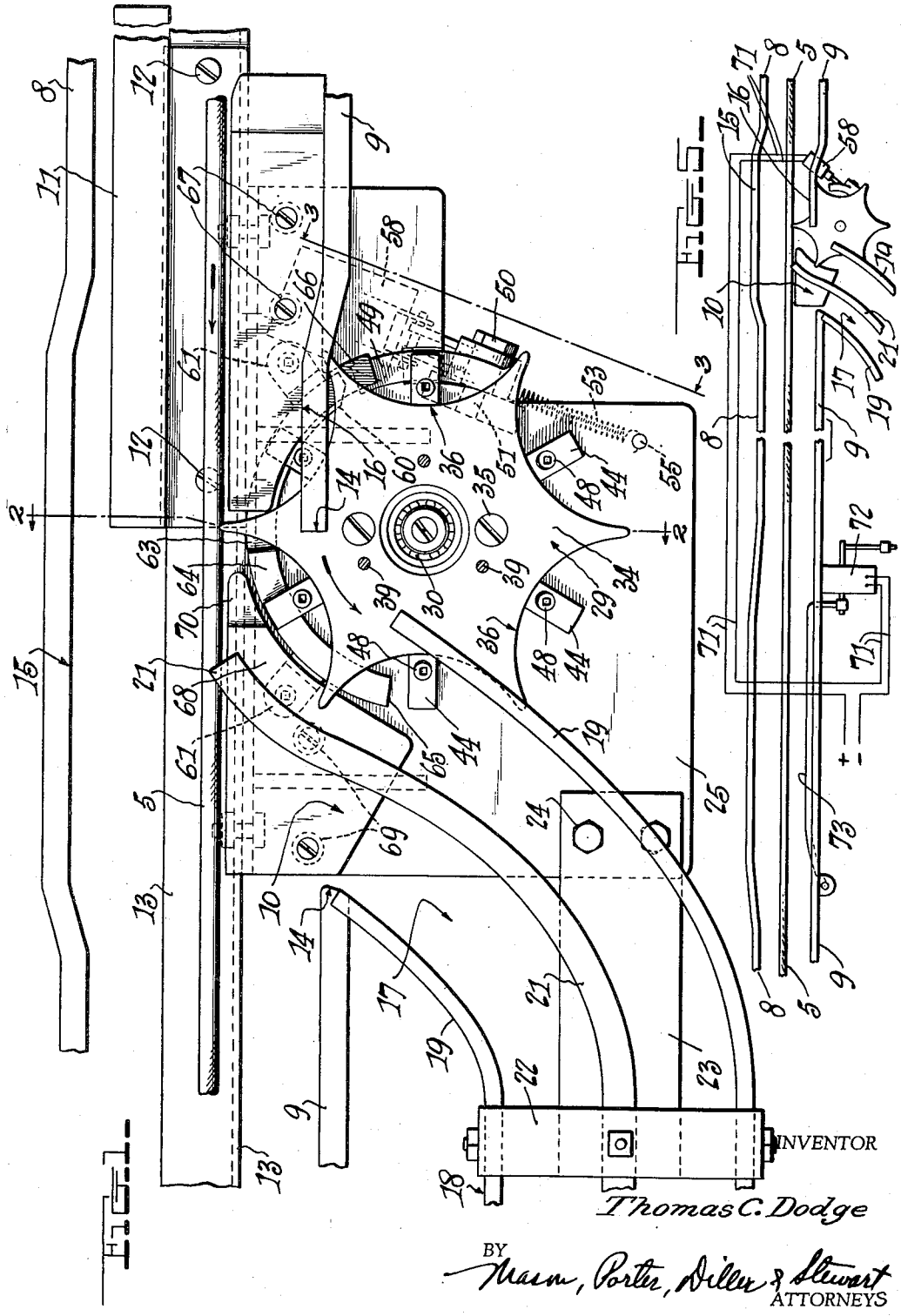
Aug. 18, 1953 T. C. DODGE 2,649,184

AUTOMATIC CAN DISTRIBUTOR

Filed Oct. 5, 1951 3 Sheets-Sheet 1



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AUTOMATIC CAN DISTRIBUTOR

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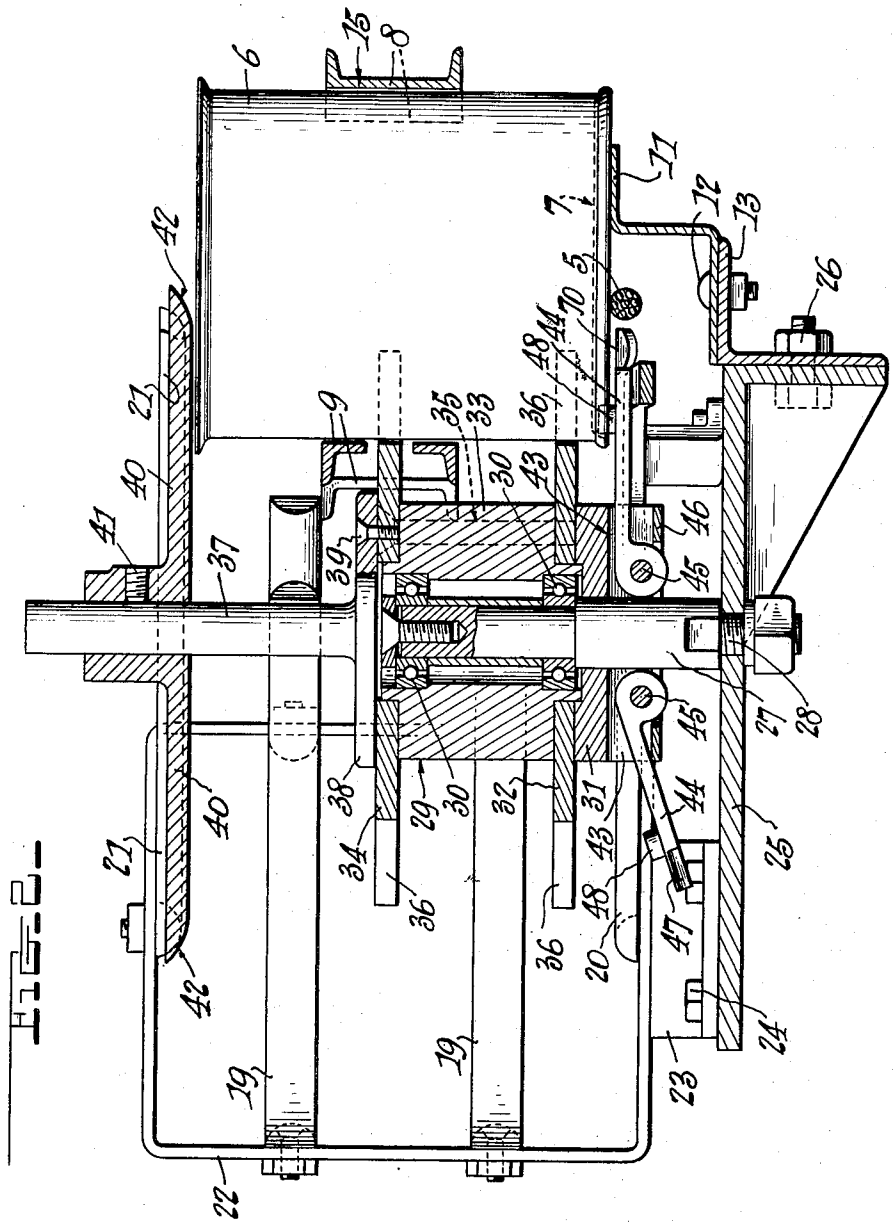


FIG. 2

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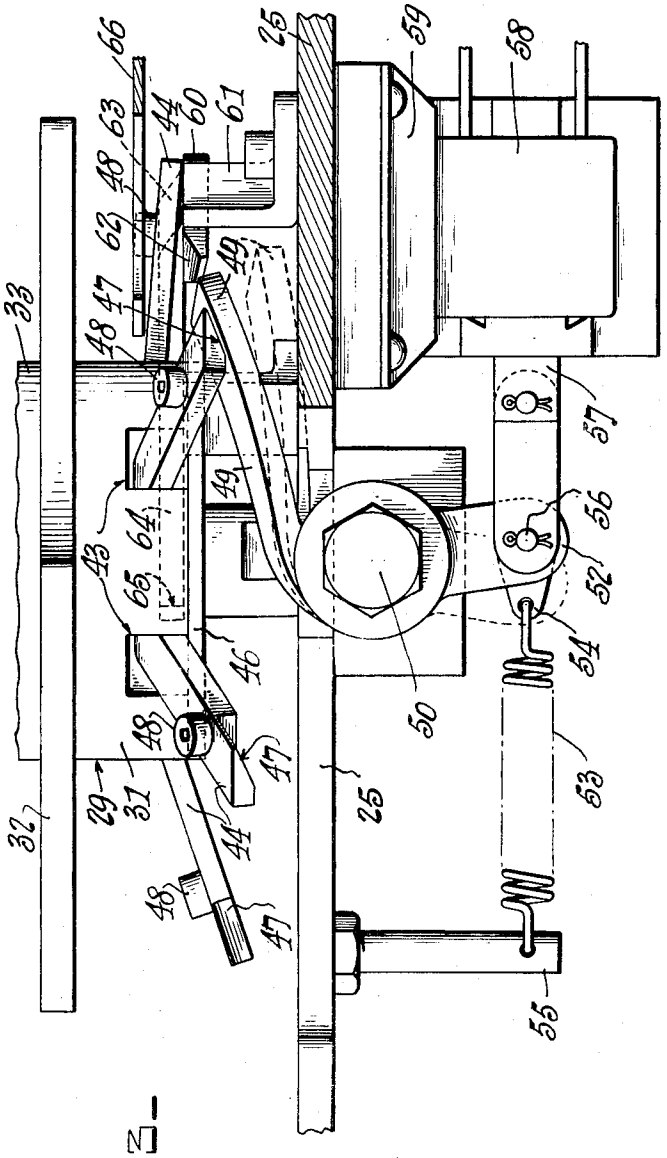


FIG. 3

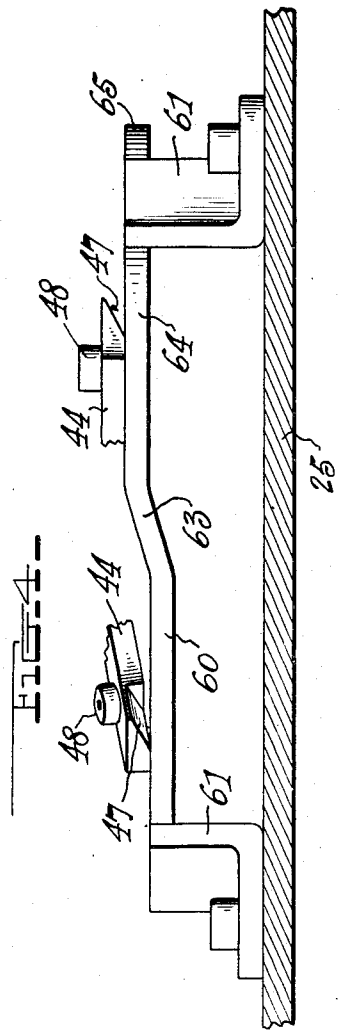


FIG. 4

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AUTOMATIC CAN DISTRIBUTOR

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14 Claims. (Cl. 198—22)

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The invention relates generally to apparatus for conveying cans and primarily seeks to provide a novel means for engaging cans being fed along by one conveyer and diverting or distributing cans from said conveyor onto another conveyor.

It is quite common to provide conveyors for feeding cans uprightly and in a line from place to place in can manufacturing plants, storage warehouses, canning plants or the like, and in such systems it is desirable at times to divert cans from one conveying line to another conveyor, or to a place of deposit, such as a selected bin. One common form of conveyor employed in such systems is a simple travelling cable on which the can bottoms rest and which serves to move the cans along uprightly between confining guides. A purpose of the present invention is to provide a novel form of can diverter mounted beside a conveyor of the cable type or of a comparable type whereon the cans are conveyed with portions of the conventional bottom countersinks exposed and including a pocketed rotor which rotates in time with the movement of the cans on the conveyor, and which includes means engageable in the can bottom countersinks to cause the cans to remain in the rotor pockets long enough to be diverted from the conveyor when it is desired to divert cans onto another conveyor.

Another object of the invention is to provide a diverter of the character stated wherein the rotor is rotated by contact of the cans being conveyed.

Another object of the invention is to provide a diverter of the character stated wherein there are included an upwardly and downwardly swingable arm aligned with each rotor pocket and including thereon a projection engageable in the bottom counter sink of a can engaged in the particular pocket to cause the can to remain in said pocket, an arcuate track having a receiving end, a main body for supporting the arms with their projections in the can bottom countersinks while travelling along beside the conveyor, thereby to cause the cans to remain in the rotor pockets and be removed from the conveyor, and a discharge end which will permit the arms to fall away and release their projections from the can bottom countersinks after the cans have been diverted, and means for lifting each arm onto the receiving end of the track when it is desired to divert cans from the conveyor.

Another object of the invention is to provide a diverter of the character stated wherein the means for lifting the arms onto the receiving end of the track includes a solenoid subject to electrical control from a remote point.

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Another object of the invention is to provide a diverter of the character stated wherein the control of the solenoid is effected automatically in response to a condition of the cans on the conveyor line.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawings.

In the drawings—

Figure 1 is a fragmentary plan view illustrating the invention, the top plate of the rotor and its supporting spindle being removed.

Figure 2 is a vertical cross-section taken on the line 2—2 of Figure 1.

Figure 3 is a fragmentary vertical cross-section taken on the line 3—3 on Figure 1.

Figure 4 is a fragmentary view illustrating the arm supporting arcuate track in side elevation, the course of travel of two of the pivotally mounted arms over said track also being indicated.

Figure 5 is a somewhat diagrammatic plan view illustrating an example of means for automatically controlling the can distributor.

In the example disclosure of the invention made herein the main can conveyor takes the form of a travelling cable 5 whereon the cans rest upright with the bottoms on the cable in the manner clearly illustrated in Figure 2, said cans including the usual bottom countersink at 7. The cans are thus conveyed upright between side guides 8 and 9.

One diverter or distributor station is indicated at 10, and while moving toward this station the can bottoms may pass over a rail 11. It is to be understood that while the can bottoms pass over the rail 11 they always rest upon and are moved along by the travelling cable 5. The rail 11 is secured as at 12 on a supporting angle 13. See Figures 1 and 2.

At the diverter or distributor station 10 the rail 9 has an opening 14 therein to permit diversion of cans therethrough, and opposite this opening the rail 8 is recessed at 15 to allow cans to tilt away from the opening 14 while passing the same. It will be apparent by reference to Figures 1 and 2 that the clearance or recess 15 in the side guide 8 is spaced outwardly or laterally from the supporting and conveying cable 5 a distance greater than the radius of a can, thereby to tend to cause the cans to tilt outwardly away from the discharge opening 14. The end portion of the guide 9 in advance of the open-

ing 14 is offset as at 16 so as to be effective to engage cans moving along on the cable 5 and cam them over into the recess 15 and away from the discharge opening 14, thereby to assure the tilting of the cans as aforesaid. The diverter station opening 14 communicates with the receiving end 17 of a conveyor generally designated 18. This conveyor 18 may be a gravity chute, a belt or cable, or it may deliver through a twister into a rollway. Within the scope of the invention the receiver or conveyor 18 may take any form or may merely constitute a discharge into a receiving bin or the like.

The side guides 19 form a part of the receiving end of the second conveyor, and there is also provided a bottom support 20 and an overlying hold-down guide 21, all supported on a frame ring 22 which is in turn supported on a bracket 23 secured at 24 on the support bracket 25. See Figures 1 and 2. The bracket 25 is secured as at 26 to the supporting angle 13.

A vertically disposed stud 27 is secured as at 28 on the bracket plate 25, and a rotor generally designated 29 has anti-friction bearing on the stud as at 30. The rotor generally designated 29 is composed of a bottom section 31, a lower plate 32, an intermediate section 33 and an upper plate 34, said parts being secured in assembly by screws 35. The plates 32 and 34 have equidistantly spaced peripheral pockets 36 shaped to fit the external surfaces of the cans 6 which engage in the pockets as they are moved along by the cable 5. A center spindle 37 extends upwardly at the axis of the rotor from a mounting plate 38 which is secured as at 39 upon the upper plate 34. At its upper end the spindle 37 carries a hold-down plate 40 which is secured thereon at 41, and said plate is equipped with an upwardly feathered edge effective to guide can top portions or flanges thereunder in the manner clearly illustrated in Figure 2.

A radial recess 43 is provided in the bottom of the rotor section 31 at the center of each pocket, and in each said recess a radially projecting arm 44 is mounted on a horizontal pivot pin 45. A ring 46 secured to the bottom of the rotor section 31 serves to limit downward swinging movement of the arms 44 in the manner clearly illustrated in Figure 2. It will be apparent by reference to Figures 2, 3 and 4 of the drawings that each arm 44 is provided at its outer end with an undercut cam surface 47, and a button-like upward projection 48 is provided inwardly of each arm end.

The undercut cam surfaces 47 of the arms are disposed for engagement with an arcuate arm lifter 49 which is mounted to be swingable upwardly and downwardly about a pivot pin 50 secured at 51 on the bracket plate 25. The arm 49 has a depending crank or actuator 52, and a retractile spring 53 is connected at one end as at 54 to the actuator, and at its other end to an anchor pin 55 depending from the bracket plate 25. In this manner the spring constantly tends to hold the arm in its lowered, ineffective position illustrated in dotted lines in Figure 3. The actuator extension 52 of the arm 49 also is connected at 56 to the armature 57 of a solenoid 58 supported as at 59 beneath the bracket plate 25. It is to be understood that each time the solenoid 58 is energized the armature 57 will be retracted and this will result in a lifting of the arm 49 from the dotted line position illustrated in Figure 3 to the full line position.

When the arm 49 is lifted to the full line position illustrated in Figure 3 it will be engaged by an oncoming arm 44, or rather the cam portion 47 thereof, and will serve to lift the outer end of the arm onto an arcuate track 60 supported as at 61 above the bracket plate 25 in the manner clearly illustrated in Figures 1 to 4 of the drawings. It will be noted that the track 60 has a dipped receiving end portion 62, an intermediate rise 63 and a high level portion 64 and is disposed in concentric relation to the rotor axis. It will be apparent by reference to Figure 1 of the drawings that the discharge end 65 of the track 60 extends into the discharge outlet 10. A jump guard sector 66 overlies the track 60 in position for preventing objectionable upward jumping of the free ends of the arms 44, and the guard is supported as at 67 above the bracket plate 25.

A can discharge support plate 68 is mounted in the discharge outlet 10 and is supported at 69 above the bracket plate 25 and has a depressed receiving nose portion 70.

It will be apparent that under normal conditions the cans will be conveyed in a line between the guides 8 and 9 and upon the travelling cable 5, engaging in the pockets 36 of the rotor and imparting rotation thereto and all passing the discharge or distributor outlet 10, 14. During this normal free rotation of the rotor the outer ends of the arms 44 will be in their lowered position illustrated at the extreme left in Figures 2 and 3, the cam portions 47 thereof passing freely over the lifter arm 49 without contacting the same, and under the track 60.

Whenever cans are to be diverted from the conveyor cable 5 into the conveyor, chute or outlet 18 the arm 49 will be lifted in the manner illustrated in full lines in Figure 3, and then each oncoming arm 44 will be lifted onto the receiving end 62 of the track 61. Each arm so lifted will ride along the track portion 60 as shown in Figure 4, and then will be lifted by the rise 63 so as to cause the respective button-like projection 48 to move upwardly into and engage in the countersink 7 of a can 6 engaging in the particular rotor pocket from which the particular arm 44 projects. The engagement of the button in the can countersink will serve to extract the can from the conveyor cable 5 and deliver it over the plate 68 onto the support 20 and into the guides 19 and the conveyor 18. This diversion or distribution of the cans will continue so long as the arm 49 is held in its full line position illustrated in Figure 3.

While it is preferred that the lifting and lowering of the arm 49 be automatically and electrically controlled, it is to be understood that the arm may be lifted mechanically by manual actuation of a part attached to the actuator 52, or it may be controlled manually and remotely through electrical connections with the solenoid 58. Obviously the lifting and lowering of the arm 49 may also be automatically and mechanically controlled through devices actuated by can contact.

There is also illustrated one simple and acceptable means for automatically controlling the diversion or distribution of cans in accordance with conditions in the line of conveyed cans on the conveyor cable 5. This arrangement is somewhat diagrammatically illustrated in Figure 5 wherein the solenoid 58 is shown as connected by lines 71 with a power source and with a control

switch 72 adapted to be controlled by a can engaged actuator 73. In this simple example illustration whenever the cans being fed along on the cable 5 crowd against and hold the actuator 73 displaced, the switch 72 will function to bring about an energizing of the solenoid 58 and a lifting of the arm 49 to the can diverting position.

While an example illustration of the invention is disclosed in detail herein it is to be understood that variations in the form and arrangement of the parts may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. In a can distributing means for distributing cans having countersinks in the bottoms thereof, the combination of a conveyor having provision for moving the cans along uprightly, a peripherally pocketed rotor rotatably mounted at one side of the conveyor in position for having the conveyed cans engage in the pockets thereof, said conveyor including means for supporting the cans as they are being conveyed and presenting a clearance downwardly through which at least portions of the can countersinks are exposed downwardly as the cans are engaging in the rotor pockets, means movable at times for engaging in the downwardly exposed countersinks of cans while they are engaged in rotor pockets for retaining the engaged cans in the rotor pockets temporarily so as to remove them from said conveyor, and a discharge way into which the cans temporarily held in the rotor pockets are discharged.

2. Apparatus as defined in claim 1 wherein the rotor is freely-rotatably mounted and has rotation imparted thereto by engagement of the conveyed cans in the pockets thereof.

3. In a can distributing means for distributing cans having countersinks in the bottoms thereof, the combination of a travelling cable conveyor whereon the can bottoms rest with parts of their countersinks exposed, and side guides for guiding and laterally supporting the uprightly conveyed cans, one said guide having an opening therethrough providing a discharge station, a peripherally pocketed rotor rotatably mounted at said discharge station in position for having conveyed cans engage in the pockets thereof, and means for at times engaging in the countersinks of cans while they are engaged in rotor pockets for retaining the engaged cans in the rotor pockets long enough to carry them through said discharge opening and then for releasing said engaged cans from the engaging means and the rotor pockets.

4. In a can distributing means for distributing cans, the combination of a travelling cable conveyor whereon the can bottoms rest, and side guides for guiding and laterally supporting the uprightly conveyed cans, one said guide having an opening therethrough providing a discharge station, and the other of said guides having a recess therein opposite the discharge opening in the opposite guide and spaced laterally with relation to said cable a distance greater than the radius of a can so as to be effective to allow the cans to tilt away from said opening while being conveyed past the same.

5. In a can distributing means for distributing cans, the combination of a travelling cable conveyor whereon the can bottoms rest, and side guides for guiding and laterally supporting the uprightly conveyed cans, one said guide having an opening therethrough providing a discharge station, and the other of said guides having a recess therein opposite the discharge opening in the opposite guide and spaced laterally with relation to said cable a distance greater than the radius of a can so as to be effective to allow the cans to tilt away from said opening while being conveyed past the same, and means on said opposite guide immediately in advance of the opening therein for engaging cans being conveyed therepast and tilting them over into said guide recess.

6. In a can distributing means for distributing cans having countersinks in the bottoms thereof, the combination of a travelling cable conveyor whereon the can bottoms rest with parts of their countersinks exposed, and side guides for guiding and laterally supporting the uprightly conveyed cans, one said guide having an opening therethrough providing a discharge station, and the other of said guides having a recess therein opposite the discharge opening in the opposite guide and effective to allow the cans to tilt away from said opening while being conveyed past the same, and means on said opposite guide immediately in advance of the opening therein for engaging cans being conveyed therepast and tilting them over into said guide recess, a peripherally pocketed rotor rotatably mounted at said discharge station in position for having conveyed cans engage in the pockets thereof, and means for at times engaging in the countersinks of cans while they are engaged in rotor pockets for retaining the engaged cans in the rotor pockets long enough to carry them through said discharge opening and then for releasing said engaged cans from the engaging means and the rotor pockets.

7. In a can distributing means for distributing cans having countersinks in the bottoms thereof, the combination of a travelling cable conveyor whereon the can bottoms rest with parts of their countersinks exposed, and side guides for guiding and laterally supporting the uprightly conveyed cans, one said guide having an opening therethrough providing a discharge station, a peripherally pocketed rotor rotatably mounted at said discharge station in position for having conveyed cans engage in the pockets thereof, an upwardly and downwardly swingable arm pivoted on the rotor to project radially therefrom beneath and in alignment with each peripheral pocket therein and including thereon an upward projection engageable in the bottom countersink of a can engaged in the particular pocket to cause the can to remain in said pocket and be diverted from the conveyor, an arcuate track beneath which the outer ends of the arm normally are free to travel and including a receiving end, a main body for supporting the arms with their projections engaging in the can bottom countersinks, and a discharge end which will permit the arms to fall away and release their projections from the can bottom countersinks after the cans have been diverted, and means for lifting the arms onto the receiving end of the track when it is desired to divert cans from the conveyor.

8. Apparatus as defined in claim 7 in which the arcuate track includes a downward dip at its receiving end, and wherein each arm includes at its outer end a cam surface shaped to be receivable on said track end dip.

9. Apparatus as defined in claim 7 wherein there is provided an arcuate hold down track overlying the arcuate track and effective to prevent upward jumping of the swingable arms.

10. Apparatus as defined in claim 7 in which

there is included a platform piece to receive and support cans as they are diverted from the conveyor and before they are disengaged by lowering of the arms, said platform piece having a depressed receiving end portion.

11. Apparatus as defined in claim 7 in which the means for lifting the arms comprises an upwardly and downwardly shiftable cam arm, and means for shifting the cam arm.

12. Apparatus as defined in claim 7 in which the means for lifting the arms comprises an upwardly and downwardly shiftable cam arm, and remotely controlled electrically operated means for shifting the cam arm.

13. Apparatus as defined in claim 7 in which the means for lifting the arms comprises an upwardly and downwardly shiftable cam arm, spring means for normally holding the cam arm in a lowered non-effective position, and remotely controlled solenoid means for shifting the cam arm to its elevated effective position.

14. Apparatus as defined in claim 7 in which the means for lifting the arms comprises an upwardly and downwardly shiftable cam arm, spring means for normally holding the cam arm in a lowered non-effective position, solenoid means for shifting the cam arm to its elevated effective position, and means for automatically controlling the solenoid means in accordance with conditions of cans being conveyed on the conveyor.

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