

Jan. 22, 1952

J. ALBERTOLI
CAN FEEDING DEVICE

2,583,313

Filed Dec. 3, 1945

3 Sheets-Sheet 1

Fig -1-

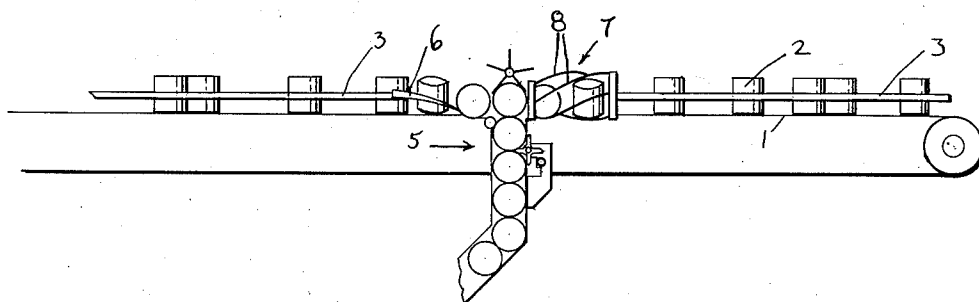


Fig-2-

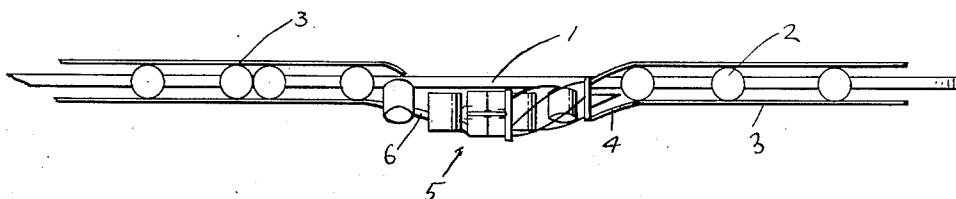
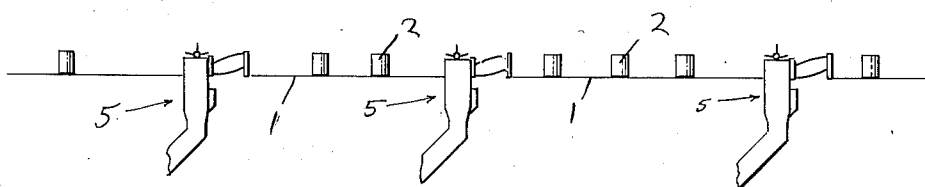


Fig-3-



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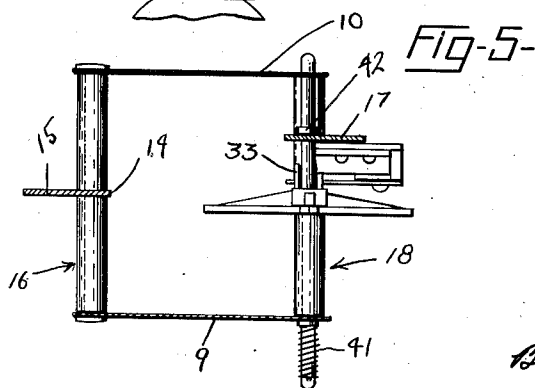
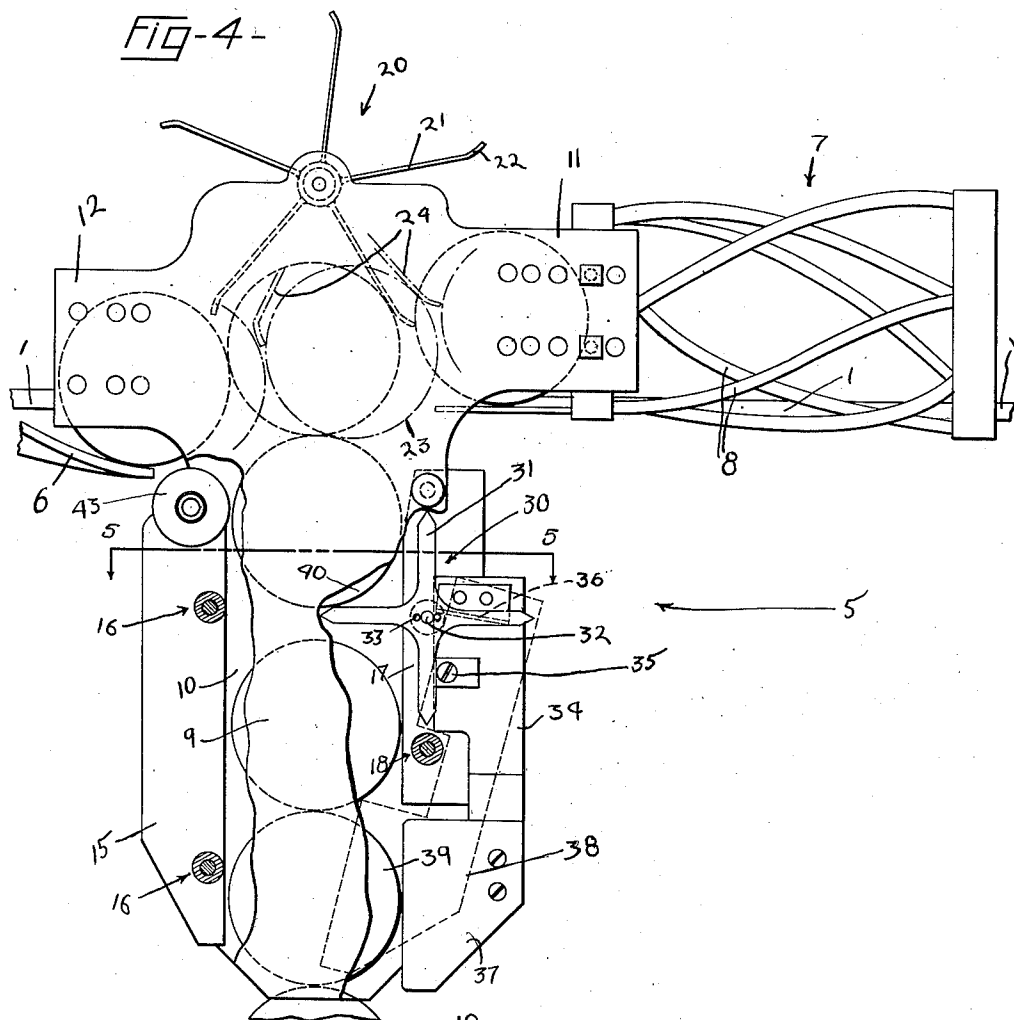
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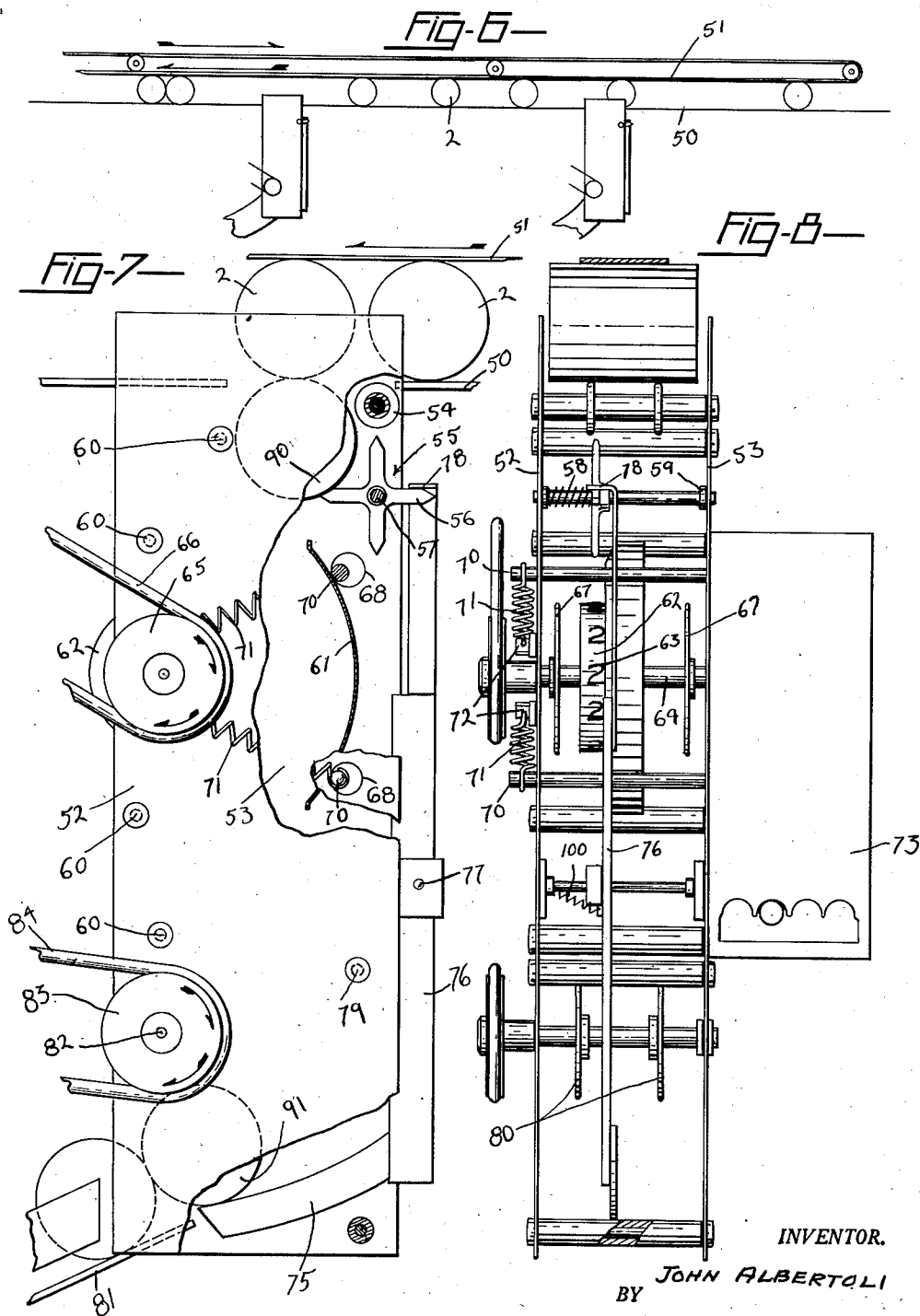
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3 Sheets-Sheet 3



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2,583,313

CAN FEEDING DEVICE

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Application December 3, 1945, Serial No. 632,476

5 Claims. (Cl. 198—19)

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This invention relates to a can feeding device and has for one of its objects an improved device for feeding cans to one or more stations from a single source and in a manner whereby cans to each station will be automatically replenished as they are withdrawn.

In the canning industry there are various places where the delivery of cans in succession to an operator or machine is required. In most instances there may be a plurality of stations to which such delivery of cans is desired, and the cans are ordinarily in a row and in a predetermined position at each station. Sometimes the withdrawal of cans from the row at one station may cease or be slower than at another station. During such stoppage or slowing of operations at one or several of such stations the delivery to the other stations must be maintained irrespective of whether such stations would normally receive cans from a single source earlier or later than the other stations.

With the present invention a simple apparatus is provided that insures uniform delivery of cans from a single source to any number of stations irrespective of differences in conditions at the various stations. The source of supply is a constantly moving row of cans supported on a carrier at a level above the various stations. Cans in a row are withdrawn from said carrier and are delivered to each station, the speed of the carrier being such as to insure delivery of a normal supply of cans to each station under conditions where the operators or machines at said stations are all operating at maximum speed. If the operation at any station slows up or ceases the row of cans leading to such station is filled (if depleted) ready for resumption of normal operation of such station, and the cans in the single continuously moving row forming the source of supply automatically passes the filled row. But the instant cans are withdrawn from said filled row the cans from the source of supply automatically are fed thereto.

In the drawings, Fig. 1 is a diagrammatic side view of the can feeding system at one of the stations, and Fig. 2 is a plan view of the same.

Fig. 3 is a diagrammatic view showing the system applied to a number of stations.

Fig. 4 is a side elevational view of one of the devices for feeding cans to each station, the view being partially broken away and partially in section.

Fig. 5 is a sectional view taken along the line 5—5 of Fig. 4.

Fig. 6 is a diagrammatic side view of a slightly

different arrangement than is shown in Figs. 1 to 5 for feeding cans to a station.

Fig. 7 is a part elevational and part sectional view of a device for feeding cans to a station that includes a printer for the cans.

Fig. 8 is an elevational view of the device of Fig. 7 at right angles to the latter view.

In detail, referring to Figs. 1 to 3 the general system disclosed therein comprises an endless can carrier 1 that extends horizontally at a level above the separate stations that are below said carrier. This carrier may be in the form of a cable having an upper run on which the cans 2 are supported in a row. Side strips 3 support the cans vertically on the said upper run, which side strips are diverted laterally at spaced points, as at 4, for shunting the cans off the carrier at said points, and to feed devices 5 each of which is adapted to feed cans to one of the said stations.

At the opposite side of each device from the diverted strips 3 are members 6 that are adapted to restore any cans passing each device to upright position on the carrier 1 for continuing its movement on the latter to the next device.

The feed devices 5 are each arranged to receive the cans on their sides, and for this reason the vertically disposed cans on carrier 1 must be given a quarter turn before actually reaching the feed portion of each device. A turning device 7 of substantially conventional type is positioned at the ends of the diverted strips 4, said turner comprising horizontally extending strips 8 defining the skeleton walls of a generally spiral, horizontally extending passageway, which strips follow portions of spiral paths for turning the cans from vertical positions to horizontal positions.

In Fig. 4 one of the devices 5 is shown in detail, which device comprises a generally vertically extending chute, two of the opposite sides 9, 10 of said chute may be projected upwardly above the level of the carrier 1 and horizontally elongated so as to provide lateral extensions 11 that are adapted to be secured to one end of the turning device 7. Lateral extensions 12 opposite extensions 11 are adapted to be secured to the strips 6 or to any desired support.

One of the other two sides of the chute comprises the edge 14 (Fig. 5) of a plate 15 that is parallel with sides 9, 10. Tie rods and spacers, generally designated 16, may secure the sides 9, 10 spaced apart slightly greater than the length of each can 2 when the latter is lying horizontal, and said rods and spacers also function to hold plate 15 in position at a point intermediate sides 9, 10.

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The side of the chute opposite plate 15 may comprise the edge of a plate 17 that is also parallel with sides 9, 10 and that is held in position between said sides by tie rods and spacers generally designated 18.

The end of the can turner 7 that is connected with extensions 11 is adapted to deliver the cans to the upper end of the chute in a horizontal position with the ends of the cans adjacent sides 9, 10 respectively. If the upper end of the chute were not open the cans would merely be shunted off the carrier, turned on their sides, and then restored to vertical position on the carrier 1 without interruption, and even if the upper end of the chute were open this result would happen in some instances were it not for the provision of a spacer wheel 20 mounted over the upper end of said chute for rotation in bearings carried by the upper ends of sides 9, 10.

The wheel 20 is rimless, and has spokes 21 projecting radially of its hub, the outer ends of which spokes are spaced apart so as to successively receive cans 2 from turner 7 in a manner that the cans will pass under the hub and will automatically rotate wheel 20 under the pressure of the succeeding cans passing through the turner 7.

The ends 22 of the spokes 21 may be slightly bent in direction toward the oncoming cans, thus when a can is in the position 23 (indicated by dot-dash line) Fig. 4, and the adjacent pair of spokes between which such can is positioned are in dot-dash position 24, the can in said position will be spaced from the oncoming cans and will therefore be free to drop into the chute, provided the chute is clear. If it were not for the provision of means for so spacing said can, the can might be carried across the chute merely by its frictional engagement between cans at opposite sides thereof.

The vertical can chute ordinarily is virtually a section of a chute that leads to a station where the cans may be successively removed by an operator or where the cans may be taken off by a machine or fed into a machine. The lower ends of sides 9, 10 may connect with the continuation of the chute that leads to a station or the cans may be fed onto a chute that extends to the station. In any event, where the operator or machine at the station stops removing the cans, or where the cans are fed to the station faster than the operator or machine removes them, the row of cans in the chute will fill up, and in such instance provision is made in the feed device of Fig. 4 for supporting the uppermost can of the filled row in a position for supporting the cans that are shunted off the conveyor 1 through the turner 7 so that these cans will continuously pass over said uppermost can and back onto the conveyor. However, means is also provided so that the instant cans are again drawn from the chute (by reason of the operator or machine at the station fed by the chute) the uppermost can in the row leading to the station will immediately drop so that cans will again be fed into the upper end of the chute.

The means for so supporting a can in the upper end of the vertical chute comprises a star wheel 30 having arms 31 radially projecting from its hub. This wheel is mounted for rotation on a horizontal shaft 32 that is supported at its ends in sides 9, 10 and which shaft also extends through plate 17.

The shaft 32 is offset to the side of the chute passageway adjacent plate 17 so that arms 31

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will successively move to a position extending horizontally into said passageway for obstructing free dropping of cans through the same and for supporting a can in the upper end of the chute in a position in which cans from turner 7 will roll over such can for movement to the strips 6 and restoration in upright position on carrier 1 if the star wheel is held with said arm in said horizontal position. However, wheel 30 is free to rotate under the weight of a can on the arm that extends into the chute unless prevented therefrom.

The star wheel 30 is provided with a pair of axially extending lugs or projections 33 on its hub at opposite sides thereof. A vertically extending lever 34 pivoted intermediate its ends on horizontal pivot 35 (Fig. 4) on plate 17 carries a stop member 36 at its upper end that is adapted to swing over one of the lugs 33 when one of the arms 31 is horizontal in the chute for holding the star wheel against turning. The plate 17 terminates short of the level of the lower end of plate 15 leaving a free space for a plate-like lower end portion 37 on said lever that is virtually in continuation of the plate 17 when the lever is vertical. Thus portion 37 is positioned substantially opposite the plate 15, and the edge that faces into the chute is substantially in the same plane at right angles to sides 9, 10 as the correspondingly positioned edge of plate 17.

The pivot 35 for said lever 34 is substantially nearer the stop member 36 than it is to the bottom end of the lever, and said portion 37 is positioned so that it will automatically tend to swing into the chute in dotted position 38 at all times. However, when a can, such as is indicated at 39, is in the chute, said can will swing lever 34 to vertical position locking the star wheel 30 against rotation in the full line position seen in Fig. 4, but as soon as the can so engaging portion 37 is withdrawn, the lever will automatically swing to said dotted position 38 and stop member 36 will automatically release the star wheel for turning.

In operation, when the row leading to the operating station is filled it will be seen that a can, such as the one at 39, will move to a position locking the star wheel 30 in a position in which said wheel supports the uppermost can 40, the position shown in Fig. 4, whereby the main row of cans on carrier 1 will be shunted therefrom and across can 40 and back onto said carrier. As soon as can 39 drops from engagement with portion 37 of lever 34, due to withdrawal of cans from the station that is fed by the device, the star wheel 30 will drop can 40 and its place will be taken by a can from the main row that forms the source of supply.

A spring 41 (Fig. 5) on shaft 32 functions to draw a friction collar 42 against plate 17 to cut down the momentum of the star wheel, thereby preventing the same from coming to a stop where the stop member 36 may otherwise engage one of the lugs 33 in line with the axis of the wheel. The lever 34 should be free to make its intended swing at any time free from interference with the lugs 33. Also, by use of the spring 41 and friction collar 42, the star wheel will always move only a quarter turn (where four equally spaced arms are used), which is essential to the desired smooth operation of the device.

The take-off side of the upper end of the vertical chute where the strips or strip 6 receive cans that pass over the can in position 40, is preferably slightly lower than the delivery side, and

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a horizontal roller 43 is positioned to facilitate the passage of cans to strip 6.

Inasmuch as the cable carrier 4 passes very closely alongside the feed device, it is obvious that the degree of shunting therefrom in order to move the cans over the upper end of the chute is very little, and by this method there is no interference whatsoever with the carrier. Hence the feed devices are adapted to be used in association with the conventional cable type can carriers that are employed in many packing houses and places where cans are handled.

In Fig. 6 is a slight modification of the device and system of Figs. 1 to 5, but the fundamental idea is the same.

The cans are supported on their sides on a carrier 50 and are rolled along the carrier by a power driven endless hold-down belt 51. The carrier 50 is formed with a gap, best seen in Fig. 7, for dropping of cans from the carrier into the upper end of a feed device such as shown in Fig. 4 or for dropping into a modified form of device seen in Figs. 7, 8.

The feeding device of Figs. 7, 8 comprises a pair of opposed plates 52, 53 that substantially correspond to plates 9, 10 of Fig. 4 in that they form the same two opposed sides of the chute.

A roller 54 is carried by plates 52, 53 adjacent the edge of carrier 50 over which oncoming cans are adapted to fall into the chute, and over which roller the cans are carried.

A star wheel 55 below roller 54 has four equally spaced arms 56 projecting therefrom, said wheel being supported for rotation on a horizontal shaft 57 that is journaled in plates 52, 53 at its ends. A spring 58 and friction collar 59 function for the same purpose as spring 41 and collar 42 in the device of Fig. 4, namely: to prevent momentum of the star wheel from carrying its arms an undesirable distance around its axis when the same is revolved by the weight of a can.

Spacers 60 extending between plates 52, 53 space the plates and also function to prevent the cans from falling out of the chute at one side thereof, therefore said spacers may be said to define one of the sides of the chute.

Upon cans falling into the chute from carrier 50, they will successively engage the arms 56 of the star wheel and each can will effect a quarter turn of said wheel.

As said cans move past the star wheel they will pass downwardly between the concave face of an arcuately shaped plate 61 and a printing wheel 62 that carries printing type 63 on its peripheral surface. This printing wheel is conventional and is carried on a shaft 64 that is journaled at its ends in plates 52, 53. A pulley 65 and belt 66 driven from any suitable source may rotate the printer in the direction of the arrows (Fig. 7), which direction of rotation will also facilitate movement of the cans past plate 61. Disks 67 on shaft 64 also may engage the cans for holding them horizontal during their movement past plate 61.

Plate 61 may be supported at its upper and lower ends on horizontal rods 70 that extend through enlarged openings 68 in sides 52, 53. Springs 71 are secured at one of their ends to the outwardly projecting ends of rods 70, and the other ends of said springs are secured to lugs 72 on plate 52 (Fig. 8). There are a pair of similar springs at opposite ends of said rods, only one set being shown, inasmuch as the other set is concealed in a box 73 that houses a conventional mechanism for shifting the printer 62.

The printer is ordinarily used for printing on

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the cans any desired symbol for designating the grade of fruit in the cans or to be placed in them.

The cans that pass the printer are adapted to move downwardly by gravity onto a projection 75 that is at the bottom end of a vertically extending lever 76. Lever 76 is pivoted at 77 for swinging of its lower end inwardly and upwardly, while the upper end of the lever has a lateral projection 78 that is adapted to engage one of the arms 56 of the star wheel when said lower end is so swung. A spacer and tie rod combination 79 between plate 61 and said portion 75 prevent cans from contacting lever 76. A spring 100 (Fig. 8) may connect the end of lever 76 below pivot 77 with wall 52 so as to swing the lever vertically with the projection 78 clear of the arms of the star wheel unless there is a can against said portion 75.

Cans engaging portion 75 will also be engaged by rotating disks 80 for tending to rotate the cans off the portion 75 and onto the continuation 81 of the chute that leads to the station. These disks 80 are on a shaft 82 that carries a pulley 83, which pulley in turn is driven by a belt 84 from any suitable source of power.

The star wheel 55 is so positioned that one of its arms will be locked in a position extending horizontally into the chute when a can is against the portion 75 of lever 76, and when a can such as is indicated at 90 in Fig. 7 is in said position, the cans 2 of the main row, which is the source of supply for the feed device, will be moved across can 90 and onto the continuation of the carrier beyond said can.

If the chute 81 is filled with cans, in which case a can, such as the one indicated at 91 is on the portion 75, it is obvious that the can 90 will be held in the upper open end of the portion of the chute that is the feed device, and no cans will pass into the chute, but as soon as the can 91, or the like, clears the portion 75, then cans from the carrier will again pass through the feed device.

From the foregoing description and from the drawings, which are merely illustrative of the invention and not restrictive thereof, it will be seen that the feed device forms an economical, simple and dependable feed device for automatically feeding cans to any member of stations from a single row or a single source of supply.

I claim:

1. A can feeding device comprising a generally vertically extending chute for passing cans in a single file therethrough and open at its upper end for receiving such cans therein, conveyor means respectively leading to and from opposite sides of said upper end for carrying cans to and from said end, can engaging means actuated by downward movement by gravity of one can at a point in said chute for movement of said can engaging means into said chute in a position for holding a can in the upper end of said chute in a position for supporting cans for movement thereover between the said opposite sides free from dropping into said chute, a pivoted arm operatively connected with said can engaging means and actuated by said one can at said point for releasably retaining said can engaging means in said position and for releasing said can engaging means upon movement past said point whereby the can adapted to be so held in the upper end of said chute will be released for dropping and clearing said upper end to receive another can, a wheel positioned over the upper end of said chute for spacing successive cans deliv-

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ered to said upper end from cans on said conveyor means at said opposite sides.

2. A can feeding device comprising a generally vertically extending chute for passing cans in a single file therethrough and open at its upper end for receiving such cans therein, conveyor means respectively leading to and from opposite sides of said upper end for carrying cans to and from said end, can engaging means actuated by downward movement by gravity of one can at a point in said chute for movement of said can engaging means into said chute in a position for holding a can in the upper end of said chute in a position for supporting cans for movement thereover between the said opposite sides free from dropping into said chute, a pivoted arm operatively connected with said can engaging means and actuated by said one can at said point for releasably retaining said can engaging means in said position and for releasing said can engaging means upon movement past said point whereby the can adapted to be so held in the upper end of said chute will be released for dropping and clearing said upper end to receive another can, said conveyor means including an endless carrier extending past said upper end and shunt means extending between said carrier and said opposite sides of said upper end respectively for diverting cans from said carrier to one of said sides and for returning cans to said carrier from the other of said sides.

3. A can feeding device comprising a generally vertically extending chute for passing cans by gravity in single file therethrough and open at its upper end for dropping cans therein, conveyor means leading to and from said upper end, a star wheel supported on said chute at one side thereof for rotation about a horizontal axis, the arms of said wheel projecting at one side thereof into said chute and spaced for engaging and for successively delivering cans in said chute therepast upon rotation of said wheel, a pivoted arm in engagement with such cans at a point in said chute below said wheel actuated for movement by each can delivered by said wheel to said point and engageable with said star wheel for releasably locking said wheel against rotation and delivery of cans therepast until such can at said point has moved therepast.

4. In combination with an endless horizontally extending carrier adapted to support a row of cans thereon for movement of the cans longitudinally of said row, a vertically extending chute alongside said carrier open at its upper end, means for shunting the cans of said row to said upper open end for delivery of cans into said chute, means for returning cans from said open end back to said carrier when said chute is filled, means in said chute for supporting the upper can therein when said chute is so filled in a position for supporting cans for movement

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thereover between said first and second mentioned means, and a wheel for spacing cans successively delivered over said upper open end from cans at opposite sides thereof, a generally vertically extending arm swingably supported for movement of its lower end toward and away from the cans in said chute and engageable at its upper end with said can supporting means for locking the latter when said lower end of said arm is engaged by a can and for releasing said can supporting means when a can moves downwardly past said lower end by gravity whereby each can so delivered will be free to drop into said chute upon withdrawal of cans from said chute and dropping of said upper can in the chute for passage therethrough.

5. A can feeding device comprising a generally vertically extending chute for passing cans by gravity in single file therethrough and open at its upper end for dropping cans therein, conveyor means leading to and from said upper end, a star wheel supported on said chute at one side thereof for rotation about a horizontal axis, the arms of said wheel projecting at one side thereof into said chute and spaced for engaging and for successively delivering cans in said chute therepast upon rotation of said wheel, an arm alongside said chute supported at a point intermediate its ends for swinging on a horizontal axis, means at the lower end of said arm normally disposed in the downward path of travel of cans in said chute for outward swinging of the lower end under the influence of the weight of cans in said path for permitting movement of said cans therepast, means at the upper end of said arm engageable with means on said star wheel adjacent the axis of rotation of said wheel for releasably locking said wheel against rotation upon such outward movement of said lower end of said arm and consequent swinging of said upper end in an opposite direction, means on said star wheel adapted to be so engaged by the means at the upper end of said arm, said means on said upper end being releasable from locking engagement with the means on said star wheel upon cans in said chute clearing said means at the lower end of said arm and consequent inward swinging of said lower end.

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