Sheet 1. 2 Sheets.

M. D. Whipple.

Fringe Mach.

No. 6,911. Patented Nov. 27, 1849.

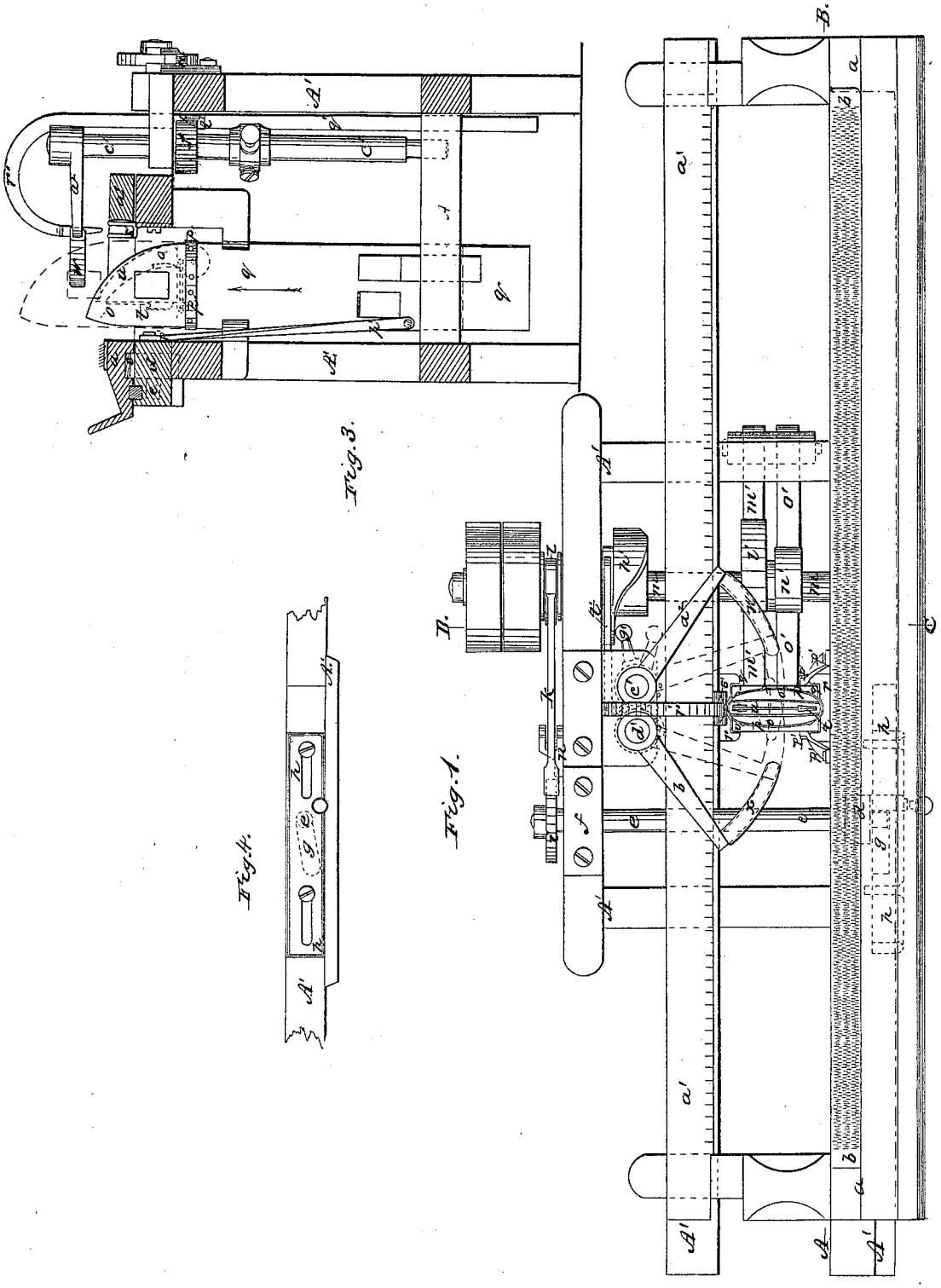

Fig. 3.

Fig. 4.

Fig. 1.

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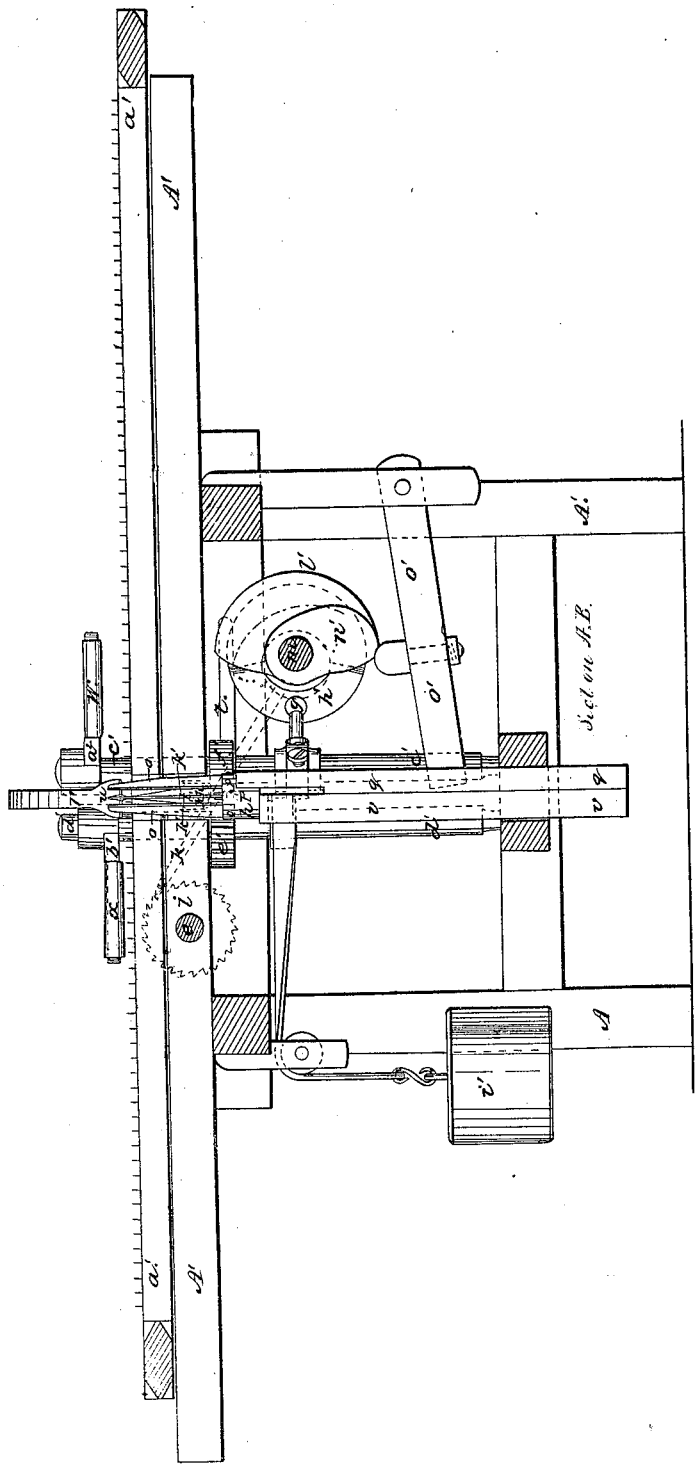
Fig. 2.



UNITED STATES PATENT OFFICE.

MILTON D. WHIPPLE, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO BAY STATE MILLS.

MACHINERY FOR TWISTING SHAWL-FRINGE.

Specification of Letters Patent No. 6,911, dated November 27, 1849.

To all whom it may concern:

Be it known that I, MILTON D. WHIPPLE, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Machine for Twisting the Fringes of Shawls, &c., and that the following description, taken in connection with the accompanying drawings hereinafter referred to forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said invention by which it may be distinguished from others, together with such parts or combinations of parts as I claim and desire to have secured to me by Letters Patent.

The figures of the accompanying plate of drawings represent my machine. Figure 1 is a plan of the same. Fig. 2 is a longitudinal vertical section, taken in the plane of the line A B, Fig. 1. Fig. 3 is a transverse vertical section taken in the plane of the line, C D, Fig. 1, and Fig. 4 is a detail view which will be explained in the sequel.

The operation of twisting the fringes of shawls and other similar articles, has hitherto been accomplished exclusively, as I believe, by hand, and of course at no inconsiderable cost, compared with that of effecting it by machinery.

My machine is so contrived, and constructed, as to imitate, and perform the ordinary manual operations of dividing the yarns into proper quantities to form the two single strands; and then twisting the said strands separately in one direction, and afterwards bringing together, and twisting them in opposite directions, to form the fringe.

A′ A′ A′ A′ is the frame work of the machine, constructed as shown in the drawings, or in any other substantial and suitable way.

a a a′ a′ is a stretching frame, having a strip of card teeth, *b b*, Fig. 1, on the stationary side of the frame, and a set of vertical points on the sliding bar, *a′ a′*. The yarn from which the fringe is formed, having woven fabrics on each side as usual, is stretched from said card teeth to said points, and the bar, *a′ a′*, is arranged so as to slide in and out to accommodte different lengths of fringes. This stretching frame is moved, or fed along by means of rack teeth formed on the underside of the bar, *a a*, as shown at *c*, Fig. 3, which engage with the teeth of a pinion, *d*, on the shaft, *e e*, said pinion being shown by dotted lines in Fig. 1. This shaft has one of its bearings on the top of side of the frame work, A′ A′ A′ A′, as shown at *f*, Fig. 1; its other bearing being in a diagonal mortise, *g*, in the adjustable sliding bar, *h h*, fitted in the opposite side of the frame work, as shown by dotted lines in Fig. 1, and in detail in Fig. 4, so that by moving the said sliding bar in one or the other direction, the pinion may be thrown into or out of gear with the rack, and permits the stretching frame to be moved backward, after twisting the fringe of one side of a shawl, for a new operation. During the operation of twisting, this frame is fed along accurately by means of a ratchet wheel, *i*, on the shaft, *e e*, the teeth of which are operated upon by the long pall, *k*, working on an eccentric, *l*, fitted on the driving shaft, *m m*, as shown in Fig. 1, and by dotted lines in Fig. 2.

The feed motion is regulated by means of the adjustable forked supporter, *n*, in which the pall, *k*, rests, as shown in the drawings, by raising or lowering which supporter, the fall of the pall, *k*, when it is drawn backward on the ratchet wheel, *i*, by the action of the eccentric, *l*, will be diminished or increased, as the case may be.

The machinery for dividing the yarns into proper quantities, to form the two single strands, as hereinbefore suggested, is as follows: *o o* are two metallic triangular dividing plates, set at a proper interval apart on opposite sides of the elliptical ring, *p p*, which ring is firmly fitted on the top of the vertical sliding beam, *q q*, Figs. 1 and 2, arranged so as to slide up and down in proper guides, *r r*, as shown in the drawings. The plates, *o o*, are curved transversely, and vertically, so as to effectually separate the yarns; and have a rectangular slot or opening formed through each, as shown at Fig. 3, for the passage of twisting fingers or rubbers hereinafter described. The yarns embraced between these plates, *o o*, are subdivided or halved, for the purpose of forming two strands by means of the separator, *t u*, having the same triangular contour as the plates, *o o*, so as to enter,

as they do, between the yarns at a mere point at first, and not get entangled with them. This separator is constructed in two parts, with sufficient space cut out to allow the passage of the rubbers or twisting fingers before referred to; both of said parts being connected to the top of the sliding beam, *v v*, arranged side by side with that before referred to, and denoted at *q q*, and moving up and down in the same guides. One of said parts, *t*, of the separator is required to be fixed to said beam, *v v*, and the other, *u*, is hinged as shown by dotted lines in Fig. 3, so as to turn from it, when, in descending, it comes against the top of the upper twisting fingers, the operation being similar to that of a pair of callipers or bent compasses used for measuring the diameter of cylinders, &c.

After the yarns have been divided as above described, into two parcels for the formation of two strands, they are twisted by the curved twisting fingers or rubbers, *w*, *x*, which slide over each other, one above and the other below the yarns, as they pass through the openings in the dividing plates, *o—o*, and separator, *t u*. These twisting fingers or rubbers should be clothed with leather or some other suitable substance, sufficiently rough to turn and twist the yarns. They are connected to the ends of two arms, a^2—b^1, projecting out when the machine is stationary, about at right angles to each other, from the vertical shafts, *c′ c′—d′ d′*, and arranged with set screws so as to be adjustable thereon. These vertical shafts have proper bearings in the framework, and are connected in their movements, so as to turn together by the pinions *e′—f′*, arranged on them as shown in the drawings. Said shafts are turned inward, so as to bring the twisting fingers toward and over each other by the projecting stud, *g′*, inserted in the shaft, *c′ c′*, as shown in Fig. 2, and abutting against the cam formed on the pulley, *h′*, on the driving shaft as shown in Fig. 1. The outward or back turning of said shafts, *c′ c′—d′ d′*, is effected by the heavy counteracting weight, *i′*, connected to the shaft, *d′ d′*, as shown in Fig. 2.

When the rubbers or twisting fingers are passing over each other, twisting the yarns into two strands, the yarns are supported and lifted up in grooves in the upper side of flange pieces set on each side of the two parts, *t u*, of the separator, as shown at *k′ k′ k′* &c., Fig. 2 by dotted lines; and after the two strands are sufficiently twisted, the separator, *t u*, is drawn downward, opening over the rubbers or twisting fingers in its descent; which descent is effected by the cam, *l′*, on the driving shaft, *m*, *m*, said cam operating on the treadle, *m′ m′*, the moving end of which is connected to the vertical sliding beam, *v v*, on which the separator is fastened as above suggested.

When the separator is withdrawn after the two strands are twisted, as above explained, the rubbers or twisting fingers are moved outward by the action of the weight as above set forth, twisting the two strands together firmly, and forming the fringe as perfectly as it can be done by the most skillful operative. The two dividing plates, *o—o*, are then withdrawn by a cam, *n′*, on the driving shaft, said cam operating on the treadle, *o′ o′*, and vertical sliding beam, *q q*, on which said plates are fixed, in the same manner as I have explained above, for the beam, *v v*, and cam and treadle by which it is operated. The stretching frame is now fed along, and the cams ceasing to act upon the treadles, the retroacting springs, *p′ p′—p′ p′*, connected to the beams, *v v* and *q q*, bring them, and with them the plates, *o o*, and separator, *t u*, between the yarns, for another operation.

While the yarns are being divided by the plates, *o o*, and separator, it is absolutely essential that they should be stretched transversely a little, and held tight, in order to be easily divided, and that during the operation of twisting, this stretching and holding should be gradually relaxed. This result is attained by the long metallic hooked depressor and holder, *q′ r′*, which moves up and down in proper guides or mortises in the frame work. The end, *r′*, of this depressor and holder falls on the yarn just behind the plates, *o o*, and separator, *t u*, and immediately after said yarns have been divided, and presses them into a groove or bent plate formed at *s′*, Figs. 1 and 3, to receive them. This bent depressor is operated by an arm, *t′*, which extends at right angles from one side of it, and rests on the face of a proper cam, formed to regulate its motions, on the pulley, *h′*, as shown by dotted lines in Fig. 2.

It will be evident that the precise forms of the several operative parts of the machine, may be varied somewhat from those represented in the drawings; and that the mechanical means employed for moving them, are susceptible of numerous alterations and modifications, by the substitution of mechanical equivalents therefor; but the essential features of the apparatus, as I have indicated them in the foregoing description, must be preserved in order successfully to twist the fringes of shawls by machinery.

It will readily be seen that in view of having one set of rubbers to which a reciprocating circular motion is given, there may be two sets revolving in opposite directions— one set twisting the single strands, and the other twisting the two strands together, or the rubbers may be arranged so as to have

a reciprocating rectilinear motion over each other but either of these modes I have suggested are believed to be substantially the same as that hereinabove specifically set forth.

Having thus described my invention, I shall state my claims as follows:

What I claim as my invention, and desire to have secured to me by Letters Patent is,

1. Dividing the yarns into proper quantities for the formation of the two strands, by means of the dividing plates and separator, shaped, and made to slide up and down, substantially as hereinabove set forth.

2. I claim twisting the two strands separately, first, and then together, by means of the twisting fingers or rubbers, constructed and arranged so as to turn inward and outward over each other, one above, and the other below the yarns, substantially as hereinabove set forth.

3. I claim the peculiar construction and arrangement of the separator, (as I have termed it) so that it may open over the rubbers, and drop down just before the two strands are to be twisted together, substantially as hereinbefore described.

4. I claim a machine for twisting the fringes of shawls &c., having a stretching frame, dividing plates and separator, twisting fingers or rubbers, combined, and operated successively as hereinbefore specified, and described.

Boston May 25th 1849.

MILTON D. WHIPPLE.

Witnesses:

EZRA LINCOLN, Jr.,

LUTHER BRIGGS, Jr.