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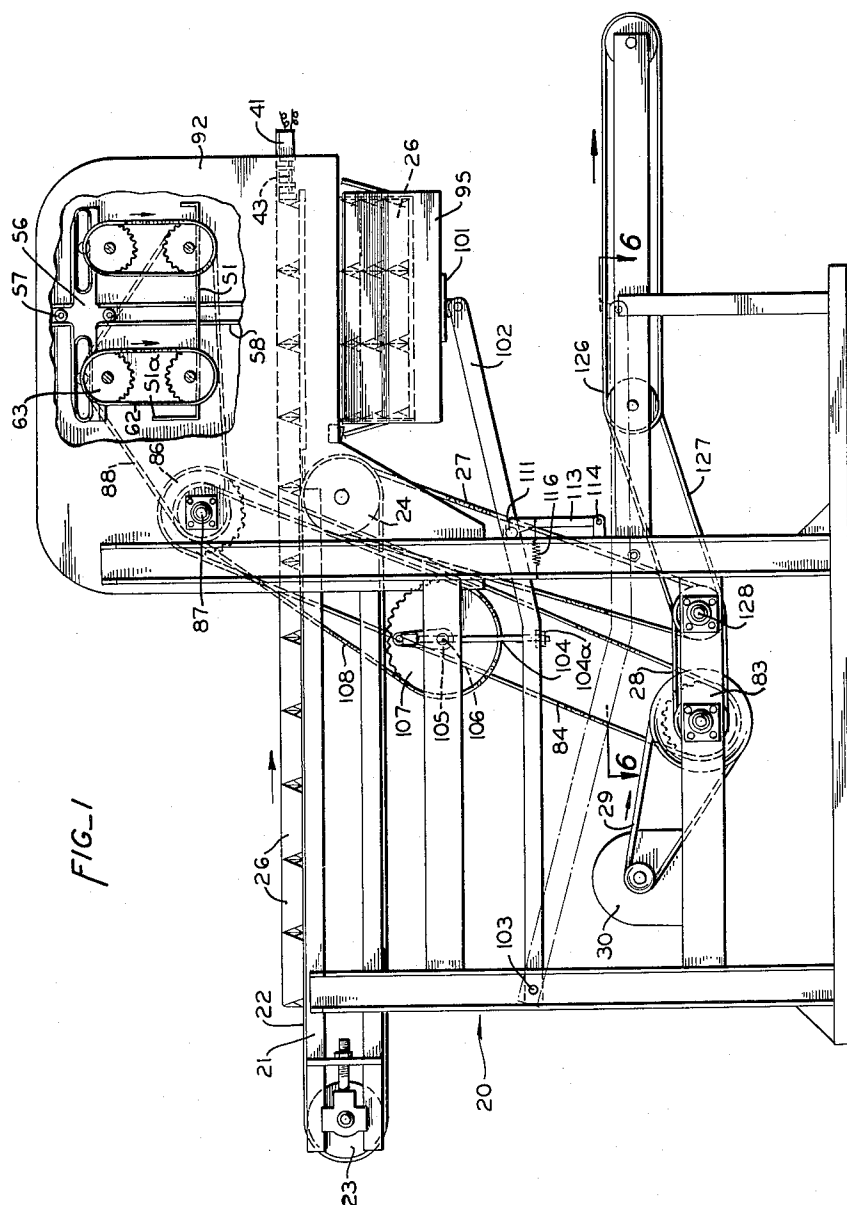
J. L. LAWRENCE ET AL

3,014,599

PACKAGE CASER

Filed July 12, 1957

4 Sheets-Sheet 1



INVENTORS
JOSEPH L. LAWRENCE
FREDERICK J. LAWRENCE

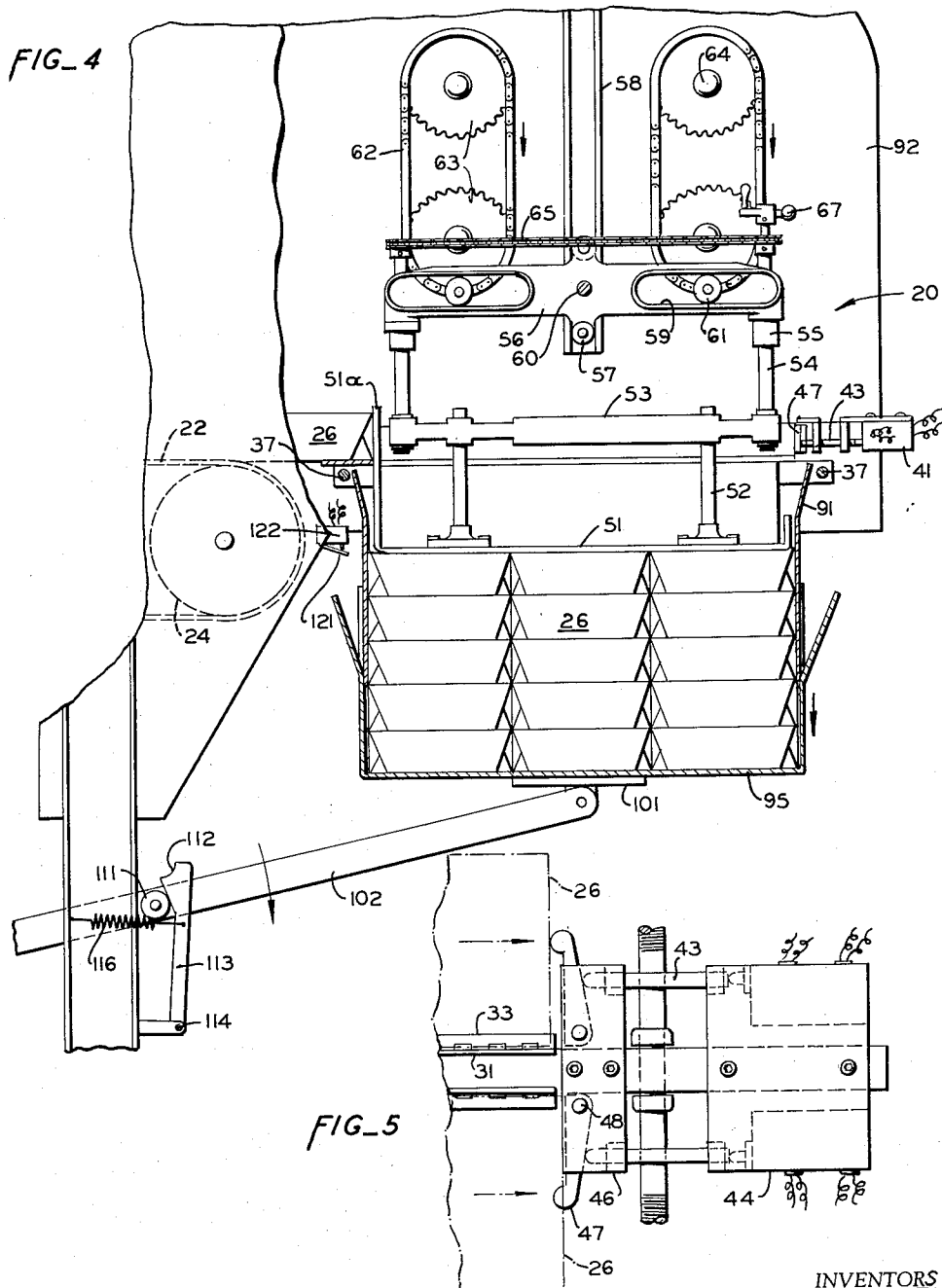
BY *Allen & Channing*
ATTORNEYS

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4 Sheets-Sheet 3



INVENTORS
JOSEPH L. LAWRENCE
FREDERICK J. LAWRENCE

BY *Allen & Chrony*
ATTORNEYS

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J. L. LAWRENCE ET AL

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PACKAGE CASER

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FIG-6

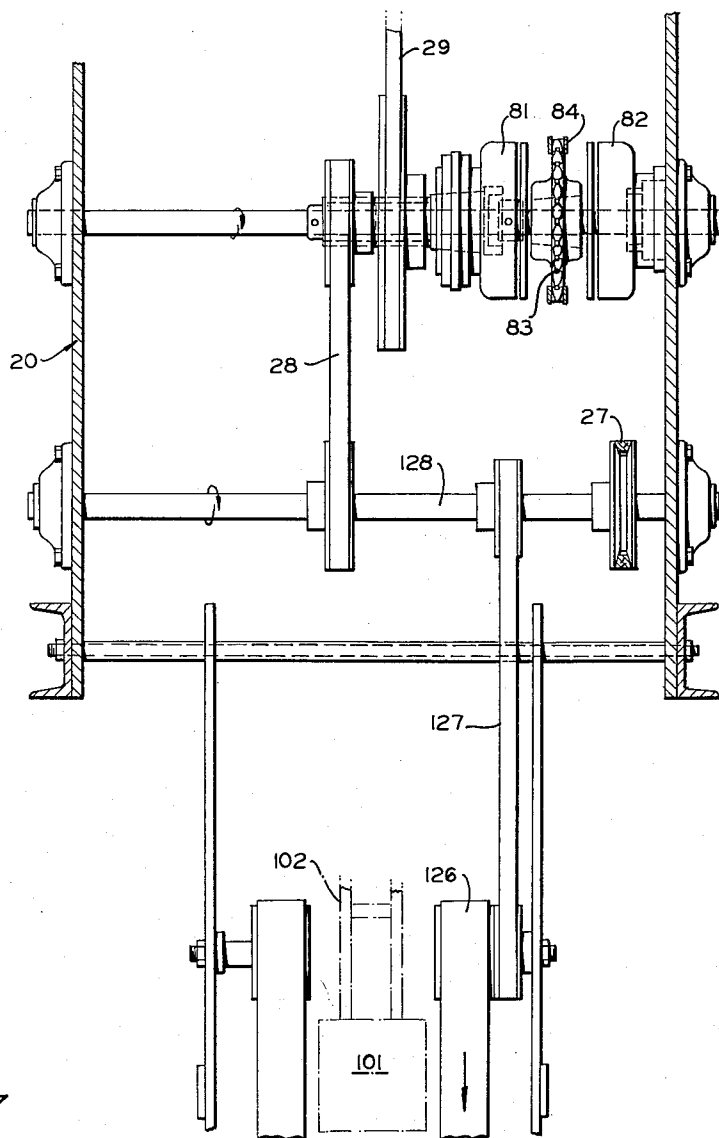
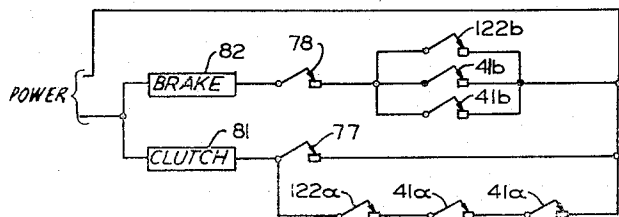


FIG-7



INVENTORS
JOSEPH L. LAWRENCE
FREDERICK J. LAWRENCE

BY *Allen & Churny*
ATTORNEYS

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3,014,599

PACKAGE CASER

Joseph L. Lawrence and Frederick J. Lawrence, San Francisco, Calif., assignors to King Sales & Engineering Co., San Francisco, Calif.

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2 Claims. (Cl. 214-6)

The present invention relates to casers for packages or cartons of the type normally used in packing foods, and is concerned more particularly with an improved caser of the above type for assembling the cartons as a layer and moving the layer into a case.

It is a 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 the caser is adjustable to accommodate different sizes and numbers of packages or cartons in a case.

A further object of the invention is to provide a caser of the above type in which an advantageous pusher construction is provided for moving the assembled layer from its assembly station into a case.

A still further object of the invention is to provide a caser of the above type in which advantageous interlocking controls are provided to prevent operation of the machine when conditions are not proper for operation, such as for example, an incomplete layer of cartons, or the absence of a case to receive the cartons.

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, with certain parts broken away for clarity of illustration;

FIGURE 2 is an enlarged view of the upper right hand portion of FIGURE 1, but showing the assembling station and associated parts in section;

FIGURE 3 is a sectional view taken as indicated by the line 3-3 in FIGURE 2;

FIGURE 4 is a view similar to FIGURE 2 but showing the condition of the parts after filling of a case with packages;

FIGURE 5 is a fragmentary plan view taken as indicated by the line 5-5 in FIGURE 2;

FIGURE 6 is a fragmentary sectional view illustrating the drive mechanism, the view being taken as indicated by the line 6-6 in FIGURE 1; and

FIGURE 7 is a schematic wiring diagram.

The caser of the instant invention as illustrated as employed with rectangular packages or cartons of frozen food as received continuously or intermittently from a freezing line, or other source of supply, which are to be placed in a case for storage or shipment. The cartons or packages are assembled in a layer of approximately the proper dimensions for insertion in a case and are translated or moved as a layer to enter the case, preferably certain controls or interlocks being provided so that no translation of the layer can be effected when the layer is incomplete insofar as any of the packages or cartons is concerned. Also, an interlocking control is provided so that the layer will not be translated unless a case is in position to receive its charge of packages.

Referring to FIGURES 1, 2 and 4, the caser includes a fabricated frame 20 which adjacent its upper edge provides a support track 21 for a pair of adjacent parallel package conveyors 22 which are trained about suitable idler drums 23 and drive drums 24. Each conveyor 22 is of a width to accommodate one package 26. The drive drums 24 for the conveyors 22 is driven constantly through suitable chain and sprocket drive connections 27 and 28

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and a belt and pulley combination 29, from a driving motor 30 carried on the frame 20.

The two rows of cartons 26 are fed in end-to-end fashion from the conveyors 22 onto two parallel tracks formed by associated yieldable supports or track members 33 provided between spaced-apart side rails 31 (FIGURES 2 and 3), which are mounted on rails 34, 35 and 36. The yieldable track members 33, as seen in FIGURE 3, are pivotally mounted in respective support rails 34, 35 and 36, and are urged by suitable resilient means (not shown) to a horizontal position, being yieldable downwardly to pass the packages therebetween. The outer rails 34 and 35 are carried by a pair of adjusting rods 37 (FIGURES 2 and 3) which are journaled in the center support rail 36 and have threaded engagement with respective outer rail supports 34 and 35 by respective right and left hand threaded portions thereof. By operating the handle 38 on one of the support shafts 37, these shafts can be rotated to vary the spacing between the side rails 31 of the track and thereby accommodate the equipment to different package dimensions.

It will be noted that the cartons after leaving the conveyor 22 are pushed frictionally along the supporting track members 33, so that, if there is no following carton to push them, a carton once placed on the members 33 will remain in its initial position until pushed from this position by a succeeding carton. In this way, the assembly station for a layer of cartons provided by the track members 33 will not be filled unless there is an ample supply of cartons.

Means is provided responsive to the presence or absence of a full layer of cartons at the assembly station for interrupting or disabling the drive for feeding a layer of cartons if the layer is incomplete. This means takes the form of a pair of switches 41 (FIGURES 2, 4 and 5) which are normally conditioned to prevent operation of the layer feed unless the respective control buttons 42 are pressed to the right as viewed in FIGURE 5 by respective floating rods 43 slidably journaled in a mounting bracket 44 for the switches 41 on a panel mounting bracket 46 suitably secured on the frame of the machine. These floating rods 43 abut respective pawls 47 pivoted at 48 on the bracket 46 and having their rounded ends disposed in the path of the respective rows of oncoming cartons. The switches 41 in a control circuit for the carton translating means or pusher member are described later.

Means is provided for translating as a layer the layer of six packages on the track members 33 and this means takes the form of a pair of U-shaped pusher members 51, each supported by a pair of rods 52 from a vertically reciprocable frame 53. Each frame 53 is carried by a pair of rods 54 having threaded engagement in respective bosses 55 of an operating slide 56 having vertically spaced rollers 57 engaging in a track 58 on the frame 20. The operating slides 56 are connected by a spacer bar 60 and each slide has a pair of elongated horizontal slots 59 engaged by respective rollers 61 on respective chains 62, each chain 62 being carried by a pair of sprockets 63 on respective shafts 64. The vertical support rods or shafts 54 carry at their upper ends respective sprocket wheels 66 connected by a chain 65 for simultaneous rotation, and one of the sprocket wheels carries a shaft extension having an operating handle 67. By adjustment of these shafts 54, the spacing of the pusher members 51 from their operating slide 56 can be varied in accordance with the thickness of cartons to be placed in a case.

The translating means including the pusher members 51 and the drive means therefor including chains 62 and the sprocket 63, are operable cyclically to move the pusher members from their upper home position as shown

in FIGURE 1, to their lower extended position as shown in FIGURES 2 and 4. The cyclic drive is provided by a magnetic clutch 81 and a magnetic brake 82, as seen in FIGURES 1 and 6, which are of a conventional construction, the magnetic brake 82 serving to arrest motion when the drive from the clutch 81 is disabled. As seen in FIGURE 1, intermediate the clutch 81 and the brake 82 a driven sprocket 83 is provided which is connected by a chain 84 to a driven sprocket 86 on a counter shaft 87 which drives the chains 62 through a chain 88 engaging respective sprockets (not shown) on two of the shafts 64.

The magnetic clutches 81 and 82 are controlled in a conventional manner to provide a cyclic drive for the pusher members 51. The cyclic control means for the drive chains 62 is in the form of a spur gear 71 on one of the shafts 64 and meshing with a spur gear 72 carried by a control shaft 73 journaled in the frame 20. This shaft 73 carries a pair of control cams 74 of conventional type to operate the plungers 76 of a pair of switches 77 and 78 which are connected respectively to control a magnetic clutch 81 and a magnetic brake 82 and maintain the control for a full cycle.

A packing chute is provided below the assembly station to guide the layer of packages into a case at the end of the chute and to place these packages in the proper spacing for insertion into the case. This assembly chute takes the form of respective end plates 91 extending between the frame plates 92, and respective side plates 93 detachably secured by bolts 94 to the respective side plates 92 and extending downwardly and inwardly to provide a form with the plates 91 for insertion of a case 95 thereover. Referring to FIGURE 3, resilient side guide strips 96 depend from the adjustable supports 34 and resilient inner guide strips 97 depend from the inner support 36 to yieldably hold a layer of cartons pushed therebetween, the cartons being gradually converged into the proper rectangular spacing for entry into the case 95.

Means is provided for holding and presenting a case to the bottom of the carton chute, this carton holding and presenting means being operated intermittently and in synchronism with the pusher member 51. As seen in FIGURES 1, 2 and 3, a case supporting plate 101 is secured at the end of an arm 102 made up of a pair of parallel strips pivotally mounted at 103 on the frame. Intermediate its ends the arm 102 is connected by a lift link 104 to a lift arm 105 secured on a shaft 106. The lift link 104 is pivotally connected to the lift arm 105, and is provided with a lost motion connection with the arm 102, being slidably received in this arm 102 and having an abutment 104a beneath the arm. The shaft 106 also carries a sprocket 107 which is driven through a chain 108 from a suitable sprocket on the shaft 87, the gear ratio being such that the lift arm 105 and the lift link 104 are operated through a complete cycle for each operation of the pusher mechanism, every other cycle being inactive as will now be described.

A yieldable latch is provided for the case holding and presenting means, which is released under control of the pusher members 51. For this purpose the arm 102 (FIGURE 1) carries a pin 111 which engages a seat 112 at the upper end of a latch arm 113 pivotally mounted on the frame at 114. A spring 116 urges the latch arm 113 into the position shown in FIGURE 2 where the case 95 is held in its upper position. The insertion of the last layer of cartons into a case moves the case supporting arm 102 to effect release of the latch arm 113. The case holding plate 101 is adapted in its lower-most position shown in dotted lines in FIGURES 1 and 6 to pass between and below two case discharge conveyors 126. One of these conveyors being driven through a belt 127 from the control shaft 128.

In the upper position of the case 95 it engages and closes a contact arm 121 of a switch 122 which is placed in series with the switches 41 so that the pusher drive

cannot be operated unless all of the switches are suitably conditioned. Referring to FIGURE 7, there is shown a schematic wiring diagram of the relation of the various switches, each of the switches 41 and 122 having two sets of contacts, one set 41a and one set 122a being normally open and another set 41b and 122b being normally closed. By reference to FIGURE 7 it will be seen that the contacts 122a, 41a and 41a are in series with each other and are placed in parallel with the clutch switch 77 for the magnetic clutch 81. Also it will be seen that the switches 41b, 41b and 122b are placed in parallel in the brake circuit and this parallel relation is in series with the brake switch 78 for the magnetic brake 82. As a result, once the three switches 122a, 41a and 41a are closed to start operation of the clutch, the clutch driven parts operate to close the clutch switch 77 and to maintain the clutch energized for the full cycle irrespective of opening of one or more of the switches 41a, 41a and 122a.

Also, it will be seen that the brake circuit will be maintained in the condition shown in FIGURE 7 as long as any one of the switches 41b and 122b remains closed, and that all three of these switches must be open to inactivate the magnetic brake 82. However, once the cycle of operation is started, the brake switch 78 is open so that subsequent closing of the switches 41b and 122b will have no effect on the cycle in process, but these switches will close to take effect at the end of the cycle when the holding switch 78 again closes.

In operation, assuming the machine to be properly adjusted for the number of layers of cartons to a case by adjusting the screw supports 54, and to the width of packages in a case by adjusting the horizontal screw support shafts 37, and assuming a case to be placed on the carton chute so as to close the switch 122, the operation will proceed as follows:

The cartons are coming down the two parallel conveyors 22 and are discharged therefrom onto the support tracks 33 for frictional feeding until a complete layer of cartons is assembled at the carton assembling station, and the two endmost cartons have closed the respective switches 41. At this time the circuit for the clutch 81 is completed and the circuit for the brake 82 is interrupted so that one cycle of operation begins and the clutch 81 is maintained operating through the cycle by closing of the clutch switch 77 during this one-cycle drive of the pusher mechanism the pusher slides 56 start descending to move the pushers 51 downwardly for the depth of one carton, and at this time the switches 41 again become open because of the absence of cartons at the carton assembly station. During this downward pushing movement the extensions 51a of the pusher members 51 hold the oncoming cartons from the assembling station. Also during this first cycle of movement of the pusher members 51, the lift crank 105 and the lift link 104 perform an idle movement because of the lost motion connection between the lift link 104 and the case support arm 102.

When the pusher members 51 recede or move upwardly, the cartons are again free to enter onto the support track 33 and complete the assembly of another layer and thus initiate another cycle of the carton-translating or pusher means, and this cycle will be effective to move the second layer of cartons into the case, and as this is done, the case holder arm 102 is pushed free of its latch arm 113 and can move downwardly to deposit the case on the conveyor 126 for discharge from the equipment. This second cycle of operation in effect moves the case supporting arm 102 and the case 95 from the position shown in FIGURE 2 to that shown in FIGURE 4, and the case 95 and its contents will descend as rapidly as permitted by the link 104, and when the case 95 is engaged with the conveyor 126 it will be rapidly discharged from the equipment, and leave the case supporting or holding arm 102 free to be lifted by the lift link 104 and the lift crank 102 to the position shown in FIGURE 1.

While we have shown and described a preferred em-

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bodiment of the invention, it will be apparent that the invention is capable of variation and modification of the form shown so that the scope thereof should be limited only by the scope of the claims appended hereto.

We claim:

1. In a caser for cartons of goods having a frame, means for assembly cartons in a horizontal layer at a layer assembly station on said frame, and also having carton receiving means disposed below said station, carton translating means disposed above said station including a pusher member for engaging the layer of cartons, a drive slide member connected to said pusher member, said drive slide member being mounted for vertical movement by means including a pair of rollers thereon and a vertically extending track on said frame and engaged by said rollers, said drive slide member having a pair of horizontally extending slots therein, respective pairs of vertically spaced sprockets on said frame and disposed in the region of said drive slide, chain means engaged with each sprocket, and roller means carried by each chain means and engaging one of said horizontal slots and said

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drive slide member, said chain means being disposed in vertical overlapping relation with said drive slide member to provide reduced height of the caser.

2. In a caser as recited in claim 1 in which adjustable connecting means is provided between said drive slide member and said pusher member, said connection including an internally threaded element carried by one of said members, and an externally threaded element carried by the other said members and engaged with said internally threaded element.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,014,599

December 26, 1961

Joseph L. Lawrence et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 5, line 7, for "assembly" read -- assembling --.

Signed and sealed this 24th day of April 1962.

(SEAL)
Attest:

ESTON G. JOHNSON
Attesting Officer

DAVID L. LADD
Commissioner of Patents