April 26, 1932. H. J. HARDING 1,855,628

BOX END LABELING MACHINE

Filed Sept. 13, 1930 4 Sheets-Sheet 1

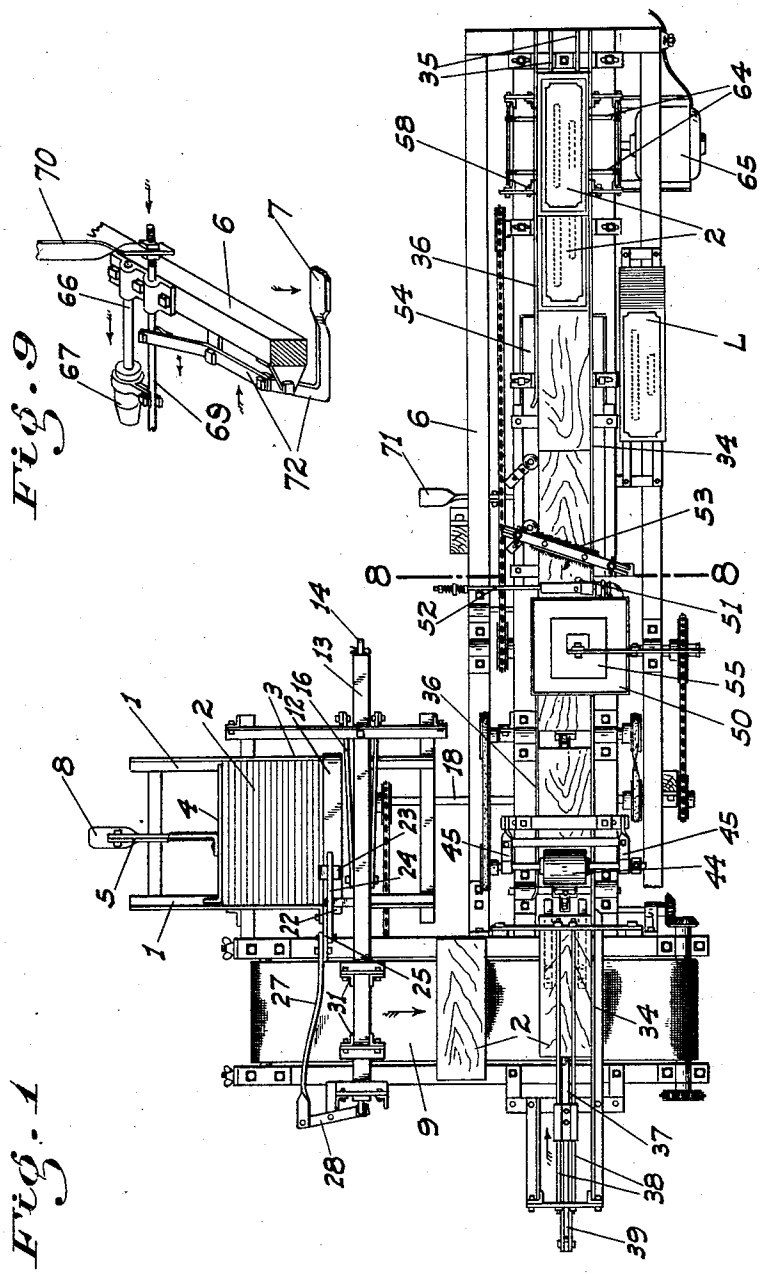


Fig. 9

Fig. 1

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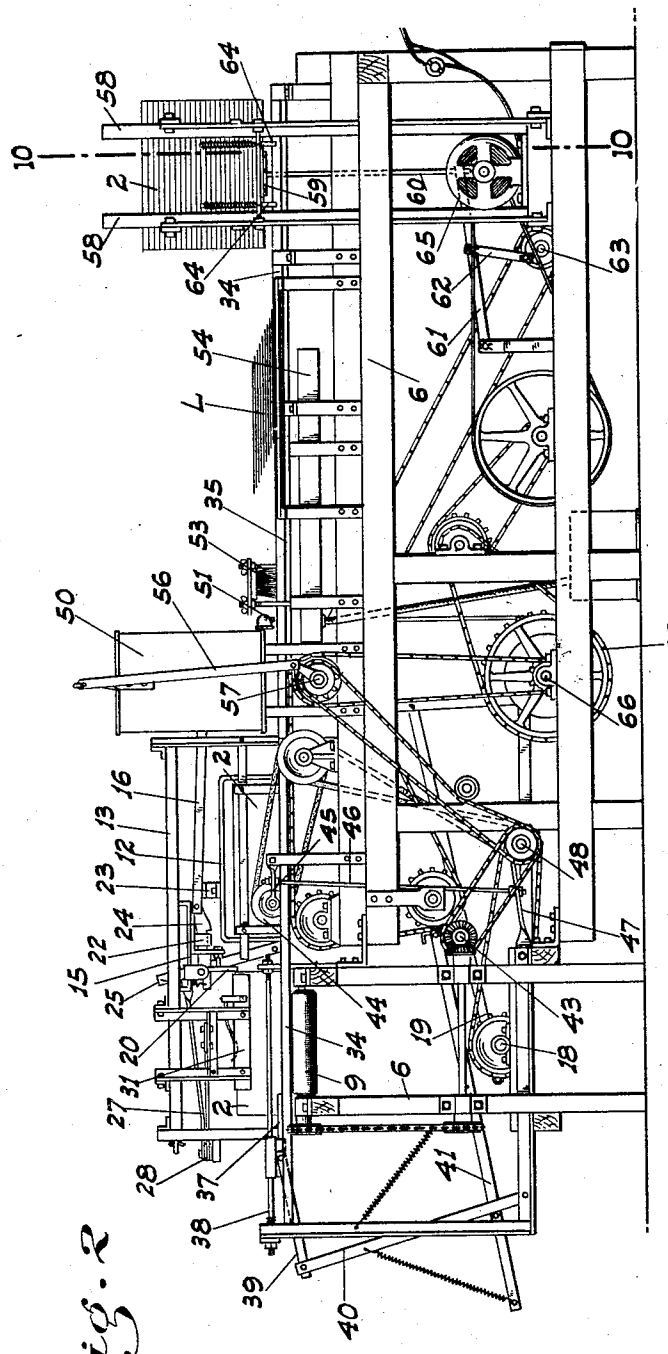


Fig. 2

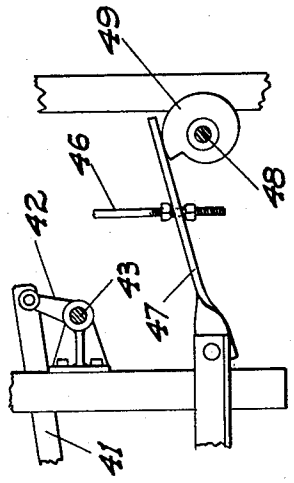


Fig. 7

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Fig. 3

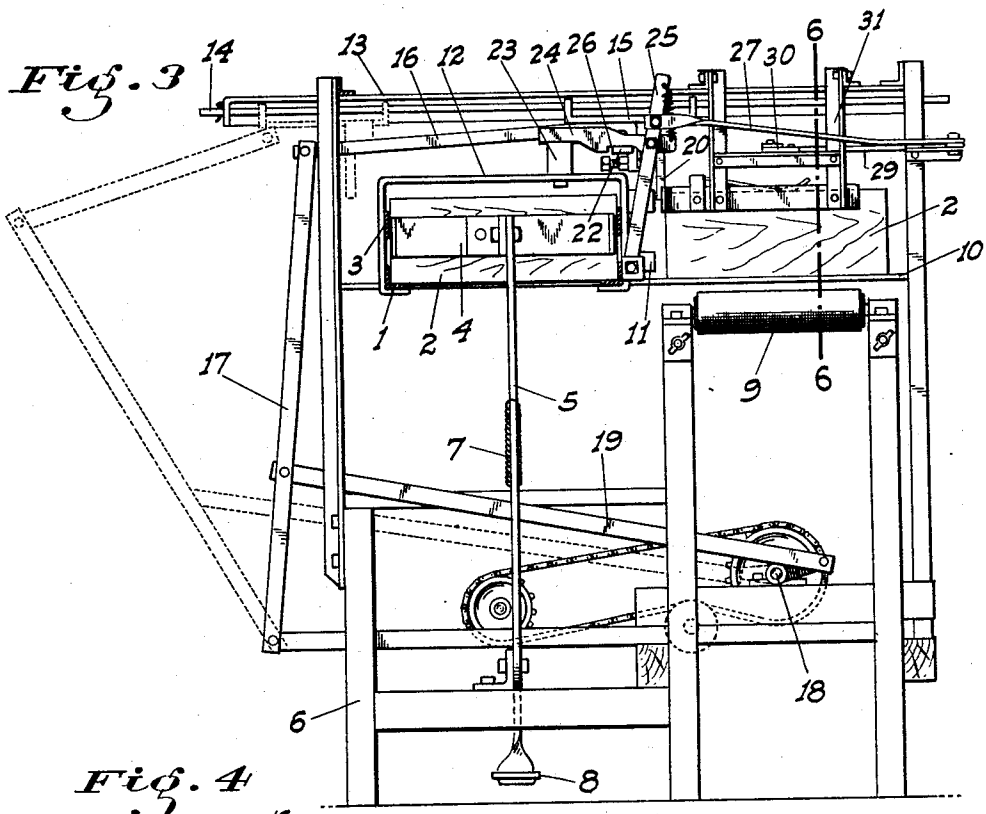
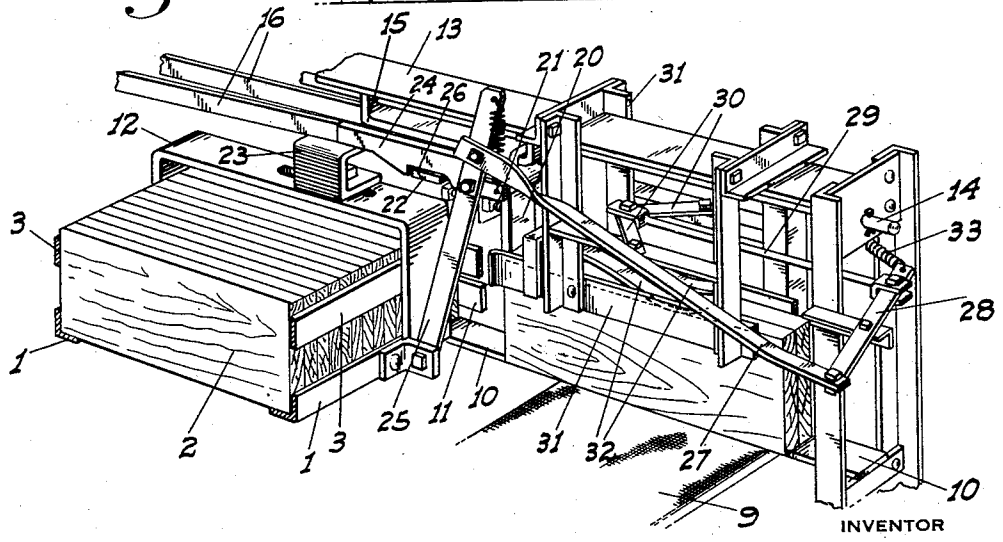


Fig. 4



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Fig. 5

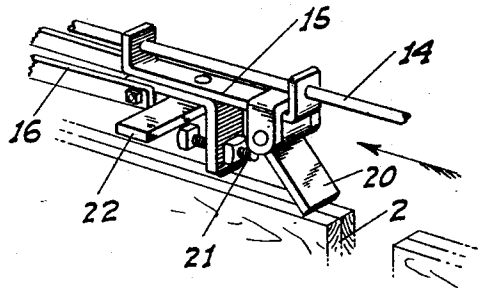


Fig. 6

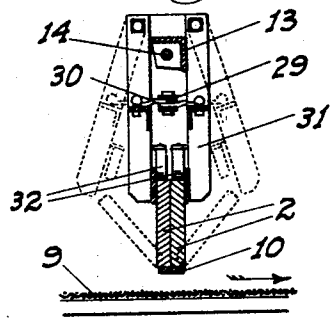


Fig. 8

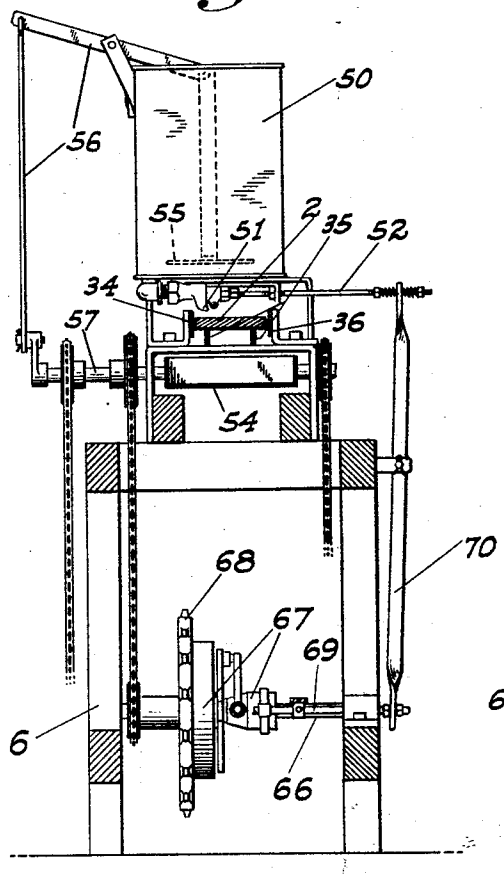
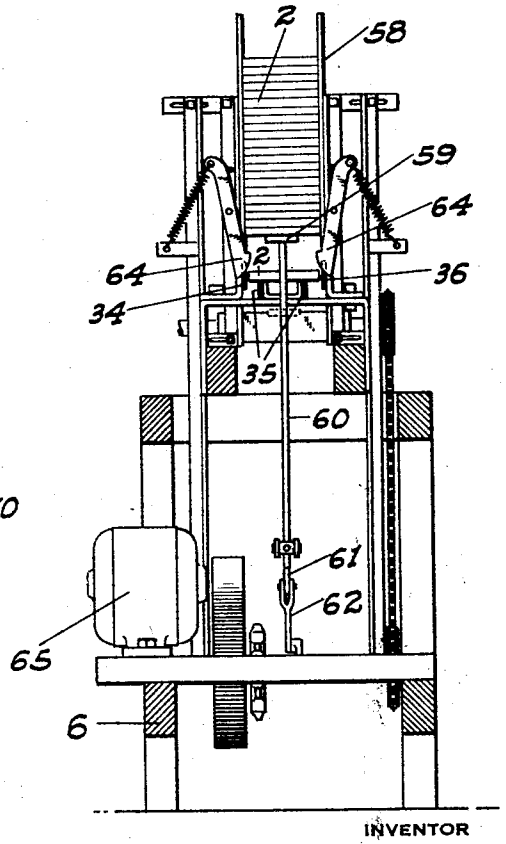


Fig. 10



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1,855,628

UNITED STATES PATENT OFFICE

HAROLD J. HARDING, OF CERES, CALIFORNIA

BOX END LABELING MACHINE

Application filed September 13, 1930. Serial No. 481,656.

This invention relates to machines for facilitating the placing of the usual printed labels on the ends of fruit boxes. My principal object is to provide a machine for the purpose which is arranged to automatically feed individual box-ends past an operator in a predetermined position and at a definite speed, and with their upper surfaces moistened with an adhesive. This enables the operator to merely place the labels on the box ends as they move past him without his having to devote any time to manipulate said box ends or to apply adhesive thereto or to the labels. The machine subsequently functions to automatically stack the box ends after the label has been applied. Labeling operations are therefore expedited considerably and the labor incident to performing such operations is also greatly lessened over what is necessary when the handling of the box ends and the applying of the adhesive thereto is all done by hand as was previously the case.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a top plan view of the complete machine.

Fig. 2 is a side elevation of the same.

Fig. 3 is a fragmentary side view of the machine taken from the opposite side.

Fig. 4 is a perspective view showing the mechanism for initially feeding a pair of box ends from the supply stack.

Fig. 5 is a fragmentary perspective view of such mechanism.

Fig. 6 is a fragmentary cross section taken substantially on the line 6—6 of Fig. 3.

Fig. 7 is a fragmentary view showing the actuating means for the board engaging roller.

Fig. 8 is a cross section on the line 8—8 of Fig. 1.

Fig. 9 is a fragmentary perspective showing the clutch actuating mechanism of the machine.

Fig. 10 is a cross section of the machine at the stacker end taken substantially on the line 10—10 of Fig. 2.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes a pair of horizontal transversely spaced rails which form the supports for a stack of box ends 2 (hereinafter referred to as boards) and onto which the labels are to be applied; side rails 3 above the rails 1 guiding the side edges of said boards. In the manufacture of boards of this character it is customary to surface only one face of the same and in placing the boards on the rails in stacked relation they are arranged in pairs so that their surfaced faces abut against each other. The boards are supported on the rails so that they stand vertically with their longitudinal edges horizontally as shown in Fig. 4. A presser bar 4 engages the outermost board of the stack and is constantly held against the same, so as to tend to advance the stack along the rails, by means of a vertical lever 5. This lever is connected to the bar 4 and is pivoted on the supporting framework 6 of the machine and has a tension spring 7 acting on the same in a direction such that the bar 4 exerts a constant pressure against the board engaged thereby. A pedal 8 is associated with the lower end of the lever so that the presser bar may be withdrawn from the stack to permit another supply of boards to be placed in position on the rails.

An endless belt 9 or similar conveyor is disposed to one side of the rails below the level of the same but parallel thereto; said belt extending some distance beyond the inner end of the stack and rails, or beyond that end opposite to the presser bar. A horizontal supporting rail 10, level with the rails 1, extends transversely of the same and over the belt 9, from the inner ends of the rails; the width of the bar being substantially equal to the width of the two boards. The rail 10 is disposed above the level of the belt 9 a sufficient distance to enable a board resting on the belt to pass under said rail in clearance relation thereto. Stop means 11 of suitable character limit the advancing movement of the stack so that the two endmost boards thereon normally aline with the rail 10. Said

rail 10 is just beyond a bridge 12 which is supported by the rails 1 and straddles the adjacent portion of the stack, as shown in Fig. 4.

A pair of boards are withdrawn from the inner end of the stack, moved along the rail 10 in overhanging relation to the belt 9, and then caused to fall onto the belt with their surfaced faces uppermost by the following means: Overhanging the stack and the rail 10 and extending lengthwise of the latter is a fixed bar or other member 13 which supports a rod 14 or the like thereunder which is parallel to said rail 10. A carriage 15 is slidable on the rod, the length of which is sufficient and is so arranged that the carriage can move from a point beyond the side of the stack opposite the rail 10 to a point beyond the opposite side of the stack. The movement is imparted to the carriage to move the same through the necessary distance, which is of course greater than the length of a board 2, by the following means:

Horizontal links 16 are connected to said carriage and extend to a point beyond the side of the stack opposite the belt 9. At their outer ends these links are connected to a vertical lever 17 which is pivoted at its lower end in connection with the frame 6. Intermediate its ends this lever is connected in cranked relation with a drive-shaft 18 by a connecting rod 19.

The end of the carriage nearest the belt 9 carries a swivelly mounted and depending pusher finger 20. This finger is free to swing upwardly in one direction but is limited in its downward movement beyond a vertical position in the opposite direction by a stop 21 fixed on the carriage. A rigid tongue 22 projects laterally from the side of the carriage in overhanging relation to the bridge 12. This tongue is also positioned on a level so that it may pass under a rest 23 supported on the bridge. Slidable on and engaging the rest is a bar 24 which is pivoted at one end on a vertical arm 25 which in turn is pivoted at its lower end in connection with one of the rails 1. The under edge of this bar slopes down for a certain portion of its length toward its pivot, and just beyond the sloping portion it is provided with a notch 26 to receive the adjacent end of the tongue as shown in Fig. 4. This bar 24 therefore forms a catch member engageable with but detachable from the tongue. A link 27 which is connected to the arm 25 intermediate the ends of the same extends in the direction opposite to the bar 24 to the plane of the outer end of the member 13, and is there connected to one end of a transversely extending lever 28. This lever is disposed on a level above the boards 2 and is pivoted intermediate its ends in a fixed position. A rod 29 which is pivoted on the opposite end of the lever extends over the rail 10 and is connected to the adjacent ends of a pair of laterally extending toggle links 30. The opposite ends of these links are connected to opposed board guiding units 31 which are pivoted in connection and depend from the support 13. Flat leaf springs 32 are carried by said units and are positioned to engage the upper edges of a pair of boards 2 disposed between said units. A spring 33 applied to the lever 28 acts to hold the same so that said guide units closely engage the boards, and said spring also acts on the arm 25, through the link 27, to hold the bar 24 in a position such that the sloping portion thereof is in front of the rest 23.

The parts of the structure thus far described are arranged to operate as follows:

When the carriage 15 is at the end of its stroke opposite the bar 10 and guide units 31, the finger 20 then depends below the level of the top edges of the two endmost boards of the stack, which as previously stated are normally alined with the rail 10. With the advance of the carriage due to the reciprocation of the actuating lever 17, these two boards are of course moved into position on the rail 10 between the guide members 31. When the carriage reaches its limit of movement in the board feeding direction, the tongue 22 drops into place in the notch 26 of the catch member 24; said catch member and the parts connected thereto being up to this time held in their normal positions by reason of the action of the spring 33. With the retracting or returning movement of the carriage, the tongue 22 being now engaged with the member 24, moves the same lengthwise. This movement is of course transmitted to the rod 29 through the interconnected parts, which causes the toggle links 30 to be moved so that the guide units 31 are separated toward their lower ends, as indicated in dotted lines in Fig. 6. This separation of these guide units causes them to disengage the boards so that the latter have no side support. In addition the springs 32 provided with said units, and which frictionally engage the top edges of the boards, act on said board with the separating movement of the units to tilt said boards away from each other. As a result the boards after a comparatively slight tilting movement naturally fall of themselves onto the belt 9 on opposite sides of the supporting rail 10. Since the surfaced faces of the boards are those which were initially against each other, such faces will now be uppermost on the belt.

By the time the carriage and member 24 have moved sufficiently to cause the guide units to be separated to the necessary extent, the sloping portion of the member 24 has engaged the rest 23 and said member 24 will thus be raised sufficiently to cause the tongue to be disengaged from said member. The spring 33 is then again free to act, and the guide units and all parts connected thereto

return to their original normal positions. The tongue after its release from the member 24 passes under the rest and of course does not again function until a subsequent feeding movement of the boards has taken place. In the meantime the stack has of course advanced so that another pair of boards is abutted against the stop 11 and in position to be fed onto the rail 10. The depending finger 20 in its retracting movement therefore merely tilts upwardly and passes over said boards without tending to move the same, as shown in Fig. 5.

As the boards drop onto the belt 9 in spaced relation as above described, they are carried along by the movement of the belt until the foremost one abuts against a stop 34 which extends across said belt at a predetermined point. This stop is in the form of a guide bar for one side of the board and extends a considerable distance to one side of the belt as shown in Fig. 1. Bottom rails 35 for the support of the boards after they leave the belt 9 also extend lengthwise of the guide rail from said side of the belt and on a level with the same. Another guide bar 36 for the opposite side edges of the boards extends parallel to the bar 34 but stops short of the same or so as not to extend across the belt.

A plunger 37 is slidably supported by rods 38 which extend transversely of and above the belt centrally between the guide bars 34 and 36; said plunger being adapted to engage the edge of the board abutted against the stop 34.

The plunger is connected by a horizontal link 39 with a vertical arm 40 which is pivoted at its lower end in connection with the frame 6. This arm is oscillated so as to reciprocate the plunger through a stroke sufficient to push the board off the belt and onto the rails 35, by a substantially horizontal arm 41 which operatively engages the arm 40 intermediate its ends and which is connected to a crank 42 fixed on a driven shaft 43. (See Fig. 7). As the board leaves the belt and is received onto the rails 35 it passes under and is frictionally engaged by a transverse driven roller 44, which is mounted on short horizontally extending and flexible arms 45. These arms are arranged to exert a downward pressure on the roller so that the latter will firmly engage the board, and it is therefore best to positively raise the roller just as the board reaches the same to avoid having to initially force the board under the roller. To do this one of the arms 45 is connected to a depending rod 46 which at its lower end engages a substantially horizontal bar 47 which is pivoted at one end in connection with the frame 6. At its free end this bar rides on a cam 48 fixed on a driven shaft 49. This cam is of course arranged in timed relation with the advance of the board so as to cause the roller to be lifted just as the board reaches the same. Also the shape of the cam is such that the duration of the lift is very short.

The boards as they are successively fed by the roller 44 along the rails 35 abut in end to end relation so as to form a continuous intermittently advancing unit which moves past the stack of labels L which are disposed to one side of the rails 35 and in a position convenient to the operator who is stationed on the opposite side of the rails and boards.

An apparatus to apply adhesive to the upper surfaces of the boards is arranged in connection with the rails 35 before the boards reach the plane of the labels. This apparatus comprises a receptacle 50 mounted in overhanging relation to the advancing boards and having a bottom spout 51 to deliver onto a board. The flow from this spout is controlled by a slide valve arranged in connection therewith to which a laterally extending rod 52 is secured. Beyond the spout the boards are engaged by a transverse and diagonally extending brush 53 which distributes the adhesive evenly over the entire surface of the boards with their advancing movement and wipes excessive adhesive clear of the same. This excess adhesive is swept off one side of the boards and drops into a pan 54 positioned below the same; the adjacent side rail 36 being omitted where the adhesive drains off the boards so as to not interfere with the draining. The adhesive is preferably of a semi-liquid or free flowing character and is maintained agitated by a plunger 55 which depends into the receptacle and is reciprocated by suitable lever and linkage connections 56 operated from a driven shaft 57.

As the boards pass by the operator therefore their upper surfaces are properly supplied with adhesive and in a condition to receive the labels which are placed thereon by the operator as the boards halt in their movement past his station. The labels are preferably first wetted so that they are limp and easily applied and the stack of labels is therefore combed as shown so as to facilitate the movement of the individual labels from the stack.

As the labeled boards move beyond the operator they pass between the side uprights 58 of a stacker. When the boards are in position between the guides they are engaged underneath by a head 59 provided on the upper end of a rod 60. The lower end of this rod is connected to the free end of a horizontal arm 61 which is pivoted at its other end is a fixed position. A vertical link 62 is connected at its upper end to the arm intermediate its ends and at its lower end has crank connection with a driven shaft 63. The stroke of the link is sufficient to raise the board engaged by the head 59 from the level of the rails 36 to a level somewhat higher

than that of notched supporting catches 64 which are yieldably mounted in connection with the uprights 55 and whose lower notched edges normally project inwardly or the plane of the side edges of the boards. These catch members support the entire weight of the stack and as each board is raised from the rails it must first engage the adjacent board above and raise the same sufficiently to permit the lowest board to be engaged by the catches. The rod 60 and parts associated therewith must therefore be stiff enough to intermittently support the weight of the entire stack.

An electric motor 65 mounted on the frame 6 is preferably employed to operate the machine. It is of course to be understood that all the driven shafts previously described, as well as the belt 9, are operated by chain or gear drives as shown in Fig. 2. It is also to be understood that these drives operate at such relative speeds and in such synchronized relation to each other that the actuation of the members controlled by the shafts take place in definitely timed relation to each other. The movement of the boards from the initial to the final stack is therefore mechanically and automatically controlled without danger of the boards jamming or interfering with each other with their various movements.

One of the driven shafts 66 which is interposed between the motor and board advancing mechanism is directly under the receptacle 50 and is provided with a normally engaged clutch structure 67. This clutch is interposed between the sprocket wheel or gear 68 on said shaft, and which is more or less directly connected to the motor and the shaft itself, from which the other driven shafts are driven. The slidable member of this clutch is connected to a rod 69 disposed to one side of the shaft 66 and parallel thereto. The outer end of the rod is connected to a vertical lever 70 which is pivoted intermediate its ends on the frame 6 and at its upper end engages the valve rod 52 of the adhesive spout. A pedal 71 is operatively connected to the rod 69 by suitable linkage mechanism 72 (see Fig. 9) in such a manner that with the depressing of the pedal the rod 69 is moved to disengage the clutch; and the connection of said rod with the valve rod is such that with such disengagement of the clutch the spout 51 will be closed. Since the disengagement of the clutch causes the operation of the board advancing mechanism to be halted, there is no danger of the adhesive continuing to run out of the spout when the boards are no longer moving under the same.

From the foregoing description it will be readily seen that I have produced such a device as will substantially fulfill the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. A box-end labeling machine including means for supporting a row of box ends arranged in end to end relation, means for advancing the box-ends along said means, means associated with the supporting means for supplying adhesive to the upper surfaces of the box-ends as they are advanced, a label support beyond the adhesive supplying means whereby labels may be applied to the box ends after the adhesive has been supplied thereto, and stacking means associated with the box-end supporting means beyond the label support to form a vertical stack of the box-ends above the support after the labels have been applied thereto.

2. A box-end labeling machine including means for supporting a row of box-ends arranged in end to end relation, means for advancing the box-ends along said means, an adhesive receptacle associated with the supporting means, a valved spout connected to the receptacle positioned to permit adhesive to drop onto a box-end advancing along the supporting means, drive means for the advancing means, a normally engaged clutch in said drive means, manual means for disengaging the clutch at will, and connections between the clutch disengaging means and the spout for closing the valve of the spout with the disengagement of the clutch.

3. In a box-end labeling machine, a support for a row of box ends, a driven roller extending above the support adjacent one end and arranged to frictionally engage the box ends as the latter are fed onto the support, means to feed the box-ends toward and under the roller from beyond said end of the support, and driven means acting in conjunction with the feeding means to positively raise the roller clear of the box-ends as the forward ends of the latter are initially fed under the roller.

4. In a box-end labeling machine, means to support a stack of box-end boards disposed on edge with their side edges horizontal and with the surfaced faces of adjacent boards in face to face relation, means for feeding a pair of the boards horizontally and transversely from the stack simultaneously, a horizontal conveyor disposed to the side of the stack toward which the boards are fed, and over which they are disposed by the feeding means; and means associated with and functioning subsequent to the action of the feeding means to cause the boards to drop onto the conveyor in horizontally spaced re-

lation to each other with their surfaced faces uppermost.

5. In a box-end labeling machine, means to support a stack of box-end boards disposed on edge with their side edges horizontal, means to feed a pair of the boards from the stack simultaneously and in a transverse horizontal direction, a horizontal conveyor disposed to that side of the stack toward which the boards are fed and over which they are disposed by the feeding means, and means associated with but functioning subsequent to the feeding means to cause the boards to drop flatly onto the conveyor in horizontally spaced relation to each other.

6. In a box-end labeling machine, means to support a stack of box-end boards disposed on edge with their side edges horizontal, means to feed a pair of the boards from the stack simultaneously and in a transverse horizontal direction, a horizontal conveyor disposed to that side of the stack toward which the boards are fed and over which they are disposed by the feeding means, said conveyor extending lengthwise of the stack, means functioning in conjunction with but subsequent to the action of the feeding means to cause the fed boards to drop flatly onto the conveyor in horizontally spaced relation to each other, means for driving the conveyor to cause the boards thereon to be carried away from the stack, a support for the boards extending at right angles to the conveyor, adhesive applying means associated with said support, and means to successively feed the individual boards from the conveyor onto said support.

7. A structure as in claim 4, in which said last named means includes side guides for the opposed outer faces of the pair of boards, springs mounted in connection with the guides to engage the upper edges of the boards, and means for moving the guides outwardly of the boards whereby to cause the springs to tilt the boards outwardly so that they will then fall flatly onto the conveyor of themselves.

8. In a box-end labeling machine, means to support a stack of box-end boards disposed on edge with their side edges horizontal, a horizontal conveyor extending lengthwise of and beyond the stack to one side of the same, a rail overhanging the conveyor and extending laterally from one end of the stack support on a level therewith, means acting on the stack to normally maintain the innermost pair of boards thereof in alinement with said rail, means to simultaneously engage said pair of boards and feed them from the stack onto the rail in overhanging relation to the conveyor, and means associated with the rail and feeding means to tilt the boards away from each other when they are in overhanging relation to the conveyor so as to cause them to then drop flatly and of themselves onto the conveyor.

9. In a box-end labeling machine, means to support a stack of box-end boards disposed on edge with their side edges horizontal, a horizontal conveyor extending lengthwise of and beyond the stack to one side of the same, a rail overhanging the conveyor and extending laterally from one end of the stack support on a level therewith, means acting on the stack to normally maintain the innermost pair of boards thereof in alinement with said rail, means to simultaneously engage said pair of boards and feed them from the stack onto the rail in overhanging relation to the conveyor, said means including a reciprocating carriage whose movement in one direction thus feeds the boards, means mounted in connection with the rail to tilt the fed boards away from each other, and means functioning with the retractive movement of the carriage to actuate the board tilting means.

10. In a box-end labeling machine, means to support a stack of box-end boards disposed on edge with their side edges horizontal, a horizontal conveyor extending lengthwise of and beyond the stack to one side of the same, a rail overhanging the conveyor and extending laterally from one end of the stack support on a level therewith, means acting on the stack to normally maintain the innermost pair of boards thereof in alinement with said rail, means to simultaneously engage said pair of boards and feed them from the stack onto the rail in overhanging relation to the conveyor, said means including a reciprocating carriage whose movement in one direction thus feeds the boards, laterally separable guides for the opposed outer faces of the boards on the rail mounted in connection with the rail, springs mounted in connection with the guides to frictionally engage the upper edges of the boards, means for spreading the guides, and actuating means for said spreading means mounted in connection therewith and with the carriage and functioning with the retractive movement of the latter.

11. A structure as in claim 10, in which the guide spreading means includes angled toggle links connected to the guides, a longitudinally movable rod connected to the links, a vertical arm pivoted at one end, and connections between the arm and rod to move the latter in a link spreading direction with a swinging movement of the arm in the same direction as the retractive movement of the carriage; and the actuating means comprises a notched catch member projecting from the arm in said direction, a tongue projecting from the carriage to engage the notch in the catch member just as the carriage reaches the end of its stroke in a broad feeding direction whereby with the retractive movement

of the carriage the catch member will be drawn along and the parts connected therewith likewise moved, means acting to disengage the catch from the tongue after the catch has been moved a predetermined distance, and means acting to then return said catch and associated parts to their normal positions.

12. A structure as in claim 1, said stacking means comprising vertical guides for the box-ends upstanding from the support at the delivery end of the same, a vertical reciprocating plunger under the guides to engage and lift the box ends in succession in timed relation with the advancing of the same, and catch means associated with the guides to engage the lowest box end and hold the stack against downward movement.

In testimony whereof I affix my signature.

HAROLD J. HARDING.