2 Sheets, Sheet 1.

C. Lang,
Collar Machine.

No. 112,155. Patented. Feb. 28. 1871.

Figure 1.

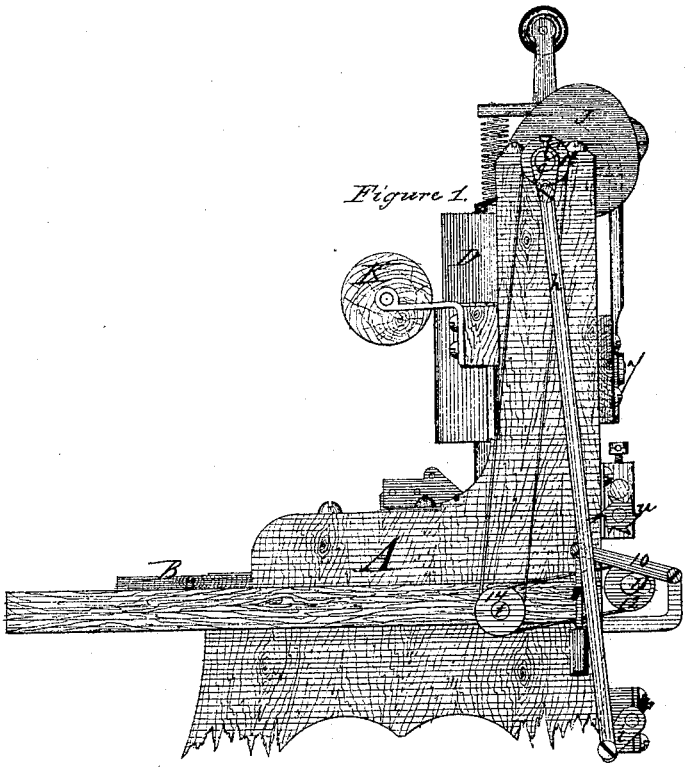
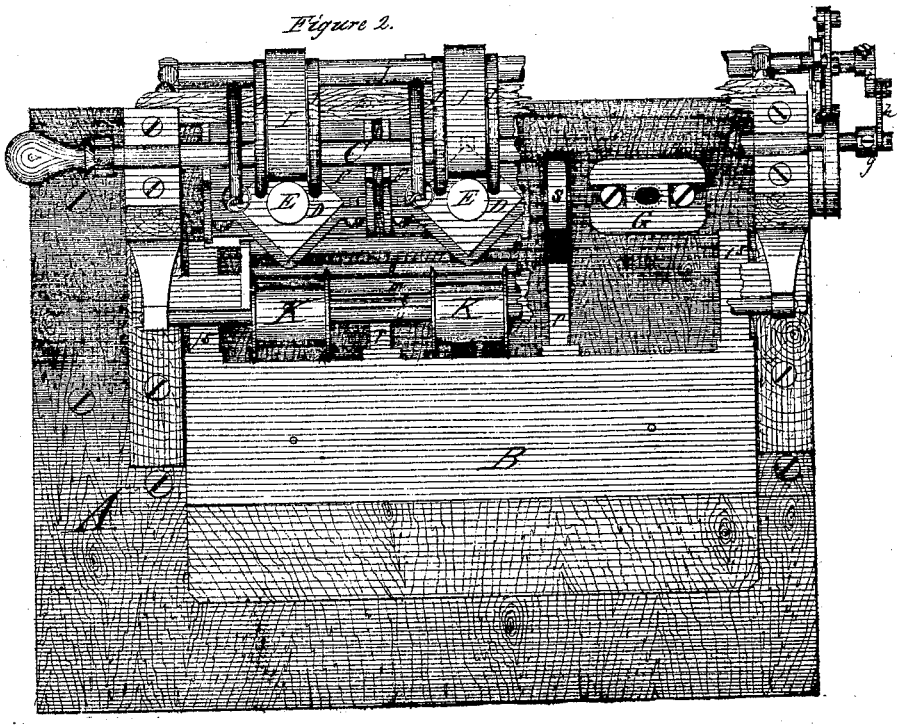


Figure 2.



WITNESSES,

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J. B. Beecher

INVENTOR,

Charles Lang

2 Sheets Sheet 2.

C. Lang,

Collar Machine.

No. 112,155. Patented. Feb. 28, 1871.

Figure 3.

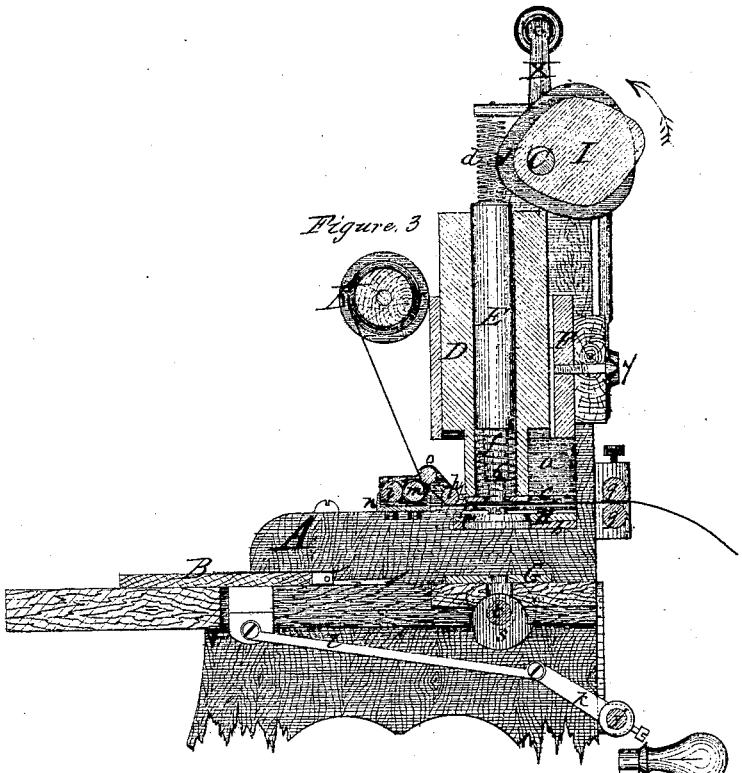
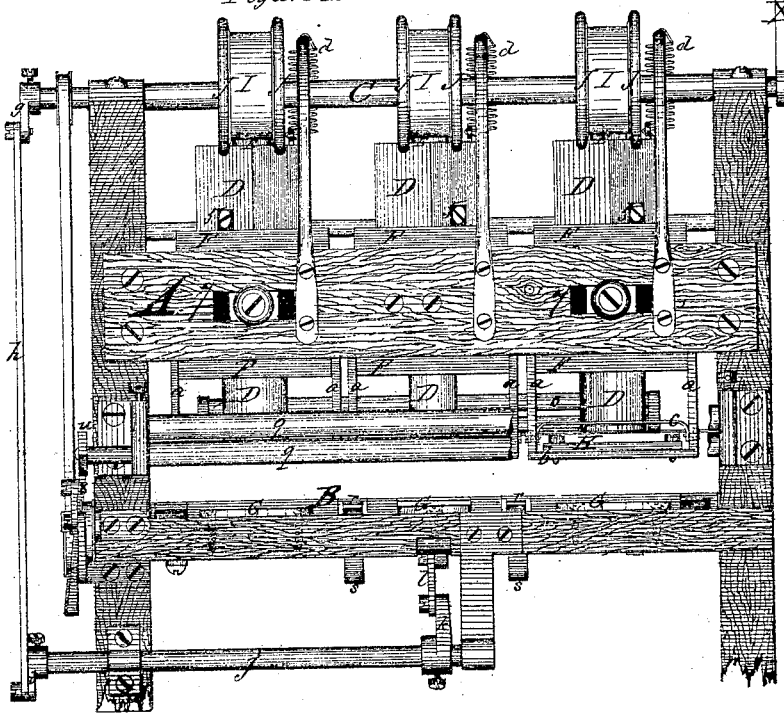


Figure 4.



WITNESSES,

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United States Patent Office.

CHARLES LANG, OF JERSEY CITY, NEW JERSEY, ASSIGNOR OF ONE-HALF HIS RIGHT TO HENRY G. CLAGSTONE, OF NEW YORK CITY.

Letters Patent No. 112,155, dated February 28, 1871.

IMPROVEMENT IN MACHINES FOR PATCHING, PUNCHING, AND EMBOSSING BUTTON-HOLES OF PAPER-COLLARS.

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, CHARLES LANG, of Jersey City, in the State of New Jersey, have invented certain new and useful Improvements in Machinery for Patching, Punching, and Embossing the Button-Holes of Paper-Collars and Cuffs; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing making part of this specification.

The object of the present invention is to greatly simplify and expedite the operation of cutting out the patches used for strengthening the button-holes of paper-collars, pasting them upon the collar, and punching the button-holes, and this is effected by the combination in a machine of mechanical devices, by which all of these operations can be performed by a substantially simultaneous operation, thereby very materially reducing the expense of a very material part of the work in the manufacture of paper collars.

In the accompanying drawing—

Figure 1 represents a side elevation of the machine, the legs having been removed.

Figure 2 is a plan view of the machine, certain of the upper parts of the mechanism having been removed to expose the top of one of the dies.

Figure 3 is a vertical central longitudinal section of the machine.

Figure 4 is a rear elevation of the machine.

Figure 5 shows a modification in the construction of the punches.

A designates the frame of the machine, which may be of any suitable construction. I have shown a table, at the sides of which are uprights, which support the bearings of a main shaft, C, which shaft derives a rotary motion from any suitable motor, and through which shaft motion is imparted to the several parts of the machine.

B designates a carrier, which is arranged to slide upon the table portion of the frame.

D D D are punches, and H H H are the dies for said punches. These punches and dies operate together to cut out the patches.

Within the punches D D D other punches E E E are arranged, and G G G are the dies for the same. These latter punches and dies serve to cut, and, when desired, to emboss the button-holes.

The cutting ends of the punches D and E may be formed of pieces of metal separate from their shanks, and secured therein by any suitable means.

In the drawing each punch and shank is represented as made in one piece, and is called, in general terms, a punch, and designated by a single letter.

The shanks of the punches D are made square, to prevent them from turning, and they slide in boxes F F F, secured to horizontal bars, which are attached to the frame in any suitable manner; or, if of other shape, a slot or pin, or equivalent mechanical device, may be used to prevent their rotating.

The lower portions of the punches D fit the dies H, and correspond in shape and size to the patches it is desired to cut.

The shanks or upper parts of the punches E are made of any desired shape to fit the openings through the punches D. They are shown circular in the drawing, and each punch E is prevented from turning or moving too far by a screw, 5, sliding in a slot in the side of D.

The bottom of each punch E is shown in fig. 3, as reduced in size, and around it is a coiled spring, *f*, resting against the bottom of the punch D, and pressing against a shoulder on said punch E, to raise it after it has been pressed down.

The extreme lower end of the punch E is the portion which, in connection with the opening in die G, performs the cutting of the button-hole.

On the shank of said punch E, a suitable distance above its lower end, is a shoulder, 6, which, after the end of the said punch enters the die G, presses against the patch on the collar and embosses the latter with the device engraved upon the face of die G.

In the drawing a dotted line, to represent stitching, is shown as engraved on the die, for the ornamentation of the button-hole of the collar.

The shoulder 6 may also be engaged if desired.

This shoulder 6 may be omitted, and the opening in the bottom of the punch D be made to fit the lower end of the punch E, in which case the punch D, in pasting on the patch, will also emboss the button-hole without additional mechanism.

Each of the dies H is supported a short distance above one of the dies G in any suitable manner, for instance, by a plate, *b*, having side pieces *a a*, which extend upward and are secured to a guide-block, F.

A little above each die H a plate, *c*, is secured, which plate relieves the punch D of the strip of cloth as the former rises.

Upon the main shaft C three double cams, I J J, are secured. The central portions of these cams operate the punches E, and the rims or flanges J J constitute another cam, in two parts, which operates the punch D.

The cams J J press the punches D downward only in the present instance, and in such case they are retracted by springs *d*, and the punches E are pressed downward by cams I, and retracted by springs *f*.

The perimeters of cams J are, on the sides thereof furthest from the shaft, and for a short distance, made

or formed on the true arc of a circle struck from the centre of said shaft, or nearly so, and the cam I is so constructed that its largest radius is at that point, as is clearly shown in fig. 3, the effect being that the cam J presses the punch D down, which latter carries the patch and pastes it upon the collar and holds both, while the projecting portion of the cam I moves the punch E down, which latter cuts the button-hole and embosses the collar around the button-hole.

In some instances I propose to use frames or straps attached to the punches, within which the cams work, thus giving said punches a positive motion in both directions, and dispensing with the use of springs.

The machine may be readily adjusted to operate on collars of different sizes by sliding the outer cams, punches, and dies to or from the center.

To facilitate this operation I have shown the lower dies G as secured by set-screws, arranged in slots, as represented in fig. 2, and the bearings F F of the outer punches D D as secured by screws 7 7, in slots in the horizontal cross-bars, in the upper part of the frame, which permit these bearings to be shifted to or from the center, and as they carry with them the punches and the dies H, which are attached, these are also adjusted. The cams are shifted in the usual way and secured by keys or set-screws.

On the shaft C is a crank or eccentric, *g*, which, by means of a pitman-rod, *h*, and arm *i*, gives motion to a rock-shaft, *j*, as seen in figs. 1 and 4, and an arm, *k*, on the latter, operates the carriage B by means of a connecting-rod, *l*, pivoted to said arm *k* and to a lug on the bottom of the carriage.

One or both of the eyes in the end of rod *h*, or in *l*, is elongated, allowing sufficient slack motion to cause the carriage B to pause at each end of its travel.

The strips of cloth, which are gummed upon one side in the usual manner, are fed from rollers or reels K, and the gummed side of each is moistened by coming in contact with a wetting-roller, *m*, whose periphery is covered with cloth or other suitable absorptive material, from which the surplus water it receives from revolving in a vat, *n*, is expressed by a roller, *i*, before it comes in contact with the gummed strip.

A guide-roller, *o*, will serve to keep the strip of cloth in contact with the wetting-roller *m;* and said strip of cloth passes, preferably, but not necessarily, under a guide-roller, *p*, and from thence between the plate *c* and dies H, and thence through the feed-regulating rollers *q q*. When passing through the latter rollers it is but a skeleton strip, the patches being punched out while said strip is between a punch, D, and die H.

When desired, paste or mucilage may be put in the trough *n*, instead of water, and, in such case, ungummed cloth may be used, and gum applied to it immediately before it is required for use, in the same manner as the wetting, previously described, is effected.

After the patches have been cut and applied, the button-holes punched, and the punches raised to repeat the operation, the feed-rollers *q q* are rotated, to advance the cloth, by a pawl, 8, which engages with the teeth of a ratchet-wheel, *u*, secured to one of the rollers.

The pawl is operated by the lever 10, (see fig. 1,) which pawl is lifted by a cam, 11, secured to a wheel, 12. A weight on the pawl assists to retract it as well as lever 10, so that the same will be in a position to rotate the ratchet-wheel *u* the distance of another tooth. The wheel 12 receives a rotary motion equal in speed to that of shaft C by any suitable means.

In the drawing, a pulley, 13, on the shaft C, is shown, for driving a pulley, 14, of equal size, on an intermediate shaft, *t*, and another pulley on shaft *t*, equal in size to 12, drives the latter by a belt. It is essential that the motion of the wheels 12 and 14 coincide exactly with that derived from shaft C; so, in practice, I prefer to use chains, which engage with properly constructed wheels, and thus I avoid all danger of slipping. In other cases I effect this result by the use of gear-wheels. The wheel 12 may also be operated directly from shaft C by a chain, or the pawl-lever 10 may have a motion derived directly from a cam or eccentric on shaft C, arranged to give the movement at the proper portion of the revolution, in the same manner as cam 11. Either a push or pull-pawl may be used to operate the ratchet-wheel *u*, according to the arrangement of the ratchet-wheel.

Hinged to the rear edge of the carriage B are two or more arms, *r*, having forked ends, and straight plates, 15, are also attached to the carriage. The collar is laid upon the plates *r* and 15 beyond the edge of the carriage B, and slight projections of the plate on the top of B prevent the collar from rising above the edge.

When the carriage B begins to travel forward the collar or cuff is carried between the dies G and H; but before it reaches that position the plates *r* rise upon the high sides of cams *s* on shaft *t*, and are thereby elevated so that the forked ends strike against the edge of the collar, previously operated upon, and push it off into any suitable receptacle.

When the carriage moves the collar forward into position between the dies, it comes to rest for a moment, as before explained, until the punches operate upon and hold the collar, at which time the cam *s* permits the plates *r* to fall, and the carriage is drawn backward, pulling the said plates from underneath the collar, and bringing them into position to receive another collar.

The operation of the several parts is as follows:

Rotary motion is imparted to the shaft C by the crank *x*, or otherwise, and it revolves in the direction of the arrow. When the carriage is in the position shown the punches are elevated, a collar is, at such time, placed upon the plates *r* 15, and, when the carriage progresses, the collar is carried forward upon them between the dies G G G and H H H, while, at the same time, the finished collar is pushed away, as before explained. At or a little before this time the feed-rollers *q* are revolved, and thereby bring fresh portions of the wetted gummed cloth under the punches.

By the revolution of the shaft C the cams J J now begin to press upon the punches D, which latter descend upon the cloth, and, in connection with dies H, cut out the patches and carry them down and paste them upon the collar. The cams J remain in that position until the cams I press down the punches E, which cut the button-holes, and, when desired, emboss the collar or cuff around the same with the design on the dies G. Meanwhile, the plates *r* have dropped down and the carriage has commenced its return for another collar.

The punches now rise, the plates *b* pull the collar off the punch E, and the plates *c* strip the cloth off D. The carriage has by this time arrived at its first position, where it remains at rest for a moment, to permit a new collar to be placed upon *r* and 15, and the operation is repeated.

It is evident that rectangular or other shaped pieces of paper may be fed into the machine, and afterward cut into collars of the desired shape. So, also, a sheet of paper may be fed between the dies by rollers similar to *q q*, and the button-holes be patched, punched, and embossed on such paper at intervals, the collar being afterward cut out by another operation.

It will be observed that, by the mechanism described, the collar or cuff, or the paper from which it is to be made, is brought into position, and the patches

are cut, pasted on the article, and the button-holes cut and embossed, all in one continuous and nearly simultaneous operation in the same machine.

It is also evident that this machine may be used for patching, cutting the button-holes in, and embossing paper cuffs, by simply regulating the number and adjusting the punches, and dies, and carriers.

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

1. The method of cutting out and applying the strengthening patches to paper collars and cuffs, and cutting or punching therein the button-holes, substantially as herein specified, that is to say, by first cutting out the patch, then pasting it upon the collar, and then cutting or punching the button-hole in both patch and collar, the entire operation being effected by one forward travel of the punches, and by a practically simultaneous operation.

2. The combination of the punch and die D and H with the punch and die E and G, and mechanism for operating the same in rapid succession, for cutting out the patch and pasting it upon the collar and cutting the button-hole in both patch and collar, substantially as herein specified.

3. In a machine for cutting the button-holes in and applying the patches to paper collars, the combination, with the punches D and E, of the cams I J, mounted on the shaft C, and arranged and operating substantially as and for the purposes herein specified.

4. The combination, in a machine for the purposes herein specified, of the following members, to wit: the patch-cutting and pasting-punches D D D and dies H H H, the button-hole cutting-punches E E E and dies G G G, the gum-dampening or applying mechanism *n m i*, the cloth-feeding devices K *q q*, and a collar-carrier, B *r*, all arranged and operating substantially in the manner and for the purposes herein specified.

CHARLES LANG.

Witnesses:
M. M. LIVINGSTON,
T. B. BEECHER.