(No Model.) 2 Sheets—Sheet 1.

T. H. BALL.

MACHINE FOR CRIMPING AND PREPARING ELASTIC FABRIC.

No. 266,074. Patented Oct. 17, 1882.

Fig 2

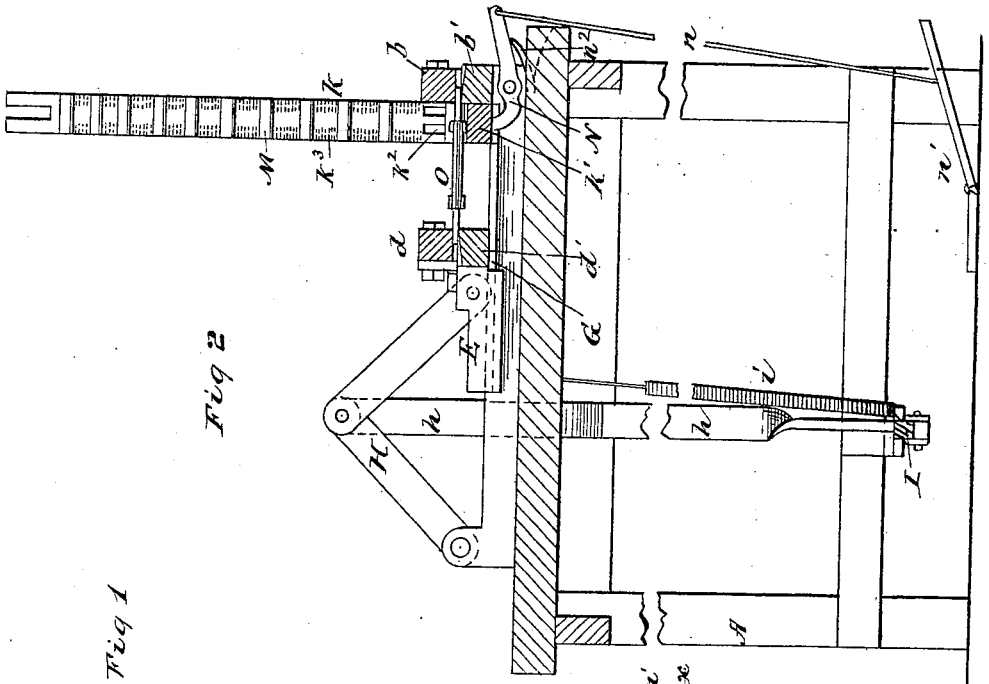
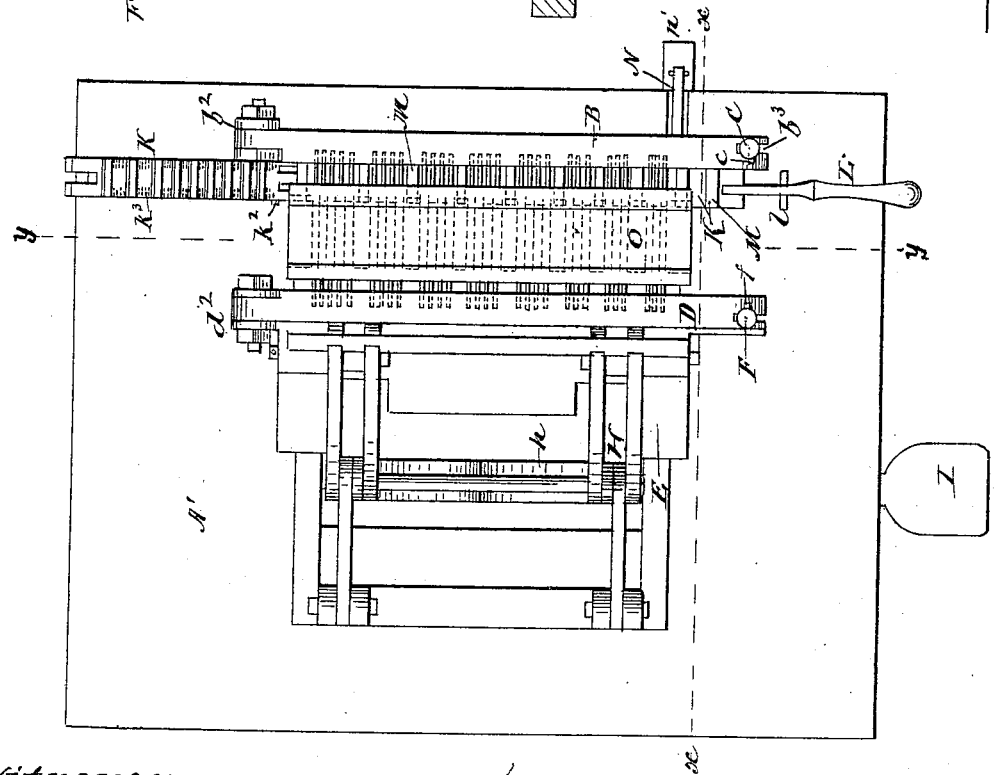


Fig 1



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(No Model.) 2 Sheets—Sheet 2.

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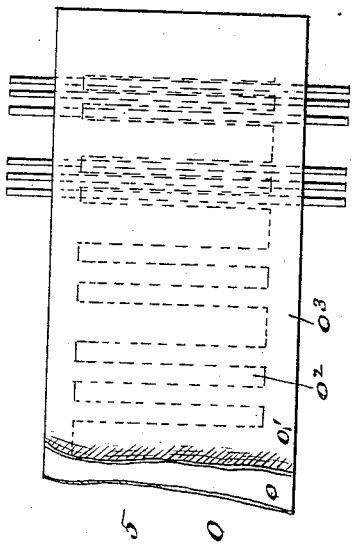

Fig 5

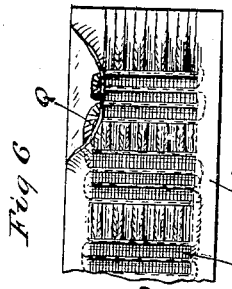

Fig 6

Fig 7

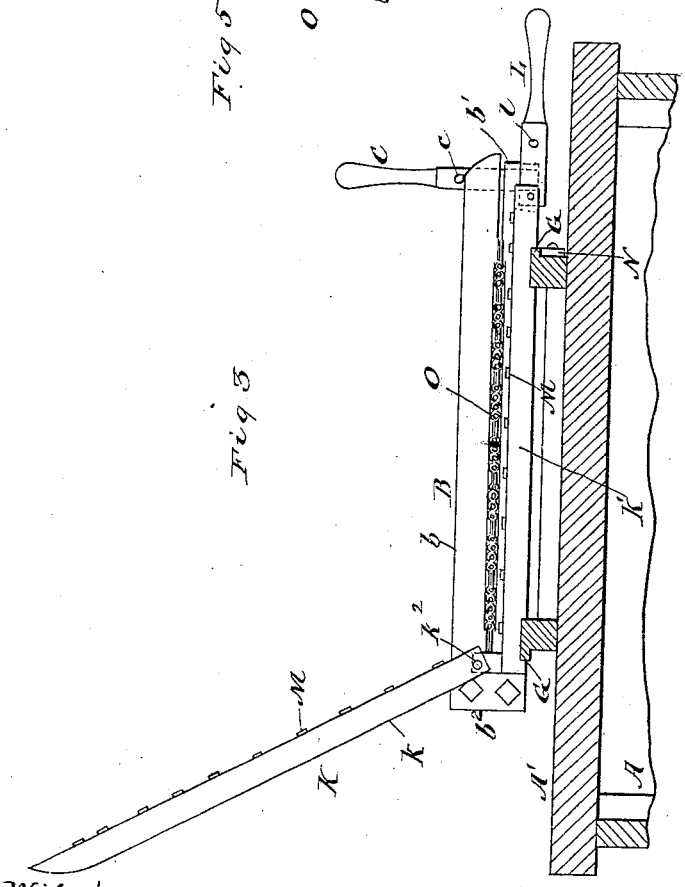

Fig 3

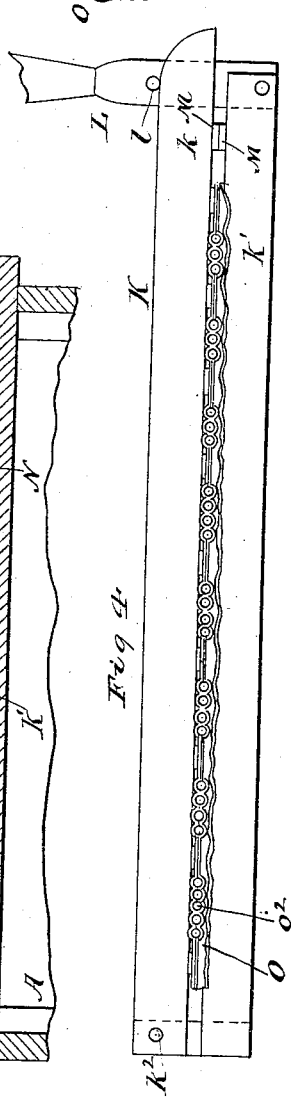

Fig 4

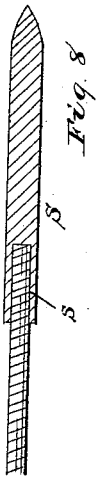

Fig 8

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UNITED STATES PATENT OFFICE.

THOMAS H. BALL, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE CHICAGO CORSET COMPANY, OF SAME PLACE.

MACHINE FOR CRIMPING AND PREPARING ELASTIC FABRIC.

SPECIFICATION forming part of Letters Patent No. 266,074, dated October 17, 1882.

Application filed April 10, 1882. (No model.)

To all whom it may concern:

Be it known that I, THOMAS H. BALL, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Crimping and Preparing Elastic Fabric, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan view of a machine embodying my invention; Fig. 2, a cross-section of the same, taken on the line *x x*, Fig. 1; Fig. 3, a similar section of the table portion of the machine, taken on line *v v*, Fig. 1; Fig. 4, a side elevation of the clamp and fabric removed from the machine and on an enlarged scale; Fig. 5, a detail plan on the same scale of fabric with the needles in place; Fig. 6, a similar view of the fabric after crimping and insertion of the springs; Fig. 7, detail plans of the needle; and Fig. 8, a similar view on an enlarged scale of modified needle.

My invention relates to a machine for crimping or shirring a fabric preparatory to the introduction of springs, whereby it is made elastic, it being intended especially for use in the manufacture of the peculiar elastic fabric shown in the patent of S. Florsheim, No. 238,100, granted February 22, 1881, though it may also be employed in the manufacture of other styles of fabric to which it is applicable.

I will proceed to describe in detail the construction and operation of a machine in which I carry out my improvements, and will then point out definitely in the claims the special improvements which I believe to be new and wish to protect by Letters Patent.

In the drawings, A represents a suitable supporting-frame, on which the mechanism is mounted, and which is provided with a table, A′.

At one side of the machine is a fixed holding-clamp, B, composed of two parts, *b b′*, the first being fastened to the table, and the second connected to the former at one end of the joint b^2. At the other end a lever, C, is pivoted to the lower member, and is provided with a pin, *c*. A notch or recess, b^3, is cut in the corresponding end of the upper member of the clamp, which receives the lever as it is thrown up, so that the pin projecting from each side passes over the end of the bar and so fastens the two members of the clamp together. A similar clamp, D, is mounted on a slide, E, inside of the former and parallel therewith. It is composed of the two members, *d d′*, connected together at one end by the hinged joint d^2, and at the other provided with a lever, F, having a pin, *f*, by means of which the two parts of the clamp are fastened together, as described above. The slide E is mounted upon suitable ways, G, arranged on the table at right angles to the clamps, so that it may be moved toward and from the stationary clamp, for the purpose hereinafter described. A toggle-joint, H, connects the slide to the table, preferably one of these joints being arranged near each end of the slide, as shown in Figs. 1 and 2 of the drawings. A pitman, *h*, connects the toggle-joint to a treadle, I, at the lower part of the frame, which is provided with a suitable retracting-spring, *i*, by means of which the treadle is held up when the toggle is raised, as shown in Fig. 2 of the drawings; but obviously, when the treadle is depressed, the toggle will be drawn down and the slide moved forward, carrying the clamp mounted thereon up toward the stationary clamp. A third clamp, K, is constructed substantially the same as the two already described, but independent of any other portion of the machine. The upper and lower members, *k k′*, are pivoted together at one end by the joint k^2 and at the other end are secured by the lever L, having the pin *l*, the same as in the other clamps. Each member of this clamp is provided with little blocks of rubber, M, arranged at suitable distances from each other transversely of the bars and corresponding with each other, so that they will be brought together in pairs when the clamp is closed, these blocks projecting somewhat over the inner faces of the bars. The edges of these faces between the rubber blocks are preferably provided with slight serrations k^3, extending inward a little ways, as shown in Figs. 1 and 2 of the drawings. A suitable seat or support for this clamp is provided on the table just inside of the stationary clamp B, so that when in position, as shown in Figs. 2 and 3 of the drawings, this clamp will be on a level with the other two. A lever, N, is pivoted to the table transverely

of the clamps in such a position that one end will rest under one end of the clamp K when in position on the table. A rod, *n*, connects the other end to the treadle *n'* at the bottom of the frame, and a spring, n^2, is placed under the outer end of the lever, as shown in Fig. 2 of the drawings.

If it is desired to make the fabric described in the patent mentioned above, the two thicknesses *o o'* of cloth or other material are first stitched together, as described in the said patent, and as shown in Fig. 6 of the drawings, so as to make a double fabric, O, with transverse pockets or receptacles o^2 running nearly across the strip, but the edges o^3 on each side in this case being left unstitched. The pockets or receptacles are arranged in groups, and the spaces between the rubber blocks on the clamp K should be made to correspond with these sections.

In operation the fabric is first prepared by inserting wires P in the pockets, of sufficient length to project out beyond the fabric at each side and to extend from the sliding to the stationary clamp. The removable clamp K is then placed in position on the table and opened, as shown in Figs. 1 and 2 of the drawings. The fabric is then laid in place in the space between the two stationary and sliding clamps, the ends of the wires resting upon the lower members of each, respectively. The stationary and sliding clamps are then closed and fastened, the latter being constructed to close down so tightly upon the ends of the wires as to prevent their slipping therein, while the former is closed lightly upon the wires, so as to permit them to slide out between the two parts thereof. The treadle I is then forced down, straightening the toggle, and thereby moving up the slide and clamp D. Obviously the fabric in this movement will be crimped or shirred on the wires, the latter being slid out through the clamp B. The movement of the sliding clamp is continued until it reaches the removable clamp K, in which position it held or fastened by any suitable device attached either to it or the treadle.

It will be seen from this description that the fabric is now all shoved in over the lower member of the clamp K, resting on the latter and between the stationary and sliding clamps in a shirred condition. The clamp K is now closed, the rubber blocks thereon biting the fabric closely between the pocket-sections and holding securely from slipping, while the pocket-sections are held somewhat more loosely. The sliding clamp is then opened, and the wires are drawn out from the fabric through the clamps B and K by nippers or any other suitable device. The clamp K is then removed from the table, the lever N being brought into requisition to facilitate this by lifting the clamp if necessary. The wire Q is now introduced by means of a suitable needle, R, to which it is fastened, the needle being run back and forth through the pockets in the fabric, as they are held in suitable position for this purpose in the clamp K, as shown in Fig. 4 of the drawings. The serrated edges of the clamp tend to prevent any slight slipping of the material which might disarrange the pockets. The wire is drawn continuously back and forth from one pocket to the other, and from one section of pockets to another, as described in the patent already mentioned, so as to make an elastic fabric like the one therein described, and also as shown in Fig. 6 of the drawings.

The needle R (shown in Fig. 7 of the drawings) consists of a straight pointed shaft, the opposite end of which is of diminished size, so as to make a short section, *r*, just suitable to enter within the coil of the wire and leave the latter flush with the main shaft, as shown in the drawings. The draw upon the wire will obviously have a tendency to tighten the coil upon this portion of the needle, thereby preventing it from slipping. In Fig. 8 I have shown a needle, S, slightly modified in construction in this instance. The end opposite the point is provided with a socket, *s*, in which the end of the wire coil is placed, as shown in the drawings. The strain upon the coil will prevent it from slipping out of this socket. Either form of needle may be used, and it will be seen that the device is exceedingly simple and the wire coil readily attached to it. After the wire coil is introduced, as described, the fabric may be finished up, as set forth in the Patent No. 238,100.

As heretofore stated, this machine may be applied to the construction of elastic fabrics differing from the special one herein referred to, suitable changes being made in the clamps to adapt them to the special fabric. Modifications may also be made in details of construction in the machine as described above, and I do not wish to be understood as limiting myself to the particular and special construction and organization of devices herein shown and described, provided always the machine is organized to operate substantially as above set forth.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for preparing elastic fabric, a stationary clamp or holder, in combination with a movable clamp or holder, within which the two ends of the wire thrust through the fabric are received, and a removable clamp into which the fabric is crimped or shirred by the moving up of the sliding holder, substantially as and for the purposes set forth.

2. The supporting-wires passed through the pockets in the fabric, in combination with the clamp B, receiving and loosely holding one end of said wires, and the sliding clamp D, in which the other ends of the wires are tightly fastened, whereby when the latter clamp is moved toward the former the wires are slipped through the clamp B and the fabric puckered or shirred, substantially as described.

3. The wires on which the fabric is arranged, in combination with the clamp B, sliding clamp D, toggle H, and mechanism for operating the latter to reciprocate the clamp D, substantially as and for the purposes set forth.

4. The wires P, on which the fabric is supported by insertion in pockets therein, in combination with the stationary clamp B, loosely holding these wires at one end, the movable clamp D, tightly holding the wires at the other end, and the removable clamp K, arranged on the machine at the side of the clamp B in an open position while the clamp D is moved up to it, substantially as and for the purposes set forth.

5. The clamp K, the two members of which are provided with blocks M, of elastic material, arranged at suitable distances apart to receive the pocket-sections in the fabric between them when placed in the clamp, substantially as and for the purposes set forth.

6. The clamp K, composed of the two members *k k'*, provided with elastic blocks M on their inner faces and with serrations k^3 on the edges of their inner faces, substantially as and for the purposes set forth.

7. A clamp composed of two members provided with blocks or projections on one or both of their inner faces, arranged at intervals to clamp the fabric in the spaces between the pocket-sections when the two members are fastened together, substantially as described.

8. The needle R, consisting of a straight shaft pointed at one end and at the other provided with a section, *r*, of smaller diameter, to which the wire coil Q is attached by slipping it upon the section *r*, substantially as described.

9. The stationary clamp B, in combination with the sliding clamp D, removable clamp K, slide E, toggle H, pitman *h*, and spring-treadle I, substantially as described.

10. The stationary clamp B, in combination with the removable clamp K and lever N, substantially as and for the purposes set forth.

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