Feb. 23, 1943. W. D. KIMBALL 2,312,060

CAN-ARRANGING APPARATUS

Filed July 26, 1940 3 Sheets-Sheet 1

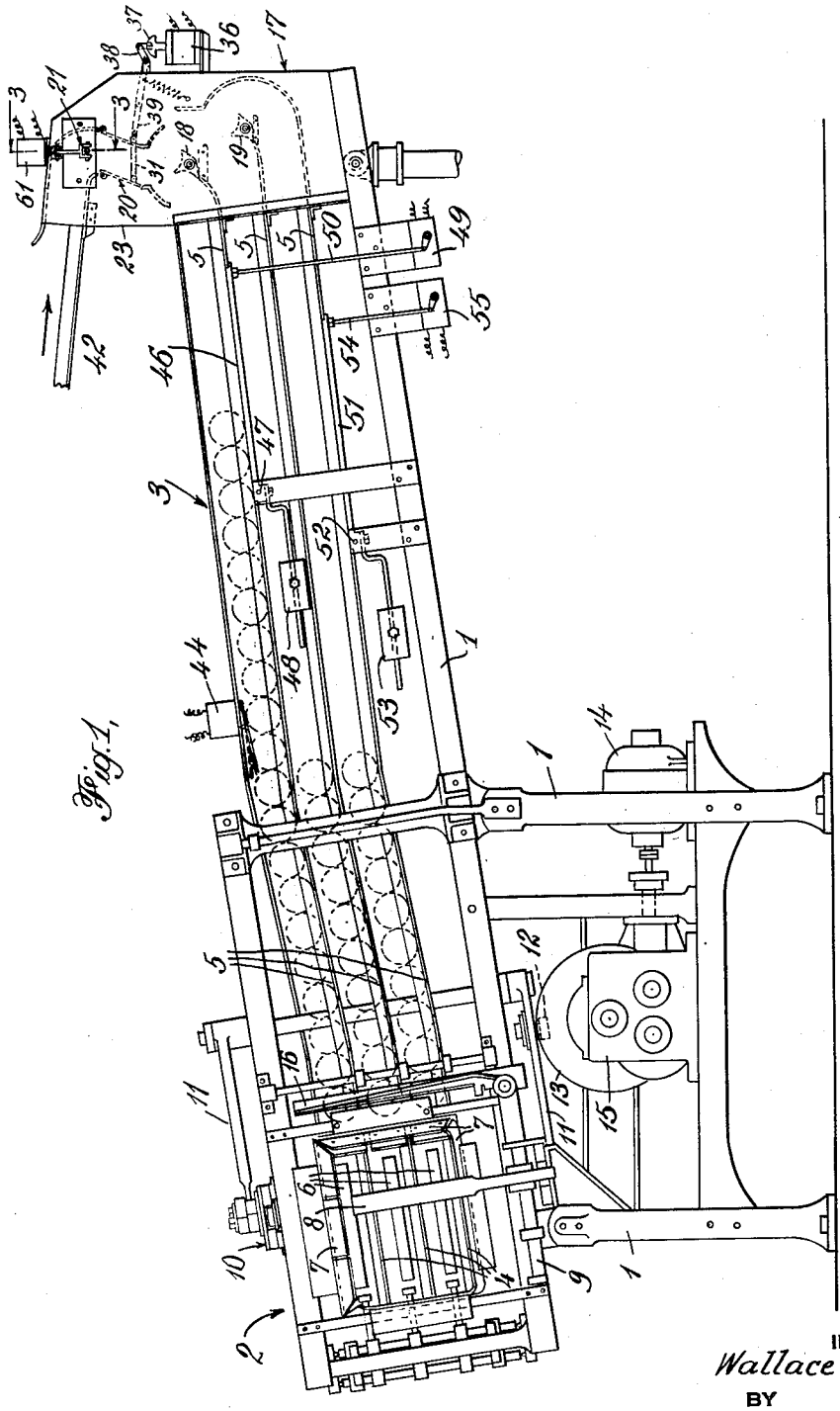


Fig. 1.

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Filed July 26, 1940 3 Sheets-Sheet 2

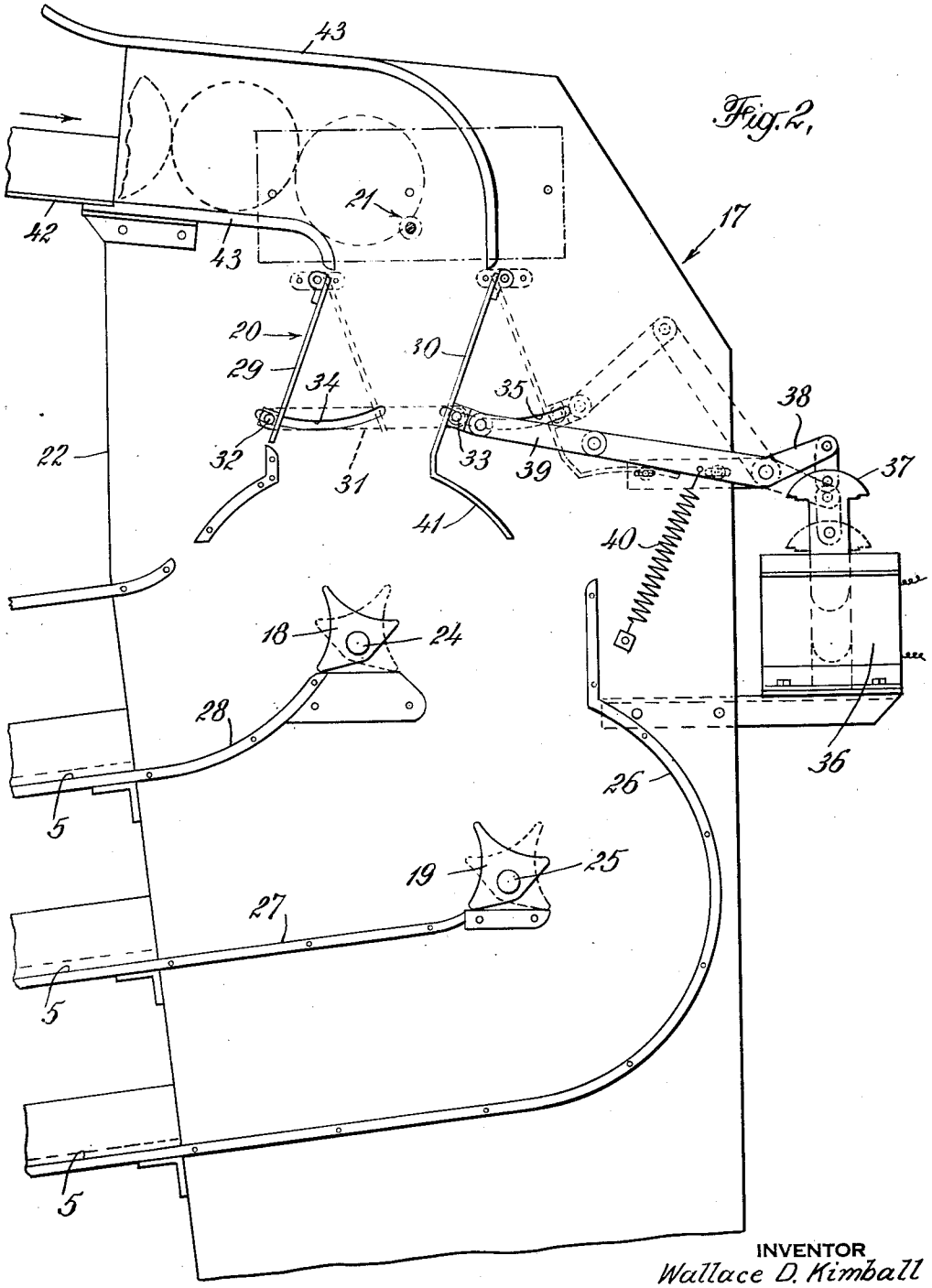


Fig. 2.

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Filed July 26, 1940 3 Sheets-Sheet 3

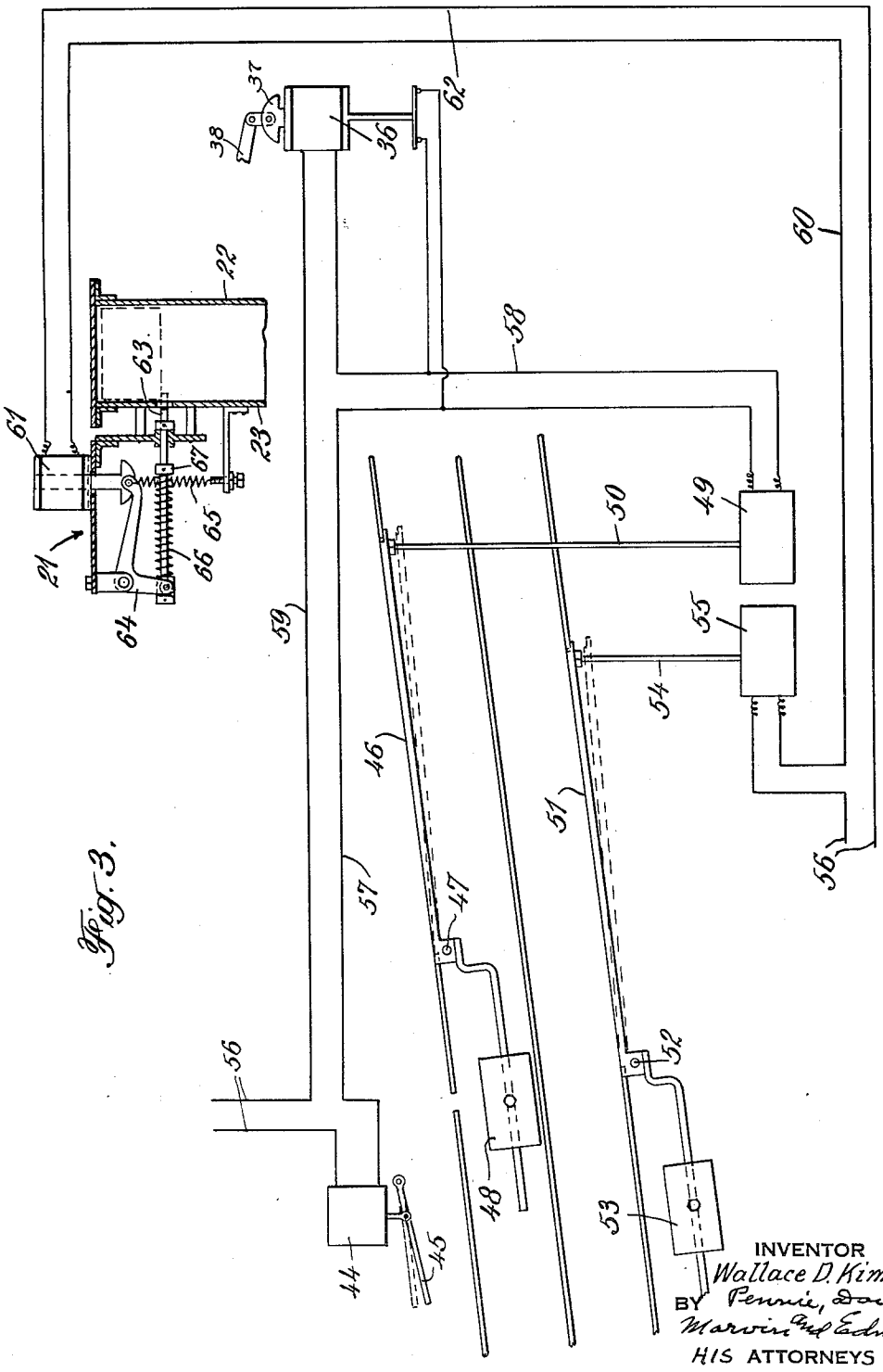


Fig. 3.

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UNITED STATES PATENT OFFICE

2,312,060

CAN-ARRANGING APPARATUS

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Application July 26, 1940, Serial No. 347,584

23 Claims. (Cl. 193—39)

This invention relates to an improved apparatus for rearranging rolling cans from a single line into three lines.

In the handling of canned goods, such as canned food products, after the filling and processing operations are completed, the cans are labeled and then packed in suitable cases for shipment such as corrugated board or fibreboard shipping cartons. The labeling is done by means of a labeling machine through which the cans roll in a single line but most packing machines require that the single line of cans leaving the labeling machine be rearranged into a plurality of lines so as to facilitate the forming of the charge and placing of it in the shipping case.

A single row or line of cans is readily rearranged into two lines or any multiple of two lines by means of a can "divider" or distributing mechanism which is provided with can-deflecting means which is shiftable by the cans themselves so as to deliver alternate cans into either of two lines. Such mechanism has not customarily been employed for rearranging cans from a single line into three lines or a multiple of three lines because of the difficulty in obtaining an equal distribution of the cans among the three lines. Can distributing mechanism of this type is frequently referred to in the industry as "star wheel divider" mechanism because of the fact that the can-deflecting member is in the form of a portion of a star wheel.

The primary object of my present invention is to provide a can-rearranging or distributing mechanism of the "star wheel divider" type which is capable of rearranging a single line of cans into three lines having an equal average distribution of the cans between them so that cans may be removed from each of the three lines at the same rate, that is to say, the same quantity may be taken from each of the three lines per unit of time.

A specific object of the invention is to provide a can-distributing mechanism for supplying cans to a case packing machine for placing the cans in shipping cases in which the cans are stacked in three superposed rows and then pushed endwise into the case.

Another object of the invention is to provide a can-distributing mechanism of a particular construction which is capable of use in distributing cans into three rows with either an equal or an unequal average distribution, that is, of general application.

The invention will be understood from a consideration of the accompanying drawings which illustrate, by way of example, an embodiment of the invention in a case packing machine. Referring now to these drawings:

Fig. 1 is a view in side elevation of the improved can-rearranging or distributing mechanism applied to the runways of a case packing machine which is adapted to insert a charge of cans consisting of three rows of four cans each into the packing case;

Fig. 2 is an enlarged view of the can-distributing mechanism shown in Fig. 1 with the front side plate thereof removed; and

Fig. 3 is a diagram of the electrical connections and also illustrating a vertical section taken on line 3—3 of Fig. 1, drawn to an enlarged scale, showing the can gate or stop mechanism.

Referring to Fig. 1, the case-packing machine comprises a frame 1 which supports packing mechanism indicated generally by reference numeral 2 and a can runway or track section indicated generally by reference numeral 3. The packing mechanism 2 comprises 3 superposed shelves 4 which receive the cans to be packed from the three superposed runways 5.

After a charge comprising 12 cans, four on each of the three shelves 4, has been received by the packing mechanism, a set of plungers 6, carried by a common head or carriage, are advanced and push the cans forward in the direction of their axes through a funnel 7 on which the case to be packed has been telescoped. This motion of the plungers 6 ejects the charge of cans into the packing case on the funnel and the weight of the cans causes the case to be lowered by means of a drop-off arm 8 which is pivoted on a shaft 9 and causes the filled case to be turned through an angle of 90° to upright position and deposited upon a conveyor (not shown) by which the filled cases are carried to the next operation, usually that of closing, gluing and sealing the flaps ready for shipment.

The head or carriage for the packing plungers 6 is indicated generally by reference numeral 10 and is reciprocated by a pair of arms 11, the lower one of which carries a cam roller 12 which engages a face cam 13. This cam is rotated by means of an electric motor 14 through suitable reduction gearing 15 and control mechanism (not shown). This brief description of the packing mechanism is believed sufficient for present purposes and further details thereof may be found in Kimball, Braren and Schaefer Patent 2,127,924, granted August 23, 1938, to the assignee of the present application.

Suitable gate mechanism, indicated by numeral

16 which is applied to the actuating member thereof is provided for controlling the admission of the cans from the runways 5 to the shelves 4 of the packing mechanism. It will be understood that this gate mechanism is operated in timed relation to the advance of the plungers 6.

Referring now to Fig. 2 of the accompanying drawings which illustrate the construction of the improved can distributing mechanism, indicated generally by reference numeral 17, this mechanism includes two can-deflecting devices or means 18 and 19 of the "star wheel divider" type and a can-switching device or means 20, together with a can feed stop mechanism 21 illustrated in Fig. 3. These various devices are all mounted or assembled between two parallel plates 22 and 23, the rear plate 22 being illustrated in Fig. 2 and the front plate 23 in Fig. 1. These plates are mounted in fixed relation and spaced apart from one another slightly more than the length or height of the cans which the apparatus is to handle so that the cans when lying on their sides may move freely between these plates.

Each of the can-deflecting devices 18 and 19 comprise a pair of members in the form of a portion of a star wheel and fixed in alinement with one another to their respective supporting shafts 24 and 25. These shafts are mounted for free oscillation in suitable bearings carried by the side plates 22 and 23 and their construction and operation is illustrated and described in detail in the aforementioned Letters Patent 2,127,924. The pairs of star wheel members constituting each of these can-deflecting devices are spaced apart on their supporting shafts 24 and 25 sufficiently so that they will engage the beads of the cans rather than the can bodies. It will be understood that each of these can-deflecting devices 18 and 19 is shiftable by the passage of the cans to either of the two positions shown respectively in full and dotted lines in Fig. 2. Hence when a can descends from the switching device 20 onto can-deflecting device 18, it will be diverted or deflected to the right, and while moving past the right hand side of can-deflecting device 18, will shift it from the full line to the dotted line position so that the next can will consequently be deflected to the left. The can-deflecting device 19 operates in a similar manner.

Can-deflecting device 19 is positioned so as to deliver cans alternately to the lowermost can runway or track 5 and the intermediate can runway or track 5. Can-deflecting device 18 being disposed above and slightly to the left of deflecting device 19, is arranged to deliver cans alternately to a point substantially above the vertical center line of the deflecting device 19 and to the uppermost can runway or track section 5.

In order to suitably guide and maintain the cans as they pass to the left of can-deflecting devices 18 and 19 so that they will pass sufficiently close to these devices to insure the shifting thereof, an appropriately shaped can supporting plate 26 is provided which extends between the side plates 22 and is carried by these plates. Similarly supported guide plates 27 and 28 deliver cans from deflecting members 19 and 18, respectively, to the intermediate and uppermost runways 5.

The can-switching device 20 comprises a pair of downwardly directed parallel plates 29 and 30 which are pivoted at their upper ends to swing freely between the side plates 22 and 23. They are maintained in parallel relation by means of a pair of links 31 arranged on the outside of plates 22 and 23 and connected to the lower ends of switch plates 29 and 30 by pins 32 and 33 which extend through arcuate slots 34 and 35 in the side plates. These can switch plates 29 and 30 are shiftable from the full line position shown in Fig. 2 to the dotted line position by means of a solenoid 36. The plunger 37 of this solenoid is connected by a short link to a bell crank lever 38 which is connected at its opposite end to a link 39 to switch plate 30. This leverage and linkage system is biased to the full line position shown in Fig. 2 by means of a helical spring 40 and when the solenoid coil 36 is energized the switch plates of switch mechanism 20 are shifted to the right in dotted position so as to deliver the cans vertically over the center line of can-deflecting device 19. Right hand switch plate 30 is provided with a curved extension 41 to preserve the cans in operative engagement with can-deflecting device 18 when the switching device is in the full line position.

The cans are delivered to the can-distributing mechanism 17 by an inclined main feed chute 42 and are received between a pair of vertically spaced guide plates 43 which are curved downwardly at the right hand end toward the can feed stop 21 and the upper end of the can-switching device 20.

In order to suitably control the can-switching mechanism 20 and the can stop mechanism 21 so as to cause the can-distributing mechanism 17 to produce an equal average distribution of cans among the three can runways or tracks 5, so that equal quantities of cans per unit of time can be removed from the discharge or lower ends of these runways, as, for example, by the case-packing machine illustrated in Fig. 1, the can-switching mechanism 20 and the can stop device 21 are controlled by the electric switching devices illustrated in Fig. 1 which are electrically connected as shown in Fig. 3.

Mounted above the uppermost runway or track section 5 is an electric switch 44 which is provided with an operating lever 45 (Fig. 3) arranged in the path of the cans and when this lever is raised by cans passing beneath it, switch 44 is closed. This switch is positioned about midway between the discharging mechanism 17 and the case packing mechanism 2 so as to provide a can storage section for the packing mechanism to the left of switch 44 and an operating can supply section to the right of switch 44.

Also in the uppermost can runway section 5 there is arranged adjacent the can distributing mechanism 17 a counterbalanced pivoted track section 46. This track section is pivoted at 47 and counterbalanced by an adjustable weight 48. It is connected to operate a second electric switch 49 by means of a rod 50.

In the lowermost can runway section 5 and also adjacent can-distributing mechanism 17, there is a similar pivoted track section 51 pivoted at 52 counterbalanced by weight 53 and connected by an operating rod 54 to operate a third electric switch 55. Both of these pivoted track sections operate in the same way; that is to say, when sufficient cans rest upon either of the respective track sections their counterweights are overbalanced causing the right hand end of the sections to descend, thereby closing their respective electric switches 49 and 55.

Referring to the circuit diagram of Fig. 3 the holding switch 44 is in series with switch 49 so

that current is received from one of the supply mains 56 and passes first through holding switch 44, then through conductor 57 to switch 49, thence through conductor 58 to solenoid coil 36 for operating the can-switching device 20, and thence through conductor 59 back to the other supply line 56.

The third switch 55 receives its current from one of the supply conductors 56 and the current then passes through conductor 60 to the operating coil 61 of can stop device 21, thence through conductor 62 back to the supply conductors 56. The can stop mechanism 21 consists of a laterally and horizontally shiftable rod 63 which, when solenoid coil 61 is deenergized, is withdrawn to the left as shown in Fig. 3 out of the path of the cans. When the coil is energized, however, its plunger lifts one arm of a bell crank lever 64 against the tension of a helical spring 65 and the other arm of the bell crank lever is yieldably connected through a second helical spring 66 and a collar 67 to shift the stop rod 63 to the right, or dotted position, into the path of the cans so as to prevent their passage.

In the operation of the can-distributing mechanism a continuous supply of cans is usually fed along the main feed line 42 to the distributing mechanism 17, and, assuming that for some reason the packing mechanism 2 is temporarily not operating, the cans descend through can-switching device 20 (which is in the full line position as shown in Fig. 2) onto the star wheel divider 18 by which one-half of the cans are directed or deflected into the uppermost runway section 5 while the other half of the cans is delivered to the second star wheel divider or can-deflecting device 19, and this half of the cans is thus again divided into two sections so that one-fourth of the cans delivered through the switching device 20 are received upon the intermediate and lowermost runway sections 5.

As the upper runway section fills with cans as far as holding switch 44, the operating member 45 of the switch will be closed, but this does not close the circuit of solenoid 36 because balance beam operated switch 49 is still open. As the cans further collect in the uppermost runway, however, this runway will be substantially filled so that there will be sufficient cans on pivoted section 46 to overbalance weight 48 and cause switch 49 to be closed. When this occurs, solenoid 36 is energized and can switch mechanism 20 is moved to the right-hand or dotted position shown in Fig. 2. This cuts off the delivery of cans to the uppermost runway section and causes all of the cans passing through can switch 20 to be delivered to can-deflecting device 19 so that one-half of the cans is now being sent into the intermediate runway section and the other half into the lower runway section 5.

When the cans build up in the lower runway section 5 to the point where pivoted track section 51 is forced downwardly, switch 55 is closed and this energizes solenoid 61 and causes can stop 21 to prevent the further delivery of cans from the main feed line 48.

Assuming now that the operator places the packing mechanism 2 in operation, cans will begin to be removed from the storage runway section to the left of holding switch 44, and the cans in the operating supply section to the right of switch 44 will descend to take their place. As soon as the cans on the lowermost runway have receded from pivoted section 51, this section will rise, and switch 55 will be opened, thereby de-energizing coil 61 of the can stop 21 and permitting resumption of the supply of cans to the intermediate and lowermost runway sections 5. This will continue until the cans on the uppermost runway section 5 recede below the operating lever 45 of holding switch 44, at which time this switch also will be opened and cause coil 36 to be deenergized, thus causing can switch 20 to be shifted back to the full line position. Coil 36 is not de-energized by the opening of switch 49 when the cans recede from the balanced pivoted track section 46 because of the closing of "holding circuit" contacts 68, shown diagrammatically in Fig. 3, which are moved to closed position by the lowering of plunger 37.

In this manner the flow of cans, one-half to the uppermost runway section 5, and one-quarter to each of the other two runway sections, will be resumed. Hence, during the normal operation of the machine, that is to say, with the can-packing machine removing cans from the storage runway continuously, the supply of cans on the runway sections will build up until these sections are completely filled and then will be depleted until the cans in the uppermost runway recede to the left of holding switch 44 when the building up operation of the can supply on the runway will begin again. Operation in this manner will continue so long as cans are supplied through the main feed line 42 and the cans can be removed from the three runway sections at the same rate as they are supplied by the main feed line. Thus an equal average distribution of cans from a single feed line to three separate lines is accomplished.

While my invention has been described in connection with apparatus for handling the ordinary sheet metal cans of commerce, it is capable of, or readily adaptable to the handling of other round articles and hence the term "can" will be understood to include not only sheet metal cans and the like, but other round articles or objects capable of being rolled on their sides.

It will be understood that changes can be made in the arrangement of the improved mechanism which I have disclosed without departing from the spirit of the invention, the scope of which is intended to be set forth in the appended claims. Thus, for example, by properly shifting the can-switching device 20, an unequal average distribution of the cans between the three lines can be obtained. For example, any desired proportion of the cans up to one-half may be sent into the uppermost line.

I claim:

1. In a machine of the character described, three can runways or tracks arranged at different levels, and mechanism for supplying cans to said runways or tracks comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways or tracks having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to the lower two runways or tracks and the other can-deflecting means being arranged to deliver cans to the uppermost runway or track and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflector means, and when in the second position adapted to deliver said cans to the second can-deflecting means, and means actuated by the cans in the

uppermost runway or track for controlling said can-switching means.

2. In a machine of the character described, three can runways or tracks arranged at different levels, and mechanism for supplying cans to said runways or tracks comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways or tracks having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to the lower two runways or tracks and the other can-deflecting means being arranged to deliver cans to the uppermost runway or track and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means, and when in a second position adapted to deliver the cans to the second can-deflecting means, can stopping mechanism for cutting off the delivery of cans to the can-switching means, and means for controlling said can-switching means and said can-stopping mechanism to provide a desired distribution of cans among the three runways or tracks.

3. In a machine of the character described, three can runways or tracks arranged at different levels, and mechanism for supplying cans to said runways or tracks comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways or tracks having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to the lower two runways or tracks and the other can-deflecting means being arranged to deliver cans to the uppermost runway or track and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means, and when in a second position adapted to deliver the cans to the second can-deflecting means, can stopping mechanism for cutting off the delivery of cans to the can-switching means, and means actuated by the cans in said runways for controlling said can-switching means and said can-stopping mechanism to provide desired distribution of cans among the three runways or tracks.

4. In a machine of the character described, three can runways or tracks arranged at different levels, and mechanism for supplying cans to said runways or tracks comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways or tracks having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to the lower two runways or tracks and the other can-deflecting means being arranged to deliver cans to the uppermost runway or track and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means, and when in a second position adapted to deliver the cans to the second can-deflecting means, can stopping mechanism for cutting off the delivery of cans to the can-switching means, and means for controlling said can-switching means and said can-stopping mechanism to provide an equal average distribution of cans among the three can runways or tracks.

5. In a machine of the character described, three can runways or tracks arranged at different levels, and mechanism for supplying cans to said runways or tracks comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways or tracks having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to the lower two runways or tracks and the other can-deflecting means being arranged to deliver cans to the uppermost runway or track and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means, and when in a second position adapted to deliver the cans to the second can-deflecting means, can stopping mechanism for cutting off the delivery of cans to the can-switching means, and means actuated by the cans in said runways for controlling said can-switching mechanism and said can-stopping means to provide an equal average distribution of cans among the three can runways or tracks.

6. In a machine of the character described, three can runways or tracks arranged at different levels, and mechanism for supplying cans to said runways or tracks comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways or tracks having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to the lower two runways or tracks and the other can-deflecting means being arranged to deliver cans to the uppermost runway or track and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means, and when in a second position adapted to deliver the cans to the second can-deflecting means, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, means actuated by the cans in one of said runways for controlling said can-switching means and means actuated by the cans in another of said runways for controlling said can-stopping mechanism to provide an equal average distribution of the cans among the three can runways or tracks.

7. In a machine of the character described, three can runways or tracks arranged at different levels, and mechanism for supplying cans to said runways or tracks comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways or tracks having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to the lower two runways or tracks and the other can-deflecting means being arranged to deliver cans to the uppermost runway or track and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means, and when in a second position adapted to deliver the cans to the second can-deflecting means, can stopping mechanism for cutting off the delivery of cans to the can-switching means, and means actuated by the cans in the uppermost runway for controlling said can-switching means and means actuated

by the cans in one of the other two runways for controlling said can-stopping mechanism to provide an equal average distribution of the cans among the three can runways or tracks.

8. In a machine of the character described having two star wheel can deflectors so arranged that the first of said deflectors delivers one-half of its cans to the second of said deflectors and three lines of cans emerge, and having can-switching means for delivering cans to either of said deflectors, a main feed line for supplying cans to said can-switching means and can-stopping mechanism for cutting off the supply of cans to the can-switching means, the combination of means actuated by cans delivered by the first of said can deflectors for controlling said can-switching means and means actuated by cans delivered by the second of said can deflectors for controlling said can stopping means to cause the cans to be delivered by said can deflectors to each of the three emerging lines at the same average rate.

9. In a machine of the character described, three can runways arranged at different levels, and mechanism for supplying cans to said runways comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to two of said runways and the other can-deflecting means being arranged to deliver cans to the third of said runways and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means, and when in a second position adapted to deliver the cans to the second can-deflecting means, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, and means for controlling said can-switching means and said can-stopping mechanism to provide a desired distribution of cans among the three runways.

10. In a machine of the character described three can runways arranged at different levels and mechanism for supplying cans to said runways comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways having a first can-deflecting means for guiding cans alternately in either of two directions being disposed to deliver cans to the lowermost of said runways and a second can-deflecting means arranged to deliver cans to the uppermost of said runways and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means and when in a second position adapted to deliver the cans to the second can-deflecting means, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, and mechanism actuated by the cans in said uppermost and lowermost runways for controlling said can-switching means and said can-stopping mechanism to provide a desired distribution of cans among the three runways.

11. In a machine of the character described three can runways arranged at different levels and mechanism for supplying cans to said runways comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to two of said runways and the other can-deflecting means being arranged to deliver cans to the third of said runways and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means and when in a second position adapted to deliver the cans to the second can-deflecting means, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, and means for controlling said can-switching means and said can-stopping mechanism to provide an equal average distribution of cans among the three can runways.

12. In a machine of the character described three can runways arranged at different levels and mechanism for supplying cans to said runways comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to two of said runways and the other can-deflecting means being arranged to deliver cans to the third of said runways and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means and when in a second position adapted to deliver the cans to the second can-deflecting means, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, and means actuated by the cans in two of said runways for controlling said can-switching means and said can-stopping mechanism to provide an equal average distribution of cans among the three can runways.

13. In a machine of the character described three can runways arranged at different levels and mechanism for supplying cans to said runways comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to two of said runways and the other can-deflecting means being arranged to deliver cans to the third of said runways and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means and when in a second position adapted to deliver the cans to the second can-deflecting means, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, means actuated by the cans in said third runway and in one of the other runways for controlling said can-switching means and said can-stopping mechanism to provide an equal average distribution of cans among the three can runways.

14. In a machine of the character described three can runways arranged at different levels and mechanism for supplying cans to said runways comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to two of said runways and the other can-deflecting means

being arranged to deliver cans to the third of said runways and to said first can-deflecting means, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means and when in a second position adapted to deliver the cans to the second can-deflecting means, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, means actuated by the cans in the third of said runways for controlling said can-switching means and means actuated by the cans in one of the other two runways for controlling said can-stopping mechanism to provide an equal average distribution of the cans among the three can runways.

15. In a machine of the character described, three can runways arranged at different levels, and mechanism for supplying cans to said runways comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways having a can-deflecting means for guiding cans alternately in either of two directions disposed to deliver cans to two of said runways and can-switching means receiving cans from the main feed line and adapted when in one position to deliver cans to the can-deflecting means, and when in a second position to cause cans to flow to the third of said runways, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, and means for controlling said can-switching means and said can-stopping mechanism to provide a desired distribution of cans among the three runways.

16. In a machine of the character described, three can runways arranged at different levels, mechanism for supplying cans to said runways comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways having a can-deflecting means for guiding cans alternately in either of two directions disposed to deliver cans to the lower two runways, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver cans to the can-deflecting means, and when in a second position to cause cans to flow to the uppermost runway, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, and means for controlling said can-switching means and said can-stopping mechanism to provide a desired distribution of cans among the three runways.

17. In a machine of the character described, three can runways arranged at different levels, and mechanism for supplying cans to said runways comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways having a can-deflecting means for guiding cans alternately in either of two directions disposed to deliver cans to two of said runways and can-switching means receiving cans from the main feed line and adapted when in one position to deliver cans to the can-deflecting means, and when in a second position to cause cans to flow to the third of said runways, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, and means actuated by the cans in said third runway and in one of the other two runways for controlling said can-switching means and said can-stopping mechanism to provide the desired distribution of cans among the three runways.

18. In a machine of the character described, three can runways arranged at different levels, mechanism for supplying cans to said runways comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways having a can-deflecting means for guiding cans alternately in either of two directions disposed to deliver cans to the lower two runways, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the can-deflecting means, and when in a second position to cause cans to flow to the uppermost runway, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, and means actuated by the cans in the uppermost runway and in one of the two lower runways for controlling said can-switching means and said can-stopping mechanism to provide a desired distribution of cans among the three runways.

19. In a machine of the character described, three can runways arranged at different levels, and mechanism for supplying cans to said runways comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways having a can-deflecting means for guiding cans alternately in either of two directions disposed to deliver cans to two of said runways and can-switching means receiving cans from the main feed line and adapted when in one position to deliver cans to the can-deflecting means, and when in a second position to cause cans to flow to the third of said runways, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, and means actuated by the cans in the uppermost runway and in one of the lower two runways for controlling said can-switching means and said can-stopping mechanism to provide a desired distribution of cans among the three runways.

20. In a machine of the character described, three can runways arranged at different levels, and mechanism for supplying cans to said runways comprising a main feed line for cans, a can distributor interposed between said main feed line and said runways having a can-deflecting means for guiding cans alternately in either of two directions disposed to deliver cans to two of said runways, and can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the can-deflecting means, and when in a second position adapted to cause cans to flow to the third of said runways, and two can-actuated controlling devices for said can-switching means arranged in said third runway at different distances from said can-distributor, the engagement of both of said controlling devices by the cans on said runway causing the operation of the can-switching means in one direction, the operation of the can-switching means in the opposite direction being controlled by the release of the control device which is farthest from the distributor, when the cans recede from said control device.

21. In a machine of the character described, three can runways arranged at different levels, and mechanism for supplying cans to said runways comprising a main feed line for cans, a can-distributor interposed between said main feed line and said runways having a can-deflecting means for guiding cans alternately in either of two directions disposed to deliver cans to two of said runways, can-switching means receiving

cans from the main feed line and adapted when in one position to deliver the cans to the can-deflecting means and when in a second position adapted to cause cans to flow to the third of said runways, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, two can-actuated controlling devices for said can-switching means arranged in said third runway at different distances from said can-distributor, the engagement of both of said controlling devices by the cans on said runway causing the operation of the can-switching means in one direction, the operation of the can-switching means in the opposite direction being controlled by the release of the control device which is farthest from the distributor, when the cans recede from said control device, and means actuated by the cans in one of said two runways for controlling the can-stopping mechanism.

22. In a machine of the character described, three can runways arranged at different levels, and mechanism for supplying cans to said runways comprising a main feed line for cans, a can-distributor interposed between said main feed line and said runways having a can-deflecting means for guiding cans alternately in either of two directions disposed to deliver cans to the lower two of said runways, can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the can-deflecting means and when in a second position adapted to cause cans to flow to the uppermost runway, can-stopping mechanism for cutting off the delivery of cans to the can-switching means, two can-actuated controlling devices for said can-switching means arranged in the uppermost runway at different distances from said can-distributor, the engagement of both of said controlling devices by the cans on said runway causing the operation of the can-switching means in one direction, the operation of the can-switching means in the opposite direction being controlled by the release of the control device which is farthest from the distributor, when the cans recede from said control device, and means actuated by the cans in one of the lower two runways for controlling the can-stopping mechanism.

23. In a machine of the class described, three can runways arranged at different levels, and mechanism for supplying cans to said runways comprising a main feed line for cans, a can-distributor interposed between said main feed line and said runways having two can-deflecting means for guiding cans alternately in either of two directions, one of said deflecting means being disposed to deliver cans to two of said runways and the other can deflecting means being arranged to deliver cans to the third of said runways and to said first can-deflecting means, can-switching means receiving cans from the main feed line and adapted when in one position to deliver the cans to the first can-deflecting means, and when in a second position adapted to deliver the cans to the second can-deflecting means, and means actuated by the cans in the third runway for controlling said can-switching means.

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