

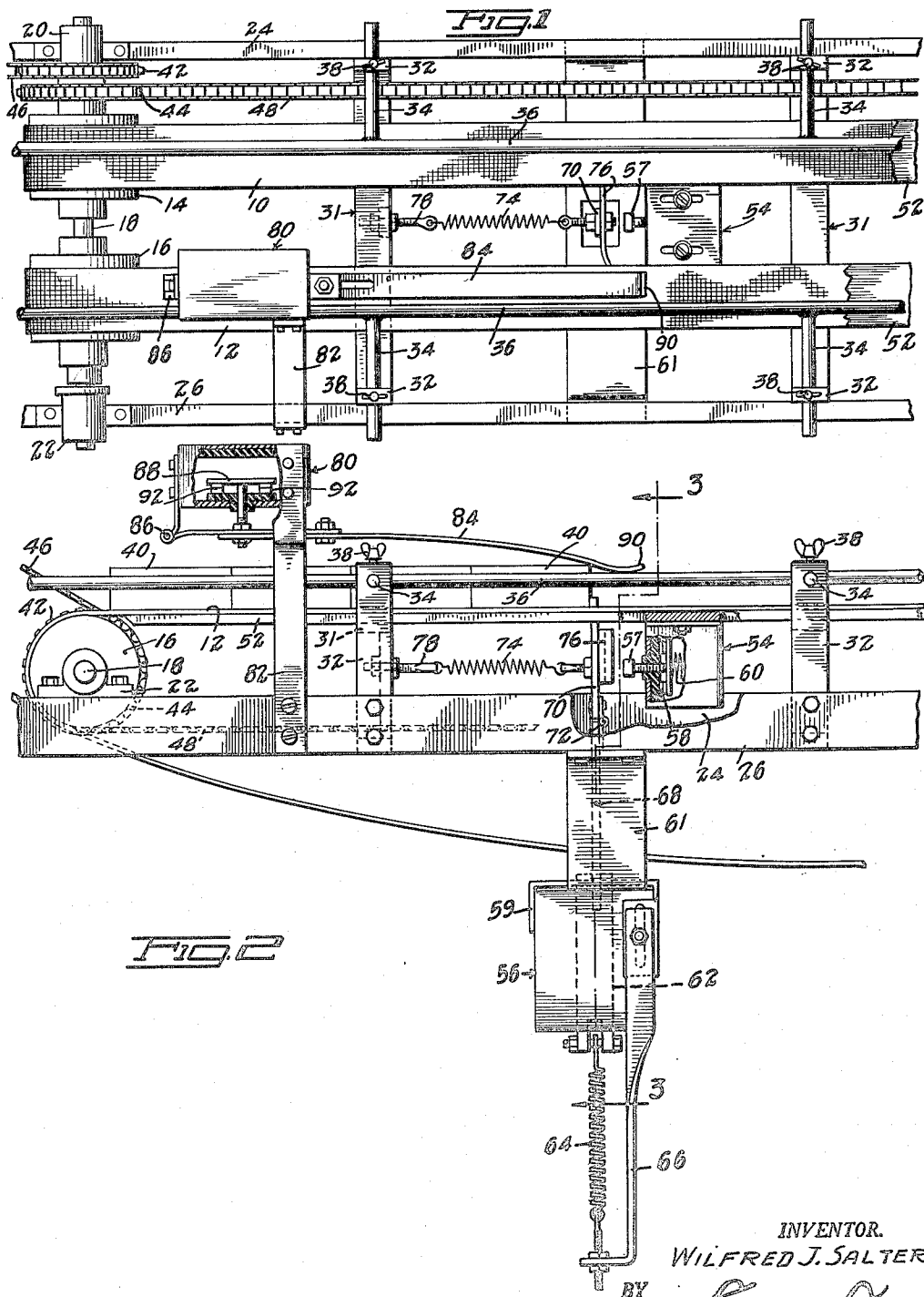
Oct. 5, 1954

W. J. SALTER
ACCUMULATOR DEVICE

2,690,832

Filed March 27, 1952

2 Sheets-Sheet 1



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Fig. 3

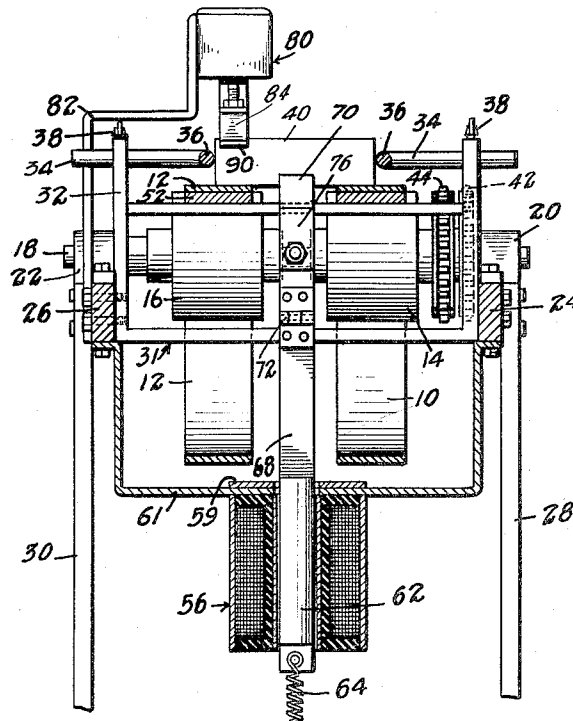
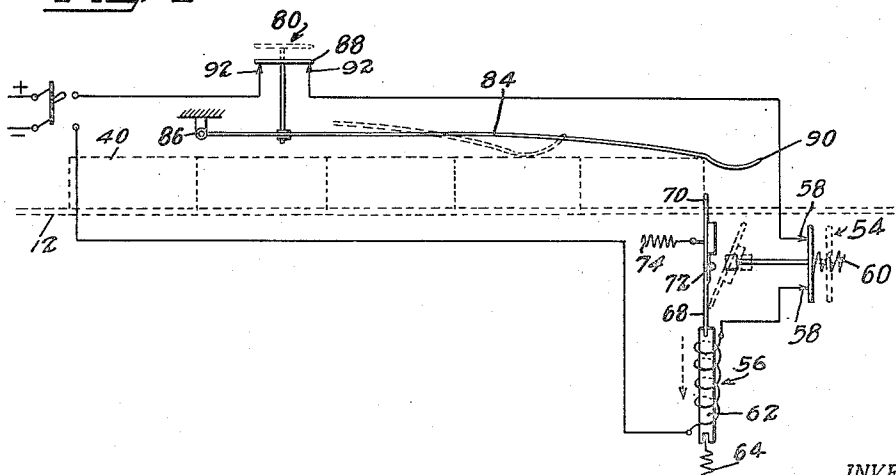


Fig. 4



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2,690,832

ACCUMULATOR DEVICE

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Application March 27, 1952, Serial No. 278,773

6 Claims. (Cl. 198—34)

1

This invention relates to an accumulating device.

It is an object of this invention to provide means for accumulating containers on a continuously moving conveyor until a predetermined quantity is accumulated.

It is a further object of this invention to provide means for releasing containers so accumulated.

Still a further object of this invention is to provide a device which will collect a predetermined number of packages or cartons out of a random number to send them to a secondary operation.

It is still a further object of this invention to provide a collecting device wherein the number of packages or containers collected can be readily adjusted.

It is still a further object of this invention to provide means to accumulate a predetermined quantity of containers from a random number along a continuous conveyor, release the containers and return to the operative position to collect a second quantity of cartons or the like.

Other objects and advantages of this invention will be apparent from the following description.

In the drawings:

Figure 1 is a top plan view of a continuous conveyor embodying this invention.

Figure 2 is a side elevation of the accumulating device.

Figure 3 is an end view taken along line 3—3 of Figure 2.

Figure 4 is a schematic wiring diagram.

Referring now to the drawings, and particularly Figure 1, a continuous conveyor is illustrated moving from left to right in Figures 1 and 2. The conveyor comprises belts 10 and 12, which are looped about pulleys, such as 14 and 16, at each extremity of the belts. Each pair of pulleys, such as 14 and 16, are mounted on a shaft 18, which is journaled in bearings 20 and 22, which in turn are suitably mounted on the longitudinal runners 24 and 26 of the conveyor. The runners are supported by legs, such as 28 and 30, spaced at suitable intervals along the conveyor and strengthened by cross braces 31.

Spaced at suitable intervals along the runners 24 and 26 are a plurality of upright braces 32, 50

2

each of which is provided with an aperture adapted to receive a cross bar 34 of one of the rails 36. Set screws 38 are provided to position the cross bars in the upright braces so that the distance between the rails is adjustable to accommodate various size cartons or containers 40, which rest upon the belts 10 and 12, and are conveyed by movement of the belts. Said belts are driven by rotation of shaft 18, which has mounted thereon a pair of sprockets 42 and 44. About sprocket 42 the endless drive chain 46 is looped which is driven by any suitable source of power (not shown). About the sprocket 44 one end of endless drive chain 48 is looped, the other end being looped about a similar sprocket formed on a shaft similar to shaft 18, which has mounted thereon pulleys corresponding to pulleys 14 and 16 and about which the unshown ends of belts 10 and 12 are looped.

It is desirable to provide supporting plates, such as 52, beneath the belts 10 and 12, to provide a stable surface upon which the containers are supported. Depending from the spaced supporting plates 52 is a switch 54. The switch comprises a plunger 57, which is urged to the closed position against contacts 58 by a spring 60. This switch closes a suitable circuit to energize a solenoid 56. The solenoid 56 is supported by bracket 59, which in turn is supported from a U-shaped bracket 61, the opposed arms of which are joined to the runners 24 and 26. The solenoid when switch 54 is closed, raises the iron core 62 against the pressure of spring 64, which spring is attached at one extremity to the iron core and at the opposite extremity to the bracket 66, which is suitably secured to the bracket 59. Attached to the core 62 is a plate or finger 68, which has pivoted arms mounted at its upper extremity to stop member 70, as best seen in Figure 3. The connection between the stop member 70 and the finger 68 is by means of a hinge 72. A suitable spring 74 is attached at one extremity to the stop 70 and at the other extremity to the adjacent cross brace 31, urging the stop to the upright position. When the solenoid is energized, raising the iron core, finger, and stop to its uppermost position, the upper extremity of the stop projects between the parallel belts 10 and 12 and prevents the containers 40 from being carried beyond the stop. When a sufficient num-

3

ber of containers 40 have thus been backed up along the belt, the force of such containers will urge the stop to pivot in a clockwise direction against the pressure of spring 74. The stop 70 carries thereon a breaker 76, which is adapted to strike plunger 57 of switch 54, urging the plunger 57 away from the contacts 58 against the pressure of spring 60, thus opening the switch. When the switch is thus opened, the circuit is broken, the solenoid 56 is de-energized permitting the spring 64 to draw the core, finger, and stop 70 downwardly so that the upper extremity of stop 70 is drawn below the level of the belts 10 and 12, permitting the containers 40 thus accumulated to continue to travel along the conveyor. It is readily apparent that the number of the containers thus accumulated prior to the breaking of the switch 54 by the pivoting of the stop 70 can be varied by varying the tension of the spring 74. For this purpose, it is desirable to join the spring 74 to the cross brace 31 by means of an adjustable screw 78. It is desirable to provide means for delaying the closing of the circuit to the solenoid when the stop 70 is lowered, for at this time the spring 74 urges the stop to its upright position and the switch 54 is again closed by the action of spring 60. Depending, of course, upon the pressure of spring 74, it is possible to accumulate a large quantity of containers, so that all of the containers would not be carried beyond the position of the stop by the time switch 54 has closed and the solenoid is thereby energized, raising the stop 70 into the operative position. In this event, it is desirable to provide delaying means in the electrical circuit energizing the solenoid.

One means of causing the delay is provided by an overhead switch 80, which is supported from the vertical bracket 82, projecting upwardly from the longitudinal runner 26.

The switch 80 has an arm 84 pivotally connected at one extremity, as at 86, and projecting substantially horizontally along the path of travel of the containers. This arm 84 carries thereon one contact 88 of the switch. Thus, when a container is held by the stop, the arm 84 is in its lowered position with its extremity 90 projecting beyond the carton 40 and the switch 80 is closed completing the circuit to solenoid 56. When the cartons pass beyond stop 70 they contact extremity 90 raising arm 84 and opening the switch 80, thus opening the circuit to solenoid 56, independent of switch 54. When the cartons have passed extremity 90, the arm 84 pivots downwardly, closing switch 80. The switch 80, when closed, completes the circuit to the solenoid 56, energizing said solenoid and raising the stop 70 into the path of the containers. When this overhead switch 80 is utilized to re-energize the solenoid, the circuit containing switch 54 is open until the switch 80 is closed, so that the closing of the switch 54, after the stop 70 has been lowered below the path of the containers, will not energize the solenoid 56.

While what hereinbefore has been described is the preferred embodiment of this invention, it is readily apparent that various alterations and modifications can be resorted to without departing from the scope of this invention, and such alterations and modifications are intended to be included within the following claims.

I claim:

1. In a device for collecting a predetermined quantity of cartons spaced along a conveyor of the type having spaced moving belts supporting

4

the cartons therebetween the combination comprising: interrupting means projecting upwardly between said belts and interrupting travel of said cartons along said conveyor, means for pivotally mounting said interrupting means between said belts, means for urging said interrupting means between said belts against an opposing force, and means responsive to pivoting of said interrupting means to disable said urging means thereby withdrawing said interrupting means from between said belts.

2. In a device for collecting a predetermined quantity of cartons spaced along a conveyor of the type having spaced moving belts supporting the cartons therebetween the combination comprising: a stop member projecting upwardly between said belts to interrupt travel of cartons along said conveyor, a solenoid retaining said stop member between said belts against an opposing force, said stop member being pivotally connected to said solenoid, resilient means urging said stop member to an upright position, and a switch in the circuit to said solenoid actuated by pivoting of said stop member to cause said stop member to be withdrawn from between said belts.

3. A device for collecting a predetermined quantity of cartons spaced along a conveyor of the type having spaced moving belts supporting the cartons therebetween comprising: interrupting means projecting between said belts and interrupting travel of said cartons along said conveyor, means responsive to the number of cartons whose travel is thus interrupted for withdrawing said interrupting means from between said belts, and means responsive to the passage of the cartons so collected to insert said interrupting means between said belts.

4. A device for collecting a predetermined quantity of cartons spaced along a conveyor of the type having spaced moving belts supporting the cartons therebetween comprising: interrupting means projecting between said belts and interrupting travel of said cartons along said conveyor, means for pivotally mounting said interrupting means between said belts, means for urging said interrupting means between said belts, signal means responsive to pivoting of said interrupting means to disable said urging means thereby withdrawing said interrupting means from between said belts, and means responsive to the passage of the cartons so collected to actuate said urging means to insert said interrupting means between said belts.

5. A device for collecting a predetermined quantity of cartons spaced along a conveyor of the type having spaced moving belts supporting the cartons therebetween comprising: a stop member, a solenoid retaining said stop member between said belts to interrupt travel of cartons along said conveyor, said stop member being pivotally connected to said solenoid, resilient means urging said stop member to an upright position, a switch actuated by pivoting of said stop member to cause said solenoid to withdraw said stop member from between said belts, and a second switch responsive to the passage of cartons so collected to cause said solenoid to retain said stop member between said belts.

6. A device for collecting a predetermined quantity of cartons spaced along a conveyor of the type having spaced moving belts supporting the cartons therebetween comprising: a stop member, a solenoid retaining said stop member between said belts to interrupt travel of cartons

5

along said conveyor, said stop member being pivotally connected to said solenoid, resilient means urging said stop member to an upright position, a switch actuated by pivoting of said stop member to cause said solenoid to withdraw said stop member from between said belts, and a second switch, an arm pivotally mounted to said switch and carrying one of the contacts of said switch, the extremity of said arm projecting beyond said stop member, said arm pivoting when cartons are released by said stop, opening said second switch to retain said stop member in a withdrawn position, said arm pivoting downwardly when all cartons thus collected have passed its extremity, closing said second switch and causing

6

said solenoid to retain said stop member between said belts.

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