3 Sheets—Sheet 1.

# Q. S. BACKUS.

## MACHINE FOR ATTACHING LABELS TO SPOOLS.

No. 86,627. Patented Feb. 9, 1869.

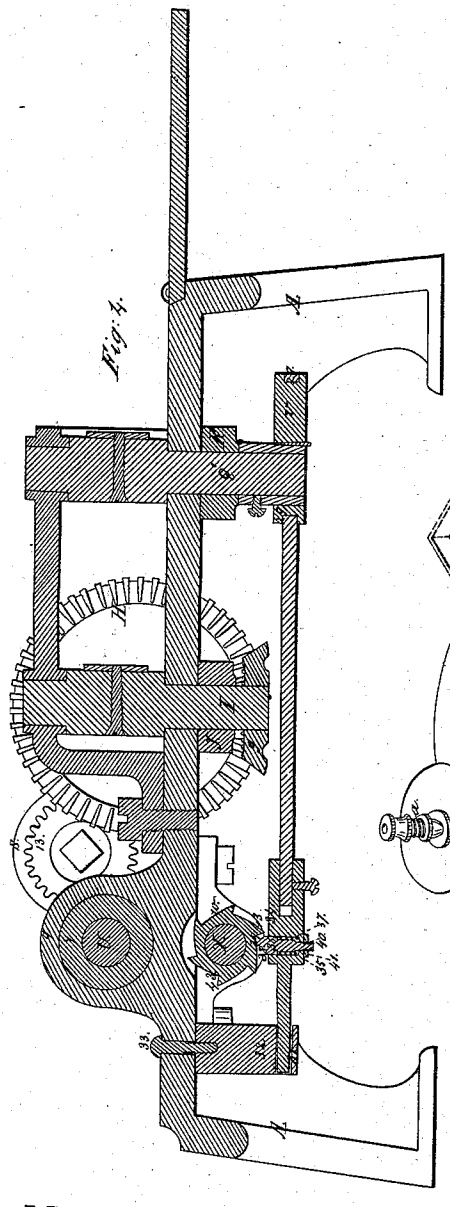

Fig. 4.

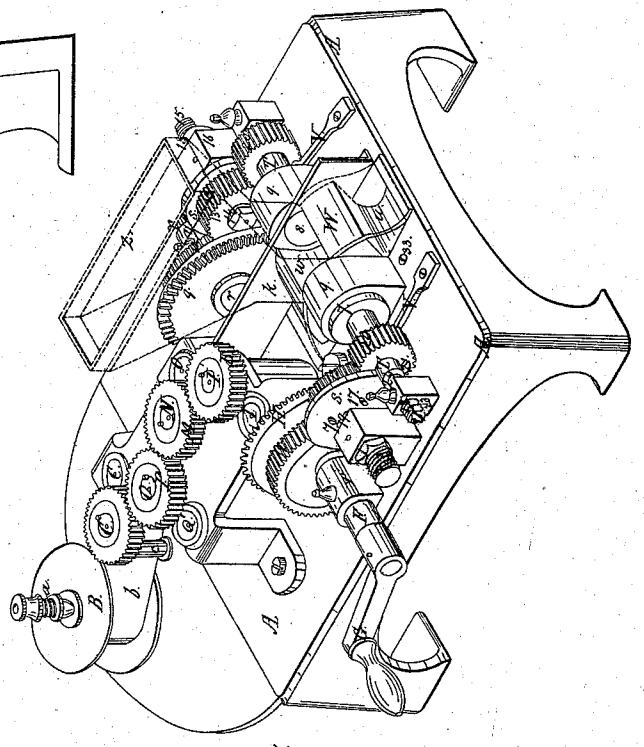

Fig. 1.

Witnesses.

S. N. Piper
W. Cambridge.

Inventor.

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per his Attorneys
Tuckermacker & Stearns.

3 Sheets—Sheet 2.

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## MACHINE FOR ATTACHING LABELS TO SPOOLS.

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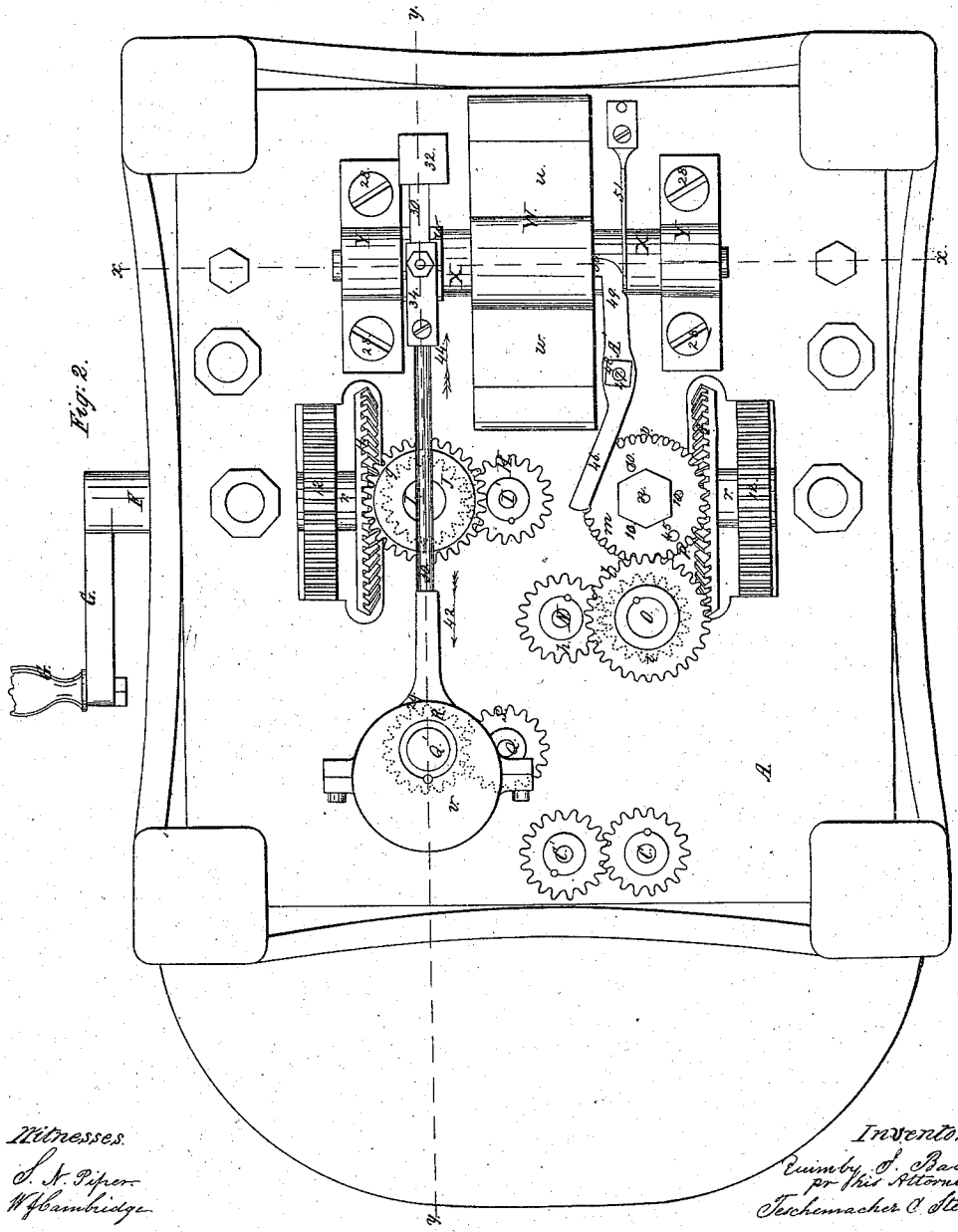
Fig: 2.



Witnesses.
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Per Quimby, S. Backus
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3 Sheets—Sheet 3.

# Q. S. BACKUS.

## MACHINE FOR ATTACHING LABELS TO SPOOLS.

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Fig. 5.

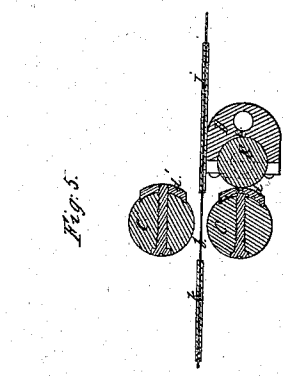
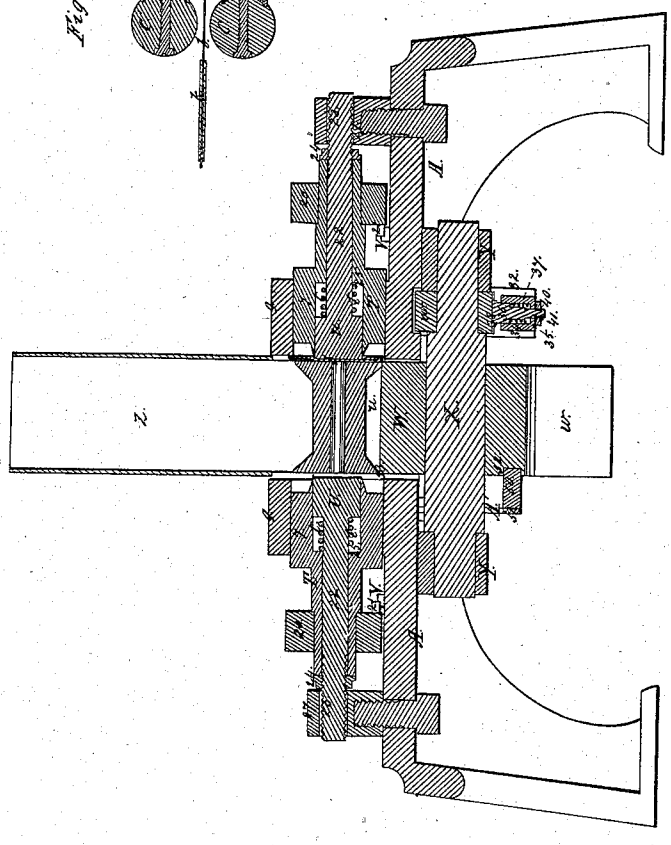


Fig. 3



Witnesses.
A. N. Piper
W. Cambridge

Inventor.
Quimby S. Backus
pr his Attorneys.
Teschemacher & Stearns

# United States Patent Office.

QUIMBY S. BACKUS, OF WINCHENDON, MASSACHUSETTS, ASSIGNOR TO HIMSELF, SIDNEY FAIRBANKS, AND ORLANDO MASON, OF SAME PLACE.

*Letters Patent No.* 86,627, *dated February* 9, 1869.

## IMPROVEMENT IN MACHINE FOR ATTACHING LABELS TO SPOOLS.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, QUIMBY S. BACKUS, of Winchendon, in the county of Worcester, and State of Massachusetts, have invented an Improved Machine for Printing, Cutting, and Attaching Labels to Spools and other articles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of my improved machine on a reduced scale.

Figure 2 is a full-size plan of the under side of the same.

Figure 3 is a vertical transverse section, on the line *x x* of fig. 2.

Figure 4 is a vertical longitudinal section, on the line *y y* of fig. 2.

Figure 5, detail to be referred to.

My invention has for its object to perform, in one individual machine, the several operations of printing, gumming, attaching, and cutting labels for spools, boxes, &c.; and

My invention consists in a pair or a series of printing-rollers, arranged in pairs, between which is fed the strip upon which the labels are to be stamped or printed, each pair of rollers being provided with a die, or type-block, for printing the label on one side of the strip, while a roller or other device applies the glutinous substance to its other side; and

My invention also consists in one or more plungers, or pistons, each of which is surrounded by a revolving tubular punch, or cutter, the piston being first moved longitudinally against the printed, gummed portion of the strip, pressing it upon one end of the spool after it has been dropped into a revolving carrying-cylinder, in line with the axis of the piston, which continues to press against the spool until the edge of the revolving cutter is advanced to cut and separate the attached label from the continuous strip.

And in connection with the above, my invention consists in certain mechanism for preventing the revolution of the spool-cylinder while the spool is being labelled, and also in certain mechanism for effecting the revolution of the spool-cylinder, to discharge the labelled spool.

My invention, furtheremore, consists in an improved reservoir, for supplying ink to the dies or type-blocks of the printing-rollers, and gum to the gumming-roller, or other device.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings—

A represents the frame-work, from which rises a vertical pin, or standard, *a*, upon which revolves, horizontally, a circular reel, B, containing the paper strip *b*, upon which the labels are to be printed, the tension of the strip being regulated by the pressure of a spiral spring in a well-known manner.

*c* is a guide, for directing the strip between a pair of vertical rollers, C C′, by which it is fed along, one of the said rollers, C, being provided with a circular die, or type-block, similar to that, *d*, fig. 5, bearing a portion of the letters, figures, or other characters to be printed, to form the label desired, while the other, C′, of this pair of rollers, is provided with a smooth, raised portion, similar to that, *d′*, fig. 5, corresponding to the form and size of the die *d*, and forms a bed for the paper strip *b* when the said die *d* is printing its portion of the impression thereon.

As several colored inks, such as red, blue, and black, may be employed in printing a label, a corresponding number of pairs of printing-rollers and inking-reservoirs is required, the dies being so constructed and placed that one will not come in contact with the impression imparted to the strip by the preceding die or dies.

It is intended to provide the roller C with a reservoir, similar to that, D, fig. 5, for holding the ink, of the color required to be printed by the die, the ink flowing through a narrow slit or opening, *e*, in the reservoir, and being taken up by a revolving roller, E, by which it is properly distributed upon the die.

The strip *b* is carried along by the friction of the dies *d d′*, and is fed forward a distance only equal to the width or diameter of the die *d*.

I will now describe the mechanism for communicating power to drive the several rollers for printing, inking, and gumming, and also for performing various other functions of the machine.

F is a horizontal driving-shaft, revolved in a suitable bearing, *f*, by operating the crank G.

The inner end of this shaft carries a bevel-wheel, H, which drives a bevel-pinion, *g*, on the lower end of the shaft of a roll, I, supported vertically in bearings in the frame-work.

Keyed to the shaft of this printing-roll I, immediately above the bevel-pinion *g*, is a cog-wheel, J, which engages with a similar gear, K, on the lower end of a gumming-roll, I′, working in connection with the roll I, the two rolls I I′ constituting a pair of a series for printing and gumming the label to be attached to the end of a spool opposite that on which is attached the label printed from the strip *b*.

The roll I′ is provided with a smooth block, or die, which, as it is made to revolve, is intended to receive a supply of gluten from a roller revolving in a reservoir, not shown, but similar in construction and operation to the reservoir D, above described, for supplying ink to the type-blocks of the printing-rolls C I.

The reservoir and roller above referred to, but not shown, are intended to apply the necessary quantity

of gluten to a paper strip, on which labels are to be printed, for the end of a spool opposite that on which is attached the label printed on the strip *b*.

The upper end of the roll I′ carries a gear, L, which drives a gear, M, secured to the top of a roll, N, similar to the roll I′, for gumming the back of the labels printed on the strip *b*, a reservoir containing the adhesive substance, and a roller for distributing it upon the gumming-roll N, being required.

To the lower end of the gumming-roll N is secured a gear, *h*, which drives a corresponding gear, *i*, secured to near the lower end of a printing-roll, O, provided with a die, or type-block, having its proper characters thereon, and being supplied by the reservoir D with ink of the color required for imparting its portion of the impression upon the label in a manner similar to the die *d* of the roll C, previously described.

The gear M, at the top of the roll N, meshes into a corresponding gear, P, secured to the upper end of one, Q, of a pair of printing-rolls, Q Q′, of similar construction and operation as those, C C′, the bottom of the roll Q′ being provided with a gear, R, which drives a corresponding gear, S, near the bottom of the roll Q.

The distance apart of the two rolls of a pair should be very carefully determined, in order to insure the proper degree of friction of the dies upon the paper strip, to feed it along to be printed and gummed.

One or both of the bearings of each pair of these rolls, or one or both of their dies or blocks, may be provided with a spring, of rubber or other suitable material, in order to allow them to move or yield slightly in a lateral direction while revolving, to allow of the passage of strips of paper of varying thicknesses, and the distance between two consecutive pairs of rollers is such that the labels may be printed close up to each other, thereby avoiding any unnecessary waste of the paper strip.

*j* is a short, flattened tube, placed longitudinally between the two pairs of rolls, C C′ and N O, to guide and protect the paper strip *b* from dirt or other injury as it passes through the said rolls.

*k* is a similar tube, for the same purpose, provided with an opening, 8, and extending from near the rolls N O to a point near a pair of rolls, not shown, between which the perforated waste strip is passed to feed it out of the machine.

The mechanism for attaching the label and separating it from the strip *b* will now be described.

Secured to the lower end of the shaft of the printing-roll O, is a gear, *l*, which drives a corresponding gear, *m*, on the lower end of a short arbor, *n*, projecting down from the under side of the frame-work.

*p* is a bevel-pinion, secured by dowel-pins 10 to the gear *m*, and engaging with a bevel-wheel, *q*, secured to the inner end of a short shaft, *r*, placed in a suitable bearing, 11.

A wheel, 12, keyed to this shaft *r*, drives a gear, 13, on the end of a stud, 14, provided with a screw-thread, 15, which passes through a standard, 16, secured to the framework.

*s* is a circular flange, or plate, fastened at 17 to the outer face of the gear 13, the flange or plate being made adjustable by moving the arbor out or in after loosening the nuts 18, 19.

The gear 13 drives a gear, 20, keyed to the outer end of a tubular cutter, T, the enlarged circular portion 7 of which has its bearing in a projecting portion, *b*, of the frame-work.

On one side of the gear 20 is formed a wedge-shaped projection, 21, which engages with or rides in contact with the circular revolving flange, or plate, *s*, by which construction the revolving cutter is made to advance, for a purpose presently to be explained.

U is a circular piston, or plunger, formed on the inner end of a spindle, 22, the outer end of which is flattened, and provided with a screw-thread, 23, on which turns a nut, 24. The portion of the spindle between the termination of the screw-thread 23 and plunger U is of a cylindrical form, in transverse section, and is surrounded by a spiral spring, *t*, one end of which abuts against the back of the plunger, while the other end of the spring rests against a shoulder, 25, formed within the interior of the revolving cutter T, the tension of the spring being carefully regulated by turning the screw-nut 24 against the outer end of the revolving cutter, to insure the plunger being pressed and kept a little in advance thereof, until the label is attached to the spool, when the cutter is allowed, by the compression of the spring *t*, to come forward, to sever the attached label from the strip.

The extremity of the flattened or screw-portion 23 of the plunger, resting loosely in an oblong slotted bearing, 27, is thus free to be moved longitudinally forward when the wedge-shaped projection 21, on the gear 20, is brought against the flange or plate *s*.

As soon, however, as the label is attached and cut, the wedge-shaped projection 21 passes off from the flange, or plate *s*, and the plunger and cutter are withdrawn, by the recoil of a spring, V, out of the line of revolution of the receptacle W, holding the labelled spool.

Said receptacle, or spool-carrier, W, is secured to a shaft, X, revolving in bearings, Y Y, screwed at 28 to the frame-work.

The receptacle or spool-carrier W consists of a cylinder, cut away so as to form suitable compartments, *u*, for holding the spools, which are dropped therein through a hopper, Z, seen in red, fig. 1, and in black in fig. 3, the cylinder being revolved by the following means:

The printing-roll Q′ projects down below its gear R, and has connected therewith an eccentric, *v*, around the periphery of which is secured a strap, 29, at one end of a connecting-rod, 30, the other end of the rod being free to slide in an open bearing, 31, formed in a block, 32, screwed at 33 to the frame-work.

Within an enlargement, 34, of the connecting-rod, is formed a recess, 35, for the reception of a pin, 36, surrounded by a spiral spring, 37, (see figs. 3 and 4,) the upper end of the pin being enlarged at 38, and provided with an inclined surface, 39, while a portion of its lower end is flattened, and projects through the recess 35, and has a screw-thread, 40, cut thereon, upon which turns a nut, 41.

*w* is a ratchet-gear secured to the shaft X.

As the connecting-rod is drawn back in the direction of the arrow 42, the projection 38, on the upper end of the pin 36, serves as a pawl, and catches against one of the teeth 43, of the ratchet, thus revolving the shaft, and the spool-cylinder secured thereto.

As the connecting-rod 30 returns in the direction of the arrow 44, the inclined surface of the upper end of the pin slides on the surface of a tooth, 43, the pin yielding by the compression of the spiral spring 37, and at the same time being prevented from revolving by the flattened-screw portion 40, resting in an oblong slot made in the enlargement 34, and corresponding in form to the said portion 40.

The tension of the spring 37 is regulated, to obtain the necessary amount of the throw of the pin 36, by turning the screw-nut 41

The spool-carrier, or cylinder W, is prevented, in the following manner, from revolving, in order that the spool within its upper compartment may be held immovable while being labelled.

The gear *m*, under the bevel-pinion *p*, is provided with a pin, 45, which, as the gear *m* revolves, is brought in contact with one arm, 46, of a lever, A′, pivoted at 47 to a stud, 48, projecting down from the frame-work. The other arm, 49, of the lever A′, is provided, at its extremity, with a circular projection, 50, which is pressed, by a stiff spring, 51, into one of a series of

circular holes, 52, made in the side of the spool-carrier, or cylinder W, each hole 52 being situated exactly in the prolongation of a line passing from the lowest point, 53, of a compartment, *u*, through the centre of the shaft X, by which construction the cylinder is held stationary, and the spool in the upper compartment is prevented from vibrating while the label is being attached to the spool and cut from the strip.

When, however, the pin 45 strikes the arm 46, the projection 50 is thrown out of its hole 52, against the resistance of the spring 51, and the cylinder is free to be revolved, and to discharge the labelled spool into a receptacle beneath.

The circular opening, 8, made in the tube *k*, is of sufficient size to allow of the entrance and free movements of the plunger and cutter therein, as they are acting on the labelled strip, and the centre of the perforation, or opening, is in the prolongation of the line passing through the axes of the plunger and spool.

In the foregoing description, I have spoken of but one plunger, for pressing the label on the spool, and but one revolving cutter, for separating the label from the strip, but I prefer to use two plungers and two cutters, revolving in contrary directions, as the spool is thereby prevented from revolving when the label is being detached from the strip, and both ends of the spool are labelled at once, in which case the mechanism for operating the plungers and cutters must be duplicated, as shown.

The cutters, by revolving in contrary directions, counteract any tendency, which they otherwise would have, to overcome the friction of the plungers on the spool, and cause it to revolve while being cut, thereby rendering it difficult to perform this operation.

One end of the spool may be first labelled, and then be reversed, to label its other end, but I prefer to label both ends simultaneously.

Spools of varying sizes require the carrying-cylinder to be changed, and also require the throw of the plungers and cutters to be adjusted to correspond thereto, this adjustment being readily performed by moving the gear 20 forward or back, by turning the screw-nuts 18, 19.

Instead of the wedge-shaped projection 21 engaging with the flange, or plate *s*, to throw the piston and cutter forward, a pin projecting from the face of the gear 20, may run into a cam-groove formed in the face of the plate *s*, or any other suitable devices may be employed for this purpose.

Instead of the power being communicated by two shafts, F *r*, I intend to use but one main or driving-shaft, in which case I shall be enabled to secure a more positive motion; and I also intend to support the rollers and other mechanism upon frames sliding in grooves, or on ways of the frame-work, as I can thereby more readily adjust the parts into their relative working-positions.

The mechanism for performing the several operations, viz, printing, gumming, attaching the label, and severing it from the strip, may be used in connection with each other, that is, collectively, in one and the same machine, or one or more of the operations may be performed by the employment of separate and independent machines, if desired; for instance, the strip may be printed or gummed, or both, before it is brought to the machine where the spool is to be labelled.

In case the strip is gummed outside of the said machine, the adhesive matter should be moistened by a stationary or revolving brush or roller, or other suitable device.

It is evident that the position of the various rolls, instead of being vertical, may be horizontal, without departing from the spirit of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. One or more pairs of intermittent feed-rollers, O C, constructed and operating substantially as described, for feeding the strip, and at the same time printing or stamping the label thereon.

2. Also, one or more revolving cutters T, and pistons U, constructed and arranged in relation to each other, substantially as and for the purpose described.

3. Also, a revolving spool-carrier, or cylinder, W, in combination with the piston U and cutter T, operating substantially as and for the purpose described.

4. Also, the eccentric, *v*, with its connecting-rod 30, pin 36, spring 37, and the ratchet-wheel *w*, for revolving the spool-carrier W, substantially as described.

5. Also, the lever A', with its projection 50, spring 51, gear *m*, and its pin 45, for preventing the revolution of the spool-carrier, substantially as set forth.

6. Also, the tubes *j k*, as and for the purpose set forth.

QUIMBY S. BACKUS.

Witnesses:

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C. C. PARKER.