M. J. MILMOE.

BOX LABELING MACHINE.

APPLICATION FILED NOV. 17, 1913.

1,126,824.

Patented Feb. 2, 1915.

5 SHEETS—SHEET 1.

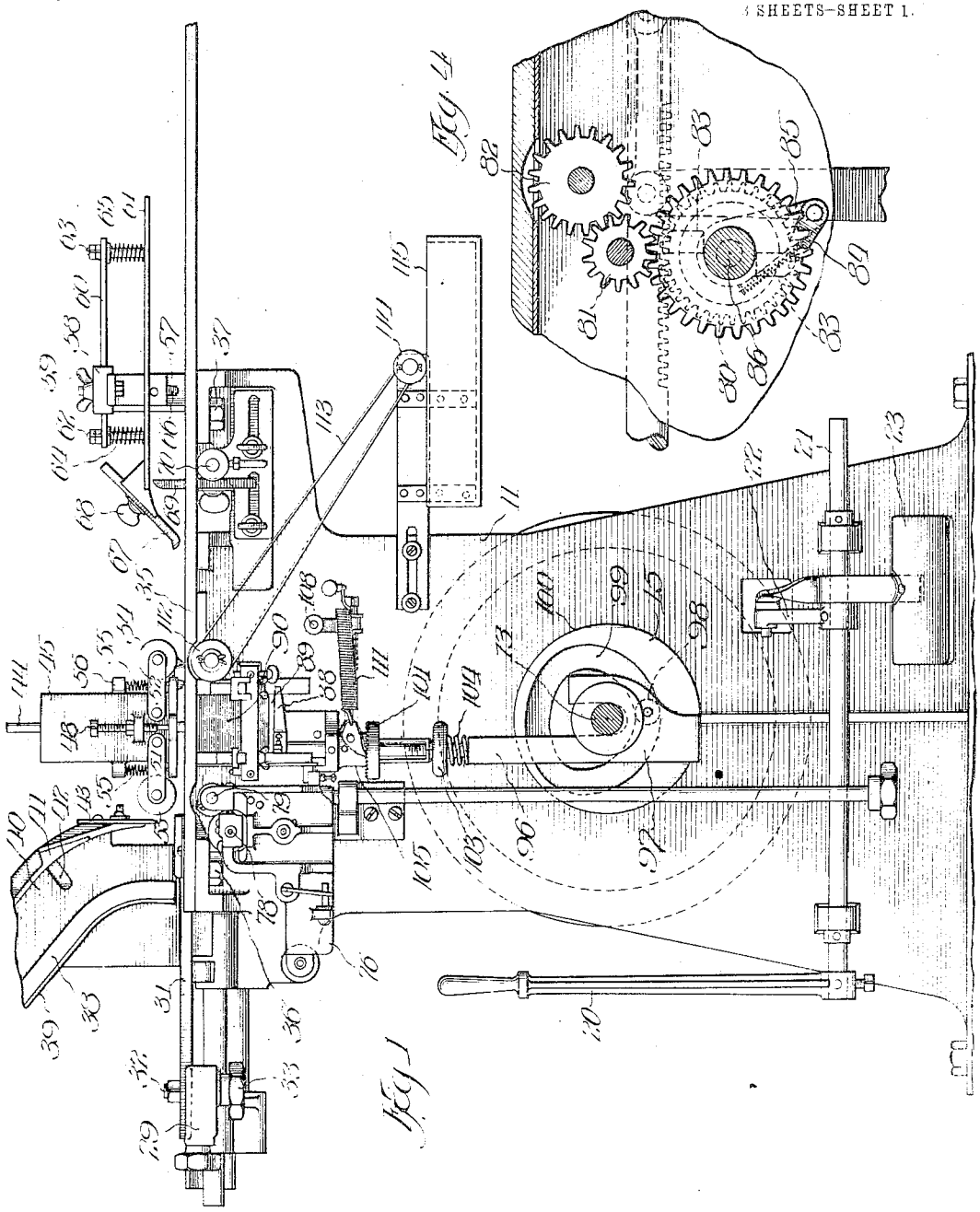


Fig. 1

Fig. 4

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3 SHEETS—SHEET 2.

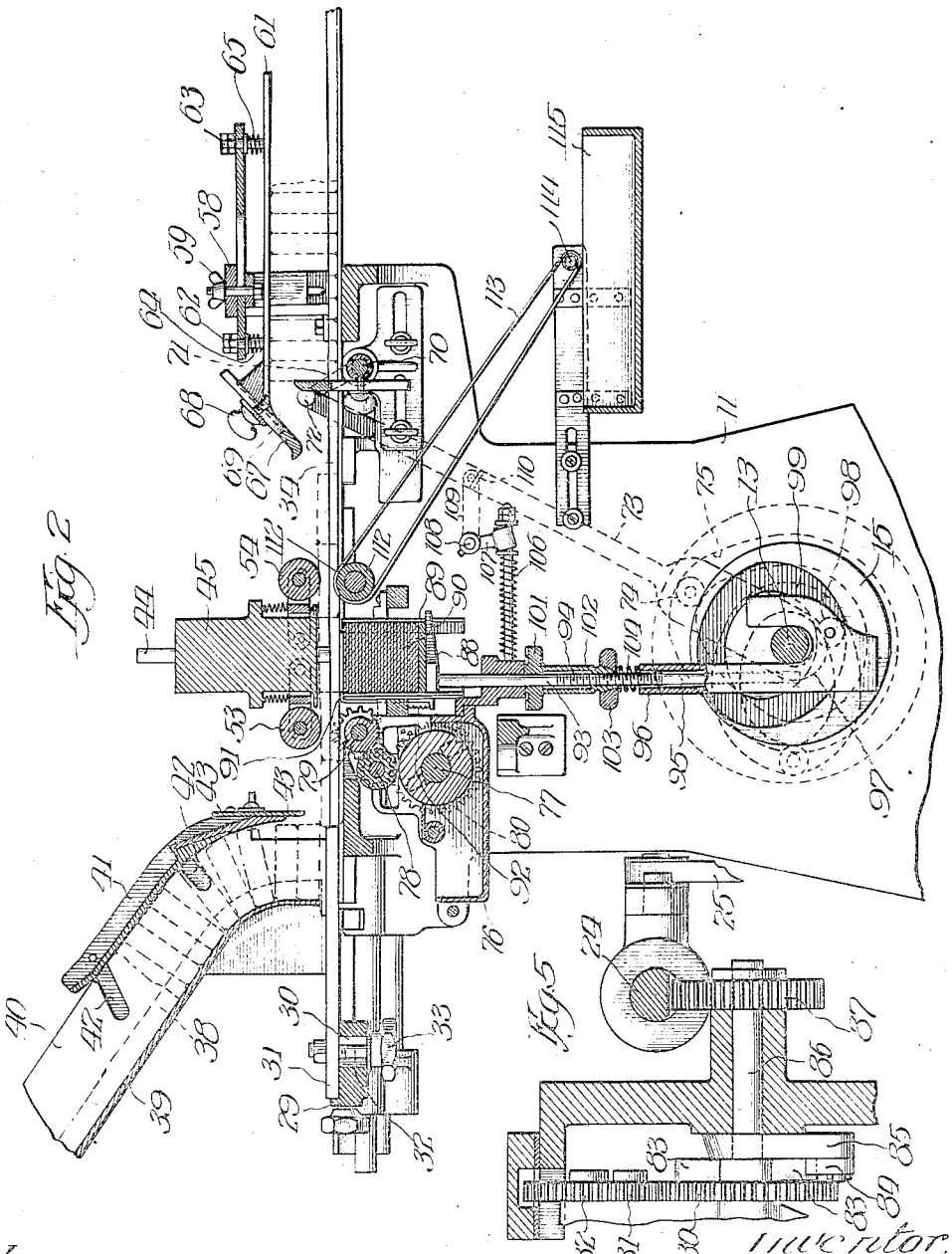


Fig. 2

Fig. 5

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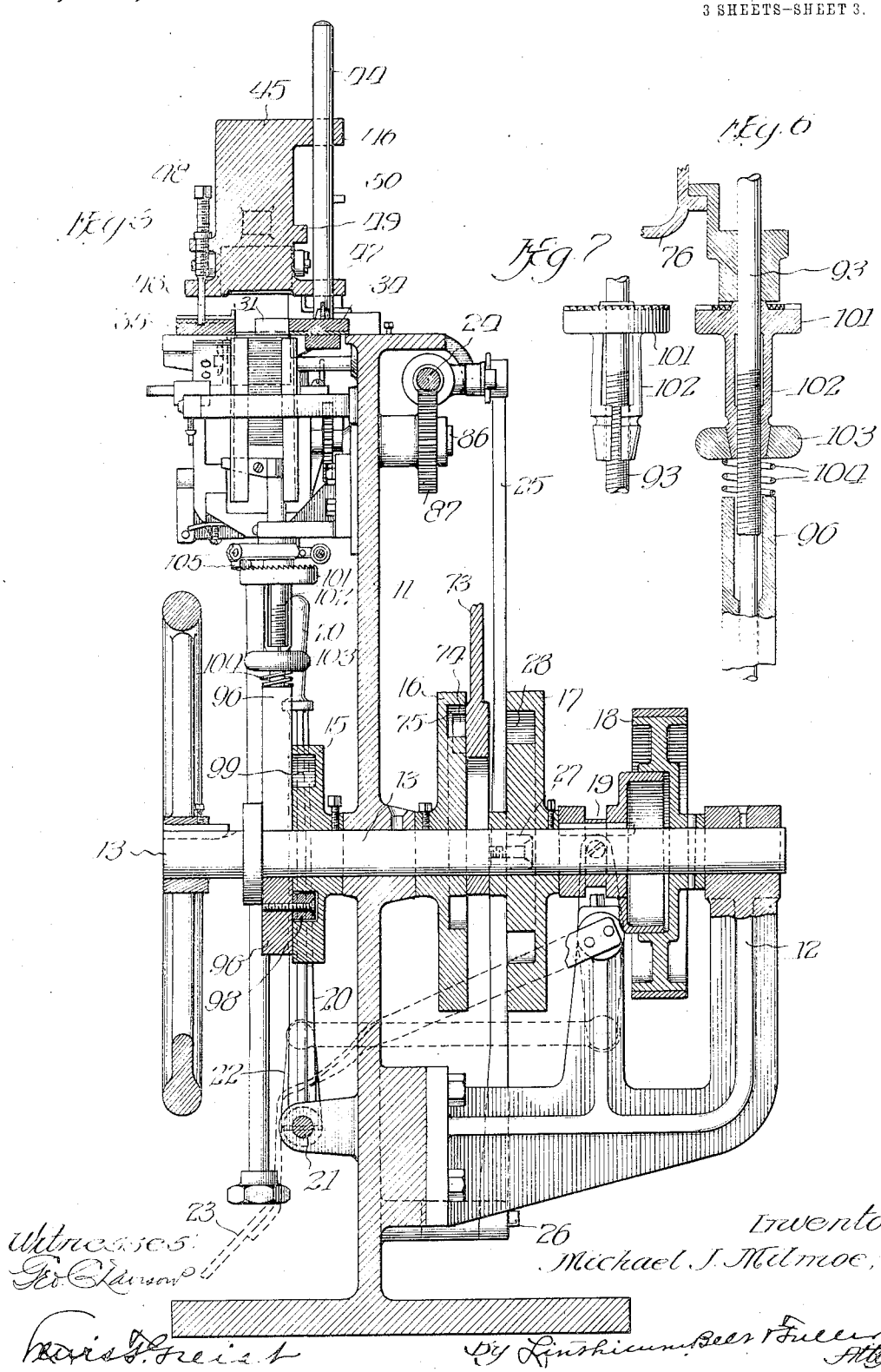
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

MICHAEL J. MILMOE, OF CHICAGO, ILLINOIS, ASSIGNOR TO W. C. RITCHIE & COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BOX-LABELING MACHINE.

1,126,824. Specification of Letters Patent. Patented Feb. 2, 1915.

Application filed November 17, 1913. Serial No. 801,361.

To all whom it may concern:

Be it known that I, MICHAEL J. MILMOE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Box-Labeling Machines, of which the following is a specification.

The invention relates to label applying mechanism adapted for the automatic application of labels in turn to a succession of articles and has for its object the provision of mechanism operating with certitude and despatch to affix the labels singly and accurately to the face of the article.

In the art of box making, small boxes, such for instance as are used for cigarettes and by druggists in the filling of prescriptions, are some times finished interiorly and around the sides with decorative or enameled paper and another sheet or label of substantially the size of the box bottom is applied thereto for finishing purposes, the box being thus supplied to the druggist or other user by whom his own distinctive label is later applied to the top face of the box, or the top or bottom of the box is supplied at the factory with a finishing sheet or label.

This invention in the preferred embodiment set forth herein for purposes of illustration, is particularly adapted for the application of these so called top labels or finishing sheets to the lids or to the bottoms of small boxes although not limited to such employment.

Moreover as the invention is susceptible of other and varied constructional forms the drawing and description setting forth the preferred embodiment are to be construed in an illustrative and not in an unnecessarily limiting sense.

In the drawing—Figure 1 is a side elevation of a box labeling machine constructed according to the present invention; Fig. 2 is a longitudinal sectional view; Fig. 3 is a transverse sectional view; Figs. 4 and 5 are detail views one in side elevation and the other in vertical section illustrating the driving mechanism for the pasting device; Fig. 6 is a longitudinal section through the label carrier-advancing mechanism; and Fig. 7 is a detail perspective view of one of the parts of the label advancing mechanism.

The machine as illustrated comprises a standard 11 and a bracket 12 which provide journal bearings for the main shaft 13 carrying the fly wheel 14 and cams 15, 16 and 17, said shaft being driven by means of the pulley 18 connected thereto by the clutch mechanism indicated generally at 19 and operated by means of the hand lever 20 through the rock shaft 21 and the link 22, or by means of the treadle 23.

In the machine frame is mounted for longitudinal reciprocation a rack bar 24 the said rack bar being connected with a cam rod 25 pivoted at 26 in the machine frame and arranged to be actuated by means of a roller 27 traveling in the groove 28 of the cam 17. The rack bar 24 is provided at its rear end with a cross head 29 slotted at 30 so as to provide for longitudinal and transverse adjustment of a pusher rod 31 which is secured to the cross head by means of a bolt 32 passing through the slot and controlled by the hand wheel 33. Extending longitudinally of the machine upon the two sides of and parallel to the path of the pusher rod 31 are the guide rails 34 and 35, the former of which may be formed integral with the machine frame or have a fixed relation thereto while the latter is mounted for lateral adjustment to and from the former by means of set screws 36 and 37. These two guide rails define the path or way through the machine for the boxes to be labeled and are provided on their inner faces near their lower edges with inwardly projecting ribs or flanges upon which the edges of the boxes are supported and adapted to slide. At the rear end of the machine is arranged a box magazine 38 having its rear wall 39 and one side wall 40 formed integral while the opposite side wall and the front wall 41 are adjustable, the latter by means of slots 42, to vary the interior dimensions of the magazine so as to adapt the same to the feeding of boxes of different sizes. The mouth of the magazine is controlled by an adjustable plate 43 to vary the size of the discharge opening and is disposed above the space between the guide rails 34 and 35 and at a point intermediate the two extreme positions of the pusher 31 whereby as the pusher is retracted a box will drop into position and upon its forward movement will be discharged from the magazine on the way between the guide rails.

Substantially midway of the machine as

illustrated and at one side of the path of the boxes is arranged a vertical standard 44 and upon this standard is slidably mounted a presser block 45 by means of its upper and lower projections 46 and 47 whereby in one position the presser block 45 overlies the path of the boxes, its lowermost position being adjustably defined by means of a set screw 48, while in another position it may be lifted and swung upon the standard 44 clear of the path of the boxes and sustained in such elevated position by the projection 49 resting upon the stud 50. This presser block has pivotally secured near its lower edge two sets of arms 51 and 52 and between the members of the two sets are journaled rollers 53 and 54. In their lowermost position the peripheries of the rollers 53 and 54 extend slightly below the bottom of the presser block and the rollers are yieldingly held in this position by means of the springs 55, 55 disposed between the arms and the projections 56, 56.

Further along at one side of the box pathway is arranged the bracket 57 having an angularly extending arm 58 within which is mounted for longitudinal and transverse adjustment by means of the set screw 59 a bar 60. A cover plate 61 is suspended from the bar 60 by means of the pins 62, 63 and held in yielding spaced relation thereto by means of the springs 64, 65 which encircle the pins 62 and 63. The cover plate 61 is arranged to frictionally engage the edges of the boxes passing thereunder when the same have been upturned, the height of the cover plate being not only variable owing to the springs 65, but also subject to positive adjustment, the arm 58 being adjustable on the standard 57 by means of the slot 66. The approach to the space beneath the cover plate is controlled by the guard plate 67 which is adjustable thereon by means of the set screw 68.

The up-ending of the boxes beneath the cover plate is accomplished by means of a finger 69 fixed upon the shaft 70, which shaft has connected thereto a crank arm 71 pivoted at 72 to an actuating rod 73, the said rod being reciprocated by means of a cam roller 74 traveling in the groove 75 of the cam 16, the wiping mechanism and its operation being best shown in Fig. 2.

Beneath the upper surface of the machine and slightly in advance of the discharge mouth of the magazine is located an adhesive receptacle 76 containing a paste roll 77, a ductor roll 78, and a paste applying roll 79 intergeared as shown by means of the pinions 80, 81 and 82. The pinion 80 has upon its outer face a pair of teeth 83, 83 adapted to be engaged by the pawl 84 carried by the pawl arm 85, fixed upon the shaft 86 of the paste roller 77. Upon the shaft 86 is also fixed a pinion 87 which is in mesh with the rack bar 24. At each reciprocation of the rack bar 24 in one direction the pinion 87 through the shaft 86 and the arm 85 will cause the pawl 84 to engage one of the teeth 83 and rotate the paste rollers through a one-half revolution and upon the return stroke of the rack bar the pawl 84 will move backwardly to a position ready to engage the other tooth upon the next reciprocation of the rack bar whereby the paste rollers will be positively actuated to apply the paste to the bottoms of the boxes passing over and in contact with the paste applying roller 79.

Immediately below the pathway of the boxes and in line with the presser block 45 is mounted the label carrier comprising a plunger head 88 adapted to be reciprocated vertically between adjustable label-retaining members 89, these members being preferably in the form of angle corner strips adapted to receive and guide the corners of the label pack 90. Upon the rear retaining wall is mounted a plate 91 having at its upper edge a flange or lip which overlies the edge of the topmost label. This plate may be rigidly mounted upon the rear wall of the label magazine or it may be yieldingly mounted under the influence of the spring 92. The plunger head 88 is carried by a spindle 93 threaded for a portion of its length as indicated at 94, the lower end of the spindle at 95 being housed for longitudinal adjustment within a tubular socket 96 of a cam rod 97 provided with a roller 98 which travels in the groove 99 of the cam 100. Rotatably mounted upon the spindle 93 is a ratchet plate 101 the lower tubular portion 102 of which is interiorly threaded for engagement with the threaded portion 94 of the spindle. The tubular portion 102 is split in its threaded portion as indicated and has a tendency to separate so as to bring its threads out of engagement with the threads of the spindle. The lower end of the split member is exteriorly coned and adapted to be received within the flaring opening of a clutch ring 103. A spring 104 seated upon the upper end of the socket 96 and bearing upwardly against the clutch ring 103 serves to contract the portions of the split member and maintain the threaded engagement between said member and spindle.

The upper face of the ratchet plate 101 is provided with ratchet teeth with which engages a pawl 105 carried by a rod 106 which is actuated by a pawl actuating arm 107 mounted upon a rock shaft 108 having fixed thereto another arm 109 which projects into the path of a tappet 110 carried by the wiper actuating rod 73. At each reciprocation of the rod 73 the tappet 110 causes the actuation of the rod 106 so as to advance the ratchet plate 101 by means of the pawl 105, the return movement of the pawl being ac-

complished by means of the spring 111. At each actuation of the ratchet plate 101 it will be readily understood that the spindle 93 with the plunger head 88 will be elevated slightly to advance the stack of labels 90 in order to compensate for those removed from the top. Upon each revolution of the cam 100 the socket 96 within which the lower end of the spindle is mounted will be reciprocated, the spindle and plunger head with the stack of labels moving downward out of contact with the labels and when in its elevated position it will be slightly advanced by the engagement of the pawl with the ratchet plate to compensate for the depletion of the labels within the carrier. If, however, the supply of boxes is interrupted so that no labels are removed from the carrier the advancement of the latter will be interrupted by reason of the fact that as the top label engages with the lip of the plate 91 the advancing movement of the carrier is arrested before the ratchet plate reaches a position to be engaged by the pawl, this premature stopping of the upward movement of the ratchet plate being permitted by the compression of the spring 104.

When the stock of labels within the carrier is depleted and the plunger head has reached its predetermined most advanced position the further advancement of the same is precluded by so proportioning the threaded portion of the spindle that the threads will pass out of engagement with the threaded portion of the ratchet plate at the instant corresponding to the reaching of such advanced position by the plunger head so that there will be no further feeding forward of the carrier. When it is desired to retract the carrier to its lowermost position in order to place a new supply of labels within the magazine the engagement between the spindle and ratchet plate is released by pressing downward upon the clutch ring 103 compressing the spring 104 and permitting the two split portions 102 of the ratchet plate to spring out of engagement with the threads of the spindle whereupon the spindle and plunger head will drop instantly to its retracted position and upon the release of the clutch ring the threaded engagement will be resumed under the influence of the spring 104.

Beneath the path of the boxes and advantageously beneath the roller 54 is a wiping roller 112 which may have an absorbent periphery or be provided with a belt 113 of absorbeent fabric such as canvas traveling over the idler roll 114. The roller 112 is adapted to be driven either directly or through the belt 112 by the friction of the boxes passing thereover, the periphery of the roll or the interposed belt serving to take up any surplus adhesive which may have escaped from beneath the label. The provision of the belt is advantageous in that any adhesive transferred thereto has an opportunity to become thoroughly dry before having traversed the roll 113 to again come into contact with another box. The belt also serves the additional purpose that if more than one label should happen to adhere to the box the belt will remove the extra label and deposit it within the receptacle 115 provided for this purpose.

The operation of the machine as an entirety will be readily understood. The boxes feed by gravity from the box magazine 40 to a position in front of the pusher 31 and by the latter they are advanced in the series as indicated in dotted lines in Fig. 2 along the path between the guide rails. Passing beneath the roller 53 and above the paste applying roller 79 they have the paste applied to the bottom surface. They then pass beneath the presser block 45 and when in this position the stack of labels is brought into contact with the pasted box and the topmost label adheres thereto and is drawn from beneath the lip of the plate 91 by the advancing box. The box with its label in position then passes between the presser roller 54 and the wiping roller 112 having the surplus paste removed therefrom. The box then reaches a position at the mouth of the delivery chute and beneath the guard plate 67. It is then caught by the wiper finger 69 and up-ended to the position indicated in Fig. 2, and the several boxes as they enter the chute advance the preceding boxes step by step, their progress being retarded by frictional engagement of their upper edges with the cover plate 61 until they emerge at the right hand end of the machine completely labeled.

It will be observed that the machine is simple in construction, not likely to get out of repair, and that the operation of labeling the boxes is entirely automatic, provision being made for the adjustment of the machine to take boxes of various dimensions and also for the control of the label delivery in case the supply of boxes should be intermitted from any cause.

It will be understood that by suitable changes in the arrangement and proportion of the parts the machine is adapted to the labeling of articles of various shapes and that depending upon the articles to be handled various kinds of labels and different adhesives will be suggested. Obviously therefore the term box is used in a generic sense to include various articles, the term paste is employed to include any suitable adhesive, and the term label to designate a sheet applied to the article whether plain, decorative or printed.

I claim:

1. In a labeling machine, a pair of parallel guide rails laterally adjustable to provide a

way through the machine for boxes of different width, a box magazine disposed at the entrance to the way and having two of its angularly disposed walls adjustable to vary the interior dimensions of the same, and a discharge chute including a vertically adjustable cover plate disposed over the outlet portion of the way, in combination with label feeding and affixing mechanism, means to propel the boxes through the machine past the labeling mechanism, and means to turn the boxes on edge and push the same through the discharge chute, substantially as described.

2. In a labeling machine, a pair of parallel guide rails laterally adjustable to provide a way through the machine for boxes of different width, a box magazine disposed at the entrance to the way and having two of its angularly disposed walls adjustable to vary the interior dimensions of the same, and a discharge chute including a vertically adjustable cover plate disposed over the outlet portion of the way, in combination with label feeding and affixing mechanism, means to propel the boxes through the machine past the labeling mechanism, and means to turn the boxes on edge and push the same through the discharge chute, said last named means comprising a wiping finger adjustable as to position and as to throw, and an adjustable guard plate at the entrance to the discharge chute, whereby to adapt the machine to boxes of varying size, substantially as described.

3. In a labeling machine, a way for boxes, means to propel boxes along the way, mechanism to feed the labels vertically to a position to contact with the boxes. and a presser block mounted above the label feeding mechanism in a position to bear by gravity on the passing boxes while being labeled, substantially as described.

4. In a labeling machine, a way for boxes, means to propel boxes along the way, mechanism to feed the labels vertically to a position to contact with the boxes, and a presser block mounted above the label feeding mechanism in a position to bear by gravity on the passing boxes while being labeled, and anti-friction rollers mounted on the block and adapted to bear upon the boxes, substantially as described.

5. In a labeling machine, a way for boxes, means to propel boxes along the way, mechanism to feed the labels vertically to a position to contact with the boxes, and a presser block mounted above the label feeding mechanism in a position to bear by gravity on the passing boxes while being labeled, and anti-friction rollers mounted on the block and adapted to bear upon the boxes before and after labeling, substantially as described.

6. In a labeling machine, a way for boxes, means to propel boxes along the way, mechanism to feed the labels vertically to a position to contact with the boxes, a standard projecting above the way at one side thereof, a presser block slidably mounted on the standard and arranged to swing from an idle position at one side of the way to an active position overlying the way above the label feeding mechanism bearing by gravity on the boxes while being labeled, substantially as described.

7. In a labeling machine, a way for boxes, means to propel boxes along the way, mechanism to feed the labels vertically to a position to contact with the boxes, a standard projecting above the way at one side thereof, a presser block slidably mounted on the standard and arranged to swing from an idle position at one side of the way to an active position overlying the way above the label feeding mechanism bearing by gravity on the boxes while being labeled, and a detent device arranged to support the presser block in an elevated position upon the standard, substantially as described.

8. In a labeling machine, a way for boxes, means to propel boxes along the way, mechanism to feed the labels vertically to a position to contact with the boxes, a standard projecting above the way at one side thereof, a presser block slidably mounted on the standard and arranged to swing from an idle position at one side of the way to an active position overlying the way above the label feeding mechanism bearing by gravity on the boxes while being labeled, and a detent device arranged to support the presser block in an elevated position upon the standard, said detent device comprising a stud carried by the standard and a projection carried by the block and adapted to overlie the stud when in an elevated idle position, substantially as described.

9. In a labeling machine, a way for boxes, means to propel boxes along the way, paste applying mechanism and label feeding mechanism arranged in succession along the path of the boxes through the machine, a presser block mounted above the label feeding mechanism in a position to bear by gravity on the passing boxes while being labeled, and a roller carried by the block and bearing upon the boxes while being coated with paste, substantially as described.

10. In a labeling machine, a way for boxes, means to propel boxes along the way, paste applying mechanism and label feeding mechanism arranged in succession along the path of the boxes through the machine, a presser block mounted above the label feeding mechanism in a position to bear by gravity on the passing boxes while being labeled, arms pivotally mounted on the presser block and projecting therefrom, a roller journaled in the arms, and a spring bearing

upon the arms to press the roller yieldingly against the boxes while being coated with paste, substantially as described.

11. In a labeling machine, a way for boxes, means to propel boxes along the way, paste applying mechanism and label feeding mechanism and paste removing mechanism arranged in succession along the path of the boxes through the machine, a presser block mounted above the label feeding mechanism in a position to bear by gravity on the passing boxes while being labeled, two sets of arms pivoted on the block and extending to positions above the paste applying and paste removing mechanisms, rollers journaled between the two sets of arms, and springs bearing upon the arms to hold the rollers yieldingly against the boxes while being coated with paste and while having the surplus paste removed therefrom, substantially as described.

12. In a labeling machine, the combination with box feeding and box delivering mechanism, of a reciprocatory label carrier, and mechanism separate from the box feeding mechanism for progressively advancing the label carrier, and including a ratchet and pawl device, a pawl actuating arm, a reciprocatory rod, and a tappet carried by the rod and arranged to engage the arm, substantialy as described.

13. In a labeling machine, the combination with box feeding and box delivering mechanism, of a reciprocatory label carrier, and mechanism separate from the box feeding mechanism for progressively advancing the label carrier, and including a ratchet and pawl device, a pawl actuating arm, a reciprocatory box delivery operating rod, and a tappet carried by the rod and arranged to engage and actuate the arm in isochronism with the box delivery, substantially as described.

14. In a labeling-machine, the combination of box-feeding, box-delivery, and label-affixing mechanism, and a friction-drive wiping-absorbent-contacting-means traversed by the freshly labeled boxes and adapted to remove the surplus adhesive therefrom, substantially as described.

15. In a labeling machine, the combination with box feeding, box delivery, and label affixing mechanism, of a wiping roller traversed by the freshly labeled boxes, and a belt carried by the roller in contact with the boxes to remove the surplus adhesive therefrom, substantially as described.

16. In a labeling machine, the combination with box feeding, box delivery, and label affixing mechanism, of a friction driven wiping roller traversed by the freshly labeled boxes, and a belt of absorbent fabric carried by the roller in contact with the boxes to remove the surplus adhesive therefrom, substantially as described.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

MICHAEL J. MILMOE.

Witnesses:
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H. M. PATTERSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."