D. M. Smyth,
Collar Machine.

No. 51,361. Patented. Dec. 5. 1865.

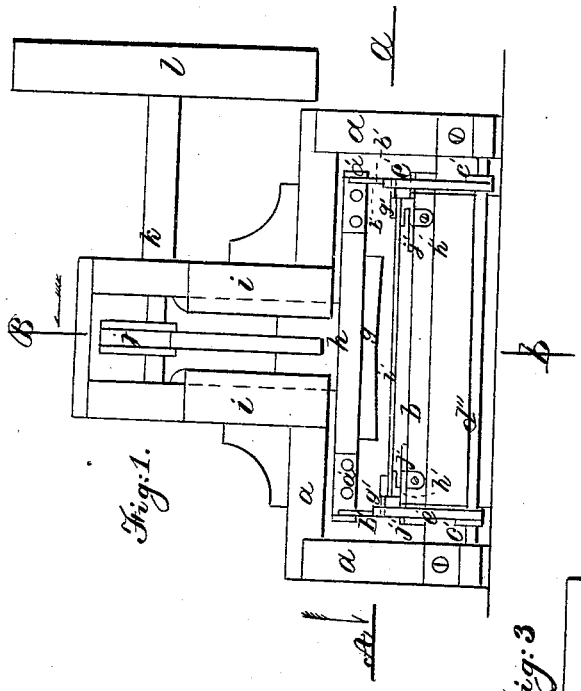

Fig. 1.

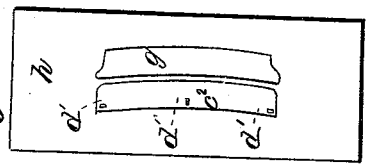

Fig. 3

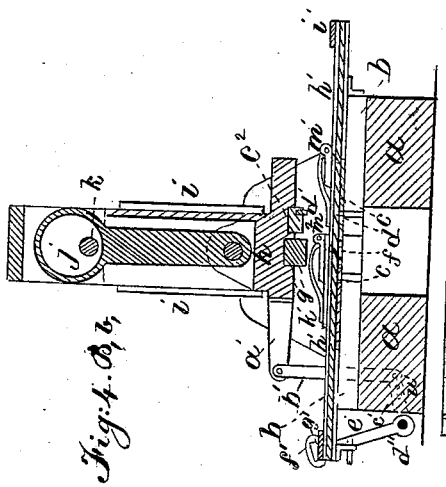

Fig. 4.

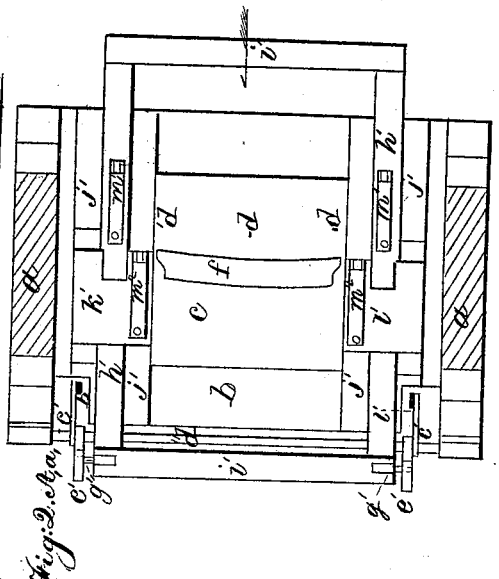

Fig. 2.

Witnesses
W. H. Bishop
A. de Lacy.

David M. Smyth

UNITED STATES PATENT OFFICE.

D. M. SMYTH, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR MAKING PAPER-COLLARS.

Specification forming part of Letters Patent No. **51,361**, dated December 5, 1865.

To all whom it may concern:

Be it known that I, D. M. SMYTH, of the city, county, and State of New York, have invented a new and useful Improvement in Machinery for Cutting and Embossing Paper Collars; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a front elevation; Fig. 2, a horizontal section taken at the line A *a*, Fig. 1; Fig. 3, a face view of the upper die, and Fig. 4 a vertical section taken at the line B *b* of Fig. 1.

The same letters indicate like parts in all the figures.

The object of my invention in machinery for cutting and embossing shirt-collars out of paper is, by an intermittent motion, to feed or move forward the sheet of paper to the required places between the cutting and the swaging dies, and there hold it while these operations are being performed.

In the accompanying drawings, *a* represents a suitable frame, and *b* the bed which forms the lower press face or die, *c*, and what may be termed the "female" portion of the shears. The lower die, *c*, is simply a flat smooth face of metal. I prefer to make it of steel. There are three apertures, *d d d*, made in it, of the form of the button-holes required to be made in each collar. These holes should be formed with sharp square edges.

A mortise, *f*, of the size and shape of the intended collar, is formed through the bed *c*, leaving the upper edge square and sharp, and this forms what I term the "female" part of the shears. To this mortise is accurately fitted a plunger, *g*, which forms the male portion of the shears. This is secured to the under face of a follower, *h*, which is fitted to slide in suitable ways, *i i*, of the frame, so as to slide accurately therein; and the lower face of this plunger *g* is beveled in opposite directions from the middle toward each end, so as to give the cutting-edge thereof, in entering the mortise or female part of the shears, a shearing cut, so that by this and the accuracy with which it fits the mortise the collars will be cut with a perfectly smooth edge and without bending the paper, thereby avoiding a serious difficulty heretofore experienced.

The face of the follower *h* by the side of the plunger is provided with an embossing-die, c^3, whose surface is smooth and parallel with the face of the die or bed *c;* and this is provided with three punches, *d' d' d'*, so as to accurately fit in the apertures *d d d* in the bed to punch the button-holes. And this embossing-die c^2 should be suitably formed to emboss the imitation of stitching; but this makes no part of my present invention.

The follower receives an up-and-down motion from an eccentric, *j*, on a horizontal shaft, *k;* or the required motion may be given by other and equivalent means.

The required motion is given to the main shaft, *k*, by a belt-wheel, *l*, which receives motion, by a suitable belt, from some suitable motor.

The feeding motion for moving the paper is taken from the platen or follower *h*, from which project two brackets, *a' a'*, which are connected by connecting-rod *b' b'*, with two arms, *c' e'*, of a rock-shaft, *d''*. From this rock-shaft project two other arms, *e' e'*, the upper ends of which are formed with slots *f' f'*, (see Fig. 4,) which receive pins *g' g'*, that project from the ends of a bar which constitutes the front part of the feeding-frame, composed of two side pieces, *h' h'* and two end bars, *i' i'*. This feeding-frame slides on the surface of the bed to which the bed-die is secured, and between ways *j' j'*, and under two cross-plates, *k'* and *l'*.

The inner edges of the side pieces, *h' h'*, of the feeding-frame are grooved longitudinally to receive the edges of the sheet of paper and to permit it to slide therein, and they are both of them cut away at top to receive and permit spring griping-fingers, *m' m'*, to gripe and hold the sheet of paper near the two edges. These spring-fingers are so formed that when the feeding-frame moves in the direction of the arrow (see Fig. 2) they will gripe the sheet so as to move it toward and between the dies, and slide over the sheet as the frame moves back, to enable them to take a fresh hold of the paper for the next operation, the sheet being held as the frame moves back by similar griping-fingers, m^2 m^2, attached to the cross-plates *k'* and *l'*.

The range of motion of the feeding-frame is equal to the width of a collar—that is, equal to the width of paper required for each collar—

and by the motions of the feeding-frame the end of the sheet of paper is first brought under the embossing-dies, there held until it is embossed, and at the next motion the embossed part is brought to the cutters, cut off, and discharged below, and by the same motion a fresh portion brought under the embossing-die.

As the motions of the feeding-frame are derived from the platen or follower which carries the cutter and punches to cut out the button-holes, and these, in making a collar, not only pass through the paper, but into the bed-die, it is necessary that the follower, with its cutters, should rise sufficiently to get out before the feeding-frame begins to move to feed the paper forward. It is for that reason that the arms e' e' of the rock-shaft d'' are formed with segment-slots f' f' to receive the pins g' g' of the bar i' of the feeding-frame, so that the said arms can move for some distance as the platen is rising, before they act on the feeding-frame.

The other arms, c' c', of the rock-shaft d'' are formed with slots or holes, w', (see Fig. 4,) in which are secured the wrist-pins that form the connection with the connecting-rods, so that by shifting the wrist-pins the range of motion of the feeding-carriage can be adjusted to any width of collar required to be made.

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

1. The reciprocating feeding-frame with the sides thereof grooved to receive the sheet of paper, in combination with the griping-fingers, substantially as described, and having a mode of operation such as described, and for the purpose specified.

2. The reciprocating feeding-frame with its griping-fingers operating substantially as herein described, in combination with the dies for embossing and cutting the collars, substantially as described.

DAVID M. SMYTH.

Witnesses:
WM. H. BISHOP,
A. DE LACY.