

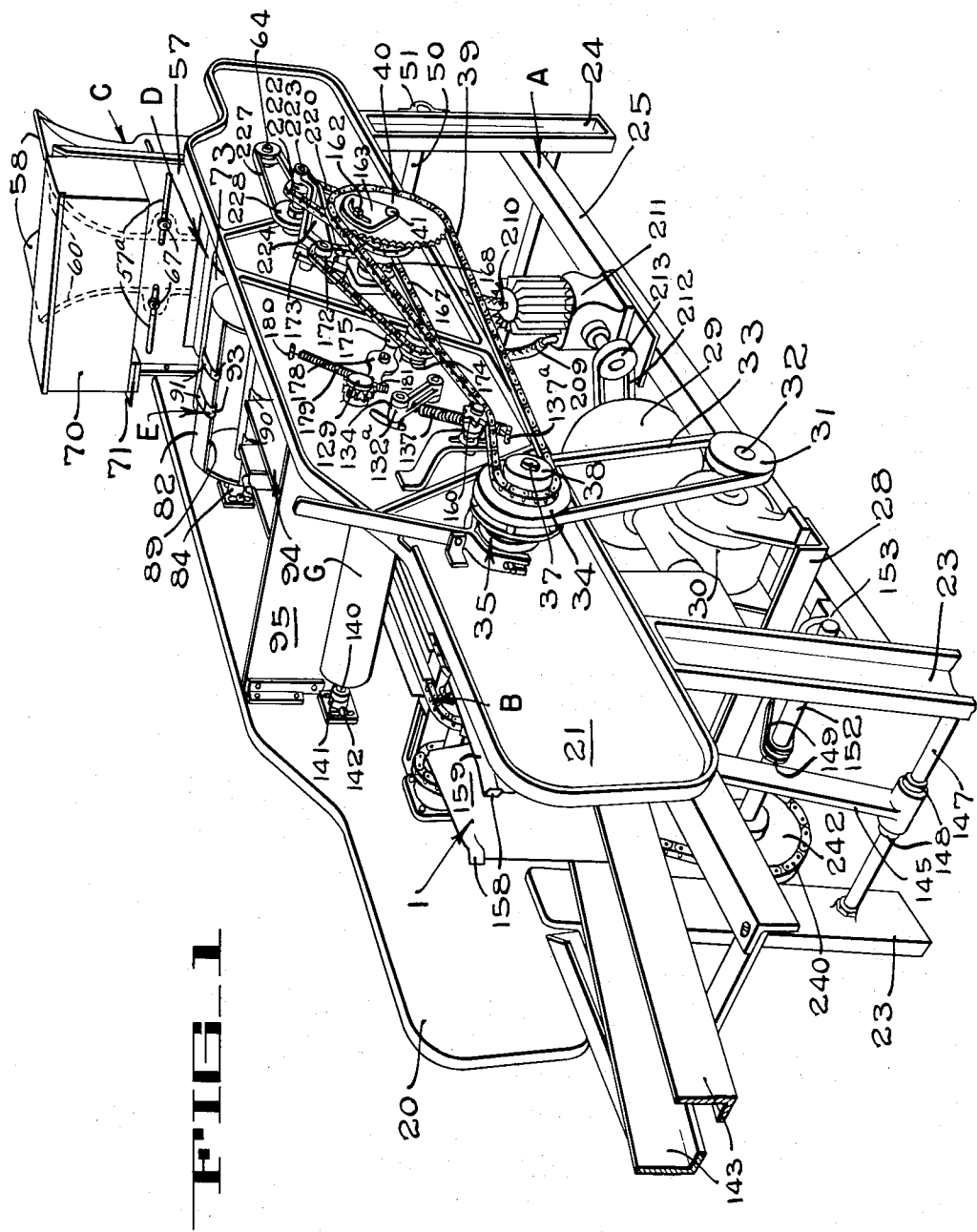
June 5, 1956

M. W. FLYNN
BOX HEAD LABELER

2,748,971

Filed Oct. 15, 1951

7 Sheets-Sheet 1



INVENTOR
MELVIN W. FLYNN

BY *Hans G. Hoffmeister*
ATTORNEY

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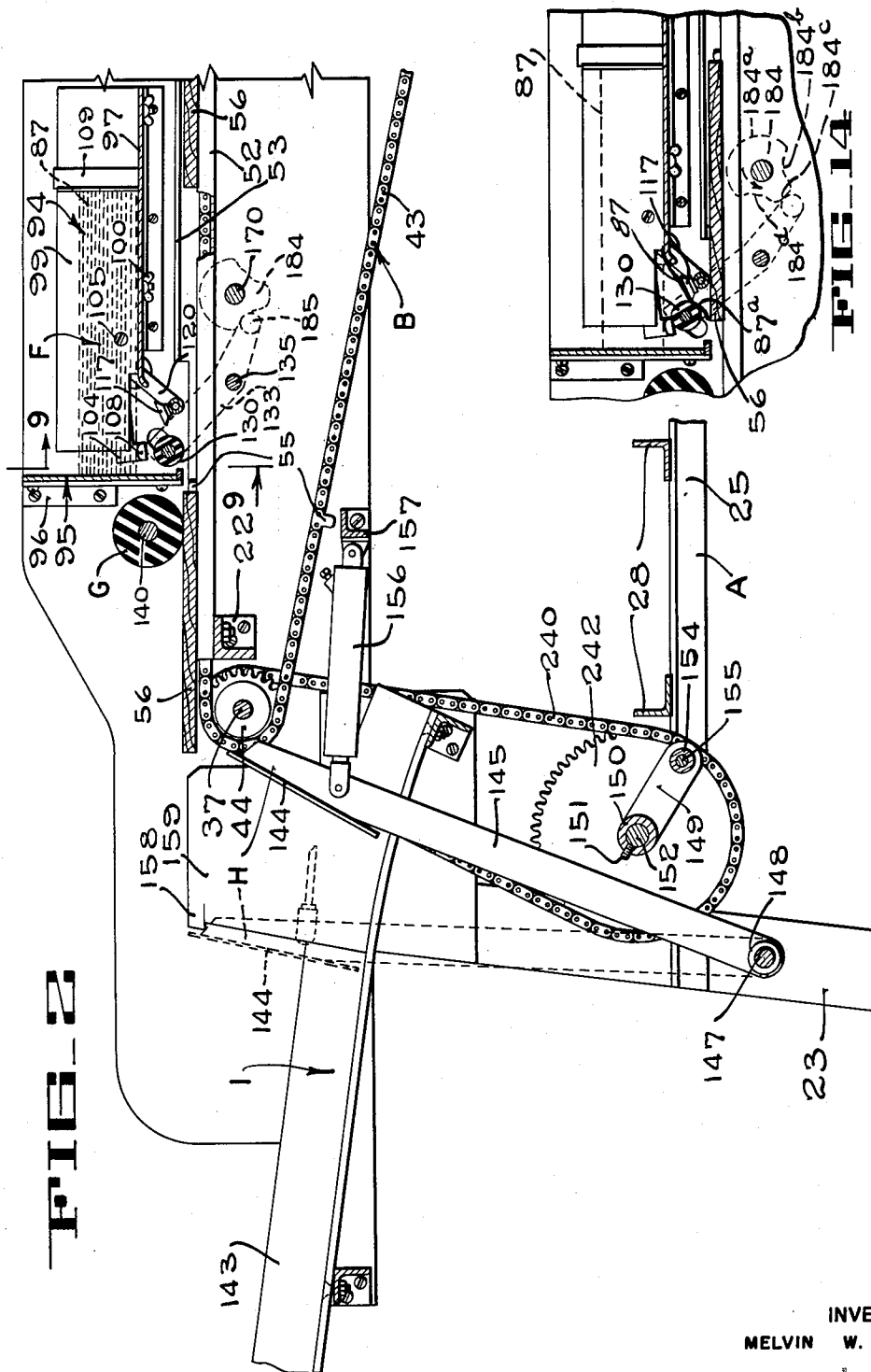
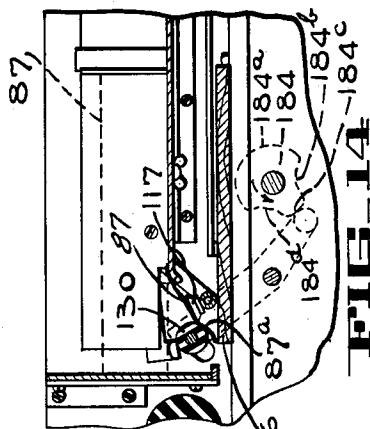
M. W. FLYNN

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7 Sheets-Sheet 2



INVENTOR
MELVIN W. FLYNN

BY *Haus G. Hoffmeister*
ATTORNEY

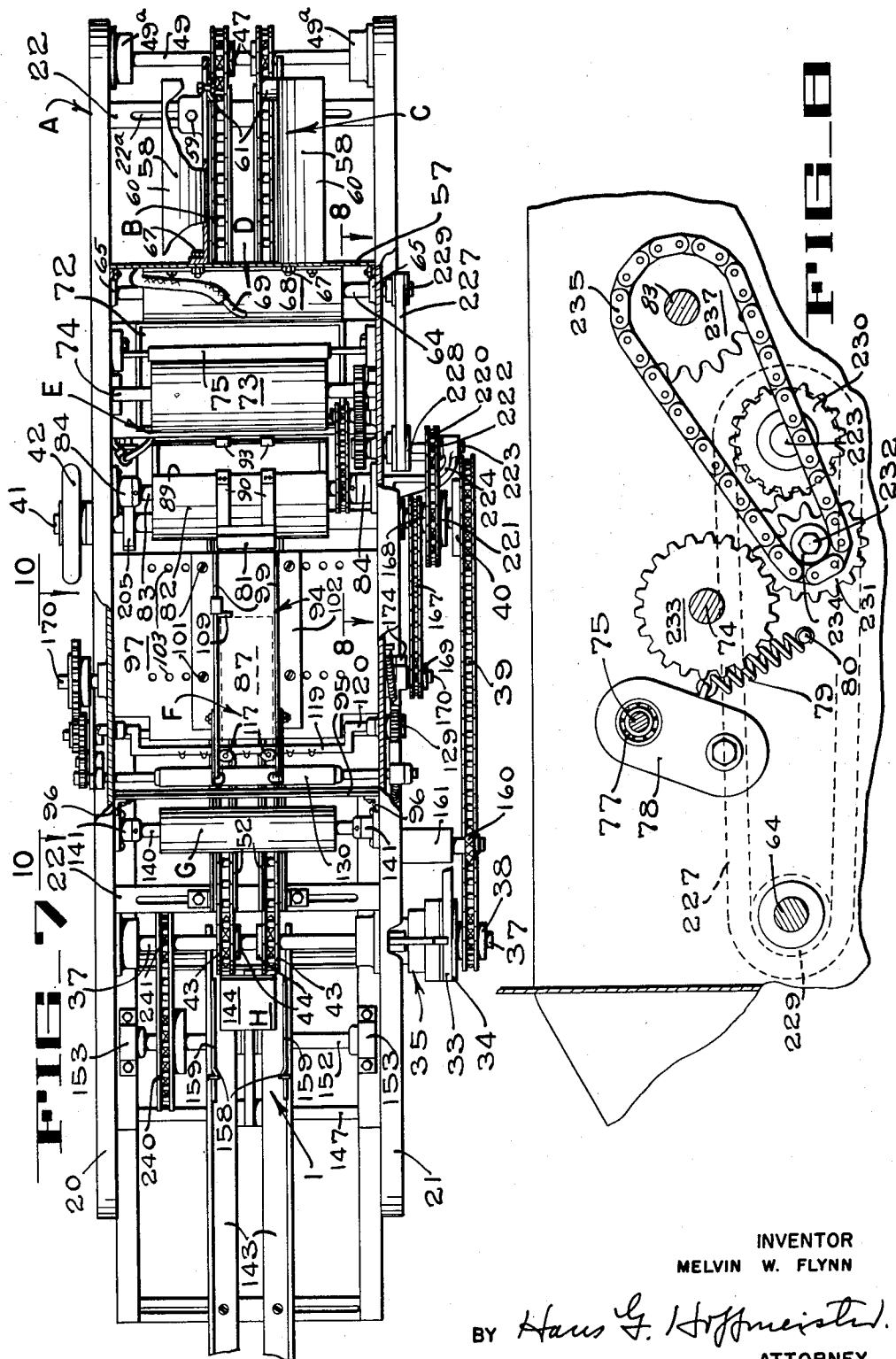
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INVENTOR
MELVIN W. FLYNN

BY *Hans G. Hoffmeister*
ATTORNEY

June 5, 1956

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FIG 9

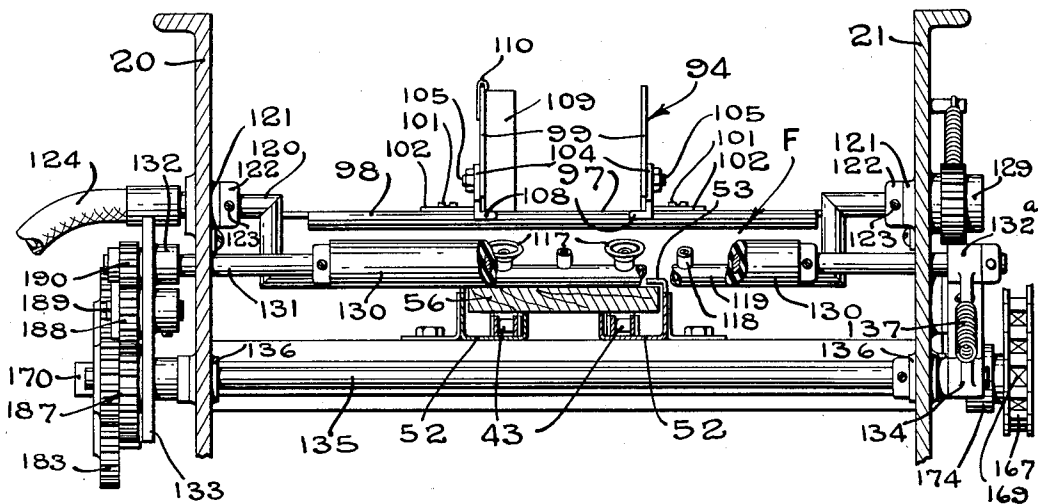
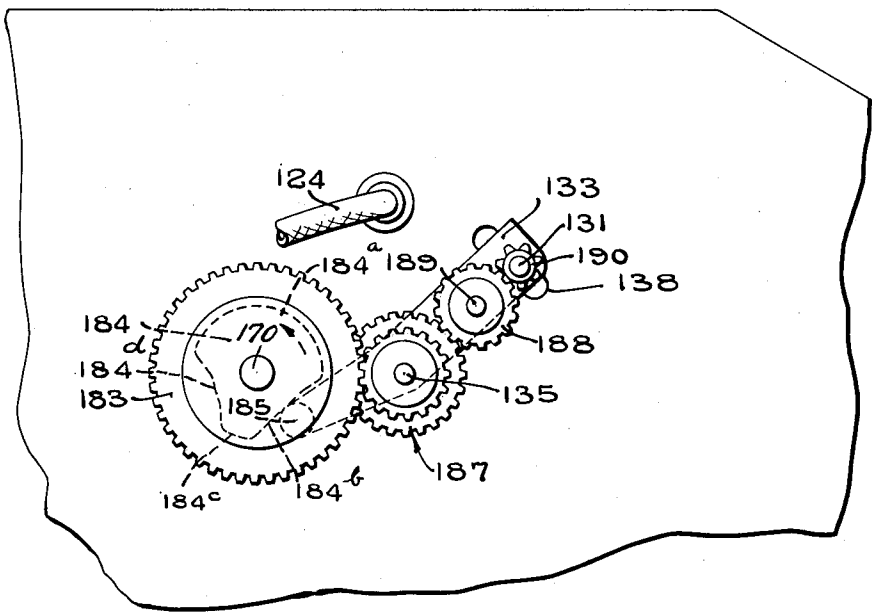


FIG 10

INVENTOR
MELVIN W. FLYNN

BY *Hans G. Hoffmeister*
ATTORNEY

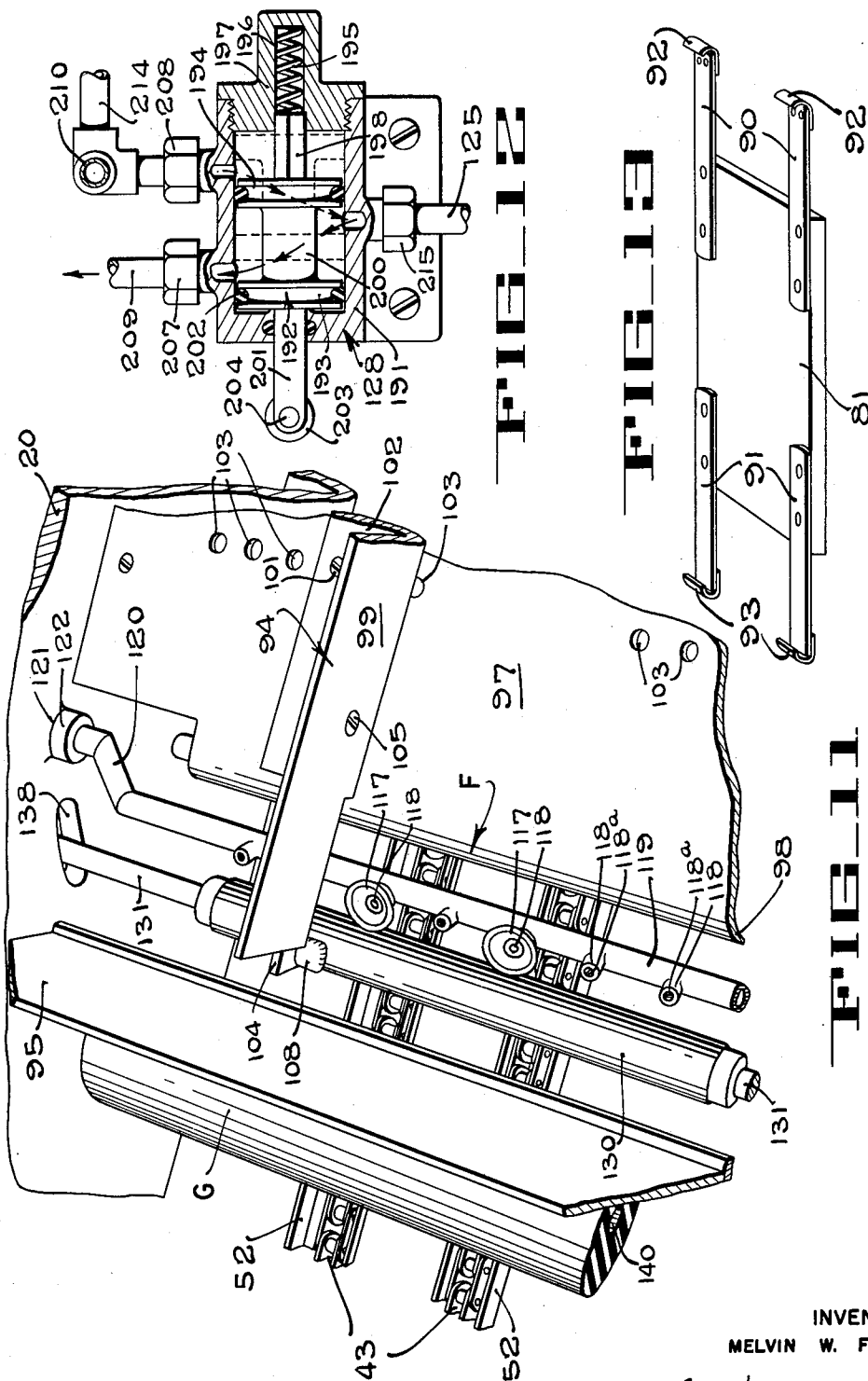
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7 Sheets-Sheet 6



INVENTOR
MELVIN W. FLYNN

BY *Hans G. Hoffmeister*
ATTORNEY

June 5, 1956

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7 Sheets-Sheet 7

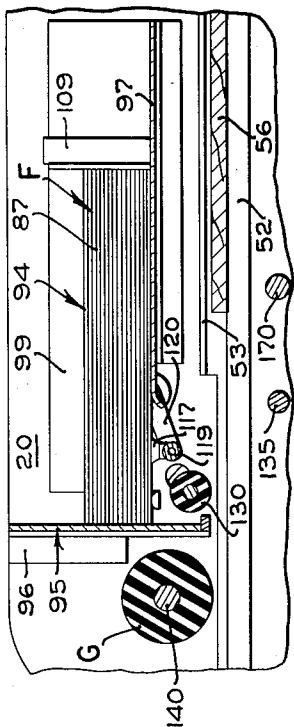


FIG. 15

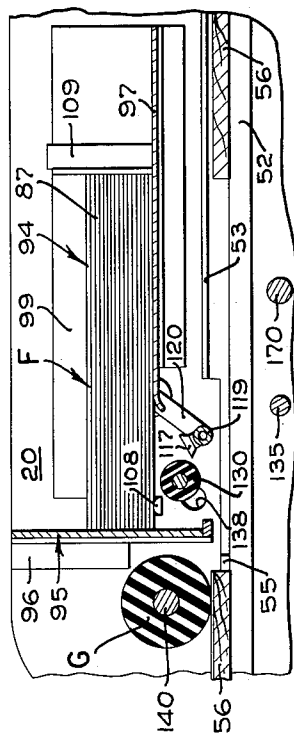


FIG. 16

FIG. 17

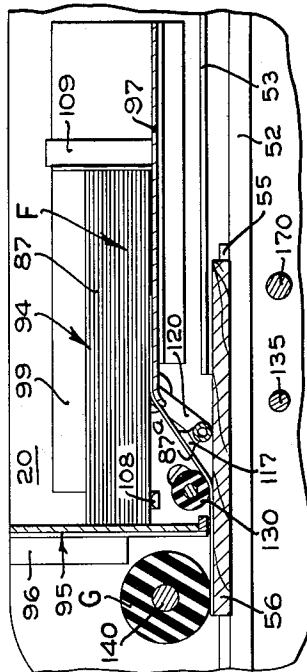
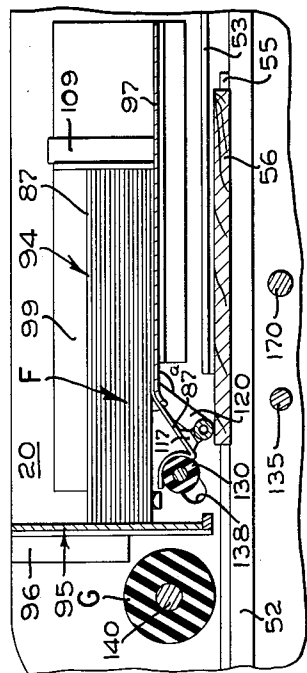


FIG. 18



INVENTOR
MELVIN W. FLYNN

BY *Haus G. Hoffmeister*
ATTORNEY

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2,748,971

BOX HEAD LABELER

Melvin W. Flynn, San Jose, Calif., assignor to Food Machinery and Chemical Corporation, San Jose, Calif., a corporation of Delaware

Application October 15, 1951, Serial No. 251,442

4 Claims. (Cl. 216—55)

The present invention appertains to labeling machines, and relates more particularly to a machine for applying labels to boards to be used as the ends of wooden boxes.

An object of the invention is to provide improved and simplified label feed mechanism for a box head labeling machine.

Another object is to provide improved adhesive applying means for a box head labeling machine.

Another object is automatically to feed and apply a label to a box head by improved vacuum feed mechanism.

Another object is to feed successive labels to predetermined areas of successive box heads carried along a predetermined path and to retain the label when no box head is available for its acceptance.

These and other objects and advantages of the invention will be apparent from the following description and the accompanying drawings wherein:

Fig. 1 is a perspective view of a machine embodying the invention, portions thereof being broken away.

Figs. 2 and 3 are complementary enlarged longitudinal sectional views of the discharge and receiving end portions, respectively, of the machine shown in Fig. 1.

Figs. 4, 5 and 6 are further enlarged elevational views of cams employed to operate various mechanisms of the machine shown in Figs. 1 to 3, inclusive, the shafts thereof being shown in section.

Fig. 7 is a plan view of the machine shown in Fig. 1, portions thereof being broken away.

Fig. 8 is an enlarged fragmentary sectional view taken on line 8—8 of Fig. 7.

Fig. 9 is an enlarged sectional view taken on line 9—9 of Fig. 2.

Fig. 10 is a further enlarged fragmentary elevational view looking in the direction of the arrow 10—10 of Fig. 7.

Fig. 11 is an enlarged fragmentary perspective view showing the forward end of the label feeding mechanism.

Fig. 12 is an enlarged longitudinal sectional view through the vacuum and compressed-air control valve.

Fig. 13 is a perspective view of the adhesive applying pad assembly as it appears when removed from the rotor upon which it is mounted in use.

Fig. 14 is a fragmentary portion of Fig. 2 with the parts thereof in a different operative position.

Figs. 15 to 18, inclusive, are fragmentary diagrammatic views of a portion of the label feeding mechanism of the present machine, illustrating successive steps in its operation.

The illustrated machine comprises in general a main frame A (Figs. 1, 2, 3 and 7) with a conveyor B mounted thereon to withdraw successive boards to be used as box heads from the bottom of a stack thereof in a magazine C at the entrance end of the machine, and to convey the heads in accurately spaced relation along a predetermined path through the machine. For the purpose of the present description the term "forward" and similar expressions will be used to mean "toward the discharge end" of the machine.

A dust removing brush assembly D is mounted forwardly of the outlet from the box head magazine C to clean the box heads as they leave the magazine. After passing beneath the brush D, the heads are conveyed beneath an adhesive applicator E, where a layer of ad-

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hesive is applied to a predetermined label receiving area of each head. The box heads then are conveyed beneath a label feeding mechanism F, which, in cooperation with the adhesive applicator E, comprises a principal feature of the invention. After a label has been applied to each box head, it is conveyed beneath a soft rubber presser roll G, which presses the label firmly onto the box head, which then is carried off the end of the conveyor B and lands on edge on a track from which it is transferred by a pusher H to a receiver I.

The main frame A comprises a pair of side plates 20 and 21 joined together by cross bracing angle members 22, 22, and is provided with usual supporting legs 23, 23 and 24, 24. A pair of angle stringers 25, 25 extend longitudinally between the legs 23 and 24 on each side of the machine, and a pair of transversely extending angle members 28, 28 are mounted on the stringers 21 and support a drive motor 29 having a usual built-in speed reducer 30. A grooved pulley 31 mounted on the take-off shaft 32 of the speed reducer 30 by means of a V-belt 33 drives a grooved pulley 34, which, by means of a usual clutch 31 has controlled driving relation with a shaft 37 upon which the pulley 34 is mounted.

The clutch controlled shaft 37 is journaled in the side frame plates 20 and 21 to extend transversely of the machine, and has secured on its near end as shown in Fig. 1 a sprocket 38, which, by means of a drive chain 39, drives a second sprocket 40. The second sprocket 40 is secured in rotatively adjusted position, in a manner to be described later herein, to the outer end of a shaft 41, also journaled to extend transversely between the side frame plates 20 and 21. The shaft 41 is provided with a hand wheel 42 (Fig. 7) on the opposite end thereof from the sprocket 40 for manipulating the machine by hand when making preliminary adjustments.

The conveyor B comprises a pair of chains 43, 43 trained around a pair of drive sprockets 44, 44 mounted on the clutch controlled shaft 37 and secured thereto in properly spaced relation so as to support boards withdrawn from the magazine C. The chains 43, 43 also are trained around similarly spaced pairs of sprockets 47 and 48 (Fig. 3) mounted on shafts 49 and 50, respectively. The shaft 49 is journaled in usual bearings, 49a (Fig. 7) on the side frame plates 20 and 21, and the shaft 50 is journaled in bearings, 51 (Figs. 1 and 3) secured to the frame legs 24, 24.

The upper runs of the conveyor chains 43, 43 ride in guide channels 52, 52 (Figs. 1, 2, 3, 7 and 9) mounted on the transverse main frame braces 22, 22 to extend lengthwise of the frame A. The outer flanges of these chain guide channels have their upper portions 53 (Fig. 9) bent inwardly to overlie the box head boards 56 as they are conveyed through the machine. The tops of the channel members 52, 52 are cut away as at 54 (Fig. 3) to clear the adhesive applying rotor E and other portions of the mechanism to be described later herein.

The conveyor chains 43, 43 are provided with lugs 55 mounted in laterally opposite pairs disposed at accurately spaced intervals therealong so as to feed the box heads 56 through the machine and to cause them to register successively with the adhesively coating device E and the label applying mechanism F.

The box head magazine C (Figs. 1, 3 and 7) at the rear or receiving end of the machine comprises an upright front plate 57 secured to extend transversely between the main frame side plates 20 and 21. A pair of magazine side plates 58, 58 are secured in laterally spaced and adjusted relation on the rear transverse angle member 22, which is slotted at 22a (Fig. 7) to receive bolts 59 therein. The forward ends of the magazine side plates 58, 58 are secured in adjusted position to the front plate 57 by bolts 67 (Figs. 1 and 7) inserted in slots 57a in the plate 57.

The upper ends 60 of the magazine side plates 58, 58 are curved outwardly to guide the box heads into properly stacked position in the magazine.

A pair of angle members 61, 61 for retaining the rear ends of the box heads in vertical alignment are secured (Figs. 3 and 7) in adjusted position, one to the inner side of each magazine side plate 58, 58. The upper ends 62 of these guide angles 61, 61 also are curved outwardly to guide the box heads to properly stacked position in the magazine. The lower edge of the forward wall 57 of the box head magazine C is spaced upwardly from the conveyor B by a distance slightly greater than the thickness of one box head 56, so that as each successive pair of chain lugs 55 passes beneath the magazine C it will take off and convey through the machine the bottom-most box head from the stack thereof in the magazine.

A rotary dust brush 63 (Figs. 3 and 7) has the shaft 64 thereof journaled in bearings 65, 65 in the main frame side plates 20 and 21. A shield 68 overlies the brush 63, and a tube 69 is connected to a supply of compressed air in a manner to be described later herein, and is mounted so as to discharge an air blast into the space beneath the shield 68 to blow away dust and sawdust loosened by the rotary brush 63.

Means for applying a layer of adhesive to a predetermined label receiving area of each board as it is conveyed through the machine comprises a supply tank 70 (Figs. 1 and 3) mounted on the forward side of the magazine wall 57. Discharge of liquid adhesive from the tank 70 is controlled by a usual manually adjustable valve 71. The liquid adhesive discharged through the valve 71 drips into a tray 72 (Figs. 3 and 7) mounted on the intumed upper flanges 53, 53 of the conveyor chain guide channels 52, 52. An adhesive pickup roll 73 is secured to a shaft 74 journaled to extend transversely between the main frame side plates 20 and 21, and is mounted to run with its bottom immersed in adhesive in the tray 72.

A usual doctor roll 75 for spreading the adhesive on the pickup roll 73, and for controlling the thickness of the film of adhesive thereon, is journaled in ball bearings 77 (Fig. 8) mounted in openings provided therefor in the ends of a pair of arms 78 (Figs. 3 and 8) journaled on the inner sides of the main frame side plates 20 and 21. Coil springs 79 (Fig. 8) connected in tension between the arms 78 and pins 80 on the main frame side plates bias the doctor roll 75 into rolling contact with the adhesive pickup roll 73.

For supporting a pad 81 (Figs. 3, 7, 8 and 13) by which the adhesive is applied to the label receiving area of each board, a cylindrical rotor 82 is mounted on a shaft 83 journaled in bearings 84 on the main frame side plates. The rotor 82 comprises a cylindrical sheet metal body portion 85 secured to head discs 88 and having a gap 89 (Fig. 3) extending lengthwise thereof. The pad 81 is of suitable material, such as sponge rubber, and is of the same size and shape as labels 87, indicated by dotted lines in Figs. 2 and 7, to be applied.

Mounting members 90, 90 and 91, 91 (Fig. 13) are secured to extend from opposite ends of the pad 81, and are provided with hooks 92, 92 and 93, 93, respectively, to hook over the edges of the rotor sheet metal body portion 85 to mount the pad 81 in adjusted position thereon. The members 90, 90 on the leading end of the pad with respect to the direction of rotor rotation are relatively non-stretchable, and may be of web fabric or sheet metal. The members 91, 91 on the trailing end of the pad, however, are resiliently stretchable, and may be strips of rubber band material. The pad 81 thus may be readily mounted on the rotor body 85 in approximately adjusted position, and may be brought into final register with the label feed mechanism F by means to be described later herein.

The label feed mechanism F comprises a label magazine 94 having a forward wall 95 (Figs. 1, 2, 7 and 11) mounted to extend between a pair of angle members

96, 96 secured to the main frame side plates 20 and 21. A magazine bottom plate 97 also is mounted to extend transversely between the main frame side plates 20 and 21 and is spaced rearwardly from the forward wall 95. The forward marginal portion 98 of the bottom plate 97 is curved downwardly to facilitate the withdrawal of the lowermost label 87 from a supply thereof in the magazine.

Label magazine side plates 99, 99 are secured in laterally adjusted position to the bottom plate 97 by bolts 101 inserted through holes in outwardly bent bottom flanges 102 of the magazine side plates 99, 99, and retained by thumb nuts 100 (Fig. 2) in selected longitudinally aligned pairs of holes 103 (Fig. 7) of a plurality thereof in the bottom plate 97.

The magazine side plates 99, 99 extend forwardly beyond the forward end of the magazine bottom plate 97, and the bottom flanges 102 of the magazine side plates 99 are cut away throughout these extending portions. For supporting the forwardly overhanging portions of the labels beyond the bottom plate 97, a label support arm 104 is secured by a bolt 105 to lie along the outer side of the forwardly extending portion of each magazine side plate 99, 99. An inwardly bent finger 108 is provided at the forward end of each arm 104 to extend beneath, and to support, the forwardly overhanging portion of the label supply. Rear aligning means for the labels in the magazine 94 consists of an angle member 109 secured by a spring clip 110 (Fig. 9) in longitudinally adjusted position to the inner side of a magazine side plate 99, and retains the labels in the magazine against rearward displacement.

Feed means for picking off successive labels from the bottom of the stack thereof in the label magazine 94 comprises a plurality of suction cups 117 (Figs. 2, 9 and 11) mounted on selected ones of outlets 118 in the throw portion 119 of a tubular crank member 120. Screws 118a (Figs. 9 and 11) seal off the unused outlets. The tubular suction cup support crank tube 120 is journaled to oscillate in bearings 121 (Figs. 9 and 11) in the main frame side plates 20 and 21, and is secured against endwise displacement by collars 122 secured thereto by set screws 123. The suction cups 117 are mounted in properly spaced relation to engage and seize the portion of the bottom label which extends beyond the magazine bottom plate 97, and which normally is supported by the inwardly extending fingers 108 (Figs. 2 and 11).

The left hand end of the tubular suction cup support crank 120, as shown in Fig. 9 has a hose 124 attached thereto. The other end of the hose 124 is attached to a tube 125 communicating with an air-vacuum control valve 128 (Figs. 3 and 12) to be described later herein. The other end of the tubular crank 120 from that to which the hose 124 is attached is sealed off and has a gear 129 (Figs. 1, 7 and 9) secured thereto for oscillating the crank tube 120 in a manner also to be described later herein in connection with other parts of the drive mechanism.

A rubber label applying roll 130 is mounted on a shaft 131 (Figs. 1, 2, 7, 9, 10 and 11) journaled in bearings 132 and 132a (Fig. 9) provided respectively in the free ends of a pair of oscillating arms 133 and 134. The oscillating roll support arms 133 and 134 are secured to opposite ends of a rock shaft 135, journaled in bearings 136 provided therefor in the main frame side plates 20 and 21. A coil spring 137 is connected in tension between the roller support arm 134 and a pin 137a (Fig. 1) on the main frame side plate 21 normally to bias the label applying roll 130 downwardly. The shaft 131 of the label applying roll 130 passes through arcuate slots 133, 133a (Figs. 1, 10 and 11) in the main frame side plates 20 and 21, respectively, to free the roll for arcuate swinging movement by the arms 133 and 134 upon oscillation of the rock shaft 135.

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The soft rubber final presser roll **G** (Figs. 1, 2, 7 and 11) is mounted on a shaft **140** journaled to rotate freely in a pair of bearings **141** adjustably secured by bolts **142** to the inner sides of the main frame side plates **20** and **21**. The final presser roll **G** rolls over the box heads after they pass the label applying roll **130** and presses the labels firmly into place.

As each box head **56** arrives at the discharge ends of the horizontal upper runs of the conveyor chains **43, 43** (Fig. 2) and the center of gravity of the box head is carried beyond the support of the chains, the head tilts by gravity and drops edgewise onto a pair of angle tracks **143, 143**, in which position it rests by gravity against the face of a pusher plate **144** mounted on the upper end of a lever arm **145** journaled at its lower end on a shaft **147** secured to extend between the legs **23, 23**, on the discharge end of the machine. Collars **148** secured to the shaft **147** retain the lever arm **145** against lateral displacement thereon.

A pair of parallel pusher plate actuating arms **149, 149** (Figs. 1 and 2) are mounted on a hub portion **150** secured by a set screw **151** (Fig. 2) in adjusted position on a shaft **152** journaled in bearings **153** (Fig. 1) on the main frame stringers **25, 25**. A roller **154** (Fig. 2) is journaled on a pin **155** between the parallel arms **149** near their free ends. The roller **154** is mounted to engage the pusher plate support arm **145** upon each rotation of the shaft **152** to swing the pusher member **H** to the dotted line position of Fig. 2 against the bias of an air-cushioned, spring-pressed extensible device **156** of a well known type which is connected in tension between the pusher arms **145** and an angle member **157** secured to extend transversely between the frame side plates **20** and **21**. The spring biased device **156** returns the pusher **H** to the solid line position shown in Fig. 2 as the pusher actuating arms **149** swing downwardly toward the position thereof shown in Fig. 2.

A pair of spring biased retaining clips **158, 158** are provided on the terminal ends of a pair of side guide plates **159, 159** secured one to each of the angle track members **143, 143**. The clips **158, 158** are adapted to be sprung apart as each box head is pushed therebetween by the pusher **H**, and then to spring inwardly to retain the box head and those preceding it into the receiver **I**.

Referring now to the drive mechanism for the various parts of the machine, the conveyor chains **43, 43** are driven by the rotation of the sprockets **44, 44** secured to the clutch controlled shaft **37**. The main drive chain **39** is maintained in properly taut condition by a usual idler sprocket **160** (Fig. 1) adjustably mounted on a slotted bracket **161** secured to the main frame side plate **21**.

The sprocket **40** (Fig. 1) is mounted for rotative adjustment on the shaft **41**, and is secured to rotate therewith by a bolt **162** which passes through a hole in the driven sprocket **40**, and also through an arcuate slotted opening in a quadrant member **163** fixedly secured to the shaft **41**. By loosening the bolt **162** the sprocket **40** can be rotatively adjusted relatively to the shaft **41**, and then can be re-secured thereto by tightening the bolt **162**.

A chain **167** (Figs. 1 and 7) is trained around a sprocket **168** on the shaft **41**, and also around a sprocket **169** secured to a label feed actuating shaft **170**, journaled forwardly of the shaft **41** in bearings provided therefor in the main frame side plates **20** and **21**. The chain **167** also passes over an idler sprocket **172** (Fig. 1) adjustably mounted on a bracket **173** provided therefor on the main frame side plate **21**.

A crank tube actuating cam **174** (Figs. 1, 5 and 7) is mounted on the label feed actuating shaft **170** inwardly of the sprocket **169**. A cam follower roller **175**, mounted on one end of a spring biased arm **178**, rides on the cam **174** and is held in rolling contact therewith by a coil spring **179**, connected in tension between the arm **178**

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and a pin **180** on the main frame side plate **21**. A gear segment **181** on the opposite end of the arm **178** from that carrying the cam follower roller **175** is in mesh with the gear **129** on the projecting sealed end of the crank tube **120**, to swing the throw **119** of the crank tube **120** up and down upon oscillation of the arm **178** by the combined action of the cam **174** and the coil spring **179**.

The mechanism for actuating the label applying roll **130** is mounted on the opposite side of the machine from the crank actuating means just described, and comprises a gear **183** (Figs. 7, 9 and 10) secured to the shaft **170** to rotate therewith. A cam **184** (Figs. 2, 4, 7 and 10) is secured to the shaft **170** inwardly of the gear **183**, and is positioned to engage a cam follower roller **185** (Figs. 2 and 10) mounted on the lower end of the support arm **133** for the label applying roll **130**.

The label applying roll **130** is rotatively driven from the gear **183** by a gear train comprising a double gear **187** journaled on the rock shaft **135**, an idler gear **188** journaled on a stud **189** on the label applying roll support arm **133**, and a gear **190** secured to the shaft **131** of the label applying roll **130**. The driving engagement of the gears **183, 187, 188** and **190** of this train is obvious from their showing in Fig. 10, as is also the oscillation of the rock shaft **135** and the roll support arms **133** and **134**, by the action of the rotary cam **184** upon the cam follower roller **185** against the tension of coil spring **137**. The gears **183, 187, 188** and **190** are proportioned so as to drive the label applying roll **130** at a peripheral speed corresponding to the lineal speed of the box heads being conveyed through the machine.

The shaft **170** is driven by the chain **167** to be rotated once for the passage of each box head thereover, and the cams **174** and **184** are adjusted on the shaft **170** so as to actuate the crank tube **120** and the label actuating roll support arms **133** and **134** in proper sequence to seize and carry down the exposed forward end portion **87a** (Fig. 14) of a label and to press it onto a box head in register with an adhesive coated area thereof and shown in Figs. 15 to 18, inclusive, in a manner to be described later herein in connection with the operation of the machine.

The combined suction and compressed air control valve **128** (Figs. 3 and 12) comprises a cylinder **191** mounted on the inner side of the side frame plate **20**. A piston **192** having a pair of axially separated head portions **193** and **194** is mounted for axial slidable movement in the cylinder **191**. A coil spring **195** mounted in a hole **196** of rectangular cross sectional shape in a cap member **197** bears against the end of a piston projection **198** of rectangular cross sectional shape corresponding to that of the hole **196** and inserted slidably therein. The spring **195** urges the piston **192** toward its left hand limit of movement as shown in Fig. 12. The portion **200** of the piston between the head portions **193** and **194** is of reduced diameter as is also a stem portion **201** which projects slidably through a hole in the opposite end of the cylinder from the cap **197**. Usual sealing rings **202** are provided as required.

The outer end of the stem portion **201** is bifurcated and a cam follower roller **203** is journaled therein on a pin **204** to ride on the periphery of a valve actuating cam **205** (Figs. 3, 6 and 7) secured to the transverse shaft **41** which is driven to rotate at the same speed as the actuating shaft **170** for the label feed means **F**. The periphery of the cam **205** is generally circular, but has a single high point **206** thereon to move the piston **192** momentarily to the right at each rotation of the shaft **41** upon which the cam **205** is mounted.

Fittings **207** and **208** on the valve cylinder **191** are connected, respectively, to a vacuum line **209** and a compressed air line **210**, which in turn are connected, respectively, to the inlet and outlet of a combined suction and air compressing pump **211** (Fig. 1) mounted on the

frame stringer 25 and driven from the shaft, not shown, of the motor 29 by a V-belt 212 and grooved pulley 213. A branch line 214 (Figs. 2 and 12) from the compressed air line 210 is connected to the tube 69 which opens into the interior of the brush shield 68. A third fitting 215 on the valve cylinder 191 is connected by the tube 125 to the hose 124 on the vacuum cup crank tube 120.

In the normal position of the valve piston 192 shown in Fig. 12 the vacuum line 209 communicates through the tube 125 with the suction cups 117, and is sealed off by the piston head 194 from the compressed air line 210. When moved to the right hand limit of its movement by the high point 206 of the cam 205, as shown in broken lines in Fig. 12, the vacuum line 209 is sealed off by the piston head 193 from the line 125 to the suction cups and the compressed air line 210 is connected thereto.

On the near side of the machines as shown in Fig. 1, a short drive chain 220 (Figs. 1 and 7) is trained around a sprocket 221 secured to the shaft 41 and also around a sprocket 222 secured to a short shaft 223 (Figs. 1, 7 and 8). One end of the short shaft 223 is journaled in a bearing bracket 224 secured to the main frame side plate 21, and the other end of which is journaled in a bearing provided therefor in the side plate 21 itself. A V-belt 227 is trained around a grooved pulley 228 secured to the short shaft 223 and also around a grooved pulley 229 secured to the shaft 64 of the dust removing brush 63 to drive the underside of the dust removing brush counter to the direction of conveyor travel therebeneath.

A gear 230 (Figs. 7 and 8) is secured to the inner end of the short shaft 223 and meshes with an idler gear 231 journaled on a stud 232 secured to the inner side of the main frame side plate 21. The idler gear 231 also meshes with and drives a gear 233 secured to the shaft 74 of the adhesive pickup roll 73. A sprocket 234 also is mounted on the stud 232 and is secured to rotate with the idler gear 231. A chain 235 is trained around the sprocket 234 and also around a sprocket 237 secured to the shaft 83 of the adhesive applying rotor 82 to drive the rotor at a speed that will move the outer surface of the pad 81 thereon at a peripheral speed corresponding to the lineal speed of a box head 56 being conveyed through the machine.

The pusher H is operated by a drive chain 240 (Figs. 1, 2 and 3) trained around sprockets 241 and 242 secured to the shafts 37 and 152 respectively. The sprockets 240 and 241 are proportioned and adjusted so as to cause the pusher H to be swung forwardly to advance into the receiver I each freshly labeled box head 56 as it is dropped onto the angle tracks 143, 143.

In operating the machine, after adjusting the side walls 58, 58 and rear angle members 61, 61 of the box head magazine C to fit the boards to be labeled, and to locate the boards in a desired position over the conveyor chains 43, 43, a supply of box head boards 56 is stacked in the magazine C so as to be fed one at a time from the bottom of the stack as each successive pair of lugs 55 on the conveyor B passes therebeneath. The label magazine 94 likewise is adjusted to fit the labels to be applied, and a supply of labels 87 is stacked therein.

Suction cups 117 are mounted on selected outlets 118 of the crank tube 120 so as to seize the forwardly projecting portion of the lowermost label in the magazine 94 (Fig. 16) in a proper manner to withdraw it from its supported position on the fingers 108 and to flex it downwardly beneath the label applying roll 130 on each cycle of operation of the crank tube 120. The unused outlets 118 are sealed by screws 118a (Fig. 11) screwed therein.

Before starting the machine the parts are adjusted to insure that the labels will be applied in proper register with the adhesive coated areas of the boards. Lateral adjustment is made by moving the pad 81 axially of the adhesive applying rotor 82 so that the adhesive coated

areas of the boards will line up with the labels fed to the boards by the label feed mechanism F.

Longitudinal register is accomplished in part by providing the relatively non-stretchable leading straps 90, 90 on the pad 81 of a proper length so as to position the pad in a desired location circumferentially of the rotor body portion 85. Additional adjustment may be made by means of the arcuately slotted quadrant 163 (Fig. 1) and the sprocket 168 as described previously herein. The hand wheel 42 provides convenient means for manipulating the mechanism during the making of the preliminary adjustments.

With the parts properly adjusted, upon energization of the drive motor 29 and actuation of the clutch 35 the conveyor chains 43, 43 are driven so that the lugs 55 thereon withdraw successive box heads 56 from the bottom of the stack thereof in the magazine C and carry them beneath the rotary dust brush 63. This brush, with the aid of the air blast from the tube 69, cleans the box heads of dust and sawdust. The box heads then are conveyed successively beneath the adhesive applying rotor 82, where the pad 81 imprints a film of adhesive upon a predetermined area of each box head, after which the box head is conveyed beneath the label feed mechanism F.

Prior to the arrival of each box head at a position beneath the label applying roll 130, and in fact at the time of completion of the application of the label to the box head next preceding it, a high portion 184a of the cam 184 (Figs. 4, 9 and 10) acting on the cam follower roller 185, swings the lever arm 133, in a clockwise direction from its position shown in Fig. 2 (counterclockwise as shown in Fig. 10) to the position shown in Fig. 15. This action turns the rock shaft 135 upon which the arm 133 is mounted, and swings the other lever arm 134 similarly to the movement of the arm 133 against the tension of coil spring 137. This combined movement of the arms 133 and 134 swings the label applying roll 130 upwardly to clear the pathway of the box heads passing therebeneath. At the same time, the cam 174 (Figs. 1, 5 and 7) acting on the cam follower roller 175 (Fig. 1) swings the crank tube actuating lever 178 to cause the gear segment 181 thereon to turn the gear 129 on the suction cup crank tube 120 so as to move the throw portion 119 thereof upwardly (Fig. 16). Simultaneously with this movement, the roller 130 is moved downwardly, this being caused by the cam follower 185 riding into the low portion 184b of cam 184, thereby removing the roller 130 from the path of the throw portion 119 as it rises to bring the suction cups 117 into contact with the under side of the exposed forward portion 87a of the lowermost label in the magazine 94. The valve actuating cam 205 at this stage of operation of the machine is in the position shown in Fig. 3. This allows the valve spring 195 (Fig. 12) to move the piston 192 to the position shown in Fig. 12 to vacuumize the suction cups 117, thereby causing them to attach themselves to the exposed portion of the lowermost label in the magazine 94.

The cam 174 thereupon swings the vacuum cup crank tube 120 to move the throw 119 thereof downwardly. This action pulls the forward end portion 87a (Fig. 17) of the lowermost label in the magazine 94 from the supporting fingers 108, 108, immediately after which the roller 130 is raised by the action of the cam follower riding onto the high portion 184c, of short duration, on the cam 184. The forward label portion 87a is thereby flexed downwardly past the rubber label applying roll 130, where the resiliency of the label straightens the label portion 87a out to extend beneath the roll 130 as shown in Fig. 14. This downward flexing of the forward label portion 87a past the rubber roll 130 is accomplished in the following manner. When the vacuum cups 117 have pulled the label portion 87a out of contact with the supporting fingers 108, 108, the underside of the label portion 87a comes into contact with the roll 130 which continuously rotates in a clockwise direction (Fig. 2). Due to the

friction between the rubber roll 130 and the label portion 87a, and the aforementioned clockwise rotation of the roll 130, said label portion is immediately folded back upon itself in an upward direction and simultaneously pushed down into the space between the roll 130 and the suction cups 117, see Fig. 2. Thereafter, the continued clockwise rotation of the roll 130, the descent of the suction cups 117, and the rise of the roll 130 to the position shown in Fig. 14 causes the label portion 87a to move sufficiently downward relative to the roll 130 that its free forward end is released from contact with the roll 130 and the portion 87a snaps forward below the roll 130 into the position shown in Fig. 14.

While the flexed label portion 87a is thus held, the roll 130 is then moved downwardly (Fig. 18) at the moment when the adhesive-coated area of each board is advanced into registry with the forward end of the label portion beneath the label applying roll 130. The cam follower roller 185 rides into a second low portion 184d of the cam 184 thereby allowing the coil spring 137 (Figs. 1, 7 and 9) to lower the label applying roll 130 onto the box head. This grips the label between the rotatively driven roll 130 and the box head 56 to which it is to be applied, and exerts a wringer-like action on the label which withdraws it from the magazine and applies it to the board. Simultaneously with this final lowering of the label applying roll to grip the label to the box head, the high point 206 (Fig. 3) of the valve actuating cam 205 engages the piston mounted roller 203 to move the valve piston 192 toward the right from its position shown in Fig. 3. This cuts off the vacuum to the cups 117 and introduces a puff of compressed air into the line 125 to the suction cups to free the label 87 therefrom (Fig. 18).

In the event that no board is present beneath the roll 130 on its final downward swing, the label obviously will not be withdrawn from the magazine, since the box head to which the label is to be applied is one of the two essential elements of the gripping means. The label therefore will remain in the magazine, and the forward portion 87a thereof will be carried back up as the crank throw 119 is swung upwardly on the next cycle of operation thereof, so that the same label portion 87a will be carried up and down until a box head does arrive beneath it for acceptance of the label.

As they are conveyed beyond the label feed mechanism F, the labeled box heads 56 pass beneath the soft rubber presser roll G, which rolls down any loose portions of the labels. Each box head then is carried along to the terminal ends of the upper runs of the conveyor chains 43, 43 and drops down edgewise onto the angle tracks 143, 143 where it rests by gravity against the face of the pusher plate 144.

The pusher H then is swung by the rotation of the arms 149 to its dotted line position of Fig. 2, advancing the box head against the previously advanced boards in the receiver I where it is retained in supported position by the spring pressed clips 158. The pusher H thereupon is released by the continued rotation of the arms 149 and is returned to its normal solid line position of Fig. 2 by the extensible, air-cushioned, spring pressed device 156.

While I have illustrated and described a preferred embodiment of the present invention, it will be understood, however, that various changes and modifications may be made in the details thereof without departing from the spirit and scope of the invention as set forth in the appended claims.

Having thus described the invention what I claim as new and desire to protect by Letters Patent is as follows:

1. In a box head labeling machine having means for conveying a box head along a predetermined path, means for supporting a supply of labels adjacent said path, means for flexing a portion of a label of said supply toward said path, a roll mounted adjacent said label supporting means for movement toward said path, timed actuating means mounted to move the roll into pressing contact with said

label portion and with a predetermined portion of a box head conveyed along said path, and coordinated drive means mounted to rotate the roll at a peripheral speed corresponding to the surface speed of a box head conveyed along said path to withdraw the label from the label supporting means and to apply it to the box head.

2. In a box head labeling machine having means for conveying a box head along a predetermined path, a label support magazine mounted adjacent said path, a pair of arms pivoted co-axially on opposite sides of said path adjacent said magazine, a label applying roll journaled in said arms with the roll axis parallel to and spaced from the pivotal axis of said arms, means for seizing a portion of an end label in said magazine and for flexing said label portion to a position beyond said roll from said magazine, timed actuating means mounted to swing said arms to move the roll and said label portion into pressing contact with a predetermined portion of a box head conveyed along said path, and coordinated drive means mounted to rotate the roll at a peripheral speed corresponding to the surface speed of a box head conveyed along said path to exert a wringer-like force on the label to withdraw it from the magazine and to apply it to the box head.

3. In a box head labeling machine having means for conveying a box head along a predetermined path, a label support magazine mounted adjacent said path, a pair of arms pivoted co-axially on opposite sides of said path, a label applying roll journaled in said arms with the roll axis parallel to and spaced from the pivotal axis of said arms, a crank tube pivoted to swing toward and away from said label magazine, a suction cup mounted on said crank tube and positioned to contact a label in said magazine, means for swinging said arms and said crank tube in timed relation with each other and with the movement of a box head along said path, means for controlling evacuation of said suction cup to seize and to flex a portion of a label in said magazine to a position beyond said roll from said magazine, said arms and tube swinging means being adapted to swing said arms to move the roll into pressing contact with the flexed label portion and with a predetermined portion of a box head conveyed along said path, and coordinated drive means mounted to rotate the roll at a peripheral speed corresponding to the surface speed of a box head conveyed along said path to withdraw the label from the magazine and to apply it to the box head.

4. In a box head labeling machine having means for conveying a box head along a predetermined path, means for supporting a stack of labels adjacent said path, a label applying roll mounted for rotation on its own axis and for movement toward and away from said path, means for flexing a portion of a label in said stack toward said path and into contact with said roll while it is near said path, means for rotating said roll and for moving it away from said path to move said flexed label portion toward said path and into a position between said roll and said path, and means for moving said roll toward said path to apply said label portion to a box head moving therealong.

References Cited in the file of this patent

UNITED STATES PATENTS

1,238,561	Ohl	Aug. 28, 1917
1,495,621	Turner et al.	May 27, 1924
1,652,040	Molins	Dec. 6, 1927
1,809,262	Aicher	June 9, 1931
1,886,102	Johne	Nov. 1, 1932
1,998,067	Arelt	Apr. 16, 1935
2,170,068	Taylor et al.	Aug. 22, 1939
2,195,111	Kagley	Mar. 26, 1940
2,248,744	Cohen	July 8, 1941
2,262,798	Elliot	Nov. 18, 1941
2,573,182	Carter	Oct. 30, 1951

FOREIGN PATENTS

24,307	Great Britain	Dec. 18, 1914
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