

THOMAS HENDERSON.

Improvement in Machine for Forming Fringe on Textile Fabric.

No. 123,017.

Patented Jan. 23, 1872.

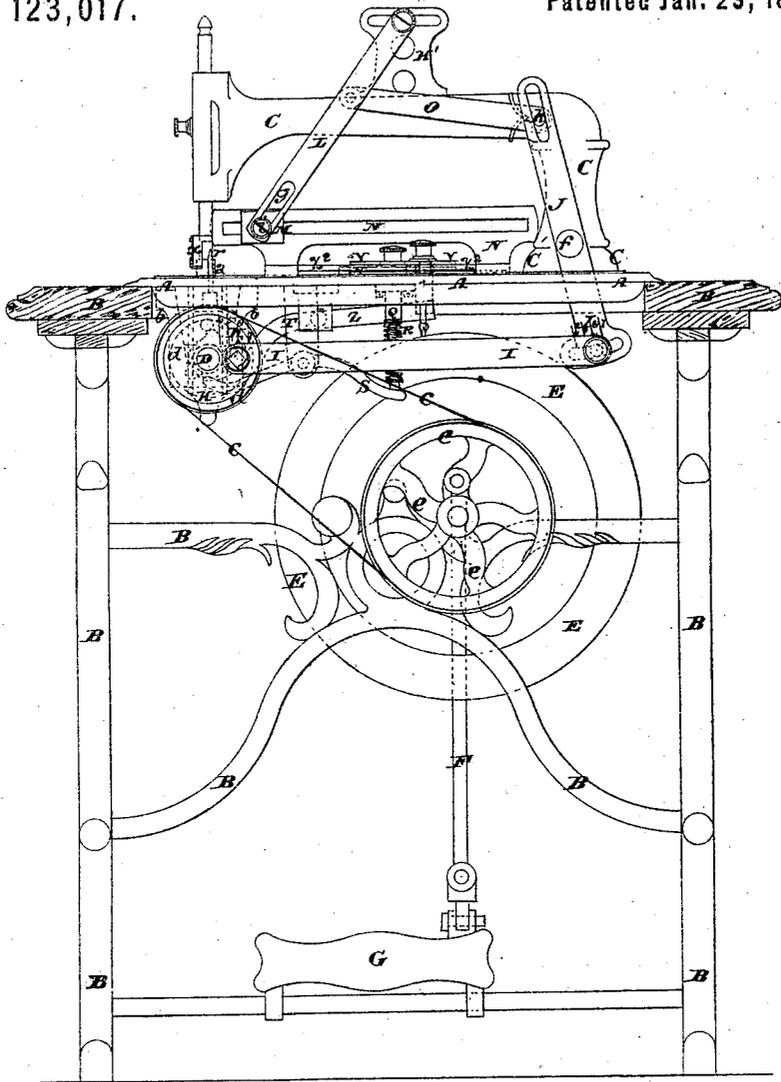


FIG. 4.

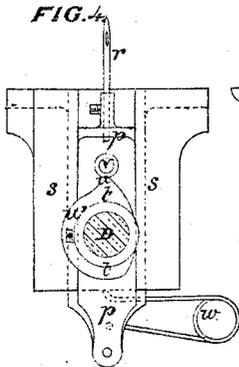


FIG. 5.

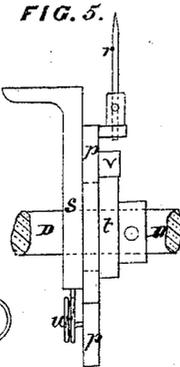


FIG. 2.

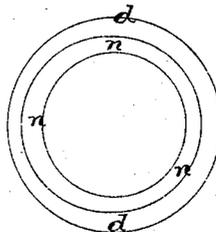
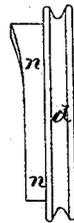


FIG. 3.



*John Brown Witness  
John C. Macomber Witness* } *Thos Henderson*

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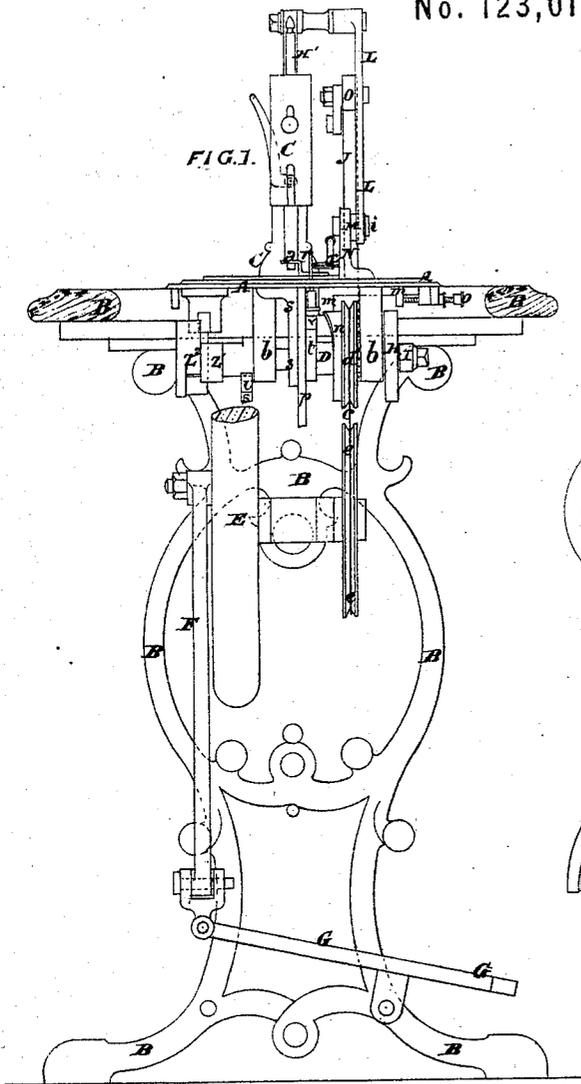


FIG. 2.

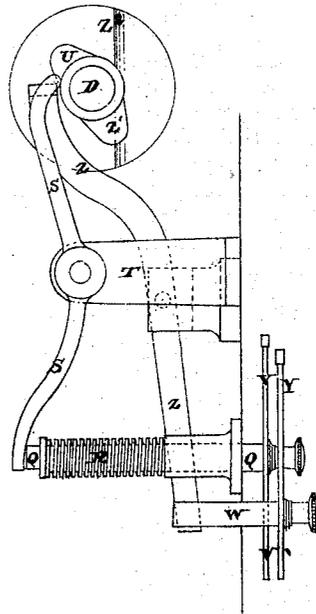
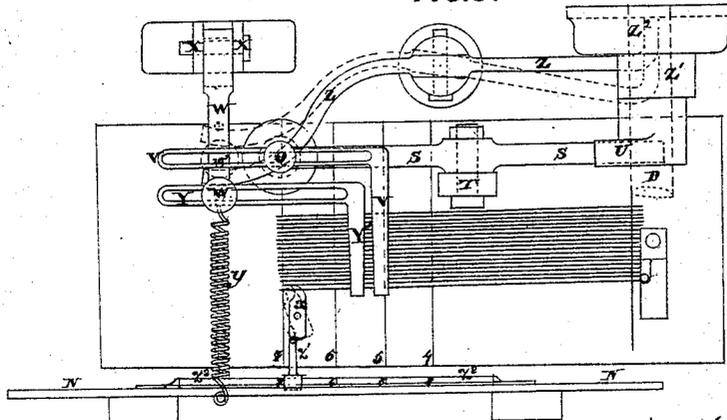


FIG. 3.



*John Brown Witness*  
*John Macandrew Witness* } *Thomas Henderson*

# UNITED STATES PATENT OFFICE.

THOMAS HENDERSON, OF GLASGOW, NORTH BRITAIN.

IMPROVEMENT IN MACHINES FOR FORMING FRINGE ON TEXTILE FABRICS.

Specification forming part of Letters Patent No. 123,017, dated January 23, 1872.

## SPECIFICATION.

I, THOMAS HENDERSON, of Glasgow, in the county of Lanark, North Britain, have invented "Improvements in Forming Fringes on Textile Fabrics, and in the Machinery or Apparatus employed therefor," of which the following is a specification:

This invention, which relates to a machine for forming fringes on textile fabrics, consists of a combination and arrangement of mechanism for producing a fringe on shawls, mantles, skirtings, or other woven articles requiring to have a fringe either on the edges or at any distance from the edges; and it is so constructed that the fringe may be put in shorter or longer lengths, and closer together or wider apart, as requires, with silk or woollen yarn, or any kind of thread.

### *Description of Drawing.*

On Sheet 1 of the drawing hereunto annexed, Figure 1 is a side elevation of the improved fringing-machine which constitutes my said invention, while Figs. 2, 3, 4, and 5 are enlarged detail views of certain parts of the same. On Sheet 2, Figure 1 is an end elevation of the machine, and Figs. 2 and 3 are further detail views, also drawn to an enlarged scale.

On the several figures on Sheets 1 and 2, corresponding parts are indicated by the same letters of reference.

The machine consists of a flat sole-plate, A, supported on a table, B, and provided on its upper side with a stationary arm, C, which holds the driving-levers, and the pressure-bar *a*, by which the cloth is retained in position while the fringe is being formed thereon. Underneath the sole-plate A a driving-shaft, D, is situated, and supported by brackets *b*, the upper parts of which are bolted or otherwise fixed to the underside of the sole-plate A. The shaft D is that by which the whole of the machinery is actuated, and it is driven by a band or belt, *c*, passed round a pulley, *d*, situated on the shaft D, and also around another driving-pulley, *e*, carried on the shaft of the fly-wheel E, as shown in side elevation at Fig. 1, Sheet 1, and in end elevation at Fig. 1 Sheet 2. Motion is transmitted to the fly-wheel E through the link F by the attendant in the ordinary manner, communicating an oscillating motion to the treadle G; or the machine may be act-

uated by steam or other power. On one end of the driving-shaft D a crank-disk, H, is situated, as shown, to which one end of a connecting-rod, I, is coupled, and the other end of the said rod is jointed to the lower extremity of the main lever J, which passes down through the sole-plate A, as shown at Fig. 1, Sheet 1. The lever J is fixed to the stationary arm C by a pin or stud, *f*, and the part of the lever above the sole-plate is, by preference, longer than the portion below it. At or near the center of the arm C, and projecting upward therefrom, a bracket, H', is situated, as more particularly seen at Fig. 1, Sheet 1, having one end of a lever, L, connected thereto, the opposite end of which is formed with a slot, *g*, in which a pin, *i*, projecting from the side of a block, M, is placed so as to work freely in the slot. The block M is provided with a hook, *x*, projecting from one end thereof, by which the yarn or fringe is taken from the needle, as hereinafter more particularly described; and the block M travels in a slot, race, or guide, N, fixed to the sole-plate A of the machine, as shown at Fig. 1, Sheet 1, of the accompanying drawing. The lever L is coupled to the main lever J by a connecting-rod, O, and the upper end of the lever J is formed with a slot, as shown, so that, by adjusting the stud *k* (which connects the lever J and the rod O) in the slot, the slide-block M and hook *x* are caused to travel through any length of stroke that may be required to form the fringe. The cloth to be fringed is fed to the machine by a feeder, *m*, more particularly seen in end elevation at Fig. 1, Sheet 2, of the drawing, and which is a four-motion or step feed, actuated by a cam, *n*, formed on or placed at the side of the driving-pulley *d*, as shown at Fig. 1, Sheet 2, and by the enlarged detail views at Figs. 2 and 3, Sheet 1. The cam *n* acts against a heel formed on the feed *m*, and the cam *n* is so arranged that the parts of greater radius and also the wider portion is uppermost and raises and draws forward the feed *m*, and together with it the cloth, while the needle is below the cloth-plate; also, by means of the screw *o*, shown at Fig. 1, Sheet 2, the feed may be so adjusted that the cam *n* will act on the heel so as to draw forward the feed *m* a longer or shorter distance, and thereby form a close or wide fringe on the cloth, as required.

When the feed *m* is released from contact with the cam *n* it is drawn back to its normal position by means of a spiral spring, not shown on the drawing. Under this invention the needle or needles by which the yarn or thread is fed to the fringing-hook *x* is or are driven from the under side of the machine, and passes or pass upward through the cloth from the under side, in contradistinction to driving it or them from the upper side downward through the cloth. In the example illustrated on the appended sheets of drawing, one needle, *r*, is shown, and which is fixed to a needle-plate, *p*, fitted in a slide-guide, *s*, situated below the sole-plate A, and worked by a cam, *t*, on the driving-shaft D, as shown in enlarged side elevation at Fig. 4, Sheet 1, and in enlarged end elevation at Fig. 5, Sheet 1. As the cam *t* is rotated by the driving-shaft D the point *u* thereof comes in contact with the projecting pin *v* formed on the needle-bar *p*, as shown, by which means the needle *r* is pushed up through the cloth, with the yarn or thread passed through the eye thereof in position to be seized by the fringing-hook *x*; and as the cam *t* further revolves, and the point *u* comes out of contact with the pin *v*, the needle-bar *p* is drawn downward by the spring *w* until the pin *v* rests on that part of the cam marked *u'*, Fig. 4, Sheet 1. By this means a loop is formed in the yarn or thread between the eye of the needle and the cloth, into which the fringing-hook *x* enters. The needle *r* remains in the last-mentioned position until the fringing-hook *x* has taken the required length of yarn or fringe, after which the part of least radius of the cam *t* bears against the pin *v*, and the needle-plate *p* is allowed to descend, and the feed *m* carries forward the fabric, which is then ready for another fringing operation. In lieu of a spring of the form shown at *w* being employed to keep the needle-plate *p* pressed against the arm *t*, as hereinafter described and shown at Figs. 4 and 5, Sheet 1, of the drawing, a spiral spring may be used for that purpose. The machine is also provided with a stopper or holder for taking the yarn or fringe off the fringing-hook *x* when the said hook has been drawn back to the desired distance corresponding to the length of fringe by the arrangement of levers hereinbefore described. The stopper or holder is shown in position at Fig. 1, Sheet 1, of the drawing, but is more clearly illustrated in enlarged side elevation at Fig. 2, and in plan at Fig. 3, Sheet 2; and it consists of a rod, *Q*, working through the sole-plate A of the machine, and which is reciprocated upward and downward therein. On the lower part of the shaft or rod *Q* a spiral spring, *R*, is placed, as shown, and against the lower extremity of the said shaft or rod one end of a lever, *S*, bears. The lever *S* is carried in a bracket, *T*, fixed to the under side of the sole-plate A, as shown more particularly in side elevation at Fig. 3, Sheet 2, and its opposite extremity is acted upon by a cam, *U*, fixed on the driving-shaft D; and the said cam *U* is so

constructed and set in position on the driving-shaft D as to raise the fringe-holder *V* above the fringing-hook *x* when it is coming forward, and to drop the holder on the fringe or yarn when the fringing-hook is at its proper length of travel, as shown at Fig. 3, Sheet 2, thereby enabling the hook to get back clear of the fringe. After the fringe has been formed, as above described, it is drawn away from the fringe-stopper *V* and fringing-hook *x* by the arrangement of mechanism now about to be described. The fringe-drawer consists of a bent arm, *W*, Figs. 2 and 3, Sheet 2, situated underneath and working through the sole-plate A. The arm *W* at one end is fitted into a slide-block, *X*, and is formed with a slot, which works on a pin passed through the block. The other end of the arm *W* is turned upward and projects through the sole-plate A, and on the upturned end a bent slotted arm, *Y*, which constitutes the fringe-drawer proper, is fixed, as more particularly seen in plan at Fig. 3, Sheet 2. On the under side of the end *Y'* of the fringe-drawer *Y* a piece of leather, India rubber, or other similarly-suitable material is fixed so as not to injure the fringe by contact with the drawer *Y*. The fringe-drawer *Y* is worked from the under side of the sole-plate A by a rocking lever, *Z*, which is actuated by two cams, *Z<sup>1</sup>* *Z<sup>2</sup>*, situated on the driving-shaft D. Of the two cams, that marked *Z<sup>1</sup>* is that by which the end of the lever *Z* in contact therewith is depressed and the fringe-drawer *Y* raised as the fringing-hook *x* is being carried back to the needle *r* by the action of the levers and links *J*, *L*, *I*, and *O*, respectively, as hereinbefore described, while the other cam *Z<sup>2</sup>*, acting on the heel of the lever *Z*, shown in dotted lines at Fig. 3, Sheet 2, gives a side motion to the lever *Z*, which is communicated to the fringe-drawer *Y* by the action of the opposite end of the lever on the pin *w'* fixed in the arm *W*, as shown at Fig. 3, Sheet 2, thereby pushing the fringe-drawer *Y* over the fringe and close to the fringe-stopper *V*, when the fringe-drawer drops upon the end of the fringe and draws it away out of the fringe-stopper *V* and clear of the fringing-needle, in which position it retains the fringe until the fringing-needle *r* takes the next loop of fringe. The rocking lever *Z* is kept in contact with the cams *Z<sup>1</sup>* and *Z<sup>2</sup>* by means of a spiral spring, *y*, as shown at Fig. 3, Sheet 2, of the drawing. When the fringing-hook *x* has accomplished the full length of its stroke, and before it is freed from the fringe or yarn held thereon, one end of the hook strikes against a projecting pin fixed to or formed on an adjustable bar, *z'*, as more particularly seen at Fig. 3, Sheet 2. This has the effect of causing the point of a knife contained within the hook *x* to be thrown out so as to cut or sever that part of the fringe held by the hook *x*, as indicated by the dotted lines at Fig. 3, Sheet 2, and after which cutting operation the hook *x* recedes and the fringe is drawn to one side by the drawer *Y*, as hereinbefore described. The end

of the bar  $z^1$  opposite to that whereon the projecting pin is fixed is formed with an eye, by which it is supported on a rod,  $z^2$ , fixed to and extending along the back of the race or guide N. The rod  $z^2$  is divided into grades, as shown in Fig. 3, Sheet 2, and by adjusting the bar  $z^1$  thereon to one or other of these grades a longer or shorter fringe is formed, as required. The travel of the hook  $x$  is also to be regulated by similarly grading the crank-disk H and lower end of the lever J, as shown at Fig. 1, Sheet 1, and by adjusting the pins or studs which hold the link I to the crank-disk H and lever J to a grade corresponding to that to which the bar  $z^1$  has been adjusted.

It is to be here understood that the operation of fringing textile fabrics, as hereinbefore set forth, may be accomplished with any desired number of needles fixed in the needle-plate  $p$ , and supplied with the same color of thread or yarn, or with differently-colored threads or yarns, so as to form a variegated fringe. By the arrangement of the needles and bobbins beneath the work-plate, not only is the construction of the machine simplified, but the inconvenience of complex mechanism above the work-plate is avoided, while the

operating parts are better protected from injury, and prevented from becoming so readily clogged with dust.

*Claims.*

1. The needle or needles  $r$ , arranged adjacent to the feed device so as to penetrate a fabric from below, in combination with the hook  $x$ , traversing above the work-plate and seizing and drawing out the needle-thread, forming loops, as specified.
2. The combination of the subject-matter of the first claim, the knife, and the stop  $z^1$ , arranged and operating as specified.
3. The fringed stopper V, in combination with the actuating cam U, as hereinbefore described.
4. The combination of the fringed stopper V and the fringed drawer Y, operating as hereinbefore described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOS. HENDERSON.

Witnesses:

JOHN BROWN,  
JOHN C. MACANDIE.