

Oct. 18, 1960

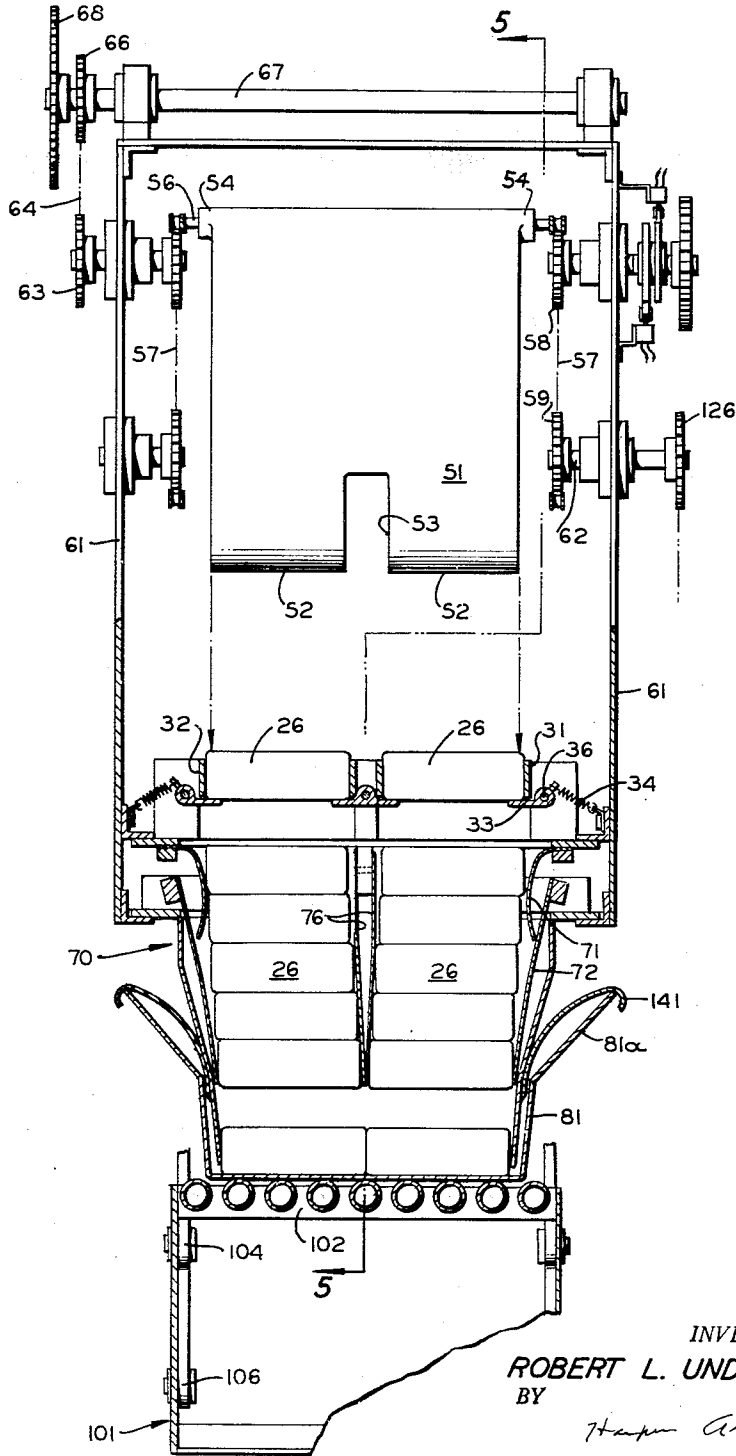
R. L. UNDERWOOD
FREEZE PACKAGE CASER

2,956,384

Filed July 12, 1957

6 Sheets-Sheet 2

FIG. 2



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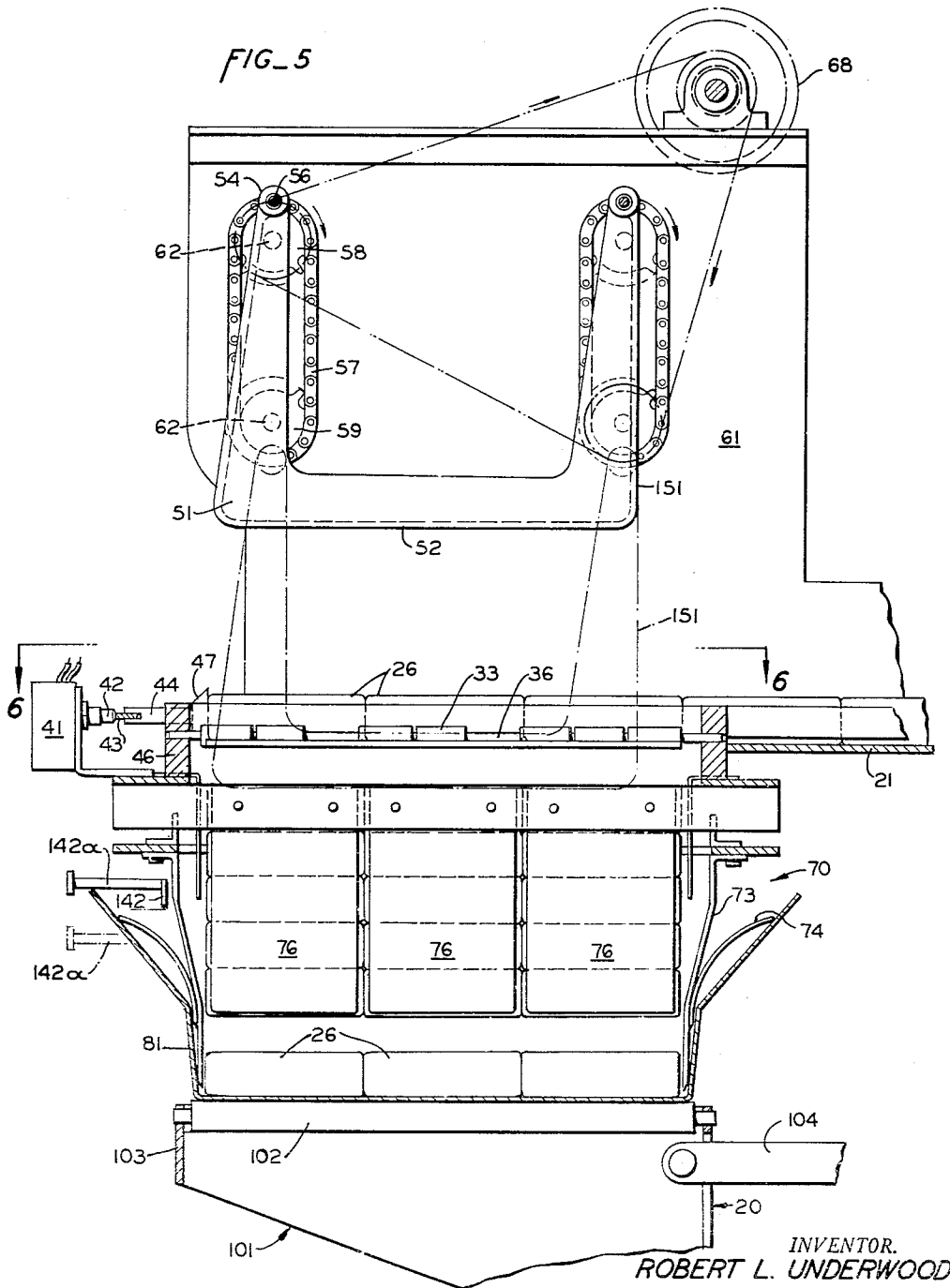
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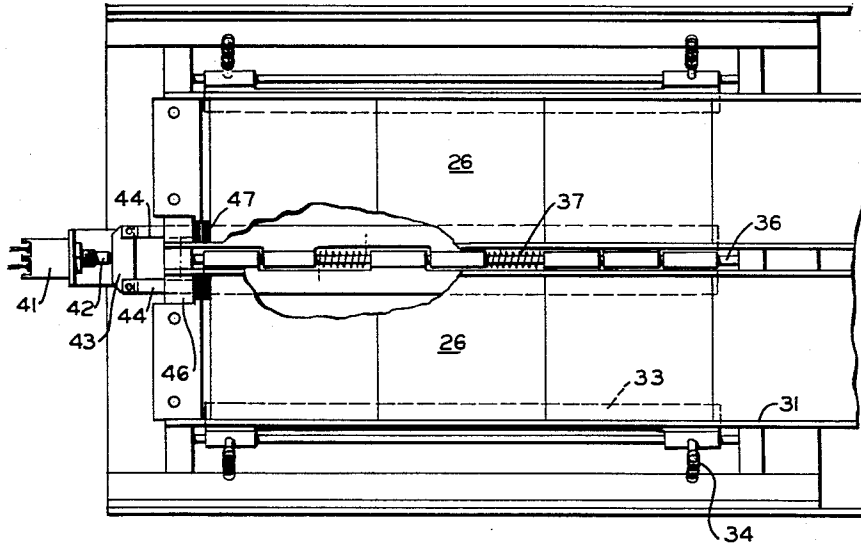
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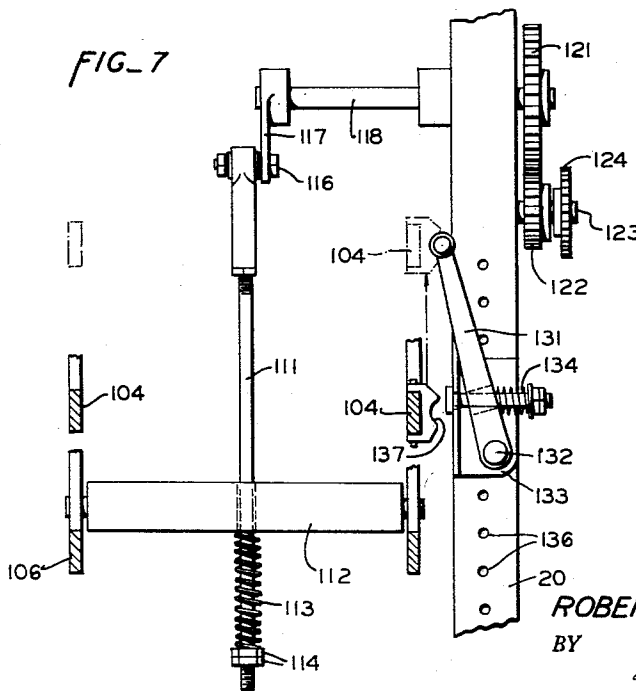
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FIG_6



FIG_7



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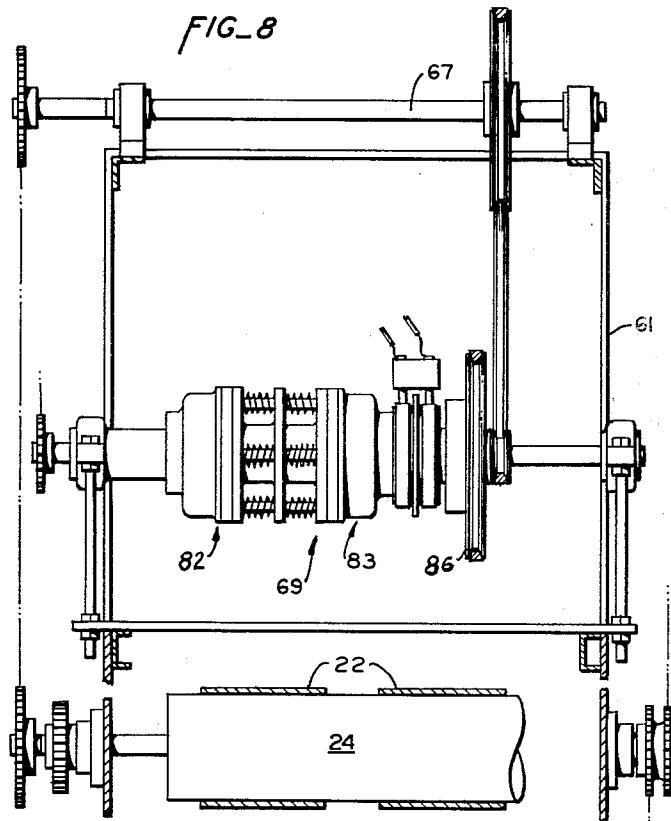
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6 Sheets-Sheet 6



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2,956,384

FREEZE PACKAGE CASER

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4 Claims. (Cl. 53—154)

The present invention relates to casers for packages or cartons of the type normally used in packaging foods, for example frozen foods, and is concerned more particularly with an improved caser of the above type which is automatic in its operation in assembling cartons as a layer and in moving the layer into the case, and also in requiring a full charge or layer of cartons to be packed, and the presence of a case to receive the carton before operation of the machine will continue.

It is the general object of the invention to provide an improved caser for packages or cartons.

Another object of the invention is to provide a caser of the above type in which an advantageous arrangement for automatically placing the cartons in the case is provided.

A further object of the invention is to provide a caser of the above character having desirable interlock means which serve to prevent operation of the caser unless conditions are proper for operation.

Other objects and advantages of the invention will be apparent from the following description of a preferred embodiment thereof, as illustrated in the accompanying drawings, in which:

Figure 1 is a side elevational view of a caser embodying the invention;

Figure 2 is a vertical sectional view partially in elevation, the view being indicated by the line 2—2 in Figure 1;

Figure 3 is a fragmentary end elevational view taken as indicated by the line 3—3 in Figure 1;

Figure 4 is a schematic view similar to a portion of Figure 2 illustrating the operation of the carton conveyor;

Figure 5 is a sectional view partially in elevation taken as indicated by the line 5—5 in Figure 2;

Figure 6 is a horizontal sectional view through the machine taken as indicated by the line 6—6 in Figure 5;

Figure 7 is a fragmentary sectional view taken as indicated by the line 7—7 in Figure 1; and

Figure 8 is a fragmentary sectional view taken in a plane indicated by the line 8—8 in Figure 1.

The caser of the instant invention is illustrated as employed in connection with rectangular packages or cartons of frozen food, which are received either continuously or intermittently from a freezing line, or other source of supply and are to be placed in a case for storage or shipment. Preferably the cartons or packages are assembled in a layer, suitable for placing in the case and are translated or moved as a layer in a direction to enter a case, with suitable controls provided so that no translation of a layer is effected when the layer is incomplete insofar as number of packages or cartons is concerned. Also suitable interlocking controls are provided so that no layer will be translated unless a case is in position to receive its charge or packages. The operating controls are preferably such that the machine stops when an abnormal condition exists such as the

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lack of a case or an insufficient supply of cartons and the operation will be resumed automatically when the deficiency is corrected.

Referring to Figures 1, 2 and 5, the caser includes a fabricated frame 20 which adjacent its upper edge provides a support track 21 for a pair of parallel package conveyors 22 which are trained about a suitable idler and drive drums 23 and 24. Each conveyor 22 is of a width to accommodate one package 26. A feed conveyor 27 of conventional type is shown at the right of Figure 1. The drive drum 24 for the conveyors 22 is driven constantly through suitable gear and chain connections from a driving motor 28 carried on the frame 20.

The two rows of cartons 26 are fed in end to end fashion from the conveyors 22 into two parallel tracks and associated yieldable supports provided between spaced apart guide rails 31 (Figure 2). The outer yieldable supports or strips 33 are urged to the package supporting position shown in Figure 2 by means of associated springs 34. As seen in Figure 6, the intermediate yieldable supports or strips 33 are pivotally mounted on a center rod 36 and have torsion springs 37 connected thereto and to the frame to urge them to their normal package supporting position shown in Figures 2 and 4.

As seen in Figure 6 the cartons 26 are in place on the supporting strips 33 so that a full layer for a case is present and in place by virtue of the push of oncoming cartons being conveyed by the conveyors 22. If for example there is a deficiency in the number of cartons on one conveyor, the cartons being frictionally supported on their support strips 33 will stop on these strips until another oncoming carton pushes them along.

Means is provided responsive to the presence or absence of a full layer of cartons for interrupting or disabling the drive for feeding the layer of cartons if the layer is incomplete. This means takes the form of a switch 41 (Figures 5 and 6) which is normally open unless its control button 42 is pressed to the left as viewed in Figures 5 and 6 by a control plate 43 abutting the button 42 and pivotally mounted on two control plungers 44 carried in suitable brackets 46 on the frame and having control ends 47 disposed respectively to be engaged by the endmost cartons 26 of the two rows of cartons. The arrangement and dimension of the parts is such that the control button 42 will not be moved to close the switch 41 unless both of the control ends 47 have been contacted and moved by a carton 26. The arrangement of the switch 41 in the circuit will be described later.

Means is provided for translating as a layer, the layer of six packages and this means takes the form of a U-shaped pusher member 51 (Figures 1, 2 and 5) having two lower spaced apart pusher portions 52 separated by an opening 53. At the upper ends of the member 51 there are provided respective opposite bosses 54 carrying support rods 56 extending from respective opposite pairs of chains 57 carried by respective upper and lower sprockets 58 and 59 suitably journaled in side plates 61 of the frame by support shafts 62. Certain of the support shafts 62 for the sprockets 58 and 59 are extended to the left as seen in Figure 2 and carry sprockets 63 which are engaged by a drive chain 64 (Figures 1 and 2) extending to a drive sprocket 66 on a countershaft 67 suitably journaled on the frame and having a chain and sprocket drive 68 to a drive mechanism 69. The drive arrangement is such that the chains 57 are driven in the direction of the arrows in Figures 1 and 5 so that a translatory movement of the pusher member 51 is effected and this pusher member will operate upon the layer of cartons 26 which is carried by the strips 33 as

shown in Figure 2 and push this layer of cartons down into a packing chute 70 and into engagement with suitable resilient retaining means. This retaining means is in the form of a plurality of resilient sheet metal members 71 and 72 at either side of the layer of cartons, and 73 and 74 at the end of the layer of cartons (Figure 5). These spring members 71 and 72 are shaped converging fashion with respect to the layer of cartons, and the center dividing strip 76 converges downwardly so that the cartons are finally moved together as seen in Figure 2 into the proper width layer to be received in a case 81.

The drive mechanism 69 is provided with a constantly-available drive from the motor 85 (Figure 1) to the pulley 86 (Figures 1 and 8). The drive mechanism 69 when energized by simultaneous operation of the clutch and brake mechanism 82 and 83 (Figure 8) serves to effect a single cycle of movement of the pusher member 52. At the end of this single cycle of movement, the brake mechanism operates at the time the clutch is disengaged to insure the stopping of the pusher member 52 in its home position as shown in Figure 5. Any suitable drive mechanism can be employed for the pusher member 52, as long as a full single cycle of operation is provided by such drive.

The operation of the pusher member 51 as described hereinafter serves to push a layer of cartons past their support strips 33 and into engagement with spring urged retaining supporting members 71, 72 and 73, repeated operation of the pusher member 51 serving to supply a succession of layers of cartons or packages in the chute 70 as illustrated in Figure 2. In Figure 2 the lowermost layer of cartons has been pushed free of the lowermost retaining members 72, the cartons falling freely through the distance remaining to the bottom of the case 81. Upon a subsequent operation of the pusher member 51, the next layer of cartons will complete the filling of the case 81.

Means are provided for holding and presenting a case to the bottom of the carton chute 70, this carton holding and presenting means being operated in synchronism with the pusher member 51 and at half the rate. As seen in Figures 1 and 2 there is provided a case platform structure indicated generally at 101 and comprising a platform of rollers 102 suitably journaled in a frame 103, which is shown in its lower position in Figure 1, and in its upper position in Figure 2. The frame 103 is supported by pairs of parallel links 104 and 106 pivoted at 107 on the main frame 20, the links 106 being extended to carry a counterweight 108.

Means is provided for yieldably moving the case holder 101 upwardly from the position shown in Figure 1 and this means comprises an actuating rod 111 (Figures 1 and 7) passing through a cross piece 112 pivoted in the lower parallel arms 106. A spring 113 engages this cross piece 112 and abuts suitable holding nuts 114 on the threaded lower end of the actuating rod or link 111. At its upper end the link 111 is pivotally connected at 116 to a crank arm 117 on a stub shaft 118 suitably journaled in the frame. This shaft 118 carries a gear 121 meshing with a pinion 122 on the countershaft 123 and this countershaft is connected by a chain and sprocket mechanism 124 (Figure 1) to a shaft 125 which is connected by a chain and sprocket mechanism 126 to one of the support shafts 62 of the drive chains for the pusher member 51. In this way the case holder is operated in synchronism with the pusher member once for every two operations of the pusher member.

The case holder is normally resiliently latched in its upper position by means of a latch arm 131 (Figures 1 and 7) pivotally mounted at 132 on a bracket 133 and spring urged to latching position by a spring 134. The bracket 133 can be adjustably positioned by means of a series of apertures 136 in the frame 20. The end of the latch arm 131 is adapted to engage a latching notch 137 carried by the adjacent parallel arm 104 so that when the

case support and holder 101 is in its raised position it is releasably held there until positively displaced by its drive mechanism.

The case 81 (Figure 2) is provided with a stop for its upturned flanges 81a in the form of hooks 141 carried by the carton or package chute 70, and case responsive switch means is provided which is operated by the case when in position to receive cartons. This case responsive switch means includes lever arm 142 (Figures 3 and 5) pivotally mounted at 143 on a switch 144 whose contacts 146 are closed when the arm 142 is raised by a case engaging over the package chute 70. The offset end 142a of the arm 142 is raised by a case from its dotted line position in Figure 5 to its full position and completes the operating circuit.

In operation, assuming the frozen food cartons to be flowing either continuously or intermittently on the two conveyors 22 and assuming a case 81 to be present on the case holder 101, each time six packages are in the proper aligned relation as a layer over the carton chute the switch 41 is closed. Assuming carton holder has been raised so as to close the switch 144, the brake mechanism 82 is disabled, and the clutch mechanism 83 is enabled, so that the drive for pusher member 51 is active and the operation of this pushing member begins. As this pusher member pushes the layer of cartons down below the level of the conveyors 22, any oncoming cartons are held by the upright surface 151 (Figure 5) of the pusher member 51 and the first layer of cartons is pushed into the carton or package chute 70 substantially as shown in Figure 4 for example. As long as the carton feed continues successive layers of cartons or packages are pushed into the chute until a first layer drops into the case. On the next cycle of operation of the pusher the second layer drops into the case, and with the size of the case shown a full case load is present and the holder is unlatched by the pusher acting against the cartons in the case and allowed to drop to its lower position. The operator then withdraws the filled case and inserts an empty case in its place, restoring the case holder to its raised position so that the operation of the pusher member can proceed.

While I have shown and described a preferred embodiment of the invention, it is apparent that the invention is capable of variation and modification from the form shown so that its scope should be limited only by the scope of the claims appended hereto.

I claim:

1. In a caser for cartons of products such as food a carton assembly station including respective pairs of parallel guide members defining parallel paths of movement for cartons, a pair of yieldably mounted opposite carton supporting strips related to said guide members, a divided carton chute disposed below said guide members in alignment therewith and comprising yieldable carton retaining means and a central downwardly converging V-shaped guide, and a pusher mounted in the caser above said supporting strips for movement into engagement with a carton supported thereby to cause yielding of said strips and movement of a carton into engagement with said yieldable retaining means, said yieldable retaining means also providing means for effecting approaching movement of parallel cartons moving downwardly past said V-shaped guide.
2. In a caser for cartons of products such as food, a pair of parallel conveyors for supplying parallel files of cartons, a carton layer assembling station including a plurality of yieldable track means arranged in parallel spaced apart relation at the discharge ends of said conveyors for receiving the respective files of cartons therefrom, a pusher mounted for movement in a direction perpendicular to an assembled layer of cartons to effect movement of the layer in a direction perpendicular to said layer and to cause yielding of said track means to pass said cartons, carton receiving means disposed on

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the opposite side of said track means from said pusher, and means operative as the cartons are moved from said track means toward said carton receiving means for directing the respective files of cartons into engagement with each other as a continuous layer including means urging the files toward each other and V-shaped guide means converging in a direction away from said spaced-apart track means.

3. In a case as recited in claim 2, in which said pusher is split to provide an opening for passing said V-shaped guide means. 10

4. In a case for cartons of products such as food, a pair of parallel conveyors for supplying parallel files of cartons, a carton layer assembling station including a plurality of yieldable track means arranged in parallel spaced apart relation at the discharge end of said conveyors for receiving the respective files of cartons therefrom, a pusher mounted for movement in a direction perpendicular to an assembled layer of cartons to effect movement of the layer in a direction perpendicular to said layer and to cause yielding of said track means to pass said cartons, carton receiving means disposed on the opposite side of said track means from said pusher, 15

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means operative as the cartons are moved from said track means toward said carton receiving means for directing the respective files of cartons into engagement with each other as a continuous layer, and mounting means for said pusher including respective pairs of drive chains having connections to said pusher and operating said pusher through a translatory path intersecting said station, said pusher being generally U-shaped, and having a depending relation with respect to its respective connections to said chains. 20

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