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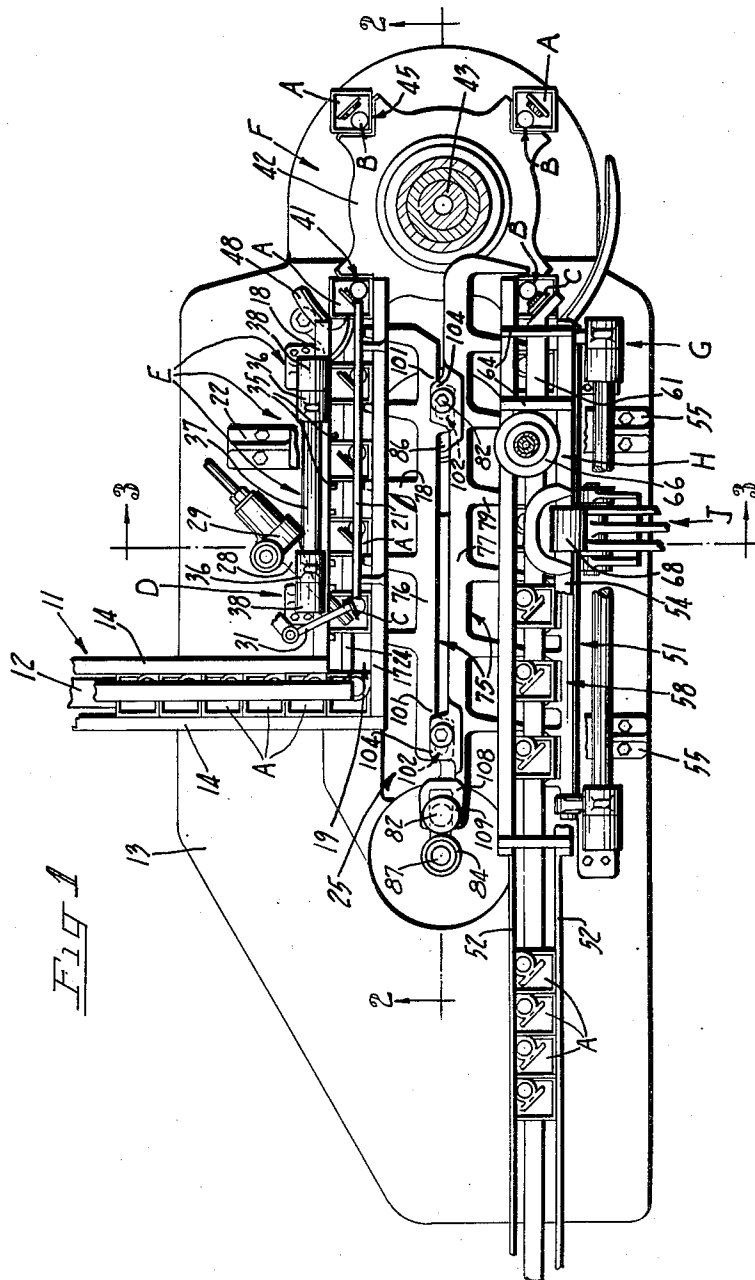
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2,357,799

CONTAINER HANDLING MACHINE

Filed March 29, 1941

3 Sheets-Sheet 1



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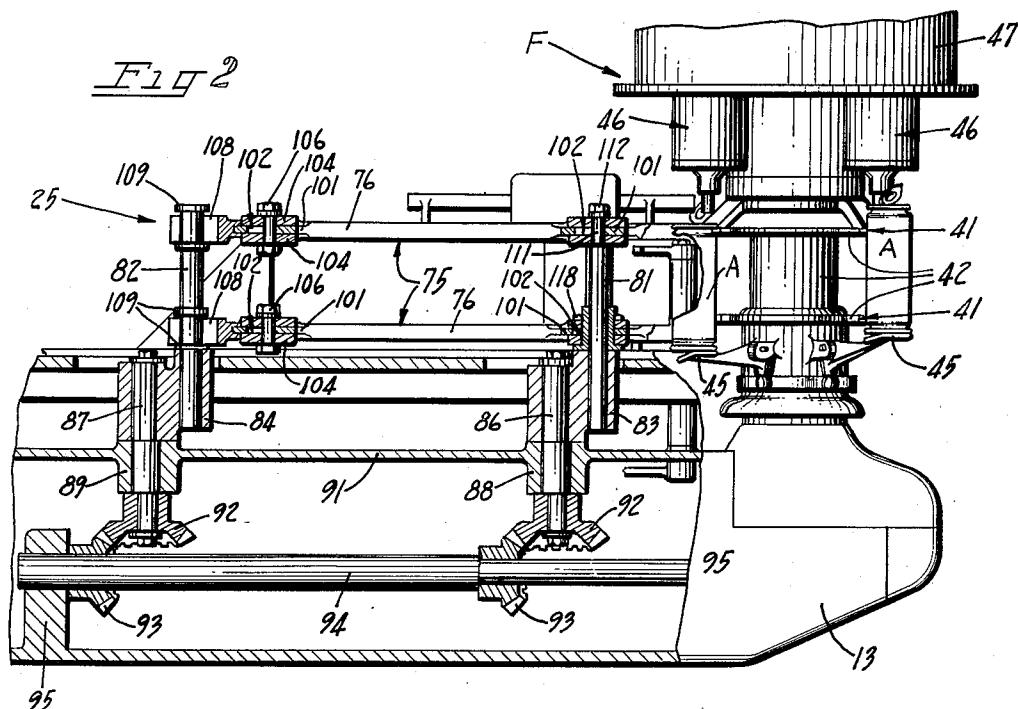
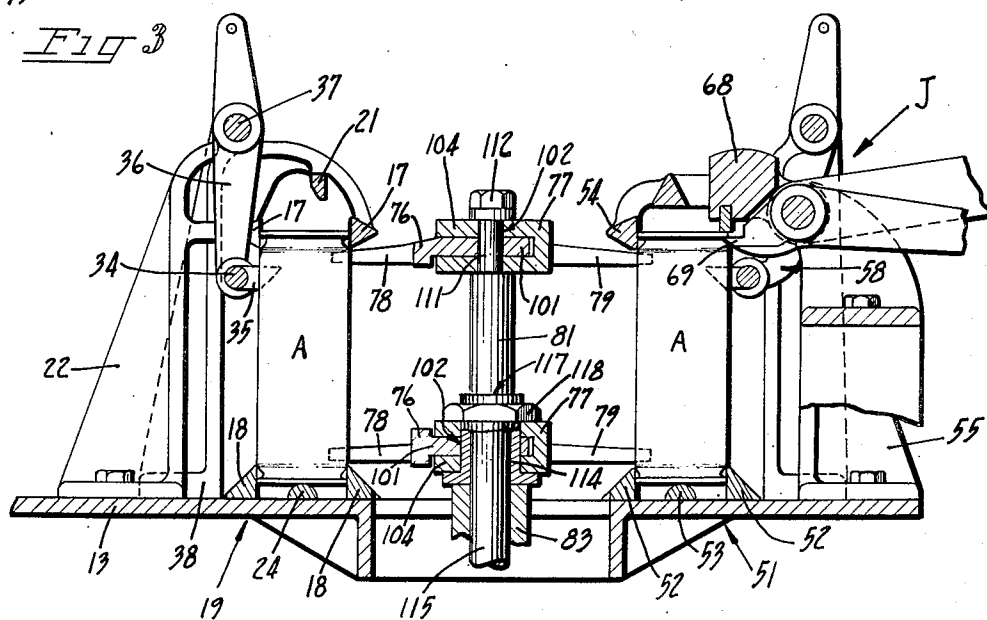
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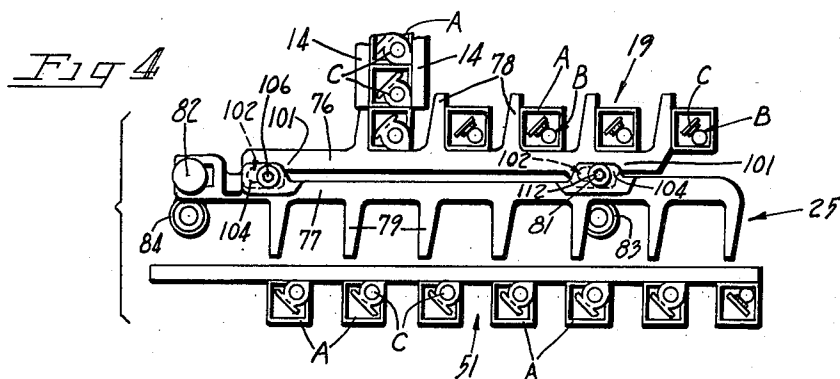
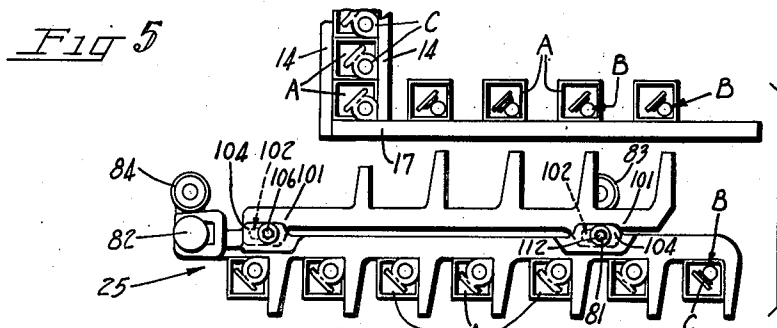
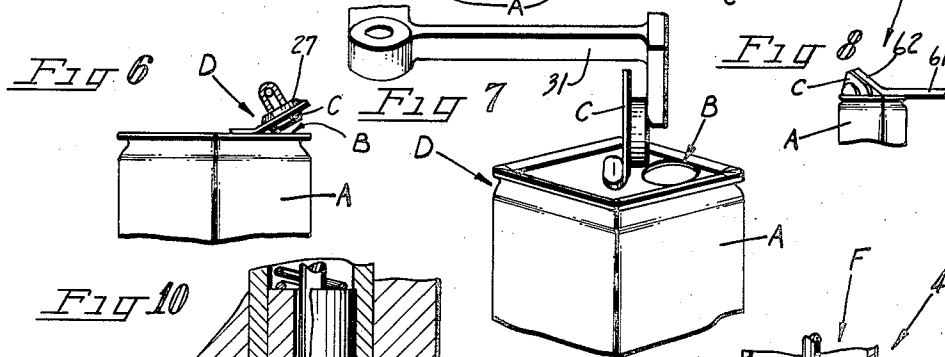
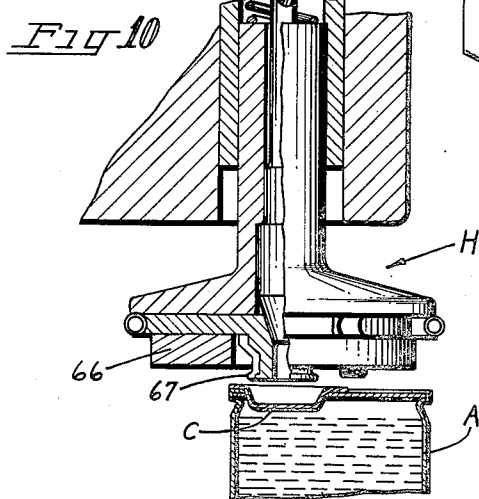
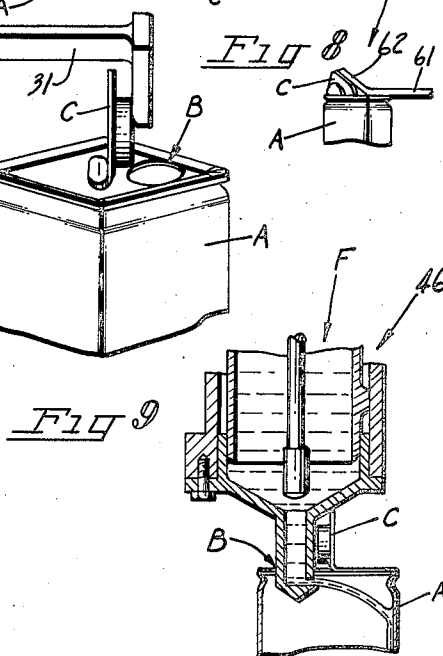
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2,357,799

CONTAINER HANDLING MACHINE

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Application March 29, 1941, Serial No. 385,914

3 Claims. (Cl. 198—221)

The present invention relates to machines for handling containers and has particular reference to feeding a plurality of lines of containers through the machine simultaneously in different directions and with an intermittent movement.

An object of the invention is the provision in a container handling machine of feeding devices which operate to feed two parallel lines of containers in opposite directions, such machine occupying substantially the same floor space with no greater quantity of mechanism than that required for feeding only one line of containers.

Another object is the provision of such a feeding device wherein the lines of containers passing through the machine may be moved alternately with an intermittent motion so that the containers in each line may be progressively operated upon at various working stations disposed adjacent the path of travel of the containers.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a top plan view of a machine embodying the instant invention, with parts broken away;

Fig. 2 is a longitudinal vertical section taken substantially along the line 2—2 in Fig. 1, with parts broken away;

Fig. 3 is an enlarged transverse section taken substantially along the line 3—3 in Fig. 1, with parts broken away;

Figs. 4 and 5 are schematic details of the feeding devices in the machine and showing the moving parts in different positions, with parts broken away; and

Figs. 6, 7, 8, 9 and 10 are fragmentary details of devices for performing desired operations on the containers at various working stations in the machine, the views being drawn to various scales and showing the upper portion of a container in place in the devices, Figs. 6 and 8 being side elevations, Fig. 7 being a perspective view and Figs. 9 and 10 being sectional views.

As a preferred embodiment of the invention the drawings illustrate feeding devices as being associated with a machine for filling milk into empty square fibre containers A (Fig. 7) of the character disclosed in United States Patent 2,085,979, issued July 6, 1937, to J. M. Hotherhall. Such a container A is formed in its top end with a filling and dispensing opening B which when the empty container is received in the machine, is already

closed with a hingedly attached friction plug closure element C.

The empty containers A are introduced into the machine in an upright position and along a runway 11 (Fig. 1) in which the containers are crowded against each other in an orderly straight line. The containers are supported on a bottom rail 12 secured to a frame 13 which constitutes the main frame of the machine. Side guide rails 14 secured to the main frame 13 maintain the containers in line while a top rail 15 prevents vertical displacement of the containers.

The innermost container A in the entering line stops against the inner pair of upper and lower guide rails 17, 18 (see also Fig. 3) of a container advancing runway 19 which preferably is disposed at right angles to the entrance runway 11. This advancing runway extends longitudinally of the machine frame 13 and communicates with the entrance runway.

The container advancing runway 19 includes two spaced and parallel upper guide rails 17 and a top rail 21 which are secured to a bracket 22 bolted to the main frame 13. The runway also includes two spaced and parallel lower guide rails 18 and an intermediate bottom container support rail 24.

The containers A in the entrance runway 11 are pushed individually sidewise into the advancing runway 19 by a feeding device 25 and are propelled along the advancing runway in an intermittent or step-by-step movement in spaced and timed order. In moving along this runway the containers stop at working stations arranged against the runway for the performance of desired operations on the containers.

By way of example, in the instant machine the empty containers first may be advanced to a station D (Fig. 1) at which the closure element C is opened to uncover the filling opening B in the container. The opening of the closure element is preferably effected by a vacuum cup or sucker head 27 (Fig. 6) which is secured to a rocker shaft 28 (Fig. 1) carried in a bearing bracket 29 bolted to the main frame 13.

Rotation of the rocker shaft lifts the suction head and the closure element C. A holding arm 31 (Figs. 1 and 7) then comes into engagement with the raised closure element and holds it open while the suction head is released from the element. This closure element opening and holding device is a usual filling machine attachment and is disclosed in detail in United States Patent 2,174,514, issued October 3, 1939, to J. M. Hotherhall.

When the opened container is moved through the next step of advancement the closure element is held open by the top guide rail 21 of the runway.

Following this container opening operation, a container A is advanced through three idle stations E. At each station along this runway the placed containers are centralized at the stations and are held against movement. This is brought about by a rod 34 which extends along the outer edge of the runway and is formed along its length with pairs of spaced and inwardly extending prongs 35 which project into the runway. The ends of the rod are fixed in depending lever arms 36 (see also Fig. 3) which are mounted on a longitudinal rocker shaft 37 carried in bearing brackets 38 (Fig. 1) bolted to the main frame 13. The lever arms and the shaft may be rocked in any suitable manner in time with the passage of the containers along the runway.

Every time the containers are advanced one step the rocker shaft 37 moves the prongs 35 into the runway where they straddle the containers and shift them slightly forward or backward to bring them into the proper position. The prongs remain in place to hold the containers in this position while they are being operated upon. Just before the next step of advancement, the shaft 37 rocks the prongs out of the runway to permit the containers to advance without interference.

When a container has advanced the entire length of the runway the feeding device 25 pushes it out of the end of the runway and into a pocket 41 of a multi-pocket rotating turret 42 (Figs. 1 and 2). This turret is part of a filling mechanism F preferably of the character disclosed in detail in United States Patent 2,222,617, issued November 26, 1940, to J. M. Hothersall et al., on Filling machine. In this mechanism a measured charge of milk is filled into the container through its filling opening B. The turret is mounted on an intermittently rotated spindle 43 which may be revolved in any suitable manner in time with the other moving parts of the machine.

A container A received in a pocket 41 of the turret 42 is supported on a lifter pad 45 which is disposed under the pocket. The supported container is directly below one of a plurality of filling heads 46 (Figs. 2 and 8) which are secured to a tank 47 carried on the rotating spindle 43.

As the spindle 43 rotates, the lifter pad 45 raises the container into engagement with the above filling head 46 so that the nozzle of the head is in inserted position in the filling opening B of the container. A curved guide rail 48 holds the container in its turret pocket. The filling of the container follows. By the time the turret has made approximately three-quarters of a revolution, the container is filled and has been returned to its original level with the lifter pad and is ready to be further advanced for closing.

At this place in the advancement of a container A, the feeding device 25 sweeps the filled container off of its lifter pad 45 and pushes it into a return runway 51 (Figs. 1 and 3). This return runway is similar in construction to the advancing runway 19 and it extends back along the machine main frame 13 in spaced and parallel relation to the advancing runway.

The return runway 51 includes a pair of spaced and parallel lower guide rails 52 with an intermediate container support rail 53 which are secured to the main frame 13. The runway also includes a pair of spaced and parallel upper guide

rails 54 which are secured to brackets 55 bolted to the main frame.

The feeding device 25 propels the filled containers A along this return runway 51 in the same step-by-step movement as in the advancing runway 19. Also in moving along this return runway, the containers may stop at various working stations arranged adjacent the runway for the performance of desired operations on the containers. At each station the containers are centralized and temporarily held in place by centralizing devices 58 which are identical in construction and operation as those disposed adjacent the advancing runway 19.

By way of example, there are three working stations located along the return runway. The first of these is a closure element closing station G at which is located mechanism of the character disclosed in United States Patent 2,170,821, issued August 19, 1939, to J. M. Hothersall et al., on Can closing machine. As a container is moved into this station G the opened closure element C engages against a stationary plate 61 (Figs. 1 and 8) having an upwardly bent end piece 62. The plate is secured by straps 64 to the upper guide rails 54. This plate pushes the closure element down into its filling opening B and thus closes the filled container.

At a further advanced station H the plug section of the closure element may be expanded to produce an outwardly extending bead which is located inside the container and which seals the closure element against accidental opening. This expanding operation is preferably performed by a closing head 66 (Fig. 10) of the character disclosed in the above mentioned Hothersall Patent 2,170,821. Spring held segmental jaws 67 enter the plug section of the closure element and expand it outwardly.

In some cases the filled containers may be marked with the date of filling. Accordingly, at another advanced station a marking device J (Fig. 1) may be provided. This marking device is preferably of the character disclosed in the Hothersall Patent 2,174,514. In this device pivoted jaws 68, 69 (Fig. 3) cooperate in squeezing the desired mark into a top edge of the container.

In the present case the marking of the container completes the operations to be performed on it and accordingly it is moved along the return runway to a place where it is assembled with other completed containers so that they may be manually removed to a suitable place of deposit or otherwise disposed of as desired.

The feeding device 25 which propels the containers along the runways 19, 51 will now be explained. This feeding device includes spaced and parallel upper and lower feeding elements 75 which are disposed in between the two runways 19, 51. Each set of feeding elements includes a pair of spaced and parallel longitudinal feed bars 76, 77 having long integral feed fingers 78, 79 projecting outwardly therefrom along their length, resembling a rake.

These rake-like feed bars 76, 77 are mounted adjacent their ends, on upright pivot pins 81, 82 (Fig. 2) which are secured in respective spaced crank arms 83, 84. The crank arms are mounted on the upper ends of vertical crank shafts 86, 87 which are journaled in spaced bearings 88, 89 formed in a horizontal web section 91 of the machine main frame 13. The vertical crank shafts 86, 87 are continuously rotated by bevel gears 92 which are carried on the lower ends of the shafts. These gears mesh with bevel gears 93 which are

mounted on a drive shaft 94 journaled in bearings 95 formed in the machine main frame.

Hence through the gears 92, 93 the drive shaft 94 rotates the crank shafts 86, 87 in a clockwise direction as viewed in Figs. 1, 4 and 5, and this swings the pivot pins 81, 82 through circular paths of travel concentric with the crank shafts. This circular path of travel of the pivot pins imparts to the feed bars 76, 77 an oscillatory or double reciprocating motion which shifts them longitudinally and transversely of the machine simultaneously.

With such a motion the feed bars 76, 77 first move toward the advancing runway 19 and thus project the feed fingers 78 of feed bar 76 into the path of travel of the containers in the runway, as best shown in Fig. 4. The feed fingers 79 on feed bar 77 are accordingly shifted out of and away from the return runway 51. This movement is brought about by rotation of the crank arms 83, 84 swinging in a direction toward the advancing runway 19 and it is this movement that brings the feed fingers 78 into engagement with the containers in the advancing runway.

As the crank arms 83, 84 begin to swing away from the runway 19 the feed bars 76, 77 move toward the right, as viewed in Fig. 4, and also begin shifting transversely of the machine and away from the runway. It is this movement that advances the containers one step along the advancing runway 19. During this movement of the containers in the advancing runway, the containers in the return runway 51 are standing still and are being operated upon.

Continued rotation of the crank arms 83, 84 swings them from the position shown in Fig. 4 to that shown in Fig. 5. As they swing into this latter position they shift the feed bars 76, 77 toward the return runway 51 and thus move the feed fingers 79 on bar 77 into the path of travel of the containers in this runway. This brings the fingers 79 into engagement with the containers and as the crank arms continue to rotate the feed bars are moved through a return stroke. As a result the containers in the return runway are advanced toward the left one step. During the advancement of the containers in this runway, the containers in the advancing runway 19 are standing still and are being operated upon.

In this manner, the rotating crank arms 83, 84 shift the proper feed fingers alternately into the two runways. Thus during each cycle the containers in one runway move first while those in the other runway remain stationary, following which those first moving come to rest and the stationary containers move.

Provision is made for adjusting the feed bars 76, 77 relative to each other and also relative to the working stations adjacent the runways so that they will properly locate the containers at the stations. For such adjustment the feed bar 76 adjacent its ends is formed with inwardly extending flat lugs 101 having elongated longitudinally disposed slots 102. These slotted lugs fit into bifurcated lugs 104 formed on the adjacent feed bar 77.

Adjacent the feed bar pivot pin 82, the feed bars 76, 77 are secured together by bolts 106 (Fig. 2) which extend through suitable holes in the bifurcated lugs 104 and through the slot 102 in the lug 101. By loosening these bolts the feed bars may be shifted longitudinally of the machine. At this same end of the feed bars the upper and lower feed bars 77 are formed with

yokes 108 which straddle the pivot pins 82. Spaced collars 109 on the pivot pins retain the yokes in vertical position. The yokes permit the adjustment of the feed bars.

At the opposite end of the feed bars 76, 77 the slotted lug 101 and the bifurcated lug 104 of the upper set of bars are mounted on a reduced diameter upper stud section 111 (Fig. 3) of the pivot pin 81. This reduced section 111 forms a shoulder in the pivot pin to hold the feed bars at their proper elevation on the pivot pin. A locknut 112 threaded on the reduced section 111 retains the feed bars in place.

The slotted and bifurcated lugs 101, 104 of the lower set of feed bars at this end of the machine are mounted on a flanged sleeve 114 (Fig. 3) which surrounds a lower reduced diameter section 115 of the pivot pin 81. This reduced section is secured in the crank arm 83. The flange of the sleeve rests on the crank arm. The body of the sleeve extends up through holes in the bifurcated lug 104 and through the slot 102 in the lug 101 and terminates adjacent a shoulder 117 on the pivot pin. The shoulder confines the sleeve against vertical displacement. A nut 118 threaded on the upper end of the sleeve holds the lugs in place on the sleeve.

These locknuts 112, 118 at this end of the feed bars are loosened at the same time that the bolts 106 at the other end of the bars are loosened. Thus accurate and quick adjustment of the bars may be obtained.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a container handling machine, the combination of a pair of spaced and parallel runways for the containers, said runways being disposed adjacent each other, a pair of feed bars fixedly secured together located between said runways, pusher means on the outer edge of each feed bar, the pusher means of one bar projecting toward one runway and the pusher means of the other bar projecting toward the other runway, means for transferring containers from one runway to the other, and actuating means operable to move both feed bars longitudinally forward and backward and transversely as a unit so that the pusher means of one bar when the bars are moving forward will enter into the adjacent runway and will advance the containers in that runway, and when the bars are moving backward the pusher means of the other bar will enter into the other runway and will move containers therein in a backward direction.

2. In a container handling machine, the combination of a pair of spaced and parallel runways for the containers, said runways being disposed in a horizontal plane in side by side relation, a pair of feed bars fixedly secured together located between said runways, a plurality of feed fingers spaced along the outer edge of each feed bar, the fingers of one bar projecting toward one runway and the fingers of the other bar projecting toward the other runway, means for transferring articles from one runway to the other, a pair of longitudinally spaced crank arms on which said feed bars are pivotally mounted,

and means for rotating said crank arms in unison to shift said feed bars as a unit forwardly and rearwardly through an oscillatory path of travel, so that the fingers of one bar when the bars are moving forward will enter into the adjacent runway and will advance the containers in that runway, and when the bars are moving backward the fingers of the other bar will enter into the other runway and will move containers therein in a backward direction.

3. In a container handling machine, the combination of a pair of spaced and parallel runways for the containers, said runways being disposed in a horizontal plane in side by side relation, a pair of feed bars fixedly secured together disposed between said runways, a plurality of feed fingers spaced along the outer edge of each feed bar, the fingers of the other bar projecting toward one runway and the fingers of the other

5 bar projecting toward the other runway, means for transferring containers from one runway to the other, a pair of longitudinally spaced crank arms on which said feed bars are pivotally mounted, and means for rotating said crank arms in unison to shift said feed bars as a unit forwardly and rearwardly through an oscillatory path of travel, so that the fingers of one bar when the bars are moving forwardly will enter into the adjacent runway and will advance the containers in such runway, and when the bars are moving rearwardly the fingers of the other bar will enter into the other runway and will move containers therein in the opposite directions 10 along said runways in a step-by-step manner, and means for adjusting said feed bars relative to one another to vary the extent of feeding movement.

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