April 15, 1958 R. E. J. NORDQUIST 2,830,691

FEEDING DEVICE WITH IMPROVED DIVIDER MECHANISM

Filed Dec. 30, 1953 6 Sheets-Sheet 1

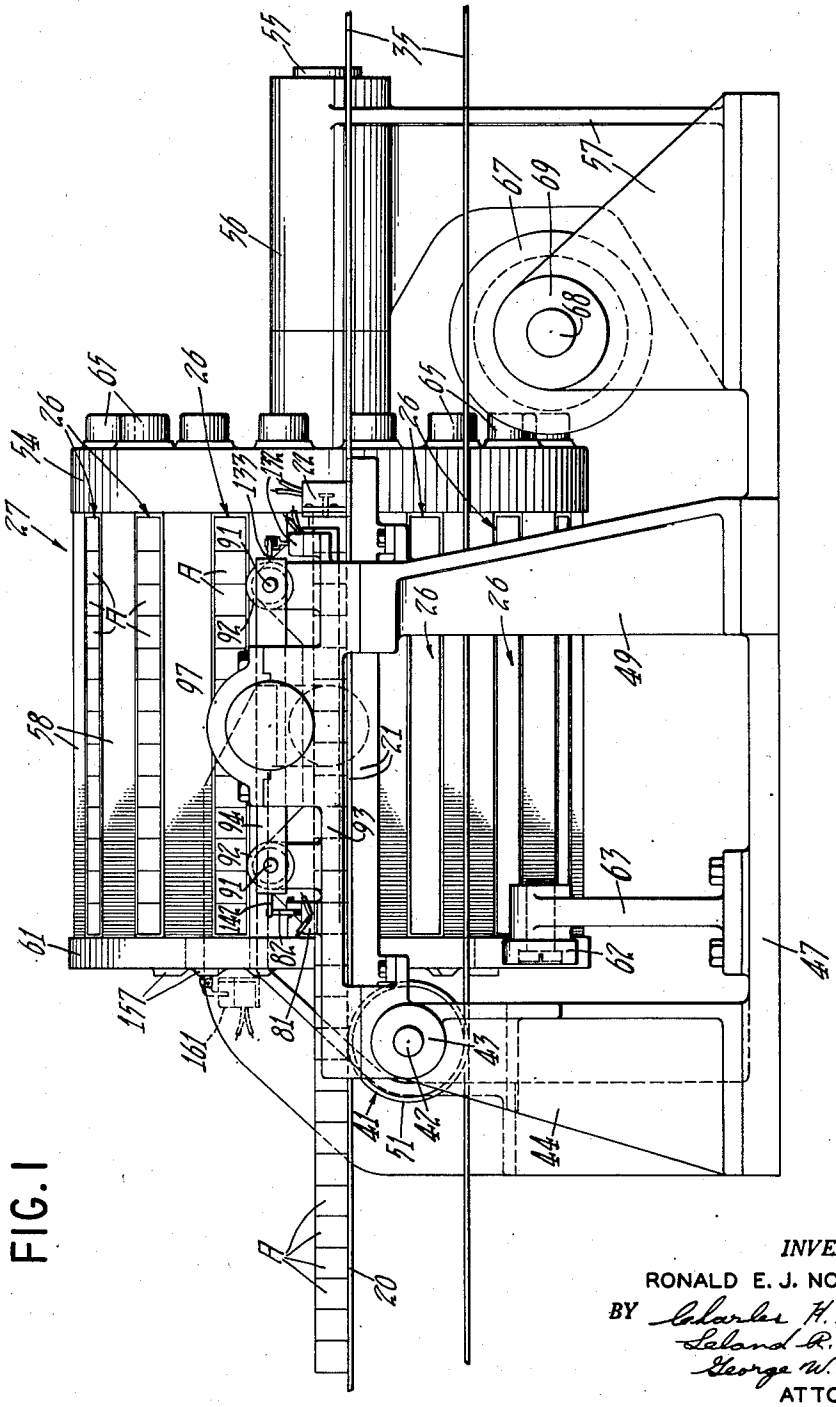


FIG. 1

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FEEDING DEVICE WITH IMPROVED DIVIDER MECHANISM

Filed Dec. 30, 1953 6 Sheets-Sheet 2

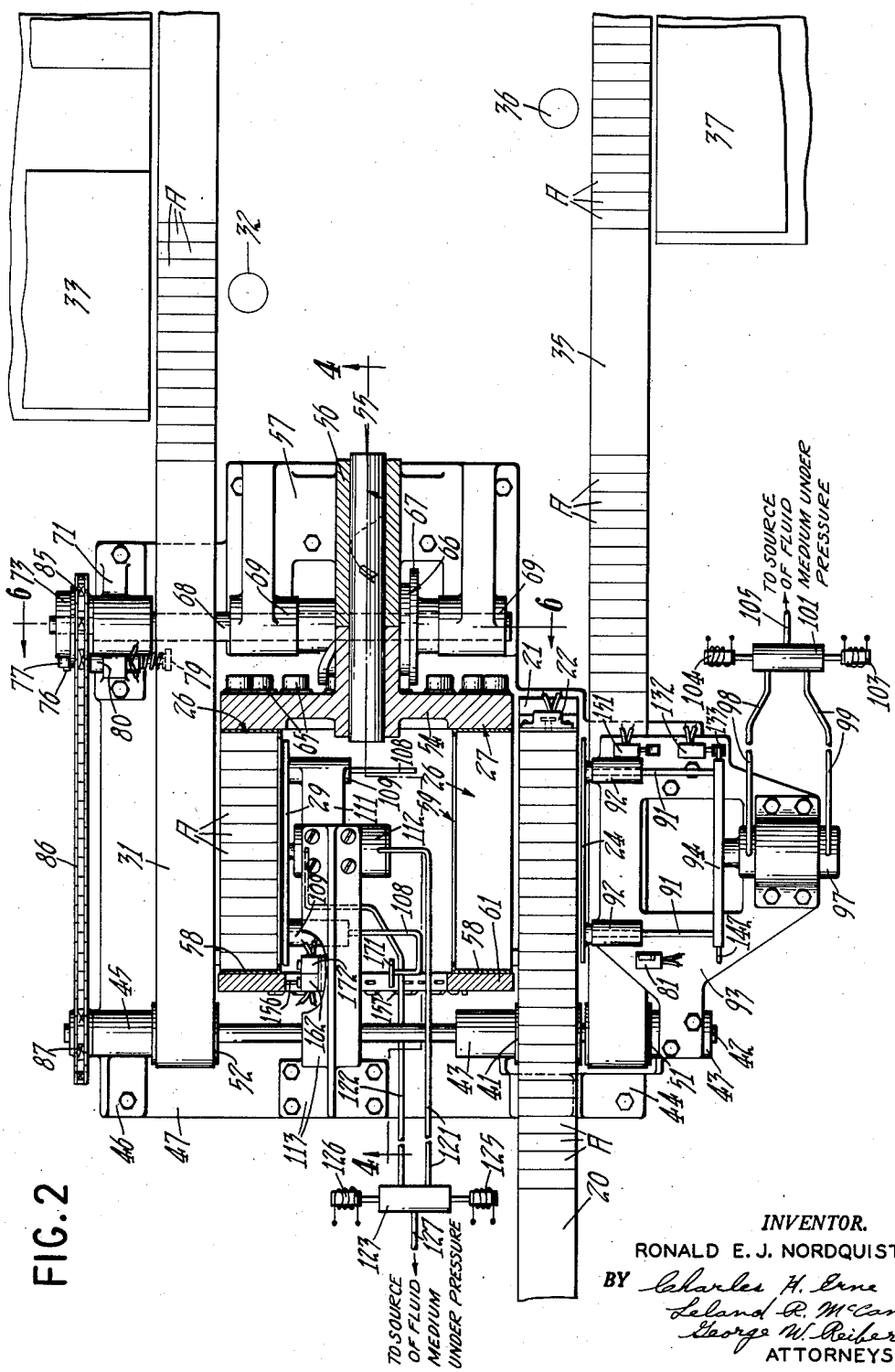


FIG. 2

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FEEDING DEVICE WITH IMPROVED DIVIDER MECHANISM

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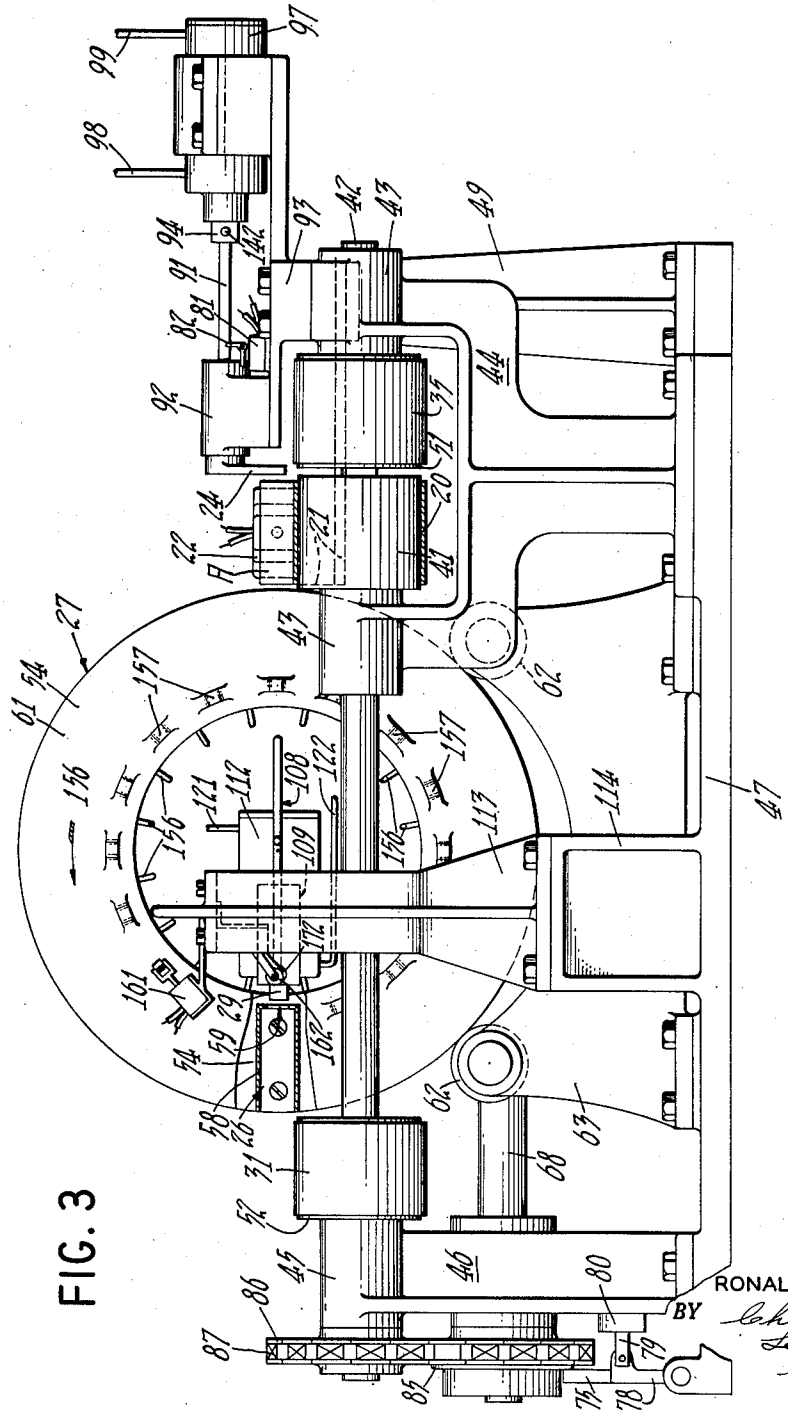


FIG. 3

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April 15, 1958 R. E. J. NORDQUIST 2,830,691

FEEDING DEVICE WITH IMPROVED DIVIDER MECHANISM

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FIG. 5

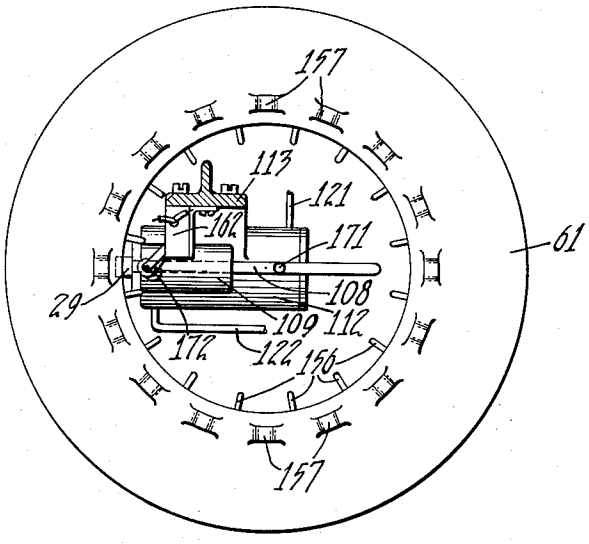
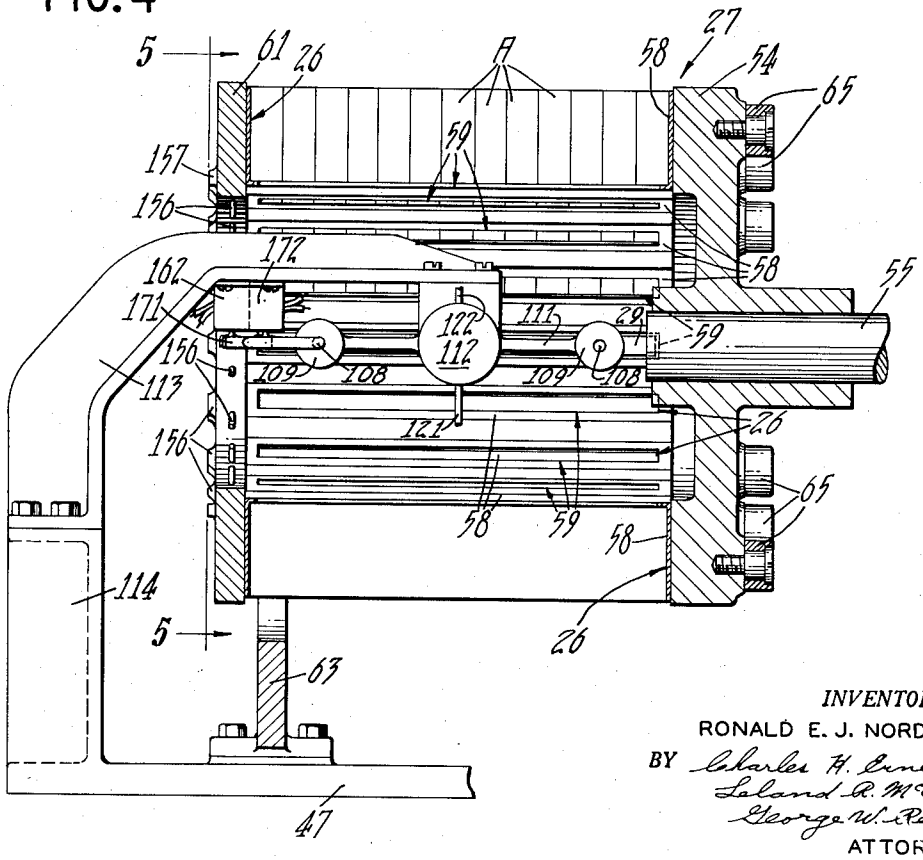


FIG. 4



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April 15, 1958 R. E. J. NORDQUIST 2,830,691

FEEDING DEVICE WITH IMPROVED DIVIDER MECHANISM

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FIG. 6

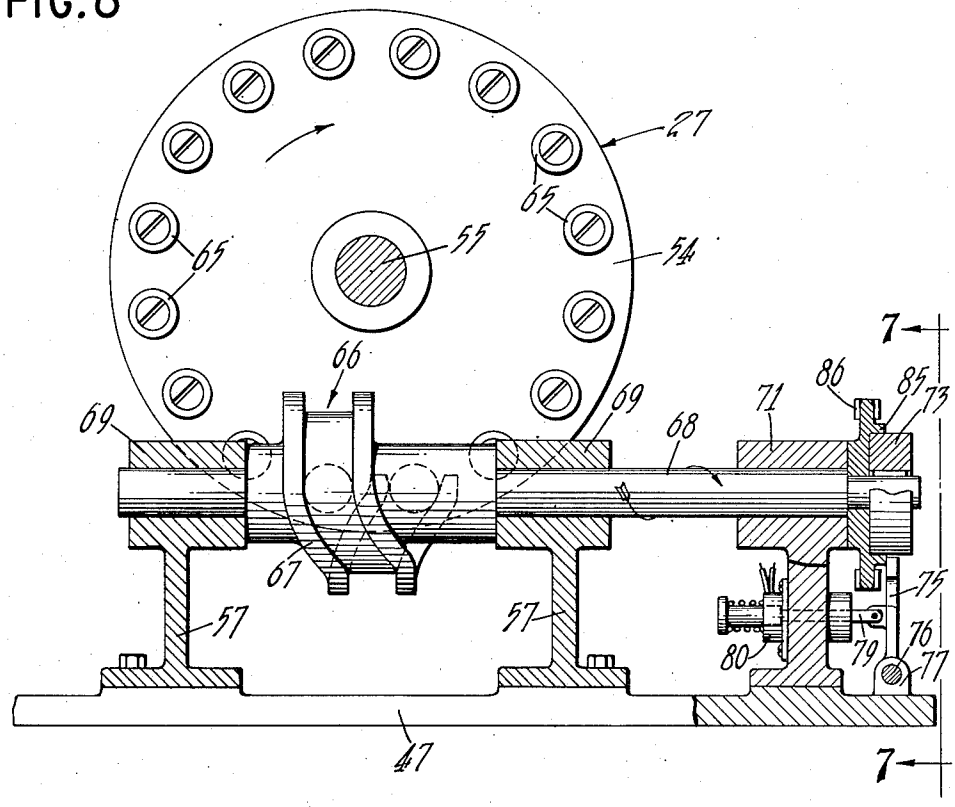


FIG. 7

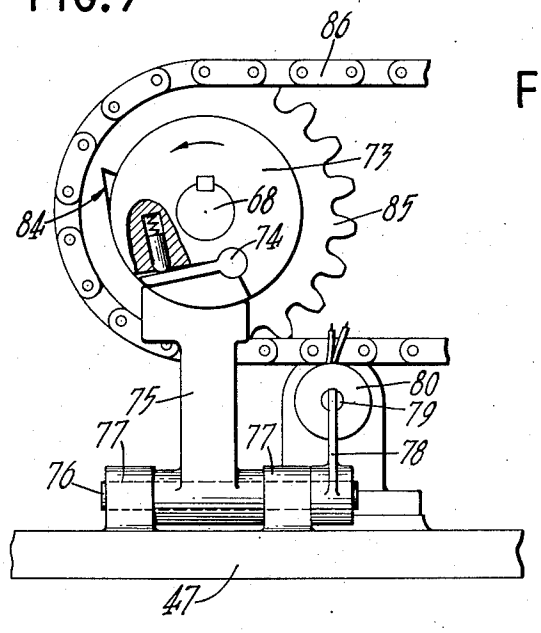
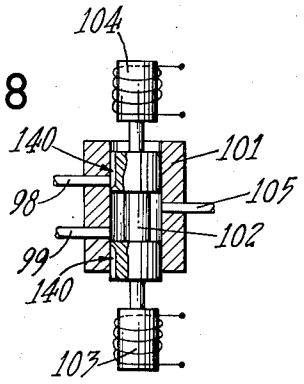


FIG. 8



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FEEDING DEVICE WITH IMPROVED DIVIDER MECHANISM

Filed Dec. 30, 1953 6 Sheets-Sheet 6

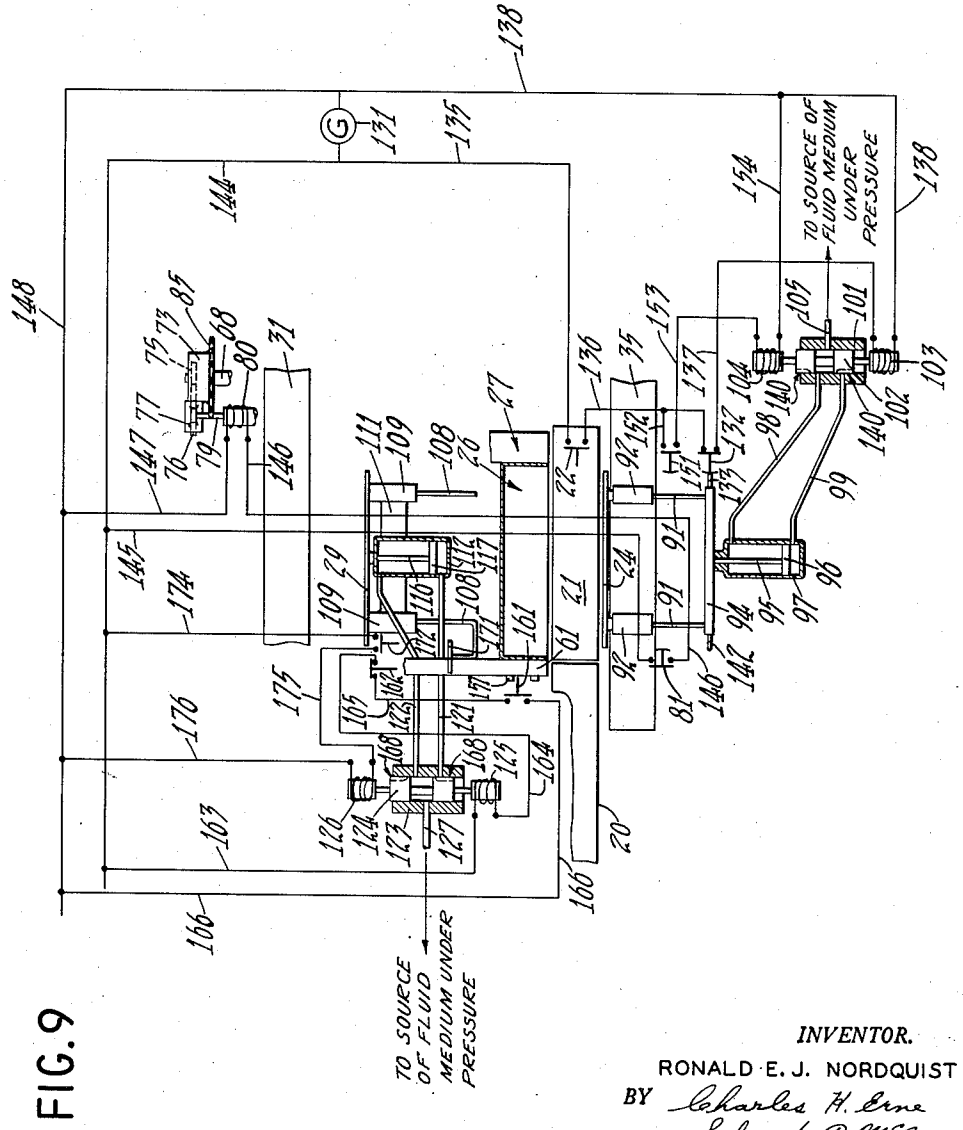


FIG. 9

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United States Patent Office

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2,830,691

FEEDING DEVICE WITH IMPROVED DIVIDER MECHANISM

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Application December 30, 1953, Serial No. 401,315

8 Claims. (Cl. 198—31)

The present invention relates to feeding devices for advancing articles such as containers and the like along a predetermined path of travel and has particular reference to an improved divider mechanism for dividing the articles so that they can be advanced in two or more lines of travel.

An object of the instant invention is the provision in a feeding device of an improved divider mechanism for receiving articles moving in a substantially continuous procession in one line and for dividing the articles into batches of a predetermined number for advancement in two or more lines so that the articles may be quickly handled for packing or other operations.

Another object is the provision of such a divider mechanism wherein alternate batches of articles are turned over to facilitate keeping of one end of the articles in a predetermined relation so that in the packing of the articles into receptacles, the articles will be in proper position for packing as they are received by the packer.

Another object is the provision of such a divider mechanism which is particularly adapted to the handling of articles such as containers or cans at high speeds of 700 and upward containers per minute.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a side elevation of a feeding device embodying the instant invention, with parts broken away;

Fig. 2 is a reduced scale top plan view of the device shown in Fig. 1, with parts broken away and parts shown in section;

Fig. 3 is an end elevation of the device as viewed from the left in Fig. 1;

Fig. 4 is an enlarged sectional view taken substantially along the line 4—4 in Fig. 2, with parts broken away;

Fig. 5 is a view taken substantially along the line 5—5 in Fig. 4;

Fig. 6 is an enlarged sectional view taken substantially along the line 6—6 in Fig. 2;

Fig. 7 is an enlarged elevational detail as viewed along a plane indicated by the line 7—7 in Fig. 6, with parts broken away;

Fig. 8 is an enlarged sectional view of one of the valves used in the mechanism; and

Fig. 9 is a combined schematic view showing a wiring diagram of the electric apparatus used in the mechanism and showing a fluid pressure system for actuating certain parts of the mechanism.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate a feeding device for receiving rectangular fibre milk containers A moving flat on their sides at a speed of 700 containers and upward per minute in a substantially continuous single line in contiguous processional order and for dividing the single line into at least two separate lines to facilitate manual

packing of the containers in orderly fashion into large paper bags, carriers or cartons for shipment and storage. The containers are of the character shown in United States Patent 2,085,979 issued July 6, 1937 to John M. Hothersall on Container. Such containers are provided with a filling and dispensing opening top closure and in packing the containers in carriers it is desirable to have the tops of the containers all point in the same direction. Provision is therefore made in the dividing mechanism for arranging the containers during the dividing operation in the proper direction to facilitate proper packing.

In the feeding device, the containers A lying flat on their sides, are received from any suitable source of supply such as a container making machine, on an endless belt conveyor 20 (Figs. 1 and 2) and are conveyed into position onto a table 21 and against a normally open electric stop switch 22 which arrests further longitudinal advancement of the containers. When a solid line of containers of sufficient length, avoiding spaces between the containers, is in position against the stop, they exert sufficient pressure against the switch 22 to close it and thereby establish an electric circuit which operates a divider member or pusher plate 24 disposed adjacent the containers stopped on the table 21.

The pusher plate 24 when actuated moves through a forward stroke across the table 21 and pushes a batch of the containers, about 13 to 15 in number, endwise into an aligned pocket 26 of a rotary carrier wheel or drum 27 located adjacent the conveyor 20 with its axis in parallelism therewith. The pusher plate 24 remains in this forward position until the containers left on the conveyor 20 move forward behind the pusher plate to build up another solid row against the electric stop switch 22.

While the row of containers A from the conveyor 20 is building up on the table 21 against the stop switch 22, the carrier drum 27 rotates through a partial rotation to carry the containers in the pocket 26 upwardly over the top of the drum. The drum 27 is formed with a plurality of these pockets 26 disposed in spaced relation adjacent its outer periphery so that after the mechanism gets under operation, all of the pockets 26 of substantially the entire upper half of the drum will be filled with containers.

On the side of the drum 27 opposite the table 21 (Fig. 2), a discharge pusher bar or element 29 disposed within the drum, behind the pockets, moves outwardly when the drum comes to rest after a partial rotation and pushes the row or batch of containers out of the pocket onto an adjacently disposed second endless belt conveyor 31. The belt conveyor 31 carries the containers to one or more packing stations 32 where operators pick the containers up and pack them into carriers 33 supported in the proper position directly in front of the operators. The discharge of a batch of containers from their pocket 26 on one side of the drum 27 takes place while another batch is being inserted into another pocket 26 on the opposite or entrance side of the drum adjacent the table 21.

The drum 27 makes only one partial rotation after each forward stroke of the divider pusher plate 24 and while the pusher plate remains in position until a new batch of containers builds up behind it. When the new batch is built up and operates the electric stop switch 22 again, the divider pusher plate 24 moves back through a return stroke and in so doing sweeps the new accumulated batch of containers off the table 21 onto a third endless belt conveyor 35. This third conveyor 35 carries the batches of containers to one or more packing stations 36 where operators remove the containers and pack them into car-

riers 37 supported in the proper position directly in front of the operators.

In this manner the containers A entering on the entrance conveyor 20 and table 21 are shifted in batches alternately by the divider pusher plate 24 into the pockets 26 of the drum 27 and onto the third conveyor 35. The containers placed on the third conveyor 35 are carried directly to the packing stations 36, while the containers shifted into the drum pockets 26 are carried up over the drum and then discharged onto the second conveyor 31 for transmittal to the packing stations 32. In being carried over the drum, the containers for the packing stations 32 are turned over and thus their top closure ends are in proper position for packing of the containers into the carriers 33 in the same relation as the containers on conveyor 35 are packed into their carriers 37.

A detailed description of the feeding device will now be given. The endless belt entrance conveyor 20 operates over a driving pulley 41 (Figs. 1, 2 and 3) which is mounted on a main drive shaft 42 journaled in bearings 43 formed in a bracket 44 and a bearing 45 formed in a bracket 46. The brackets are secured to a base plate 47. The main drive shaft 42 is rotated continuously in any suitable manner.

The table 21 is disposed in a horizontal position coextensive with the entrance conveyor 20 and is long enough to hold about 16 containers and carry the electric stop switch 22 at its far end. This table is supported on the bracket 44 and on a second bracket 49 secured to the base plate 47.

The second belt conveyor 31 and the third belt conveyor 35 are operated from the main shaft 42 and are disposed in parallelism with the conveyor 20 and table 21. The third conveyor 35 is located immediately adjacent the outer edge of the table 21 and is operated by a pulley 51 carried on the main shaft 42. This third conveyor 35 extends beyond the table 21 to the packing stations 36.

The second belt conveyor 31 is located on the opposite side of the table 21 in widely spaced relation thereto so as to provide room between this conveyor and the third conveyor 35 for the packing operators located at the packing stations 32, 36. This second conveyor 31 is operated by a pulley 52 (Figs. 2 and 3) on the main shaft 42. The conveyor extends to the packing stations 32.

The rotary carrier drum 27, having the peripheral pockets 26, is located between the table 21 and the second conveyor 31 with its axis parallel to the conveyor and table. The drum 27 comprises in part a disc 54 which is mounted on a shaft 55 rotatably carried in a horizontal bearing 56 in a bracket 57 mounted on the base plate 47. The peripheral pockets 26 are formed in substantially rectangular sheet metal cages 58 (Fig. 2) of sufficient length to carry from 13 to 15 containers in contiguous side-by-side relation. The front or outer side of the cages are open and the opposite or inner sides are formed with an elongated slot 59. These cages 58 are arranged in a circle around the disc 54 adjacent its outer periphery and have one end of each cage secured to the disc. The opposite ends of the cages 58 are secured to a support ring 61 the outer periphery of which rests and rides on a pair of rollers 62 (Figs. 1 and 3) carried in a bracket 63 secured to the base plate 47. This construction provides a hollow drum which is supported on one end of the shaft 55 and the rollers 62.

The drum 27 is rotated through partial rotations to successively and individually align the cages 58 with the table 21 for the reception in the pockets 26 of batches of containers A from the table as explained above. This stepped rotation is effected by an indexing device which includes indexing rollers 65 (Figs. 1, 2 and 6) secured to the outer face of the disc 54 and located one adjacent each cage 58. The rollers 65 are successively engageable in an interrupted cam groove 66 of a Geneva type barrel cam 67 carried on a cross shaft 68 mounted in bearings 69 formed on the bracket 57.

The cam shaft 68 normally is stationary and is rotated periodically in time with the divider pusher plate 24, through a conventional one revolution clutch device. For this purpose one end of the cam shaft 68 extends beyond the bearing bracket 57 and is carried in a bearing bracket 71 (Figs. 2 and 6) secured to the base plate 47. Adjacent this bearing bracket 71 the cam shaft 68 is keyed to an internal clutch member 73 (see also Fig. 7) which carries a spring held pivotally mounted driving dog 74 which is held normally out of driving position by a flapper 75 mounted on a pivot pin 76 carried in a pair of spaced lugs 77 on the base plate 47.

The flapper 75 is movable laterally of the dog 74 by a lever 78 which at one end is mounted on the pivot pin 76 and which at its opposite end is connected to a movable, spring held, armature 79 of an electric solenoid 80 attached to the bearing bracket 71. The solenoid is controlled through suitable electric circuits to be hereinafter explained, by a normally open electric switch 81 (Fig. 2) actuated by the divider pusher plate 24. The switch 81 is provided with a pivoted actuating element 82 (Fig. 3) which when tripped on a forward stroke of the plate 24 will momentarily close the switch but on a reverse direction tripping will not close the switch.

The flapper 75 of the clutch device holds the driving dog 74 out of engagement with a driving notch 84 (Figs. 6 and 7) in a continuously rotating sprocket 85 which surrounds the internal clutch member 73. The sprocket 85 is rotated by an endless chain 86 which is driven by a sprocket 87 on the main drive shaft 42.

When the switch 81 is momentarily closed by the pusher plate 24, the electric solenoid 80 is energized and this pushes the lever 78 and its connected flapper 75 outwardly and this releases the driving dog 74 so that when the rotating sprocket 85 rotates the notch 84 into position adjacent the released dog, the dog engages into the notch and thus rotates the internal clutch member 73 and the cam shaft 68.

Before the shaft 68 has completed one revolution the flapper 75 is released and moves back into position to withdraw the dog 74 from the notch 84 and thus limit the rotation of the shaft 68 to one revolution. This is a conventional clutch device. The shaft 68 in turning through one revolution, rotates the drum 27 through the cam 67 and rollers 65, through a partial revolution sufficient to remove one pocket 26 from alignment with the table 21 and to align the next pocket with the table.

The divider pusher plate 24 and the discharge pusher bar 29 preferably are actuated by compressed air or other suitable fluid pressure medium. For this purpose the divider pusher plate 24 which is disposed adjacent the table 21 is carried on a pair of spaced and parallel horizontal guide rods 91 (Figs. 2 and 3) mounted in a pair of slide bearings 92 which extend up from a support plate 93 secured to the upper ends of the upright brackets 44, 49 (see Fig. 1). At their outer ends, the guide rods 91 are secured to a cross bar 94 which is mounted on a piston rod 95 (see Fig. 9) having a piston 96 operating in a cylinder 97. The cylinder 97 near its ends is connected by pipes 98, 99 to a control valve 101 having a slide valve 102 which is reciprocated by normally deenergized electric solenoids 103, 104 to connect one or the other of the pipes 98, 99 to an inlet pipe 105 which leads from a suitable source of fluid medium under pressure.

In a similar manner, the discharge pusher bar 29 which is disposed within the carrier drum 27 for pushing the containers out of the pockets 26 onto the second conveyor 31, is supported on a pair of spaced and parallel guide rods 108 (Figs. 2, 4 and 5). These guide rods 108 are slideably carried in a pair of spaced slide bearings 109 formed on a horizontal web 111 extending outwardly from a cylinder 112. The cylinder 112 is secured to a bracket 113 which is fastened to an upright section 114 of the base plate 47 (see Figs. 2 and 3).

The pusher bar 29 is also secured to a piston rod 116 (Fig. 9) having a piston 117 which operates in the cylinder 112. Near its ends, the cylinder 112 is connected by a pair of pipes 121, 122 to a control valve 123 having a slide valve 124 which is reciprocated by normally deenergized electric solenoids 125, 126 to connect one or the other of the pipes 121, 122 to an inlet pipe 127 which leads from a suitable source of fluid medium under pressure.

The electric solenoids 103, 104 and 125, 126 of the respective control valves 101, 123 and the electric solenoid 80 of the one revolution clutch on the cam shaft 68 are energized and deenergized through suitable electric circuits and switches including the stop switch 22 connected with a source of electric current such as a generator 131 (Fig. 9). Actuation of the mechanism is controlled primarily by the entering containers as they stop against and close the normally open stop switch 22.

When a full line or batch of containers A is on the table 21 and closes the stop switch 22, an electric circuit is established which includes the switch 22, an electric switch 132 which is normally held closed by a projection 133 on the divider pusher cross bar 94, and the solenoid 103 which is normally deenergized. With this circuit established electric current flows from the generator 131 along a connecting wire 135, closed switch 22, a connecting wire 136, closed switch 132, a connecting wire 137, solenoid 103, and a return wire 138. Current flowing along this circuit, energizes the solenoid 103 and shifts the slide valve 102 from the position shown in Fig. 9 to the position shown in Fig. 8. This shift in position of the slide valve 102 connects the pipe 99 with the inlet pipe 105 and vents the pipe 98 through vent passages 140 in the slide valve 102.

Thus the fluid pressure medium from the inlet pipe 105 flows through the pipe 99 into the cylinder 97 and exerts a pressure against the outer face of the piston 96 to push the divider pusher plate 24 inwardly toward the carrier drum 27 and thereby pushes the row of containers off the table 21 and into the aligned pocket 26 of the drum.

As soon as the pusher plate 24 starts to move forward, the projection 133 rides off the switch 132 and thereby causes the switch to open. This breaks the circuit and deenergizes the solenoid 103. However the slide valve 102 remains in its shifted position and continues to keep the pipes 99, 105 in communication.

The removal of the containers A from the table 21 also opens the stop switch 22 so that it is in readiness to be reclosed by the following containers which are advanced by the inlet conveyor 20 into position on the table behind the pusher plate 24.

As the pusher plate 24 nears the completion of its forward stroke while seating the containers in the drum pocket 26, a projecting pin 142 on the pusher cross bar 94 trips the pivoted actuating element 82 of the normally open electric switch 81 hereinbefore mentioned in connection with the one revolution clutch on the cam shaft 68 and thereby momentarily closes the switch. The closing of this switch 81 establishes an electric circuit which causes current from the generator 131 to flow along a connecting wire 144, a wire 145, through closed switch 81, a connecting wire 146 to and through the normally deenergized solenoid 80, and along connecting return wires 147, 148 to the generator. Current momentarily flowing along this circuit momentarily energizes the solenoid 80 to momentarily release the clutch flapper 75 and thereby effect rotation of the cam shaft 68 through one revolution and a partial rotation of the carrier drum 27 to move a filled pocket 26 away from the table 21 and to align the next empty pocket with the table for a repeat operation.

The carrier drum 27 is not partially rotated again until the divider pusher plate 24 returns to its original position as viewed in Fig. 9 and then completes another forward stroke. The return of the pusher plate 24 is effected when another accumulated solid row of containers on

the table 21 again closes the switch 22. This time the closing of the switch reestablishes the original circuit through a normally open electric switch 151 which is closed by the projection 133 on the pusher cross bar 94 when the pusher is fully forward. This switch 151 is closed when the pusher plate completes its forward stroke and remains closed until the pusher starts to return.

Hence with the stop switch 22 and the switch 151 closed, current from the generator 131 flows along wire 135, through closed switch 22, wire 136, a wire 152, closed switch 151, a wire 153, through the normally deenergized slide valve solenoid 104 and a wire 154 to the return wire 138. The current flowing along this circuit energizes the solenoid 104 and thus shifts the slide valve 102 back into its original position as shown in Fig. 9 and thereby cuts off the pipe 99 and brings pipe 98 into communication with the inlet pipe 105. Thus pipe 99 is vented through the valve vents 140 and the fluid pressure medium flows through pipe 98 into the cylinder 97 and exerts pressure against the inner face of the piston 96 to return the pusher plate 24 to its original position.

During this return movement of the pusher plate 24 it sweeps across the table 21 and thereby pushes the row of containers thereon off the table and places them on the third conveyor 35 for advancement to the packing stations 36 as hereinbefore explained. During this outward movement of the pusher plate 24, the clutch switch 81 is not actuated because the spring held one direction actuating element 82 on the switch pivots as the projecting pin 142 on the cross bar 94 passes the switch and thus leaves the switch unactuated. The projection 133 on the opposite end of the cross bar 94 also leaves the switch 151 and causes it to reopen to break the solenoid actuating circuit and leave the slide valve 102 in its shifted position to permit the completion of the return stroke of the pusher plate. At the completion of this return stroke the projection 133 engages and recloses the switch 132 to set the circuit for a repeat forward stroke when the stop switch 22 is next closed by a new batch of containers.

Thus the divider pusher plate 24 on each of its forward strokes inserts accumulated containers A into one of the pockets 26 of the carrier drum 27 and on each of its return strokes places another batch of containers onto the third conveyor 35 for advancement to the packing stations 36.

After the carrier drum 27 has made a partial rotation the discharge pusher bar 29 operates to discharge the row of containers from their pocket 26 onto the second conveyor 31 for advancement to the packing stations 32. This is effected through the alternate energization of the normally deenergized solenoids 125, 126 and by spaced pins 156 (Figs. 4 and 5) which project from the inner face of the drum support ring 61 and by spaced bosses 157 on the outer face of the ring. There is one pin 156 and one boss 157 for each container pocket in the drum 27.

Unlike the divider pusher plate 24, the discharge pusher bar 29 makes a complete forward or outer stroke and immediately returns to its original position. This is effected by a pair of electric circuits, the first of which includes the slide valve solenoid 125 (Fig. 9), a normally open switch 161 which is adjacent the path of travel of the bosses 157 on the drum ring 61, and a normally closed reset switch 162 which is in the path of travel of the pins 156 on the drum ring 61 (see Figs. 3, 4 and 5). The reset switch 162 remains in closed or open condition when actuated as distinguished from the other switches which are spring controlled so that, upon release after actuation, they automatically return to normally open or closed positions.

When the drum 27 stops after a partial rotation, a boss 157 engages against and closes the switch 161 and

thereby establishes the circuit which includes the slide valve solenoid **125**. Electric current immediately flows from the generator **131** along wire **144**, a connecting wire **163**, through the solenoid **125**, a connecting wire **164**, through the closed reset switch **162**, a connecting wire **165**, the closed switch **161**, a connecting wire **166**, and return wire **148**. Current flowing along this circuit energizes the solenoid **125** and thus shifts the slide valve **124** from its position shown in Fig. 9 to a position where the inlet pipe **127** is in communication with the pipe **121**, and the pipe **122** is cut off and vented through vents **168** in the slide valve.

The shifting of the slide valve **124** permits the fluid pressure medium from the inlet pipe **127** to flow into the cylinder **112** and exert a pressure against the outer face of the piston **117** to force the discharge pusher bar **29** outwardly through the slot **59** in the back of the aligned container cage **58** and thus push the containers A out of their pocket **26** onto the second conveyor **31** for advancement to the packing stations **32**. Upon completion of this forward stroke of the pusher plate **29**, a switch actuating pad **171** formed on one of the plate guide rods **108**, engages and opens the normally closed reset switch **162**. This breaks the first circuit and deenergizes the slide valve solenoid **125**.

Simultaneously with the opening of the reset switch **162**, the actuating pad **171** engages and closes a normally open electric switch **172** in the second circuit which includes the slide valve solenoid **126**. The closing of the switch **172** establishes this second circuit and accordingly electric current flows from the generator **131** along wire **144**, a connecting wire **174**, closed switch **172**, a connecting wire **175**, solenoid **126**, a connecting wire **176**, and return wire **148**. Current flowing along this circuit energizes the solenoid **126** and thus returns the slide valve **124** to its position shown in Fig. 9. This shifting of the slide valve **124** cuts off the pipe **121** to the vents **168** and effects communication between the inlet pipe **127** and the pipe **122**. The fluid pressure medium from the inlet pipe **127** thereupon flows into the cylinder **112** to exert a pressure on the inner face of the piston **117** to immediately return the pusher bar **29** to its original position as shown in Fig. 9 where it is free of the drum **27** to permit the drum to make its next partial rotation for a repeat discharge operation.

As soon as the pusher bar **29** begins to return to its original position, the actuating pad **171** releases the switch **172** and thereby permits it to open and thus break the second circuit and deenergize the slide valve solenoid **126** for a repeat operation. The reset switch **162** however remains in its open condition until the drum **27** begins to turn through its next partial rotation. This is done to prevent immediate reenergization of the slide valve solenoid **125** through the switch **161** in the same circuit which is held closed by its boss **157** while the drum is stationary. When the drum begins to rotate, the boss **157** rides off and releases the switch **161** and thus opens the circuit which includes the slide valve solenoid **125**. Before the next pocket **26** rotates into alignment with the discharge pusher plate **29**, the reset switch **162** must be closed to reset the circuit for a repeat operation. This is effected by the pins **156** on the inner face of the drum ring **61**. The pins **156** are located between the bosses **157** so that as soon as a boss **157** releases the switch **161**, a pin **156** immediately engages and closes the reset switch **162**. Thus the circuit which includes the slide valve solenoid **125** is ready for a repeat operation when the drum again stops after a partial rotation. This completes the cycle of operation of the mechanism.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a feeding device for advancing containers along predetermined paths of travel for a subsequent operation, the combination of a support for a batch of containers, means for advancing said containers into position on said support, a conveyor disposed adjacent said support on one side thereof for receiving batches of containers from said support, a rotatable drum having peripheral pockets disposed adjacent said support on the opposite side thereof for receiving batches of containers from said support, a pusher member disposed adjacent said support, means for reciprocating said pusher member transversely across said support for pushing alternate batches of containers from said table onto said conveyor and for pushing in-between batches of containers from said table into the pockets of said drum, and means for partially and intermittently rotating said drum to align said pockets individually and successively with said support for the reception of said in-between batches of containers.

2. In a feeding device for advancing containers along predetermined paths of travel for a subsequent operation, the combination of a support for a batch of containers, means for advancing said containers into position on said support, a conveyor disposed adjacent said support on one side thereof for receiving batches of containers from said support, a rotatable drum having peripheral pockets disposed adjacent said support on the opposite side thereof for receiving batches of containers from said support, a pusher member disposed adjacent said support, means for reciprocating said pusher member transversely across said support for pushing alternate batches of containers from said table onto said conveyor and for pushing in-between batches of containers from said table into the pockets of said drum, means for partially and intermittently rotating said drum to align said pockets individually and successively with said support for the reception of said in-between batches of containers and for carrying said containers to a place of discharge, means for discharging said batches of containers from said pockets at said place of discharge, and means at said place of discharge for receiving said discharged containers and for advancing them for subsequent treatment.

3. In a feeding device for advancing containers along predetermined paths of travel for a subsequent operation, the combination of a support for a batch of containers, means for advancing said containers into position on said support, a conveyor disposed adjacent said support on one side thereof for receiving batches of containers from said support, a rotatable drum having peripheral pockets disposed adjacent said support on the opposite side thereof for receiving batches of containers from said support, a pusher member disposed adjacent said support, means for reciprocating said pusher member transversely across said support for pushing alternate batches of containers from said table onto said conveyor and for pushing in-between batches of containers from said table into the pockets of said drum, means for partially and intermittently rotating said drum to align said pockets individually and successively with said support for the reception of said inbetween batches of containers and for carrying said containers to a place of discharge, a pusher element operable within said drum for discharging said batches of containers from said pockets at said place of discharge, means for operating said pusher element in time with the partial rotations of said drum, and a conveyor disposed adjacent said drum at said place of discharge for receiving said discharged containers and for advancing them for subsequent treatment.

4. In a feeding device for advancing containers along

predetermined paths of travel for a subsequent operation, the combination of a support for a batch of containers, means for advancing said containers into position on said support, receiving means disposed on opposite sides of said support for receiving batches of containers from said support, a pusher member disposed adjacent said support between said receiving means, means for reciprocating said pusher member transversely across said support through a forward stroke and through a return stroke for transferring said batches of containers alternately in opposite directions from said support to said oppositely disposed receiving means for dividing said containers for subsequent operations, a control device operable by a said batch of containers on said support, and control means operable by said pusher member and cooperable with said control device and said reciprocating means for starting each of said forward and return strokes of the pusher member only when sufficient containers are assembled on said support to constitute a new batch.

5. In a feeding device for advancing containers along predetermined paths of travel for a subsequent operation, the combination of a support for a batch of containers, means for advancing said containers into position on said support, a conveyor disposed adjacent said support on one side thereof for receiving batches of containers from said support, rotary means disposed adjacent said support on the opposite side thereof for receiving batches of containers from said support, a pusher member disposed adjacent said support, means for reciprocating said pusher member transversely across said support for pushing batches of containers from said table in one direction onto said conveyor and pushing an alternate batch of containers from said table in an opposite direction into said rotary means for dividing said containers for subsequent operation, means for rotating said rotary means, and control means operable by said pusher member for actuating said rotating means in time with the reciprocation of said pusher member.

6. In a feeding device for advancing containers along predetermined paths of travel for a subsequent operation, the combination of a support for a batch of containers, means for advancing said containers into position on said support, a rotatable drum having peripheral pockets disposed adjacent said support for receiving batches of containers from said support, a pusher member disposed adjacent said support, means for reciprocating said pusher member transversely across said support for pushing batches of containers successively from said table into the pockets of said drum, means for partially and intermittently rotating said drum to align said pockets individually and successively with said support for the reception of said batches of containers and for carrying said containers to a place of discharge, a pusher element operable within said drum for discharging said batches of containers from said pockets at said place of discharge, means for operating said pusher element in time with the partial rotations of said drum, and a conveyor disposed adjacent said drum at said place of discharge for receiving said discharged containers and for advancing them for subsequent treatment.

7. In a container feeding device, the combination of a rotatable drum having pockets for receiving batches of containers, means for feeding batches of containers successively to said pockets, means for intermittently rotating said drum, a pusher element operable within said drum, and means including abutments on said drum for operating said pusher element in time with said intermittent rotations of the drum to discharge said batches of containers successively from said pockets.

8. In a container feeding device, the combination of rotary means for receiving and turning a container through an arc, means for feeding containers successively to said rotary means, means for rotating said rotary means, control means engageable by said feeding means for intermittently actuating said rotating means, a pusher element operable within said rotary means and alignable with a said turned container therein, means for operating said pusher element, and a second control means engageable by said rotary means for actuating said operating means to move said pusher element toward and against said aligned container between said intermittent rotations to discharge said container from said rotary means.

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