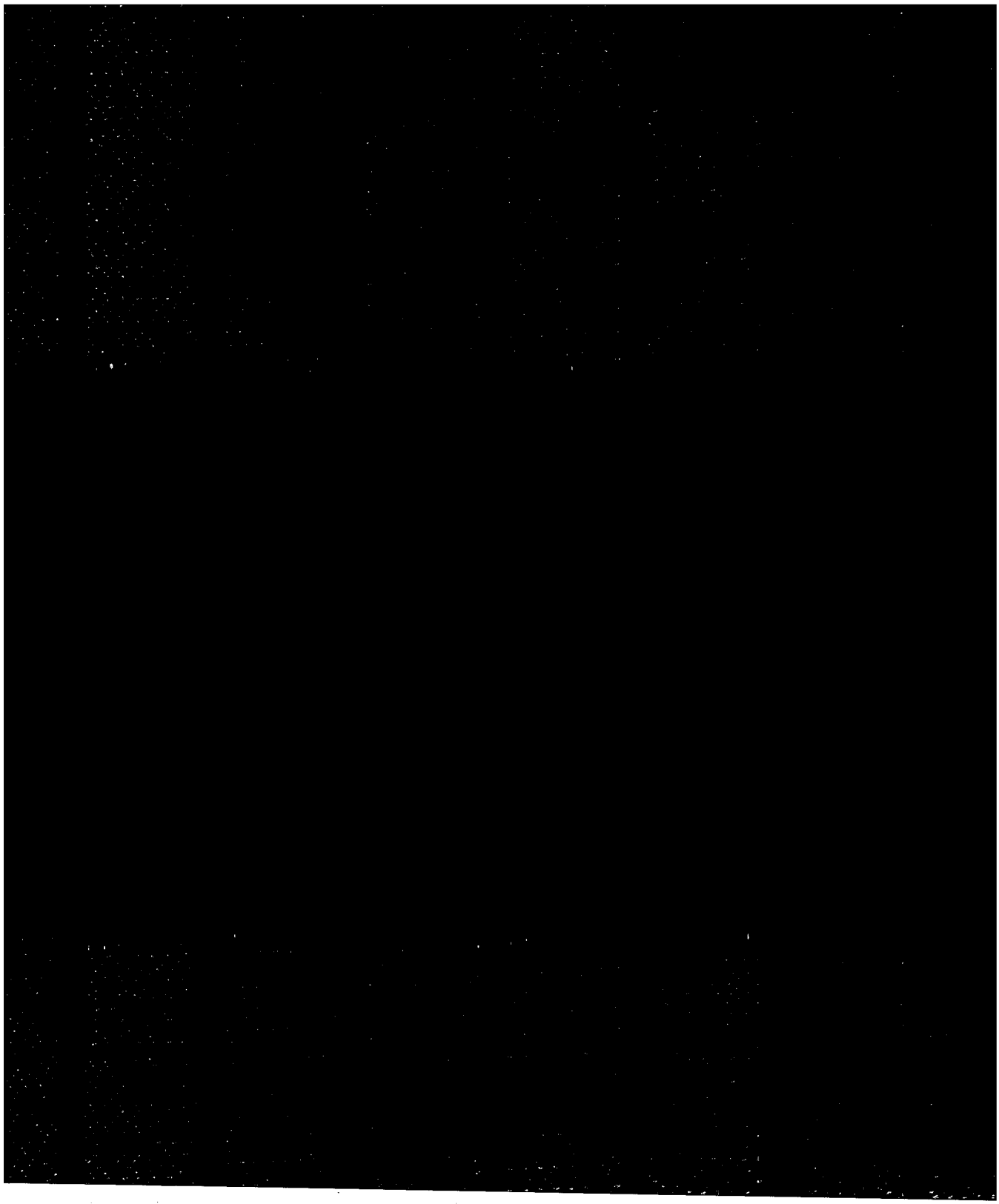


A. H. RAY.

PRINTING MACHINE.

APPLICATION FILED APR. 7, 1917.

1,318,108.

Patented Oct. 7, 1919.

3 SHEETS—SHEET 1.

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3 SHEETS—SHEET 2.

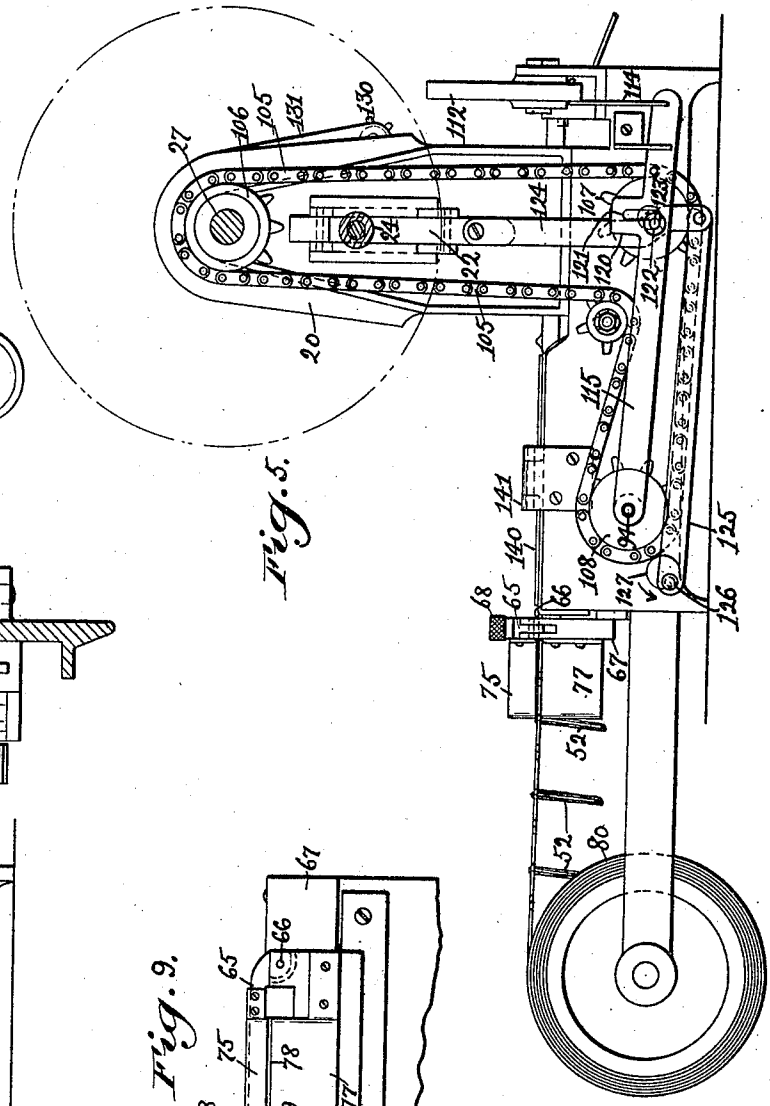


Fig. 5.

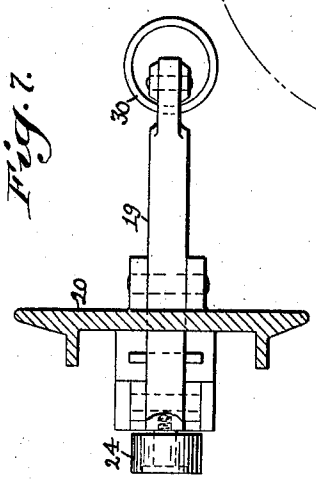


Fig. 7.

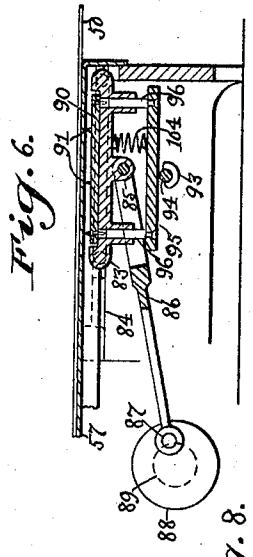


Fig. 6.

Fig. 9.

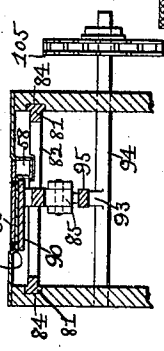


Fig. 8.

Inventor

Albert H. Ray

by Jas. H. Schmehill

atty.

A. H. RAY.

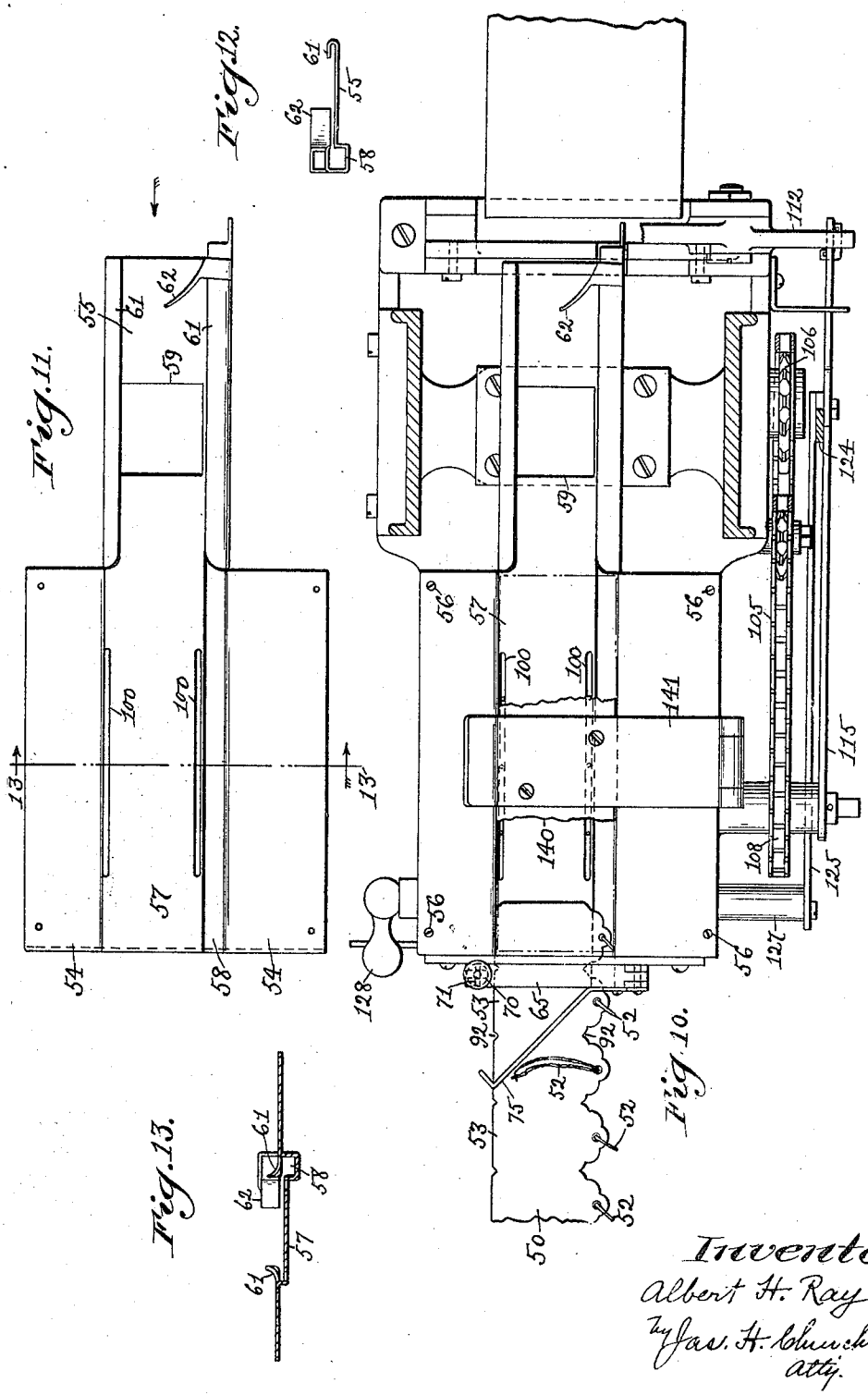
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3 SHEETS—SHEET 3.



Inventor
Albert H. Ray
by Jas. H. Churchill
atty.

THE COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALBERT H. RAY, OF ASHLAND, MASSACHUSETTS.

PRINTING-MACHINE.

1,318,108. Specification of Letters Patent. Patented Oct. 7, 1919.

Application filed April 7, 1917. Serial No. 160,390.

To all whom it may concern:

Be it known that I, ALBERT H. RAY, a citizen of the United States, and a resident of Ashland, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Printing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to a printing machine of that character in which a continuous strip or web of paper or like material is intermittently fed between coöperating printing members, one of which is reciprocated with relation to the other.

The present invention has for its object to provide a machine of the character described, which is capable of printing a continuous strip or web having strings attached to sections thereof, so that when the said sections are severed from the strip, printed tags are produced having a string attached to each one thereof.

Provision is made for producing tags printed on one or both surfaces at the will of the operator. Provision is also made for obtaining a superior printing effect as will be described.

Provision is also made for preventing the strings from interfering with the printing and cutting as will be described.

These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is an end elevation of a printing machine embodying this invention.

Fig. 2, an inverted view of the reciprocating printing member.

Fig. 3, a longitudinal section of the machine shown in Fig. 1, taken on the line 3—3.

Fig. 4, a detail of a portion of the feed mechanism.

Fig. 5, a side elevation of the machine shown in Fig. 1 looking toward the right.

Fig. 6, a longitudinal section of the feed mechanism.

Fig. 7, a detail in plan showing the reciprocating printing member.

Fig. 8, a detail in section of the feed mechanism on the line 8—8, Fig. 3.

Fig. 9, a detail in elevation of the end of the machine shown in Fig. 5 looking toward the right.

Fig. 10, an enlarged plan view of the bed of the machine to illustrate the passage of the strung strip or web through the machine.

Fig. 11, a plan of the bed plate removed.

Fig. 12, an end view of the bed plate looking toward the left in Fig. 11, and

Fig. 13, a cross section on the line 13—13, Fig. 11.

Referring to the drawing and especially Fig. 3, *a* represents a stationary platen member and *b* the reciprocating printing member coöperating therewith. The reciprocating member *b* comprises a chase 15 containing type 16 and secured to a plunger 17, connected by link 18 with the long arm of a lever 19, pivoted to a side upright 20 of the framework of the machine, and having its short arm extended through said upright and connected by links 21 with a block 22 sliding vertically in guides 23 attached to said upright. The sliding block 22 carries a roller 24, which enters a path cam 25 in a disk 26, fast on a shaft 27 supported in the upright 20 and in an upright 28 on the opposite side of the base frame 29 of the machine. The path cam 25 is suitably shaped to obtain a substantially long dwell of the reciprocating member *b*, when the latter is in its withdrawn position, that is, at the end of its stroke away from the stationary member *a*.

The member *b* is reciprocated in a stationary cylindrical guide 30.

The type 16 are inked with printers' ink by means of one or more ink rollers 31, herein shown as three in number, see Fig. 3, which are supported by an endless carrier in the form of parallel link chains 34, each of which passes over a sprocket wheel 35 fast on the shaft 27 and under sprocket wheels 36, 37 located in a substantially horizontal plane on opposite sides of the path of reciprocation of the printing member *b*, so that the endless carrier has imparted to it a substantially triangular form with the base of the triangle below the level of the reciprocating printing member *b*, when the latter is in its elevated or withdrawn position shown in Fig. 3. As a result, the inking roller 31 is moved in a substantially horizontal path on its passage beneath the reciprocating printing member *b*, and makes contact with the type carried by said member and thereby applies ink to the said type. During the passage of the ink roller under the reciprocating printing member, the latter is held stationary by the path cam 25. By employing three inking rollers 31 as

herein shown, fresh ink is applied to the printing member *b* after each printing stroke of said member, said rollers being arranged equi-distant on the endless carrier. The inking rollers 31 have coöperating with them an ink distributing device in the form of a disk 40, see Fig. 1, which is pivoted at 41 to a support in the form of a sheet metal strip or plate 42, which is bent to fit over upon and be supported by the bearings for the cam shaft 27, see Fig. 3. The disk 40 is provided with teeth 44, which are designed to be engaged by a series of lugs or projections 45 on one of the link chains 34, which lugs or projections are located on the chain so as to rotate the disk 40 when an inking roller 31 is out of contact with the disk.

The machine as thus far described is not herein claimed broadly, as it forms the subject matter of another application Ser. No. 70872 filed by me Jan. 7, 1916.

The present invention has for one of its objects to enable the machine above described to print sections of a strip or web 50 of paper or like material having on one side or edge a plurality or series of holes 51, see Fig. 10, through which are passed strings which are tied to form loops 52, there being a loop of string for each section 53 of the strip or web 50, so that, when a section 53 is printed and cut from the web or strip 50 a tag will be produced which is strung and printed ready for use.

To facilitate description, the unprinted strip or web 50 carrying the loops 52 of string will be hereinafter referred to as the strung strip or web. To enable the strip or web 50 to be strung and then printed, I have provided the base frame of the machine with a bed plate, see Figs. 10 to 13 inclusive, which is provided as herein shown with a substantially wide body portion 54 and a substantially narrow neck portion 55.

The body portion 54 is secured as by screws 56 to the opposite sides of the base frame 29, and between its opposite side edges said bed plate is provided with a substantially wide depression 57, see Figs. 10, 11 and 13, of a depth substantially equal to the thickness of the strip or web 50, and of a width substantially equal to the greater portion of the said strip or web, so that the portion of the side of the strip or web provided with the holes 51 through which the strings 52 are passed, projects beyond the bottom of the depression 57. The bed plate 54 at one side of the depression 57 is provided with a slot or channel 58 over which projects the side of the strip or web having the holes 51, so that, the strings 52 passed through said holes may pass into said slot or channel and be retained therein, as the strung strip or web is fed through the machine, and thereby be removed from the path of the reciprocating printing member, and enable the strung strip or web to be printed without interference by the strings. The neck portion 55 of the bed plate is provided with an opening 59, see Fig. 11, for the reception of the pad 60 on the stationary platen member *a*, and on its opposite sides with inwardly extending flanges 61, which form guides for the strung strip and also serve to hold the latter down on the pad 60. The neck portion 55 may and preferably will be provided near its end with a curved finger 62, which extends toward the longitudinal center of the neck portion to act as a deflector and engage any strings which might ride up over the upper surface of the strip, and guide or deflect them back into the channel or slot 58 and out of the way of the knife 63 employed to cut a printed section from the strip or web.

The bed plate at what may be considered its front end has coöperating with it a device for guiding the strip 50 into the depression 57 in the bed plate. This device may be made as herein shown and consists of a lever 65, see Fig. 9, pivoted at 66, a bar 67 attached to the front end of the base frame 29, and adapted to be extended across the depression 57 and secured in this horizontal position by a thumb nut 68, which engages the threaded end of a lever 69 capable of being moved into a slot 70, see Fig. 10, in the end of the lever 65 and having a pin 71 which is designed to pass over the end of the lever 65 and engage the upper surface thereof to lock the said lever against upward movement.

The lever 65 in its horizontal position coöperates with the bar 67, see Fig. 3, to form an opening or space 72, substantially equal to the thickness of the paper strip or web 50, and the bar 67 is secured to the base 29 so that its upper surface is level with the upper surface of the bottom wall of the depression 57 in the bed plate, whereby the strip or web 50 when passed through the opening 72 will be properly guided into the depression 57.

Provision is made for directing or deflecting any of the strings 52 which might lie upon the upper surface of the strip or web 50, into position for entrance into the slot or channel 58, and to this end the lever 65 has attached to it near its pivot an arm 75 which is inclined away from the lever and is made of sufficient length to extend across the strung strip or web 50, see Fig. 10, and is preferably provided at its free end with a bent finger 76 so as to provide means for removing the knot of a string which might lodge in the notch 92.

A similar deflector or guide 77 is secured to the cross bar 67 below the deflector 75, see Fig. 9, so as to deflect or direct any strings below the strip or web 50, which may not be properly positioned for entrance into the slot or channel 58. The deflectors 75, 77,

are separated by a space 78, see Fig. 3, which is substantially equal to the thickness of the strip or web 50. The strung strip or web 50 may and preferably will be wound into the form of a roll 80 which is shown in Figs. 3 and 5, as a plain roll but which in practice will be provided with the strings or loops 52, and is fed through the machine by a feed mechanism which may be substantially such as shown in the application above referred to and which consists of a carriage having side bars 81 connected by cross bars 82 and an intermediate bar 83, see Figs. 3, 4 and 8. The side bars 81 slide in guideways 84 in the opposite sides of the base frame 29, and the intermediate bar 83 has a lug 85 on its underside which is connected by a link or rod 86 with a crank pin 87 on a disk 88 fast on a shaft 89, which is driven from the main or cam shaft 27 as will be described.

The carriage referred to supports a plate 90, which is provided in the present instance with a plurality of pins or projections 91 arranged in rows near the opposite sides of the plate and spaced apart a distance substantially equal to the width of a section of the web to be printed upon. The feed pins 91 are designed to engage the strip or web between adjacent sections, and in the present instance, the web or strip is provided on its opposite sides with notches 92, see Fig. 10, for the reception of the feed pins, when the latter are elevated.

The pin plate 90 is elevated by a cam 93 on a shaft 94, see Fig. 3, which cam engages a bar 95 having at its opposite ends, posts or rods 96, which are movable in hollow bosses 97 on the underside of the center bar 83 of the carriage, said posts having the plate 90 secured to their upper ends as by screws 98. The cam 93 is suitably shaped and timed so as to raise the plate 90 when the carriage 81, 82, is at the end of its stroke away from the printing mechanism, and thereby raise the pins or projections 91, through elongated slots 100 in the bottom wall of the depression 57 and into the notches 92 in the web or strip 50 and to keep said pins in said notches while the shaft 89 is making a half turn in the direction indicated by the arrow 102 in Fig. 3, thereby causing the strung strip or web 50 to be fed between the printing members and into position to be printed upon.

At or near the end of the forward movement or stroke of the carriage 81, 82, the cam 93 allows the plate 90 to drop by gravity assisted by the spring 104, so as to withdraw the feed pins 91 from the notches 92 and the slots 100 in the bed plate, and when the feed pins have been lowered out of engagement with the strips or web 50, and below the bed plate, the carriage 81, 82, is moved backward or away from the printing mechanism and the feed pins are properly positioned below and in line with a new set of notches 92 in the strip or web.

The shafts 89, 94 may be driven from the cam shaft 27 by a link chain 105, see Fig. 5, which engages a sprocket wheel 106 on the shaft 27, a sprocket wheel 107 on the shaft 89 and a sprocket wheel 108 on the shaft 94.

A printed section 53 of the web may be severed from the continuous or imprinted portion of the web, by a cutting mechanism, which comprises a movable cutter or knife 63, and a stationary cutter 110, see Fig. 1. The movable cutter 63 is operated by the path cam 25 and is connected by a link 114 with the free end of a lever 115, see Fig. 5, which is designed to be oscillated by the path cam 25.

Provision is made for operatively disconnecting the movable cutter from the cam 25, whereby the machine may be used to print one or both sides of the strips or web as desired or required.

To this end the lever 115 is provided with a lug 120 having a slot 121 provided at its lower end with a lateral extension 122, and coöperating with these slots is a pin 123 on a link 124, which connects the sliding block 22 with one end of a link or bar 125, having its other end connected with a crank pin 126 on a shaft 127 supported by the sides of the base frame 29 and provided with an operating handle 128, see Figs. 5 and 10. By turning the shaft 127 in the direction of the arrow Fig. 5, the link 125 is moved so as to remove the pin 123 from the horizontal slot 122 and into the vertical slot 121, and when the pin is in this position, the link 124 is capable of being reciprocated by the cam 25 without moving the lever 115 to which the knife 63 is connected, and by turning the shaft 127 into the position shown in Fig. 5, the pin 123 is moved into the horizontal slot 122 and the lever 115 is thereby connected with the link 124 so that the cutter or knife 63 is operated to cut a tag from the strip or web.

It will thus be seen that in the machine herein shown, the movable knife or cutter may be operatively connected with the cam 25 to be operated thereby or it may be disconnected therefrom at the will of the operator, which is advantageous as it enables the tags to be printed on one or both sides.

To illustrate, when the tags are to be printed on only one side, the movable knife 63 is connected with the cam 25 to be operated thereby, and the knife will cut each printed tag from the web or strip. When it is desired to print the tags on both sides, the knife 63 is disconnected from the cam as described and the strip or web is run through the machine and printed on the upper side or face, and as the knife 63 is inoperative the strip or web with the printing on one

face of each section will be run through the machine intact. After the strip or web has been run through the machine, it is reversed and again run through the machine with the knife operatively connected with the cam, and as a result tags printed on both faces are produced.

Provision is made for obtaining an even distribution of ink on the inking rollers, and to this end, the link chains 34 have coöperating with them sprocket wheels 130 on the lower ends of levers 131 pivoted at their upper ends to the side uprights 20, 28. The levers 131 are arranged so that their sprocket wheels 130 will engage the external surfaces of the chains substantially opposite the center of the distributing disk 40 and said levers have their free ends drawn inwardly toward said distributing disk by suitable springs 132, which cause the ink rollers 31 to make firm and efficient contact with the distributing disk. The bed plate 54 has coöperating with it a cover, strip or plate 140 carried by a lever 141, which is hinged to the base frame 29, see Fig. 10, said cover serving to keep the strip or web in proper position on the bed plate as the said strip or web is fed through the machine.

I have herein shown one construction of machine embodying this invention, but it is not desired to limit the invention to the particular construction shown.

Claims.

1. In a machine of the character described, in combination, a printing mechanism having printing members, one of which is reciprocated with relation to the other, means for feeding to the printing mechanism a strip or web strung at one side with strings for individual tags to be formed from said strip or web, and a bed plate having a depression for the reception of the greater portion of the string strip or web and a channel for the reception of the portions of the strings which extend below the strip or web, means for supporting a roll of the strung strip or web in line with said bed, and means for directing the strings into position to be received by said channel.

2. In a machine of the character described, in combination, a printing mechanism having a stationary member and a movable member reciprocating toward and from said stationary member, a bed plate having a neck portion provided with an opening for the reception of said stationary printing member, and having a body portion provided with a depression for the reception of the greater portion of a strung strip or web and having a channel extended into said neck portion for the reception of strings with which sections of said strip or web are strung, means for supporting a roll of the string strip or web in line with said bed, means for feeding said strung strip or web from said roll to said bed and through said machine, and means for directing the strings into position to be received by said channel.

3. In a machine of the character described, in combination, a printing mechanism comprising printing members, one of which is reciprocated with relation to the other, means for feeding to said printing mechanism a strip or web strung with strings at one edge, a bed plate provided with a slot or channel at one side of the printing mechanism in which the portions of the strings depending below the strip or web are confined and move with the said strip or web, means for supporting a roll of the strung strip or web in line with said bed, and means for directing the strings into position to be received by said channel.

4. In a machine of the character described, in combination, a printing mechanism comprising printing members, one of which is reciprocated with relation to the other, means for feeding to said printing mechanism a strip or web strung with strings at one edge, a bed plate provided with a slot or channel in which the portions of the strings depending below the strip or web are supported and confined, and means for engaging and guiding the strings which may lie on the strip or web into said slot or channel before the strip or web reaches the printing mechanism.

5. In a machine of the character described, in combination, a printing mechanism comprising printing members, one of which is reciprocated with relation to the other, means for feeding to said printing mechanism a strip or web strung with strings at one edge, a bed plate provided with a slot or channel in which the portions of the strings depending below the strip or web are supported and confined, and means for guiding the strings into said slot or channel before the strip or web reaches the printing mechanism, and means for guiding the strings on the upper surface of the strip into said channel after the strip has been printed upon.

6. In a machine of the character described, in combination, a printing mechanism comprising printing members, means for feeding to said printing mechanism a strip or web strung with strings, means for forming a channel through the machine in which the portions of the strings depending below the strip or web are confined and move with said strip, a knife to cut the said strip into tags, a lever for operating said knife, a reciprocating device actuated by said cam and connected with said lever by a pin and slot connection, which in one relation connects the said reciprocating device with said lever to oscillate the latter and operate the knife and in another relation to operatively dis-

connect said lever from said reciprocating device and permit the latter to be reciprocated without operating said lever and knife, and means under the control of the operator for changing the relation of the pin and slot connection.

7. In a machine of the character described, in combination, a printing mechanism having printing members, means for reciprocating one of said members and for holding it stationary for a substantial length of time in its withdrawn position, an inking device movable between said printing members, an endless carrier for said inking device, a rotatable ink distributing device with which the inking device coöperates, and means engaging said endless carrier for insuring efficient contact of the inking device with said distributing device.

8. In a machine of the character described, in combination, a printing mechanism having printing members, means for reciprocating one of said members and for holding it stationary for a substantial length of time in its withdrawn position, an inking device movable between said printing members, an endless carrier for said inking device, an ink distributing device with which the inking device coöperates, a rotatable device engaging the external surface of said endless carrier, a lever carrying said rotatable device, and a spring to act on said lever and move the endless carrier toward said distributing device.

9. In a machine of the character described, in combination, a printing mechanism comprising printing members, one of which is reciprocated with relation to the other, means for feeding to the printing mechanism a strip or web strung with strings at one edge, a bed plate having a slot or channel in which the strings depending from the strip or web may pass freely through the machine, and a deflector coöperating with the upper surface of the strip or web to engage strings lying thereon and deflect them into said slot or channel.

In testimony whereof, I have signed my name to this specification.

ALBERT H. RAY.

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