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H. G. PYLES
CONVEYER SYSTEM

2,667,260

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3 Sheets-Sheet 1

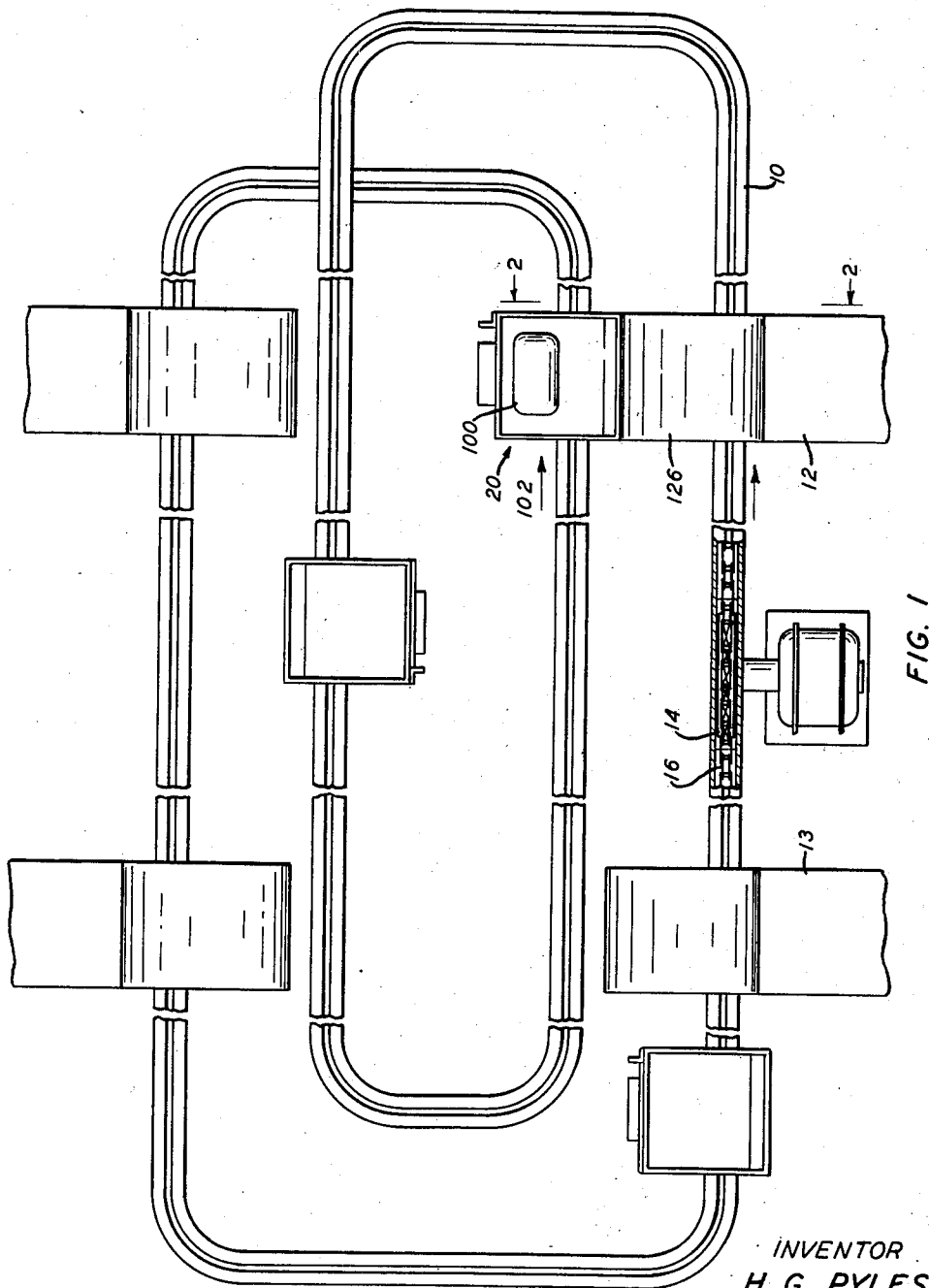


FIG. 1

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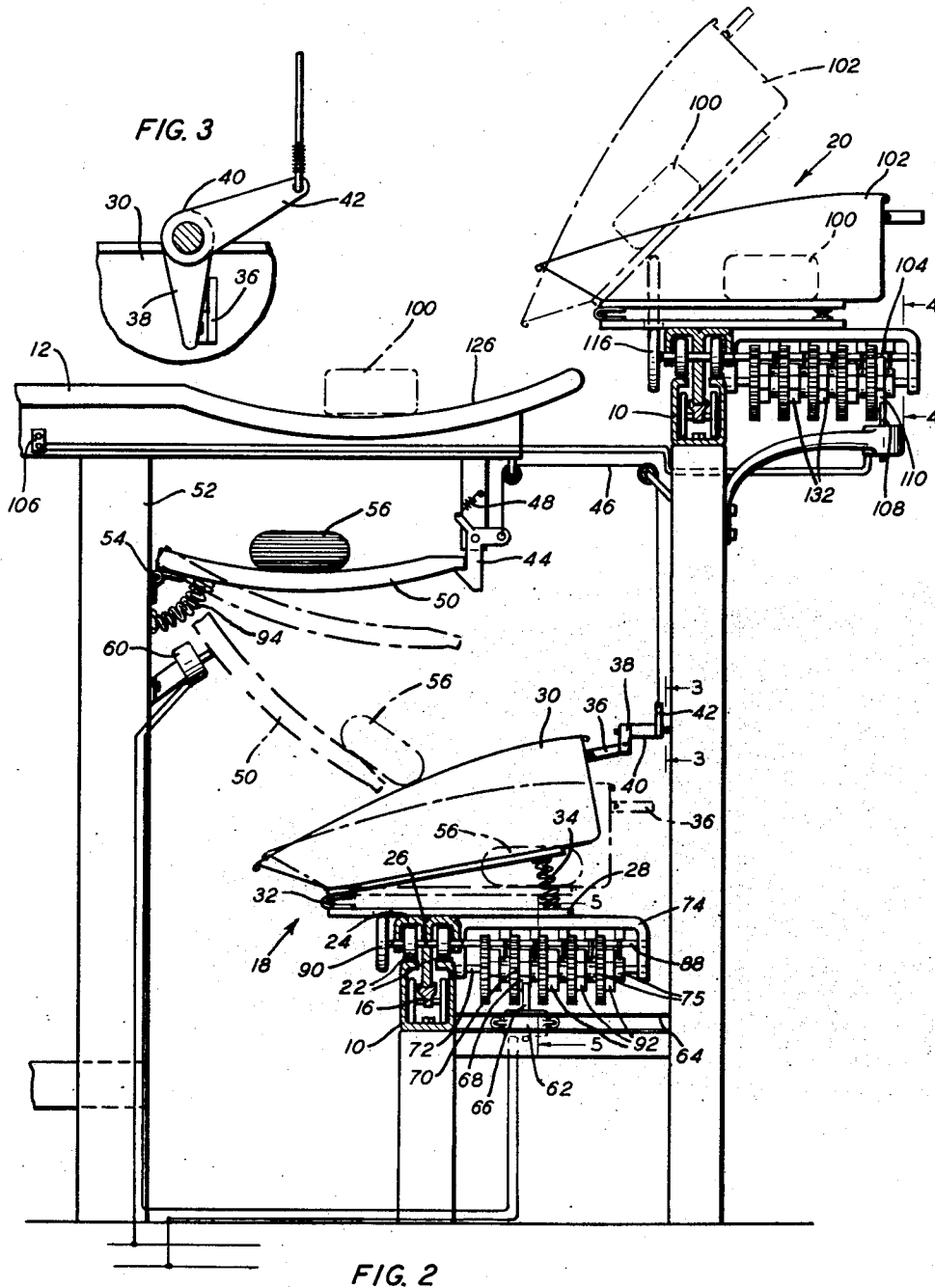
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3 Sheets-Sheet 2



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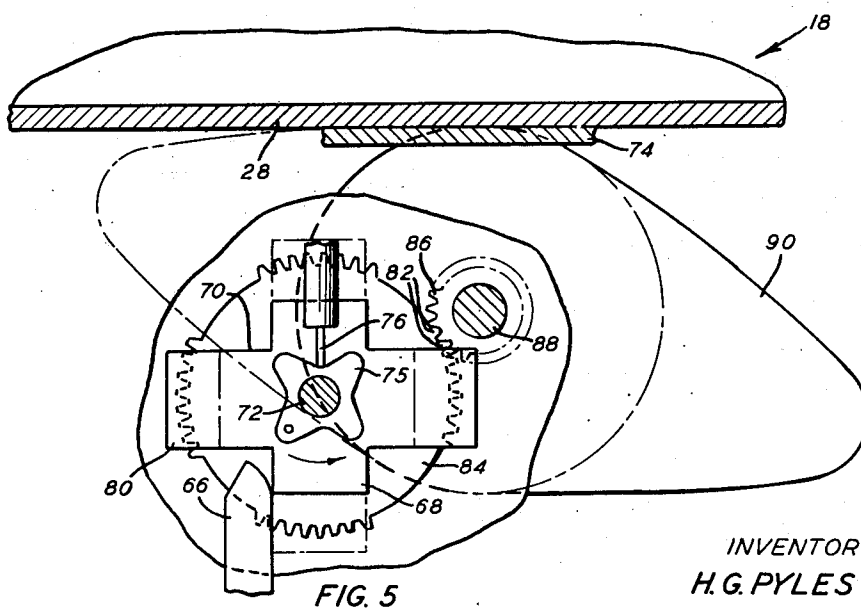
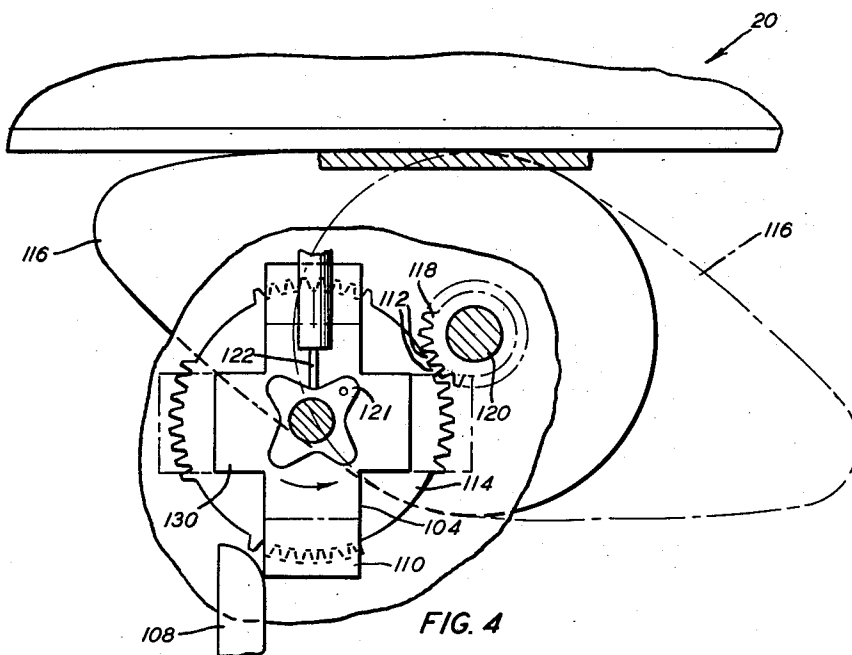
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3 Sheets-Sheet 3



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CONVEYER SYSTEM

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6 Claims. (Cl. 198—38)

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This invention relates to conveyor systems, and has for an object thereof the provision of new and improved conveyor systems.

A conveyor system illustrating certain features of the invention may include a plurality of load carriers, means for moving the carriers along a predetermined path, means for loading articles on the carriers at a predetermined point in the path of the carriers, means for setting carriers for selective unloading operations, and means for selectively unloading the carriers.

A complete understanding of the invention may be obtained from the following detailed description of a conveyor system forming a specific embodiment thereof, when read in conjunction with the appended drawings, in which:

Fig. 1 is a fragmentary, plan view of a conveyor system forming one embodiment of the invention;

Fig. 2 is an enlarged, vertical section taken along line 2—2 of Fig. 1;

Fig. 3 is an enlarged, vertical view taken along line 3—3 of Fig. 2;

Fig. 4 is an enlarged, vertical section taken along line 4—4 of Fig. 2, and

Fig. 5 is an enlarged, vertical section taken along line 5—5 of Fig. 2.

Referring now in detail to the drawings, there is shown therein a conveyor track 10 having a loading section which runs below work benches illustrated by benches 12 and 13 and also having an unloading section extending slightly above the work benches. A sprocket 14 advances a roller chain 16 (Fig. 1) along the track 10, and the roller chain serves to support load carriers, illustrated by load carriers 18 and 20 (Fig. 2). The load carrier 18 includes a pair of rollers 22—22 designed to ride on the track 10, and the rollers 22—22 support a bracket 24 by a shaft 26. A base 28 is secured rigidly to the bracket 24, and a pan 30 secured to the base 28 by a hinge 32 is urged away from the base by a compression spring 34.

When the pan 30 is empty, the compression spring 34 maintains it in its position shown in full lines in Fig. 2, in which position it is tilted to some extent but not sufficiently to discharge articles from the pan, and the path of movement of a dog 36 fastened rigidly to the pan is in alignment with a trip arm 38 of a bell crank lever 40. When the dog engages the arm 38 of the bell crank lever 40, it pivots the lever in clockwise direction, as viewed in Fig. 3, and an arm 42 of the lever releases a latch 44 through a connecting line 46 by pivoting the latch in a

counterclockwise direction, as viewed in Fig. 2, against the action of a tension spring 48. As the latch 44 is pivoted in a counterclockwise direction, it releases a loading plate 50 secured to a post 52 of the work bench 12 by a hinge 54. Release of the latch permits the loading plate to swing in a clockwise direction and a bundle 56 placed on the loading plate 50 by an operator at the work table 12 to slide into the pan 30. The weight of the bundle 56 depresses the pan 30 against the action of the spring 34 so that the dog 36 is moved to its position shown in broken lines in Fig. 2, in which position the dog 36 will not strike any of the arms corresponding to the arm 38 of the bell crank lever 40 at any of the other work benches, which are provided with loaders identical with that of which a portion has just been described.

The bundle 56 moves the plate 50 downwardly after the plate 50 has been unlatched until the plate 50 strikes a switch 60 to close a circuit to a solenoid winding 62 mounted for adjustment along a guideway 64. The solenoid winding 62 is energized and moves a setting plunger 66 into the path of a short arm 68 of a cross 70 carried rotatably on a rod 72. The rod 72 is carried rigidly by a bracket 74 fastened to the base 28. As the cross 70 is moved to and past the plunger 66, the short arm 68 strikes the setting plunger 66 and the cross 70 is turned through an angle somewhat over 45°, in a counterclockwise direction as viewed in Fig. 5. A four-lobed cam 75 secured rigidly to the cross 70 is engaged by a spring-pressed plunger 76 and after the cross 70 has been moved through the angle slightly greater than 45°, the action of the spring-pressed plunger 76 on the cam 75 moves the cross 70 to a position in which it has been turned 90° in a counterclockwise position from its full-line position shown in Fig. 5, and a long arm 80 of the cross 70 is directed downwardly.

As the cross 70 is turned by the plunger 66, which occurs while the bundle is sliding off the plate 50 and the switch 60 is kept closed, teeth 82—82 of a discontinuous gear 84 fastened rigidly to the cross 70, engage and turn a gear 86 keyed to a shaft 88. This rotation of the shaft 88 causes a cam 90 fastened rigidly to the shaft 88 to rotate clockwise through 180° from the full-time position of the cam 90 to the broken-line position thereof, as shown in Fig. 5. The cross 70 then has been set in a position in which the carrier 18 may be unloaded at a selected point as described hereinbelow. Crosses 92—92 are also rotatably mounted on the rod 72 of the

carrier 18 at laterally spaced points thereon, and the solenoid winding 62 and the setting plunger 66 may be positioned selectively at any point along the guideway 64 for selectively setting any of the crosses 70 and 92—92.

After the bundle has slid off the plate 50, a spring 94 moves the plate away from the switch 60 and the solenoid winding 62 is deenergized. The plunger 66 then falls back to a retracted position out of the path of any of the crosses of any of the carriers.

The load carrier 20, which is shown carrying a bundle 100 on a pan 102 thereof, includes a plurality of crosses similar to the crosses 70 and 92—92. A cross 104 of the carrier 20 has been set in a manner similar to the setting of the cross 70. An operator at the work bench 12 (Fig. 2) needing the bundle 100, or one identical therewith, actuates a switch 106 to raise an unloading plunger 108 into the path of a long arm 110 of the cross 104, and the arm 110 of the cross 104 engages the plunger 108. As the cross 104 is moved past the plunger 108, the cross 104 is turned thereby in a counterclockwise direction, as viewed in Fig. 4, through substantially 90°. Teeth 112—112 of a discontinuous gear 114 connected rigidly to the cross 104 turn a cam 116 through a pinion 118 and a shaft 120 in a clockwise direction through an arc of 180°. That is, the cam 116 is turned through 180° by a 90° movement of the gear 114 and the cross 104. The 90° movement of the cross 104 and the gear 114 are insured by an overcenter device comprising a four-lobed cam 121 and a spring-pressed plunger 122. As the cam 116 is so turned, it tilts the pan 102 to the position thereof shown in broken-lines in Fig. 2, which causes the bundle 100 to slide from the pan to a receiving portion 126 of the work bench 12. The operator then actuates the switch 106 to retract the unloading plunger 108 if no more bundles are needed at that work bench.

The 90° movement of the cross 104 just described moves a short arm 130 of the cross 104 into a downwardly directed position so that it may be actuated as the pan 102 is reloaded at one of the work benches to preselect the unloading station at the work bench 12 or one needing bundles identical with the bundle 100. Any other of crosses 132—132 of the carrier 18 may be selected to cause unloading of the carrier 18 at a work bench other than the last-mentioned work benches.

Operation

An operator at the work bench 12 moves the loading plate 50 from its normal position, which is the upper broken-line position thereof shown in Fig. 2, past the latch 44 to latch the plate 50 in its full-line position shown in Fig. 2, places the bundle 56 on the plate 50, and sets the solenoid winding 62 in the position on the track 64 designed to set the next empty one of the carriers illustrated by carriers 18 and 20 for the work bench or benches designed to receive the bundle 56. Assuming that the carrier 18 is empty and is the first empty carrier to approach the work bench 12, the pan 30 is in its full-line position, and the dog 36 trips the bell crank lever 40 to release the latch 44. The bundle 56 pushes the support 50 downwardly against the switch 60 and slides into the pan 30. The bundle 56 pushes the pan 30 downwardly against the spring 34 so that the dog 36 is lowered and does not trip another

of the bell crank levers corresponding to the lever 40.

Actuation of the switch 60 energizes the solenoid winding 62 to force the setting plunger 66 upwardly into the path of the short arm 68 of the cross 70, and as the carrier 18 is moved to and past the plunger 66, the plunger 66 turns the cross 70 through 90° to move the long arm 80 thereof to a position directed downwardly so that it will engage a plunger similar to the plunger 108 set therefor at one of the work benches. When the arm strikes this plunger, the cam 90 is swung through the upper portion of its path of revolution, as viewed in Fig. 5, to tilt the pan 30 and unload the bundle 56 therefrom.

The plungers corresponding to the unloading plunger 108 are not positioned high enough when in their actuating positions to engage the short arms corresponding to the short arms 68 and 130 of the crosses so that only a loaded load carrier which is set for the particular plunger corresponding to the plunger 108 or the plunger 108 is tripped by those plungers. That is, unloaded carriers have only the short arms of their crosses directed downwardly and the unloading plungers do not reach high enough to engage these short arms. Since the unloading plungers at some of the work benches are positioned selectively at laterally spaced points with respect to the path of the load carriers, only the load carriers which have the particular cross set for a particular unloading plunger will be actuated by that unloading plunger. If all the loading stations are full, their unloading plungers are retracted by the operators thereat and loaded load carriers move along the endless path of the conveyor track 10 without being unloaded. Since these loaded load carriers are already filled with bundles, none of the loading mechanisms at any of the work benches will be actuated.

The above-described conveyor system serves to conveniently and expeditiously deliver bundles to a large number of work benches. It is simple in construction and efficient and certain in operation.

What is claimed is:

1. A selective conveyor system, which comprises a loader, a guide track, a carrier support movable along the guide track, means for moving the support along the track, a pan mounted pivotally on the support, means for tilting the pan with respect to the support, a plurality of actuators pivotally mounted on the support, each of the actuators being provided with a short arm and a long arm, means for engaging a short arm of one of the actuators to turn the actuator to a predetermined position in which the long arm thereof extends in a predetermined direction, and means for engaging the last-mentioned long arm to tilt the pan.

2. A conveyor system, which comprises a loader, a guide track, a support movable along the guide track, means for moving the support along the track, a pan mounted pivotally on the support, a rod carried by the support in a position extending transversely with respect to the track, a plurality of crosses each having a long and a short arm mounted rotatably on the rod at spaced points therealong, a plurality of gears secured rigidly to the crosses, over-center devices for holding the crosses individually in positions spaced 90° apart, selective means at the loader for positioning any one of the crosses so that a long arm thereof extends in a predetermined di-

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rection, a shaft extending parallel to the rod, a cam mounted on the shaft, gears keyed to the shaft and engaging the gears on the crosses so that the cam is turned when any one of the crosses is turned, said cam being provided with a lobe portion for tilting the pan, and a plurality of unloading plungers spaced along the guide track, each of said plungers being movable from a position in which no cross is engaged thereby to a position in which it is engaged only by a long arm of a cross extending in said predetermined direction whereby the cross is rotated to turn the cam so as to tilt the pan.

3. A conveyor system, which comprises a loader, a guide track, a carrier support movable along the guide track, means for moving the support along the track, a pan mounted pivotally on the support, a plurality of crosses mounted for individual rotation and carried by the support at points spaced transversely with respect to the track, each of said crosses having a long arm perpendicular to a short arm, over-center devices for holding the crosses individually in positions spaced 90° apart and with one of the arms of each cross extending perpendicularly, selective means at the loader for engaging one of the crosses for moving it from a position in which one short arm thereof extends perpendicularly to a position in which a long arm thereof extends perpendicularly, means for tilting the pan actuable by movement of any of the crosses from a position in which a long arm thereof extends perpendicularly to a position in which a short arm thereof extends perpendicularly, and a plurality of unloading plungers for actuating the pan-tilting means each movable from a position in which it is not engaged by any of the crosses to a position in which it is engaged by one of the long arms of a selected cross when said arm extends perpendicularly.

4. A conveyor system, which comprises a plurality of load carriers movable along a predetermined path from a loading position to a plurality of spaced unloading positions, means for advancing the carriers along said path, means positioned at the loading position and responsive to movement of one of the carriers for loading an article thereon, an adjustable unloading means secured to each carrier, means positioned at each of the unloading positions for actuating the unloading means of a selected one of the carriers, and means responsive to the loading means for adjusting the unloading means on a carrier for actuation only at a preselected unloading position.

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5. A conveyor system, which comprises a plurality of load carriers movable along a predetermined endless path, means for advancing the carriers along said path, means positioned at spaced loading points along said path and responsive to movement of one of the carriers for loading an article thereon, unloading means secured to each carrier, means positioned at spaced unloading points along said path for actuating the unloading means of a selected one of the carriers, each of said unloading means having a control means settable to allow it to be actuated only at a selected unloading point, and means responsive to the loading means for setting the control means on the carriers so that articles carried thereby will be unloaded at said selected unloading point.

6. A conveyor system, which comprises a plurality of load carriers movable along a predetermined endless path, means for advancing the carriers along said path, means positioned at spaced loading points along said path and responsive to movement of one of the carriers for loading an article thereon only when the carrier is empty, unloading means secured to each carrier, each unloading means having an associated rod on which a plurality of spaced, rotatable members are mounted so that rotation of a selected member will cause the unloading means to be actuated, a plunger slidably adjustable parallel to each rotatable member for engaging and partially rotating said member in response to one of said loading means, and means positioned at a selected spaced unloading point along said path for further rotating said partially rotated member to actuate said unloading means so that an article will be unloaded at said selected unloading point.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
709,203	Clarke -----	Sept. 16, 1902
748,577	Bivert -----	Jan. 5, 1904
1,113,738	Beane -----	Oct. 13, 1914
1,297,680	Hanak -----	Mar. 18, 1919
1,362,034	Olson -----	Dec. 14, 1920
1,435,263	Soubier -----	Nov. 14, 1922
1,470,663	Barnett -----	Oct. 16, 1923
1,869,354	Bletso -----	Aug. 2, 1932
2,435,498	Hapman -----	Feb. 3, 1948
2,518,037	Mackechnie -----	Aug. 8, 1950