Ma 17, 1960 J. F. EARP 2,936,681

CONTAINER BLANK FEEDER MECHANISM

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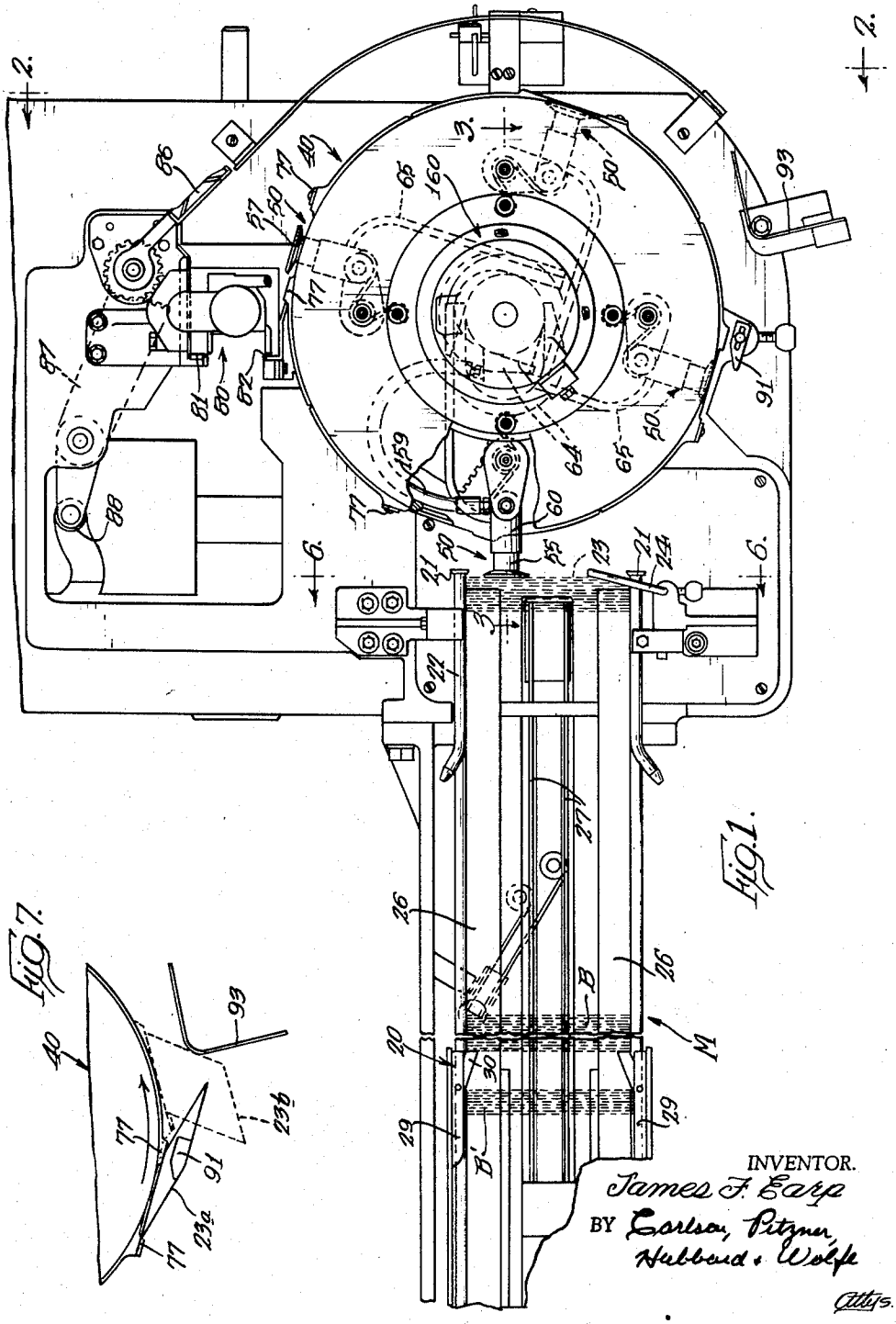


FIG. 1.

FIG. 7.

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Fig. 6

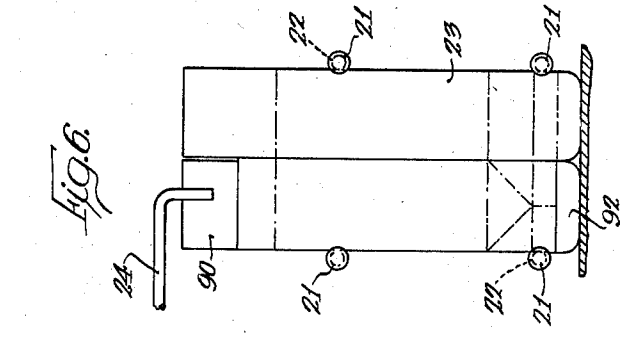
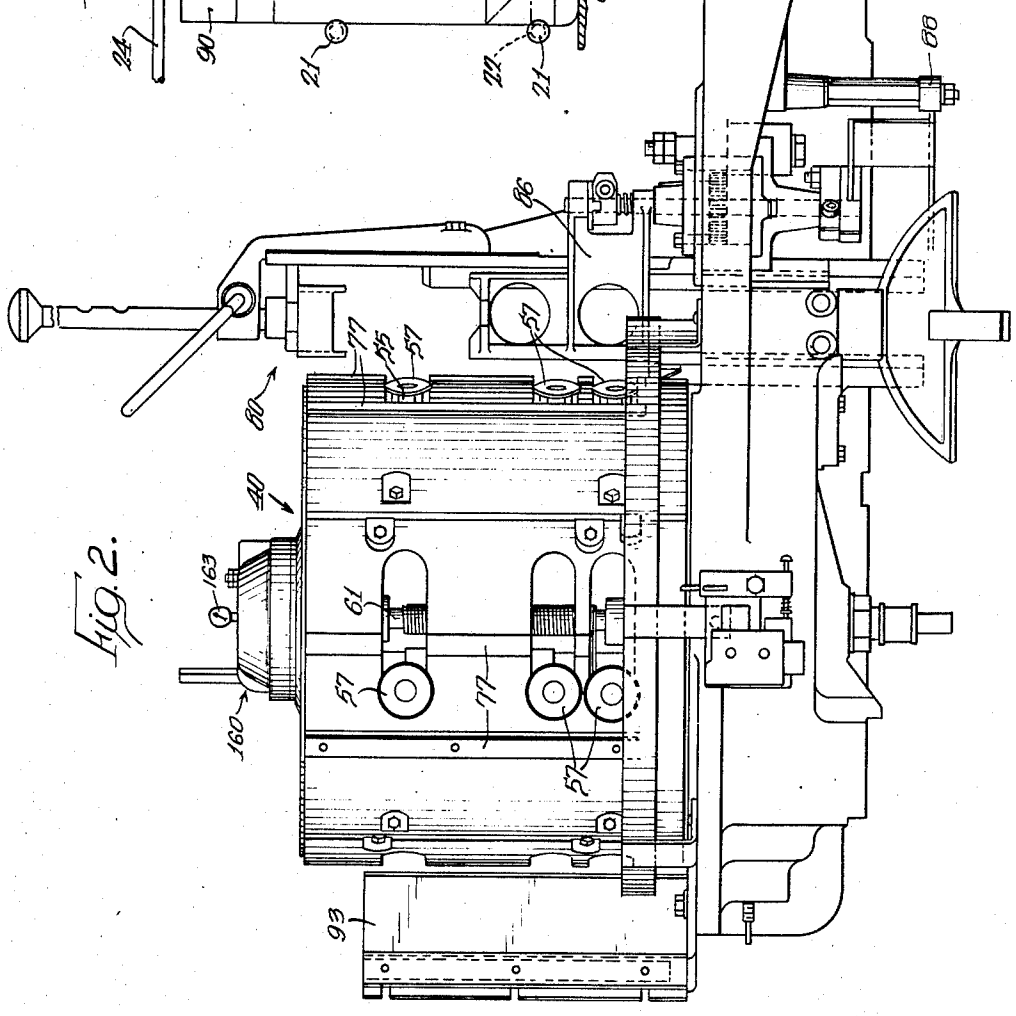


Fig. 2.



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Fig. 3.

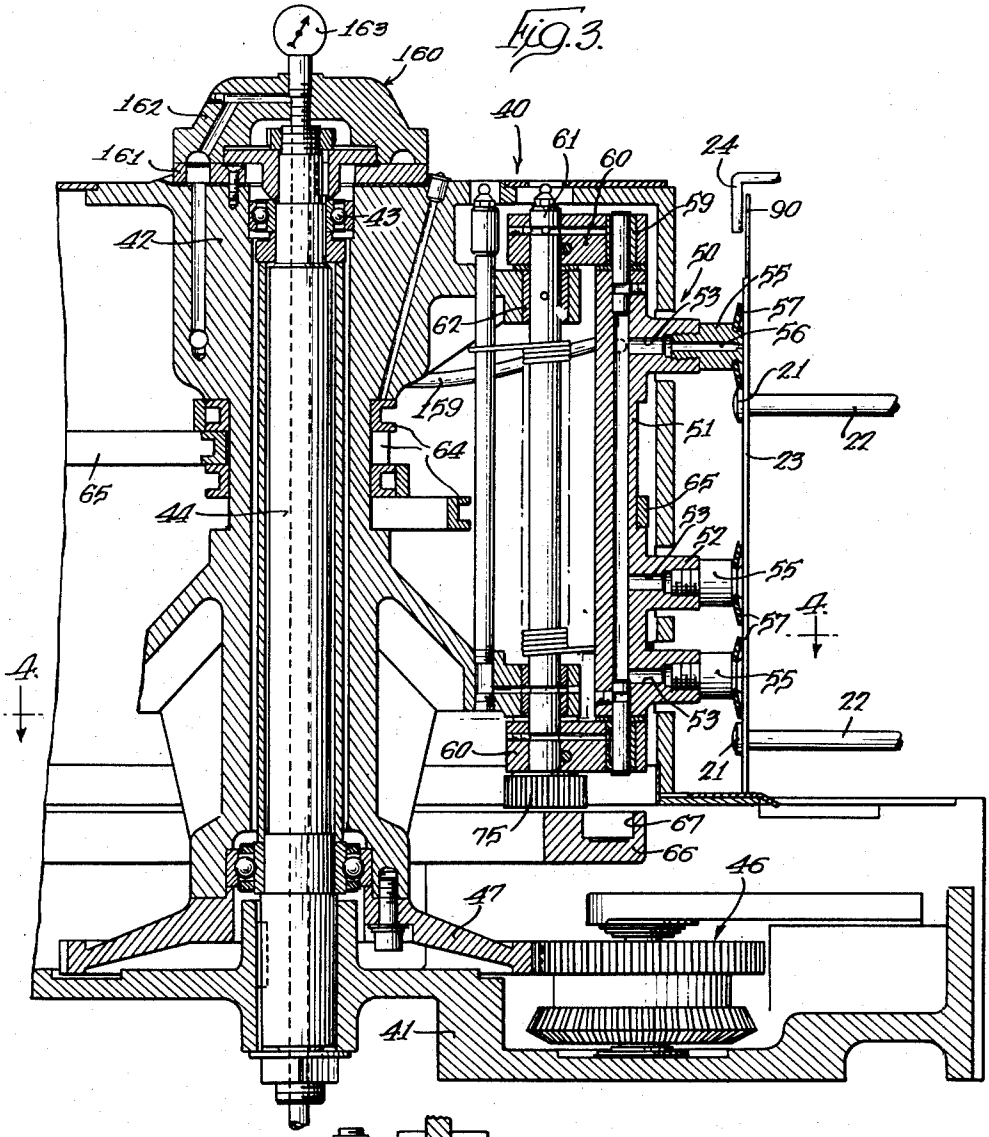
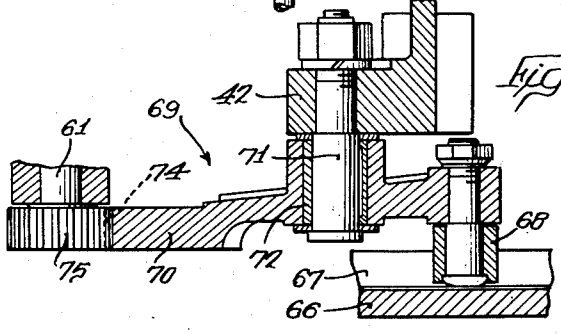


Fig. 5.



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CONTAINER BLANK FEEDER MECHANISM

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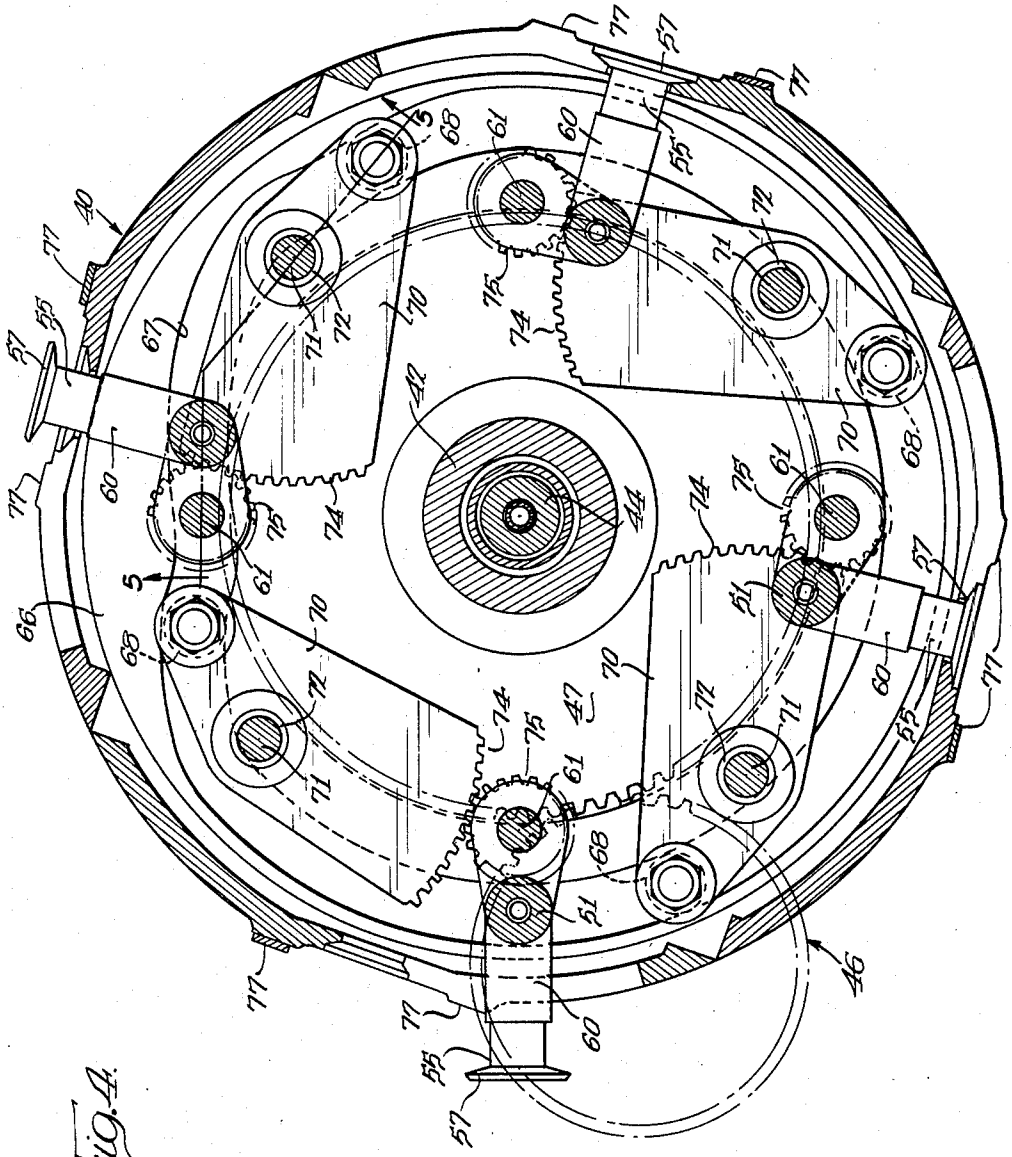


Fig. 4.

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CONTAINER BLANK FEEDER MECHANISM

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Fig. 8.

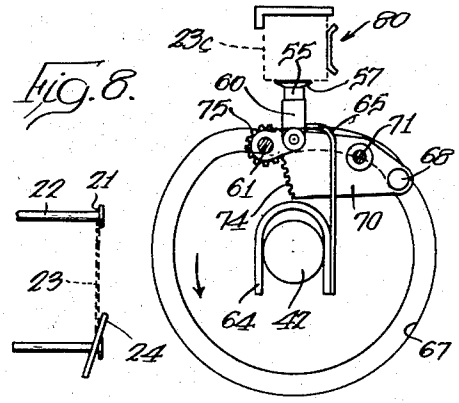


Fig. 11.

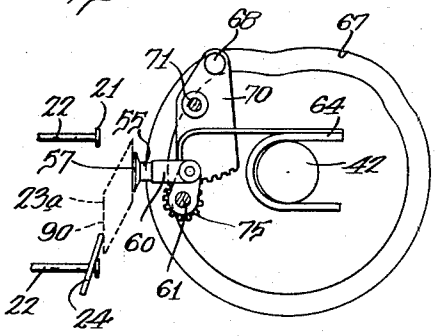


Fig. 9.

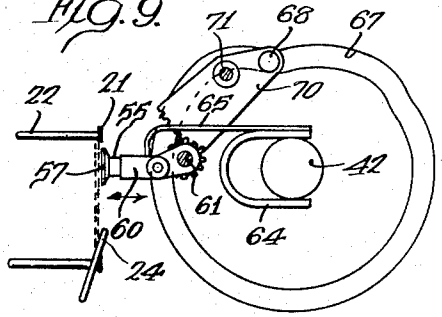


Fig. 12.

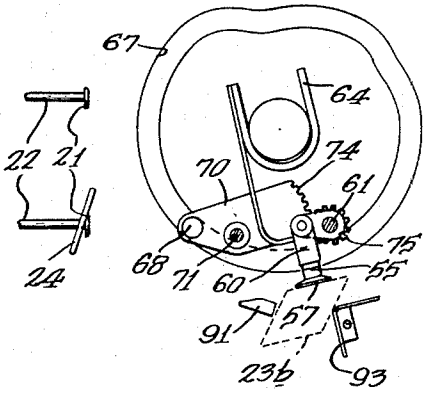


Fig. 10.

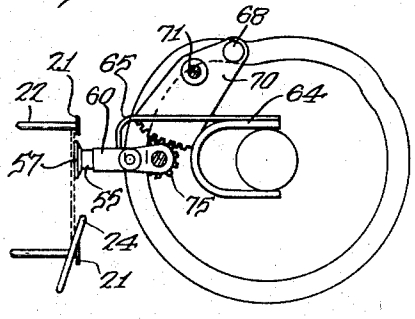
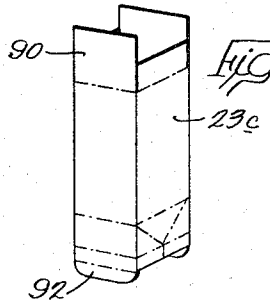


Fig. 13.



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2,936,681

CONTAINER BLANK FEEDER MECHANISM

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Application January 30, 1957, Serial No. 637,214

9 Claims. (Cl. 93—53)

The present invention relates to apparatus for fabricating paper containers and more particularly to a mechanism for feeding containers in collapsed form from a stack or pack to a mechanism for erecting them into shaped tubular containers suitable for filling and sealing.

Container fabricating machines of the type on which a feeder mechanism exemplary of the present invention is useful are capable of performing all of the operations necessary to produce a filled and sealed container from a flat folded blank. In such a machine, a flat folded blank is withdrawn from an appropriate magazine or stack of blanks by a feeding mechanism, erected into a tubular form and passed through a bottom forming mechanism, a moisture proof coating mechanism, and a cooling mechanism. The thus formed containers are then filled, closed and sealed.

One example of a paper container is the familiar gable-top paper milk container which is extensively used for the distribution of milk and other dairy products. These milk containers have met with widespread public acceptance by reason of their convenience and ease of use, sanitary character and disposability. One gable-top container which has proven eminently successful in the packaging of various liquid dairy products is disclosed in U.S. Patent No. 2,750,095, issued June 12, 1956, in the name of Carroll R. Alden. This container comprises a single blank of sheet paper scored so as to be divided into a plurality of panels and areas which are utilized for the walls of the container and the closure parts when the container is erected. The erected container is self-sustaining in shape, is amply strong, low in cost and may be readily fabricated upon machines designed and constructed to perform the various necessary container forming, charging and sealing operations.

In U.S. Patent No. 2,665,044 issued January 5, 1944, in the name of Charles Z. Monroe and Dwight T. German, there is disclosed a container blank feeding mechanism illustrative of the type of mechanism presently in use on packaging machines of the character referred to above. This mechanism includes a feeder rack or magazine for supplying collapsed container blanks to a rotary transfer turret. The forward blank is individually and positively separated from the remaining blanks in the magazine by a peeler wheel rotating in timed relation to the transfer turret. The turret carries suction devices which swing outwardly from the turret as it passes the magazine to pick up the separated container blank and then swing back again. The container carried by the suction devices on the turret is then squared out to form a tube. The bottom flaps on the squared tubes subsequently are closed and the containers are filled and sealed. The present invention relates to improvements in feeding or transfer mechanisms of the rotary turret type.

It is the primary object of the present invention to provide an improved feeder mechanism for removing container blanks from a magazine pack and which is capable of faster and more positive operation and in which wear of the feeding mechanism caused by a sliding engagement of the container blanks is eliminated.

It is another object of the present invention to provide an improved feeder mechanism of the character set forth and having container blank engaging suction devices which move radially outwardly from a turret rotating continuously at a constant angular speed to engage a container blank and then inwardly to remove the blank from the magazine without moving across to the surface of the blank.

A further object of the present invention is to provide a feeder mechanism of the foregoing character which is capable of rapid and positive removal of a container blank from a pack or magazine without requiring the use of a peeler wheel or the like to separate the blank from the rest of the pack before it is picked up by the transfer or feeding mechanism.

Other objects and advantages will become apparent as the following description proceeds, taken in connection with the accompanying drawings wherein:

Figure 1 is a plan view of a collapsed tubular container blank magazine and transfer turret illustrative of the present invention.

Fig. 2 is a vertical elevation view taken substantially in the plane of line 2—2 of Fig. 1 and showing the improved transfer turret and its relation to a container discharge chute.

Fig. 3 is a vertical section view through the transfer turret taken substantially in the plane of line 3—3 of Fig. 1.

Fig. 4 is a plan view of the transfer turret operating mechanism taken substantially in the plane of line 4—4 of Fig. 3.

Fig. 5 is a fragmentary vertical section view of a portion of the transfer turret operating mechanism taken substantially in the plane of line 5—5 of Fig. 4.

Fig. 6 is a fragmentary section view taken substantially in the plane of line 6—6 of Fig. 1 and showing a collapsed tubular blank in a feed magazine and in a position ready for engagement by a transfer turret.

Fig. 7 is a diagrammatic view showing a portion of the container blank transfer means and portions of the stationary means with which the blank is caused to engage to effect the squaring-out operation, the container transfer means being shown in several successive positions by full and dotted lines and an advancing container being likewise indicated in several positions in the same manner.

Figs. 8 through 12 inclusive are of diagrammatic nature to show in succession the several positions occupied by a blank engaging transfer turret in effecting the squaring-out and delivery of a blank and continuing without reversal of direction, to its original position preparatory to a further cycle of operation.

Fig. 13 is an isometric view of a squared-out blank, the end product of the novel mechanism.

While one illustrative mechanism is shown in the drawings and will be described below in considerable detail, it should be understood that there is no intention to limit the invention to the specific form disclosed. On the contrary, the intention is to cover all modifications, alternatives, equivalents and uses falling within the spirit and scope of the invention as expressed in the appended claims.

In accordance with the present invention, a collapsed tubular container blank positioned in a magazine supporting a pack of such blanks is engaged by a transfer turret mechanism, pulled free of the magazine, and carried to a squaring station. There the container is advanced into contact with abutments which square the container along pre-scored lines and apply reverse bends to the scores so that the container retains its shape when it is introduced into the bottom-forming mechanism. The trans-

fer turret rotates continuously at a constant speed about its axis and includes means which pause momentarily in their rotation to move linearly out and in to pick up the foremost container blank from the magazine and then continue to rotate and carry the blank to the squaring and discharge stations. The mechanism rotates through a full 360° angle in each cycle.

Referring more particularly to the drawings, a magazine M for supporting in pack formation a plurality of collapsed tubular container blanks may, in its details, vary widely. The particular construction shown here, however, has been found to have a number of advantages over the others heretofore made use of for this purpose. The pack, indicated at B, comprises a considerable number of individual collapsed blanks, each vertically disposed and engaged by the blanks to either side. The pack extends horizontally from a pack advancing member 20 to a series of pack retainers 21. These retainers comprise, for example, disc-like parts rigidly secured upon the ends of severally horizontally extending pack guiding or retaining rails 22. The other ends of the pack retaining rails 21 are flared outwardly to guide the pack. The inner edges of the pack retainers 21 project into the path of movement of the pack so that each blank, such as the blank indicated at 23, as it reaches the end of the pack is engaged along its vertical edges by the retainers 21 and thus held in position until removed by being bowed and drawn forwardly between the retainers by the transfer turret mechanism hereinafter to be described. An abutment arm 24 extends into contact with the upper flap of the foremost pack to aid in the initial opening of the container blank as it is removed from the magazine. The pack advancing member 20 is guided in the magazine M on a pair of base rails 26 which also serve to support the pack B.

Means are provided for urging the blanks forwardly in the magazine. One illustrative means comprises a pair of cables 27 extending between the rails 26 and fixed at one end to the advancing member 20 and at the other end to a weight (not shown). The weight pulls the pack advancing member 20 forwardly against the pack. The pack member 20 is thus constantly urged against the pack so that the pack is continuously fed in such manner that the end container 23 will engage the pack retainers 21. Additional packs of container blanks can be added to the pack in the magazine without releasing the force urging the foremost container 23 against the retainers 21. To this end, the pack advancing member 20 is desirably constructed, as shown in Fig. 1, with a pair of spaced upstanding arms 29 having pack-engaging abutments 30 on their forward ends. The rearwardly extending surface of the abutments 30 slope inwardly. To add a fresh pack of blanks to the stack in the magazine, the pack, indicated at B' in Fig. 1 is inserted between the arms 29 of the pack advancing member 20 and held there either by hand or by suitable mechanical means. The pack advancing member 20 is then moved rearwardly of the new pack of blanks which slide past the abutments 30 and take their place in the magazine. Thus, a fresh pack can be inserted in the magazine at any time without disturbing the operation of the machine.

The foremost blank 23 is pulled from the magazine M past the retainers or stops 21 and carried to the squaring and discharge stations by means of a continuously rotating constant speed transfer turret 40. The turret is provided with a plurality of suction devices spaced approximately 90° apart around its periphery. The turret is mounted for rotary movement on the machine base 41 adjacent the discharge end of the magazine so that as the turret rotates, the suction devices are brought into proximity with the forwardmost blank in the magazine. The turret comprises a cast member 42 journaled by suitable bearings 43 on a trunnion 44 keyed to the base 41 (Fig. 3). The turret is drivingly connected with a suitable gear drive mechanism 46 by means of an input gear 47 secured thereto adjacent the lower end.

Means are provided on the turret for engaging the forwardmost container in the magazine. One illustrative means comprises a plurality of suction devices 50 which are advanced and retracted from the turret as the mechanism functions, being advanced to engage a collapsed tubular blank in the position of blank 23 in Fig. 1 and thereafter retracted to withdraw the blank 23 from the magazine M. The suction device 50 holds the blank as it is passed through the squaring station and is then partially advanced to release the squared blank into the discharge chute.

The aforesaid suction device 50 comprises a tubular riser 51 vertically disposed on the turret and having a plurality of arms 52 extending outwardly radially of the turret and having a bore 53 communicating with the tubular riser. For engaging the forwardmost container blank 23 in the magazine M, each arm is equipped with a nozzle 55. A bore 56 extends from the outer surface of the nozzle and into communication with the tubular riser 51. To obtain a seal between the surface of the blank and the nozzle 55, a flexible suction cup 57 is secured at the outer end of each nozzle 55. The suction cups 57 may be of any character known in the art. The nozzle and arms are bored to provide passages in which a sub-atmospheric pressure and atmospheric or greater than atmospheric pressure may alternately exist for purposes of holding or releasing the blanks. The bore in the tubular riser is in communication with sources of such pressure through a flexible conduit 159 and a control valve 160.

So as to ensure the establishment of sub-atmospheric pressure in each suction device and the reestablishment of atmospheric or greater than atmospheric pressure in the devices at precisely timed periods in the cycle of operation of the feeder mechanism, the control valve 160 is formed as a part of the transfer turret and its mounting. Suitable passages in the turret casting 42 communicate with the suction devices through the flexible conduits 159. An apertured wear plate 161 is mounted on the turret and cooperates with a valve stator 162 fixed on the trunnion about which the turret rotates. The valve stator 162 is in communication with both a suitable vacuum pump and either an atmospheric or a greater than atmospheric pressure source. A pressure gauge 163 indicates the level of pressure within the suction devices. Additionally, a manually actuated valve (not shown) is provided to shut off the source of sub-atmospheric pressure when it is desired to rotate the transfer turret without picking up collapsed container blanks from the magazine.

In order to speed up the feeding operation, the turret is desirably continuously rotated at a constant speed. This is accomplished by means of a suitable transmission (not shown) geared to the turret through the drive gears 46. It is generally practical to connect the transfer turret gear train 46 to the main drive mechanism of the container fabricating and filling machine although a separate power source may be provided.

For purposes of positively engaging a collapsed tubular container blank in the position of the blank 23 shown in the magazine in Fig. 1 without stopping or even slowing the rotation of the turret, and at the same time preventing rotary movement of the nozzles during the pick up, means are provided for projecting the nozzles directly towards the blank into engagement with it, and then withdrawing the blank from the magazine before rotation of the nozzle and the blank with the turret is initiated. This is accomplished by means mounting the suction devices on the turret for relative swinging movement. To this end, the vertical tubular riser 51 is journaled, at its ends, in suitable bearings 59 in a pair of spaced apart arms 60 fixed to a vertical shaft 61, which is in turn journaled in suitable bearings 62 on the turret casting 42. Accordingly, rotation of the shaft 61 about its axis swings the

nozzles 55 in an arc. As a result, the nozzles are mounted on the turret for swinging movement relative thereto. For example, as the turret rotates counterclockwise at a fixed, constant speed, the suction devices can swing clockwise at such a speed that the nozzles have a zero angular movement relative to the machine base 41 and instead, move only linearly relative to the base. This linear movement is afforded by mounting the shaft 61 eccentrically of the turret trunnion 44 and supporting the riser 51 on the arms fixed to the shaft 61.

Provision is made for holding the nozzles in radial alinement with the turret to thereby ensure that the nozzles move in a straight in-and-out direction relative to the magazine. Such a movement is desirable for the principal reason that the nozzle should approach the forwardmost blank in the magazine at as nearly a right angle as possible and with little or no wiping action. In the same regard, the withdrawal of the blank from the magazine, after it has been engaged by the suction device, is best effected with a straight-line outward movement. This ensures that the facing areas of the blank will be initially separated to facilitate further squaring and also that improper bending of the blank will be prevented. Further, the location of the nozzles on the blank is more precise and the chances of a faulty delivery of a squared container from the turret to the discharge chute is lessened.

The vertical riser 51 is positioned to hold the nozzles radial relative to the turret by means of a yoke 64 slidably and rotatably mounted on the trunnion. The yoke is fixed to the riser by a yoke arm 65 and, as the riser arms rotate to swing the nozzles, the yokes hold the nozzles radially alined with the turret as shown in Figs. 8 through 12.

For purposes of moving the nozzle radially of the transfer turret into engagement with a collapsed container blank, means are provided for rotating the shaft 61 relative to the turret in timed relation to the rotation of the turret and to the position of the nozzles relative to the magazine. Referring to Figs. 3, 4 and 5, one illustrative means for accomplishing this comprises a cam plate 66 fixed to the machine base 41 and having a cam track 67 cut therein for receiving and guiding a cam follower 68. The shaft 61 is operatively connected to the cam follower 68 by means of a sector gear mechanism 69 (Fig. 5).

The sector gear mechanism 69 serves to rotate the shaft 61 and thereby move the nozzles 55 radially of the turret in response to variations in the path of the cam track 67. To this end a sector gear 70 is pivotally mounted by means of a suitable pin and bearing 71, 72 on the turret casting 42. The sector gear 70 is formed with teeth 74 which mesh with a pinion gear 75 fixed on the lower end of the nozzle shaft 61.

In operation, the cam mechanism just described is designed to first rotate the nozzle shaft 61 to move the nozzle through the stages shown in Figs. 8 through 12. Describing this operation, the nozzle 55, after a squared carton has been discharged into a chute (Fig. 8) moves outwardly to its maximum extension by moving forwardly in the direction of turret rotation. Further forward movement relative to the turret causes a slight withdrawal of the nozzle 55 inwardly of the turret. At this instant, the nozzles are directly in line with the magazine and the collapsed blank carried thereby (Fig. 9). The cam mechanism then swings the sector gear 70 to rotate the nozzle shaft 61 and swing the nozzle in the direction opposite to the direction of turret rotation and at substantially the same speed. The nozzle, accordingly, has a zero angular velocity relative to the machine base 41 but moves linearly outwardly from the turret into engagement with the forwardmost blank 23 (Fig. 10). The suction pressure is applied at this point by the control valve 160 which is also in timed relation to the turret and cam. The container, upon application of suction pressure, is engaged by the nozzles and is held tightly thereto. The suction cups 57 on the nozzles prevent the leakage of air into the suction system and the valves 160 are subsequently closed. Loss of suction pressure is prevented by the suction cups 57 and the container to be erected will be held to the nozzles so long as air is not admitted to the system by the control valve 160.

When the nozzle has reached its outermost point and the suction is applied, one panel of the collapsed tubular container blank is engaged (Fig. 10). Immediately, the nozzle begins its inward movement and the blank is snapped past the retainers 21 on the ends of the guide rods 22 of the magazine. During withdrawal of the blank in the magazine, the cam and sector gear is swinging the nozzle clockwise or in the direction opposite to the direction of rotation of the transfer turret and at the same speed at which the turret is moving. During in-and-out movement of the nozzles, the yoke 64 holds the nozzles in radial alinement with the turret (see Figs. 8 to 12). A straight, or linear in-and-out movement is accordingly provided and the collapsed blank is withdrawn directly forward from the magazine. Any backlash between the sector gear 70 and the pinion gear 75 on the shaft 61 is taken up by a coil spring 76 acting between the turret and the vertical riser 51.

At its innermost position on the turret (Fig. 11), the nozzles 55 hold the blank 23 against a pair of ridges 77 formed on the peripheral surface of the turret housing. The nozzles 55 and the blank they carry now rotate with the turret and at the same angular speed, carrying the blank to the squaring station (Fig. 12).

The suction devices are advanced and retracted as the mechanism functions to engage a collapsed tubular blank in the position of the blank 23 of Fig. 1 and to draw the blank towards the turret to withdraw it from the magazine. The nozzles remain retracted until the turret has been turned to the position for discharging the squared container into a discharge chute 80 (Fig. 1) which leads to a bottom-forming mechanism and subsequently to the coating, filling, and sealing mechanisms. At this point, shown in Fig. 8, the cam mechanism causes the nozzle to move outwardly slightly thereby positioning the container above the chute. In its movement from the magazine M to the chute 80, the blank occupies a number of successive positions and in the drawings, particularly in Figs. 1 and 8 through 12, certain successive positions of the blank are indicated by the numbers 23, 23*a*, 23*b*, and 23*c*, the blank of position 23 being in the magazine, 23*a* being withdrawn from the magazine, 23*b* being squared and reversely bent by the squaring abutments, and 23*c* being discharged into the chute.

The chute 80 comprises two spaced side members 81, 82 disposed in parallel relation and together comprising a guide through which a squared out blank, such as indicated at 23*c*, may be advanced by means of a pusher (not shown). Opposite the guide members 81, 82 is a swingable gate 86 operatively connected by means of a sector gear 87 to a cam follower 88 riding in a cam track 89 on the drive mechanism for the turret. The gate is operated in timed relation with the nozzle cam track 66. As the squared container is positioned against the stop members 81, 82, the gate 86 swings inwardly to square the opposite side of the container before the container is discharged into the chute 80.

The blanks of the pack are shown to be inverted, i.e. foldable top portions lowermost and bottom flaps uppermost, since the squared out blanks are to be inserted in the chute while so positioned (Fig. 13). When the blank is initially withdrawn from the magazine, it is in collapsed condition and will remain in substantially collapsed condition until one bottom end flap 90 comes into contact witht a stationary abutment member 24, positioned adjacent the blank retainer 21, whereupon this flap and the panel from which it extends is held stationary momentarily while the engaged, forward panel of the blank moves toward the turret as the suction devices

are retracted, the effect being to cause the blank to open into the position in which it is shown as 23*a* in Fig. 11.

Provision is made for squaring the container and for applying a reverse bend, as indicated at 23*b* in Fig. 12, for the purpose of breaking down the fibers along the parallel scorings at the corners of the blanks somewhat and lessening the tendency of the blank to resume its original form when released. This is accomplished by the engagement of one end flap 92, which is one of the terminal flaps of the folded upper end closure of the container with a stationary abutment 91, whereupon this flap 92 and the panel from which it depends is separated from the adjacent panel as the blank moves with the turret, the effect being to cause the blank to partially open. Continued movement of the turret causes the leading corner of the partially opened blank to strike a second abutment 93, which tends to square out the container. Movement of the squared container past abutment 93 causes the application of reverse bend to the container as shown at 23*b*, in the manner shown in Fig. 12. When the nozzles and container have moved past the abutments, the container snaps out to approximately a squared position and ready for discharge into the chute. An illustrative squared out container blank is shown in Fig. 13.

By the foregoing structure, there is provided a feeder mechanism for removing collapsed container blanks from a magazine, squaring them out, and discharging them into a bottom-forming mechanism, a coating mechanism, a filling mechanism, and finally, a sealing mechanism. To accomplish removal of the collapsed container blanks from the magazine, an improved revolving transfer turret is provided with a plurality of nozzles capable of holding a collapsed container by means of suction pressure. The nozzles are advanced and retracted as the mechanism functions, being advanced to engage a collapsed, tubular blank in the position of blank 23 of Fig. 1, thereafter fully retracted toward the turret to withdraw the blank, remaining retracted until the turret has been rotated through a full 360° and returned to the position in which it has been shown in Fig. 1. The nozzles are positioned for engaging a collapsed container blank by being moved faster and ahead of the turret and then at the same speed of the turret only in the reverse direction so that the nozzles first move outwardly to pick up a collapsed container blank from a magazine and then inwardly to withdraw the blank from the magazine without angular movement. When the blank has been withdrawn from the magazine by a linear movement, the nozzles and the blanks carried thereby rotate with the turret and at the same speed to carry the carton blanks to a squaring-out station, where a reverse bend is applied, and then to a discharge station where the nozzles move outwardly from the turret a slight amount and the squared containers are discharged into a chute.

A simple, rugged, transfer turret and nozzle mechanism has thus been described which is capable of functioning over a long period of time with a minimum of attention. The blank squaring operation which it accomplishes is performed with rapidity and accuracy.

I claim:

1. A container blank feeding mechanism for use with a container filling machine which includes a base mounting a magazine for holding collapsed container blanks and supplying them to a feeding station, a container squaring means, and a container discharge means, said machine including a transfer mechanism for withdrawing a collapsed container blank from the magazine and presenting it to the squaring means and finally introducing the squared carton to the discharge means, said transfer mechanism comprising, in combination, a rotatable turret mounted on the base for rotation about an axis, means for rotating said turret continuously in one direction at a constant angular speed, a suction device for engaging and holding a blank, means pivotally mounting said suction device on said turret for angular movement about an axis spaced radially from the axis of rotation of the turret and for rotation about a third axis spaced from both aforesaid axes, a yoke between said device and said turret for holding said device in radial alinement with said turret as said device swings relative thereto, and means operative in response to rotation of said turret about its axis for swinging said device relative to said turret first in the direction of turret rotation and then in the opposite direction so that during the latter movement, said device moves linearly relaive to said base for approaching and withdrawing a carton from the magazine while said turret continues to rotate at said constant angular speed.

2. A container blank feeder mechanism for withdrawing a collapsed container blank from a magazine mounted on a base and carrying a pack of collapsed container blanks, said mechanism comprising, in combination, a rotatable turret mounted on the base for rotation about an axis, means for rotating said turret continuously in one direction at a constant angular speed, a suction device for engaging and holding a blank, means pivotally mounting said suction device on said turret for angular movement about a pair of spaced axes spaced radially from the axis of rotation of the turret, means for holding said device in radial alinement with said turret axis as said device swings relative thereto, and means operative in response to rotation of said turret about its axis for swinging said device relative to said turret first in the direction of turret rotation and then in the opposite direction so that during the latter movement said device moves linearly relative to said base for approaching and withdrawing a carton from the magazine while said turret continues to rotate at said constant angular speed.

3. In a container fabricating machine, the combination comprising a magazine for a pack of collapsed container blanks, a squaring out means, a discharge chute into which the blanks are introduced after having been squared out, and a feeder mechanism for withdrawing single blanks from the magazine, carrying them to the squaring out means and then introducing the squared out blanks into the discharge chute, said feeder mechanism comprising a suction device for engaging and holding a blank, a turret mounting said suction device and rotatable about a fixed axis, means for rotating said turret continuously at a constant angular speed about said axis, and a mechanism for rotating and radially moving said suction device relative to said turret comprising a shaft journaled on said turret parallel to said turret axis, an arm fixed on said shaft and journaling said suction device, a yoke fixed on said suction device for holding said suction device in radial alinement with said turret, a sector gear swingably mounted on said turret, a pinion gear on said shaft meshed with said sector gear, and means for swinging said sector gear in timed relation to the rotation of said turret about its axis to rotate said shaft and thereby move said suction device radially and angularly of said turret, said suction device moving linearly with respect to the machine when the shaft is rotated to swing the suction device relative to said turret in the angular direction opposite to the direction of rotation thereof.

4. In a container fabricating machine, the combination comprising a magazine for a pack of collapsed container blanks, a squaring out means, a discharge chute into which the blanks are introduced after having been squared out, and a feeder mechanism for withdrawing single blanks from the magazine, carrying them to the squaring out means and then introducing the squared out blanks into the discharge chute, said feeder mechanism comprising a suction device for engaging and holding a blank, a turret mounting said suction device and rotatable about a fixed axis, means for rotating said turret continuously at a constant angular speed about said axis, and a mechanism for rotating and radially moving said suction device relative to said turret comprising a shaft journaled on said

turret parallel to said turret axis an arm fixed on said shaft and journaling said suction device, a yoke fixed on said suction device for holding said suction device in radial alinement with said turret, a sector gear swingably mounted on said turret, a pinion gear on said shaft meshed with said sector gear, and a cam track fixed on said machine and guidably receiving a cam follower mounted on said sector gear for swinging said sector gear in timed relation to the rotation of said turret about its axis to rotate said shaft and thereby move said suction device radially and angularly of said turret, said suction device moving linearly with respect to the machine when the shaft is rotated to swing the suction device relative to said turret in the angular direction opposite to the direction of rotation thereof.

5. In a container fabricating machine, a container blank feeder mechanism for withdrawing collapsed tubular container blanks from a pack in a magazine, squaring them out and introducing them successively into a discharge chute, means for withdrawing a collapsed container blank and carrying the same through said squaring out and discharge operations comprising, in combination, a transfer turret mounted on the machine for rotation about a fixed axis, a suction device mounted on the turret for swinging movement about a pair of spaced axes spaced from and parallel to the turret axis, means for rotating said turret continuously at a constant angular velocity about its axis, means for swinging said suction device in the direction opposite to the rotation of said turret, means for positively holding said suction device in radial alinement at all times with said turret as the latter rotates, said swinging means and said holding means operating in timed relation to the rotation of said turret to move said suction device linearly relative to the magazine and with zero angular movement whereby said suction device moves linearly as said turret rotates for engaging and withdrawing a collapsed container blank from the magazine and then resumes rotation with said turret for carrying said blank to the squaring out and discharge stations.

6. In a container fabricating machine including a magazine for holding a pack of collapsed container blanks, a squaring out means for squaring said blanks and a discharge chute for receiving said squared blanks, a transfer mechanism for engaging and withdrawing a blank from the magazine and carrying said blank to the squaring out means and discharge chute, said transfer mechanism comprising, in combination, a turret journaled for rotation on a vertical trunnion fixed to the machine, a shaft journaled for rotation on said turret and having its axis parallel to said trunnion, a pair of spaced arms fixed to said shaft, a suction device including a vertical tubular riser journaled at its ends in said arms and having a plurality of nozzles extending therefrom, a control valve operable in timed relation with said turret and including a stator member fixed to said trunnion and a rotor member fixed to said turret, said riser and nozzles having bores communicating with said rotor, a source of subatmospheric pressure in communication with said stator, a yoke slidably and rotatably mounted on said trunnion, and fixed to said riser for holding said nozzles radially alined with said turret, a sector gear swingably mounted on said turret and meshed with a pinion gear fixed on said shaft, and a cam track fixed on the machine and guidably receiving a cam follower depending from said sector gear for swinging said sector gear to rotate said shaft and swing said nozzles relative to said turret in response to rotation of said turret on said trunnion, said suction devices moving linearly with respect to the machine when the shaft is rotated to swing the suction device relative to said turret in the angular direction opposite to the direction of rotation thereof, said valve connecting said source of subatmospheric pressure to said nozzles when said nozzles have reached substantially their outermost point of travel to engage the forwardmost blank in said magazine, said nozzles removing the blank from the magazine upon inward linear movement and holding the same against the turret for rotation therewith to the squaring means and discharge chute, and said cam and sector gear operating to swing said nozzles outwardly for projecting the squared blank from the turret into the discharge chute preparatory to the discharge of the blank thereinto.

7. In a container fabricating machine, the combination comprising a magazine for a pack of collapsed container blanks, a squaring out means, a discharge chute into which the blanks are introduced after having been squared out, and a feeder mechanism for withdrawing single blanks from the magazine, carrying them to the squaring out means and then introducing the squared out blanks into the discharge chute, said feeder mechanism comprising a suction device for engaging and holding a blank, a turret mounting said suction device and rotatable about a fixed axis, means for rotating said turret continuously at a constant angular speed about said axis, and a mechanism for rotating and radially moving said suction device relative to said turret comprising a means swingably linking said suction device to said turret, means fixed on said suction device for holding said suction device in radial alinement with said turret during swinging movement relative thereto, means including a cam guidably received in a cam track fixed on said machine for swinging said suction device in timed relation to the rotation of said turret, said means swinging said suction device first forwardly relative to said turret and then rearwardly, thereby to move said suction device radially and angularly of said turret, said suction device moving only linearly with respect to the machine when swung rearwardly relative to said continuously rotating turret.

8. In a container fabricating machine, the combination comprising a magazine for a pack of collapsed container blanks, a squaring out means, a discharge chute into which the blanks are introduced after having been squared out, and a feeder mechanism for withdrawing single blanks from the magazine, carrying them to the squaring out means and then introducing the squared out blank into the discharge chute, said feeder mechanism comprising a suction device for engaging and holding a blank, a turret mounting said suction device and rotatable about a fixed axis, means for rotating said turret continuously at a constant angular speed about said axis, and a mechansim for rotating and radially moving said suction device relative to said turret comprising a shaft journaled on said turret parallel to said turret axis, an arm fixed on said shaft and journaling said suction device, a yoke fixed on said suction device for holding said suction device in radial alinement with said turret during swinging movement relative thereto, and means for swinging said suction device in timed relation to the rotation of said turret about its axis, said means swinging said suction device just forwardly relative to said turret and then rearwardly thereby to move said suction device radially and angularly of said turret, said suction device moving only linearly with respect to the machine when the shaft is rotated to swing the suction device rearwardly relative to said continuously rotating turret.

9. In a container fabricating machine including a magazine for holding a pack of collapsed container blanks, a squaring out means for squaring said blanks and a discharge chute for receiving said squared blanks, a transfer mechanism for engaging and withdrawing a blank from the magazine and carrying said blank to the squaring out means and discharge chute, said transfer mechanism comprising, in combination, a turret mounted on the machine for rotation about an axis, a suction device for engaging and holding a container blank, a shaft journaled on said turret radially spaced from and parallel to the turret axis, means swingably connecting said suction device to said shaft for swinging movement about an axis spaced from said shaft, means for positively holding said suction device in continued radial alinement with said turret, and

means for swinging said suction device about said radially spaced shaft axis in timed relation to and in the opposite direction to the rotation of said turret about its axis whereby said suction device moves linearly outwardly from said turret to engage a blank and linearly inwardly toward said turret along said radius to withdraw said blank from the magazine, then angularly with said turret to carry said blank to the squaring out means and the discharge chute, and then linearly outwardly from said turret to position said squared out blank in said discharge chute.

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