

June 19, 1934.

H. PAXTON

1,963,377

AUTOMATIC STOP

Original Filed July 17, 1930 2 Sheets-Sheet 1

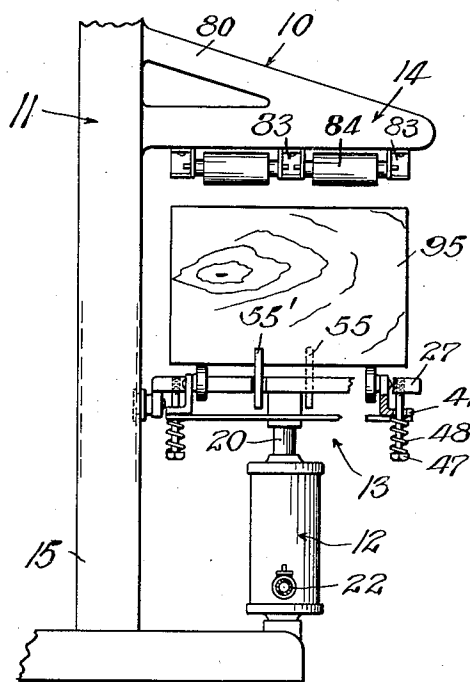


Fig. 1.

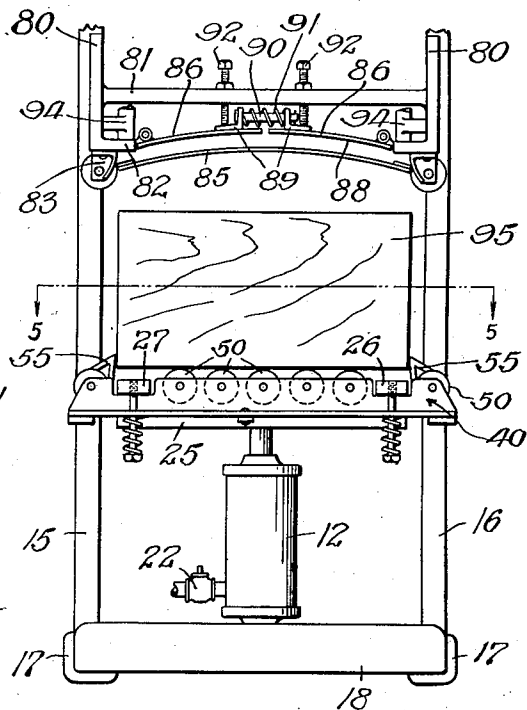


Fig. 2.

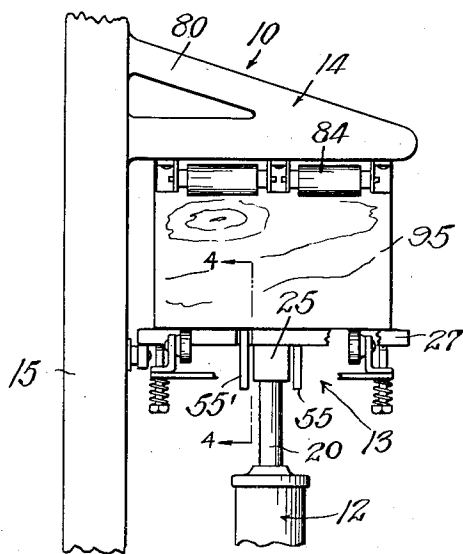


Fig. 3.

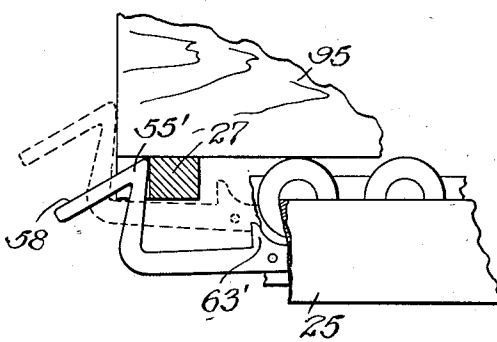


Fig. 4.

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2 Sheets-Sheet 2

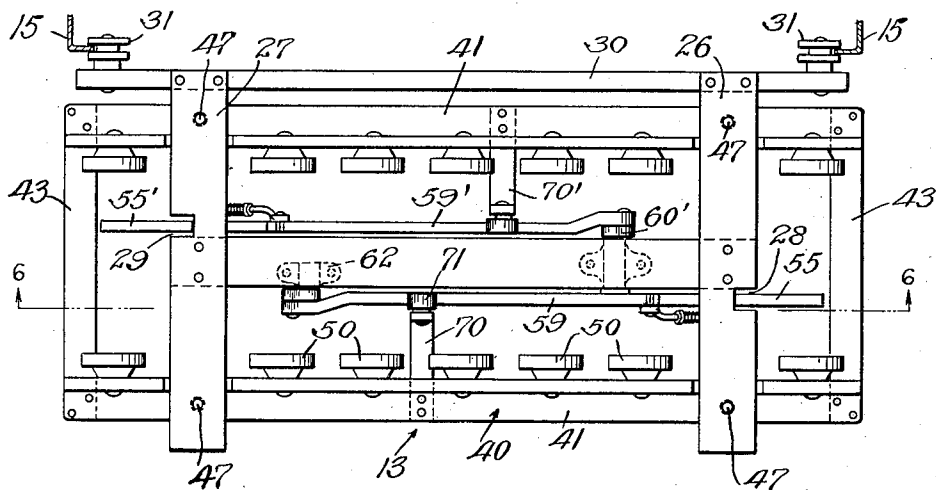


Fig. 5.

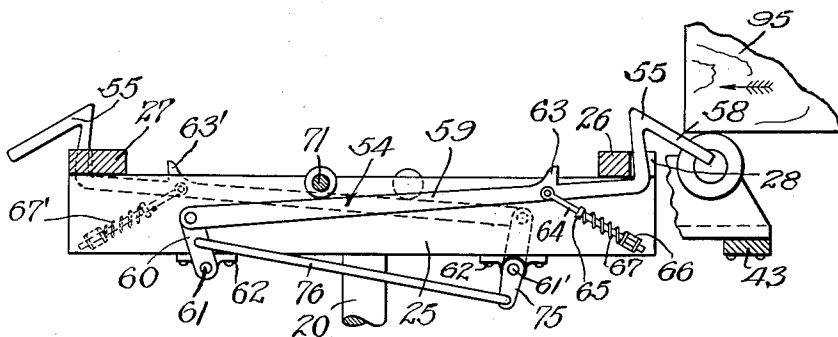


Fig. 6.

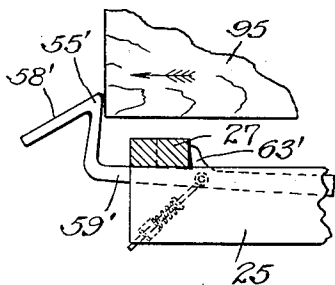


Fig. 8.

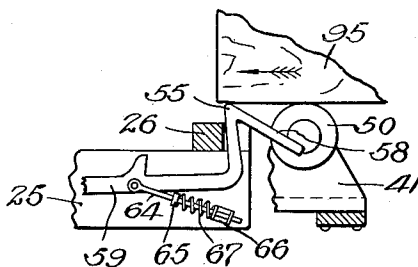


Fig. 7.

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UNITED STATES PATENT OFFICE

1,963,377

AUTOMATIC STOP

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Application July 17, 1930, Serial No. 468,680
Renewed January 18, 1932

14 Claims. (Cl. 1—10)

My invention relates to automatic stops, such as are adapted for use on box nailing machines, and particularly such machines which are employed in lidding boxes.

In the lidding of boxes, it is a common practice to use a nailing machine having a work station onto which the boxes roll from a conveyor, and from which a box is discharged onto another conveyor after it has been lidded. In order to properly lid the box, it is necessary that this be alined with the nailing mechanism when this is set in operation. To accomplish this, stops have previously been employed which are fixed to the frame of the nailing machine, it being necessary to move the box out from the stops after a lidding operation in order to discharge the box from the nailing machine.

It is an object of my invention to provide an automatic stop which may be used on nailing machines to hold a box in the proper position for nailing the lid thereon, and which will be automatically disengaged from the box when a nailing operation is accomplished.

It is a further object of my invention to provide automatic stops which may be used on a nailing machine so as to permit boxes to be received from either side of the machine, and which will position these boxes against longitudinal movement in either direction when the box reaches the proper work station in the machine.

In my copending application for U. S. Letters Patent, Serial No. 526,927, filed April 1, 1931, and in my U. S. Letters Patent No. 1,858,556, issued May 17, 1932, I show nailing machines for lidding boxes in which the boxes are lifted into operative contact with a lid nailing mechanism. When the box has been lidded in one of these machines, it is desired to automatically discharge it from the machine as the box is being lowered.

Accordingly, it is another object of my invention to provide automatic stops responsive to a lidding operation in a lidding machine, to permit a box to be discharged from this machine while being lowered.

The manner of accomplishing the foregoing objects, as well as further objects and advantages, will be made manifest in the following specification taken in connection with the accompanying drawings, in which:

Fig. 1 is a side elevational view of a nailing machine having a preferred embodiment of my invention incorporated therewith, and showing a box on the nailing table.

Fig. 2 is a front elevational view of Fig. 1.

Fig. 3 is a fragmentary view similar to Fig. 1 and indicating the nailing table in raised position.

Fig. 4 is a fragmentary enlarged detailed view showing one of the stops of my invention in two of its positions.

Fig. 5 is a plan view of a nailing table of my invention.

Fig. 6 is a longitudinally vertical sectional view taken on the line 6—6 of Fig. 5.

Fig. 7 is a fragmentary detailed view of one of the stops of my invention being depressed by a box passing thereover.

Fig. 8 is a fragmentary detailed view of one of the stops of my invention being engaged by the front end of the box moving into its work station so as to move this stop into box indexing position.

Referring specifically to the drawings, my invention is here seen as embodied in a nailing machine 10 having a frame 11, a hydraulic cylinder 12, a nailing table 13, and a lid supporting and nailing mechanism 14.

The frame 11 includes channel iron side standards 15, these having feet 17 preferably formed of heavy angle iron, these feet being connected by a solid beam 18.

The hydraulic cylinder 12 is rigidly secured in upright position on the beam 18, and has a piston rod 20 upon the upper end of which the nailing table 13 is mounted. The cylinder 12 is provided with a suitable valve 22 through which fluid is admitted to operate this cylinder for a purpose to be made manifest hereinafter.

The nailing table 13 includes a solid beam 25 which is fixed upon the upper end of the piston rod 20. Across opposite ends of the beam 25 are rigidly mounted nailing anvils 26 and 27, these anvils having notches 28 and 29 as clearly shown in Fig. 5. Connecting inner ends of the anvils 26 and 27 is a bar 30 on opposite ends of which are mounted flanged rollers 31 which engage forward flanges of the channel standards 15 so as to guide the nailing table during vertical movement thereof.

Extending longitudinally of the nailing table 13 is an auxiliary table 40 having longitudinal angle iron members 41 which extend beneath the anvil bars 26 and 27, and are connected at their opposite ends by cross bars 43. The longitudinal member 41 have their vertical flanges notched opposite the anvils 26 and 27 to permit upper edges of these angle iron members to be brought substantially to the same level as the upper faces of the anvil bars. Fixed in the anvils 26 and 27 are bolts 47 which extend downwardly through the auxiliary table member 41,

these bolts having heads on their lower ends and springs 48 disposed about the bolts between these heads and the frame members 41. The springs 48 thus yieldably support the auxiliary table 40 on the nailing table 13. Mounted on the vertical flanges of the members 41 are conveyor rollers 50, the uppermost points in these rollers preferably lying in a horizontal plane which is disposed above the upper faces of the anvil bars 26 and 27, as clearly shown in Figs. 1, 2, and 6.

Provided on the nailing table 13 is a stop mechanism 54, which includes two stops 55 and 55'. The stop 55 is shaped as shown in Fig. 6 so as to provide an oblique cam face 58, this stop being mounted upon the end of an arm 59 which is pivotally mounted on the upper end of an arm 60 fixed on one end of a short shaft 61 which is journaled in a bearing 62 mounted on the lower face of the nailing table beam 25. The arm 59 has a lug 63, and pivotally connected to this arm is a short rod 64 which has a collar 65 and slides through a slide block 66 which is pivotally mounted on a side face of the solid beam 25. Coiled about the rod 64 between the collar 65 and the slide block 66 is a compression spring 67 which yieldably urges the stop 55 upwardly and inwardly so that this stop normally extends above the uppermost point of the rollers 50, as clearly shown in Fig. 6. Provided on that auxiliary table frame member 41 which lies adjacent to the stop 55 is an arm 70 having a roller 71, the latter being disposed directly over the arm 59 and in contact therewith when the stop 55 is in its normal upward position as shown in Fig. 6.

The description thus far of the stop 55 applies equally to the stop 55', and where it is necessary hereinafter to refer to corresponding parts of the stop 55 these will be referred to by the same numerals with a prime added thereto.

It is to be noted in Fig. 6 that the shaft 61' extends through the bearing 62', and has an arm 75 extending downwardly therefrom. Pivotally connected to the arms 60 and 75 at points equal distances from their respective shafts 61 and 61' is a link 76. It is thus seen that when either of the stops 55 or 55' is moved in a horizontal direction, the other stop is caused to move exactly the same distance in the opposite direction. This movement, of course, is assisted by the springs 67 and 67' when the stops are moving towards each other, and is resisted by these springs when the stops are being separated.

It is also noted that the positioning of the rollers 71 and 71' over the arms 59 and 59' has the effect, whenever the auxiliary table 40 is depressed relative to the nailing table 13, of depressing the stops 55 and 55', the utility of this function being made manifest hereinafter.

The lid supporting and nailing mechanism 14 is mounted upon heavy overhanging arms 80 which are connected together by cross bars 81 and have lugs 82 formed along their lower edges. Journaled in suitable brackets 83, fixed on the under faces of the lugs 82, are rollers 84 between which a lid 85 is adapted to be supported as shown in Fig. 2. Hinged at their outer ends to the lugs 82 are opposite end portions 86 of a crown plate 88, these portions having angle brackets 89 mounted on their inner ends. Slidably mounted in these brackets are bolts 90 about which compression springs 91 are coiled so as to urge the respective end portions of the crown plate 88 apart, and thereby bulge this plate up-

wardly. Threadedly mounted in the cross bars 81 are set screws 92 which bear against the brackets 89 and adjust the curvature of the crown plate 88.

Secured to inner faces of the arms 80 are nailing chucks 94 of the mechanism 14, this mechanism including means for driving nails downward from these chucks at the will of the operator.

The operation of my invention is as follows:

It is assumed, of course, that the nailing machine 10 is placed in a line of conveyors in the usual manner so that boxes 95 may be fed thereto from such a conveyor which is disposed as usual on the same level as the rollers 50 when the nailing table 13 is in its normal position. A discharge conveyor also provided on this level is to be assumed as being positioned at the opposite side of the nailing machine 10. Under some circumstances it is desired to receive boxes for lidding in the nailing machine 10 for one side of the machine and discharge these in the opposite direction. At another time these directions may be reversed completely. At other times it may be desired to receive boxes from one direction and after the boxes are lidded discharge these boxes back in the same direction from which they came. A further manner of operation of the machine 10 is to receive the boxes from either of the two sides thereof, and after these boxes are lidded push these boxes directly rearwardly through the frame 11 of the machine along a suitable discharge conveyor provided there to receive these boxes as shown in my U. S. Letters Patent above noted.

The operation of the invention under all of these circumstances will be made clear by describing its use when the boxes are received from the right hand side of the machine 10, and discharged on the left hand side thereof. The normal positions of the stops 55 and 55' are shown in Figs. 5 and 6. In Fig. 5 a box 95 is diagrammatically shown as approaching from the right.

In Fig. 7 it is shown how the box contacting the cam face 58 depresses the stop 55. After this stop is depressed the box 95 continues on over the rollers 50 until it comes in engagement with stop 55' which, as shown in Fig. 8, gives way to the momentum of the box until the lug 63' engages the anvil 27 which checks the leftward movement of the stop 55' and the box 95. As formerly described, horizontal movement of either of the stops 55 and 55' is transmitted through the link 76 to the other stop to cause this to move an equal distance in the opposite direction. In this case the stop 55 is moved to the right by the described movement of the stop 55' so that the stop 55 clears the righthand end of the box 95, and is moved upwardly by the spring 67 opposite the righthand end of the box thus trapping the box between the two stops 55 and 55', as clearly shown in Fig. 2.

The stops 55 and 55' are so disposed on the nailing table 13 that when the box 95 is thus trapped it is correctly positioned for having a lid applied thereto by the lid supporting and nailing mechanism 14. To accomplish this, the valve 22 is opened to supply fluid under pressure to the cylinder 12 thereby lifting the nailing table 13 and bring the box 95 against the lid 85. This compresses the lid upward against the crown sheet 88 so that the ends of the lid are pressed against the lugs 82 directly beneath the nailing chucks 94. The nailing mechanism 14 is now

actuated so as to nail the ends of the lid 85 onto the box 95.

The compressing of the ends of the lid 85 between the box 95 and the nailing mechanism lugs 82 cause the continuing movement of the nailing table 13 to lift the nailing anvils 26 and 27 into contact with the opposite lower ends of the box 95, and compresses the springs 48. The vertical movement thus caused between the nailing table 13 and the auxiliary table 40 results in the rollers 71 and 71' depressing the stops 55 and 55' entirely beneath the level of the bottom of the box 95 so that under the action of the springs 67 and 67' the stops move inwardly towards each other in their respective notches 28 and 29 as indicated in Fig. 4. In this figure stop 55' is shown in dotted lines in the position it held while the box 95 was being elevated, and in full lines it is shown in the position which it assumes as a result of elevating the box to the lidding position above described.

Accordingly, after the lidding is completed, both stops 55 and 55' are disposed beneath the box 95, and cannot therefore obstruct movement of the box from the auxiliary table 40 in any direction that it is desired to move this box. It is thus seen that any of the operating conditions mentioned hereinabove will be served by the stops 55 and 55' as they will receive a box from either side of the machine 10, will automatically and positively position this box against movement longitudinally, and will permit this box after it is lidded to be discharged in either of said longitudinal directions or through the rear of the machine, if this is desired.

While I have shown and described but a single embodiment of my invention, it is to be understood that various modifications might be made in this without departing from the spirit of the invention or the scope of the appended claims.

What I claim is:

1. In combination: means forming a runway passing through a work station; a stop for halting at said station an object travelling along said runway; means for yieldably urging said stop towards said object while it is thus engaging said object; means for performing an operation on said object at said work station; and means actuated by the last aforementioned means to depress said stop beneath the level of said object, said yieldable means urging said stop beneath said object when thus depressed.

2. A combination as in claim 1 in which said object is supported by a table at said work station and in which the depression of said stop is accomplished by an excessive vertical pressure of said object against said table incidental to said operation.

3. In combination: means forming a runway passing through a work station and including a table beneath said work station; a stop for halting an object in said station on said table; means cooperating with said table for compressing said object vertically thus increasing the pressure between said table and said object; and means responsive to said increase of pressure to withdraw said stop from in front of said box.

4. In combination: means forming a runway passing through a work station; a pair of longitudinally spaced stops adapted to engage opposite ends of an object so as to positively position said object at said station as said object travels along said runway, said stops being yieldingly mounted to give way before an object moving along said runway onto said work station from

either direction; means for performing an operation on said object at said station; and means actuated by the last aforementioned means to withdraw one of said stops from the path of said object to permit said object to be moved along said runway when said operation is completed.

5. In combination: means forming a runway passing through a work station; a pair of longitudinally spaced stops adapted to engage opposite ends of an object so as to positively position said object at said station as said object travels along said runway; means for performing an operation on said object at said station; and means actuated by the last aforementioned means to withdraw both of said stops from the path of said object to permit said object to be moved along said runway in either direction, the discharge of said object from said position causing both of said stops to be automatically restored to operative position.

6. A combination as in claim 3 embodied in a box nailing machine in which said table includes nailing anvils and an auxiliary table yieldably supported thereabove, the pressure against a box resting on said auxiliary table causing relative vertical movement between said auxiliary table and said anvils to position said anvils in contact with ends of said box, said relative movement effecting the withdrawal of said stop as aforesaid.

7. In a box nailing machine, the combination of: a nailing table including nailing anvils and an auxiliary table yieldably mounted to support a box with its ends above and out of contact with said anvils; stop means to position a box on said nailing table; means to perform a nailing operation on said box and including a press which applies pressure to said box to cause relative vertical movement between said auxiliary table and said anvils and brings the latter into contact with end portions of said box; and means actuated by said relative movement to release said stop means from said box.

8. A combination as in claim 7 in which said nailing means has a fixed position above said nailing table and in which means is provided to elevate said table to bring said box into contact with said nailing means and perform said nailing operation.

9. In a box nailing machine, the combination of: a nailing table including nailing anvils and an auxiliary table yieldably mounted to support a box with its ends above and out of contact with said anvils; a pair of stops mounted on said nailing table at opposite ends thereof; means for connecting said stops to cause each to respond to a movement of the other by a movement in the opposite direction and yieldably urging them towards each other and into the path of a box being moved horizontally onto said auxiliary table, there being cam faces on said stops causing either stop in the path of a box being moved as aforesaid to be depressed by said box, said last-mentioned means causing said stops to separate a sufficient distance to receive said box between the stops when said box engages the farther stop, whereupon said means urges said stop first contacted upwards at the rear of said box thereby positively trapping said box in position for a nailing operation; nailing means having a fixed position above said nailing table; and means to elevate said table to bring said box into pressurable contact with said nailing means, to perform a nailing operation on said box, the pressure of said contact causing said anvils to move up into

contact with end portions of said box after elevation of said auxiliary table has halted, said movement depressing said stops and permitting them to be urged towards each other beneath said box thereby causing these stops to be trapped in retracted positions where neither can interfere with removing said box from said auxiliary table.

10. In a lidding machine the combination of: a nailing table; a pair of stops positioned nearer together than the length of a box and adapted to engage opposite ends of said box to position it against movement in either direction on said table; and yieldable means for mounting said stops whereby the foremost stop will yield out of the path of a box and the farthest stop will be yieldably carried with said box to permit said first stop to be lifted up by said yieldable means at the rear of said box.

11. In a box handling machine, the combination of: means forming a runway passing through a work station; a pair of stops, one of which is disposed at each end of said station in the path of a box travelling on said runway; and means for yieldably supporting said stops to cause the first stop engaged by said box to be depressed thereby, said yieldable means then permitting the second stop to yield horizontally to uncover said first stop and permit the latter to extend into said runway at the rear of said box.

12. A combination as in claim 11 in which said stops operate as aforesaid to receive a box from either direction on said runway and centralize said box in said work station.

13. In a box handling machine, the combination of: means forming a runway passing through a work station; a pair of stops, one of which is located at each end of said station and provided with outwardly disposed sloping cam faces and inwardly disposed stop faces; mechanism actuated by a moving box engaging the stop face of the farther of said stops to move the other stop in the opposite direction; and means urging said stops into said runway and towards each other.

14. In a lid press for lidding a box having a flexible bottom and overfilled with fresh farm produce the combination of: a nailing table for receiving said box; lid end engaging members disposed over said table; means causing relative vertical movement between said table and said members to press said lid onto said box, the lid being arched over the upwardly protruding contents of said box with the lid ends positioned on the box ends for nailing thereto; anvils provided on said table so as to be under said box ends during said lid pressing operation; and an idle roller conveyer yieldably mounted on said table between said anvils and supporting said flexible bottom along opposite side portions thereof on a level above said anvils, said conveyer being depressed by said lid pressing operation to bring said box ends onto said anvils during the nailing of the lid to said box ends.

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