Dec. 16, 1958 H. E. ENGLESON ET AL 2,864,288

CARTON EXPANDING AND TRANSFER MECHANISM

Filed March 30, 1956 4 Sheets-Sheet 1

FIG. 1

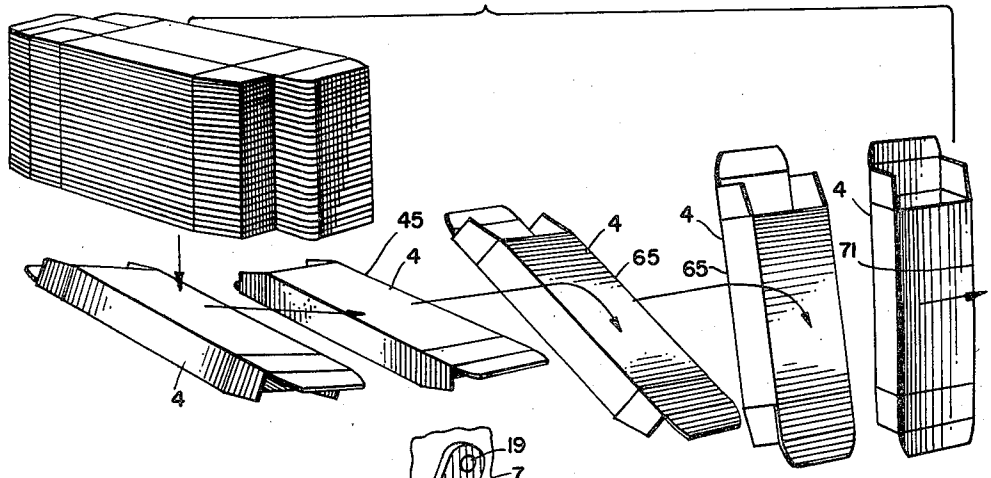
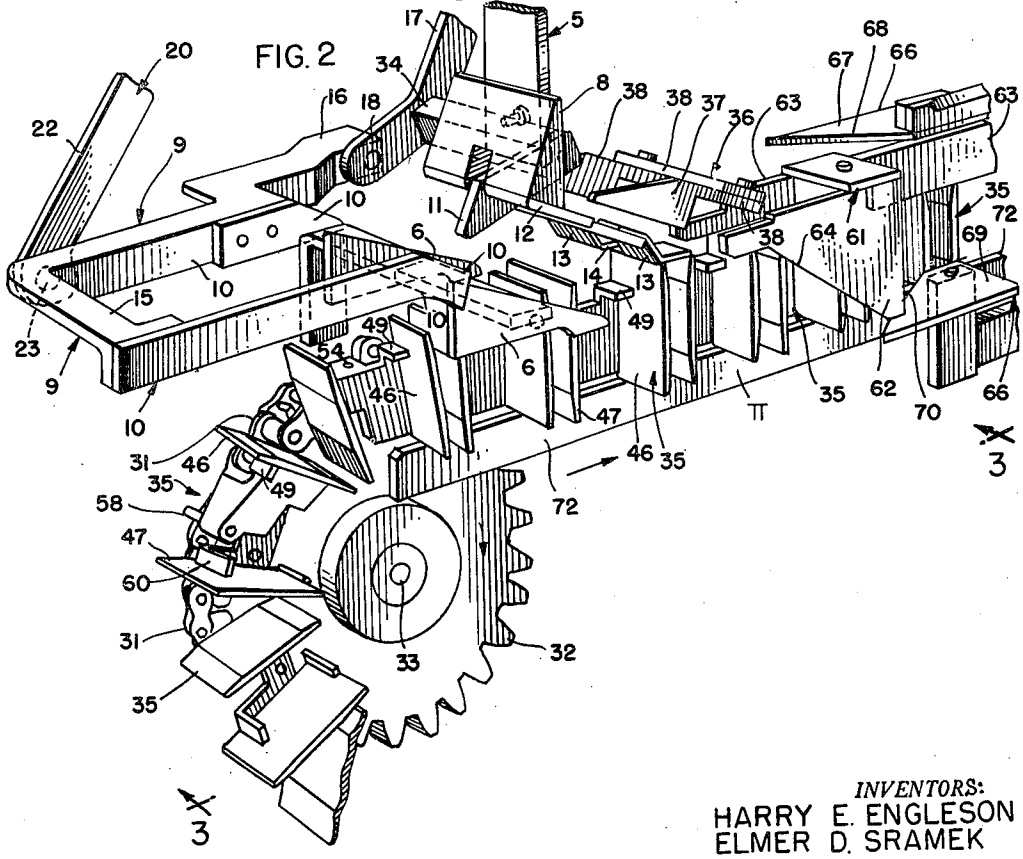


FIG. 2



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FIG. 3

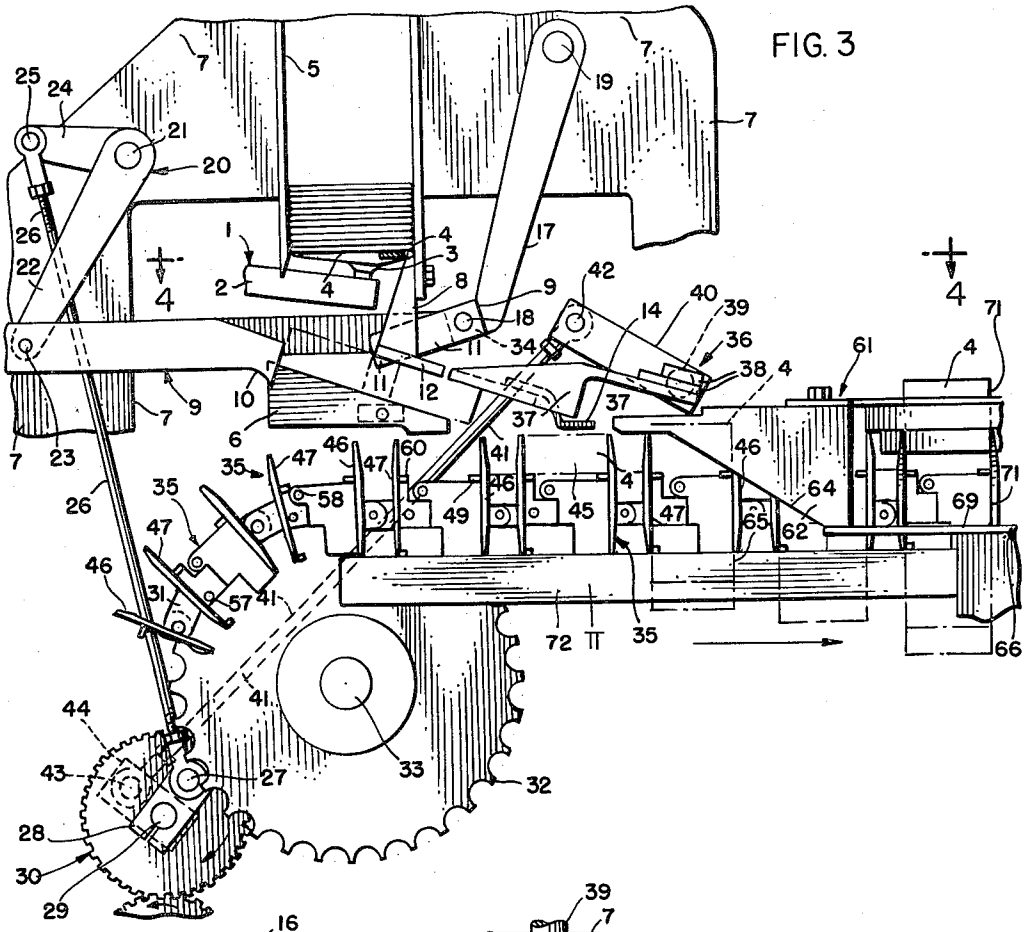
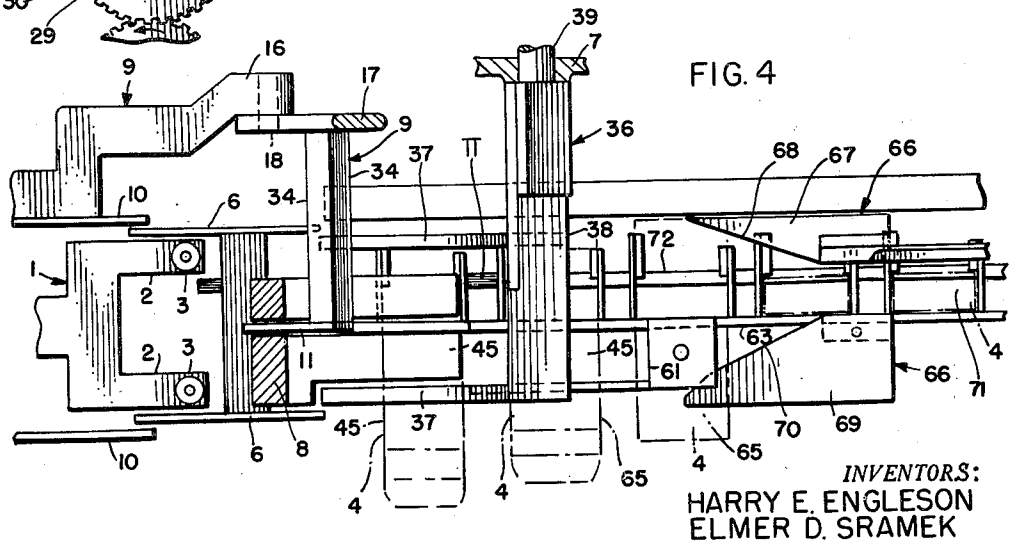


FIG. 4



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FIG. 5

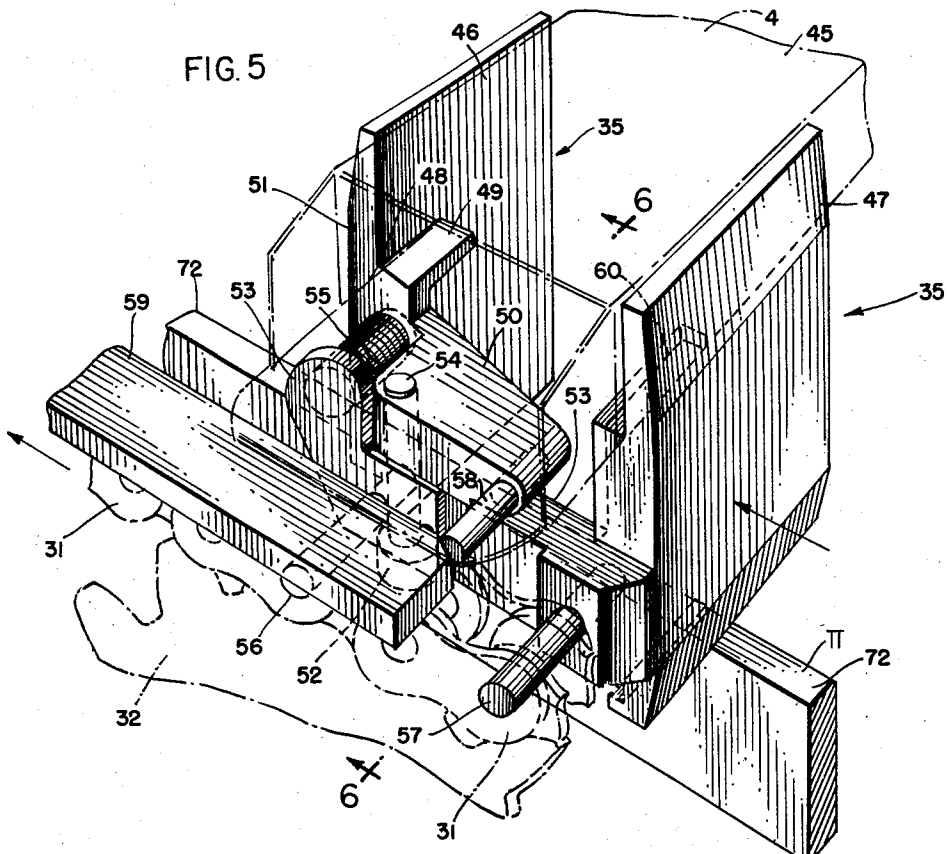
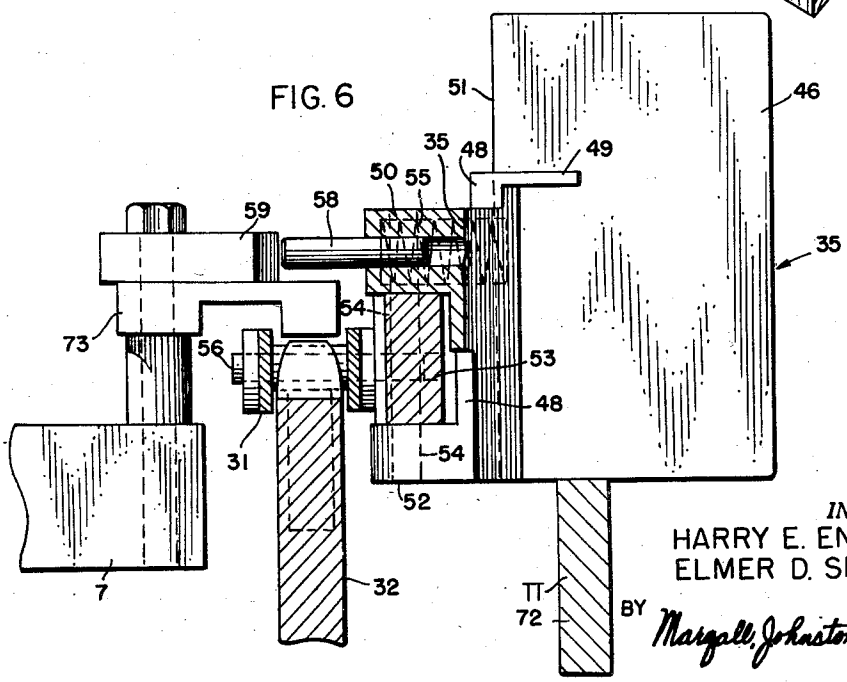


FIG. 6



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CARTON EXPANDING AND TRANSFER MECHANISM

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FIG. 7

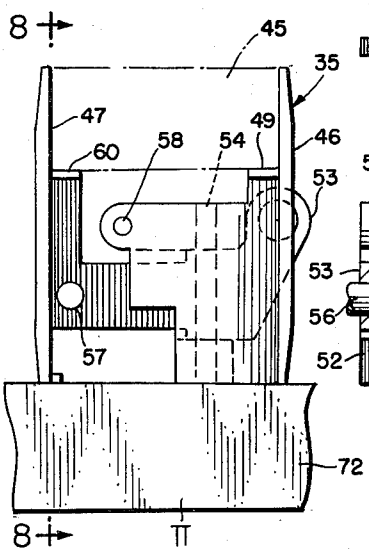


FIG. 8

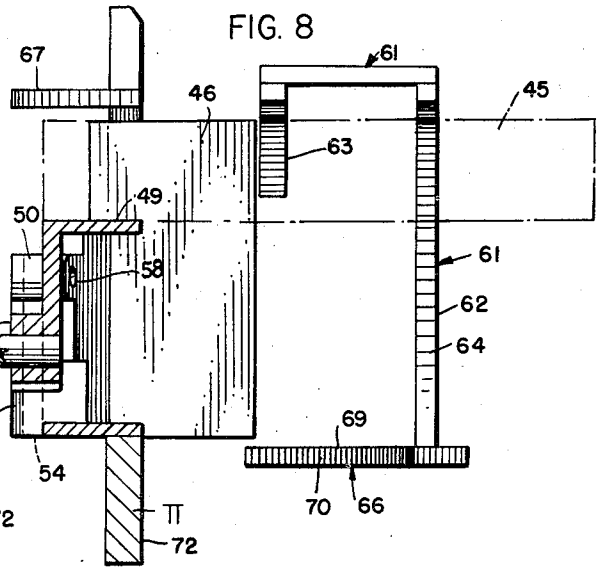


FIG. 9

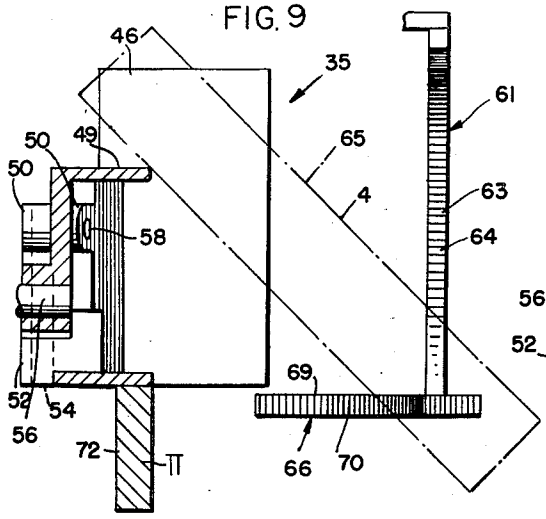
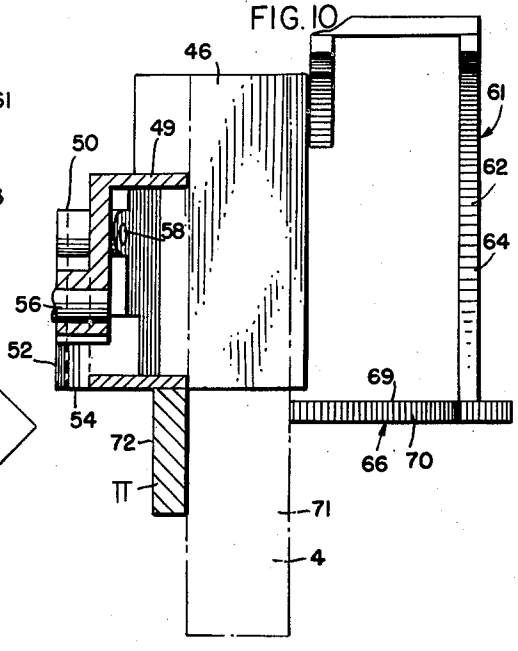


FIG. 10



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United States Patent Office 2,864,288 Patented Dec. 16, 1958

2,864,288

CARTON EXPANDING AND TRANSFER MECHANISM

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Application March 30, 1956, Serial No. 575,264

15 Claims. (Cl. 93—53)

This invention relates to a carton expanding and transferring mechanism, and particularly to transfer mechanism for transferring cartons individually and successively to a continuously moving conveyer.

The invention comprises, in general, a continuously operating conveyer comprising a plurality of hingedly connected buckets. Each bucket is preferably made without a bottom, and comprises spaced apart side walls to which interconnecting members are arranged at the rear. An expanded carton is laid on top of projections or ledges on the inner face of the side wall of each bucket, with the carton in horizontal position. The carton is then caused to be tilted or shifted within the bucket to attain a vertical position, the projections or ledges acting as fulcrums to effect the tilting movement of the carton. Each bucket has one wall spring-urged with respect to its cooperating wall, so that the carton may be clamped therebetween, but still shifted ninety degrees from a horizontal position to a vertical position. The projections or ledges on the inside of the side plates of the buckets support the carton in its original position, there being means provided for shifting the carton about the ledges through a ninety degree movement during the continuous movement of the conveyer.

The primary object of the present invention is the provision of new and novel means for feeding cartons from a stack of collapsed cartons in a magazine, and then inserting the cartons in expanded position in a continuously moving conveyer.

Another object of the invention consists in the formation of a continuous conveyer comprising a plurality of hingedly connected buckets, the buckets having means for permitting the expanded cartons to be shifted in each bucket successively from a flat horizontal position to a vertically extending position.

Another object of the invention consists in the provision of new and improved means for transferring collapsed cartons from a magazine into spaced buckets of a continuously operating conveyer with the cartons in expanded position, the expanded cartons being shifted ninety degrees from a relatively horizontal position to a relatively vertical position while the cartons are in the moving buckets.

A further object of the invention is the provision of a new and improved endless conveyer which comprises a plurality of hingedly connected buckets of a particular formation, whereby the buckets are adapted to first support the carton in a horizontal position and then shifted to a relatively vertical position.

A still further object consists in the provision of a new and improved bucket for a bucket conveyer, whereby each bucket is connected to a chain, the enclosing side walls of each bucket being spring tensioned, one relative to the other, and provided with abutments to permit the operating mechanism to shift or tip the carton from the horizontal to the vertical position.

Still another object of the invention relates to the method of shifting cartons progressively and continuously from a horizontal position to a vertical position during movement of the buckets in which the cartons are received and carried.

Numerous other objects and advantages will be apparent throughout the progress of the specification which follows later.

The accompanying drawings illustrate a certain selected embodiment of the invention, and the views therein are as follows:

Fig. 1 is a detail schematic or diagrammatic view showing the manner in which collapsed cartons are caused to be expanded and the expanded cartons shifted progressively from a horizontal to a vertical position;

Fig. 2 is a detail perspective view showing certain of the apparatus, including the bucket conveyer, for causing cartons to be arranged successively in successive buckets of a bucket conveyer and then tilted vertically during the continuous movement of the endless conveyer;

Fig. 3 is a detail elevational view of that part of the apparatus for causing the collapsed cartons to become expanded and applied in position in the buckets in a horizontal position for tilting movement to a vertical position;

Fig. 4 is a detail plan section on the line 4—4 of Fig. 3;

Fig. 5 is a detail perspective view of a bucket and showing the manner in which adjacent buckets are connected to a continuously operating chain, a carton being shown in a bucket in a horizontal position;

Fig. 6 is a detail vertical sectional view on the line 6—6 of Fig. 5;

Fig. 7 is a detail front elevational view of one of the buckets;

Fig. 8 is a detail vertical sectional view on the line 8—8 of Fig. 7, a carton being arranged therein in a horizontal position;

Fig. 9 is a view similar to Fig. 8, but showing the carton being in tilted or partly tipped position; and

Fig. 10 is a view similar to Figs. 8 and 9, but showing the carton tilted or tipped to its vertical position.

The particular construction herein shown for the purpose of illustrating the invention comprises a machine having a pneumatic gripper 1, Figs. 3 and 4, having gripper arms 2 to which rubber suction cups 3 are attached. The suction cups 3 engage the under side of a carton 4. The cartons 4 are arranged in collapsed position in a carton holding magazine 5. The suction cups 3 engage the lowermost collapsed carton and pull it from the bottom of the stack. The gripper arms 2, after engaging a collapsed carton 4, move downwardly to the lowermost position of the gripper 1, whereupon the carton 4 will become expanded and rest on a pair of opposed triangular-shaped, rigid, stationary supporting plates 6, 6 which are secured to a frame part 7 of the machine. The lowermost carton 4 from the stack of collapsed cartons in the magazine 5 is caused to become expanded as the pneumatic carton gripper 1 operates to remove the lowermost carton from the stack in the magazine. The carton is expanded as it is moved from the magazine 5 by means of an expander block 8 which is arranged at the lower end of the magazine 5 and preferably rigidly connected thereto, as shown more particularly in Fig. 3. The lowermost collapsed carton 5, as it is engaged by the suction cups 3 and becomes expanded by engagement of the expander block 8, is deposited on top of the triangularly shaped supporting plates 6. The suction from the cups 3 is released just as the suction arms 2 reach the end of their downward movement, at which time the expanded carton will rest on the top edges of the supporting plates 6.

The expanded carton 4, lying on top of the downwardly inclined plates 6, is pushed forwardly in the direction of

travel by a transfer member 9, Figs. 2 to 4, which includes forward carton pusher arms 10 and a front pusher carton holder part 11, Fig. 2. The pusher arms 10, Figs. 2 to 4, push the expanded cartons 4 under spaced stationary shoes 12 which are arranged adjacent to the rigid stationary expander block 8 fastened to the carton magazine 5, Figs. 2 to 4. The stationary spaced shoes 12 project forwardly in the form of spaced flat feet 13, Figs. 2 to 4, which terminate forwardly in guide toes 14, Fig. 3. The front carton holder part 11 of the transfer member 9 is in the form of a vertical blade which moves between the spaced shoes 12, 12 when the transfer member 9 is operated.

Transfer member 9

The transfer member 9, Figs. 2 to 4, is made relatively U-shaped in form, Figs. 2 and 4, and lies in a horiztonal plane. This U-shaped transfer member 9 includes a rigid closed end or base 15 which is secured rigidly to the spaced apart pusher arms 10, 10, Figs. 2 and 3. The U-shaped transfer member 9 has an angularly formed extension 16, Fig. 2, to which a holding arm 17 is pivotally connected at its lower end as indicated at 18, Fig. 2. The upper end of the arm 17 is pivotally attached to a stationary part 7 of the machine frame. A bell crank 20, Figs. 2 and 3, is pivoted at 21, Fig. 3, to a part 7 of the frame, and has a lower arm 22 which is pivotally connected at 23 to the transfer member 9. The upper arm 24 of the bell crank 20 is pivoted at 25 to a rod 26 which has its lower end connected at 27 to a crank arm 28 fixed to a driven shaft 29. The shaft 29 is driven by gearing 30 which is driven from the same power driving mechanism which drives a forward driving sprocket (not shown, but located at the opposite end of the machine). This driving sprocket drives a conveyer chain 31 which also passes over an idler sprocket 32, Figs. 2 and 3, mounted on a sprocket shaft 33. The pusher arms 10, 10 of the transfer member 9, therefore, operate synchronously in timed relation with the conveyer chain 31. Also, the carton gripper 1 operates synchronously with the conveyer chain 31 and the transfer member 9 because the gripper, likewise, is driven from the same prime mover which moves the transfer mechanism and the conveyer chain 31.

The carton holder part 11 of the transfer member 9, Figs. 2 to 4, is in the form of a blade operating in a slot between the two aforesaid spaced shoes 12, 12. The blade-like carton holder part 11 is secured rigidly to a horizontal bar 34 which is fixed to the pivotally mounted holder arm 17. The pusher arms 10, 10 and the carton holder blade 11 thus operate together in unison, and push, as well as support, the expanded carton 4 on the spaced triangularly shaped supporting plates 6. The pusher arms 10, 10, as well as the blade 11, move in a relatively straight line. The blade 11 moves between the shoes 12, 12 and stays and holds the carton in place, and prevents the carton from collapsing. The expander block 8 is provided with a cutout, Fig. 2, to permit free movement of the carton holder blade 11. The stationary shoes 12, 12 guide successive cartons as they are pushed by the pusher arms 10, 10 in position to be received in carton supports 35, generally known in the trade as "buckets," Figs. 2 to 10.

The carton buckets 35 are pivotally mounted on the conveyer chain 31, and are spaced a suitable distance apart so that a carton, after being pushed by the pusher arms 10, 10, will be in proper position with respect to the continuously moving conveyer chain 31.

The pushers 10, 10 and the carton holder blade 11 reciprocate back and forth in timed relation with an oncoming moving bucket 35 so that an expanded carton 4 will be in position to be received in the successively spaced, adjacently arranged, oncoming spaced buckets 35, Figs. 2 to 4. As soon as the pushers 10, 10 push the expanded carton 4 to the end of the travel of the pusher 9, the expanded carton 4 will lie in a flat horizontal position immediately above a bucket 35 for insertion into its respective bucket by means of a carton transfer presser member 36, Figs. 2 to 4. The carton transfer presser member 36 operates in timed relation with the pusher arms 10, 10, the carton holder blade 11, and the chain 31 to which the buckets 35 are attached.

Carton presser 36

The carton presser member 36, Figs. 2 to 4, comprises a pair of spaced apart presser arms 37, 37 which are fixed to a horizontal bar 38. The bar 38 has its inner end fastened to a shaft 39, which is mounted in a rigid bearing fixed to a part 7 of the frame. The shaft 39 is fastened to a crank arm 40, Fig. 3, and is oscillated thereby. The crank arm 40 is driven by a rod 41 which is pivoted at 42 to the crank arm 40. The lower end of the crank rod 41 is pivoted at 43 to a crank 44 which is driven by the aforesaid driven shaft 29. The presser member 36, therefore, operates in timed relation with respect to the previously mentioned elements. The presser arms 37 of the presser 36 each have a flat, horizontal, longitudinal surface which engages the upper side or face of a horizontally positioned expanded carton 4 with the under face of the carton lying on the triangular supports 6, Figs. 2 to 4. The expanded carton is thus locked beneath the shoes 12, 12, and the carton is pushed positively into a bucket 35 with the carton coming to rest in horizontal position at the upper end of each cooperating bucket 35. The expanded carton 4 is then pushed along the plate 6 by the arms 10, being held by the blade 11, and guided by the shoes 12 and the toes 14 thereof which tend to guide the expanded carton 4 toward and into a bucket 35. The presser arms 38 assist in guiding and pushing the carton positively into a bucket 35 in horizontal position, as indicated generally by the numeral 45, Figs. 3 and 4.

The adjacently arranged buckets 35, each operatively connected to the conveyer chain 31 and driven by the driving sprocket (not shown) and trained over the idler sprocket 32, form a continuously operating endless conveyer.

Carton conveying buckets 35

Each bucket 35, Figs. 5 to 10, comprises spaced side (front and back) wings or plates 46 and 47. The plate or wing 46 is indicated as the front plate, while the plate or wing 47 is indicated as the rear plate. The front plate 46, Fig. 5, includes an inwardly extending flange 48 to which inwardly extending ribs or ledges 49 extend, the ribs or ledges 49 being integral with the inner surface of the plate 46 and with the flange part 48 thereof. An inwardly extending upper lug 50 projects outwardly from the normal side edge 51 of the plate 46, and is integral with the rib or ledge 49 and with the flange 48. The lower edge of the flange 48 is provided with a lower lug 52, whereby a space is provided between the bottom of the upper lug 50 and the top of the lower lug 52.

The plate or wing 47 carries a forwardly projecting arm 53 which is integral therewith, being arranged between the bottom of the lug 50 and the top of the lug 52.

The plate 47, Fig. 5, is pivotally connected to the plate 46 by means of a vertical pin 54 passing through alined holes in the upper lug 50, the arm 53, and the lower lug 52. A spring 55, interposed between the extreme outer end of the arm 53 and the edge 51 of the plate 46, normally urges the plates or wings 46 and 47 toward each other. The arm 53 carries spaced pins 56 and 57 which extend through the chain 31 and, therefore, each bucket 35 is connected at two points to the chain 31. The chain 31 is generally of the roller type comprising spaced apart and overlapping links, the pins 56 and 57 acting as pivots for the connecting links, as well as pivotally connecting each bucket to the chain in the manner shown in Figs. 5 and 6. The inner end of the upper lug 50, on the plate 46, carries a pin 58 which is adapted to engage a cam

bar 59, Fig. 5, to shift the plate 46 inwardly against the tension of the spring 55 and, therefore, spread the plates or wings 46 and 47 apart to permit ease of movement of the carton inside and out of the bucket. The plate or wing 47, Figs. 5 and 7, also carries an inwardly extending rib or ledge 60 which is adapted to cooperate with the ledge or rib 49 on the plate 46. These ribs or ledges support the carton 4 after they are pushed into the buckets 35 by means of the depresser arms 37 of the depresser means 36. The carton 4 is, therefore, maintained in horizontal position by resting on top of the ribs or ledges 49 and 60, and is held in such position by the side plates 46 and 47 of the buckets because of the spring action of the spring 55. The carton, then, when in its position 45, lie on top of the ledges 49 and 60, and is spring held between the plates 46 and 47.

The cartons 4, in their horizontal position 45, are moved by the conveyer chain 31 (to the right, Figs. 2 to 4) for engagement with guide and tilt means 61. The ledges or ribs 49 and 60 act as fulcrums about which the carton tilts when the carton becomes engaged by the guide means 61.

Guide and tilt means 61

The guide means 61, Figs. 2 to 4, comprise a pair of spaced plates 62 and 63 which are located outside and forwardly of successive buckets being moved by the chain 31. Therefore, the cartons, as they are being moved by the bucket conveyer, will engage the underside, inclined surface 64 of each of the plates 62 and 63. The inclined surface of one plate may have a steeper incline than the inclined surface of its companion plate, so as to effect progressive tilting. Therefore, the upper surface of the carton will be caused to be tilted or tipped about the fulcrums or edges of the ledges 47 and 60 in the manner shown in Fig. 9. The continued forward movement of the conveyer causes the diagonally positioned, tilted carton 4, indicated at 65, Fig. 9, to become engaged with additional guide and tilt means 66.

Guide and tilt means 66

The guide means 66, Figs. 2 to 4, comprise an upper horizontal plate 67 having an inclined edge 68, and a transversely spaced lower plate 69 having an inclined edge 70 (best shown in Fig. 2). The upper guide plate 67 is arranged rearwardly of the inner edge of the buckets, while the plate 69 is arranged forwardly of the buckets. Therefore, the buckets operate between the plates 67 and 69. The diagonally positioned carton (indicated at 65, Fig. 9) thus becomes engaged by the inclined surfaces 68 and 70. The cartons 4 have their rear faces at their upper ends engaged by the inclined surfaces 68 of the upper member 67 and their front faces at their lower ends engaged by the inclined surface 70 of the lower member 69, Figs. 2 and 4. Therefore, the cartons 4 are tilted to a vertical upright position, as indicated at 71, Figs. 3, 4 and 10. The guide means 61 for partially tilting or tipping the cartons, and the guide means 66 for fully tilting the cartons to their vertical position 71, are secured to a rigid part 7 of the machine frame.

A longitudinal rail 72 is arranged beneath the conveyer to support the buckets 35, and prevents the buckets from sagging. A keeper member 73, Fig. 6, may be arranged above the chain 31 to prevent the chain from slipping out of the teeth of the sprockets, and to maintain it in proper engagement.

The present invention comprises a carton transferring, expanding and conveying mechanism comprising few and simple parts, all operating in proper timed relation for removing collapsed cartons, expanding the cartons and moving the expanded cartons to an inclined slide comprising the members 6. The expanded carton is then placed in horizontal position on the supporting and tilting ledges 49 and 60 of the plates 46 and 47, respectively, of each bucket 35. A continuous conveyer comprising a chain and a plurality of adjacently spaced interconnected hinged buckets move the horizontally disposed carton in each bucket to predetermined positions, whereby the cartons are progressively tilted or tipped from a horizontal position to a full vertical position, and then further conveyed to a liner-forming device, and inserted in the open-end containers.

The present invention comprises few and simple parts, all of which are synchronously driven so that the parts will all operate in proper timed relation to permit the cartons to be properly positioned and conveyed, and then be tilted from the horizontal to the vertical position by means of the unique buckets 35 which are normally spring clamped. The cartons are automatically releasable by means of a cam bar so that the cartons may be readily moved and tilted, the cam bar operating against the tension of the spring which normally tends to urge the two plates or wings 46 and 47 toward each other.

Changes may be made in the form, construction and arrangement of the parts, and the method or process may be varied to certain degrees, without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fall fairly within the scope of the following claims.

The invention is hereby claimed as follows:

1. A machine for expanding and transferring cartons comprising means for removing the lowermost carton of a stack of collapsed cartons and arranging the same in a predetermined position on an inclined slide, means for expanding the carton prior to placing it in said predetermined position on said slide, shiftable pusher means to push the carton from the slide to a horizontal position, a movable conveyer chain having buckets connected thereto and including spaced hinged plates with ledges formed on the inner surfaces of the plates, depresser means for inserting a carton between said plates and resting on the ledges, means to reciprocate the depresser means, means engaging a carton, and means progressively tilting the carton on said ledges.

2. A machine for expanding and transferring cartons comprising means for removing the lowermost carton of a stack of collapsed cartons, an inclined slide adjacent the lowermost carton, reciprocating means to shift a lowermost carton in a predetermined position on an inclined slide, means for expanding the carton prior to placing it in said predetermined position on said slide, pusher means operated by the reciprocating means to push the carton from the slide to a horizontal position, a movable conveyer chain having buckets connected thereto and including spaced hinged plates, ledges formed on the inner surfaces of the plates, reciprocating depresser means for inserting a carton between said plates and resting the cartons on the ledges, means engaging a carton and progressively tilting the carton about the ledges, and additional means to shift a tilted carton to vertical position.

3. A machine for expanding and transferring cartons comprising means for removing the lowermost carton of a stack of collapsed cartons and arranging the same in a predetermined position on an inclined slide, means for expanding the carton prior to placing it in said predetermined position on said slide, movable pusher means to push the carton from the slide to a horizontal position, a movable conveyer chain having buckets connected thereto and including spaced hinged plates, ledges formed on the inner surfaces of the bucket plates, movable depresser means for inserting a carton between said plates and resting on the ledges, means engaging a carton and progressively tilting the carton on said ledges, additional means to shift a tilted carton to vertical position, and spring means to urge the plates toward each other to impinge an expanded carton therebetween.

4. A machine for expanding and transferring cartons comprising means for removing the lowermost carton of a stack of collapsed cartons and arranging the same in

a predetermined position on an inclined slide, means for expanding the carton prior to placing it in said predetermined position on said slide, shiftable pusher means to push the carton from the slide to a horizontal position, a movable conveyer chain having buckets connected thereto and including spaced hinged plates with ledges formed on the inner surfaces of the plates, movable depresser means for inserting a carton between said plates and resting them on the ledges, means engaging cartons and progressively tilting them about said ledges, additional means to shift a tilted carton progressively to vertical position, spring means to urge the plates toward each other to impinge a carton therebetween, and a cam bar engageable by a part of a bucket to shift one plate away from the other plate against the urging action of the spring means.

5. A machine for expanding and transferring cartons comprising means for removing the lowermost carton of a stack of collapsed cartons and arranging the same successively in a predetermined position on a support, means for expanding the carton prior to placing it in said predetermined position on said support, a continuously moving endless conveyer including spaced apart buckets having opposed plates having carton engaging surfaces, ledges on the inner faces of said surfaces of the bucket plates, means for inserting a carton in a horizontal position between said opposed surfaces and on said ledges, and means for progressively tilting the carton progressively on said ledges from a horizontal to a vertical position.

6. A machine for expanding and transferring cartons comprising means for removing the lowermost carton of a stack of collapsed cartons and arranging the same successively in a predetermined position on a support, means for expanding the carton prior to placing it in said predetermined position on said support, a continuously moving endless conveyer including spaced apart buckets having opposed plates with carton engaging surfaces, ledges on the inner faces of said surfaces, movable depresser means for inserting a carton in a horizontal position between said opposed surfaces and supporting them on said ledges, means for progressively tilting the carton progressively on said ledges from a horizontal to a vertical position, means hingedly connecting said plates together, a continuously moving endless chain, and means fastening a plate to said chain.

7. A carton expanding and transfer mechanism comprising a movable conveyer including a plurality of adjacently arranged buckets having spaced vertical extending side walls hingedly connected together, carton supporting ledges on the inner surface of each of said side walls and forming fulcrums, means for mounting an expanded carton horizontally on said supporting ledges, and means for tilting said carton from a horizontal to vertical position about said fulcrums of the ledges.

8. A carton expanding and transferring mechanism comprising an endless continuously moving chain having a plurality of adjacently spaced buckets secured to said chain and forming a conveyer, said buckets each comprising vertical plates spaced apart a predetermined distance and hingedly connected together, ledges on the inner surface of each plate of each bucket to support an expanded carton thereon, a support to receive cartons successively from a stack of cartons, pusher means to push cartons to a predetermined position, movable depresser means to insert successive cartons between said plates and position them in a horizontal position between said plates and resting the cartons on said ledges, and means to tilt the successive cartons between the walls of successive buckets with the ledges acting as fulcrums.

9. A carton expanding and transferring mechanism comprising an endless continuously moving chain having a plurality of adjacently spaced buckets secured to said chain and forming a conveyer, said buckets each comprising vertical plates spaced apart a predetermined distance and hingedly connected together, ledges on the inner surface of each plate of each bucket to support an expanded carton thereon, a support to receive cartons successively from a stack of cartons, movable pusher means to push cartons to a predetermined position, means to insert successive cartons between said plates and position them in a horizontal position between said plates and on said ledges, means to tilt the successive cartons between the walls of successive buckets with the ledges acting as fulcrums, and additional means including inclined elements for further tilting the successive cartons to a vertical position and abutting against the edges of said ledges.

10. A carton expanding, transferring and conveying mechanism for removing the lowermost carton from a stack of horizontally arranged cartons in a magazine and delivering said cartons successively to predetermined positions comprising a conveyer having a movable continuous endless chain, a plurality of adjacently arranged buckets secured to said chain, said buckets each comprising a pair of spaced apart bucket plates pivotally connected together, an inclined slide arranged beneath said stack of cartons and above the buckets, oscillating means engaging the lowermost collapsed carton and placing the same on the inclined slide, a carton expander interposed between the oscillating member and the magazine to expand each successive carton prior to being mounted on the slide, pusher means to push successive cartons to a predetermined position, movable depresser means above the buckets for placing the cartons in horizontal position into buckets between the side plates thereof, ledges on the inner surface of adjacent bucket plates of each bucket to support a carton in horizontal position, and guide means having inclined surfaces which engage a carton in a bucket for tilting cartons about said ledges from a horizontal toward a vertical position.

11. A carton expanding, transferring and conveying mechanism for removing the lowermost carton from a stack of horizontally arranged cartons in a magazine and delivering said cartons successively to predetermined positions comprising a conveyer having a movable continuous endless chain, a plurality of adjacently arranged buckets secured to said chain, said buckets each comprising a pair of spaced apart bucket plates pivotally connected together, an inclined slide arranged beneath said stack of cartons and above the buckets, oscillating means engaging the lowermost collapsed carton and placing the same on the inclined slide, a carton expander interposed between the oscillating member and the magazine to expand each successive carton prior to being mounted on the slide, movable pusher means to push successive cartons to a predetermined position, movable depresser means above the buckets for placing the cartons in horizontal position into buckets between the side plates thereof, ledges on the inner surface of adjacent bucket plates of each bucket to support a carton in horizontal position, guide means having inclined surfaces which engage a carton in a bucket for tilting the carton about said ledges from a horizontal toward a vertical position, and additional tilting means comprising an upper plate arranged on one side of said conveyor and a lower plate spaced on the opposite side of the conveyor, said upper and lower plates engaging a carton in a bucket during movement of the conveyer to tilt the carton to vertical position.

12. A carton expanding, transferring and conveying mechanism for removing the lowermost carton from a stack of horizontally arranged cartons in a magazine and delivering said cartons successively to predetermined positions comprising a conveyer having a movable continuous endless chain, a plurality of adjacently arranged buckets secured to said chain, said buckets each comprising a pair of spaced apart bucket plates pivotally connected together, an inclined slide arranged beneath said stack of cartons and above the buckets, oscillating means engag-

ing the lowermost collapsed carton and placing the same on the inclined slide, a carton expander interposed between the oscillating member and the magazine to expand each successive carton prior to being mounted on the slide, movable pusher means to push successive cartons to a predetermined position, movable depresser means above the buckets for placing the cartons in horizontal position into buckets between the side plates thereof, ledges on the inner surface of adjacent bucket plates of each bucket to support a carton in horizontal position, guide means having inclined surfaces which engage a carton in a bucket for tilting the carton about said ledges from a horizontal toward a vertical position, additional tilting means comprising an upper plate arranged on one side of said conveyer and a lower plate spaced on the opposite side of the conveyer, said upper and lower plates engaging a carton in a bucket during movement of the conveyer to tilt the carton to vertical position, and spring means to urge the bucket plates toward each other.

13. A carton expanding, transferring and conveying mechanism for removing the lowermost carton from a stack of horizontally arranged cartons in a magazine and delivering said cartons successively to predetermined positions comprising a conveyer having a movable continuous endless chain, a plurality of adjacently arranged buckets secured to said chain, said buckets each comprising a pair of spaced apart bucket plates pivotally connected together, an inclined slide arranged beneath said stack of cartons and above the buckets, oscillating means engaging the lowermost collapsed carton and placing the same on the inclined slide, a carton expander interposed between the oscillating member and the magazine to expand each successive carton prior to being mounted on the slide, movable pusher means to push successive cartons to a predetermined position, movable depresser means above the buckets for placing the cartons in horizontal position into buckets between the side plates thereof, ledges on the inner surface of adjacent bucket plates of each bucket to support a carton in horizontal position, guide means having inclined surfaces which engage a carton in a bucket for tilting the carton about said ledges from a horizontal toward a vertical position, additional tilting means comprising an upper plate arranged on one side of said conveyer and a lower plate spaced on the opposite side of the conveyer, said upper and lower plates engaging a carton in a bucket during movement of the conveyer to tilt the carton to vertical position, spring means to urge the bucket plates toward each other, and cam means adapted to engage a part of a bucket to shift one bucket plate away from its other bucket plate against the action of the spring means.

14. Carton expanding and transferring mechanism for removing the lowermost carton from a stack of horizontally arranged collapsed cartons in a magazine, means expanding successive cartons and transferring and conveying successive cartons to predetermined positions comprising a conveyer including a movable continuous endless chain having a plurality of adjacently arranged buckets secured thereto, said buckets each comprising a pair of spaced apart plates pivotally connected together, one of said plates having a pair of spaced lugs at one end, an arm integrally connected to the other plate, a pivot pin extending through said arm and through said lugs to pivotally connect said plates together, pins passing through each bucket and connected to a chain, and spring means arranged between a part of each plate to normally urge the plates together.

15. Carton expanding and transferring mechanism for removing the lowermost carton from a stack of horizontally arranged collapsed cartons in a magazine, means expanding successive cartons and transferring and conveying successive cartons to predetermined positions comprising a conveyer including a movable continuous endless chain having a plurality of adjacently arranged buckets secured thereto, said buckets each comprising a pair of spaced apart plates pivotally connected together, one of said plates having a pair of spaced lugs at one end, an arm integrally connected to the other plate, a pivot pin extending through said arm and through said lugs to pivotally connect said plates together, pins passing through each bucket and connected to a chain, spring means arranged between a part of each plate to normally urge the plates together, a pin extending from one of said plates, and a cam bar adapted to be engaged by said latter pin to shift one plate relative to the other against the urging action of said spring.

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