Oct. 15, 1940. J. P. HEIL ET AL 2,217,982

RECEPTACLE TRANSFER MECHANISM

Filed April 27, 1939 2 Sheets-Sheet 1

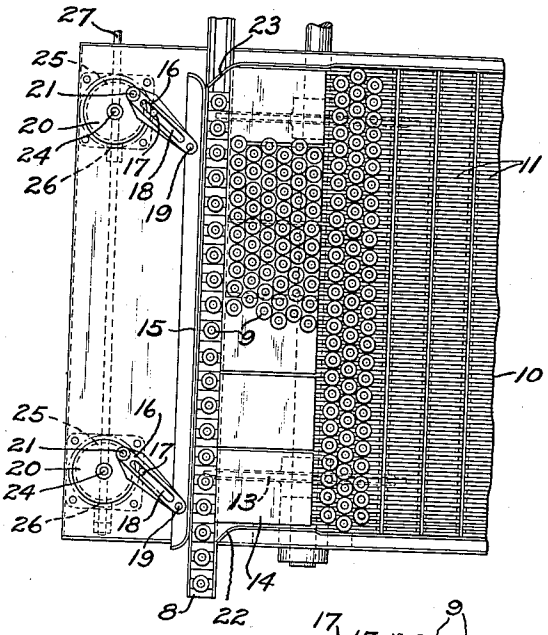


Fig. 1.

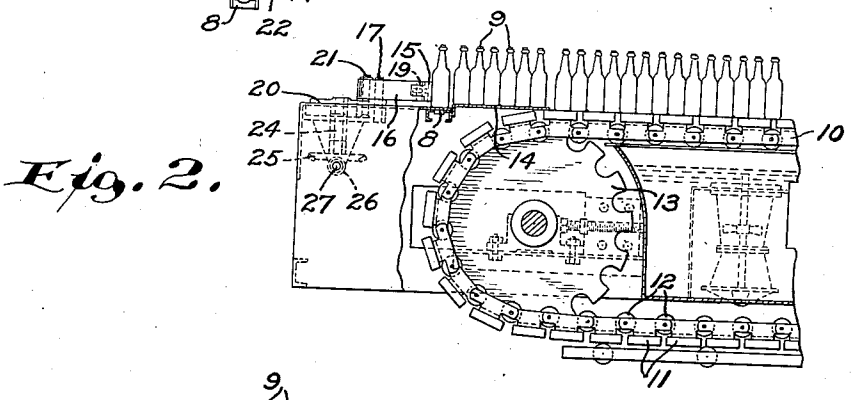


Fig. 2.

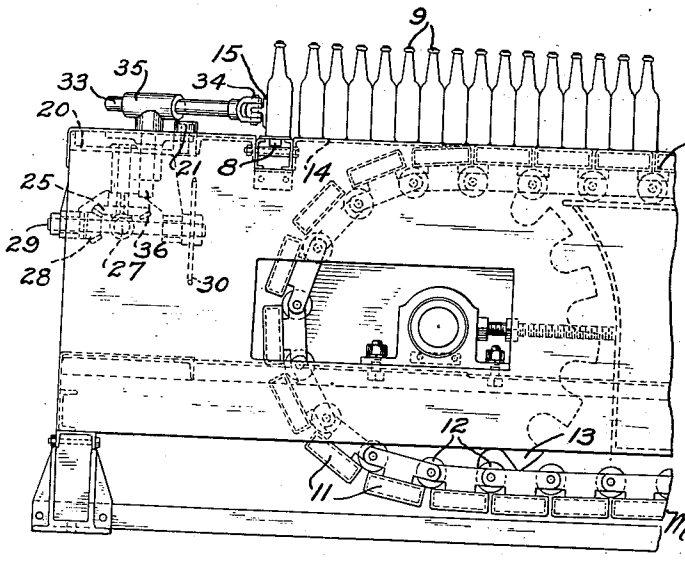


Fig. 3.

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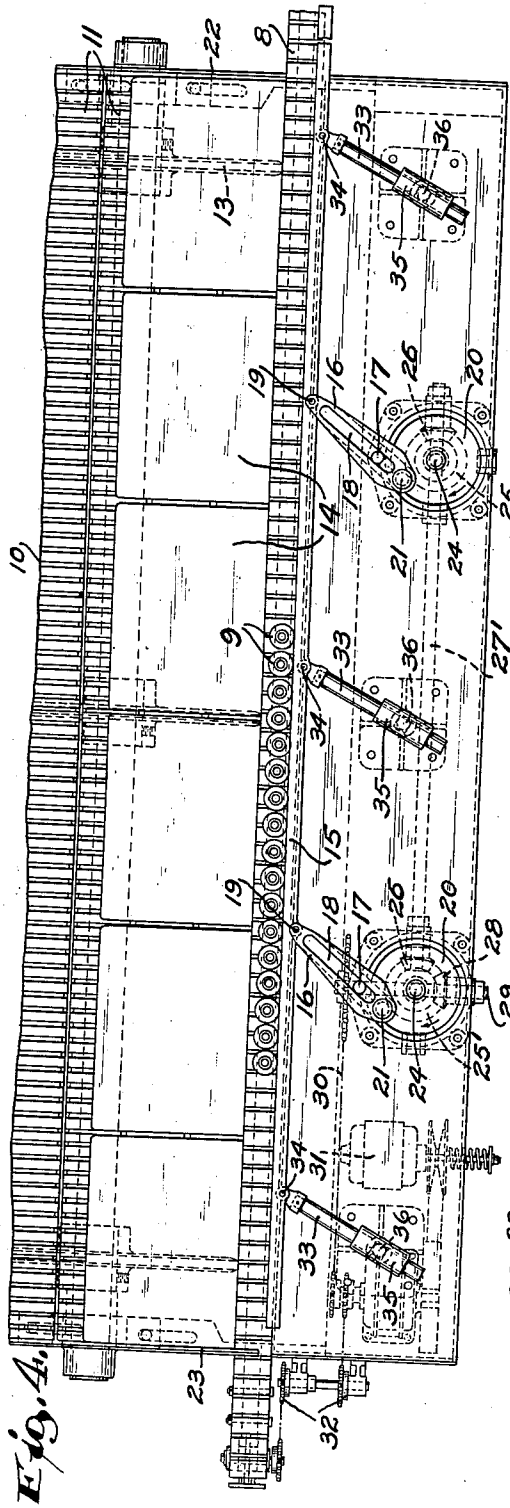


Fig. 4.

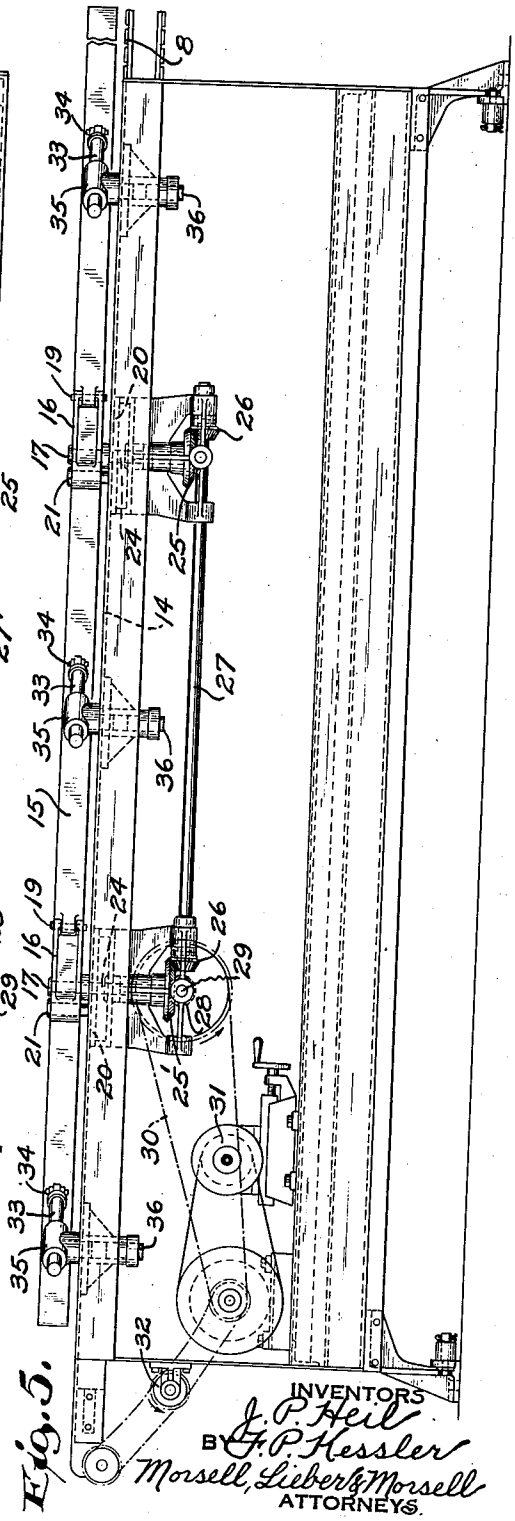


Fig. 5.

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RECEPTACLE TRANSFER MECHANISM

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Application April 27, 1939, Serial No. 270,290

8 Claims. (Cl. 198—31)

Our present invention relates generally to improvements in the art of transferring a succession of objects from one locality to another, and relates more specifically to improvements in the construction and operation of mechanism for automatically transferring successive receptacles or rows of receptacles such as cans or bottles from one conveyor to another.

Generally defined, an object of our present invention is to provide an improved receptacle transfer mechanism which is simple in construction and reliable in operation, and our present application is a continuation in part of an original application Serial No. 181,584, filed December 24, 1937, which has matured to Patent No. 2,144,800, granted January 24, 1939.

Some of the more specific objects of our invention are as follows:

To provide new and improved mechanism for automatically transferring receptacles such as cams or bottles either singly or in rows, from a conveyor travelling in one direction to another conveyor travelling in another direction.

To provide improved receptacle transfer mechanism for periodically arranging a series of cans or bottles in rectilinear rows, and for intermittently shifting the successive rows laterally onto a receiving platform or conveyor.

To provide a new and useful receptacle handling assemblage adapted to rapidly and effectively change the direction of travel of a multiplicity of circular cans or glass bottles, and to simultaneously arrange the objects in regular order.

These and other specific objects and advantages of the present invention will be apparent from the following detailed description.

A clear conception of the several features constituting the present improvement, and of the mode of constructing and of operating receptacle transfer mechanisms embodying the invention, may be had by referring to the drawings accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

Fig. 1 is a relatively diagrammatic top view of a rather simple receptacle transfer mechanism embodying our invention, showing the same applied to fragments of transversely movable receptacle conveyors;

Fig. 2 is a rather diagrammatic side elevation of the assemblage of Fig. 1;

Fig. 3 is an enlarged and more complete side view of a commercial assemblage embodying our present invention;

Fig. 4 is a similarly enlarged and completed top view of the assemblage of Fig. 3; and

Fig. 5 is a likewise enlarged and complete end view of the assemblage of Figs. 3 and 4.

While our present invention has been shown and described herein as being specifically applied to mechanism for successively transferring rectilinear rows of bottles to a fixed support and from thence to a relatively wide conveyor for transporting the rows en masse, it is not our intention to unnecessarily restrict the scope or utility of the improvement by virtue of such specific embodiment.

Referring specifically to Figs. 1 and 2 of the drawing, our invention in its broadest aspect comprises generally a longitudinal receptacle supply conveyor 8 adapted to arrange a succession of receptacles such as bottles 9 in rectilineal elongated row sections; a lateral conveyor 10 consisting of a series of pivotally interconnected links 11 and rollers 12 coacting with sprocket wheels 13, the conveyor 10 travelling transversely of the direction of movement of the conveyor 8; stationary transfer plates 14 interposed between the receptacle supporting decks of the conveyors 8, 10; and elongated pusher member or bar 15 movable to parallel positions across the supply conveyor 8; several parallel slotted levers 16 having fixed fulcrum pins 17 coacting with the medial slots 18 thereof and having corresponding ends pivotally attached to the pusher bar 15 by pins 19; and simultaneously revolvable eccentrics 20 having eccentric pins 21 coacting with the opposite corresponding ends of the levers 16.

The cooperating conveyors 8, 10 may be either continuously or intermittently movable, and the bottles 9 may obviously be replaced by other types of receptacles such as food or liquid laden cans. The opposite sides of the lateral conveyor 10 are preferably provided with guide walls 22, 23, the latter of which extends over the deck of the conveyor 8 so as to prevent the bottle rows from being carried beyond the zone of the conveyor 10. The transfer plates 14 are preferably fixedly mounted so as to present a smooth transfer surface over which the receptacles may be pushed or transferred en masse by the pusher bar 15, from one conveyor to the other without tipping the bottles 9. The eccentric disks 20 are mounted upon rotary shafts 24 each having a bevel gear 25 secured to the lower end thereof, and these gears are simultaneously revolvable in the same direction by means of bevel pinions 26 carried by a common drive shaft 27.

The modified receptacle transfer assemblage

of Figs. 3, 4 and 5 is quite similar to that of Figs. 1 and 2, and in the modification one of the bevel gears 25' is driven by a pinion 28 secured to a power shaft 29 which is rotatable through a belt or chain drive 30 by the motor 31. This motor 31 also serves to drive the supply conveyor 8 through chain gearing 32 or the like, and the other bevel gear 25 is rotatable simultaneously with the gear 25' by means of pinions 26 carried by a counter shaft 27'. In the modification, the levers 16 function to move the pusher bar 15 to parallel positions and across the conveyor 8 in precisely the same manner as in Figs. 1 and 2, but the bar 15 is additionally guided and stablized by means of guide rods 33 the corresponding ends of which are articulably connected to the bar 15 by pivot pins 34, and the medial portions of which are freely slidable in swivel blocks 35 having pivots 36 coacting with the main frame of the machine.

During normal operation of the transfer mechanisms, the two conveyors 8, 10 are being operated either continuously or intermittently, and the supply conveyor 8 is functioning to arrange the incoming bottles 9 in successive rows as shown in Fig. 1, while the pusher bar 15 is retracted from the path of travel of the entering bottles. The eccentric disks 26 are being revolved in the direction indicated in Fig. 4, thereby causing the pins 21 to swing the levers 16 about the fixed fulcrum pins 17 while at the same time causing the slots 18 of these levers 16 to ride along the fixed pins 17. As shown in Fig. 4, the levers 16 are about to push the bar 15 across the supply conveyor 8, and after this action has taken place, the levers 16 are drawn away from the conveyor 8 and at such times the bar 15 is pulled away from the conveyor 8 a considerable distance. During such withdrawal of the bar 15, the bottles 9 are arranged in rows in the path of travel of the bar 15, and the end wall 23 prevents the bottle rows from passing beyond the zone of action of the pusher bar. As the successive rows of bottles 9 are pushed off of the conveyor 8 onto the stationary plates 14, they collect en masse but retain their approximate row formations. The successive rows will be advanced along the plates 14 by subsequent actions of the pusher bar, and the bottles will be ultimately pushed off of the plates 14 onto the lateral conveyor 10 as indicated in Fig. 1. In this manner, the successive rows of bottles 9 which are supplied by the conveyor 8 are discharged from this conveyor across the fixed plates 14 to the conveyor 10, and this transfer is effected without danger of having the bottles tip over. The danger of tipping is perhaps greatest when tall bottles 9 such as shown in the drawings are utilized, and diminishes with shorter and stubbier bottles, and with tin cans.

From the foregoing description, it will be apparent that our present invention provides a bottle transfer mechanism which is extremely simple in construction but which is highly efficient in operation. The movement of the levers 16 causes the pusher bar 15 to assume parallel positions as it approaches and recedes from the conveyor 8, and with the aid of guide bars 33, such as shown in Figs. 3, 4, and 5, greater stability may be provided for the bar 15. These guide bars 33 are not however essential, since the levers 16 alone will produce parallel lateral travel of the bar 15. The assemblage besides being simple in construction is also durable and positive in action, and all parts of the mechanism are readily accessible for inspection. The improved transfer assemblage has proven highly successful in actual commercial use, in conjunction with the operation of pasteurizers for beer, but the improvement is obviously more generally applicable to other types of transfer assemblages. Due to its simplicity, this receptacle transfer mechanism may obviously be installed and operated at extremely moderate cost, and the power required for operation of the mechanism is negligible.

With the present improved receptacle transfer mechanism, it is not necessary to stop the supply of receptacles which are being advanced by the conveyor 8, or to accumulate the incoming receptacles preparatory to the next feeding movement of the transfer or pusher bar 15, as in prior transfer mechanisms of this general type. This is an extremely important feature of our invention, and our present improvement permits uninterrupted advancement of the receptacles 9 by the constantly moving supply conveyor 8, and therefore enables constant and uniform transfer of the receptacles from one conveyor to the other without shocks or gaps in the continuity.

It should be understood that it is not desired to limit this invention to the exact details of construction or to the precise mode of operation, herein shown and described, for various modifications within the scope of the claims may occur to persons skilled in the art.

We claim:

1. In combination, a supply conveyor formed to arrange successive receptacles in rows, a receptacle receiving conveyor movable transversely of the direction of travel of said supply conveyor, a pusher bar movable near and across and in the direction of travel of said supply conveyor, slotted levers pivotally mounted at one end to said bar and slidable along fixed fulcrums and being simultaneously swingable to parallel positions to move said bar to parallel positions across said supply conveyor, and a power driven eccentric for operating each lever.

2. In combination, receptacle supply and receiving conveyors, a pusher bar movable with one of said conveyors to transfer successive rows of receptacle to the other, a plurality of levers pivotally mounted at one end to said bar and oscillatable about and slidable along fixed pivots to impart receptacle transfer motion to said bar, and a power driven eccentric for operating each lever.

3. In combination, receptacle supply and receiving conveyors, a fixed receptacle support interposed between said conveyors, a pusher bar movable across and in the direction of travel of one of said conveyors toward the other, a plurality of slotted levers pivotally attached to said bar and simultaneously oscillatable about and movable laterally of fixed pivots to transfer rows of receptaces from one conveyor to the other across said support, and a power driven eccentric for operating each lever.

4. In combination, relatively transversely movable receptacle supply and receiving conveyors, a pusher bar movable laterally along and across one of said conveyors to transfer receptacles to the other, a plurality of levers pivotally mounted at one end to said bar and swingable about and slidable laterally along fixed fulcrums to move said bar, and simultaneously revolving eccentrics for moving said levers to parallel positions to produce parallel movement of said bar.

5. In combination, relatively transversely mov-

able receptacle supply and receiving conveyors, a pusher bar movable laterally across one of said conveyors to transfer receptacles to the other, a plurality of levers each having a slotted medial portion swingable about and slidable relative to a fixed fulcrum and also having one end pivotally attached to said bar, and an eccentric coacting with the other end of each lever to oscillate and move the same.

6. In combination, relatively transversely movable receptacle conveyors, a stationary receptacle support interposed between said conveyors, a pusher bar movable laterally across one of said conveyors to transfer receptacles over said support and onto the other conveyor, laterally spaced oscillatory and longitudinally shiftable levers for moving said bar, and oscillatory and longitudinally movable pivotally mounted guide rods coacting with said bar between said levers.

7. In combination, relatively transversely movable receptacle supply and receiving conveyors, a pusher bar movable laterally across one of said conveyors to transfer receptacles to the other, fixed fulcrum pins, a plurality of levers each having a slotted medial portion swingable about and slidable along one of said fulcrum pins and also having one end pivotally attached to said bar, and an eccentric coacting with the other end of each lever to oscillate and move the same.

8. In combination, approximately horizontal relatively transversely movable receptacle supply and receiving conveyors, a pusher bar movable laterally across one of said conveyors to transfer receptacles to the other, fixed upright fulcrum pins, a plurality of levers each having a slotted medial portion swingable about and slidable along one of said fulcrum pins and also having one end pivotally attached to said bar, and an eccentric coacting with the other end of each lever to oscillate and move the same.

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