Dec. 14, 1943. C. W. BLACKSTONE 2,336,839

LABELING MACHINE

Filed Aug. 29, 1942 6 Sheets-Sheet 1

Fig. 1.

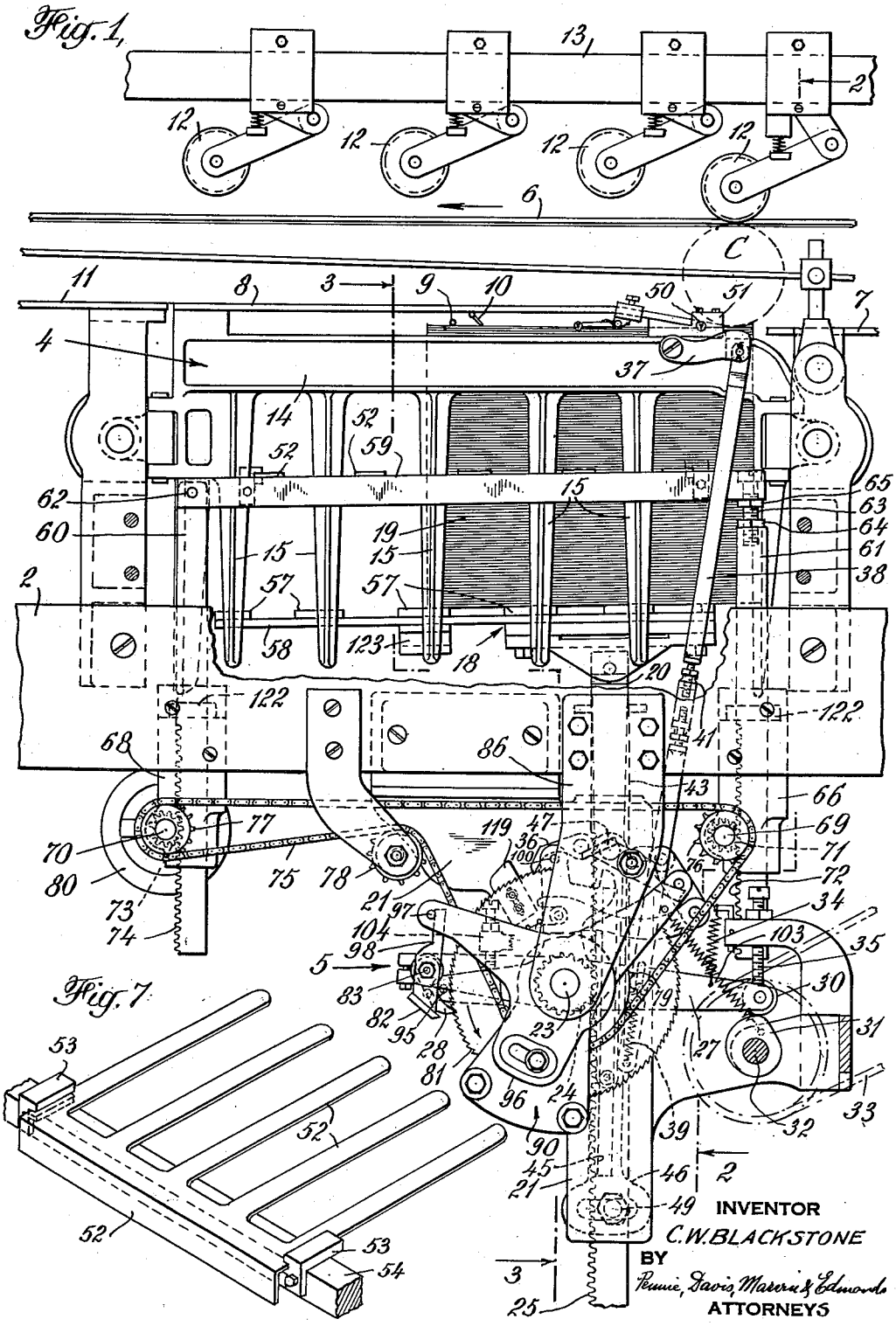


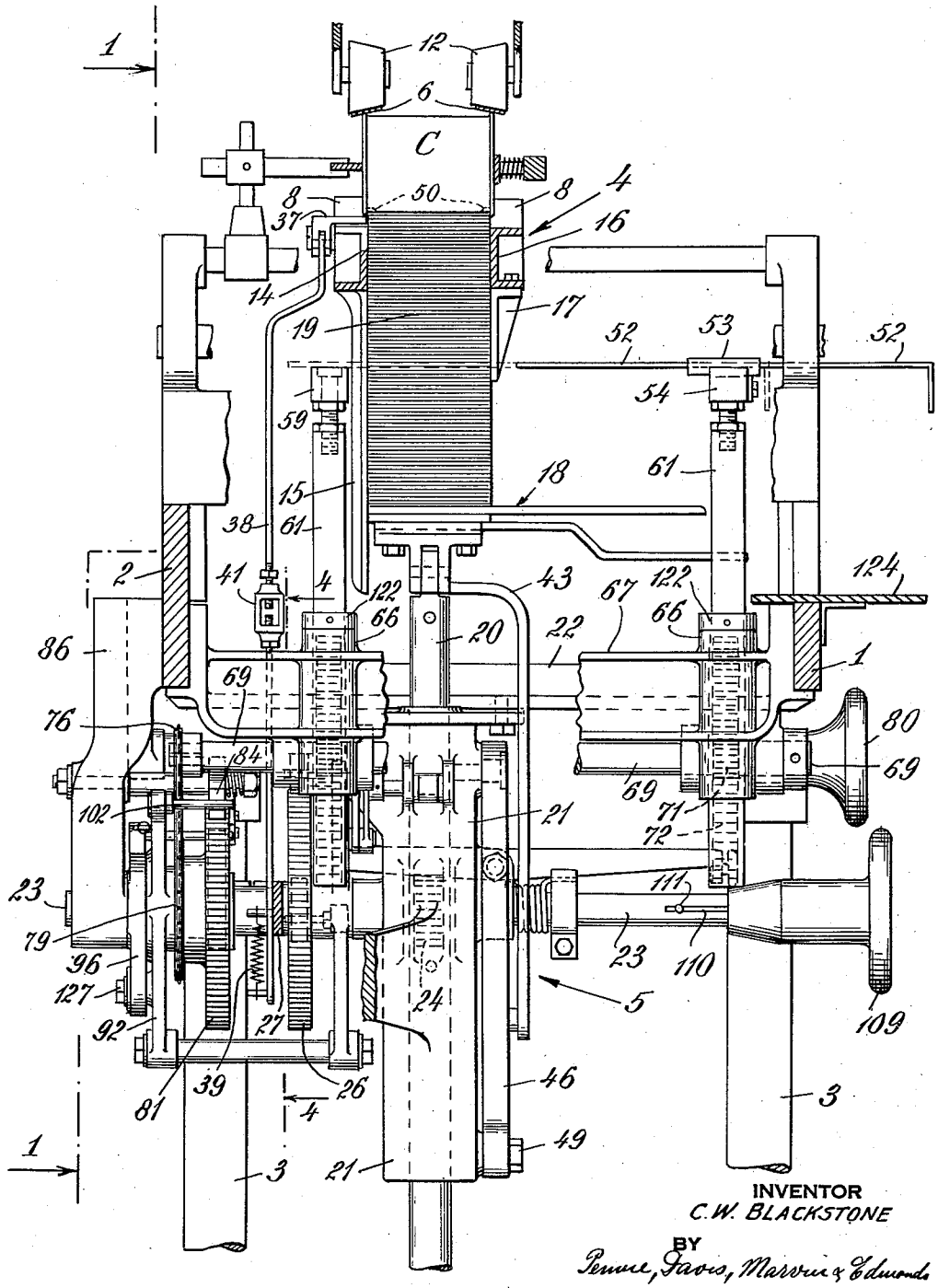
Fig. 7

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Fig. 2,



INVENTOR
C. W. BLACKSTONE

BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

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Fig. 3,

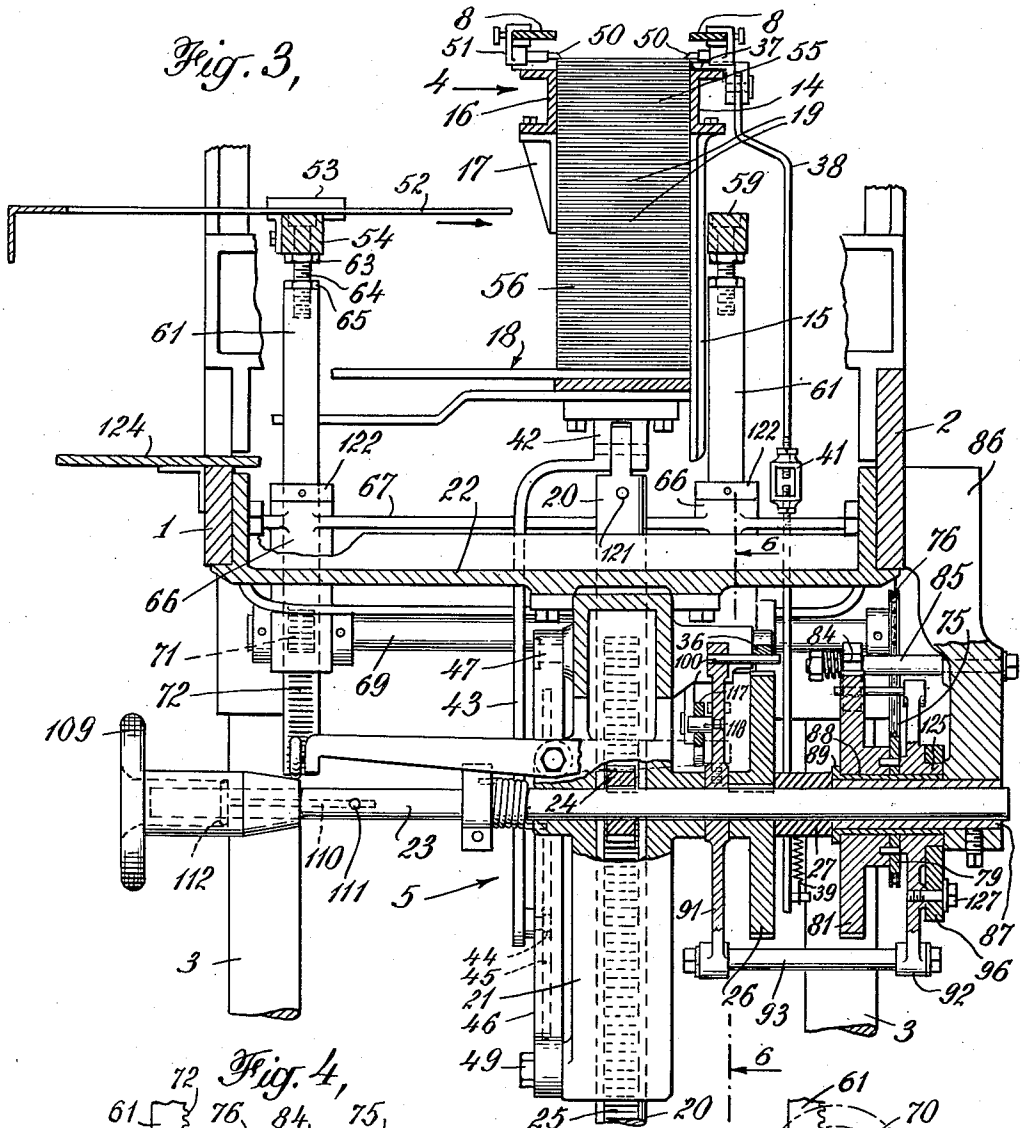
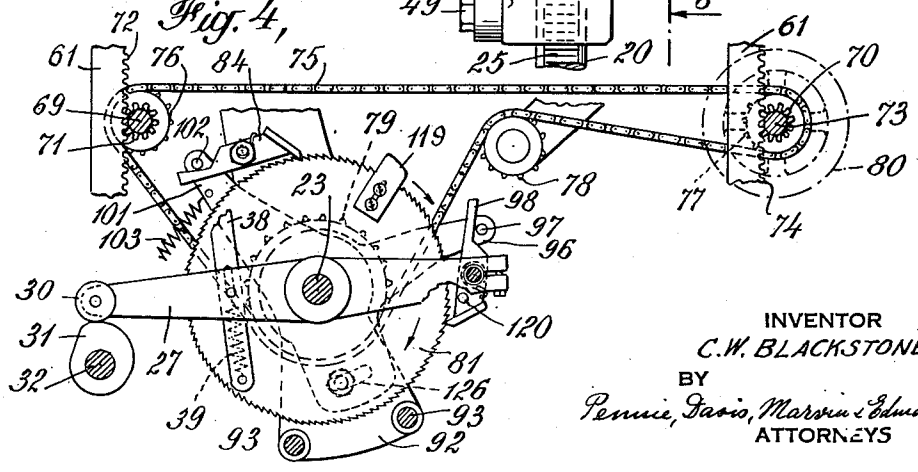


Fig. 4,



INVENTOR
C. W. BLACKSTONE
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

Dec. 14, 1943. C. W. BLACKSTONE 2,336,839

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Fig. 5,

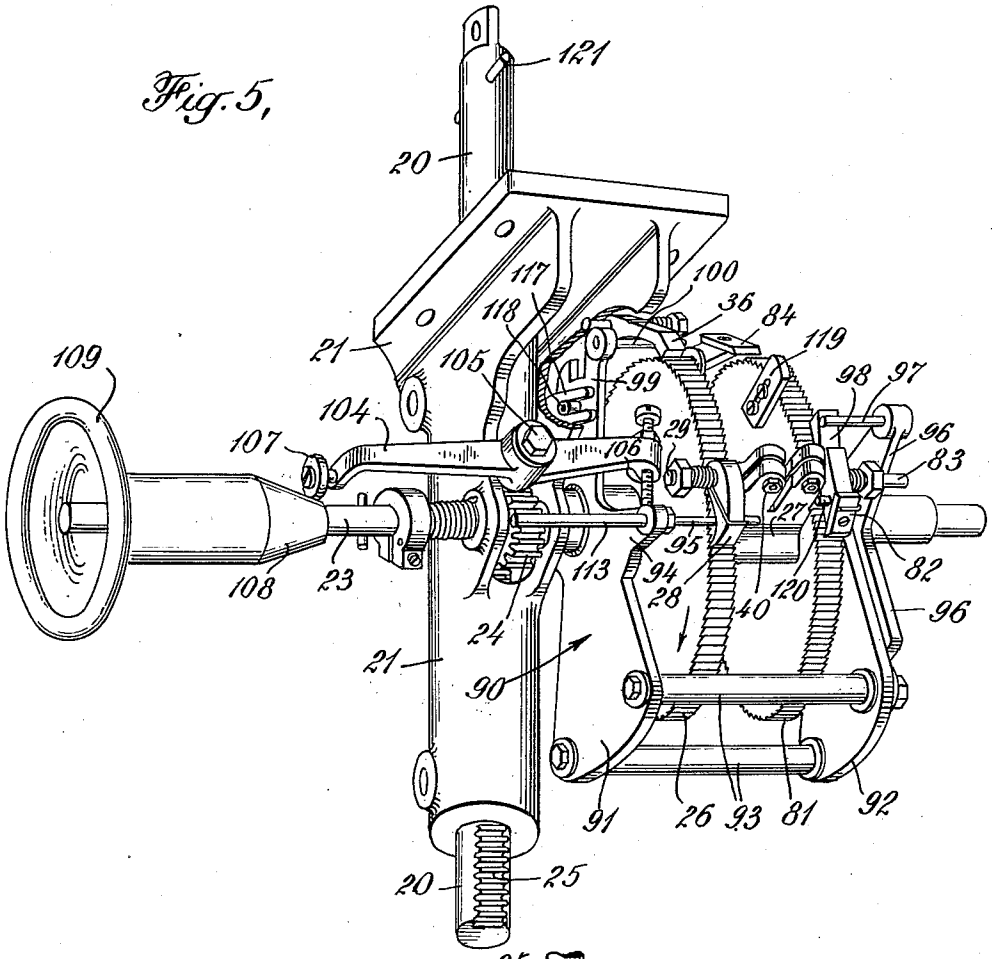
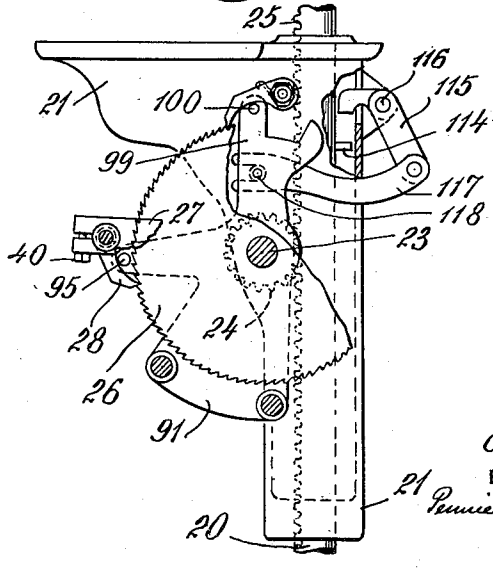


Fig. 6,



INVENTOR
C. W. BLACKSTONE
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

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Fig. 8,

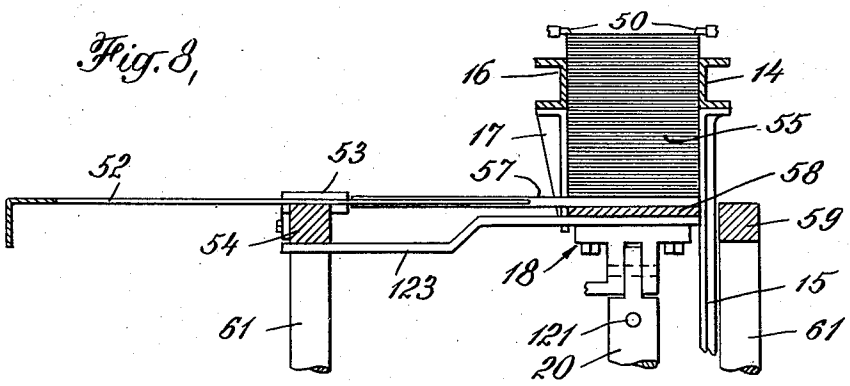


Fig. 9,

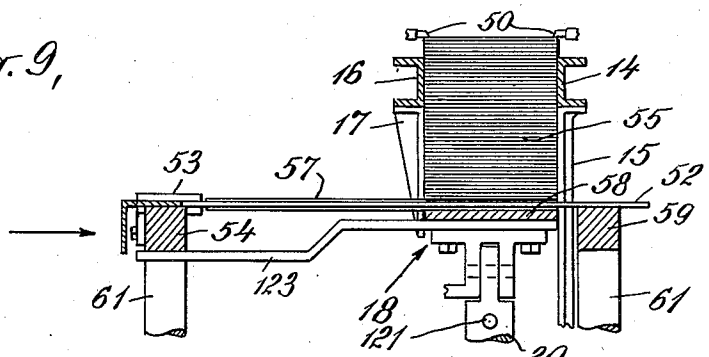
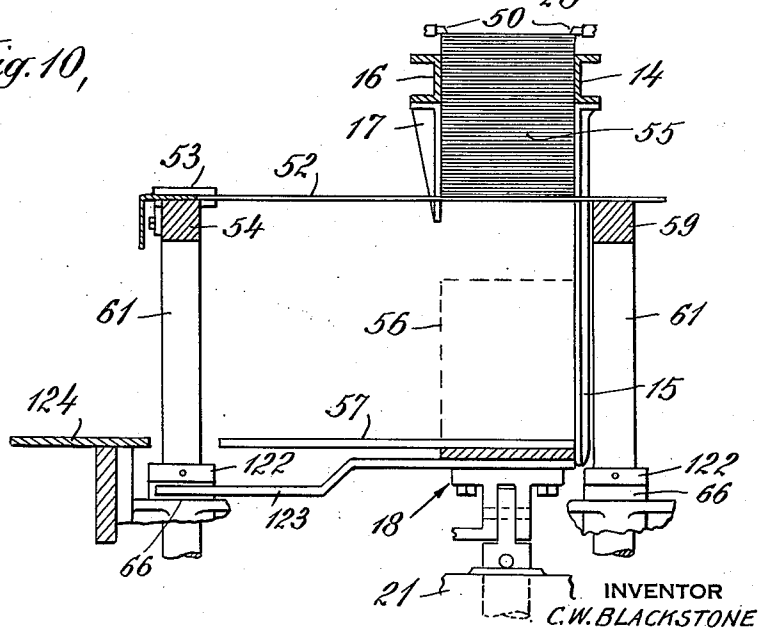


Fig. 10,



INVENTOR
C.W. BLACKSTONE
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

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Fig. 11,

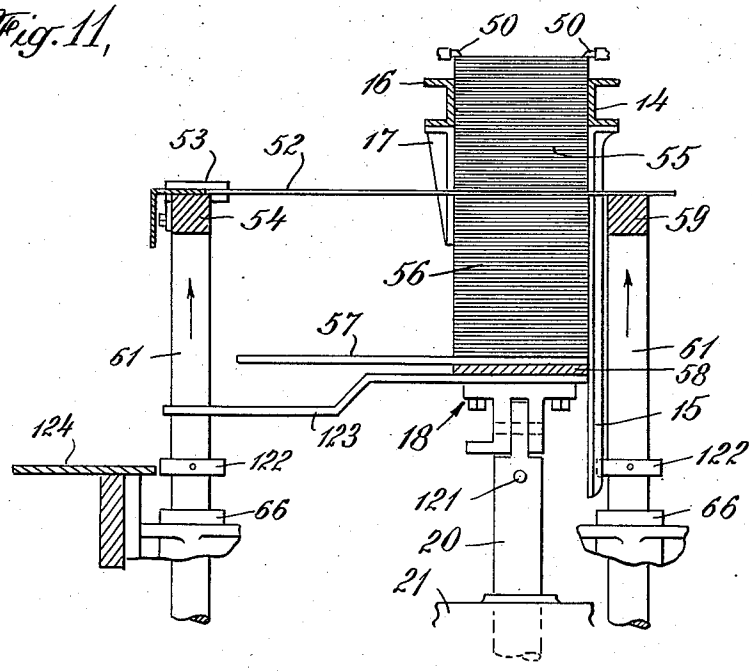
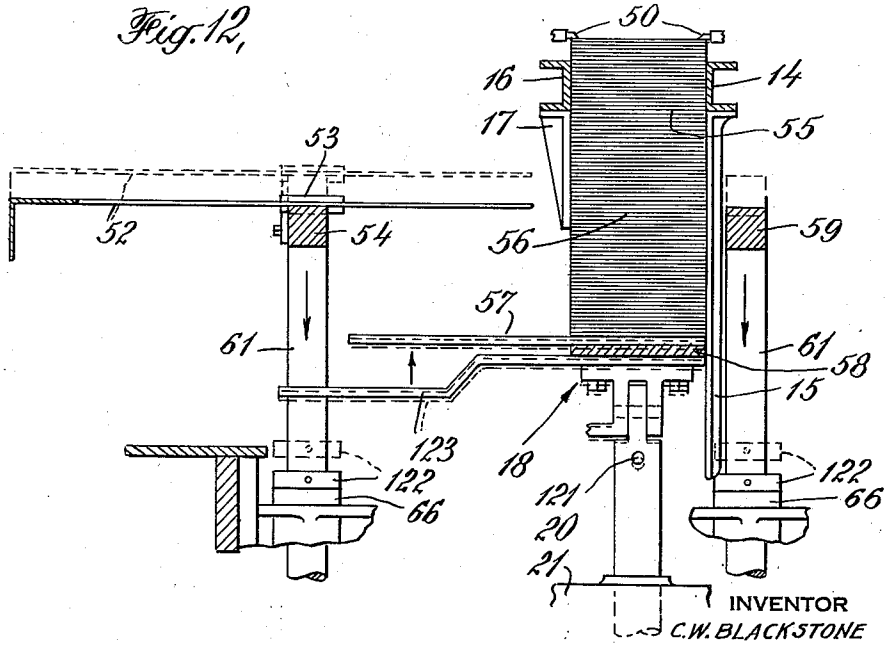


Fig. 12,



INVENTOR
C.W. BLACKSTONE
BY
Pennie, Davis, Marvin & Edmonds
ATTORNEYS

Patented Dec. 14, 1943

2,336,839

UNITED STATES PATENT OFFICE

2,336,839

LABELING MACHINE

Clarence W. Blackstone, Chicago, Ill., assignor to Standard-Knapp Corporation, Portland, Conn., a corporation of New York

Application August 29, 1942, Serial No. 456,625

12 Claims. (Cl. 216—58)

This invention relates to machines for labeling articles such as cans, bottles and the like and has for its object the provision of an improved labeling machine. The invention, more specifically, is directed to the feeding and supply of the labels and the replenishment of the label supply, and the invention aims to provide a labeling machine having a continuous label feed, or in other words, to provide for the replenishment of the supply of labels without stopping the machine.

In the majority of labeling machines now in use when the supply of labels in the label receptacle is depleted nearly to exhaustion, it is necessary to shut down the labeling machine, i. e., stop the labeling of the articles, for a sufficient length of time to insert a new stack of labels in the receptacle. Labels are usually furnished in packages or stacks of 1,000 and labeling machines have been improved to such an extent that articles are now labeled at the rate of 700 to 1,000 per minute. At such a rate of operation the label supply has to be replenished about once a minute and the shutting down of the machine even for a few seconds seriously impairs its output.

A number of attempts have heretofore been made to provide a label receptacle and feeding mechanism so arranged that the label supply could be replenished without shutting down the machine, but these machines have all been objectionable for one reason or another, the principal difficulty being the impossibility of maintaining a proper feed of the label stack toward the can runway during the replenishing operation.

It is the object of the present invention, among others, to overcome this difficulty and to provide a label mechanism in which the labels are fed toward the runway, upwardly in a horizontal labeling machine and horizontally in a vertical labeler, with a continuous positive feed, that is to say, the normal, positive feed of the labels is not interrupted during the replenishing of the label supply. The invention aims to provide a label feeding mechanism which will maintain the same positive feeding action of the body or stack of labels in the label receptacle during replenishing that takes place between replenishing operations.

The invention will be described in connection with its application to a horizontal labeling machine for cans which is illustrated in the accompanying drawings. It will be understood, however, that the invention is not limited to the specific mechanism disclosed in these drawings but that its scope is defined in the appended claims.

In these drawings:

Fig. 1 is a vertical section taken on the line 1—1 of Fig. 2 longitudinally of the central portion of the labeling machine showing the label supporting and feeding mechanism looking in the direction of the arrows, that is to say, from the rear side of the machine;

Fig. 2 is a transverse section taken on the line 2—2 of Fig. 1 looking from the right, as shown by the arrows;

Fig. 3 is a transverse section taken on broken line 3—3 of Fig. 1 looking from the left, as shown by the arrows;

Fig. 4 is a detailed sectional view, illustrating the drive for an auxiliary label supporting and feeding mechanism including an automatic feed throw-out device, taken on line 4—4 of Fig. 3;

Fig. 5 is a perspective view illustrating the main and auxiliary feeding mechanism, with certain parts broken away for the sake of clearness;

Fig. 6 is a detailed view of the main feed throw-out mechanism;

Fig. 7 is a perspective view of a fork-shaped member which forms a part of the auxiliary label supporting and feeding mechanism; and

Figs. 8–12, inclusive, are transverse sectional views of certain parts of the main and auxiliary label supporting mechanism illustrating the various steps in replenishing the supply of labels.

Referring now to these drawings, there is here illustrated a portion of a labeling machine similar to that illustrated and described in United States Letters Patent 2,206,964, granted July 9, 1940, to Wallace D. Kimball, Cornelius I. Braren and John H. Mosley and assigned to the same assignee as the present application. Reference may be had to that patent for certain details of the machine.

The principal frame members of the machine shown in the accompanying drawings are indicated at 1 and 2 (Figs. 2 and 3) and extend from end to end of the machine along the front and rear, respectively. These members are mounted in pairs of uprights 3 at the opposite ends of the machine. The label receptacle which is indicated generally by numeral 4 and the label feed and replenishing mechanism indicated generally by numeral 5, are supported by suitable brackets mounted on these two front and rear frame members 1 and 2.

The cans to be labeled are conveyed through the machine by means of a pair of drive belts 6, only the lower sides of which are shown (Figs. 1 and 2), and which move in the direction of the arrow in Fig. 1. These cause the cans to approach the label receptacle 4 on rails 7 and to pick up the uppermost label of the stack at the position in which the can C is shown in Fig. 1, suitable spots of adhesive having previously been applied to the surface of the can by appropriate mechanism.

The can advances supported by its beads upon a pair of rails 8 arranged along the sides of the label receptacle and the label is wrapped about

the can. The rear or lap end of the label is supplied with suitable adhesive by means of a paste belt 9 and this end of the label is drawn beneath a curling bar 10 and thereafter smoothed onto the surface of the can by means of a smoothing bed 11 over which the can rolls after leaving the label receptacle. The driving belt 6 is maintained in contact with the cans by means of a series of spring pressed rollers 12 mounted upon a horizontal bar 13 which extends from end to end of the machine.

The label receptacle 4 comprises a rear guide 14 having a set of downwardly extending guide fingers 15, a front guide 16 having fingers 17, and a label plate or main label support 18 which is arranged to be fed upwardly and otherwise manipulated as will be later described. Label guides 14 and 16 are mounted at their upper portions on appropriate mechanism for permitting their lateral adjustment both with respect to each other to accommodate labels of different widths and with respect to the can supporting rails 8, so as properly to accomplish the application of the labels to the cans. The rear guide fingers 15 extend downwardly below the lowest position of label plate 18 and the front guide fingers 17 extend downwardly a much shorter distance in order to permit the replenishment of the labels from the front of the machine as is to be described.

The main label support, that is, label plate 18, is fed or moved upwardly by a feeding mechanism which is regulated according to the rate of removal of the labels from the top of the label stack 19 resting on this main support 18. This feeding and regulating mechanism is illustrated in Figs. 1–5, inclusive. Main label support 18 is mounted upon the upper end of a vertically movable bar 20 which is arranged to slide in a suitable guideway in a bracket member 21. This member is bolted to the bottom of a cross member 22 which is bolted at its opposite ends to side frame members 1 and 2.

A transverse shaft 23 is arranged in suitable bearings in the bracket 21, and at the center thereof a pinion 24 is keyed. This pinion engages rack teeth 25 on the face of bar 20.

On the rear portion of shaft 23 near bracket 21 there is keyed a ratchet wheel or disk 26, and alongside this wheel and mounted for oscillation on shaft 23 there is a pawl or feed lever 27. This lever carries at its left hand end, as viewed in Fig. 1, a pawl 28 pivoted at 29 (Fig. 5) and spring pressed as illustrated into engagement with the teeth of ratchet 26.

At its right hand end, as viewed in Fig. 1, lever 27 is provided with a roller 30 which is arranged to be engaged by a cam 31 whenever the feed control or regulating mechanism about to be described is in position to cause an upward feeding of the label stack. Cam 31 is fixed to a cross shaft 32 which is continuously rotated by means of a belt or chain 33. Roller 30 of lever 27 is biased upwardly away from cam 31 by means of a helical spring 34 attached to lever 27 and urging the lever against an adjustable stop 35. A holding pawl 36 is arranged at the top of ratchet wheel 26 and mounted on bracket 21. Like feeding pawl 28, pawl 36 is also spring biased into engagement with the ratchet teeth.

The feed control mechanism comprises a feed trip lever 37 and a link 38 together with its connections with the pawl lever 27. Feed trip lever 37 is pivoted on the side of label guide 14 and has a rounded surface arranged in the path of the cans close to the side of the label stack. As long as the top of the label stack is high enough it will support the cans out of contact with the end of lever 37. When, however, due to the removal of the labels, the top of the stack is lowered somewhat, a can will strike lever 37 and force link 38 downwardly.

This causes a helical spring 39, by which the lower end of link 38 is connected to pawl lever 27, to be placed under tension. When the end of lever 37 is depressed sufficiently the tension of spring 39 will draw the right hand end (Fig. 1) of pawl lever 27 downwardly against the tension of spring 39 until roller 31 on the end of the lever 27 is within the path of cam 31. This downward movement of the right-hand end of lever 27 raises the opposite end of lever 27 (see Fig. 5) to which pawl 28 is pivoted. If the movement is sufficient, pawl 28 will be raised until it falls behind the next tooth of ratchet 26. Then on the next rotation of cam 31 the ratchet wheel will be fed forward in the direction of the arrow in Fig. 5 a distance of one tooth, and this will cause shaft 23 to be rotated a slight amount and the main label plate 18 elevated correspondingly.

In order to facilitate the adjustment to insure that feed pawl 28 engages freely behind a ratchet tooth after its upward movement by the coaction of cam 31 with roller 30, the pivot shaft 29 of pawl 28 is mounted in an eccentric which is clamped in the end of lever 27, as indicated at 40 in Fig. 5. In order to adjust the rate at which the labels are fed upwardly to the cans, link 38 is provided with a turnbuckle and suitable lock nuts 41 by means of which the length of link 38 may be adjusted.

The top of the label stack 19 should be maintained parallel with the can runway in order for the label removal and application to the cans to take place properly. Some labels, however, because of embossing, or otherwise, vary somewhat in thickness from one end to the other. When such labels are made up into a stack it will be substantially higher at one end than the other.

In order to compensate for this difference in height, the label plate or support 18 is provided with a pivot mounting 42 on the upper end of its supporting bar 20. This mounting enables label plate 18 to be tilted as shown in Fig. 1 so as to adjust the top of the label stack into parallel relation with the can runway, that is to say, with the can supporting rails 10. Since the degree of detail necessary to maintain this parallel relationship varies directly with the height of the label stack, an arrangement is made for the automatic decrease in the angle of tilt as the stack is depleted and the label support 18 rises.

This automatic control is provided in the form of an arm 43 which is secured at its upper end to the pivoted mounting 42 and which is provided at its lower end with a roller 44 which engages the walls of a slot 45 formed in an elongated member 46. Member 46 is pivoted at 47 at its upper end to the front side of bracket member 21 which is fixed to the machine frame and within which the label plate supporting bar 20 slides. At its lower end member 46 is mounted for lateral adjustment on the side of bracket 21 at the bottom, member 46 being provided with a transverse slot 48 (shown in dotted lines in Fig. 1) through which an adjusting and clamping screw 49 project. The construction of this mechanism is shown in greater detail in Patent No.

2,206,964 above referred to and described in C. W. Blackstone Patent 2,137,381, granted November 22, 1938.

It will be understood that by means of pawl 49 in slot 48 the lower end of member 46 is adjusted so that cam slot 45 is disposed at an angle with respect to the axis of bar 20. Hence as the label support 18 moves upwardly and roller 44 moves correspondingly upwardly in cam slot 45, the tilted label plate 18 will gradually approach the horizontal. The disparity in thickness between the opposite ends of labels varies with different labels and the angularity of cam slot 45 can be correspondingly varied or adjusted by means of bolt 49 and slot 48.

As the labels are fed upwardly by the feed mechanism the top of the label stack is restrained at the rear end by means of the paste belt 9, and more especially by the curling bar 10. In order to restrain the stack at the front end where the cans pick up the labels, a pair of small, thin knives 50 are provided which are mounted in suitable adjustable supports 51 one on each of the rails 8 on opposite sides of the label stack.

On account of the variation in thickness of the labels and also because of variation in the toughness of the labels, sometimes due to the fact that some labels have a coating such as varnish, it is easier for the edges of some labels to be forced past the knives than others. In order, therefore, to maintain the uniform operation of the labeling machine during replenishing of the labels, it is important to maintain a constant uniform positive feed of the labels against these knives. Otherwise some of the labels are apt to be forced past the knives before they are picked up by the can, whereas it is the intention that the pressure of the knives shall be sufficient to hold the labels in place until they are picked up one at a time by the gum spots on the cans.

The pull of the gum spots is sufficient to free the individual labels from the knives. However, should a label be forced past the knives before being picked up by a can it is liable to become displaced sidewise so that when wrapped about the can it will be crooked, or in some cases the label may be displaced to such an extent that it will not be picked up by the can, and in that case a "shiner" or unlabeled can will go through the machine and have to be removed from the conveyor line leaving the machine. The uniform upward feed of the labels during replenishing as well as in between periods of replenishing, i. e., regular feed, which is afforded by the mechanism of the present invention eliminates to a remarkable degree the incorrect application of labels to the cans. The mechanism for supporting and feeding the labels upwardly during replenishing includes an auxiliary label supporting or advancing device, mechanism by means of which this device is fed upwardly in a positive manner by the same feeding mechanism as previously described, and an arrangement by which the common feeding mechanism can be instantly shifted to actuate either the main or the auxiliary label advancing or supporting devices, as well as provision for the manual movement of both of these main and auxiliary devices to facilitate the addition of a new supply or charge of labels to the already depleted supply.

The auxiliary device for supporting the labels during replenishing comprises a fork-like member 52 (Fig. 7) having a series of parallel prongs and arranged to slide in slotted guides 53 which are attached to a generally horizontal bar 54 arranged parallel with the label receptacle on the front side of the machine. When this bar is slid inwardly in guides 53 to position shown in Fig. 9 it can be used to support the depleted portion 55 of the label stack or bundle while a new charge or supply 56, as indicated by the dotted lines in Fig. 10, is added, as will be described in detail below.

When the fork member 52 is slid inwardly to the position shown in Fig. 9, its prongs pass between the front label guide fingers 17 and in between a series of fingers or blocks (in end view) 57 of somewhat greater thickness than the prongs of fork 52 which are secured to a supporting plate 58 which forms a part of the label plate or support 18 and extends lengthwise thereof from end to end of the label receptacle. The prongs of fork member 52 pass through the spaces between fingers 57 and rest upon a second approximately horizontal supporting bar 59.

These two supporting bars 54 and 59 for the fork member 52 are in turn supported on the upper ends of two pairs of upright bars. One bar of such upright bars 60 is at the left, as viewed in Fig. 1, and the other pair 61 is at the right. The two bars of each of these pairs are arranged one directly behind the other. Supporting bar 59 for the rear ends of the prongs of fork member 52 is supported at one end by the upright bar 60 which is at the rear of the machine (Fig. 2) and at its opposite end by the rear upright bar 61. Supporting bar 54 is carried on the front uprights 60 and 61.

It is important, as will be seen later on, to have fork member 52 in parallel relation to the bottom of the residual portion 55 of label stack 19 which remains at the time of replenishing and the angle of tilt of the bottom of such residual portion depends upon the character of the labels being used and the size of the residual portion of the stack. It is therefore necessary to be able to adjust the angularity of supporting bars 54 and 59 with respect to the horizontal. This is accomplished with respect to supporting bar 59, as shown in Fig. 1, by pivoting one end of this bar at 62 to the upper end of its upright supporting bar 60, and by providing an adjustable connection at its opposite end with the upper end of one of the uprights 61. Supporting bar 54 is supported in like manner.

The adjustable connection just referred to for each of bars 59 and 54 comprises a screw 63 which is tapped into the upper end of one of the uprights 61 and which passes freely through a hole in the end of the respective supporting bars 59 and 54. The upper end of each of these holes is countersunk to receive the head of the screw. Two lock nuts 64 and 65 are provided on screw 63. The adjustment of the angularity of each of bars 59 and 54 is made by loosening both of the lock nuts 64 and 65. Then, holding the supporting bar by hand against the bottom of the head of screw 63, the screw is turned by means of a screw driver until the upper surface of the bar is at the correct angle. Then lock nut 65 is tightened against the lower surface of the supporting bar and lock nut 64 is tightened against the upper end of the upright 61.

The two upright supporting bars constituting bars 61 are mounted for vertical movement in guides 66 (Figs. 2 and 3) cast integrally with a cross member 67 which is bolted to the side frame members 1 and 2. The two uprights constituting bars 60 are similarly mounted in guides 68

(Fig. 1) only one of which is visible as they are located one directly in front of the other.

At the lower portions of guides 66 and 68 there are horizontal bores which carry two transverse shafts 69 and 70, respectively. Shaft 69 has keyed to it two pinions 71 which engage rack teeth 72 on the respective upright bars 61. Likewise shaft 70 has two pinions 73 which engage rack teeth 74 in the respective upright bars 60.

Hence equal rotation of the two shafts 69 and 70 in the same direction (Figs. 1 and 4) will cause the simultaneous raising or lowering of the two pairs of upright bars 60 and 61. Such rotation is accomplished by means of a single endless chain 75 (Figs. 1 and 4) which passes around a sprocket 76 on the rear end of shaft 69, thence around a sprocket 77 on the rear end of shaft 70, thence over an adjustable take-up sprocket 78 and thence into engagement with a sprocket 79 of the auxiliary feed mechanism presently to be described, and thence back to sprocket 76. A hand wheel 80 is fixed to the front end of shaft 70, by turning which the auxiliary label supply advancing mechanism including fork member 52 may be raised or lowered by hand when this mechanism is disconnected from the feed mechanism, as will be described.

The auxiliary label stack advancing mechanism comprises the fork member 52 and its supporting and vertically adjusting mechanism just described including the chain 75 and sprocket 79. Sprocket 79 is secured in any suitable manner to the hub of an auxiliary ratchet wheel 81 which is identical with ratchet wheel 26, particularly as to diameter and number of teeth, and the arrangement is such that this ratchet wheel 81 may be driven by the common label feeding mechanism comprising the reciprocating pawl lever 27. In order to actuate auxiliary ratchet wheel 81, lever 27 is provided with a second driving pawl 82 (Fig. 5) similar to driving pawl 28. This pawl is mounted opposite pawl 28 on the outside of the head of lever 27 on a pivot pin 83.

Ratchet wheel 81 also has a stationary detent pawl 84 which prevents the ratchet wheel from moving backwards on the back or upward stroke of driving pawl 82. Detent pawl 84 is mounted on a pivot pin 85 that is fixed to a bracket member 86 which extends downwardly from the rear side frame member 2 and forms a support for a short sleeve shaft 87 which is fixed therein by a set screw as shown in Fig. 3.

On this short sleeve shaft 87 a bushing 88 is forced having a flange 89 at its inner end which serves to separate ratchet wheel 81 from the hub of oscillating feed lever 27. Ratchet wheel 81 rotates on this bushing 88. The interior of sleeve shaft 87 furnishes a bearing for the rear end of feed shaft 23.

It is important to be able to shift very quickly, in fact instantaneously, from "regular feed" to "auxiliary feed" and vice versa, that is to say, from feeding the labels upwardly by main label plate 18 to feeding them upwardly by forked member 52. The importance of a quick shift in either direction of this feeding of the labels will be apparent when the operation of replenishing the label supply is described further on. In order to provide for such quick shift of the label feed, the main or regular feed ratchet 26, which through the mechanism previously described feeds upwardly rack bar 20 and main label feed plate 18, and the auxiliary feed ratchet 81, which feeds upwardly the two pairs of rack bars 60 and 61 and fork member 52, are each actuated (at different times) by the common oscillating feed lever 27 and its operating mechanism.

The operating connections between lever 27 and ratchet wheels 26 and 81 are made through the feed pawls 28 and 82 respectively. In shifting from regular to auxiliary feed, or vice versa, one of these pawls is moved and locked out of engagement with its ratchet wheel and simultaneously therewith the other pawl is moved into engagement with its ratchet wheel; also substantially simultaneously with these operations, one of the detent pawls 36 is moved and locked out of engagement with its ratchet wheel and the other detent pawl 84 is moved into engagement with its ratchet wheel. A pawl controller indicated generally by numeral 90 (Fig. 5) for substantially simultaneously moving or shifting the four pawls in the manner just described is provided.

This pawl controller 90 comprises two members 91 and 92, member 91 being pivoted on feed shaft 23 (Fig. 3) and member 92 being pivoted on bushing 88. These two members are tied rigidly together for simultaneous pivoting or rocking movement by means of a pair of rods 93 which are bolted at each end securely to each of the two members. Member 91 has an arm 94 carrying a pawl-shifting pin 95 adapted to engage the inner cam-like surface of feed pawl 28, and member 92 has an arm 96 carrying a pawl shifting pin 97 which engages the tail 98 of feed pawl 82 on its outer surface which is also of cam-shaped formation. Pins 95 and 97 are so positioned that the rocking of pawl controller 90 in the direction of the arrow in Fig. 5 causes the simultaneous disengagement of feed pawl 28 and from ratchet wheel 26 and the engagement of feed pawl 82 with ratchet wheel 81.

Also formed on member 91 of pawl controller 90 is a second arm 99 (Figs. 5 and 6) having a pawl control pin 100 adapted to engage the underside of detent pawl 36. Similarly member 92 (Fig. 4) has an arm 101 carrying a pawl shift pin 102 which engages the tail portion of detent pawl 84. It will be understood that as pawl controller 90 is shifted in the direction of the arrows above described, pawl-shifting pins 100 and 102 will cause pawl 36 to be lifted out of engagement with ratchet wheel 26 and detent pawl 84 to be lowered into engagement with ratchet wheel 81.

Through the instrumentality of pawl controller 90 the shift is effected from regular feed to auxiliary feed, or vice versa, by the simple expedient of shifting this pawl controller in one direction or the other. In order conveniently to effect this shifting movement, pawl controller 90 is biased in the counterclockwise direction, that is, in the direction opposite to that of the arrow in Fig. 5 by means of a helical spring 103 (Figs. 1 and 4), one end of which is attached to arm 101 and the other end of which is attached to the machine frame. Pawl controller 90 is rocked in the direction of the arrow, that is, in the clockwise direction, by means of a lever 104 which is pivoted at 105 to bracket member 21 and provided with an adjustable actuating screw 106 which engages arm 94 on member 91 of the pawl controller.

Lever 104 at its outer end has a roller 107 which engages a conical surface 108 formed on the inner end of the hub of a hand wheel 109 mounted on the outer end of feed shaft 23. The hub of this hand wheel is slidably keyed, as indi-

cated at 110 (Figs. 2 and 3) to feed shaft 23 to enable the shaft to be turned by the hand wheel and to permit the hand wheel to be shifted axially on the shaft.

A stop pin 111 limits the inward movement of the hand wheel hub and a second stop pin 112 which engages the bottom of a counterbore in the hub limits its outward movement. It will be understood that an inward shift of hand wheel 109 causes lever 104 to be rocked about its pivot to force its inner end downwardly and thus cause pawl controller 90 to be rocked in the clockwise direction as indicated by the arrow in Fig. 5, or the counterclockwise direction as indicated in Fig. 1.

Pawl controller 90 is provided with a handle 113 (Fig. 5) by which it can be shifted by hand independently of hand wheel 109 if desired. Provision is made for throwing out the auxiliary as well as the main feed in case the labeling machine is permitted to operate until the label stack is depleted beyond a predetermined minimum amount of labels, usually in the neighborhood of 800 ordinary labels.

For throwing out the main feed mechanism a pin 114 (Fig. 6) is arranged at a proper position on supporting bar 20 for the main label plate 18 to engage the short end of a bell crank lever 115 which is pivoted at 116 to bracket member 21. The opposite end of lever 115 has a link 117 pivoted to it. The opposite end of this link is slotted as shown in Fig. 6 and the bottom of this slot is arranged to engage a pin 118 on arm 99 of member 91 of pawl controller 90. Hence should the main label feed be actuated until the label supply is depleted below the minimum amount, this mechanism will cause the rocking of pawl controller 90 a sufficient amount to cause pin 95 to disengage feed pawl 28 from main feed ratchet 26.

In order to throw out the auxiliary feed mechanism auxiliary feed ratchet 81 is provided with a cam member 119 which is adjustably secured to its side by a pair of screws which pass through a slot in the cam member (Fig. 5). Should the machine be allowed to operate too long with the labels being fed by the fork member 52, when the supply has been depleted to the predetermined minimum amount of 800 labels, cam member 119 will engage pin 120 on the inside of feed pawl 82 for auxiliary feed ratchet 81 and lift this pawl out of engagement with the ratchet teeth.

In order to insure that the pawl controller 90 shifts feed pawl 82 into engagement with ratchet wheel 81 at the same instant that it disengages feed pawl 28 from feed ratchet 26, during transfer of the feed from regular to auxiliary or from auxiliary to regular, arm 96 which carries pawl shifting pin 97 is adjustably mounted on member 92. Thus arm 96 is mounted on a hub portion 125 (Fig. 3) formed on the side of member 92 and is also provided with an extension having an arcuate slot 126 (Fig. 4) through which an adjusting bolt or screw 127 passes, this screw being threaded into an aperture in member 92.

The downward movement of main label support or plate 18 is limited by means of a cross pin 121 which engages the top of bracket member 21. The downward movement of the auxiliary label advancing mechanism is limited by collars 122 which are pinned to the upright bars 60 and 61, which engage the tops of guides 66.

The operation of the improved continuous label feed mechanism in replenishing the supply of labels will be best understood from Figs. 3 and 8–11, inclusive. Ordinary labels come in packages of 1,000 labels each and are supplied to the label machine in stacks of this size, although when embossed labels are used it is desirable to insert them in groups of 500 on account of their extra thickness.

As shown in Fig. 3 the label stack 19 comprises a residual portion 55 and the new supply 56 and has just been replenished by the addition of the latter. The machine will now operate under regular feed until the label stack has been reduced to approximately 1,000 labels. This leaves 200 labels to be removed by the cans before the minimum amount of 800 would be reached and the automatic feed of the labels stopped by the the mechanism just described.

In Fig. 8 the residual portion 55 of the label stack has been reduced to approximately 1,000 labels and at this point a line-up bar 123 which is secured at about the center of the main label support 18 (Fig. 1) has engaged the lower surface of the front supporting bar for the forked member 52. This positions the fork member in vertical alinement with the spaces between fingers 57 of label support 18 on which the residual label stack 55 rests. Fork member 52 can then be slid inwardly from the position shown in Fig. 8 to that shown in Fig. 9 where its inner end rests upon the top of the rear side supporting bar 59.

At this point the hand wheel 80 of the auxiliary label advance mechanism is rotated slightly so as to cause the fork member 52 to press against the bottom of the residual label stack as shown in Fig. 10 and hand wheel 109 on feed shaft 23 is pushed inwardly thereby transferring the feed through the engagement and disengagement of feed pawls 28 and 82, from the main feed ratchet 26 to the auxiliary feed ratchet 81. The label feeding mechanism including oscillating lever 27 therefore now actuates ratchet 81 and this through the rotation of sprocket 79 drives chain 75 which rotates sprockets 76 and 77 on shaft 69 and 70 and thereby feeds upwardly the two pairs of upright bars 61 carrying the two side supporting bars 54 and 59 for the fork member 52.

The upward feed of the residual supply of labels 55 therefore continues under the same positive feed conditions as during regular feed and hand wheel 109 can now be rotated to lower bar 20 and main label supporting plate 18 to the position shown in Fig. 10 on which a new supply 56 of 1,000 labels which has been resting on supporting plate 124 can be slid forward into the dotted position shown in Fig. 10 against the rear label guide fingers 15. This new stack is lined up longitudinally with the label receptacle and then hand wheel 109 is rotated in the reverse direction to raise label plate 18 and carry the new supply 56 upwardly to the position shown in Fig. 11 where the uppermost label bears against the bottom of fork member 52.

In bringing up the supplementary supply of labels it is important not to cause them to press too hard against the residual supply 55 as that would force one or more of the uppermost labels past the controlling knives 50 so that control of such labels would be lost and a number of cans would go through the machine having crooked labels or with no labels at all. Also in transferring back to regular feed the lowering of the residual supply 55 away from knives 50 must be avoided as that would result in the labels being torn by knives 50 as they are wrapped about the

cans, or in their not being picked up by the cans.

Accordingly the fork member 52 is now slid outwardly to the dotted position shown in Fig. 12 and at the same instant hand wheel 109 is turned slightly to raise the supplementary supply 56 to compensate for the thickness of fork member 52. This movement of main label support 18 is indicated in Fig. 12 by the full and dotted positions. Hand wheel 109 is then pulled back to its outward position thereby shifting the feed back to the main feed ratchet 26, that is to say, pawl 28 is lowered into engagement with ratchet 26 and pawl 82 simultaneously lifted out of engagement with the ratchet 81, and the detent pawls 36 and 84 are also suitably actuated, detent 36 being lowered into engagement with ratchet 26 and detent 84 being raised out of engagement with ratchet 81.

During the removal of fork member 52, the side shifting of the labels in contact with the forked member is prevented by the stationary front guide fingers 17 which not only engage the residual portion 55 but also a considerable number of the labels of the new supply 56.

During the replenishing operation, that is to say, the insertion of the new supply 56, the labeling of the cans has continued and consequently a number, perhaps a considerable number of labels, has been removed from the residual portion 55. The auxiliary label advancing mechanism including the two pairs of posts 60 and 61 has therefore been fed upwardly to some such position as indicated in Figs. 11 and 12 by the fact that collars 122 are raised out of contact with the tops of guides 66. Consequently, in order to place the label feeding mechanism in condition for the next replenishing operation, hand wheel 80 is rotated so as to lower upright bars 60 and 61 and forked member 52 from the dotted position shown in Fig. 12 to the full line position.

Should the operator of the machine not commence the replenishing of the labels at the moment line-up bar 123 comes into contact with bar 54 of the auxiliary label advancing mechanism, this will do no harm as the interengagement of these two members will merely cause the auxiliary label advancing mechanism including posts 60 and 61 to be fed upwardly from this point with the fork member 53 maintained in horizontal alinement with the fingers or blocks 57 of main label support 18. The fork member can be pushed inwardly beneath the residual label stack at the operator's convenience. For continuous operation of the labeling machine, however, it is necessary for him to have the replenishment of the labels completed before the residual stack has been reduced to 800 labels. Line-up bar 123 engages bar 54 when there are about 1,000 labels left in the stack.

By means of the improved continuous label feed mechanism of the invention, there has been provided an apparatus which has proved to be highly successful in actual use on account of the fact that there is not only a positive upward feed or advance of the labels during the auxiliary feed period as well as during the regular feeding period, but also due to the fact that the transfer or shift from one of these positive feeds to the other can be made instantaneously. It is possible by means of this transfer mechanism to make the shift substantially between the application of labels to two successive cans, and with the cans passing through the machine at the rate of 700 to 1,000 per minute, this means that the transfer or shift of the feed is made in a fraction of a second. Such rapid shift, however, enables the labeling of the cans to continue right through the periods of shift from regular feed to auxiliary feed and from auxiliary feed back to regular feed without having labels placed crooked on the cans and without having cans go through unlabeled.

It will be understood that changes may be made in the machine described above without departing from the spirit or scope of the invention which is indicated in the appended claims.

I claim:

1. In a can labeling machine having a runway, a main label plate for advancing a supply of labels adjacent the runway, auxiliary label-engaging means for advancing the label supply during replenishing thereof, common feeding mechanism for said main and auxiliary label advancing devices, means for selectively connecting said label advancing devices to the feeding mechanism to feed the same toward the runway as the labels are removed from the supply and applied to the cans, a single manually operated control member for said connecting means to transfer the feed from one of said label advancing devices to the other, and manually operated means for actuating each of said label advancing devices to adjust or replenish the supply of labels.

2. In a can labeling machine having a runway, a main label plate for advancing a supply of labels adjacent the runway, auxiliary label-engaging means for advancing the label supply during replenishing thereof, common feeding mechanism for said main and auxiliary label advancing devices, means for selectively connecting said label advancing devices to the said mechanism to feed the same toward the runway as the labels are removed from the supply and applied to the cans, manually operated control mechanism having a uni-directional movement to transfer the feed from one of said label advancing devices to the other, and manually operated means for actuating each of said label advancing devices to adjust or replenish the supply of labels.

3. In a can labeling machine having a runway, a main support for a stack of labels adjacent the runway, auxiliary label supporting means for supporting the stack during replenishing thereof, common feeding mechanism for said main and auxiliary label supports, means for selectively connecting said label supports to the feeding mechanism to feed the same toward the runway as the labels are removed from the stack and applied to the cans, a single manually operated control member for said connecting means to transfer the feed from one of said label supports to the other, and manually operated means for lowering and raising each of said label supports to adjust or replenish the supply of labels.

4. In a can labeling machine having a runway, a main support for a stack of labels adjacent the runway, auxiliary label supporting means for supporting the stack during replenishing thereof, common feeding mechanism for said main and auxiliary label supports, means for selectively connecting said label supports to the feeding mechanism to feed the same toward the runway as the labels are removed from the stack and applied to the cans, manually operated control mechanism having a uni-directional movement to transfer the feed from one of said label supports to the other, and mechanically operated means for lowering and raising each of said label supports to adjust or replenish the supply of labels.

5. In a labeling machine having a runway, a label receptacle associated therewith, said recep-

tacle having a pivoted plate for advancing a supply of labels each somewhat thicker towards one end than the other, means for progressively feeding said label supply toward the runway including means for pivoting said plate to automatically adjust the thickness of the respective ends of the label supply in order to compensate for the disparity in thickness of the ends of the labels whereby to maintain the surface of the label supply substantially parallel with the runway, an auxiliary label-engaging device for advancing the supply of labels after depleting and during replenishment thereof, and means for tilting said auxiliary label advancing device so as to bring it into parallel relationship with the last label of said label supply after depletion thereof.

6. In a labeling machine having a runway, a label receptacle associated therewith, said receptacle having a pivoted plate for supporting the stack of labels each somewhat thicker towards one end than the other, means for progressively feeding said stack toward the runway including means for pivoting said plate to automatically adjust the thickness of the respective ends of the stack in order to compensate for the disparity in thickness of the ends of the labels whereby to maintain the surface of the label stack substantially parallel with the runway, auxiliary label supporting means for supporting the stack of labels after depletion and during replenishment thereof, and means for tilting said auxiliary label support so as to bring it into parallel relationship to the bottom of the label stack after depletion thereof.

7. In a can labeling machine having a runway, a label receptacle associated therewith, a main label plate for advancing the supply of labels in said receptacle, auxiliary label engaging means for advancing the label supply during replenishing thereof, feeding mechanism for said main and auxiliary advancing devices, means for operatively connecting said feeding mechanism with each of said label advancing devices, and a control device for simultaneously disengaging one of said connecting means and engaging the other of said connecting means.

8. In a can labeling machine having a runway, a label receptacle associated therewith, a main label plate for advancing the supply of labels in said receptacle, an auxiliary label-engaging means for advancing the label supply during replenishing thereof, each of said label advancing devices having a ratchet wheel for operating the same, oscillating driving pawls adapted to coact with the teeth of said ratchet wheels to rotate the same and means for simultaneously shifting certain of said pawls into operative position with respect to one of said ratchets and the remainder of said pawls to inoperative position with respect to the other of said ratchet wheels.

9. In a can labeling machine having a runway, a main label plate for advancing a supply of labels adjacent the runway, auxiliary label-engaging means for advancing the label supply during replenishing thereof, each of said label advancing devices having a ratchet wheel for operating the same, an oscillating feed member having two driving pawls one adapted to coact with the teeth of each of said ratchet wheels to rotate the same, a detent pawl for each of said ratchet wheels, and a pawl controller shiftable to two positions, said controller when in one of said positions causing the driving and detent pawls for the ratchet wheel of the main label advancing device to engage the teeth thereof and the driving and detent pawls for the other of said ratchet wheels to be locked out of engagement therewith, and said controller when in its second position causing the driving and detent pawls for the ratchet wheel of the auxiliary advancing device to engage the teeth thereof and the driving and detent pawls for the main advancing device ratchet to be locked out of engagement therewith.

10. In a can labeling machine having a runway, a label receptacle associated therewith having a rear label guide comprising a series of spaced fingers for engaging the rear side edges of the label stack, a main label support for feeding the stack of labels upwardly to the can runway, an auxiliary label support comprising a fork member having prongs adapted to be inserted horizontally between said fingers to support the residual label supply while the main label support is lowered to receive an additional label supply, means for elevating said main label support to force the top of the additional supply of labels thereon against the bottom of said prongs, and means for retaining said labels in position against the frictional displacement tendency of said fork member during its withdrawal comprising a series of front label guide fingers between said prongs extending downwardly from the mouth of the label receptacle to a point substantially below the said fork member.

11. In a can labeling machine having a runway and a label receptacle associated therewith, a main label support for advancing the labels in said receptacle toward the runway, manually operated mechanism for advancing and withdrawing the main label support during replenishing of the label supply, said main label support having a series of spaced blocks thereon on which the bottom of the label stack rests, an auxiliary label supporting means including a fork member the prongs of which are insertable between said blocks to engage the bottom of the residual label stack, said auxiliary label supporting means also including supporting devices for said fork member adapted to support the same in laterally slidable relation thereto, feeding mechanism for said main and auxiliary supports, and interengaging members on said supporting devices and said main label support engageable when the blocks on said main label support are in alinement with said fork member, for advancing the auxiliary label support, said supports thereafter being fed simultaneously toward the runway thereby permitting the sliding of said fork member laterally into engaging position with the residual label stack at any time subsequent to the engagement of said interengaging members.

12. In a can labeling machine having a runway, a label receptacle associated therewith having a main support for a stack of labels, auxiliary label supporting means for supporting the stack during replenishing thereof, common feeding mechanism for said main and auxiliary label supports, disengageable connecting means for selectively connecting said label supports to the feeding mechanism to feed the same toward the runway as the labels are removed from the stack and applied to the cans, and means actuated by the movement of each of said label supports to a predetermined elevation for moving said connecting means to disconnect the feeding mechanism and stop the feeding of the labels towards the runway when the supply of labels in the label receptacle is reduced to a predetermined amount.

CLARENCE W. BLACKSTONE.