H. M. SMITH.

LABELING MACHINE.

APPLICATION FILED DEC. 10, 1913.

1,151,223.

Patented Aug. 24, 1915.

5 SHEETS—SHEET 1.

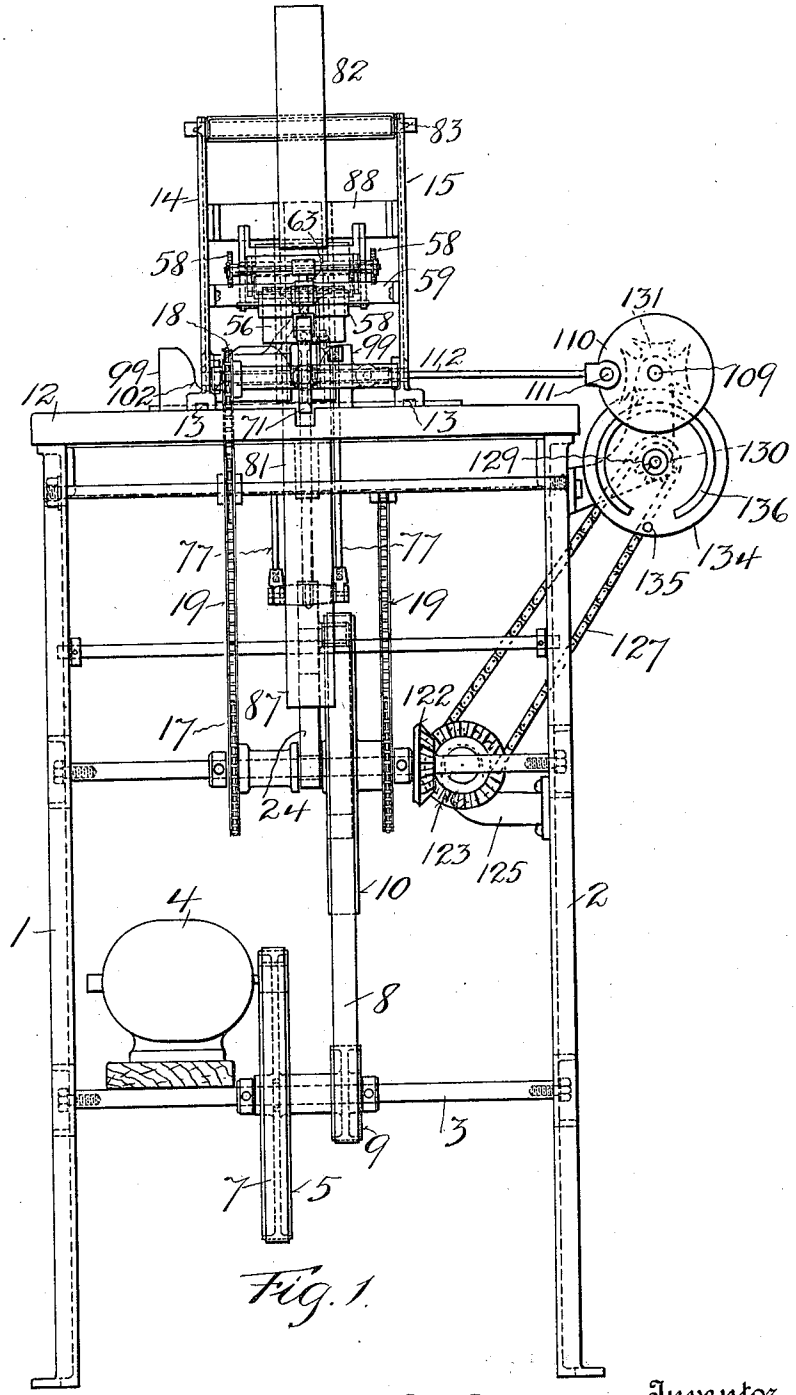


Fig. 1.

Witnesses:
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J. L. Bucklieb

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By his Attorney
Charles G. Hensley.

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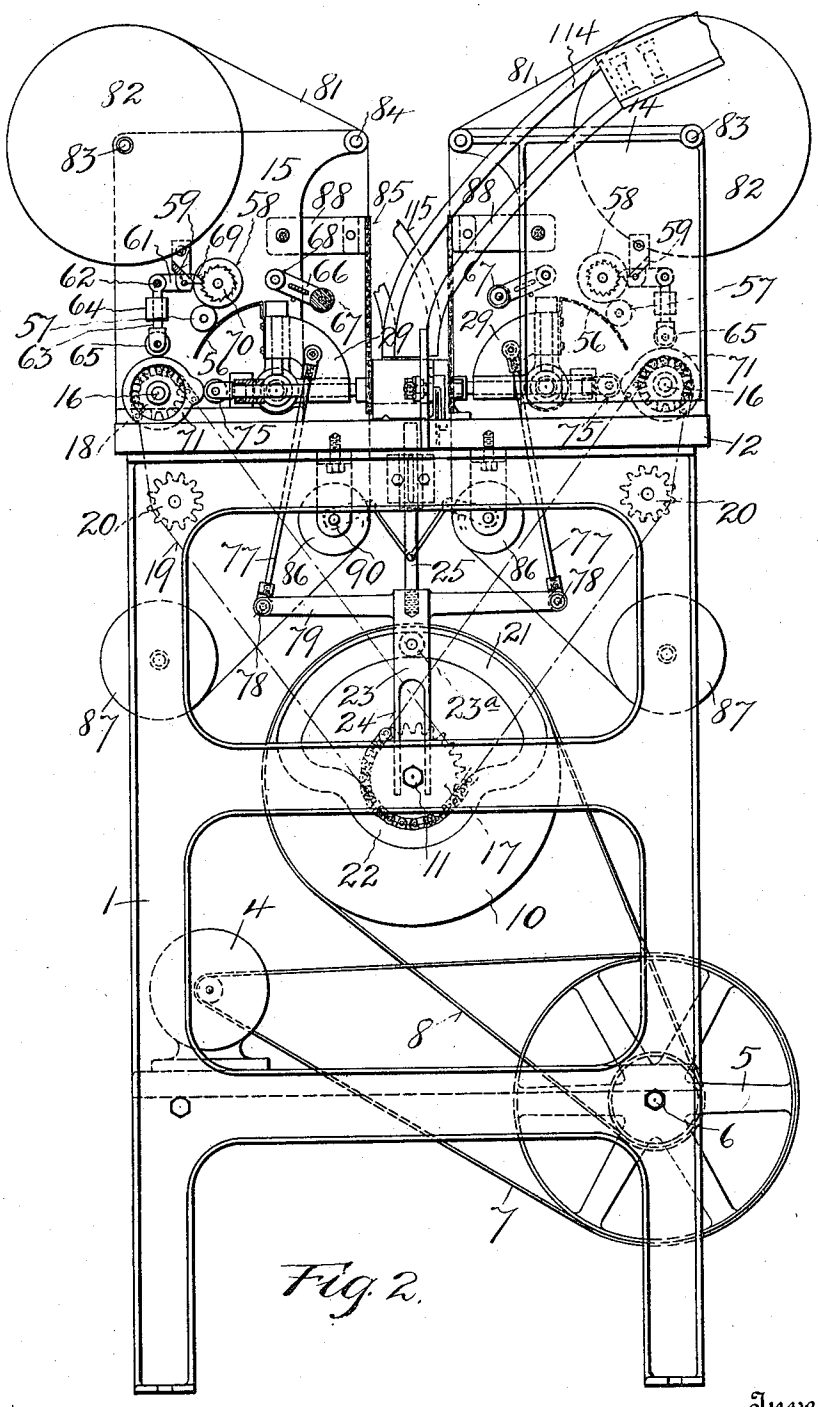


Fig. 2.

Witnesses:
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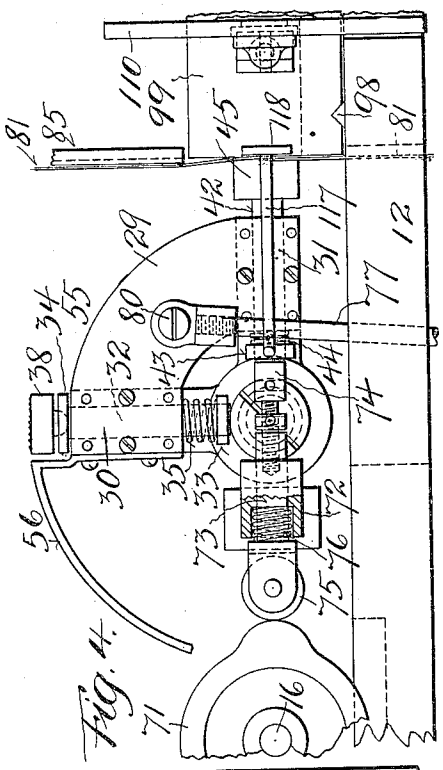


Fig. 4.

Fig. 3.

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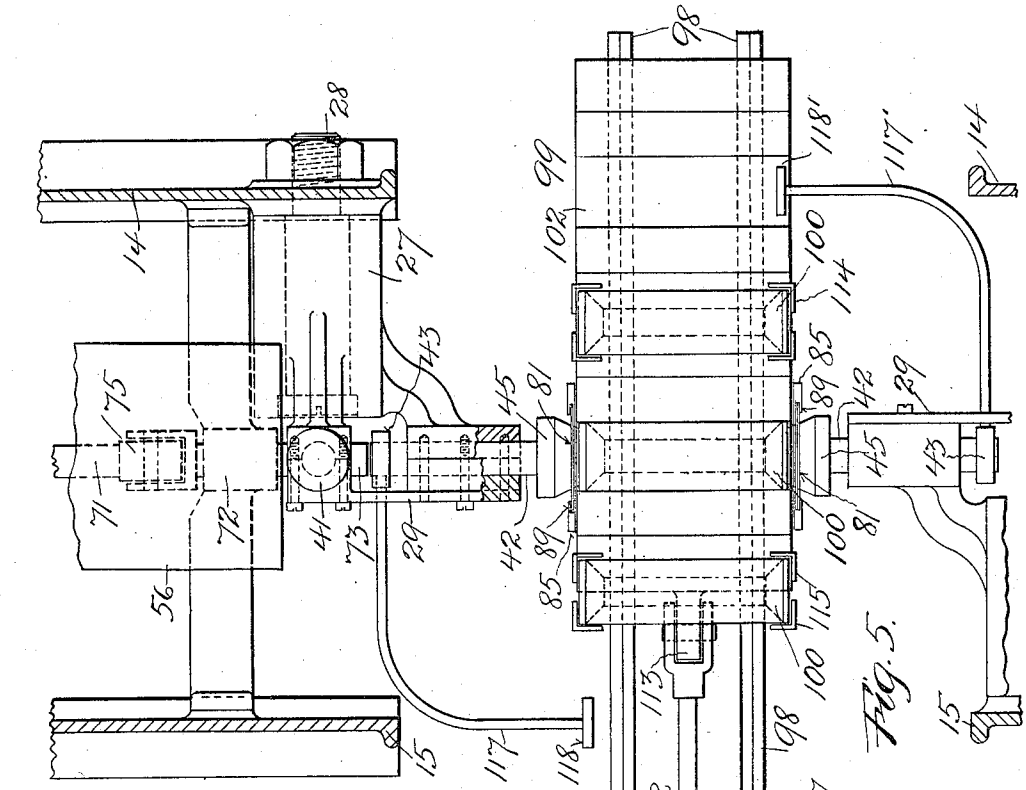


Fig. 5.

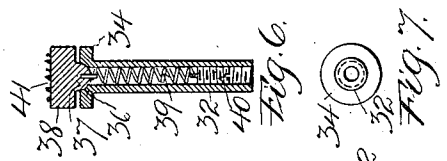


Fig. 6.

Fig. 7.

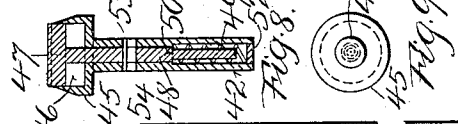


Fig. 8.

Fig. 9.

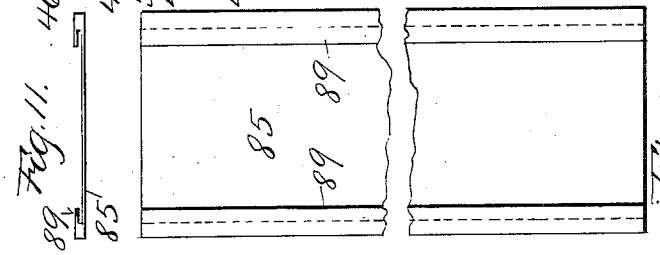


Fig. 11.

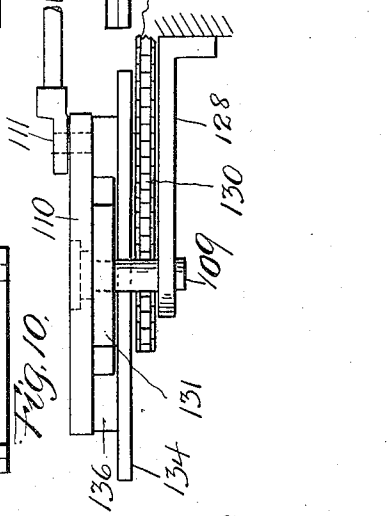


Fig. 10.

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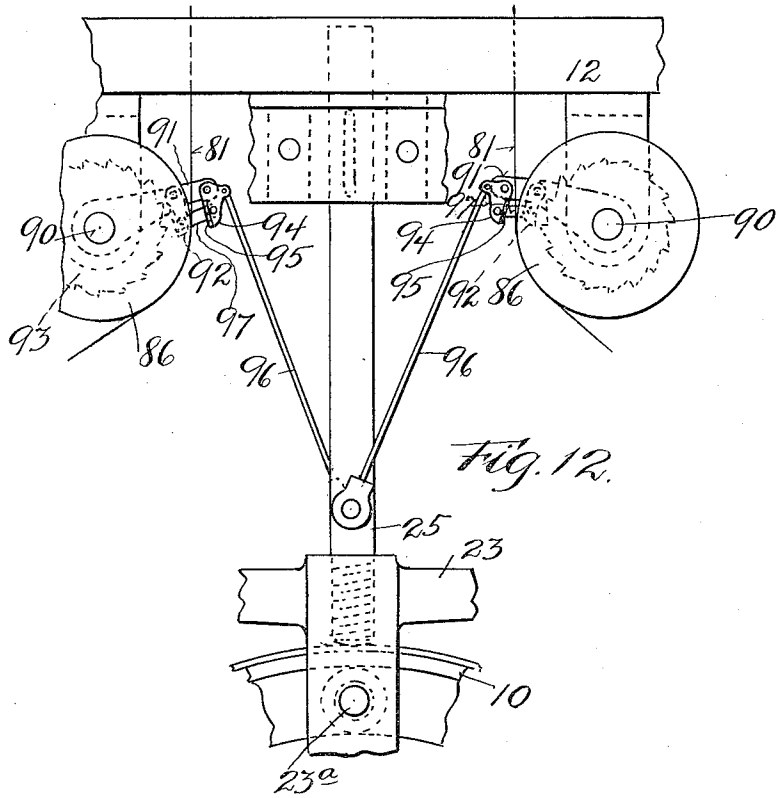


Fig. 12.

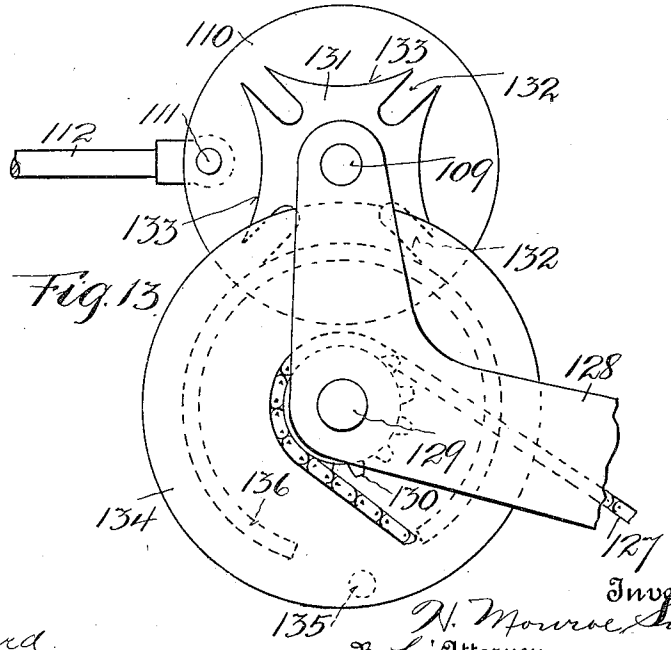


Fig. 13.

Witnesses:

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UNITED STATES PATENT OFFICE.

HENRY MONROE SMITH, OF PAWTUCKET, RHODE ISLAND, ASSIGNOR OF FORTY ONE-HUNDREDTHS TO S. MORRILL BANNER, OF NEW YORK, N. Y.

LABELING-MACHINE.

1,151,223. Specification of Letters Patent. Patented Aug. 24, 1915.

Application filed December 10, 1913. Serial No. 805,726.

To all whom it may concern:

Be it known that I, HENRY MONROE SMITH, a citizen of the United States, and a resident of the city of Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Labeling-Machines, of which the following is a specification.

My invention relates to a machine for labeling articles of merchandise.

Though the present invention may be used for labeling various articles of merchandise and though I desire to protect my invention in its various uses, I have here shown it embodied in a structure more particularly adapted for labeling spools. So far as I am aware it is common practice to label spools, such as are used to hold threads, wires and such like, by applying labels to the ends thereof by hand labor. This is not only expensive, but very unsatisfactory.

The object of my present invention, among others, is to provide an automatic machine for applying labels to either or both ends of the spools, or for stamping or marking the ends of the spools themselves. To this end I have provided a machine of simple construction for automatically labeling the spools, which will perform the work very rapidly.

Another object of the invention is to improve the quality of the work by providing a device which will provide more regular and accurate labels and attach them more accurately to the spools, than was heretofore possible.

With the present machine spools may be labeled either before they are wound or after. Even though they are wound with the most delicate silks, etc., they may be labeled without injury to the silk.

Under the present invention the labels are not only automatically attached to the spools but, preferably, they are also printed and cut by the machine; that is, the labels are made, cut and applied.

Another object of my invention is to bring the label material and a platen (which latter is preferably a part of the spool carriage), into position for the printing operation; and to bring the spool into such relation to the label material that the spool itself may serve as a platen or die member for the cutting or severing of the label; and to cut or sever the label by coöperation between the cutting member and the spool.

Another object of my invention is to print and cut the labels from a strip or web at the same position, so that the web need not be fed or advanced between the printing and cutting operations; and to apply the label to the spool at the same position where the printing and cutting are effected, and without having to feed or advance the web until the operations of printing, cutting and applying are completed. As a result of such operations it is possible to print and cut the labels so that they are all uniform; that is, so that the printing on all the labels bears the same position relative to the cutting; and, furthermore, the labels are all accurately positioned on the spools. This makes the product more regular and uniform in appearance.

Another object of my invention is to provide a very simple and effective arrangement for feeding the spools successively to the labeling position and for discharging the labeled spools.

Another object of my invention is to arrange printing devices to operate simultaneously and cutting devices to operate simultaneously, from opposite directions, so that the labels will be applied at both ends at one time and be delivered alike; that is, with similar ends turned the same way; and the shocks of the machine will, in a sense, oppose one another.

These and other objects are possible in the machine hereinafter described in detail.

In the drawings forming part of this application, Figure 1 is a side elevation of a machine embodying the invention, Fig. 2 is a front elevation of the same with one of the head plates removed to show the interior parts, Fig. 3 is a detail sectional view, on a larger scale, showing the spool feeding and discharging device, Fig. 4 is an elevation, showing the printing and cutting head and its coöperation with the spool feeder, Fig. 5 is a plan view thereof, with parts shown in section, Fig. 6 is a sectional view, and Fig. 7 an end view of one of the plungers, Fig. 8 is a sectional view, and Fig. 9 is an end view of another of the plungers, Fig. 10 is an elevation, and Fig. 11 an end view of the web guide, Fig. 12 is an elevation of the devices for intermittently advancing the webs,

Fig. 13 is an elevation of the device for intermittently reciprocating the spool carriage.

The parts are here shown as mounted upon a frame consisting of the standards 1, 2, connected by cross bolts 3. There is shown a motor 4 mounted upon the frame and arranged to drive a pulley 5, on a shaft 6, through the action of a belt 7. A belt 8 travels over a smaller pulley 9 on the shaft 6 and over a pulley 10 on a shaft 11 which latter is the main shaft of the machine from which the various devices are operated.

The machine is here shown as provided with oppositely arranged printing heads for operating upon opposite sides of the platen; and the description will relate to such an arrangement, though the invention is not, in the broadest aspect, limited to such arrangement. Both heads are alike, so that the detailed description applies to both alike.

The frame has a top or table 12 on the top of which are arranged guides or tracks 13. Upon the table, and adjustable toward and from the middle of the machine, on these tracks, are the head plates 14, 15, here shown arranged in parallel pairs, one pair for each printing head. These is a shaft 16 in each pair of head plates, which is driven from the main shaft, at a ratio of two to one by means of the sprocket 17 on the main shaft, the sprocket 18, on shaft 16, and a chain 19. There is preferably an idler 20 for keeping the chain sufficiently taut. The pulley 10 also serves as a cam and for this purpose it is provided with a cam groove on one side having the high portion 21, and the lower portion 22 running one into the other.

There is a plate 23 having a forked end 24 straddling and guided by the main shaft 11; and a rod 25 on the upper end of this plate reciprocates in a socket 26, by which it is guided.

There is a hub 27 mounted upon a stud 28 in the head plate 14, the hub and associated parts being adapted to oscillate about the stud. An annular and vertically lying plate 29, carried by the hub, is provided with plunger sockets 30, 31, radiating from the center line of the stud 28; and they are here shown as arranged ninety degrees apart.

In the socket 30 there is arranged a plunger 32 having a collar 33 on one end and a flanged head 34 on the other. Between the collar 33 and the socket member 30 there is a compression spring 35 for retracting the plunger. The head 34 is provided with a spherical socket 36 in which seats the spherical base 37 of a form 38. A spring 39 in the bore of the plunger has one end connected with the base 37 and the other end with an adjusting screw 40 for adjusting the tension of the spring. The form 38 is thus held in the ball seat by the spring in such manner that the form may rock, and this permits the surface 41 to press evenly upon the label strip.

The member 38 may be provided with type on its printing surface 41 or with any other means adapted to provide the desired impression upon the label strip or web.

In the socket 31 there is arranged a reciprocating plunger 42, shown in Figs. 8 and 9. This plunger has a collar 43 on one end between which and the socket member 31 there is a compression spring 44 which is adapted to retract the plunger. The opposite end of the plunger is provided with a cutting die 45 which is here shown as provided with a circular cutting edge and with a socket 46. Within the socket 46 there is arranged a plunger head 47 having a shank 48 which reciprocates in the bore of the plunger 42. The compression spring 49 acting between the end wall 52 of the plunger and between the shoulder 50 of the shank, forces the inside plunger 47 outwardly so that the head 47 projects beyond the cutting edge of the die 45. The movement of the interior plunger is limited by a pin 53 traveling in a slot 54 of the plunger 42. The head 55 carries an annular ink distributing plate 56 which has a rolling contact with the distributing roller 57. The latter, in turn, has a rolling contact with a roller 58 which receives the ink from a plate 59 on which the supply of ink is placed. On a shaft 68 there are arranged the arms 66 which carry the inking roller 67. This latter roller receives the ink from the distributing plate 56 at each reciprocating of the printing head and applies it to the form 38. Upon a stud 60 there are arranged arms 61 which have a pawl 69 engaging with a ratchet 70 on the shaft with the ink roller 58. Fulcrumed to the lever arms there is a shaft 62 carrying the rod 63 which is guided in a bracket 64. This rod is provided with a roller 65 which travels in contact with a cam 71 on shaft 16. At each revolution of this cam the rod 63 is reciprocated and the arms 61 are rocked; and this advances the ink roller 58 through the acting of the pawl 69 on the ratchet. The above constitutes the means for automatically supplying the form with the necessary ink for the printing operation.

In the bracket 72 there is arranged a reciprocating rod 73 having an adjustable head 74 on one end and a roller 75 on the other end. There is a compression spring 76 for retracting the rod 73. At each revolution of the cam 71, the raised portion, acting on the roller 75 reciprocates a rod 73. Oscillating movement imparted to the printing head brings either the plunger 32 or the plunger 42 into a horizontal position in line with the rod 73 and in line with the label strip and the spool. The printing head is

oscillated at each reciprocation of the plate 23 through the operation of a link 77 fulcrumed at 78 to an arm 79, and fulcrumed at 80 to the plate 29.

The labels are cut from a strip or web 81 in such a manner as to leave a continuous portion beyond the cutting position so that the web may be guided on both sides of the cutting position, and so that the label may be cut in accurate relation to each spool. I have shown a reel 82 mounted upon an arbor 83 in each pair of plates 14, 15. The web 81 from the reel is guided over a roller 84, and then passes through a strip guide 85, thence over a feed roller 86 and upon a take up reel 87. The strip guide 85 is supported upon a bracket 88 from the head plates, and is shown disposed in a vertical position. The guide consists of a plate 85 provided with flanges 89 which inclose the edges of the web and prevent lateral displacement in relation to the printing and cutting members.

The means shown herein for feeding the web consists of the following. Upon the shaft 90 of the feed roller 86 there is loosely arranged a lever arm 91 which is provided with a pawl 92 engaging the teeth of a ratchet 93 secured to the feed roller. This arm is also provided with pawl or grip arms 94 carrying a plate 95 which is arranged to press the web against the feed roller and advance it therewith. There is a link 96 fulcrumed to the arms 94, and to rod 25 on the reciprocating plate 23. At each downward movement of the plate 23 the link 96 rocks the arm 94 to move the plate 95 into engagement with the web; and this also acts through the link 97 to throw the pawl 92 into engagement with the ratchet. As the downward movement of the plate continues, the feed roller 86, together with the web, are advanced sufficiently to bring a new or uncut portion of the web into line with the printing plunger. At each upward movement of the plate 23 the pawl 92 and the grip 95 are released and carried back ready for another feeding operation. Through the above connections the web is fed at each operation of the machine, just following the operations of cutting the label from the web. Between the printing and cutting of the web the latter remains stationary.

The means for feeding and delivering the spools is shown in detail in Figs. 1, 3, 4 and 5. Upon the top of the table 12 and at right angles to and below the cutting heads there are arranged guiding rails 98 on which a spool carriage 99 reciprocates at right angles to the printing heads. This carriage is preferably of a width corresponding with the length of the spool 100. It has spool sockets 101, 102 spaced apart and defined by curved or slanting walls 103 which guide the spools from the top into the circular recesses 101, 102. The carriage reciprocates between the web guides 85 and between the oppositely arranged printing heads; and it is operated by the following device: Upon the shaft 11 there is a bevel gear 122 which meshes with another bevel gear 123; the latter being arranged upon a shaft 124 held in the bracket 125. Upon the same shaft 124 there is a sprocket 126 over which there travels a chain 127. Near one side of the table and upon a bracket 128 there is shown a shaft 129 carrying a sprocket 130 smaller than sprocket 126, over which the chain 127 also travels. Upon the shaft 109 there is secured a star wheel 131. This has four slots 132 and intermediate circular portions 133. A disk 134 on the shaft 129 has a pin 135 which is arranged to enter one of the slots 132 at each revolution; and it also has an interrupted flange 136 for engaging the circular portions 133 of the star wheel. At each revolution of the shaft 129 (which will occur twice for each revolution of the main shaft) the pin 135 will engage in one of the slots 132 of the star wheel and it will turn the star wheel and its shaft one quarter revolution. During this turning operation the open portion of the flange 136 is opposite the star wheel; and after the shifting is completed the flange lies close to one of the circular portions 133 and locks the star wheel from turning until the pin 135 again acts thereon. Upon the shaft 109 there is a disk 110 to which there is fulcrumed, at 111 a link 112. The other end of this link is fulcrumed to an ear 113 on one end of the spool carriage. At each revolution of the shaft 129 the disk 110 is turned one quarter revolution.

With the parts in the position shown in Fig. 3 the spool recess 101 is in line with the paper webs and with the printing heads. Upon a quarter revolution of the disk 110 the spool carriage is moved to the right; and upon the second movement of the disk 110 the spool carriage is again advanced to the right; and this time the spool in the recess 102 is brought into line with the webs and the cutting plungers. Upon the next quarter revolution of the disk the spool carriage is moved to the left to the intermediate position; and upon the last quarter revolution of the disk the spool carriage is moved to the position shown in Fig. 3. In the above manner the spool carriage is so operated as to bring first, the intermediate wall 99^a of the spool carriage into line with the printing plunger and then a spool pocket into line with the cutting plunger; and the spool pockets alternately into line with the spool feeding devices hereinafter described.

The device for feeding the spools automatically to the carriage is as follows: There are arranged two chutes or guides 114, 115 into each of which a stack of spools is so placed that the spools feed in a hori-

zontal position. The lower ends of these chutes terminate just above the top edge 116 of the spool carriage; so that the spools are retained and supported in the chutes until one of the spool sockets is brought below one of the chutes. Extending laterally from the collar 43 of the cutting plunger there is a rod 117, having a head 118 positioned in line with the spool socket 101 when the spool carriage is in one of the extreme positions. A similar rod 117′ projects from the cutting plunger of the opposite head; and it is directed laterally and in the opposite direction to the rod 117. When the spool carriage is in one of its extreme positions the head 118′ is in line with the spool socket 102. These rods 117, 117′ act as ejectors and force the spools endwise out of the sockets 101, 102, after the spools have had their labels applied thereto.

Operation: At each revolution of the main cam the plate 23 is moved downwardly and then upwardly. This reciprocates the heads 55 and brings first the plungers 32 and then the plungers 42 into line with their operating rods 73. Since the shaft 16 is revolved twice as fast as the main shaft, the cam 71 will operate the rod 73 twice for each revolution of the main cam; first to reciprocate the plunger 32 and then to reciprocate the plunger 42. The reciprocation of the plunger 32 causes the form 38 to impress the desired matter upon the web 81. In doing so, the form presses the web against the platen wall 99ª of the spool carriage in line therewith. This operation takes place simultaneously upon opposite sides of the spool carriage and upon both webs. After the plungers 32 have impressed the webs the heads are reciprocated to bring the plungers 42 into line with the rods 73 and in the same position previously occupied by the plungers 32. The spool carriage is also moved to the right or left to bring either the spool in recess 102 or the spool in recess 101 in line with the plunger. The second operation of the rods 73 now reciprocates the plungers 42; and their dies 45 act on the webs 81 and sever the labels therefrom. The dies act against the end of the spools, and there is no movement of the webs between the printing and cutting operations. The cutting and printing plungers operate successively at the same position. These operations, therefore, register accurately. Further movement of the main cam returns the heads to the first position, with the plungers 32 in position for printing. This also causes the webs 81 to be advanced sufficiently to bring new portions into the printing and cutting position. Thus any slight inaccuracies between the web feed and the printing and cutting operations are immaterial because the webs remain stationary between the printing and cutting operations; that is, the webs are fed between the making of different sets of labels. The above reciprocations of the heads also cause the ink to be supplied to the forms 38, through the inking devices previously described. During the cutting operations the spool carriage is positioned with either the recess 101 or the recess 102 in line with the cutting plungers. Assuming an operation to have been completed, the webs will be fed one step to bring new portions into position; and the spool carriage (see Fig. 3) will be moved to the right, bringing the platen 99ª into line with the printing plunger. The latter will then impress the desired print upon the new portions of the webs, by acting against the platens 99ª. While the spool carriage is in this (printing) position, the recess 102, which was previously emptied by the ejection of a spool, is under the chute 114; and a spool feeds from the latter into the recess, ready for the application of the labels. The carriage is again moved one step to the right by the movement of the disk 110. This brings the spool in recess 102 into line with the cutting plungers and in line with the printed portions of the webs. It also brings the spool in recess 101 into line with the ejector 118. The cutting plungers now operate to cut the labels from the webs by acting against the ends of the spool in recess 102. At the same time the ejector 118 will eject the labeled spool from recess 101. Upon another movement of the disk 110 the carriage will move to the left, to the intermediate position. The webs will also be advanced another step. This last movement of the carriage brings the platens 99ª into printing position, *i. e.*, in line with the printing plungers. The printing plungers, by this time lowered into printing position, will operate upon the webs and against the platens to print the new portions of the webs. At the same time a spool will feed from chute 115 into the recess 101. Another movement of the disk 110 will move the carriage to the left, bringing the recess 101 into labeling position and the recess 102 into ejecting position. These operations will be repeated, in the order here set forth.

I prefer to use webs 81 having one side previously supplied with an adhesive and to simply moisten the adhesive in the machine, although this particular arrangement is not imperative. In the carriage 99 there is shown a chamber 119 for holding the moistening fluid. There are wicks 120, 121 communicating with this fluid and projecting sufficiently from the carriage to make contact with the inner surface of each web 81. During the reciprocations of the spool carriage these wicks have a wiping contact with the adhesive side of the webs and they supply sufficient moisture to cause the ad-

hesive to stick the label material to the spool ends.

When the cutting plunger moves against the web, the inner head 47 first contacts therewith and holds the web. Then as the spring 49 is compressed the cutting die 45 acts on the web and against the spool to cut the desired portion from the web. Upon the retraction the cutting die 45 first leaves the web and later the head 47; so that the latter holds the severed label until the cutting die is disengaged; and then the head 47 disengages from the label, leaving the latter attached to the spool. This prevents the label from following the die and disengaging the spool.

Matters herein shown and described, but not claimed, form the subject matter of an application filed by me of the 10th day of December 1913 and serially numbered 805,725.

Having described my invention, what I claim is:

1. In a labeling machine, means for feeding articles of merchandise to be labeled, means for feeding label stock, and means operating to print the stock and to sever the labels therefrom, and arranged to perform said printing and severing operations at the same position.

2. In a labeling machine, means for feeding articles of merchandise to be labeled, means for feeding label stock, and means operating to print the stock and to sever the labels therefrom and arranged to perform said printing and severing operations at the same position, said means operating against the articles of merchandise in severing the labels.

3. In a labeling machine, means for successively feeding articles of merchandise and for holding them stationary for labeling, means for intermittently feeding label stock, and means operating to print the stock and to sever the labels therefrom and arranged to perform said printing and severing operations at the same position.

4. In a labeling machine, means for feeding articles of merchandise for labeling, means for intermittently feeding label stock, means operating to print the stock and to sever the labels therefrom and arranged to perform said printing and severing operations at the same position, and means operating on the stock at the printing position to moisten it.

5. In a labeling machine, movable means having impression and severing means, means for operating the movable means to bring the impression and severing means to operate successively at the same position, means for feeding a web, a platen and article feeding means and operating means for alternately presenting the platen to said impression means and an article to be labeled to said severing means.

6. In a labeling machine, oscillating means having impression and severing means, means for operating the oscillating means to bring the impression and severing means to operate at the same position, means for operating said impression and severing means in successive relation as they are positioned, means for feeding a web, a platen and article feeding means and operating means to bring the platen into position where the impression member will operate to impress the web and to bring the article into position for the severing means to operate thereon to sever the label.

7. In a labeling machine, oscillating means having plungers, means for operating the oscillating means to bring the plungers to operate successively at the same position, a reciprocating member held stationarily as to the movements of the oscillating member and adapted to separately actuate the plungers as they are positioned, means for feeding a web, a platen for a plunger and means for feeding articles of merchandise into position where a plunger will operate against the articles to sever the labels.

8. In a labeling machine, movable means having impression and severing members, means for operating the movable means to bring the impression and severing means to operate successively at the same position, means for feeding articles of merchandise into position for the severing means to operate against them, and a web device for holding a web in relation to an article during the operation thereon of the impression and severing members and for advancing the web between the operation for the severing means and the operation of the impression means.

9. In a labeling machine, a plurality of impression and severing devices, each having impression and severing plungers, means for operating the impression and severing devices to bring their respective plungers to operate successively at the same position, web feeding devices, and means for presenting articles of merchandise successively between the plungers of the several impression devices, whereby the plungers will operate upon the webs and against the articles to sever the labels.

10. In a labeling machine, means for operating successively upon articles of merchandise at the same position to label them, and means for presenting articles thereto, comprising a reciprocating carriage having a plurality of article pockets or recesses and chutes, each adapted to deliver articles to one of said pockets or recesses upon the reciprocation of said carriage.

11. In a labeling machine, means for op-

erating successively upon articles of merchandise at the same position to label them, and means for presenting articles thereto, comprising a carriage having a plurality of article pockets or recesses, chutes on either side of the labeling position for delivering articles to the respective pockets or recesses upon the reciprocation of the carriage, and means for ejecting the articles.

12. In a labeling machine, means for operating successively upon articles of merchandise at the same position to label them, means for feeding a web, and means for presenting articles to the labeling device, comprising a movable carriage having a recess or pocket for the articles, means for feeding articles successively to said pocket or recess, and moistening means carried by said carriage and operating upon the web.

13. In a spool labeling machine, a plurality of movable means each having impression and cutting plungers arranged to operate upon a web, means for operating said movable means to bring their respective plungers to operate successively in the same position, means for intermittently feeding webs in relation to the plungers, a reciprocating carriage having platen surfaces and means for holding spools with their ends exposed to the operation of said plungers, means for feeding spools laterally to said carriage, means for ejecting the spools endwise therefrom, and means for reciprocating the carriage to feed the spools successively and hold them stationarily between the cutting plungers for the cutting operations, and to present the platen surfaces to said impression plungers.

Signed at the city of Pawtucket, county of Providence and State of Rhode Island, this 6th day of December 1913.

H. MONROE SMITH.

Witnesses:
LAWRENCE F. NOLAN,
PETER J. HEFFIN.

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