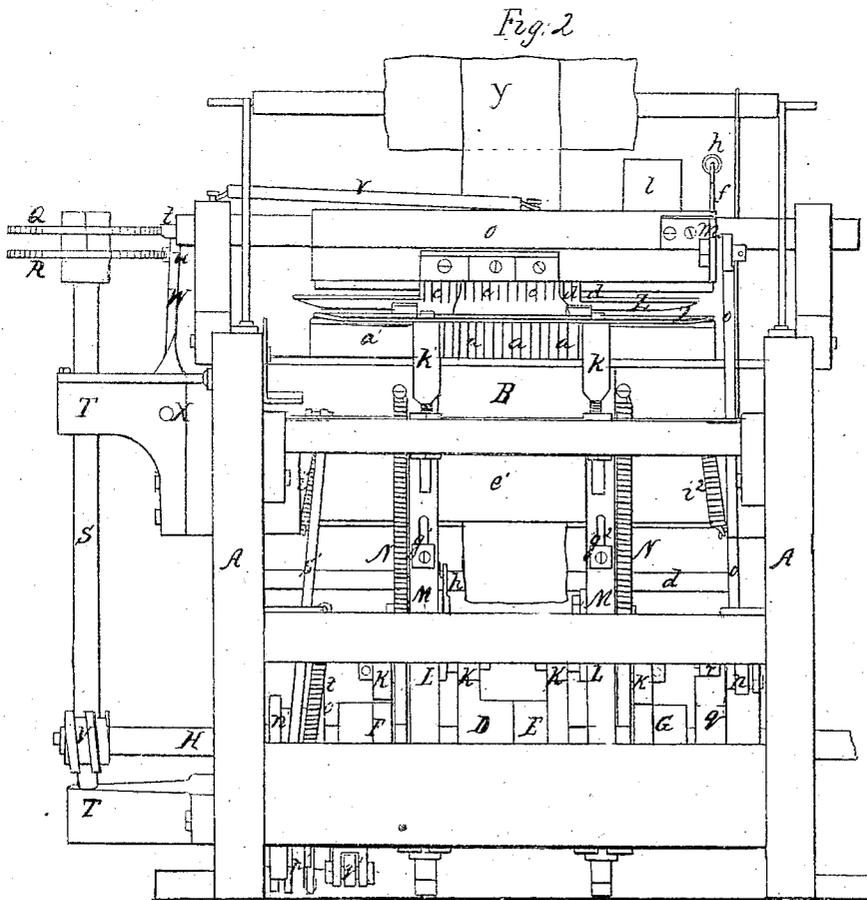
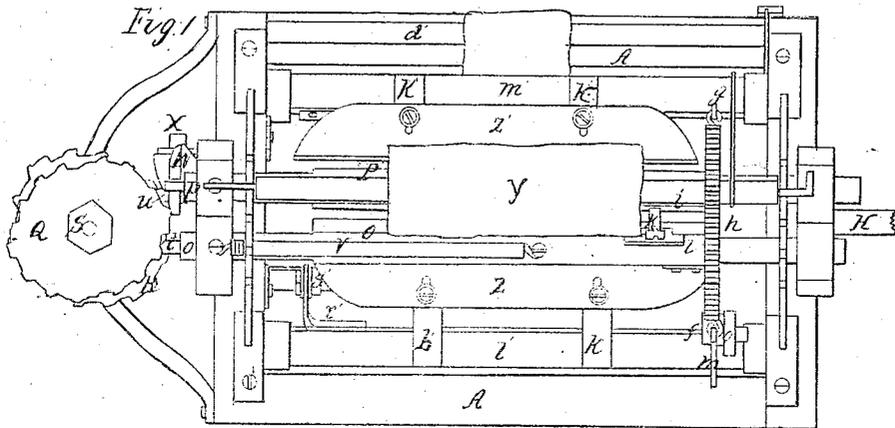


J. Mee.
Knitting Machine.

N^o 9,718.

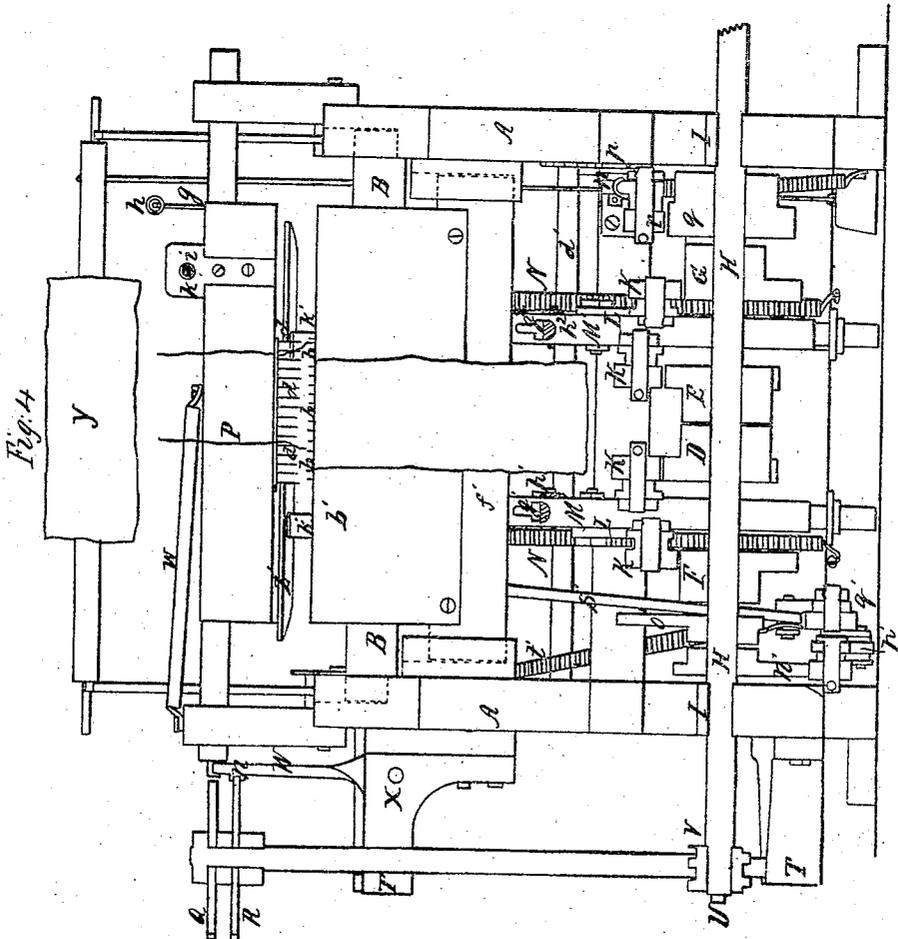
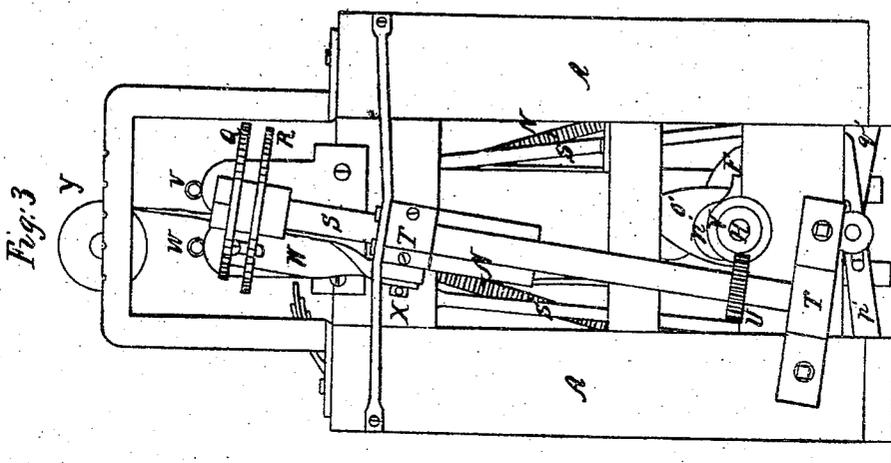
Patented May 10, 1853



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N^o 9718

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UNITED STATES PATENT OFFICE.

JOHN MEE, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO HIMSELF, JOHN ROURKE, AND GILBERT MACKENNON.

KNITTING-LOOM.

Specification of Letters Patent No. 9,718, dated May 10, 1853.

To all whom it may concern:

Be it known that I, JOHN MEE, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Power-Looms for Making Ribbed Warp-Knit Fabrics; and I do hereby declare that the same is fully described and represented in the following specification and accompanying drawings, letters, figures, and references thereof.

My improved loom is calculated for weaving a new or improved manufacture of warp knit cloth, produced by the use of two sets of warp threads, and two sets of needles and wherein the rib is shown on both sides of the cloth, and either of the same width on one side thereof as it is on the other, or of double the width on one side that it is on the other.

Of the said drawings, Figure 1, denotes a top view of my improved machine or loom. Fig. 2, is a front elevation of it. Fig. 3, is an elevation of the left end of it. Fig. 4, is a central vertical and longitudinal section of it. Fig. 5, is a central vertical, and transverse section of it.

In the said drawings A, denotes the framework which supports the operative parts of the machinery.

a, a, a, &c., b, b, b, &c., are two sets of hooked needles, each of which is elevated on or supported by one of two horizontal bars B, C, which bars are alternately elevated by means of one or more cams D, E, acting on one, and one or more cams F, G, acting on the other, the said cams being fixed on the main driving shaft H, arranged underneath the said bar, and supported in boxes I, I, as seen in the drawings. Each of said cams

operates against a friction roller K, fixed on or to an arm L, projecting from one of two bars M, M', extended down from the needle bar. Each needle bar is depressed by means of one or more retractive springs N, attached to it and the frame A. Above the two series of needles are arranged, two sets or series of thread guides, *c, c, c, &c., d, d, d, &c.,* there being a thread guide to each needle. Each series of thread guides is

made to project downward from a horizontal rocker shaft O, or P, whose journals are made and supported in bearings so as not only to enable the shaft to rotate in directions transversely of its axis, but also to slide endwise, or back and forth in a longi-

tudinal direction. From the two shafts O, P, bent arms *f, g,* extend upward, respectively, and are connected by a spring *h.* From a projection *i* from one shaft, a stud *k* extends and abuts against a projection *l,* extended upward from the other shaft, as seen in the drawings. The shaft *o,* has an arm *m,* extended from it, to which arm, and a lever *n,* (see Fig. 6, which is a transverse section of the machine taken through the stud *k*), a connecting rod *o,* is jointed. The lever *n,* works up and down upon a stationary fulcrum *p,* and is raised by means of a cam or wiper *q,* acting against a friction roller *r,* affixed to the side of the lever. A retractive spring *s,* connected to the lever, and the frame A, serves to depress the lever. Such mechanism or any equivalent, may be employed to produce the transverse movements of the thread guides, as will hereinafter be more particularly described. The longitudinal movements of the two sets of guides, or their shafts O, P, are produced by means of two cam plates Q, R, which are placed upon the upper end of an upright or slightly inclined shaft S, supported in proper bearings at T, T. This shaft is rotated by means of a worm gear U, fixed upon it, and made to engage with an endless screw V, fixed upon one end of the driving shaft H. A stud *t,* extends from the end of the shaft O, and bears against the periphery of the cam plate Q. An upright lever W, turning upon a stationary fulcrum X, rests against the end of the shaft P, and has a stud *u,* extended from it, and against the periphery of the lower cam plate R. To each of the shafts O, P, and the main frame, a retractive spring *v,* or *w,* is connected, and made to operate so as to draw its shaft toward its cam plate.

The two series of threads or warp yarns for producing the textile fabric, are wound upon a beam or delivery roller Y, suitably placed, a thread or yarn from such beam being carried or passed down between the shafts O, P, and through some one of the thread guides, the object of such thread guides being to lay the thread around the needles, during the process of knitting, in the manner as will hereinafter be more particularly described.

For the sake of illustration we will suppose that one set of thread guides is provided with red threads or yarns, while the other is provided with those of another, black

or blue for instance, although in ordinary weaving yarns of one color are generally used. To each set of needles, when needles are used, a presser bar Z, or Z', is adapted, its object being to press the points of the needles against the shanks at the proper time, during the descent of the needles, and elevation of the lifter bar, for the purpose of casting the loops thereon, over the crossed yarns lying on the needles. To each set of needles there is a lifter bar or plate *a'*, or *b'*, the two lifter bars being arranged between the two sets of needles, and so as to have the work or fabric hanging between them as seen at *c'*, such fabric being made to extend downward, and wind upon a beam or roller *d'*, as it does in other warp knitting looms. Each of the lifter plates is fixed to one of two horizontal bars *e'*, *f'*, whose ends are supported in suitable bearings that admit of the necessary vertical movements of the bar. The elevation of each lifter bar at the proper time is produced by means of two studs or projecting arms *g'*, *g''*, or *h'* *h''*, affixed to the bars M, M', M', and arranged as seen in the drawings. The depression of the lifter bars is effected by suitable retractive springs *i'*, *i''*, connected to each of them and the main frame.

The application and use of the lifter bars, is not new. I employ them, and operate them, in essentially the same manner as they are employed and used in other rib warp knitting looms, wherein two sets of needles are used. I also employ and use the presser bars Z, or Z', in a similar manner to that in which they are employed and used in such looms. Each of said pressers is affixed to arms *k'*, *k''*, projecting from a rocker shaft *l'*, or *m'*, which rocker shaft is rocked or put in motion at a proper time, by means of a cam *n'*, or *o'*, acting against a treadle lever *p'*, or *q'*, which is connected with an arm *r'*, projecting from the shaft *l'*, or *m'*, by means of a connecting rod *s'*. The treadle lever is elevated by means of a retractive spring *t'*, and produces the movement of the presser, away from the needles.

Figs. 7 and 8, are intended to show the movements or paths of each set of thread guides in connection with the two sets of needles, in order to cross the threads in a proper manner over the needles, to form the rib stitch or work having ribs of equal widths on the opposite sides, or ribs of one width on one side and those of double the width on the opposite side of the work or fabric. As each of the thread guides of each set moves exactly like every other one of the same set, it will only be necessary to describe the path or movement of one guide of each set of guides. In said Fig. 7, the needles of one set are represented at *a*, *a'*, *a''*, *a'''*, &c., while those of the other sets are shown at *b*, *b'* *b''*, *b'''*, &c., and those of one set are not

arranged directly opposite those of the other set respectively, but so that those of one set may be opposite respectively to points midway between those of the other set, or as seen in the said figure. C, and D, may be supposed to represent the two bars to which the sets of needles are respectively affixed, which bars in the Figs. 1 to 6, are seen at B, C.

The cloth during the process of weaving, hangs between two sets of needles, and has a set of loops extending from or hanging on on each set of needles. For the sake of illustration, we will suppose that all the threads of one set of thread guides are red in color, while all those of the other set are black. We will also suppose that the bars or sets of guides are so arranged that the second thread guide of the black warps, and the second thread guide of the red warps stand in position respectively with relation to the needle *b''*, as denoted by the black and red letters B, as seen in Fig. 7. Of course each of the other needles of the set will have a black and red thread guide, standing in a similar relation to it. We next put each set of thread guides in simultaneous motion, so as that only to cause one set to carry or move each of its guides in such a path, as to cause such guide to lay its thread around four needles, as denoted in Fig. 7, by the black line *x*, and black arrows, but also to cause the other set to move each of its guides in such manner as will lay its thread around four needles as denoted by the red line *y*, and its arrows in said Fig. 7. Each time a black and a red thread is crossed around one of the needles which crossing will take place by the movements of the guides as described, the loop of the said needle lying underneath the crossing, is to be cast over the upper ends of the hook, so as to form a new loop of the crossing yarns. By such a mode of operation, ribbed work may be made, in which the rib is of the same width on one side of the cloth, as it is on the other side of it.

By arranging double the number of needles on one bar as in one set, that there is on the other bar as in the other set, and so that those of one bar may stand in positions with respect to one another as seen *a*, *a'*, *a''*, *a'''*, etc., *b* *b'* *b''*, *b'''* *b''''* *b''''''*, &c., in Fig. 8, and causing each of the thread guides of the two sets to travel around them, as denoted by the black and red lines *x* *y*, and the arrows in the said figure (that is to say each guide of one set traveling in a path as denoted by the black line *x*, while each guide of the other set travels in a path as denoted by the red line *y*) and casting over the loops directly after each crossing of the threads around the needles, we can form a fabric in which the rib on one side of it, will show a width double what it does on the opposite side. In other warp net looms wherein two

sets of needles have been used, the said two sets do not move up and down independently of one another, but are made to move simultaneously or in one direction at the same time. In consequence of such movement, they have to be set at a considerable or a sufficient distance apart to allow the thread guides to work or pass between them. The necessity of setting them so far apart, causes the stitches on one set of needles, to be formed so far from those of the other set as to render it difficult to make close work. By making or causing each set of needles to move downward below the other set just previous to the operations of the thread guides on or around the latter set I am enabled to move the former set entirely out of the way of the thread guides. I can therefore bring or arrange, the two sets of needles so close together, as to obviate the difficulty of loose work, and cause the work to be made with the closeness required.

I do not herein claim the improved manufacture of ribbed fabric, made by two sets of warp threads, but

What I do claim as my invention, is—

1. The two sets of thread guides in combination with the two sets of needles (or their equivalents) and machinery for casting the loops, the whole being made to operate together, substantially as hereinbefore speci-

fied; not meaning to claim the invention of a single set of thread guides in combination with two sets of needles, and machinery for casting the loops, as such is not new, but meaning to claim the invention of two sets of thread guides in combination with two sets of needles, and machinery for casting the loops, all substantially as described, and operating together, to produce a ribbed knit fabric, such as I have explained.

2. I also claim the improvements of causing the two sets of needles to work or move up and down independently of each other, or in other words, so that one set may move downward, or be moved out of the way of the thread guides, to be brought into operation on the other set, such improvement enabling me to bring or arrange the two sets of needles close together, and thus make closer work than can be produced, when the two sets of needles are made to move in one direction (either up or down) at the same time.

In testimony whereof I have hereto set my signature this fifteenth day of May A. D. 1851.

JOHN MEE.

Witnesses:

R. N. EDDY,
BENJAMIN EDDY.