Oct. 22, 1963 A. L. BERGERON ETAL 3,107,774

PACKAGING MACHINE

Original Filed Feb. 13, 1957 11 Sheets-Sheet 1

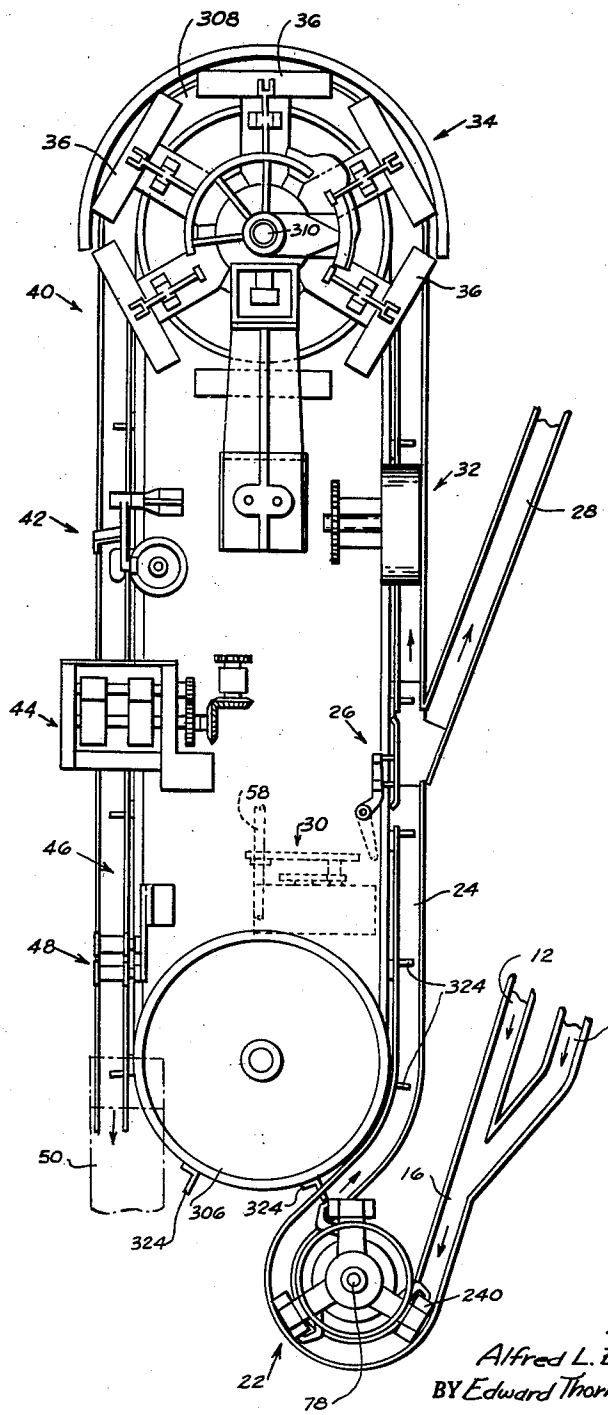



FIG. 1

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PACKAGING MACHINE

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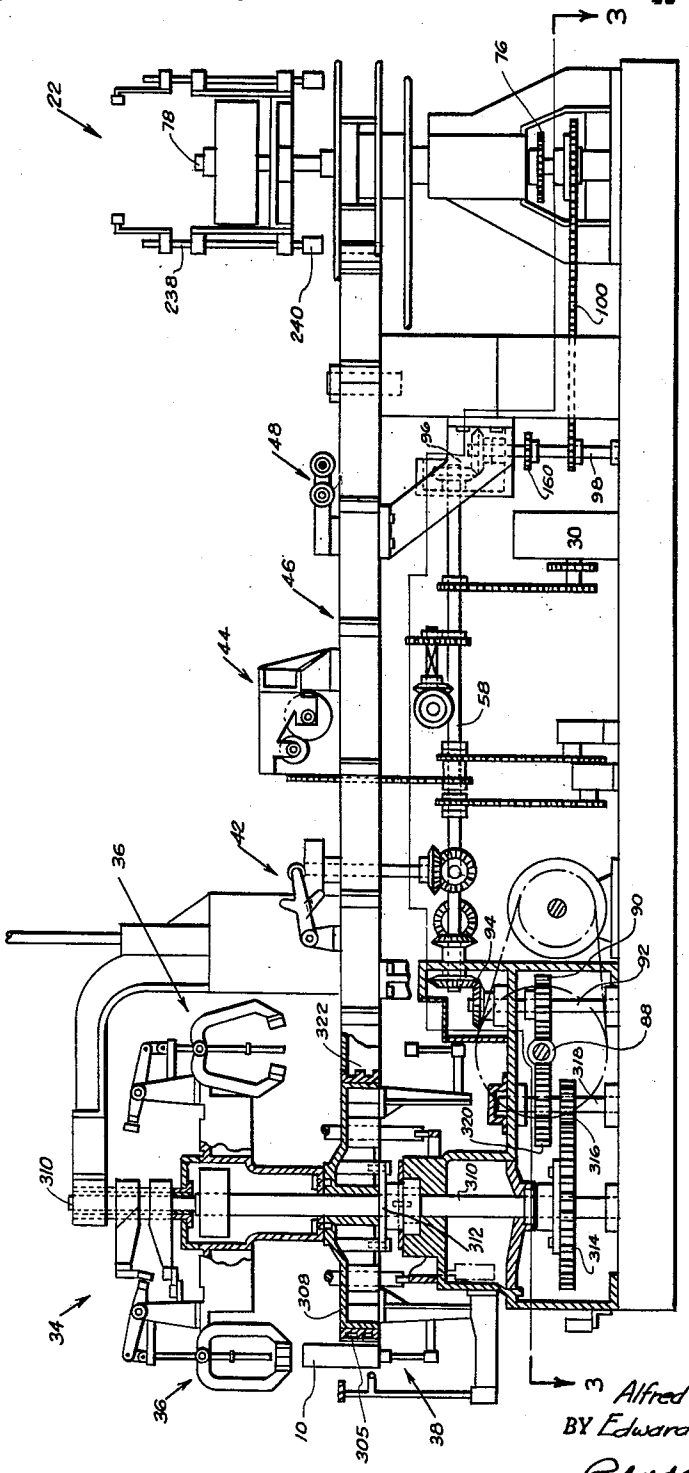



FIG. 2

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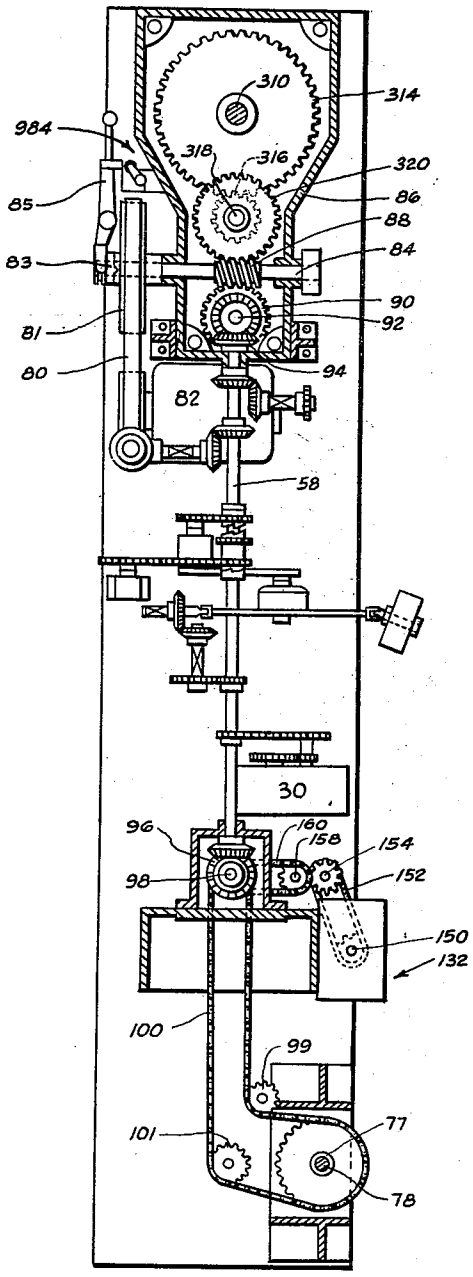



FIG. 3

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PACKAGING MACHINE

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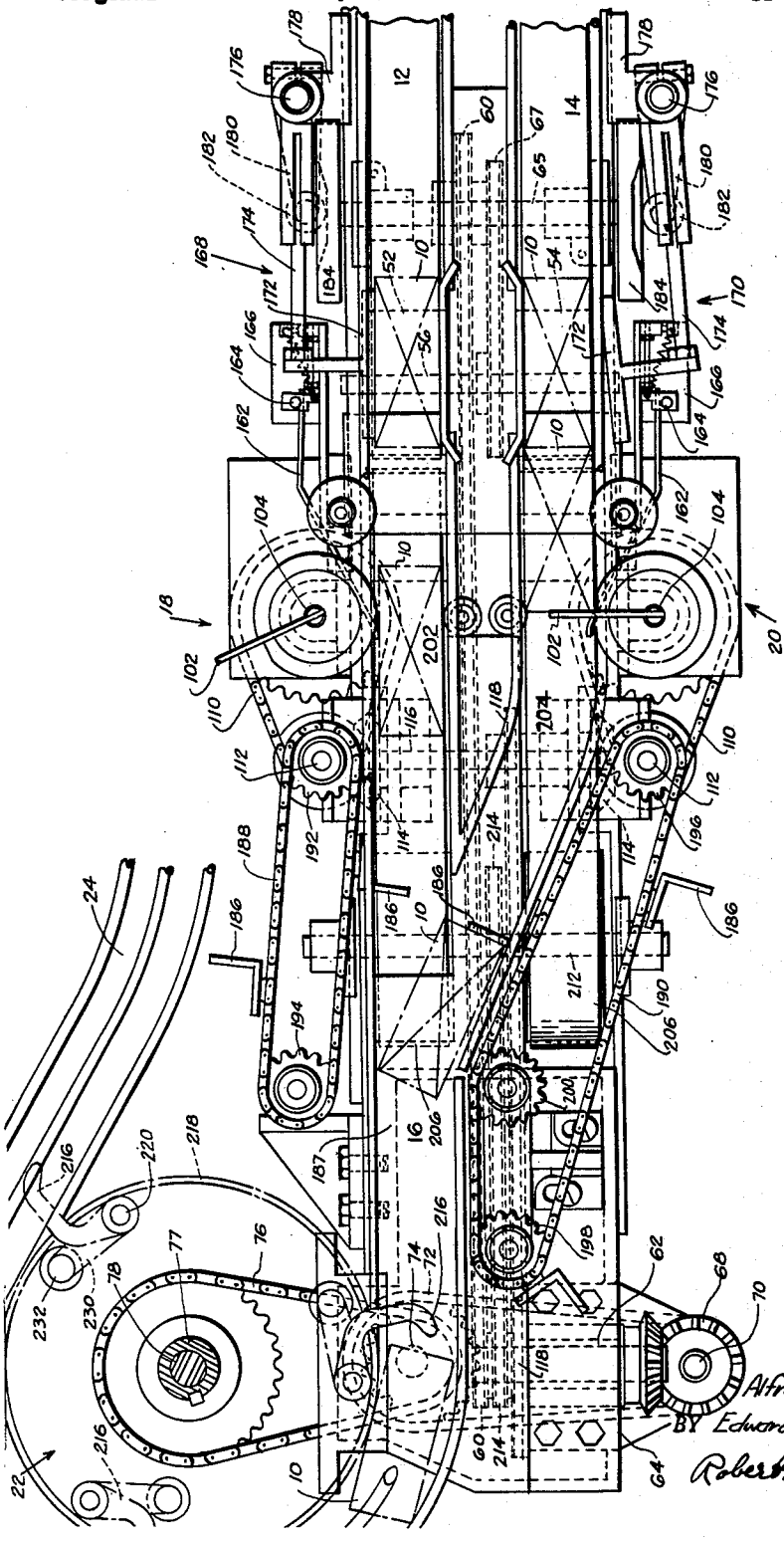


FIG. 4

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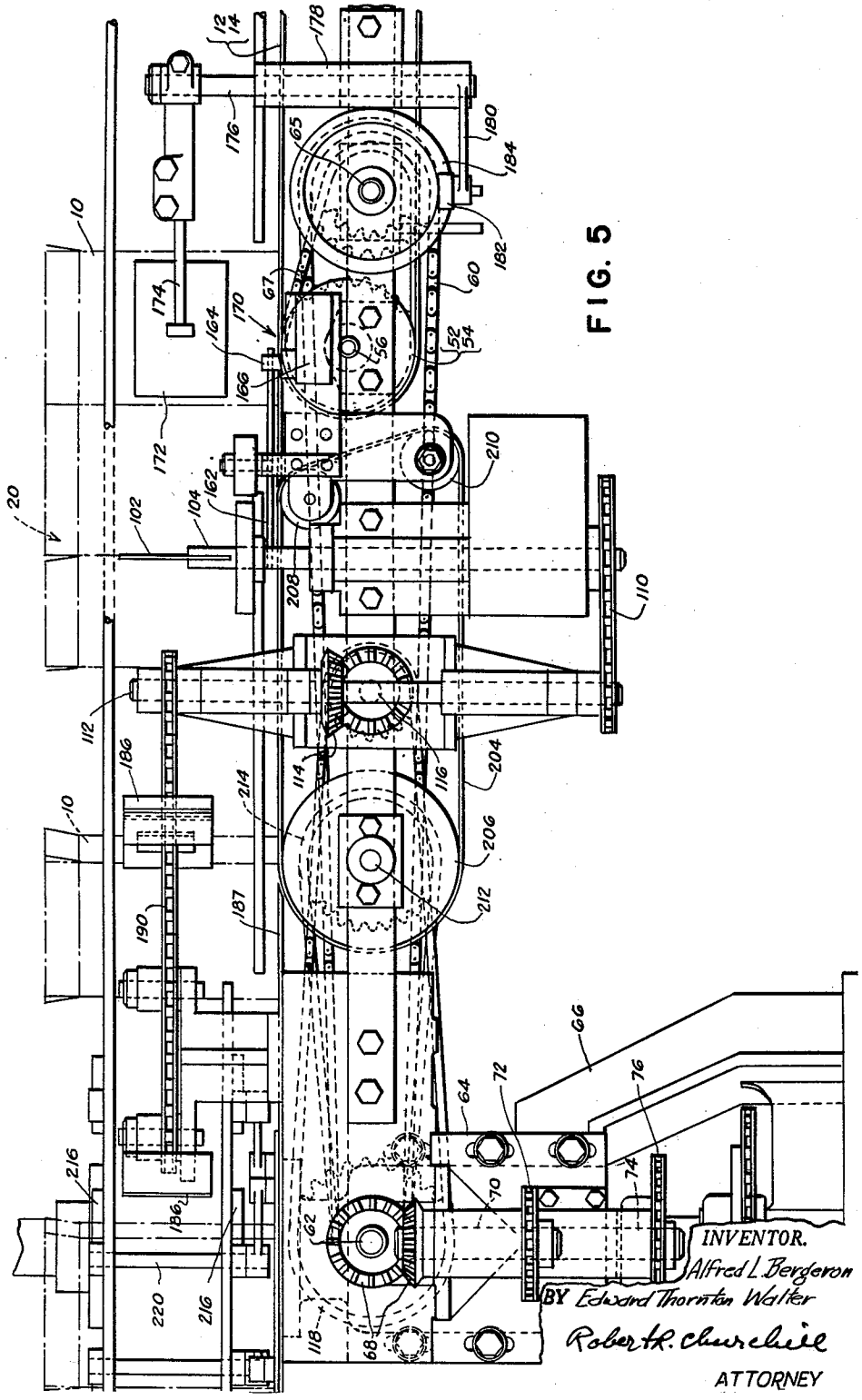



FIG. 5

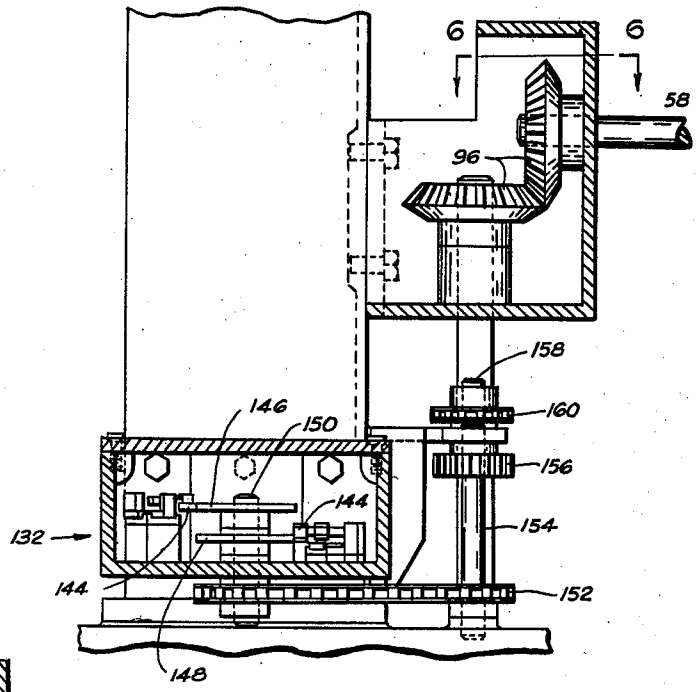
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PACKAGING MACHINE

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FIG. 7



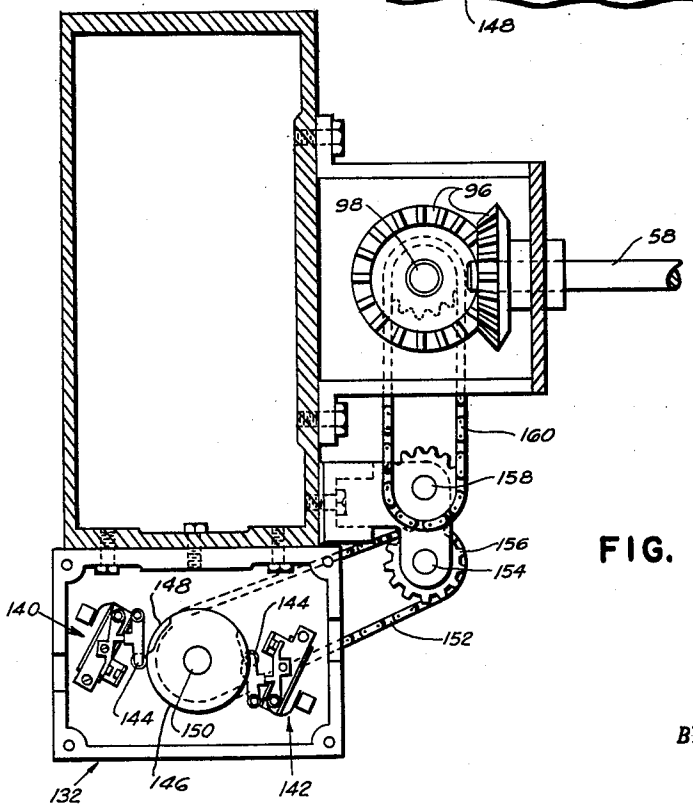




FIG. 6

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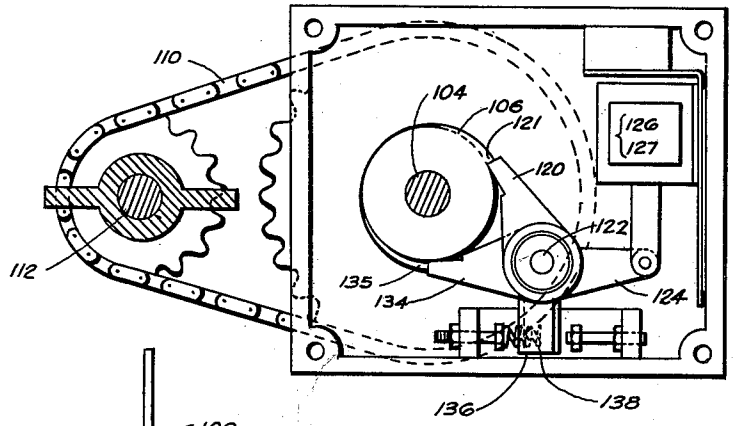



FIG. 8

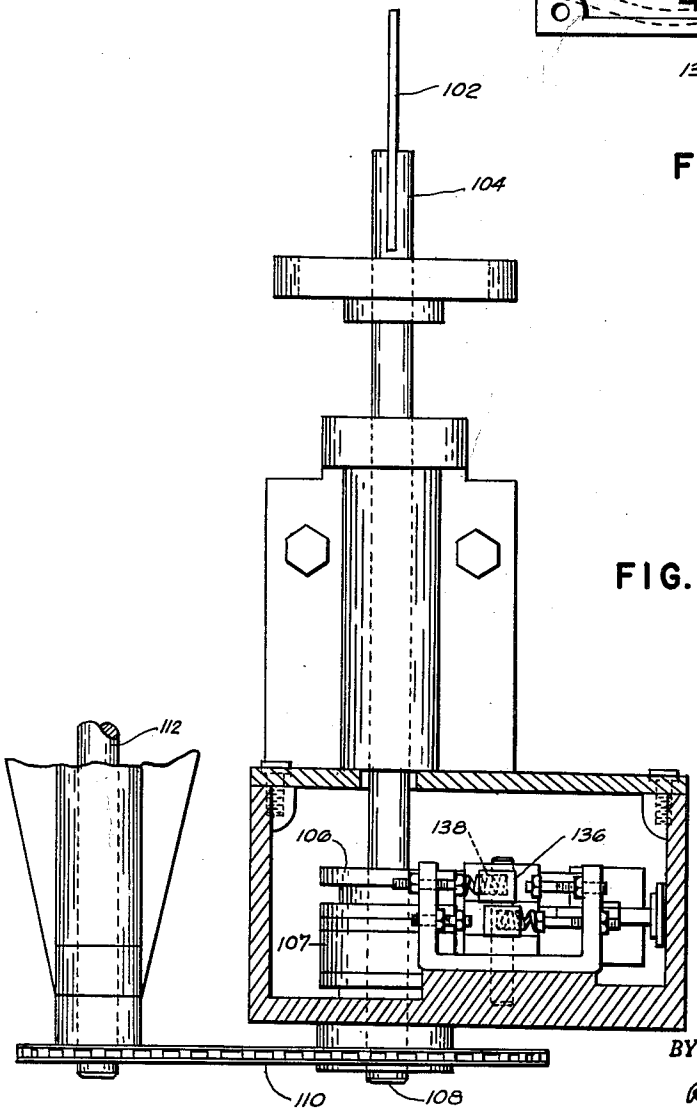



FIG. 9

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PACKAGING MACHINE

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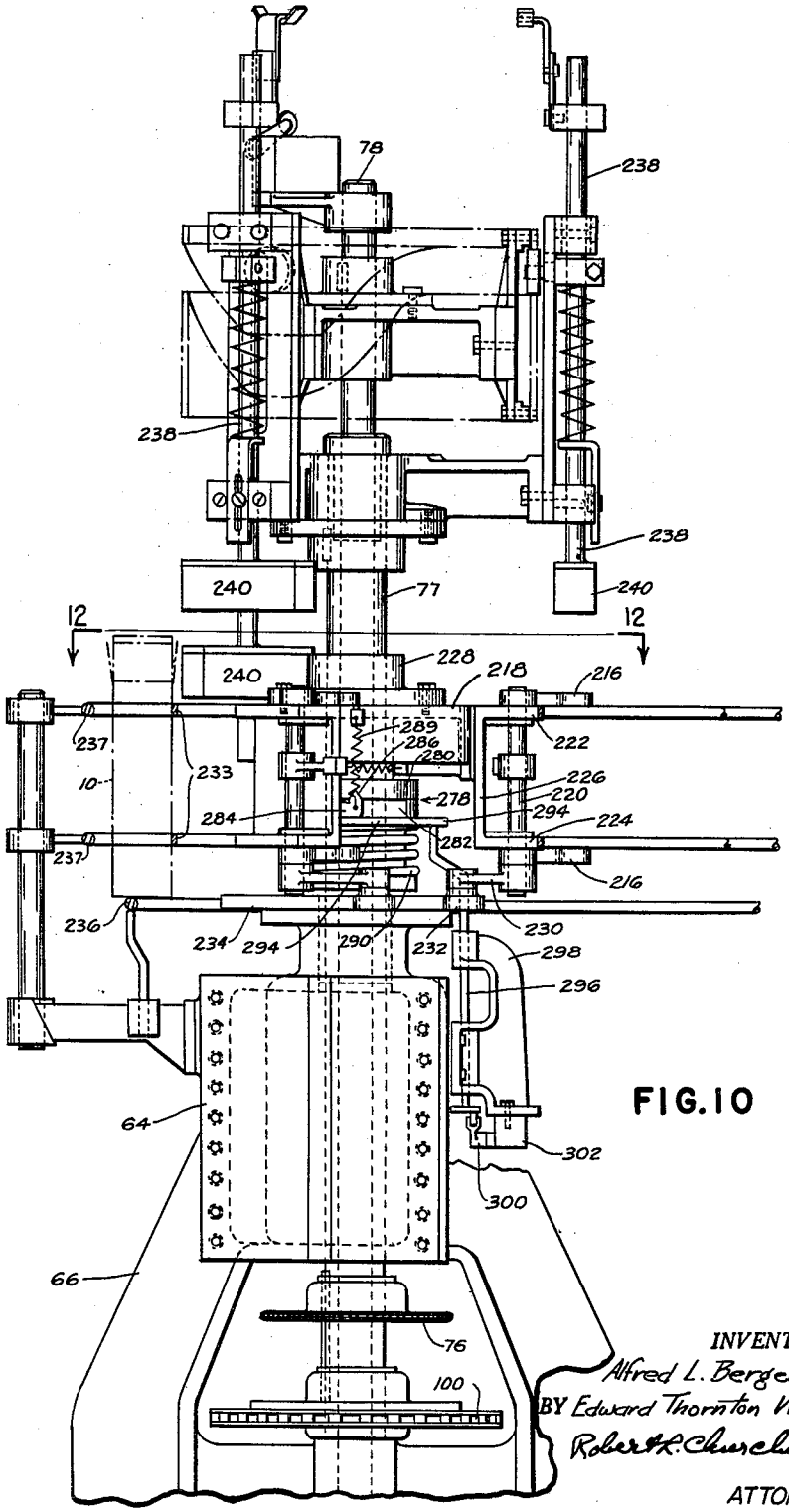



FIG. 10

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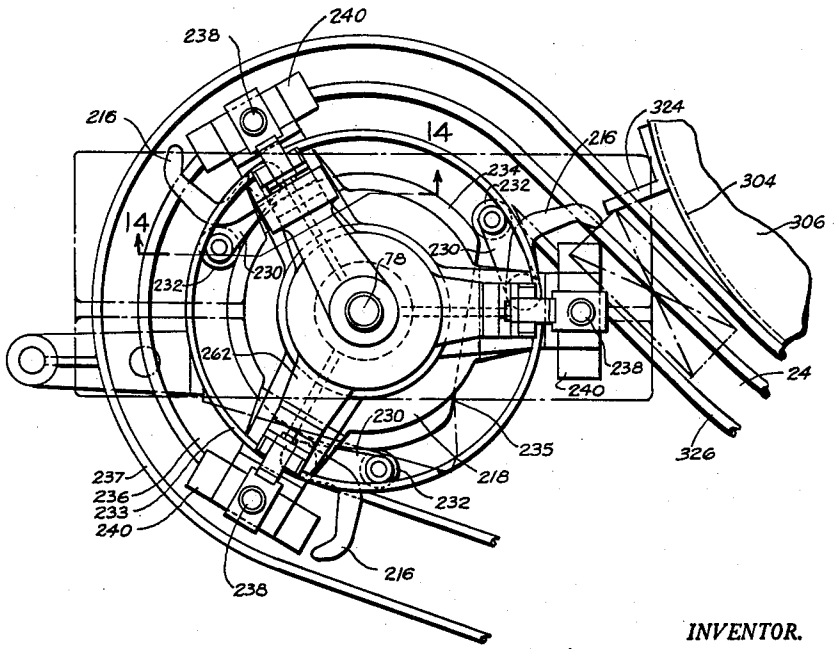



FIG. 11

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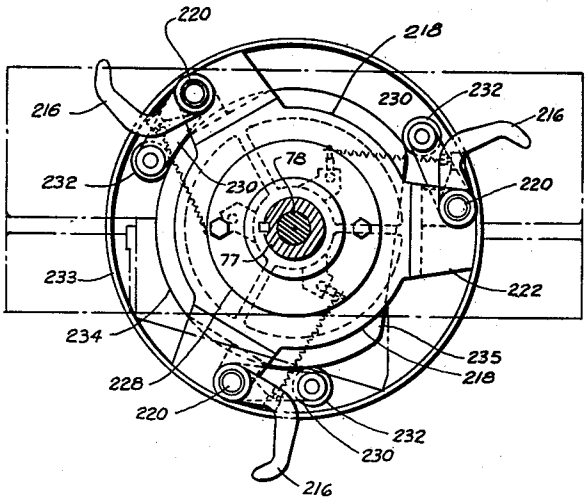



FIG. 12

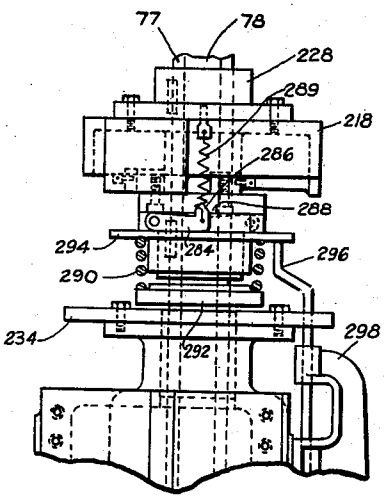



FIG. 13

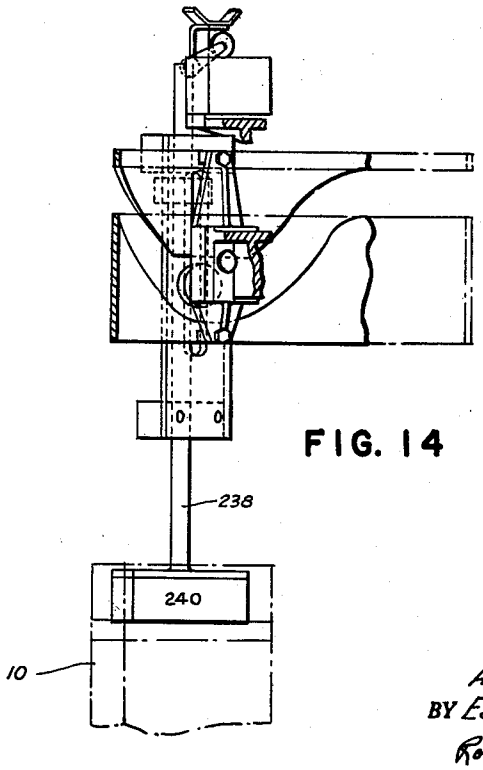



FIG. 14

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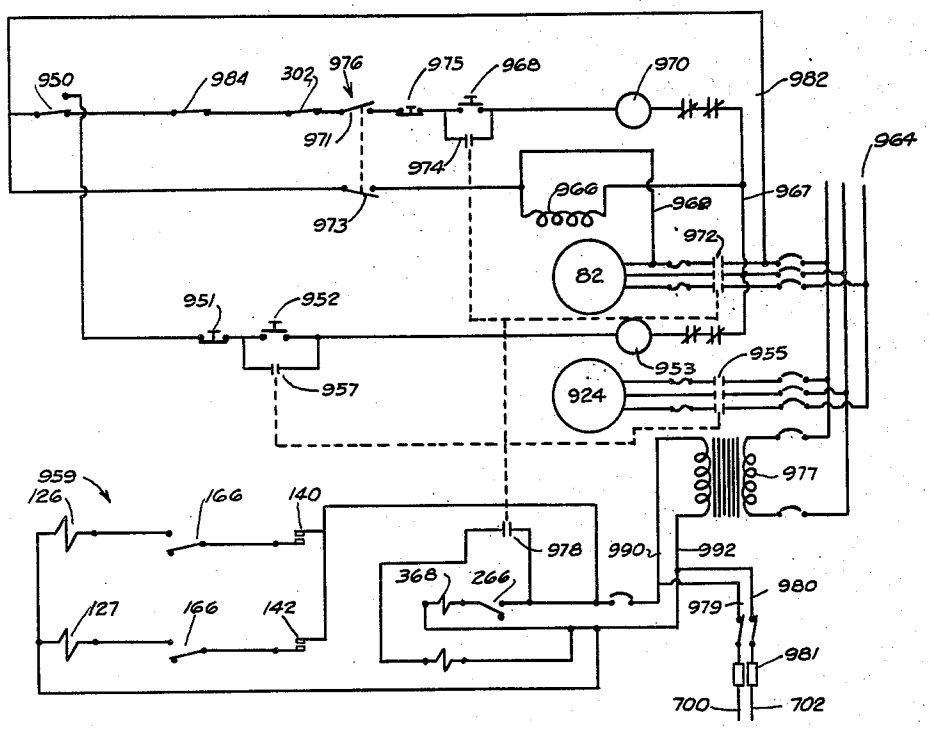



FIG. 15

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United States Patent Office 3,107,774 Patented Oct. 22, 1963



3,107,774
PACKAGING MACHINE

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Original application Feb. 13, 1957, Ser. No. 639,919, now Patent No. 2,996,855, dated Aug. 22, 1961. Divided and this application Dec. 7, 1960, Ser. No. 74,435
10 Claims. (Cl. 198—32)

This application is a division of our copending application Serial No. 639,919, for Packaging Machine, filed February 13, 1957 and now Patent No. 2,996,855 issued on Aug. 22, 1961.

The invention relates to a packaging machine and more particularly to conveying mechanism for a packaging machine.

The invention has for an object to provide a novel and improved packaging machine having provision for supporting and continuously advancing cartons in spaced relation and carton supply conveying mechanism having novel provision for alternately releasing cartons from two supply lines to provide a single line and for delivering the cartons from said single line in predetermined spaced relation into the packaging machine.

With this general object in view and such others as may hereinafter appear, the invention consists in the packaging machine and in the conveying mechanism therefor as hereinafter described and particularly defined in the claims at the end of this specification.

In the drawings illustrating the preferred embodiments of the invention:

FIG. 1 is an outline plan view of the packaging machine embodying the present invention;

FIG. 2 is a side elevation of the same shown partly in cross section;

FIG. 3 is a plan view of the drive mechanism shown partly in cross section;

FIG. 4 is a plan view of the container intake portion of the machine;

FIG. 5 is a side elevation of the intake portion of the machine shown in FIG. 4;

FIG. 6 is a plan view detail partly in cross section of timing mechanism for releasing alternate containers being advanced to the intake portion of the machine, the section being taken on the line 6—6 of FIG. 7;

FIG. 7 is a side elevation of the timing mechanism shown in FIG. 6 shown partly in cross section;

FIG. 8 is a plan view of a portion of the container release mechanism shown partly in cross section;

FIG. 9 is a side elevation partly in cross section of the apparatus shown in FIG. 8;

FIG. 10 is a side elevation of the apparatus for detecting an incompletely filled container;

FIG. 11 is a plan view of the upper portion of the apparatus shown in FIG. 10;

FIG. 12 is a cross sectional plan view taken on the line 12—12 of FIG. 10;

FIG. 13 is a detail view in side elevation of a portion of the apparatus shown in FIG. 10;

FIG. 14 is a detail in side elevation of another portion of the apparatus shown in FIG. 10 shown partly in cross section and illustrating the parts in a different position of operation; and

FIG. 15 is a wiring diagram of electrical controls to be referred to.

In general the present invention contemplates a novel and improved conveying mechanism for a packaging machine for handling lined containers having a heat sealable lining material, preferably a paper lining provided with a wax or paraffin coating, and inserted in a carton wherein the containers are continuously advanced



through the machine at a constant rate of speed, and wherein provision is made for forming a bellows fold in the mouth of the liner and for heat sealing the same without interrupting the advance of the continuously moving containers. In the preferred embodiment of the invention a plurality of bellows folding and sealing heads are moved continuously in alignment with successive containers during a portion of their travel through the machine, and provision is made for elevating the containers into operative relation to their respective folding and sealing heads during their continuous advance, during which time the bellows fold is formed and sealed whereupon the container is again lowered without interrupting the continuous advance of the container. Thereafter, the container is advanced through subsequent stations for tucking the extended lining closure into the carton and for closing and sealing the carton flaps to complete the container closing operation. The mechanisms for performing the various top closing operations on the cartons are illustrated and described in our copending application, Serial No. 639,919, above referred to.

In accordance with the present invention the lined and filled containers are delivered into the packaging machine from one or more filling or weighing machines of any usual or preferred type (not shown) and from which the filled containers are discharged onto two parallel conveyors, and provision is made in the preferred embodiment of the invention for alternately releasing the foremost container from each conveyor to form a single line of containers arranged in predetermined spaced relation to be received into the present packaging machine. Provision is also made in the preferred embodiment of the invention for detecting an incompletely filled container and for rejecting such container prior to being advanced to the folding and sealing apparatus.

Referring now to the drawings and particularly to FIGS. 1 to 4, in general the containers 10 are delivered to the present packaging machine in contiguous engagement on two belt conveyers 12, 14, the foremost containers in each line being released alternately in timed relation to the operation of the packaging machine onto a conveyer 16 to form a single line of containers arranged in predetermined spaced relation. As shown in FIG. 4, the container releasing mechanisms are indicated generally at 18 and 20 for cooperation with the containers being delivered by conveyer belts 12, 14 respectively, and in operation successive continuously moving lined and filled containers are first delivered to a rotary detecting station indicated generally at 22 which is arranged to detect incompletely filled containers during the continuous movement thereof. The containers are continuously advanced through the detecting mechanism onto a main conveyer 24 having a normally inoperative rejecting station indicated generally at 26 arranged adjacent the main conveyer and remote from the detecting station, such rejecting mechanism being rendered operative to reject an incompletely filled container from the main conveyer 24 onto a discharge conveyer 28 through timing mechanism indicated generally at 30 responsive to the detecting mechanism. The completely filled containers then pass through side flap spreading mechanism indicated generally at 32 which operates to spread the carton side flaps preparatory to the container being received into the bellows folding and sealing apparatus indicated generally at 34. The bellows folding and sealing apparatus 34 includes a plurality of identical folding and sealing heads 36 mounted to be rotated in alignment with successive containers, and in operation as the containers enter the folding and sealing station they are elevated into operative engagement therewith by elevating mechanism indicated generally at 38 while being continuously advanced at a constant rate by said

main conveyer 24. Thereafter, as the container leaves the folding and sealing station it is again lowered to its initial level where provision is made during its continuous advance for tucking the upstanding sealed portion of the lining into the carton, preferably by guide rails disposed immediately beyond the folding and sealing station in a position as indicated generally at 40, whereupon the container passes through a flap folding station indicated generally at 42 arranged to fold the leading and trailing carton end flaps over the top of the folded down sealed portions of the lining, the side flaps being spread outwardly at this time. The continuously moving containers with their side flaps spread outwardly are then passed through an adhesive applying device indicated generally at 44 for applying adhesive to the side flaps whereupon the latter are folded over the top of the carton one upon the other by folding rails immediately beyond the adhesive applying station in a position as indicated generally at 46. The completely closed and sealed container is then passed under pressure rolls 48 to press the side flaps into sealing engagement whereupon the containers are discharged from the main conveyer 24 into a dryer of any usual or preferred form indicated generally at 50. Reference is made to the parent application, Serial No. 639,919 for a more detailed disclosure of the structure and mode of operation of the top closing mechanisms above referred to.

Referring now to FIGS. 4 to 9 for a more detailed description of the intake apparatus, to which the present invention is directed, the container delivery belts 12, 14 run around pulleys 52, 54, respectively, at one end of each conveyer, the pulleys being mounted on a shaft 56 arranged to be driven from the main drive shaft 58 of the machine through connections including a chain and sprocket drive 60 from a shaft 62 supported in a bracket 64 attached to the frame 66 of the detecting apparatus 22, the chain and sprocket drive 60 being connected to a shaft 65, and a chain and sprocket drive 67 from the shaft 65 is connected to the pulley shaft 56. The shaft 62 is connected by bevel gears 68 to a vertical shaft 70 which in turn is connected by a chain and sprocket drive 72 to a vertical shaft 74. The shaft 74 is connected by a chain and sprocket drive 76 to a sleeve shaft 77 supported by a stationary central shaft 78 of the detecting apparatus 22.

As shown in FIG. 3, the main drive shaft 58 is driven through a belt connection 80 from an electric motor 82 to a shaft 84 mounted in the frame 86 of the bellows folding and sealing apparatus 34. The shaft 84 is provided with a worm pinion 88 which meshes with a worm gear 90 fast on a vertical shaft 92 which in turn is connected by bevel gears 94 to one end of the main drive shaft 58 which is extended longitudinally of the machine. The other end of the drive shaft 58 is connected by bevel gears 96 to a vertical shaft 98 which in turn is connected by a chain and sprocket drive 100 to the sleeve shaft 77 of the detecting apparatus, the chain running over idler sprockets 99 and 101 as shown. As indicated in FIG. 3, the main drive pulley 81 may be loosely mounted on its shaft 84 and is operatively connected to the shaft by a clutch member 83 fast on the shaft and arranged to be manually engaged with the pulley 81 by a clutch handle 85.

As shown in FIG. 4, each container release mechanism 18, 20 includes a rotatable vane or blade 102 mounted at the upper end of a one revolution vertical shaft 104. As shown in detail in FIGS. 8 and 9, the shaft 104 of each unit is provided with the driven member 106 of a one revolution clutch of any usual or preferred type, the driving member 107 being fast on an aligned vertical shaft 108 which is continuously rotated in timed relation to the operation of the packaging machine through connections including a chain and sprocket drive 110 from a vertical shaft 112 which, as seen in FIG. 4, is connected by bevel gears 114 to a horizontal shaft 116. The shaft 116 is driven through a chain and sprocket drive 118 from the horizontal drive shaft 62 as shown in FIG. 4. As illustrated in FIGS. 8 and 9, the one revolution clutch is held in its disengaged position by a pawl 120 pivotally mounted at 122 arranged to stop the driven shaft 104 in a predetermined position with the blade 102 extended transversely of the conveyer in the path of the foremost container in the line.

The pawl arm 120 is arranged to engage a notched portion 121 of the driven element 106 of the one revolution clutch and is provided with a second arm 124 operatively connected to a solenoid 126. In operation the opposed container release mechanisms 18, 20 disposed in operative relation to the line of containers being delivered by the conveyers 12, 14, respectively, are arranged to be rotated alternately in timed relation to the operation of the machine through timing mechanism indicated generally at 132, see FIGS. 6 and 7, which is arranged to actuate the solenoids 126, 127 alternately to effect rocking of the pawl 120 out of the notched portion 121 and permit one revolution of the shaft 104, the arm 120 again engaging the notch at the end of one revolution. A second pawl arm 134 also pivotally mounted at 122 and arranged in opposed relation to the arm 120 is arranged to engage a second and opposed notch 135 in the driven element 106 to prevent back lash or reverse rotation of the shaft 104 at the end of the one revolution. As indicated in FIGS. 8 and 9, each arm 120, 134 is provided with an extension 136 cooperating with shock absorbing coil springs 138.

As illustrated in FIGS. 6 and 7, the timing machanism 132 includes a pair of cam operated switches 140, 142 arranged to first close the circuit to the solenoid 126 of one release mechanism 18 and to thereafter close the circuit to the solenoid 127 of the second release mechanism 20 in timed relation to the movement of the containers through the machine. Each switch 140, 142 is provided with a pivotally mounted switch arm carrying a roller 144 cooperating with its respective cam 146, 148, the cams being fast on a shaft 150 arranged to be rotated through drive connections from the main cam shaft 58 which may include a chain and sprocket drive 152 between the shaft 150 and a shaft 154, spur gears 156 between shaft 154 and shaft 158, and a chain and sprocket drive 160 from shaft 158 to the shaft 98 which is connected by bevel gears 96 to the main drive shaft 58 as described. The switches 140, 142 and the solenoids 126, 127 form part of a control circuit shown in FIG. 15 which will be hereinafter more fully described.

From the description thus far it will be seen that the container release mechanisms 18, 20 operate to release successive foremost containers in each line thereof alternately to form a single line of containers in timed relation to the movement of the containers through the machine by operation of the timing switches 140, 142, and in order to permit operation of the container release mechanisms only when containers are present on the conveyers 12, 14, each conveyer is provided with a feeler arm 162 pivotally mounted at 164 which is spring urged into the path of an oncoming container on its respective conveyer adjacent the release mechanism and is arranged to be rocked outwardly by a container coming into engagement with its respective rotary release blade 102. Each feeler arm 162 is connected at its pivotal end with a microswitch 166 included in the circuits between the solenoids 126, 127 and the timing switches 140, 142. In operation the circuits to the solenoids 126, 127 are open when no containers are present on their respective conveyers, the arrival of a container into releasing position rocking its feeler arm 162 to close the circuit to its solenoid to permit subsequent actuation by its timing switch.

Provision is also made for holding back the line of containers behind a released container until the released

container passes through the release mechanism and its releasing blade 102 has rotated one revolution to return to its transverse position in the path of the line of containers and, as herein shown, see FIGS. 4 and 5, each conveyer is provided with container engaging mechanism indicated generally at 168, 170, each mechanism including a container engaging pad 172 carried by an arm 174 fast on a rocker shaft 176 mounted to rock in a bracket 178 attached to the side rail of its conveyer. The lower end of each rocker shaft 176 is provided with an arm 180 carrying a roller 182 which may be spring urged into cooperating engagement with a cam 184 fast on the drive shaft 65 which is driven from the main drive shaft 58 as previously described. In operation the cams 184 are arranged to rock the container engaging pads alternately and in timed relation to the operation of the container release mechanisms 18, 20 so as to hold back the advance of its line of containers on its respective belt 12, 14 when the foremost container is released and to again release its line of containers when its rotary releasing blade 102 has returned to its initial position at the end of its revolution.

As shown in FIGS. 4 and 5, the released containers are arranged to be engaged by pusher arms 186 carried by horizontal chain conveyers, one chain conveyer 188 cooperating with the containers released from conveyer belt 12 and the other chain conveyer 190 cooperating with the containers released from belt conveyer 14, the conveyer 14 being provided with guide rails at its discharge end to guide the containers into a single line with the containers from belt conveyer 12. The chain conveyer 188 runs over sprockets 192, 194 and the chain conveyer 190 runs over sprockets 196, 198 and 200, each chain being connected to its respective vertical shaft 112 driven from the main drive shaft as previously described in timed relation to the movement of the containers through the machine. In order to rapidly advance the released containers from their released position away from continuous engagement with a succeeding container in the line and and into operative position to be engaged by a pusher arm 186, successive released containers from each line are arranged to be received by intermediate belt conveyers 202, 204, respectively. As herein shown, each rapidly moving conveyer 202, 204 is arranged to run over drive pulleys 206 and idlers 208, 210, see FIG. 5, the drive pulleys 206 being fast on a shaft 212 connected by a chain and sprocket drive 214 from the drive shaft 62.

Successive alternately released containers thus brought into a single line and advanced in predetermined spaced relation by the pusher arms 186 are delivered across a bridge plate 187 and into the path of successive pusher fingers 216 which are carried by and rotatable with a rotary supporting disk 218. As illustrated in FIGS. 10 and 12, there are three sets of pusher fingers 216, each set comprising an upper finger and a lower finger which are mounted fast on a vertical shaft 220 rockingly mounted in upper and lower flange portions 222, 224 of brackets 226 attached to the disk 218, the latter being secured to a flange member 228 keyed to the sleeve shaft 77 through which the stationary central shaft 78 extends. Each rocker shaft 220 is provided at its lower end with a cam lever 230 carrying a roller 232 cooperating with a cam 234. The pusher fingers 216 are spring urged inwardly, as shown, and are held outwardly rocked by the cam 234 to engage the rear of a container and carry it around the rotary detecting path, the containers being guided by bottom and side rails 236, 237, respectively, supported from the machine frame, as shown, and by inner rails 233. The cam 234 is provided with a straight cut portion 235 at the intake point arranged to effect retraction of the fingers to permit a container to enter the rotary path without interference, the fingers then being extended in timed relation to the advance of the container to engage the rear face thereof to continue the movement of the container through the rotary path. The cam portion 235 also effects retraction of the fingers at the point of discharge of the container from the rotary path onto the main conveyor 24 as shown.

As illustrated in FIGS. 10 and 14, the detecting apparatus for detecting incompletely filled containers comprises a three-head turret, each head including a vertically movable rod 238 having a detecting block 240 at its lower end, and in operation as the filled containers are advanced around the rotary path of the detecting apparatus in alignment with the detecting heads provision is made for lowering the vertically movable blocks 240 into successive containers to engage the top surface of the material therein, and in the event that the container is incompletely filled the detecting block is arranged to drop into the container beyond a normal filling level indicating that the container is incompletely filled and lacks sufficient volume of material to be commercially acceptable.

In the event that a container is only partially filled, the detecting block will cotninue to be lowered into the container by its own weight, and when the detecting rod and block are permitted to fall beyond the normal fill level provision is made for closing a circuit to the control means for effecting rejection of such defective container at a point remote from the detecting turret, as described in our copending application, Serial No. 639,919, above referred to.

As illustrated in FIGS. 10 and 13, provision is made for stopping the machine in the event that undue resistance to rotation of the pusher fingers 216 occurs, such as in the event of a jam of a container by such fingers. For this purpose the sleeve shaft 77 may be separated at an intermediate point, as indicated at 278, the upper portion thereof being provided with a driven clutch element 280 and the lower portion thereof being provided with a driving clutch element 282. The driving element 282 is keyed to the lower sleeve portion in a manner such as to permit vertical sliding movement on the sleeve and is provided with a pair of pivotal arms 284, one on each side, only one of which is shown, each arm being provided with a V-shaped tooth 286 arranged to fit into a notch 288 formed in the driven element, each tooth 286 being held in driving engagement with the notches 288 by a spring 289 connected to the bracket 218, and by a spring 290 coiled about the sleeve and interposed between a collar 292 fast on the lower sleeve and an annular disk 294 bearing against the pivotal arms 284 as shown. In operation in the event that the upper or driven portion of the sleeve 77 should come to rest because of a jam, the lower sleeve portion will continue to rotate causing the teeth 286 to slip out of their notches 288 and effecting depression of the disk 294 against the force of the springs 289, 290. As herein shown, the disk 294 is arranged to cooperate with the upper end of a rod 296 mounted for vertical movement in a supporting bracket 298, the lower end of the rod 296 cooperating with a switch arm 300 forming part of a normally closed switch 302, which forms a part of the control circuit shown in FIG. 15, and which is arranged to be opened to break the circuit to the driving motor 82 of the machine when the disk 294 is depressed as the result of a jam of the containers or other undue resistance to rotation of the upper or driven portion of the sleeve shaft 77.

As illustrated in FIGS. 1 and 11, after passing through the detecting mechanism 22, successive containers are transferred into the main conveyer path 24 without interrupting the continuous advance thereof, and as herein shown, the main conveyer path 24 may comprise a metal band conveyer 304 arranged to run over an idler pulley 306 at one end of the machine and a drive pulley 308 at the other end of the machine as shown in FIGS. 1 and 2. The drive pulley 308 is mounted to rotate with the central shaft 310 of the bellows folding and sealing unit 34, the pulley being connected to a flanged hub 312 keyed

to the shaft 310 as shown in FIG. 2. The lower end of the shaft 310 is provided with a gear 314 fast thereon which is in mesh with a gear pinion 316 fast on an intermediate shaft 318. A worm gear 320, also fast on the intermediate shaft 318, is in mesh with the opposite side of the worm pinion 88 which, as above described, forms part of the driving mechanism to the main drive shaft 58. The drive pulley 303 may be connected in positive driving engagement with the band conveyer 304 in any suitable manner, herein shown as comprising spaced lugs 305 provided on the inner face of the band for cooperation with similarly spaced sockets provided in the periphery of the pulley as indicated at 322.

Referring again to FIG. 11, the band conveyer 304 is provided with a plurality of spaced pusher arms 324 and is arranged to travel in timed relation to the rotation of the pusher fingers 216 of the detecting apparatus 22, the conveyer 24 being arranged in proximity to the rotary path of the detecting mechanism so that when a container is advanced by the pusher fingers 216 onto interconnecting transfer guide rails 326 a pusher arm 324 engages the rear of the container to continue its advance along conveyer 24, the spaced upper and lower fingers 216 being arranged to straddle the pusher arms 324.

Referring now to FIG. 15, the electrical circuit for controlling the operation of the machine includes the main leads 964 to the main drive motor 82. The motor 82 is started, and the control and heating circuits are energized by pressing a start button 968 to energize a relay coil 970 and close the relay contacts 974 of a holding circuit, and when the holding circuit is energized the motor switch contacts 972 are closed. Also included in the main drive circuit is a stop button 975 and a selector switch 976, the latter forming a part of a magnetic brake circuit 966. When the motor 82 is started the brake circuit 966 is energized to release the brake through leads 967, 969 at which time the contacts 971 of the selector switch are closed. When the stop button is pressed, the circuit to the brake is deenergized to effect application of the brake, at which time the contacts 971 and 973 of the selector switch are both open. If it is desired to turn the machine over by hand the contacts 973 may be closed to energize the brake circuit through leads 982 and 967 to release the brake when the motor 82 is stopped.

The switch 302 is included in the main drive motor circuit for stopping the machine in the event of a jam at the detecting station as described. Another switch 984 comprises an overload clutch release safety switch, indicated generally in FIG. 3, which effects stopping of the machine in the event that an overload occurs such as to cause disengagement of the clutch. Rocking of the clutch handle 85 engages and opens the switch 984 to discontinue operation of the machine.

The circuit to the auxiliary motor 924 for operating the adhesive applying mechanism 44 when the main drive motor circuit is opened includes the safety switch 950, and the start button 952 which energizes the relay coil 953 to close the contacts 957 of a holding circuit, thus closing the motor contacts 955. The auxiliary motor circuit may be opened by pressing the stop button 951.

The circuit 959 to the control switches 140, 142, 166 and solenoids 126, 127, previously described, is supplied with current through a transformer 977 and leads 990, 992, and the circuit is energized simultaneously with pressing the start button 968 of the main drive motor circuit through relay contacts 978 as shown. The leads 979, 980, disconnecting switch 981 and leads 700, 702 provide power to the heater and control circuits, not shown, for the top closing elements of the packaging machine. Reference is made to the parent application, Serial No. 639,919, for a complete disclosure of the structure and mode of operation of such elements.

While the preferred embodiment of the invention has been herein illustrated and described, it will be understood that the invention may be embodied in other forms within the scope of the following claims.

Having thus described the invention, what is claimed is:

1. In a packaging machine having provision for folding and sealing the lining mouth of a filled lined carton during the continuous advance of the carton, in combination, a main conveyer for supporting and advancing the cartons in spaced relation through the machine, a pair of carton supply conveyers, a bridge plate communicating with said pair of conveyers, means for releasing the foremost carton in each of said supply conveyers alternately to form a single line of cartons on said bridge plate, means for transferring the cartons in predetermined spaced relation from said bridge plate to said main conveyer, and means intermediate the releasing means and said transfer means for engaging and advancing the cartons in timed relation to said transfer means.

2. A packaging machine as defined in claim 1 wherein the carton releasing means includes a rotary stop for each of said pair of conveyers, means for rotating each stop alternately to release successive foremost containers on each conveyer including a one revolution clutch, control means including an electrical circuit having a solenoid for each one revolution clutch, and cam operated timing switches arranged to energize the solenoids alternately to release the cartons in timed relation to the advance of the cartons on said main conveyer.

3. A packaging machine as defined in claim 2 wherein provision is made for holding back the line of cartons behind said foremost cartons, and means including a pair of carton operated switches in said circuit for preventing operation of said releasing means when no cartons are present.

4. A packaging machine as defined in claim 1 which includes driving means including a drive motor for the machine, an electrical circuit, control means cooperating with said transfer means including separable clutch members adapted to be separated when undue resistance occurs in the event of a jam of cartons, and a switch in said circuit arranged to be opened to stop the drive motor when said clutch members are separated.

5. In a packaging machine, in combination, a main conveyer provided with spaced pusher arms for supporting and advancing cartons in spaced relation through the machine, carton supply means, rotary transfer means having spaced pusher fingers for engaging and advancing successive cartons from the carton supply means to present them into the path of successive pusher arms of said main conveyer, said carton supply means comprising a pair of supply conveyers, means for releasing the foremost carton from the line of cartons in each supply conveyer alternately, means for guiding the released cartons from one supply conveyer into the line of cartons released from the other conveyer to form a single line, and carton pusher means disposed intermediate said releasing means and said rotary transfer means associated with each of said supply conveyers for engaging and advancing successive released containers in said single line to present them into the path of successive pusher fingers of said rotary transfer means.

6. A packaging machine as defined in claim 5 which includes means for rapidly advancing the released cartons into operative relation to its respective carton pusher means said advancing means including a driven belt associated with each of said releasing means.

7. A packaging machine as defined in claim 5 which includes a bridge plate intermediate the releasing means and the transfer means and across which successive released cartons are advanced by said carton pusher means to present them in timed relation to be engaged by successive fingers of said rotary transfer means.

8. A packaging machine as defined in claim 5 which includes cam operated hold-back means associated with each supply conveyer operative to alternately hold back the line of cartons on its respective conveyer to permit

release of only one carton by its releasing means during each releasing operation.

9. A packaging machine as defined in claim 5 wherein the releasing means is normally inoperative when no carton is present and carton operated control means associated with each supply conveyer arranged to permit operation of its respective releasing means when a carton is present in its line.

10. A packaging machine as defined in claim 5 wherein each of said pusher means includes an endless chain, said chains being arranged in opposed relation and provided with spaced laterally extended pusher members, a bridge plate intermediate the releasing means and the transfer means onto which the released cartons are advanced by said pusher members, one of said pusher means being extended to advance successive cartons across said bridge plate into the path of said transfer pusher fingers.



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