foregoing are all except for the conveyor 120 and its drive 122 and 123 supported on a frame 21 which in its turn is adjustably supported on a stationary frame or base 22.

The height of the frame 21 relatively to the base may be adjusted by means of a manually operable device 20.

The frame 21 is supported on the top ends of a plurality of screw-threaded spindles 25 each of which is supported in a screw-threaded bracket 26 on the base 22. The spindles are rotatable by means of gears 27, 28 of which the gear wheels 28 are supported on a horizontal shaft 29 having a crank handle 30 at one end. As will be appreciated the frame 21 can be raised and lowered by turning the handle 30. Hereby the height of the various stations 140, 160, 180 and of the conveyor 115 over the supporting surface of the conveyor 120 can be adjusted to different heights of the containers 52. In this manner the machine is adaptable to various different heights of containers 52 within certain limits.

In the frame 21 a pair of parallel guiding rails 31 are provided adjacent the sides of the upper run of the conveyor 120 so as to guide the containers conveyed by the chain 121 therebetween.

The conveyor 120 and the various control means driven in synchronism therewith is driven intermittently by means of a device 23 which comprises a ratchet wheel 24a which is indexed by means of a double acting pressure cylinder 24b.

Obviously the machine according to the invention described hereabove furthermore comprises a great number of means for controlling the operations of the various parts of the machine and coordinating and synchronizing these operations. These means may, however, be constructed in various ways which will be evident to those skilled in the art and need not be further described.

As will be appreciated the invention is not limited to the embodiments shown and described hereabove but the machine may within the scope of the invention be modified in various ways. Thus, for example, the endless belt 121 may be substituted by any other endless means such as flat belts, and the upper conveyor 115 may be substituted by for example V-belts provided only that these belts can be run in mutual synchronism and in synchronism with the other operations performed by the machine. Also the means of the various stations may be modified in many ways.

I claim:

1. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of opposite inwardly foldable side walls, a closed bottom and an open top; and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag when opened up to a level below the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened, in combination: a

receiving station for sequentially receiving collapsed composite containers,

means in said station for spreading said side portions of said container from each other and thereby open said container; and

means for inserting a strip of relatively rigid material between said bottom of the interior bag and the bottom flap portions, the width of said rigid strip being substantially equal to the width of the bottom of the container when fully opened whereby said bottom flap portions are retained substantially flat.

2. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of opposite inwardly foldable side walls, a closed bottom and an open top; and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag when opened up to a level below the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened, in combination: a receiving station for sequentially receiving collapsed composite container,

means in said station operable to engage at least one of said side portions of said container and to draw said side portion away from the other side portion and thereby open said container, and

means for inserting a strip of relatively rigid material between said bottom of the interior bag and the bottom flap portions, the width of said rigid strip being substantially equal to the width of the bottom of the container when fully opened whereby said bottom flap portions are retained substantially flat.

3. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of opposite inwardly foldable side walls, a closed bottom and an open top; and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag when opened up to a level below the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened, in combination: a receiving station for sequentially receiving collapsed composite containers,

a vacuum responsive device in said station operable to engage said container and draw said side portions away from each other and thereby open said container and at least partly fold said bottom flap portions inwardly, and

means for inserting a strip of relatively rigid material between said bottom of the interior bag and the bottom flap portions the width of said rigid strip being substantially equal to the width of the bottom of the container when fully opened whereby said bottom flap portions are retained substantially flat.

4. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of opposite inwardly foldable side walls, a closed bottom and an open top; and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag when opened up to a level below the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened, in combination:

a receiving station for sequentially receiving collapsed composite containers,

means in said station for spreading said side portions of said container from each other and thereby open said container and fold said bottom flap portions against said bottom of said interior bag to partly flatten said bottom and means in said station operable to engage said partly flattened bottom of said composite container to force said bottom flaps of said composite structure into a substantially flattened configuration,

means for inserting a strip of relatively rigid material between said bottom of the interior bag and the bottom flap portions, the width of said rigid strip being substantially equal to the width of the bottom of the container when fully opened whereby said bottom flap portions are retained substantially flat.

5. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of opposite inwardly foldable side walls, a closed bottom and an open top, and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag when opened up to a level below the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened, in combination: a receiving station for sequentially receiving collapsed composite containers,

means in said station for spreading said side portions of said container from each other and thereby open said container; and

means for inserting a strip of relatively rigid material between said bottom of the interior bag and the bottom flap portions, the width of said rigid strip being substantially equal to the width of the bottom of the container when fully opened whereby said bottom flap portions are retained substantially flat, and means operable after the insertion of said strip to release said container from said receiving station.

6. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of opposite inwardly foldable side walls, a closed bottom and an open top; and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened, in combination: a receiving station for sequentially receiving collapsed composite containers,

means in said station for spreading said side portions of said container from each other and thereby open said container; and

means for inserting a strip of relatively rigid material between said bottom of the interior bag and the bottom flap portions, the width of said rigid strip being substantially equal to the width of the bottom of the container when fully opened whereby said bottom flap portions are retained substantially flat, means operable to release said container from said receiving station after the insertion of said strip, and conveyor means operable to receive said released container having lower conveyor means operable to support said container on said substantially flat bottom and upper conveyor means operable to forcibly forward said container.

7. In a machine for processing a collapsed composite container for filling, said container being of the type com-

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prising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of opposite inwardly foldable side walls, a closed bottom and an open top; and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag when opened up to a level below the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened, in combination: a receiving station for sequentially receiving collapsed composite containers,

means in said station operable to spread said side portions of said containers away from each other and thereby open and partly flatten the bottom of the inner bag, means adapted to force said bottom into substantially flat configuration and means operable to insert between the bottom of the inner bag and the bottom flap portions a strip of relatively rigid material operable to retain said substantially flat bottom configuration after release of said container from said receiving station.

8. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of oppositely inwardly foldable side walls, a closed bottom and an open top; and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag when opened up to a level below the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened, in combination: a receiving station for sequentially receiving collapsed composite containers,

means in said station separating and spreading the outer side portions of said containers from each other and thereby open and partly flatten the bottom of said inner bag, an elongated platform having a sloping end and being mounted for reciprocation, means operable to reciprocate said platform into engagement with said partly flattened bottom of the container and force said bottom into a substantially flattened configuration, and means operable after said flattening to insert between the bottom of the inner bag and the bottom flap portions a strip of relatively rigid material operable to retain said flattened bottom configuration.

9. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of oppositely inwardly foldable side walls, a closed bottom and an open top; and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag when opened up to a level below the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag when opened, in combination: a receiving station for sequentially receiving collapsed composite containers, means in said station separating and spreading the outer side portions of said containers from each other and thereby open and partly flatten the bottom of said inner bag, an elongated reciprocal platform having an inclined end portion, moveable between an inoperative retracted position out of engagement with said container and an operative projected position in engagement with said partly flattened bottom to force said bottom into a substantially flattened configuration, means operable to reciprocate said platform to said operative position, means on said platform operable in said opera-

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tive position to provide a gap between the bottom of the bag and the flap portions of the exterior strip, and means operable to insert a strip of relatively rigid material into said gap operable to retain said flattened configuration of said bottom after release of said container from said station.

10. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of oppositely inwardly foldable side walls, a closed bottom and an open top; and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag when opened up to a level below the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened comprising: a walled structure for receiving the collapsed composite container, said structure having an interior cross-section which substantially corresponds to the cross-section of the container when fully opened and is provided with a bottom aperture through which the bottom flap portions and bottom of the bag protrude;

vacuum-responsive means associated with said walled structure for engaging the external side portions to separate and spread the outer side portions of said containers from each other and thereby open and partly flatten the bottom of said inner bag, an elongated platform having a sloping end and being mounted for reciprocation, means operable to reciprocate said platform into engagement with said partly flattened bottom of the container and force said bottom into a substantially flattened configuration, and means operable after said flattening to insert a strip of relatively rigid material between said bottom of the interior bag and the bottom flap portions, the width of said rigid strip being substantially equal to the width of the bottom of the container when fully opened whereby said bottom flap portions are retained substantially flat.

11. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of oppositely inwardly foldable side walls, a closed bottom and an open top; and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag when opened up to a level below the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened, in combination: a receiving station for sequentially receiving collapsed composite containers,

means in said station for separating and spreading the outer side portions of said containers from each other and thereby open and partly flatten the bottom of said inner bag, an elongated platform having a sloping end and being mounted for reciprocation, means operable to reciprocate said platform into engagement with said partly flattened bottom of the container and force said bottom into a substantially flattened configuration, and means operable after said flattening to insert a strip of relatively rigid material between the bottom of the inner bag and the bottom flap portions, operable to retain said flattened bottom configuration, and in which said receiving station is in the form of a wall structure having an interior cross-section which substantially corresponds to the cross-section of the container when fully opened and is provided with a bottom aperture through which the bottom flap por-

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tion and bottom of the bag protrude for contact with the platform; said walls being provided with apertures to receive said separating means, and said separation means being adapted to engage said external side portions and draw them away from each other.

12. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of opposite inwardly foldable side walls, a closed bottom and an open top; and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag when opened up to a level below the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened, comprising a magazine for collapsed containers, a station for receiving containers from said magazine, means operable to successively supply containers from said magazine to said station, means in said station operable to separate the outer side portions from each other and thereby open the container; and means in said station operable after the opening thereof to provide a gap between the closed bottom of the bag and the bottom flap portions, means in said station operable to supply a relatively rigid strip of material and insert said strip into said gap to maintain the container fully opened, means operable in second and third stations for respectively filling and closing said composite container, and means operable after insertion of said strip in said gap to release said composite container from said station and means transporting said container to said filling and closing stations.

13. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of opposite inwardly foldable side walls, a closed bottom and an open top; and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend from the bottom of the bag when opened up to a level below the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened, comprising in combination: a magazine for collapsed containers, a station for receiving said containers sequentially, comprising a wall structure defining an interior space of a cross-section which substantially corresponds to the exterior cross-section of one of said composite containers when opened up and having apertures in the opposite walls which correspond to the flat side walls of the container when inserted in said wall structure,

means for sequentially supplying collapsed containers from said magazine to said station, vacuum-responsive means in said station operable to engage the flat surfaces of the container through the apertures in said wall structure, and means operable to spread said side walls of said container apart by means of said vacuum-responsive means and thereby partly open up said container, an aperture in said wall structure adjacent the bottom thereof extending between said opposite walls thereof having apertures therein,

a bottom flattening structure mounted for reciprocation between an inoperative position outside said wall structure and an operative position inside said wall structure having an inclined surface operable to engage the bottom of said container in the position thereof being partly opened and operable to press

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the bottom flaps of said container upwardly to flatten out said bottom substantially,

a substantially flat surface extending from the top of said inclined surface operable to engage said flattened bottom when said flattening structure is further reciprocated into its operative position, and

a finger-like member pivotable mounted in vertical direction above said substantially flat surface biased against said surface,

a structure supporting said finger-like member mounted for reciprocation between an inoperative retracted position and an operative position with said finger-like member extending in the space between the bottom of the interior bag of said container and the bottom flaps of the exterior structure thereof,

means operable in response to the reciprocation of said bottom flattening structure upon completion of its reciprocation to its operative position to actuate said structure which supports said finger-like member to reciprocation to its operative position.

a magazine for strips of relatively stiff material of a width which substantially corresponds to the width of said flattened bottom of said composite container, means operable to sequentially supply strips from said magazine,

and means operable upon completion of the reciprocation of said finger member to its operative position to supply said strip into the space between the bottom of the interior bag of the container and the bottom of the exterior structure thereof,

means operable to open the bottom of said wall structure upon completion of the insertion of said strip into said composite container structure as well as to render said vacuum-responsive means inoperative to release said container from said wall structure,

conveyor means underneath said wall structure operable to receive a container released therefrom and including lower conveyor means for supporting the bottom of said container, and

upper conveyor means effectively providing a plurality of compartments each being operable to receive the upper part of a container,

means for synchronously moving said conveyor means, a filling station located adjacent said conveyor means having guide means operable to engage the top flaps of said container structure and spread them away from each other to open the top of the interior bag of said composite container,

a subsequently operable closing station having gripping means for said top flaps of the exterior reinforcement of said composite container, and closing means closing the top of the interior bag of said container.

14. In a machine for filling a composite container having an inner collapsible bag of relatively soft material which has a pair of opposite substantially flat side walls, a pair of inwardly foldable side walls, a closed bottom and an open top; and an exterior protective strip of relatively stiff material having side portions secured to and covering the flat side walls of the bag between the bottom of the bag and a point remote from the top end of the bag, flap portions at the top adapted to be folded inwardly into engagement with the top and flap portions at the bottom adapted to be folded inwardly into engagement with the bottom of the bag comprising: means operable to initially open said container and to introduce a strip of relatively rigid material into the space between the bottom of said bag and the bottom portion of said exterior protective strip so as to effectively provide a substantially flat bottom operable to enable said container to stand upright, a plurality of stations operable in sequence to fill and close said container and having guide rail means operable to engage said top flap portions during the passage of the container through said stations, and conveyor means comprising first conveyor means operable to support said containers in upright position

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and second conveyor means including transverse members defining compartments for said containers and operable to convey said containers through said stations to effect said engagement and closing of said flap portions as the containers are conveyed through said stations.

15. In a machine for processing a collapsed composite container for filling, said container being of the type comprising an interior collapsible bag having a pair of opposite substantially flat side walls, a pair of opposite inwardly foldable side walls, a closed bottom and an open top, and an exterior cover in the form of a strip of substantially self-supporting material having side portions which are secured to each of the flat side walls and extend between the bottom of the bag and a point remote from the top of the bag and which are connected by means of bottom flap portions which extend over the bottom of said bag and are adapted to be folded against the bottom of the bag when opened, said self-supporting material also having upper flap portions foldable into contact with the upper portion of the bag, in combination: a receiving station for sequentially receiving collapsed composite containers,

means in said station for spreading said side portions of said container from each other and thereby opening said container; and

means for inserting a strip of relatively rigid material between said bottom of the interior bag and the bottom flap portions, the width of said rigid strip being substantially equal to the width of the bottom of the container when fully opened whereby said bottom flap portions are retained substantially flat, means operable to release said container from said receiving station after the insertion of said strip, conveyor means operable to receive said released container having lower conveyor means operable to support said container on said substantially flat bottom and upper conveyor means operable to force forward said container and a plurality of sequentially operable stations for filling said container and closing the top end thereof, and a pair of guide members for engaging the container between the upper flap portions and the upper portion of the bag and thereby open the upper part of the bag by the movement of the container during conveyancing past said guide members.

16. In a machine for processing a collapsed composite container for filling, said container being of the type having an interior bag with a closed bottom and open top attached to relatively stiff external side walls and bottom portion in an upright position, upper portions of the side walls and bag foldable to close the top of the container, comprising first conveyor means adapted to support said containers and second conveyor means including transverse members defining compartments for said containers and adapted to convey the containers; a first station provided with diverging guide members for engaging the inner upper portions of the external side walls; and second station for closing the top of the container; a filling station associated with said first station and adapted to feed material into the bag; said diverging guide members engaging the inner surface of the upper external side wall portion as the container is conveyed into contact with the guide members to automatically force the interior bag into a more opened attitude by movement of the containers past said members,

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17. In a machine for processing a collapsed composite container for filling, said container being of the type having an interior bag with a closed bottom and open top attached to relatively stiff external side walls and bottom portion in an upright position, upper portions of the side walls and bag foldable to close the top of the container, comprising first conveyor means adapted to support said containers and second conveyor means including transverse members defining compartments for said containers and adapted to convey the containers; a first station provided with diverging guide members for engaging the inner upper portions of the external side walls; and second station for closing the top of the container; a filling station associated with said first station and adapted to feed material into the bag, said guide members engaging the inner surface of the upper external side wall portions as the container is conveyed into contact with the guide members to automatically force the interior bag into a more opened attitude by the movement of the containers beyond said members, said conveyor means comprising a pair of endless tracks, one positioned above the other, the lower of said tracks being adapted to receive the bottom of the container and the upper of said tracks being adapted to support the portions of the container above the bottom, said tracks moving synchronously for conveyancing.

18. In a machine for processing a collapsed composite container for filling, said container being of the type having an interior bag with a closed bottom and open top attached to relatively stiff external side walls and bottom portion in an upright position, upper portions of the side walls and bag foldable to close the top of the container, comprising first conveyor means adapted to support said containers and second conveyor means including transverse members defining compartments for said containers and adapted to convey the containers; a first station provided with diverging guide members for engaging the inner upper portions of the external side walls; and second station for closing the top of the containers, a filling station associated with said first station and adapted to feed material into the bag, said diverging guide members engaging the inner surface of the upper external side wall portions as the container is conveyed into contact with the guide members to automatically force the interior bag into a more opened attitude by the movement of the containers past said members, said conveyor means comprising a pair of endless tracks, one positioned above the other, the lower of said tracks being adapted to receive the bottom of the container and the upper of said tracks being adapted to support the portions of the container above the bottom, said tracks moving synchronously for conveyancing, and said tracks being positioned in a frame, said frame including means for vertically adjusting the level of the lower track.

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