

Sept. 20, 1971

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3,605,377

CARTON LOADING MACHINE

Filed Feb. 25, 1970

5 Sheets-Sheet 1

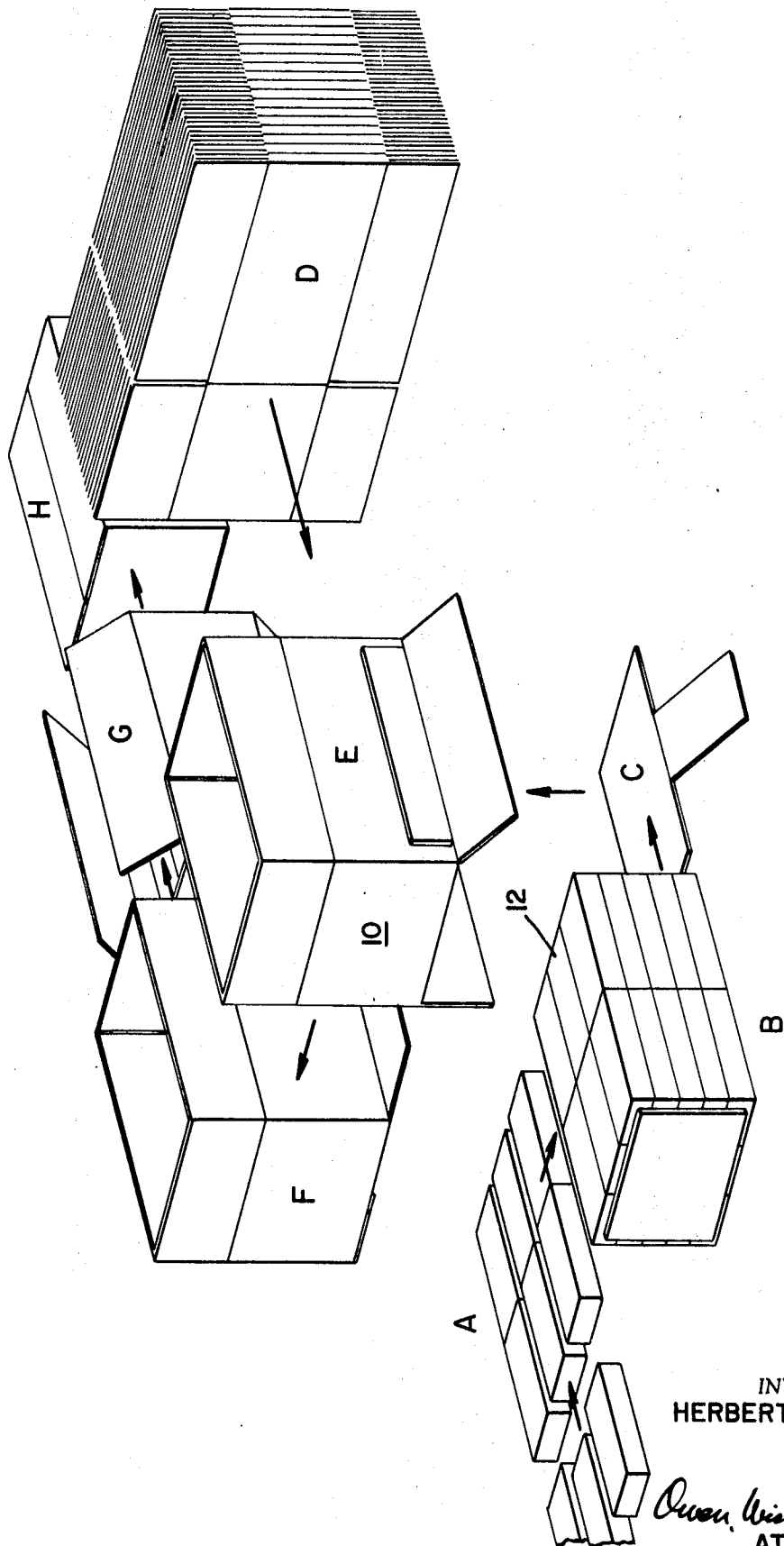


FIG-1

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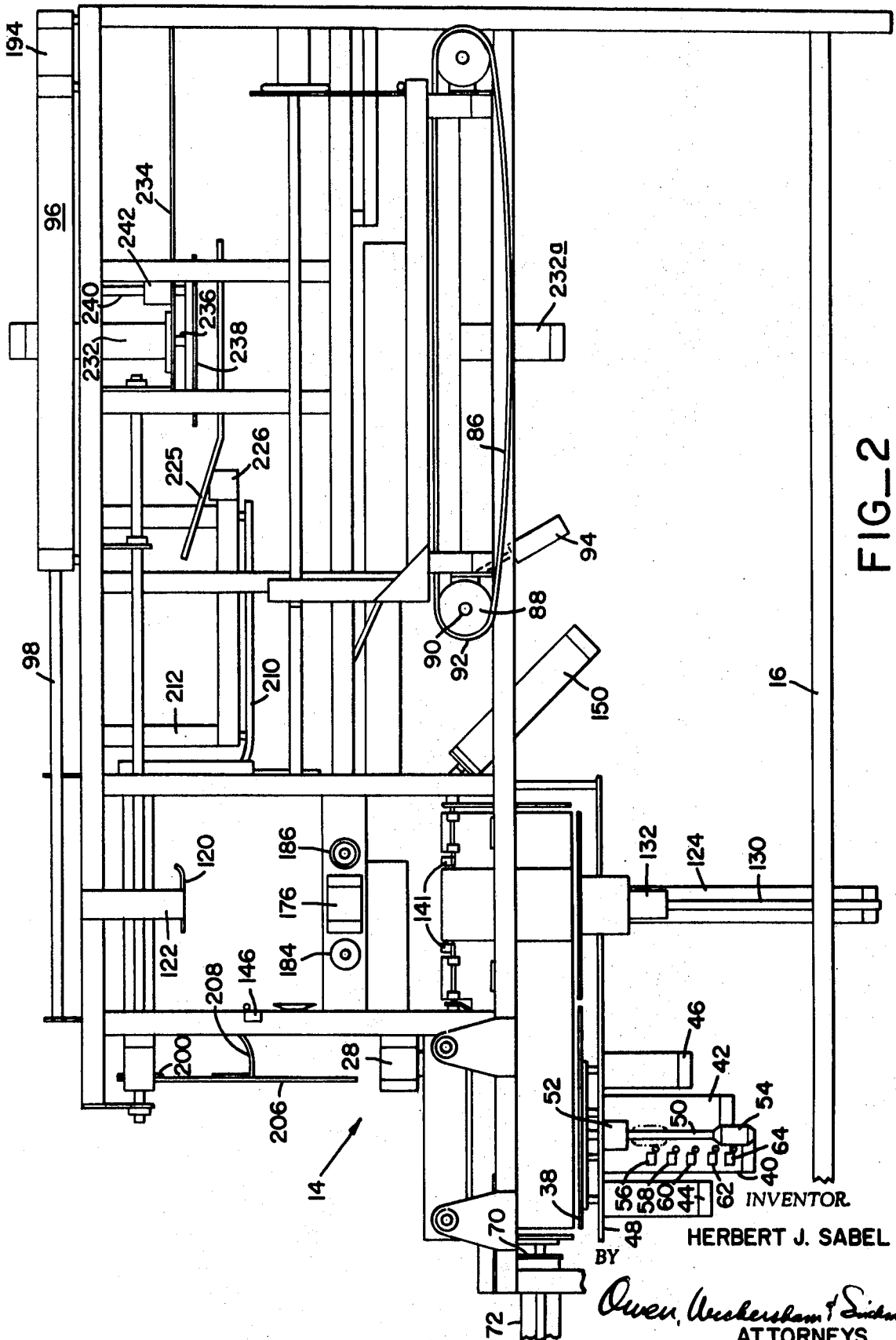


FIG-2

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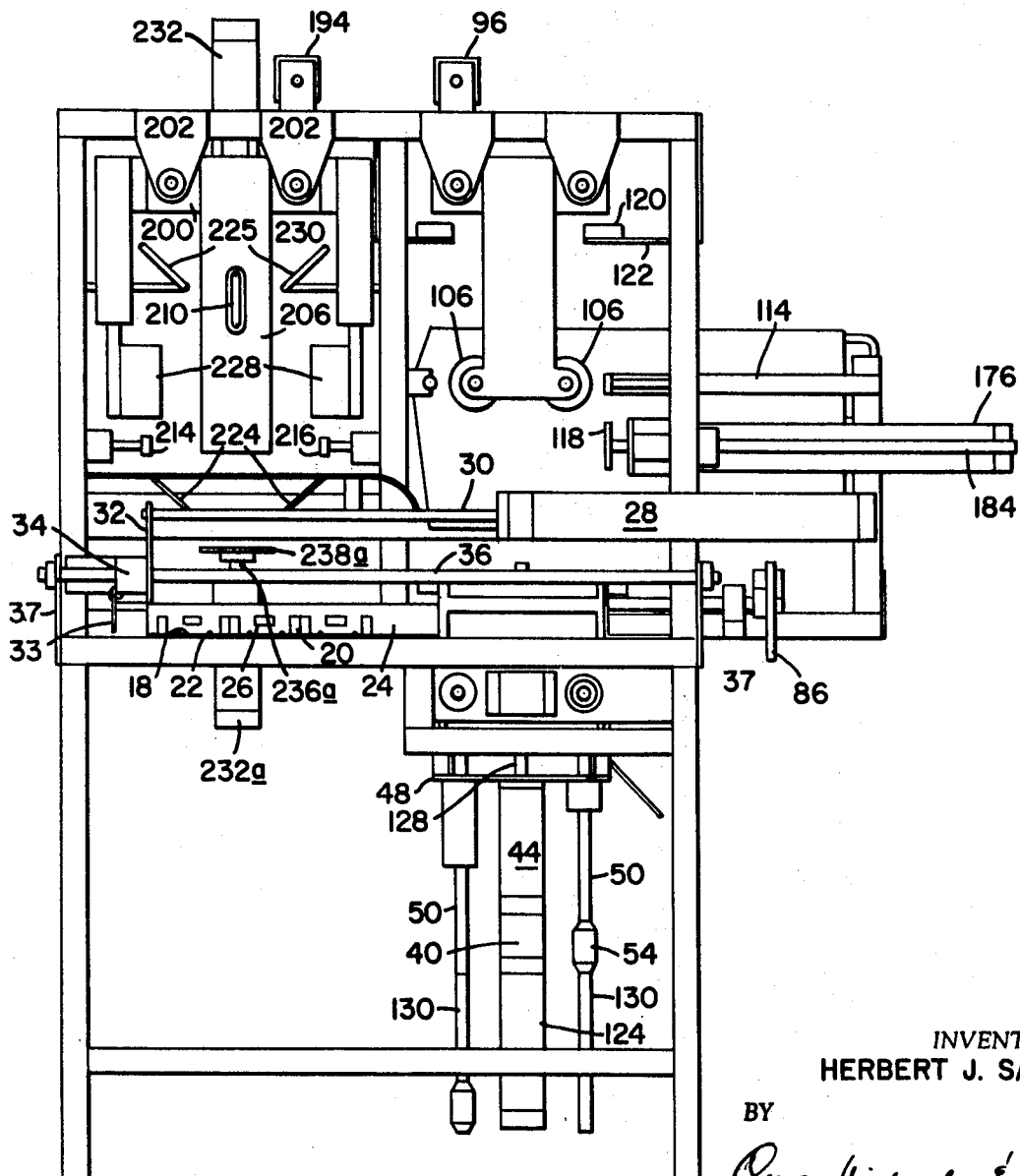
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CARTON LOADING MACHINE

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FIG_3



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CARTON LOADING MACHINE

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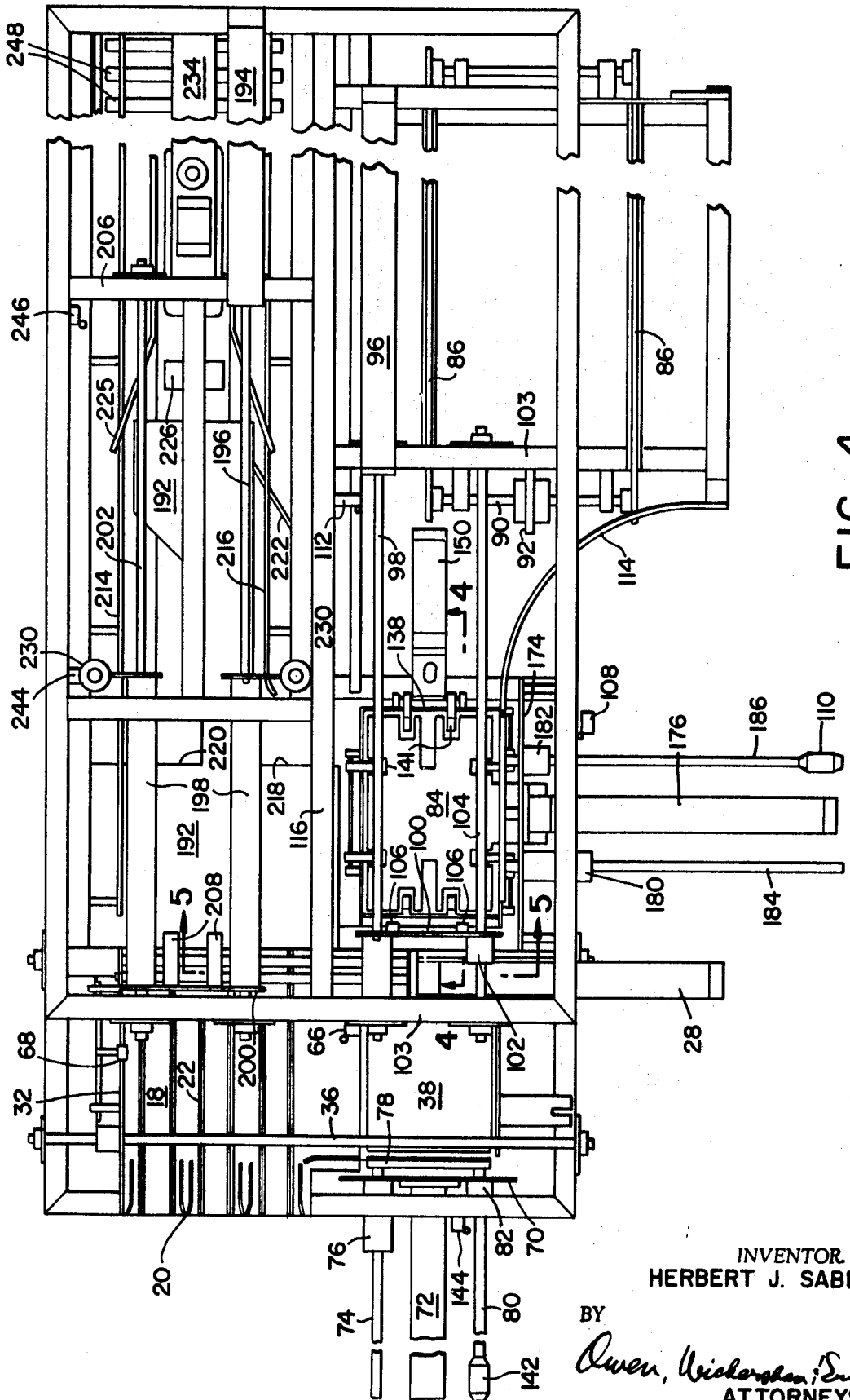


FIG. 4

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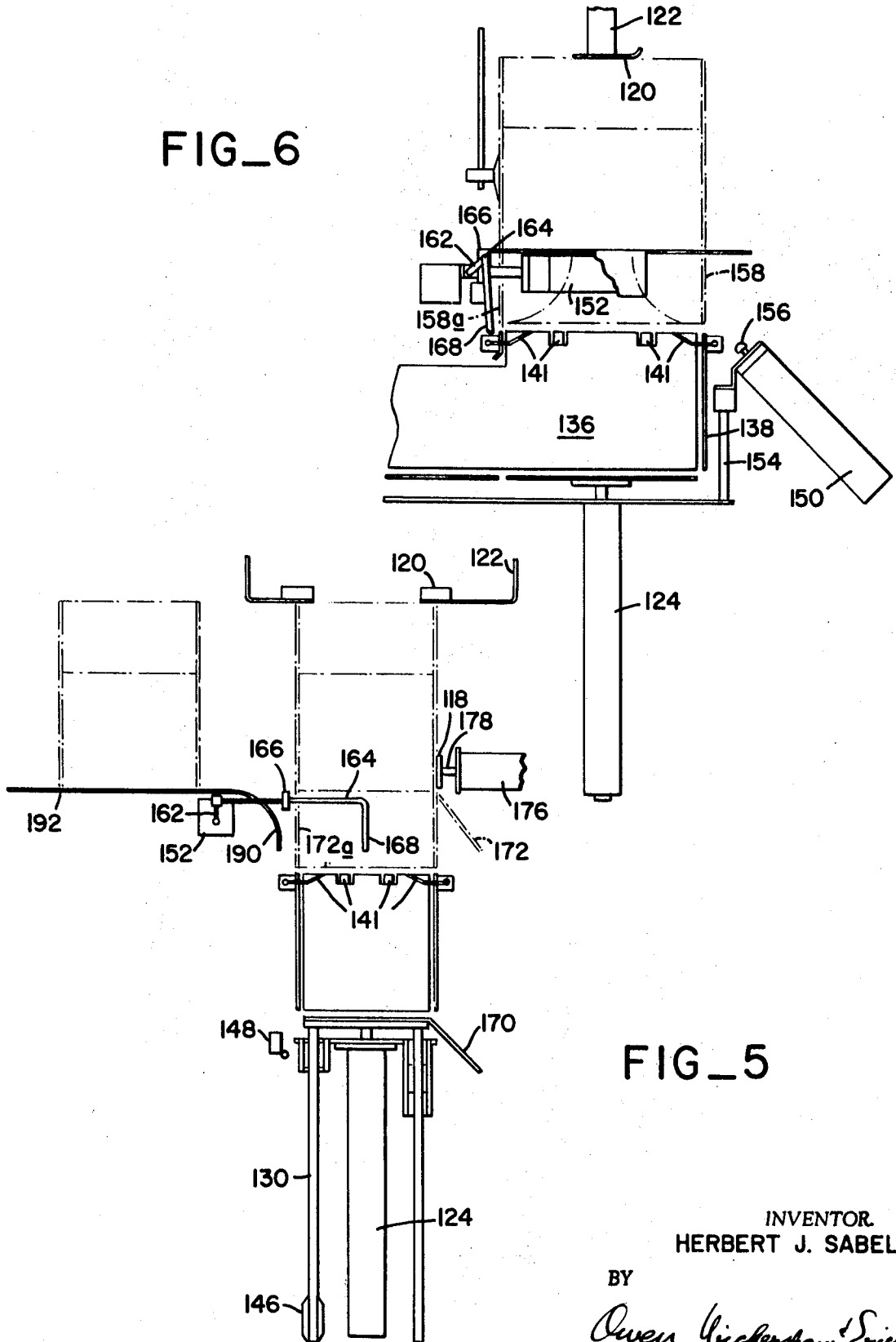
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CARTON LOADING MACHINE

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5 Sheets-Sheet 5

FIG_6



FIG_5

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CARTON LOADING MACHINE

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U.S. Cl. 53—61

14 Claims

ABSTRACT OF THE DISCLOSURE

An automatic packaging machine is disclosed for continuously loading products into a shipping carton through its open bottom. In the embodiment described, products are received from a supply source and progressively guided into a single layer and arranged in a predetermined order. As completed, each layer is moved to a stacking station which loads itself to the desired number of layers or tiers. The accumulated products in the completed stack are then moved on to an elevator platform that raises the stack upwardly and into a carton which has previously been opened and positioned above the elevator. With the products held within the open carton, its bottom end flaps are closed around the ends of the elevator platform. The carton is then pushed free from the elevator platform onto an intermediate platform with its bottom end flaps still folded. Thereafter the carton is moved longitudinally to close the bottom side flaps and the top flaps while also applying closure or sealing means such as a glue.

This invention relates to packaging machines and more particularly it relates to a machine for automatically loading articles into folding cartons or cases.

In the packaging industry various machines were heretofore developed which loaded products vertically into standard top opening boxes or cartons from the top or horizontally from one side or the end. However, for many products and packaging situations, loading from the top or side offers serious disadvantages. In top loading the products, particularly the more fragile types, are often dropped a short distance and thus can be damaged during the packaging procedure. If side or end loading of standard type top opening boxes is used, the products will be on edge if the boxes are later turned to their normal upright position, a factor that may be injurious to the products being packed. If the sided loaded boxes are allowed to remain with their closing flaps on the side after being loaded, such boxes may not be strong enough to withstand stacking or palletizing in shipment and storage. Thus, for the aforesaid reasons, as well as others, many manufacturers have sought a packaging machine for loading standard top opening boxes and yet avoid the aforesaid disadvantages. A general object of the present invention is to solve this problem.

Another object of the present invention is to provide a packaging machine that will bottom load articles into regular, slotted top opening cartons or cases which are normally provided in the flat from the box manufacturer.

Another object of the present invention is to provide a packaging machine that is reliable under fully automatic operation and requires a minimum of maintenance by relatively unskilled labor.

A more specific object of the present invention is to provide a fully automatic packaging machine that draws from a supply stack a single corrugated case folded in the flat as furnished from the case supplier. It will open the case with its top and bottom flaps extended and then locate the case at a loading station. It will then receive and accumulate in the proper pack pattern a predetermined number of products to be packaged in the open

case such as cartons or cans, move the products to a lifting platform, move the products up into the case, close the lower flaps and then the upper flaps to seal the case and make it ready for palletizing.

5 Other objects, advantages and features of the present invention will become apparent from the following detailed description of one embodiment thereof, taken with the accompanying drawings, in which:

10 FIG. 1 is a schematic view in perspective showing the steps for loading cartons in accordance with the principles of the present invention;

FIG. 2 is a view in side elevation of a packaging machine embodying the principles of my invention;

15 FIG. 3 is an end view in elevation of the machine of FIG. 2;

FIG. 4 is a plan view of the machine of FIG. 1;

FIG. 5 is a fragmentary view in section taken along line 5—5 of FIG. 4; and

20 FIG. 6 is a fragmentary view in section taken along line 6—6 of FIG. 4.

Before describing the details of my machine, reference should be made to FIG. 1, which shows, somewhat schematically, progressive positions of a group of products and a typical packing carton or case 10 as it is loaded with the products 12 in accordance with the principles of my invention. The products are first received and assembled in a predetermined packing pattern at a station A, from which they may be moved to form a stack of several layers of products at a station B. The stacked products are moved to a station C which includes an elevator platform capable of moving up and down. During or prior to the movement of the products to the station C, a carton to be loaded is removed from a supply stack D, opened up with its upper and lower flaps extended and positioned directly at a station E above station C. The elevator platform moves upwardly to push the products and funnel them inside the opened box. The end flaps of the box are then folded to a closed position and also around the ends of the elevator platform. The box is then pushed laterally, removing it from the elevator platform and moving it to a station F where one bottom side flap is closed over the end flaps. From station F, the box is moved to station G which closes the top flaps part way and positions both bottom side flaps for closing. From station G, the box is moved to station H where the carton is sealed, making it ready to palletize.

With reference now to FIGS. 2-6, a machine 14 embodying the principles of my invention and capable of performing the aforesaid sequence of operations will be described. For purposes of illustration, the machine shown is adapted for loading regular slotted corrugated cases 10 with five layers or tiers of oblong packages 12 such as packages of butter or margarine. It should be understood, however, that the principles of my invention are applicable to modified machines for loading other products of different sizes and shapes and in different quantities. The machine has a frame 16 which may be fabricated from structural members in any suitable manner. A fixed horizontal board or plate 18 forms a station A and is mounted at one end of the frame for receiving the products to be packed which may be supplied continuously from the end of an aligned movable conveyor belt (not shown). In the arrangement shown, the products to be packed are guided from the belt onto the receiving plate 18 in three lines by curved guide members 20 attached near the outside edge of the plate. A series of parallel, spaced apart ridges 22 on the plate serve as additional guide members for keeping the products aligned. The three lines of products move across the plate until they come up against a transverse stop member 24. Spaced apart along the stop member are three switch or valve members 26 each of which is aligned with one line of products (See FIG.

4). Mounted on the frame above the receiving plate is a linear actuator 28, preferably operated by compressed air and having a movable arm 30 that extends perpendicular to the lines of products and thus parallel to the fence member 24. The outer end of the arm 30 is connected to a pusher member 32 having a lower pivotal portion 33 located near one side of the receiving plate 18 when the arm 30 is extended and perpendicular to the fence member. Connected to another portion of the pusher member is a cylindrical bushing 34 through which extends a guide rod 36 that is parallel to the actuator 28. The ends of the guide rod are fixed to frame members 37 on opposite sides of the machine. The actuator 28 is energized when the receiving plate becomes completely filled with products and all three of the valve members 26 are engaged by a product package. As stated above, the power source for the actuator 28 may be some suitable fluid under pressure such as compressed air and thus the valve members 26 may be poppet type air valves of the well known type. Since such pneumatic systems and the controls therefor are well known to those skilled in the art of packaging machinery the detailed plumbing and wiring circuitry with respect to the actuator 28 and other actuators that will be described has been omitted in order to simplify the description of my invention. Other sources of power and controls for the various actuators could also be used within the scope of my invention. The valves 26 are connected in series to a source of air under pressure and thus when all three are engaged to furnish air to a control valve on the actuator 28, this actuator 28 is energized and the products 12 on the receiving plate 18 are pulled by the pusher member 33 onto an adjoining stacking plate 38 at station B. The control valves for the various actuators on my machine, which are not shown in order to simplify the drawing, may be of any suitable type such as a conventional spool valve where an air system is utilized.

Depending on the type of products being packaged, the stacking plate shown may be used to form one or more layers of products which then can be packed simultaneously in a carton. When a loading cycle commences, the stacking plate 38 is at the same horizontal level as the receiving plate 18 as shown in phantom in FIG. 2. The underside of the stacking platform is connected to the ends of actuator arms of different sizes for four different actuators 40, 42, 44 and 46 which are fixed vertically to a horizontal frame member 48. Initially, the arms of these actuators are held in the extended portion by fluid pressure in each actuator. A guide rod 50 attached to the underside of the stacking platform 38 extends downwardly through a guide bushing 52 fixed to the horizontal frame member 48 and a cam member 54 is attached to its lower end. Attached to the housing of the longest actuator 40 are a series of five spaced apart pneumatic stacking control valves 56, 58, 60, 62 and 64 which are positioned so as to be engaged and actuated by the cam member 54. The uppermost valve 56 is connected to the largest actuator 40, the valve 58 to the next largest actuator 42, the valve 60 to the actuator 44, and the valve 62 to the actuator 46. Assuming a pneumatic control system, all of the valves for controlling the stacking platform are connected through a valve 66 to a pneumatic pressure source. This valve is fixed to the frame above the stacking plate 38, and positioned so that when the actuator 38 is energized to move a group of products, a cam 68 on the member 32 actuates the valve 66 at the moment when a layer of products have reached their proper position on the stacking platform. This produces two actions. First, air is supplied to all the valves on the actuator 40 causing the uppermost valve 56 which is presently opened by the cam 54 on the guide rod 50 to operate. This operates the longest actuator 40 for that valve, causing it to retract and thereby lower the stacking platform an amount equal to the height of one layer or tier. Secondly, the valve 66 also operates to reverse the actuator 28 and return the member 32 to its

original position. The lower portion 33 pivots upwardly as it passes over products on the receiving plate 18. The stacking plate is now at a level to receive a second layer on top of the first layer, and the mechanism operates as before except that the next valve 58 is opened to operate the actuator 42 to lower the stacking plate one more increment. It will be apparent from the foregoing that any number of tiers or layers can be stacked depending on the size of the products, and the number of actuators used on the stacking platform. In any case, the stacking platform ultimately arrives at a predetermined level that is the same as an elevator platform of the next station.

Mounted on an end frame member 70 is a linear actuator 72 having an arm 74 supported in a bushing 76 on the frame member and connected to a pusher fence 78 that extends along one side of the stacking platform 38 when the actuator 70 is idle. A guide rod 80 for this actuator is also attached to the other end of the pusher fence 78 and extends through a bushing 82 fixed to the frame member 70. When the stacking platform reaches its bottom level, the cam 54 on the rod 50 operates the lower valve 64 which functions to supply air to the actuator 72. Thus, the arm 74 moves the fence 78 and the stacked articles onto an elevator platform 84 at the station C.

Prior to the time that the products reach the elevator platform 84 a carton opening and positioning means has previously removed a carton from a supply stack at the station D, opened it and positioned it above the elevator platform. The cartons 12, preferably standard regular slotted packing cases usually made of corrugated paper, are normally arranged on end in a supply stack and supported on a pair of endless spaced apart chains or belts 86. These chains are supported by pairs of sprockets 88 at each end, and at one end the sprockets are connected to a shaft 90 having a central ratchet wheel 92 which can be driven in a step fashion by an actuator 94. This actuator is controlled so that the stacked cartons are progressively moved to a feed position. On framework above the chains 86 is an actuator 96 having an arm 98 connected to a transverse plate 100 at its end. Fixed to the other end of this plate is a bushing 102 that support a guide rod 104 which extends parallel to the arm 98 and is fixed to its ends to other frame members 103. Mounted at spaced apart locations on the plate 100 are a pair of rubber suction cups 106. The actuator 96 normally operates when its control valve 108 is opened by a cam 110 during movement of a loaded carton from the station E to the station F as will be more fully explained below. A control valve (not shown) on the actuator 96 may also be manually controlled to place the first carton into position or to recycle the carton positioning means if a malfunction occurs. When the suction cups 106 engage an end panel of the nearest carton supported on the chains 86, the plate itself engages a valve 112 which causes the actuator 96 to reverse immediately, and the suction cups thus grip a carton and move it back toward a position above the elevator. After this end carbon is removed, the actuator 94 is operated to index the chains and move the stacked cartons. When the carton held by the cups 106 is moved, it engages a curved guide rail 114 whose outer end extends from one outer edge of the folded cartons near the ends of the carton stack and diverges relative to an opposite straight guide member 116 toward a pusher member 118 located to one side above the elevator. Another guide member 120 is supported by a frame member 122 above to limit the cartons vertical position. Moving a carton away from the supply stack while forcing it between the converging guide rails 114 and 116 causes it to open to its rectangular shape with all top and bottom flaps extended. The carbon is now in the loading position at station E ready to receive a load of products upwardly through its bottom.

Beneath the elevator platform, as shown in FIG. 2, is an actuator 124 connected to the frame member 48 and having an arm 128 fixed centrally to the underside of the

elevator platform. A pair of guide rods 130 are also attached to the underside of the elevator platform on opposite sides of the actuator and they extend through a pair of bushings 132 fixed to the frame member 48. Situated around three sides of the elevator in its lower loadign position are three side wall members 136, 138 and 140 which serve to support the products on the elevator platform and keep them properly stacked as they are pushed upwardly inside the carton being loaded. Around the upper edges of these wall members are a series of spaced apart pivotal guide fingers 141. These fingers normally extend horizontally inwardly from the various wall members, but when engaged by the upwardly moving products they pivot and move the bottom flaps outwardly a slight amount so that the products avoid impingement therewith and slide freely up into the carton.

As the products reach their proper position on the elevator platform by the actuator 72, and the carton to be loaded is positioned above, a cam member 142 on the guide rod 80 for the actuator 72 engages and trips a valve 144. If a carton is properly positioned for loading above the elevator, an interlocking valve 146 is open and allows air to flow through the valve 144 to the elevator actuator 124. Thus, the products are pushed upwardly until the elevator platform 84 is level with the true bottom level of the carton above it, and at this point, as shown in FIG. 5, a cam 146 on one of the actuator guide rods 130 trips another air valve 148 which controls the operation of a pair of end flap actuators 150 and 152 at the station E. As shown in FIG. 6, one actuator 150 is mounted at an angle on an upright frame member 154 located near one end wall guide 138 for the elevator 84. When its actuator arm 156 extends upwardly at an angle it will engage a downwardly extending end flap 158 and cause it to close to the horizontal position. The other actuator 152 is mounted on the frame near to and parallel with an inner side wall guide 136. The arm 160 of this actuator is connected to one crank end 162 of a rotatable rod member 164 which is supported in a bearing support 166 fixed to the frame. The other end of this rod member has a longer crank arm 168 extending therefrom which is positioned to engage and close the other bottom flap 158a of the carton.

The elevator platform is preferably made from a piece of rigid sheet metal and extending downwardly at an angle from the outer side of it is a flat member 170 which engages the outer side flap 172 of the carton being loaded as the elevator moves upwardly, as shown in FIG. 5. This cam the bottom side flap outwardly and facilitates ease of pushing the carton to the next station F.

Adjacent and parallel to the push plate 118 is a frame member 174 to which an actuator 176 is attached. The arm 178 of this actuator extends through the frame member and is fixed to the push plate. Spaced on opposite sides of the actuator are a pair of bushings 180 and 182 which support guide rods 184 and 186 that extend parallel to the actuator. The actuator 176 can be energized by the valve 148 which also controls the flaps closing actuators 150 and 152, so that the closing of the bottom end flaps 158, 158a takes place as the carton commences to be pushed off of the elevator platform.

When actuated, the push plate 118 moves the loaded carton laterally with its end bottom flaps 158, 158a still closed around the elevator plate 84. As shown in FIG. 5, when the carton moves off of the elevator toward the station F, the side flap 172a engages a curved down side portion 190 of a platform 192. This side flap is thus temporarily closed, while the other side flap 172 is bent horizontally outwardly in the open position.

Now, the loaded carton is at station F and ready to proceed through the final steps of the packaging procedure. As the actuator arm 178 extends to its full length in pushing the carton to the platform 192 a cam member 110 on the guide rod 186 engages and operates the valve 108 which controls the supply of air to a dual purpose actuator 194. This actuator is mounted on the frame

and has an actuator arm 196 connected to one of a pair of parallel, elongated bushing members 198 which are fixed at their ends to a transverse push plate 200, normally located just beyond one end of a carton on the platform 192. The bushing members 198 are slidably supported on a pair of parallel, spaced apart guide rods 202 fixed at their ends to a pair of frame members 203 and 204. When the actuator 194 is energized by opening the valve 108, a downwardly extending portion 206 of the push plate 200 bears against the end of the carton on the platform 192. Fixed to the pusher portion 206 are a pair of curved end flap folders 208. At the same level and spaced from the folders 208 on a line between them is a single end flap folder 210 which is supported on the frame by a bracket 212. As the carton is moved by the pusher 206 it is guided between a rail 214 on one side and a rail 216 on its opposite side. Several things occur as this stroke of the actuator 194 takes place. First, the bottom side flaps 172, 172a are released as the carton reaches a pair of cutout openings 218 and 220 in the platform 192. The bottom side flaps consequently tend to bend downwardly although the bottom end flaps are kept up and therefore keep the products within the carton. After being released, the front end of the bottom side flap 172 engages a sloped bar 222 which starts to fold it from its outwardly extended position around toward its normally closed position. Also, as the carton is moved from the station F, the top end flap folders 208 and the single folder 210 act to fold down the top end flaps of the carton.

Now, the carton is moving into station G, while being pulled by the member 206, and as this occurs the bottom side flaps engage a pair of angled plates 224 which deflect the bottom side flaps to a partially closed position.

At the same time the top side flaps engage a pair of folding rods 225 which partially close these flaps. Just before this folding commences, a pair of glue guns 226, mounted above and below the carton, are actuated to deposit a fast setting adhesive on the surfaces of the top and bottom end or side flaps.

As the carton is being moved by the actuator 194 from station F to station G, it engages and moves past a pair of pivotally mounted pushers 228 on its opposite sides. These pushers are each mounted in a vertical bushing 230 which is fixed to the end of an elongated bushing 198. When the actuator extends itself after a working stroke the pushers pivot so as to move past a carton located in the station G. On the next working stroke the pushers 228 bear against this carton and move it to the next station H while the pusher member 206 is moving another carton from station F to station G.

At the one closing station H, an actuator 232 is vertically mounted on a horizontal frame member 234 above the carton and has an actuator arm 236 connected to a closing plate 238. A guide rod 240, also attached to the plate, extends through a bushing 242 on the frame member 234. Below the carton, which is now supported on the sloped plates 224, is a similar actuator 232a. Its actuator arm 236a is connected to a closing plate 238a which is narrower than the gap between the plates 224. The actuators 232, 232a are energized when the actuator 194 retracts to the point where a cam 244 on the bushing 230 engages a valve 246 fixed to the frame. This allows air to flow to the control valves of these actuators and causes their closing plates 238 and 238a to push up and down and thereby seal the carton. Actuation of valve 246 also reverses the actuator 194. After the sealing has been accomplished, the sealed carton is moved by the next case to a series of rollers 248 and thence onto pallets or some other storage or shipping facility.

From the foregoing description, the operation of my machine should be readily understood. As the machine operates, it is fully automatic and the product packages flow from the receiving platform, to the stacking platform, to the elevator platform. While the embodiment shows a five layer stack of articles in three incoming

lines, it is apparent that other arrangements for receiving and stacking products can be made within the scope of the invention. When placed on the elevator platform, the products are raised and funneled into the bottom of a carton which is held above. The bottom end flaps are quickly closed around the elevator platform as the carton is pushed laterally from it and these bottom end flaps hold the products in place as the carton is pushed longitudinally to position, glue and finally close both top and bottom side flaps. As stated, the various actuators are preferably air actuated and connected in an integrated pneumatic system by appropriate air lines. Since the pneumatic circuit may be supplied in accordance with well known design practices it will not be shown in detail and no attempt has been made to show the pneumatic plumbing in the various drawing figures.

To those skilled in the art to which this invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope of the invention. The disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

I claim:

1. A machine for loading shipping cartons through the bottom comprising:

means for holding a shipping carton to be loaded in an upright position with its bottom flaps open and extended downwardly;

a horizontal elevator member located directly below said carton to be loaded;

means for moving the product to be loaded onto said elevator member;

means for moving said elevator member vertically upward into said carton;

means responsive to the positioning of said elevator member at the normal bottom level of said carton for closing the carton bottom end flaps around said elevator member;

means for pushing said carton laterally off of said elevator member with its bottom end flaps still in the closed position; and

means for closing the bottom side flaps of the carton over the bottom end flaps.

2. The machine as described in claim 1 including wall means extending upwardly adjacent the sides of the elevator member, and a plurality of pivotal guide fingers mounted on said wall means and positioned for engaging the bottom open flaps to spread them wider as the products being loaded are pushed into the carton.

3. The machine as described in claim 1 wherein said means for closing said bottom end flaps comprises a pair of actuators each having extendable arms attached to means at the ends thereof for engaging an end bottom flap and rotating it about its hinged connection on the carton.

4. The machine as described in claim 3 wherein said means for pushing said carton laterally comprises a flat pusher member, a horizontal actuator having an arm connected to said pusher member, and means for operating said horizontal actuator after said pair of actuators have commenced operating.

5. The machine as described in claim 1 wherein said elevator member comprises a relatively rigid piece of sheet metal, and vertical actuator means having an arm connected to the underside of said elevator member.

6. The machine as described in claim 1 including a carton feed means for storing a stack of cartons in an upright position in the flat and including means for removing a single carton from the stack, opening the carton to an extended position and moving it to the loaded position.

7. The machine as described in claim 6 wherein said carton feed means comprises a pair of suction cups attached to a movable mounting plate, actuator means having a movable arm connected to said mounting plate and

operable in response to movement of a carton off of said elevator member.

8. The machine as described in claim 1 including a receiving means for arranging a plurality of product packages to be loaded in a carton in a predetermined layer arrangement;

stacking means for placing a number of said layers in a vertical alignment, said means for moving the product to be loaded being operable in response to the completion of a stack of a desired number of layers.

9. The machine as described in claim 1 wherein said carton being loaded is a regular slotted type having top end and side flaps and means for closing and gluing said end and side flaps after each has been pushed free of said elevator member.

10. The machine as described in claim 1 wherein said means for closing the bottom side flaps of each carton comprises:

horizontal support means for first folding one side flap into a normally closed position and the other side flap outwardly into a horizontal, full open position after the carton leaves said elevator member, means for moving the carton off of said horizontal support so that both said bottom side flaps can bend downwardly and means for deflecting the other side flap back towards a partially closed position as the carton is moved longitudinally, means for applying an adhesive to the bottom end flaps and vertical actuator means for closing said bottom side flaps over said bottom end flaps.

11. A machine for loading shipping cartons through the bottom comprising:

means for retaining a stack of regular slotted shipping cartons to be loaded;

means for feeding one said carton from said stack to a loading position while holding it in an upright position with its bottom flaps open and extending downwardly;

means including a receiving platform for assembling a plurality of like products to be loaded in a layer having a predetermined arrangement;

means including a vertically movable stacking platform for arranging a predetermined number of layers of products in a stack to be loaded;

a horizontal elevator member located directly below said carton to be loaded;

means for moving a stack of products to be loaded from said stacking platform onto said elevator member;

means for moving said elevator member vertically upward into said carton;

means responsive to the positioning of said elevator member at the normal bottom level of said carton for closing the carton bottom end flaps around said elevator member;

means for pushing said carton laterally off of said elevator member with its bottom end flaps still in the closed position;

means for moving the loaded carton longitudinally while simultaneously commencing to close the top and bottom side flaps of the carton over the top bottom end flaps;

means for applying an adhesive to both the top and bottom flaps; and

vertical actuator means for completely closing the top and bottom side flaps over the top and bottom end flaps.

12. The machine as described in claim 11 wherein said means for moving a loaded carton longitudinally comprises an actuator with a movable arm having a pusher plate attached to one end of its said arm and a pair of pivotal pusher members located near the middle of said arm.

13. A machine for loading shipping cartons through the bottom comprising:

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means for positioning a shipping carton having bottom end and side flaps and top flaps into a loading position while holding it in an upright position with its bottom flaps open and extending downwardly;

means including a receiving platform for assembling a plurality of like products to be loaded in a layer having a predetermined arrangement;

means including a vertically movable stacking platform for arranging one or more layers of products in a stack to be loaded;

first linear actuator means for moving said products onto said stacking platform;

a horizontal elevator member located directly below said carton to be loaded;

second linear actuator means for moving a stack of products to be loaded from said stacking platform onto said elevator member;

third linear actuator means for moving said elevator member vertically upward into said carton being loaded;

means responsive to the positioning of said elevator member at the normal bottom level of said carton for closing the carton bottom end flaps around said elevator member;

fourth linear actuator means for pushing said carton laterally off of said elevator member with its bottom end flaps still in the closed position;

means including an intermediate platform for receiving a loaded carton with its bottom end flaps closed, one bottom side flap temporarily closed and the other bottom side flap open in the horizontal position;

a fifth linear actuator means for moving the loaded

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carton longitudinally a first increment during first stroke thereof while simultaneously commencing to move both bottom side flaps of the carton from a horizontal position to a partially closed position over the closed bottom end flaps;

pivotal means attached to said fifth linear actuator means for moving the loaded carton a second increment;

means for applying adhesive to said bottom flaps of the carton after movement by said pivotal means; and vertical actuator means for fully closing the top and bottom flaps of the carton.

14. The machine as described in claim 13 wherein said intermediate platform has a cutout portion for allowing the bottom side flaps of the carton to rotate downwardly as it is moved longitudinally therefrom by said fifth linear actuator means; and sloped, spaced apart guide members below said fifth actuator means for folding the bottom side flaps in a partially closed position until engaged by said vertical actuator means.

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TRAVIS S. McGEHEE, Primary Examiner

U. S. Cl. X.R.

53—164, 186, 242, 284