To all whom it may concern:

Be it known that I, Edward E. Lawrence, a citizen of the United States, and a resident of Jamaica, in the county of Queens and State of New York, have invented an improvement in Receptacle-Feeding Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to receptacle feeding apparatus and is a division of my co-pending application Serial No. 103,875 for Receptacle filling and closing apparatus, filed June 15, 1916.

In order that the principles of the invention may be readily understood I have disclosed a single embodiment thereof in the accompanying drawings wherein:

Fig. 1 is a plan view of the apparatus;
Fig. 2 is a transverse section of the same taken on line 2-2 of Fig. 1;
Fig. 3 is a section taken on the line 3-3 of Fig. 1.

The feeding apparatus herein disclosed may be used for feeding various articles but herein it is adapted for use with machines for filling cartons or receptacles and thereafter closing the same by inverting the upright flaps or cover portions thereof, as clearly disclosed in my aforesaid co-pending application.

In the apparatus referred to the filling material is deposited in predetermined quantities and by suitable means in the cartons that are conveyed to and beyond the filling stations of the machine by the feeding apparatus embodying this invention.

In the drawings, the frame is represented as consisting of a series of uprights 1 at opposite sides and these uprights are connected together or supported by a plurality of transverse cross or tie members 2. Mounted upon said frame members are travelling means herein belts 45 and 46, portions of which are supported horizontally by laterally extending members 47 and 48, which members may extend outwardly for a considerable distance as most clearly shown in Fig. 2, portions of said members being broken away to save space in the drawings. These belts are supported at their outer ends by guide pulleys 45', 46' and at their inner ends they are supported upon pulleys 49 and 50, said pulleys being illustrated in dotted lines in Fig. 1 and in full lines in Fig. 2. Thus it will be seen that the inner ends of the set of belts are brought into close proximity.

The said pulleys 49, 50 are respectively mounted upon shafts 51, 52 which shafts are respectively mounted in bearings 53, 53 and 54, 54 in the cross members 2 of the frame. Gears 55, 56 mounted respectively upon said shafts 51, 52 mesh with each other so that the two belts may be driven in opposite directions in unison. As hereinafter described, gear 56 is loosely mounted upon the shaft 52 and is adapted periodically to be clutched thereto.

Suitable means are provided for driving said belts and herein such means are adapted to impart an intermittent movement thereto, it being merely necessary for the attendant to keep a sufficient supply of articles or cartons upon the belts 45, 46 to assure the inward feeding of the same at the two sides of the machine. It is desirable that portions of said belts, that is the portions or runs upon which the receptacles or cartons are mounted and fed, be maintained in horizontal planes and preferably in the same plane and between the upper and lower runs of said belts are interposed supporting or guide members 57, 58. I have herein represented guide rolls 59, 60, 60 at the inner ends of said members 57, 58, the uppermost of which rolls, together with the rolls 45', 46' define the carton or article supporting runs of said belts. The pulleys 49, 50 are supported at a lower level than the carton receiving portions of the belts 45, 46 and hence said belts incline downwardly from the guides 59, 60 to said pulleys.

I have indicated at 61 a guiding roller beneath which the belt 46 extends. From the rollers 59, 60 the belts 45, 46 extend downwardly quite abruptly beneath troughs 62,
63 positioned angularly with respect to said belts herein at substantially right angles to the path of movement of said belts. As shown most clearly in Figs. 1 and 2, at opposite sides of the belts 45, 46 I position longitudinally extending guide plates 61, 64, 65, 66, the inner ends of which extend directly into the troughs 62, 63 so as to guide and support the incoming cartons or articles directly into the said troughs.

The said troughs are suitably supported upon side members of the frame of the machine at opposite sides thereof and directly beneath the discharge ends of the chutes shown in said copending application but omitted from the present drawings; although the positions of said chutes are indicated by the letters A, B which, in other words, indicate the filling stations of said troughs.

The said troughs may be of any desired construction but herein each consists of a bottom 66, and outer and inner walls 76, 77; the outer walls 76 of said troughs being cut away at 78 in line with the belts 45, 46 to permit entrance of the cartons from said belts. The bottom 66 of each trough is recessed to receive means for advancing the cartons along said trough which herein comprise sprocket chains, the upper runs of which are arranged within said recesses. These chains, in the present example, constitute endless conveyors constructed and arranged to receive from said belts the cartons that are carried inwardly thereby and effect the conveying of said cartons to the filling stations A and B, thence to various other stations as, for example, carton closing stations C and D and finally to a discharge station E, herein constituting a common discharge station for both the conveyors of the machine. The runs of said conveyors which work in said grooves are preferably located in substantially the same plane as are the upper runs of the belts 45, 46 so that cartons or receptacles may be transferred from one to the other, right side up, and without danger of such cartons being upset or tipped over during such transferring operations.

The sprocket chains 67 are preferably each provided with spaced upstanding lugs 68 arranged in pairs sufficiently separated to receive between them the cartons. The sprocket chains bearing said lugs are intermittently driven and so timed that they are periodically stopped with the said upstanding lugs positioned so as to receive a carton from said travelling means or belts 45, 46. The movements of the sprocket chains are then resumed and the cartons are carried to the filling stations and then to the closing or folding stations in a manner common to the machine of said copending application. Each sprocket chain 67 is supported, at its outer end, by an idler or guide sprocket wheel 69 upon a shaft 69′ shown and having any suitable means to adjust the same, thereby causing said chains to run with sufficient tautness. At its inner end each sprocket chain passes over a sprocket wheel 70 fast upon a transversely disposed shaft 70 and having thereon a pinion 72 meshing with the teeth 73 of a mutilated gear 74 mounted upon a shaft 75 whereby on each rotation of said gear 74, each sprocket chain is driven through the proper distance to receive and convey one carton.

As previously stated the endless conveyors or chains 67 conduct the cartons along the troughs past the various stations and may discharge them from opposite sides of the machine but preferably I have herein represented a duplex discharge chute 180 hinged to the frame of the machine at 181, 182 so that, when the machine is not in use, the chute may be folded up out of the way. The two parts 183, 184 of the chute meet at 185 which have herein designated as the common discharge station E of the machine from which point the filled and closed receptacle or cartons are discharged.

In order to drive the operating parts of the machine I may provide any suitable means from which power may be transmitted herein to a suitable pulley 190 which is loosely mounted upon a transverse shaft 191 journalled to rotate in suitable bearings 192, 192 upon the framing of the machine. The said pulley 190 is adapted to be clutched to the shaft by any suitable clutching means and herein is represented as having an annular grooved member 193 receiving the inner end of an operating yoke 194 carried by a rod 195 extending from side to side of the machine and guided by the side members thereof as indicated in Fig. 1.

The main driving shaft 191 is provided with a pinion 204 fast thereon and meshing with a gear 205 fast upon a transversely extending shaft 206 mounted in bearings 207 in the side members of the machine frame. 110 Fast upon said shaft 206 and about mid-width of the machine is a bevelled gear 208 meshing with a similar gear 209 upon the longitudinally extending shaft 52 whereon is supported the pulley 50 for the empty carton feeding belt 46.

As previously stated I preferably intermittently drive the empty carton conveyor belts 45 and 46 and for this purpose I have represented the shaft 52 as having thereon a clutch member 210 by which periodically to clutch to the shaft the gear 56 preferably loosely mounted thereon.

Any suitable means may be employed for operating said clutch either automatically 125 or manually but herein for this purpose I provide a clutch operating member 211 pivoted at 212 upon the framing of the machine and having a laterally extending arm 213 to which is connected a lever arm 214 130

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having a roll 215 normally in engagement with the periphery of the cam 216 upon a cam shaft 217. The lever arm 214 is pivotally mounted upon a stationary support 5 213 as most clearly indicated in Fig. 2 and extends above and below the same, it being pivotally connected at its lower end at 219 to the laterally extending arm 213 of the clutch operating member. At certain times it is desirable to stop the belts 45 and 46 without stopping the other parts of the machine in order that the cartons may not be fed too rapidly for the filling and closing devices and I have provided means whereby this may be effected. As shown most clearly in Fig. 2 I provide a link 220, the lower end of which is pivoted at 221 to the said lever arm 214 adjacent to the upper end thereof. The said link extends in an upwardly inclined direction to a side of the machine adjacent to one of the discharge chutes in a convenient position to be operated when desired and is there suitably supported by a pin upon a downwardly extending bracket 222, entering a longitudinal slot 223 in said link whereby said link may be outwardly drawn by the handle 224 so as to withdraw the roll 215 from operative relation to the periphery of the cam 216.

When the roll 215 has thus been withdrawn the movements of the belts 45 and 46 are entirely suspended.

From the foregoing description it is clear that in the disclosed embodiment of my invention wherein duplex conveyor means are shown the empty cartons are intermittently fed at each side of the machine into the troughs where they are received upon the sprocket chains in suitable spaced relation and after being advanced to the filling stations A and B filled by means not shown herein, they are then conveyed to the folding stations C and D and folded in any suitable manner, whence they are thereafter discharged from the machine at the common discharge station E.

Having thus described one illustrative embodiment of my invention I desire it to be understood, that although specific terms are employed they are used in a generic and descriptive sense and not for purposes of limitation, the scope of the invention being set forth in the following claims:

1. A feeding apparatus comprising, in combination, a belt adapted to receive articles, a conveyor onto which the articles are discharged from said belt, said conveyor being positioned at an angle to said belt and the latter extending to said conveyor substantially in the same plane therewith and then beneath said conveyor whereby the articles are discharged directly from the belt onto the conveyor, said belt and said conveyor having confining side guides therealong, whereby the receptacles are guided with certainty directly from the belt onto the conveyor and along said conveyor.

2. A feeding apparatus comprising in combination, a conveyor member adapted to receive empty cartons and to convey them inwardly, a second conveyor member arranged at substantially right angles thereto, said first conveyor member extending to the second conveyor member in substantially the same plane therewith and then abruptly beneath the second member, said conveyor members having confining side guides whereby the receptacles are guided from the first conveyor member onto the second conveyor member and with no intermediate movement are guided along the latter at substantially right angles to their first direction of movement.

3. A feeding apparatus comprising, in combination, a conveyor member adapted to receive said empty receptacles and to convey them inwardly, means to impart step-by-step motion to said member, a second conveyor member positioned at an angle to the first member and adapted to receive the receptacles, right side up, directly therefrom, means to impart a step-by-step movement to said second conveyor member and cooperating guide means to insure the abruptly angular delivery of the receptacles from the first directly to the second conveyor member.

4. A feeding apparatus comprising, in combination, a conveyor member adapted to receive and convey empty receptacles, right side up, means to impart a step-by-step motion to said conveyor member, a second conveyor member arranged at substantially right angles to the first and adapted to receive the receptacles directly therefrom, and means to impart movement to the second member during the periods of rest of said first conveyor member.

5. A feeding apparatus comprising, in combination, a conveyor member adapted to receive empty receptacles, right side up, and to move them inwardly, means to impart a step-by-step motion thereto, a second conveyor member arranged transversely to the first and having spaced receiving projections thereon, and means intermittently to move said second conveyor member into stationary position to receive receptacles from the first conveyor member.

6. A receptacle feeding apparatus comprising, in combination, a conveyor belt adapted to receive, right side up, empty receptacles and to move them inwardly, means to impart a step-by-step motion to said belt, a second conveyor belt arranged transversely to said first belt and having spaced receptacle positioning projections to engage opposite ends of the receptacles, and means to move said second belt during the periods of rest of said first belt in a position to receive
receptacles between said projections from the first belt.

7. A feeding apparatus comprising in combination, two endless conveyors at right angles to each other and adapted to convey receptacles with right side up and automatically one to the other, and stationary walls along the edges of each conveyor so as to direct the receptacles along the conveyors in straight paths, one of said walls being interrupted to permit the delivery of receptacles right angularly from one conveyor to the other.

8. A feeding apparatus comprising in combination, a conveyor member adapted to receive empty receptacles and to convey them inwardly, means to impart step-by-step motion to said conveyor member, a second conveyor member positioned at an angle to the first member and adapted to receive the receptacles right side up, directly therefrom, means to impart a step-by-step movement to said second conveyor member, and stationary confining guides at the edges of each conveyor member so as to guide the receptacles along the conveyor members in straight paths and at the speed of said conveyor members and directly from one to the other.

9. A feeding apparatus comprising in combination, a conveyor member adapted to receive and convey empty receptacles, right side up, means to impart a step-by-step motion to said conveyor member, a second conveyor member arranged at substantially right angles to the first member, means to impart movement to the second member during the periods of rest of said first conveyor member, and stationary confining guides at the edges of each conveyor member so as to guide the receptacles along the conveyor members in straight paths and at the speed of said conveyor members and right angularly from one to the other.

10. A receptacle feeding apparatus comprising in combination, a conveyor belt adapted to receive, right side up, empty receptacles and to move them inwardly, means to impart a step-by-step motion to said belt, a second conveyor belt arranged transversely to said first belt and having spaced receptacle-positioning projections, and means to move said second belt during the periods of rest of said first belt in a position to receive receptacles between said projections from the first belt, each of said conveyor belts having confining side guides therealong to guide the receptacles with certainty and right angularly from one to the other and to confine them to said conveyors.

11. A feeding apparatus comprising in combination, a conveyor member adapted to receive empty receptacles and to convey them inwardly, said conveyor member having confining edge guides spaced apart substantially the length of said receptacles, means to impart step-by-step motion to said conveyor member, a second conveyor member positioned at substantially right angles to the first conveyor member and adapted to receive the receptacles right side up directly therefrom, said second conveyor member having confining edge guides spaced apart substantially the width of said receptacles, and means to impart step-by-step motion to said second conveyor member.

12. A feeding apparatus comprising, in combination, a conveyor member adapted to receive empty receptacles and to convey them inwardly, said conveyor member having confining edge guides spaced apart substantially the length of said receptacles, a second conveyor member positioned at substantially right angles to the first conveyor member, and adapted to receive the receptacles right side up directly therefrom, said second conveyor member having confining edge guides spaced apart substantially the width of the said receptacles.

13. A feeding apparatus comprising, in combination, two conveyor members spaced apart at their inner portions but adapted to convey articles toward each other, a pair of conveyor members in parallelism, interpolated between the first-mentioned conveyor members and each member of said pair being at substantially right angles to one of said first-mentioned conveyor members, the edge guides for the first-mentioned conveyor members being spaced apart substantially the length of the articles, and the edge guides for the parallel conveyor members being spaced apart substantially the width of the said articles.

14. A feeding apparatus comprising, in combination, two conveyor members spaced apart at their inner portions but adapted to convey articles toward each other, a pair of conveyor members in parallelism, interpolated between the first-mentioned conveyor members and each member of said pair being at substantially right angles to one of said first-mentioned conveyor members and from which it receives articles, means intermittently to drive all of said conveyor members, edge guides for all of said conveyor members, the edge guides for the first-mentioned conveyor members being spaced apart substantially the length of the articles, and the edge guides for the parallel conveyor members being spaced apart substantially the width of the said articles, and means manually to stop the movement of the first-mentioned conveyor members without interfering with the movement of the second-mentioned conveyor members.

15. A feeding apparatus comprising, in combination, conveyor members at an angle
to each other and adapted to feed articles directly from one to the other, means to drive said members intermittently from a common power source, the one conveyor member being in motion while the other is stationary, control mechanism for stopping the motion of both conveyor members, and manual means for stopping the motion of one conveyor member while the other member continues in motion.

In testimony whereof, I have signed my name to this specification.

EDWARD E. LAWRENCE.