

(No Model.)

2 Sheets—Sheet 1.

E. MORRIS.

MACHINE FOR INSERTING THREADS INTO WOVEN FABRICS.

No. 534,344.

Patented Feb. 19, 1895.

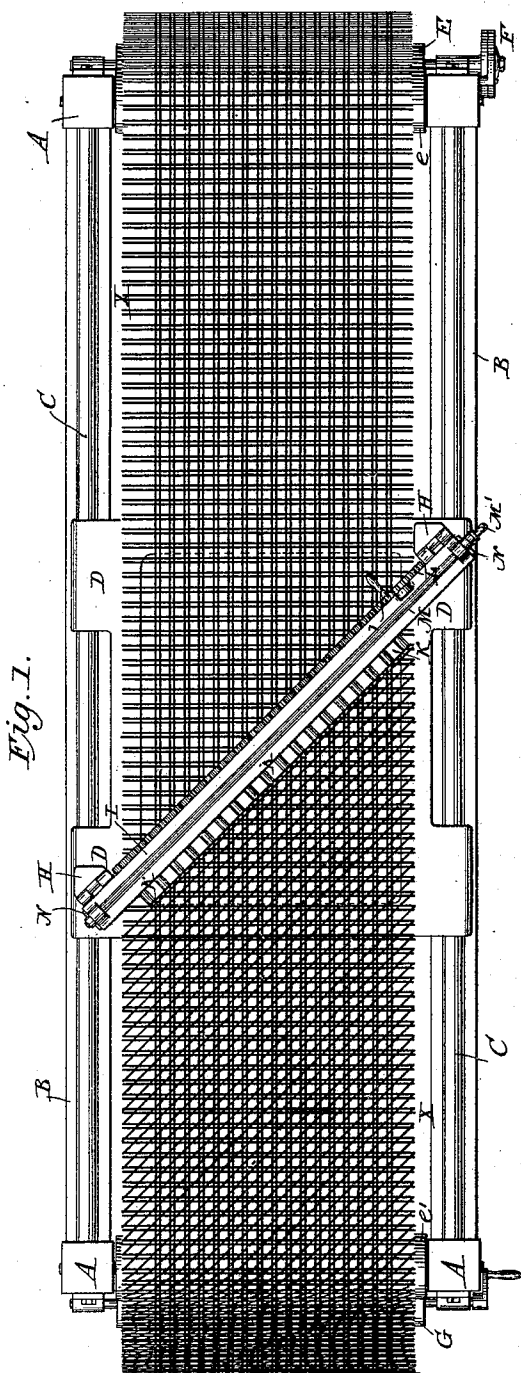


Fig. 1.

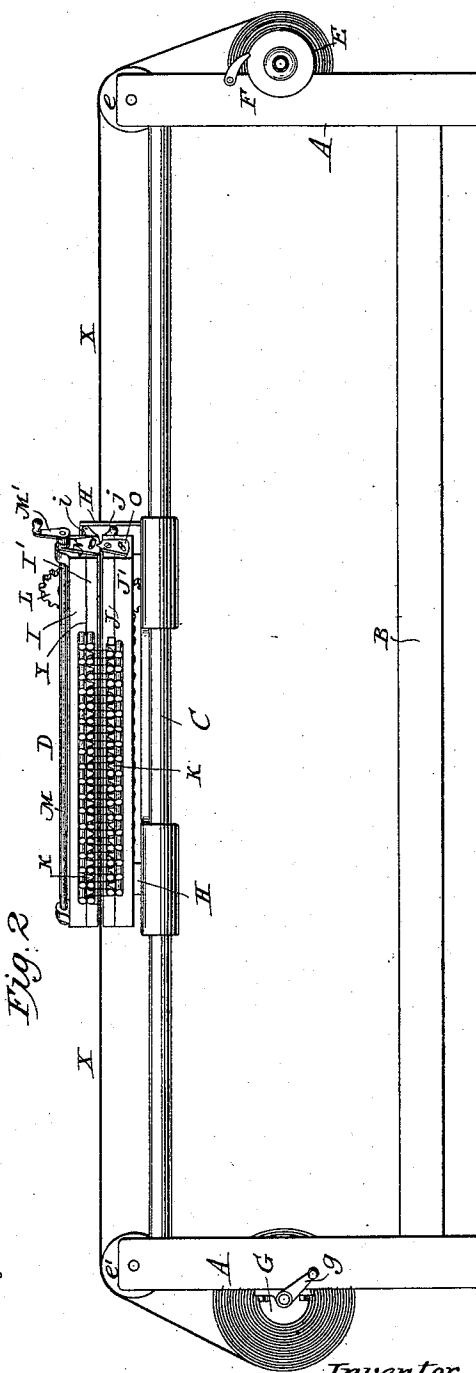


Fig. 2.

Witnesses,
 *Sidney P. Hackingworth
 Washington Miller.*

Inventor,
Edmund Morris
by his attorneys,
 Baldwin Davidson Wright

(No Model.)

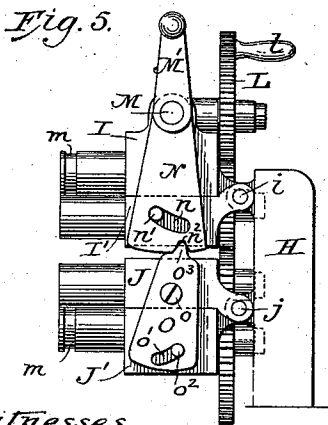
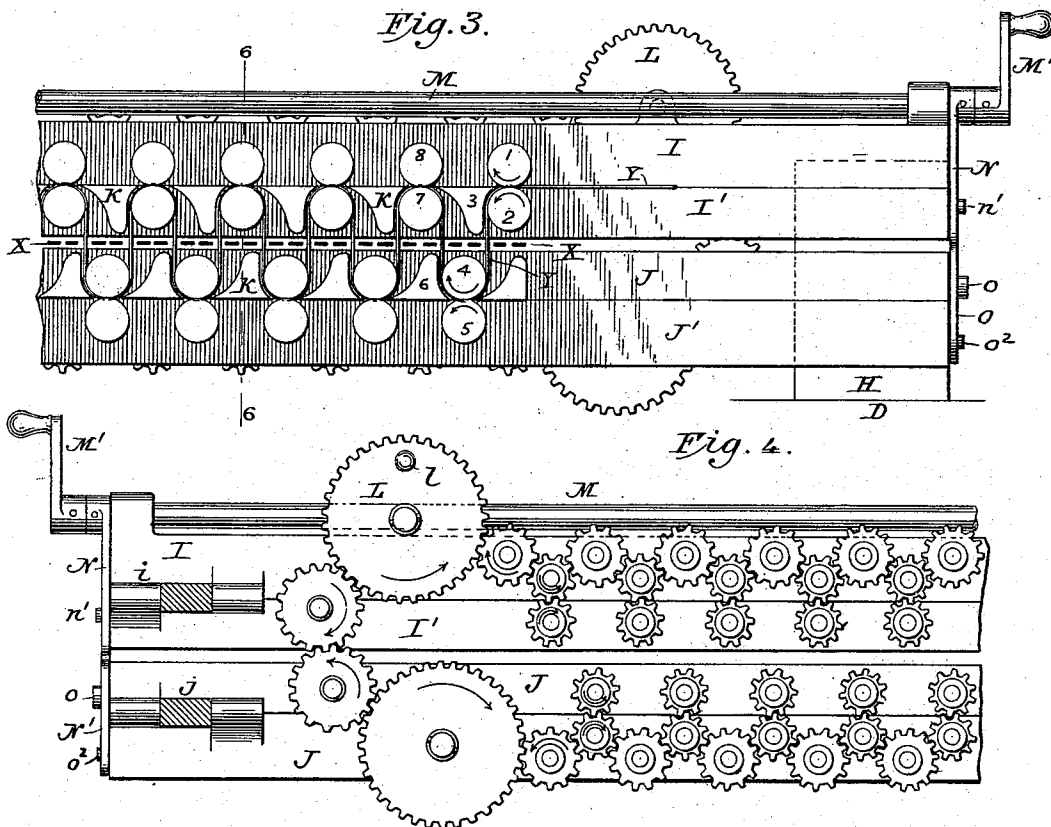
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MACHINE FOR INSERTING THREADS INTO WOVEN FABRICS.

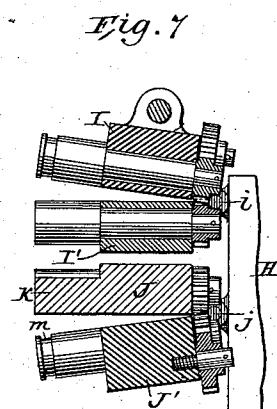
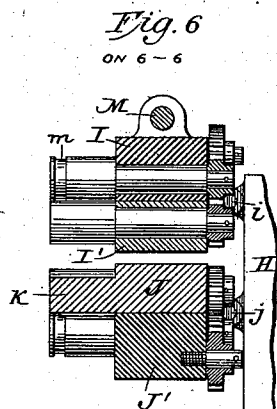
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Witnesses,

Sidney P. Hollingsworth
Washington Miller



Inventor

Edmund Morris
by his attorneys

Baldwin Davidson Wright

UNITED STATES PATENT OFFICE.

EDMUND MORRIS, OF MICHIGAN CITY, INDIANA, ASSIGNOR TO FORD,
JOHNSON & CO., OF SAME PLACE.

MACHINE FOR INSERTING THREADS INTO WOVEN FABRICS.

SPECIFICATION forming part of Letters Patent No. 534,344, dated February 19, 1895.

Application filed October 29, 1894. Serial No. 527,364. (No model.)

To all whom it may concern:

Be it known that I, EDMUND MORRIS, a citizen of the United States, residing at Michigan City, in the county of La Porte and State of Indiana, have invented a new and useful Machine for Inserting Threads into Woven Fabrics, of which the following is a specification.

This invention relates especially to the manufacture of that class of textile or woven fabrics wherein some of the threads are arranged diagonally with reference to the warp and weft threads. Such fabrics made of cane or rattan are commonly employed in the manufacture of the backs and seats of chairs. Fabrics of this kind having the warp and weft strips or threads arranged in pairs with rectangular spaces or meshes between them are, as is well understood, woven in an ordinary loom, the diagonal strips or threads being inserted afterward either by hand or by machinery. United States Letters Patent No. 401,050, granted April 9, 1889, to Henry B. Morris, shows a machine in which a diagonal channel is formed by one operation of a set of dies through which a thread is passed. Diagonal strips or threads have also been inserted in open-mesh cane cloth by what are known as crossing needles, which are passed over and under the warp and weft threads and then drawn backward to lay the strips diagonally. In each instance, however, the warp and weft threads are bent to open a channel for the insertion of a diagonal thread. According to my present invention, I dispense with the use of a needle, and interweave diagonal threads in the fabric without bending the strands thereof by automatically passing the threads successively through its meshes.

In carrying out my invention, I provide a series of movable carriers on opposite sides of the fabric which act upon additional threads to feed them forward in a sinuous course through the meshes of the cloth. Rollers are preferably employed for this purpose, and stationary guides are used to direct the threads into the bite of the rollers, which are mounted and driven in suitable ways, as will be hereinafter described.

Aside from details of construction, my in-

vention broadly consists in the combination with suitable means for supporting a woven fabric of a series of movable thread-carriers on opposite sides of the fabric, which act upon additional threads to interweave them with the threads of the cloth.

As before stated, my improvements are especially designed to interweave threads diagonally with reference to the warp and weft threads of the cloth, but my invention also comprehends an arrangement by which additional threads may be inserted otherwise than diagonally.

In the accompanying drawings,—Figure 1 is a plan view of a machine in which my improvements are embodied. Fig. 2 is a side elevation thereof. The remaining figures are on an enlarged scale. Fig. 3 is a detail view in front elevation of the devices for interweaving additional threads with the threads of the cloth. Fig. 4 is a similar rear elevation. Fig. 5 is an end view thereof. Figs. 6 and 7 are detail views in section on the line 6—6 of Fig. 3, the rollers in Fig. 7 being in a different position from that shown in Fig. 6.

The frame of the machine may be of any suitable form and any suitable material may be employed for the construction of the several parts thereof. As shown, the frame consists of four uprights or standards A, connected near their lower ends by longitudinal beams B. Parallel, longitudinal bars C are secured to the upright A, near their upper ends, and constitute guides on which slides the frame D, which carries the mechanism for inserting the diagonal threads. A roller E, provided with any suitable friction and detent devices F, is mounted on the standards at one end of the machine, and on this roller is wound the cloth or mat consisting of warp and weft threads. On the standards at the opposite end of the machine is mounted in suitable bearings a take-up roller G, on which the fabric with the additional threads inserted is wound. This roller is provided with a suitable crank or handle g.

The mechanism for feeding the cloth is herein shown as operated by hand. Obviously, automatic mechanism might be substituted.

The frame D, which carries the mechanism

for inserting the additional threads is mounted to be moved back and forth on the supporting frame by hand. The fabric X, passes from the feed roller E, over supporting guide rollers *e, e'*, at opposite ends of the machine and through the mechanism for inserting the diagonal threads. Uprights or standards H on the frame D, at diagonally opposite ends thereof, support two pairs of bars or roller-carriers on opposite sides of the plane of the fabric. The roller-carrying bars I, I', above the fabric are hinged at *i*, to the standard H, at opposite ends and the bars J J' are in like manner hinged to the uprights or standards H, at *j*, to permit of their having a movement such as indicated in Fig. 7, for a purpose hereinafter described.

The bars I I', J J', extend diagonally across the machine, as illustrated in Fig. 1, and each set of bars carries a series of pairs of feed rollers or thread carriers of the requisite diameter and arranged in such manner as shown in Fig. 3 to feed a strip or thread Y, through the meshes of the fabric X. The rollers on the bars I I' are arranged one above the other, the axes of each pair being in the same vertical line. The rollers on the bars J J' have the axes of each pair in the same vertical line, but in a line midway between the vertical planes of the two pairs of rollers in the bars I I' above them. Between each two rollers on the bar I', and also between each two rollers on the bar J, are arranged guide surfaces K, which direct the thread or strip into the bite of the rollers and through the meshes of the cloth. These guide surfaces are shown as formed on projections standing out from the bars I' and J. They are preferably made of metal and are curved in such manner and are made smooth in order that the threads may be fed forward in the proper direction without obstruction. The rollers may be driven by any suitable train of gearing. Power is applied to the toothed driving wheel L, by a handle *l*, and any suitable train of cogs, that shown in Fig. 4 being preferred, may be employed to drive the several rollers in the proper direction. In order to direct the strip in the proper direction through the rollers, I may groove the outer rollers on each set in the manner indicated at *m*, the inner series of rollers being plain and smooth, while the inner surface of the grooves may, if preferred, be milled or roughened.

The frame D, being set at the proper position, and the driving wheel L turned, a strip may be fed forward in the direction indicated by the arrow, first passing between the rollers Nos. 1 and 2, thence against the guiding surface at 3, then down through a mesh in the fabric X into the bite of the rollers 4 and 5, thence against the guide surface at 6, then through another mesh of the fabric into the bite of the rollers 7 and 8, and so on across the cloth.

When a thread has been inserted, it is necessary to release it from the bite of the rollers

in order that it may be straightened, and that the mechanism may be moved one step to insert an additional thread in another series of meshes. It will be understood that when the thread is separated from the rollers, it is straightened by hand.

In order to separate the rollers, I employ mechanism shown particularly in Fig. 5. As there shown, and as shown also in Fig. 2, a shaft M mounted in bearings at opposite ends of the bar I, is provided with a handle M', by which it may be turned. To this shaft at each end is secured a plate N, having a curved slot *n*, near its lower end, into which projects a pin *n'*, secured to the end of the bar I'. A plate O, pivoted at *o* to the bar J, projects downwardly and is provided with a curved slot *o'*, through which extends a pin or stud *o''*, secured to the bar J'. The plate O is provided with a lug *o''*, at its upper end, engaging a notch or recess *n''* in the lower end of the plate N. The organization is such that when the handle M' is turned in the proper direction, the bars I I' and J J', will be turned on their hinges as indicated in Fig. 7, to separate the pairs of rollers above and below the fabric, in such manner that the strip Y may be withdrawn from the bite of the rollers, or rather in order that as the mechanism is fed to another series of meshes the strip will slide off from the inner set of rollers on opposite sides of the fabric. These, as before explained, are smooth and allow the strip to pass from them readily. In a similar way, additional strips may be inserted diagonally in the cloth from one end of the machine to the other, the frame D, being moved step by step from one end of the supporting frame to the other, then moved back to the starting point, the fabric with additional strips inserted being wound up on the roller G, and a new section of cloth being brought into position between the rollers *e* and *e'*, and operated upon in a similar way.

As shown in the drawings provision is made for inserting only one set of diagonal strips, while as is well understood, it is customary to insert two sets of diagonal threads. This may be done by reversing or turning the cloth over and passing it through the machine and operating it in a similar way.

It will be observed that by my improvements I use no mechanism which comes in contact with the warp and weft threads of the fabric, and there is, therefore, no possible danger of injury thereto. The diagonal threads are simply carried in a natural way through the meshes of the cloth, and laid in the proper position. It is obvious that instead of moving the thread-feeding mechanism step by step over the cloth, the cloth may be fed while the thread-feeding mechanism remains stationary.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, with means for supporting a woven fabric, of a series of movable thread-

carriers on opposite sides of the fabric, which act upon an additional thread to interweave it with the threads of the cloth.

2. The combination, substantially as hereinbefore set forth, with means for supporting a woven fabric, of a series of movable thread-carriers on opposite sides of the fabric, which act upon an additional thread to interweave it with the threads of the fabric, and guides interposed between the movable carriers to co-operate with them in directing the movement of the additional thread.

3. The combination, substantially as hereinbefore set forth, with means for supporting a woven fabric, of a series of movable carriers arranged in pairs on opposite sides of the fabric, and which act on an additional thread to interweave it with the cloth.

4. The combination, substantially as hereinbefore set forth, with means for supporting a woven fabric, of a series of rotating carriers on opposite sides of the fabric which act on an additional thread to interweave it with the cloth.

5. The combination, substantially as hereinbefore set forth, with means for supporting a woven fabric, of a series of rollers arranged crosswise of the fabric and on opposite sides thereof, to guide a thread in a sinuous course to interweave it through the meshes of the cloth.

6. The combination, substantially as hereinbefore set forth, with means for supporting a woven fabric, of roller-carrying bars arranged crosswise of the fabric, and on opposite sides thereof, and rollers carried thereby for interweaving a thread with the fabric.

7. The combination, substantially as hereinbefore set forth, with means for supporting

a woven fabric, of roller-carriers on opposite sides of the fabric, each consisting of a pair of bars both carrying rollers and means for separating the roller-carrying bars of each pair.

8. The combination, substantially as hereinbefore set forth, with means for supporting a woven fabric, of roller-carrying bars arranged crosswise of the fabric and on opposite sides thereof, rollers carried thereby, gearing for driving the rollers and guides interposed between the rollers.

9. The combination, substantially as hereinbefore set forth, of the roller-carriers on opposite sides of the fabric, each consisting of a pair of bars, a shaft extending from one end of the bars to the other, a plate connected with and moved by the shaft and having an inclined slot connected with a pin on one of the bars on the upper set, a plate pivoted to one bar of the lower set, and connected by a pin and slot with the adjacent bar of the same set, and connections between the two plates, for the purpose specified.

10. The combination, substantially as hereinbefore set forth, with means for supporting a woven fabric, of a series of pairs of rollers arranged crosswise of the fabric, and on opposite sides thereof to guide a thread in a sinuous course to interweave it through the meshes of the cloth, some of said rollers having annular grooves, as described, for the purpose specified.

In testimony whereof I have hereunto subscribed my name.

EDMUND MORRIS.

Witnesses:

HENRY B. MORRIS,
ARTHUR N. GITTINGS.