

(No Model.)

2 Sheets—Sheet 1.

E. MORRIS.

MACHINE FOR INSERTING THREADS INTO WOVEN FABRICS.

No. 534,343.

Patented Feb. 19, 1895.

Fig. 1.

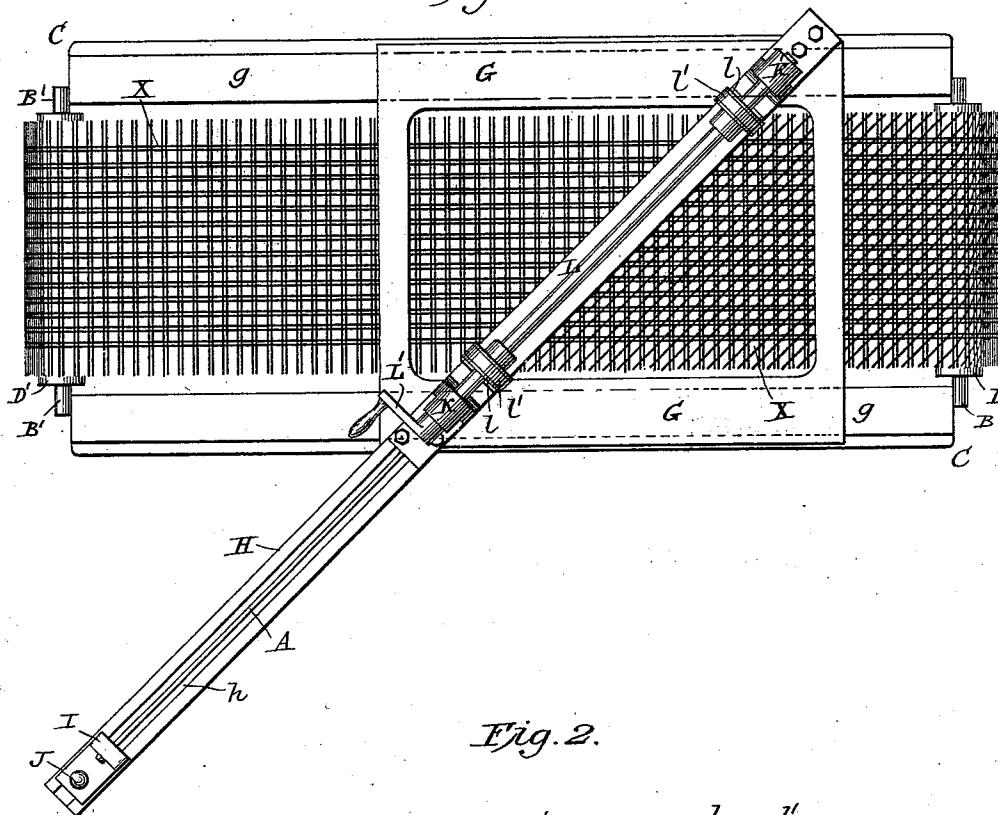
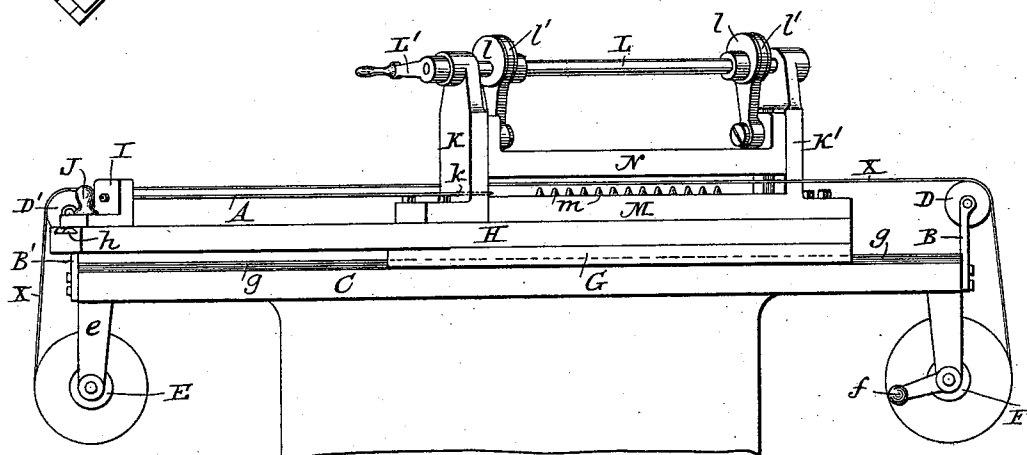


Fig. 2.



Witnesses,

Sidney P. Hollingsworth
B. Washington Miller.

Inventor
Edmund Morris.
by his attorneys

Baldwin, Davidson & Wight.

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Fig. 3.

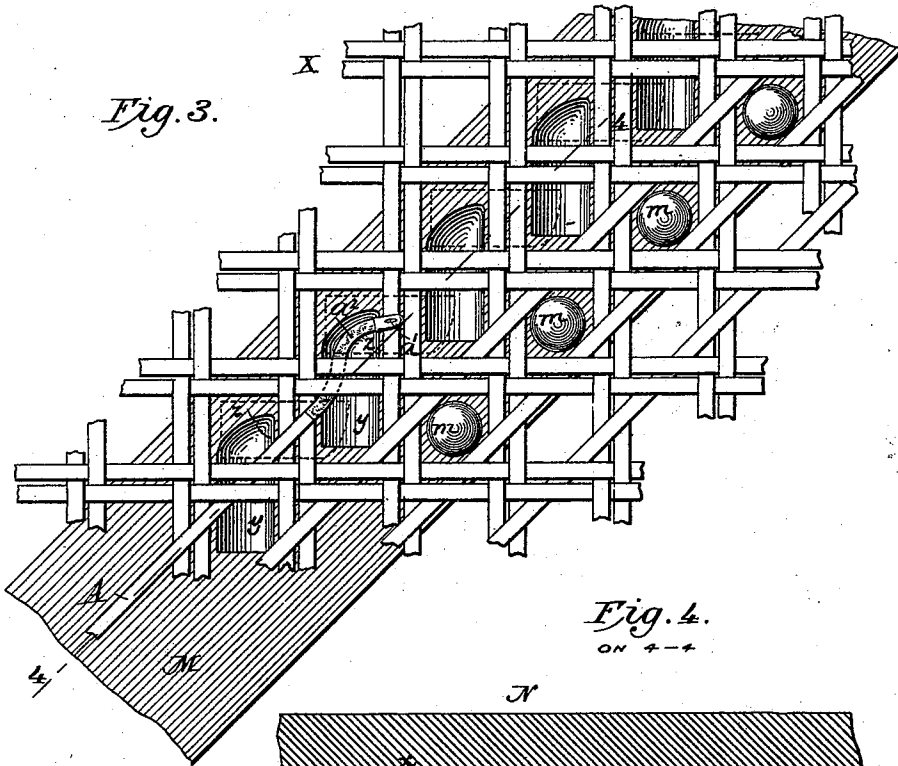


Fig. 4.

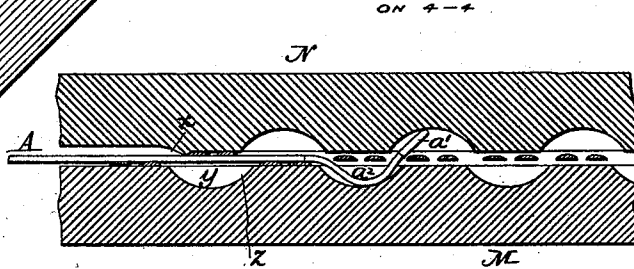


Fig. 5.

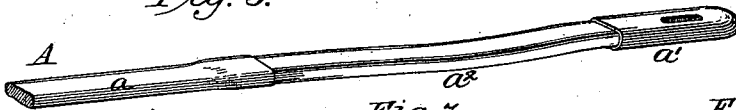
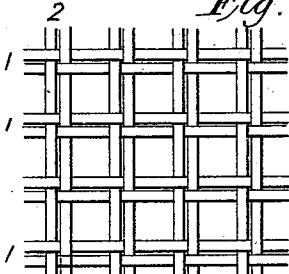


Fig. 6.



Witnesses

Spencer P. Hellingworth
Washington Miller.

Fig. 7.

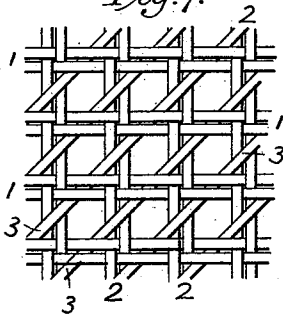
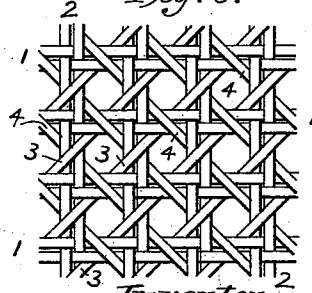


Fig. 8.



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. 534,343, dated February 19, 1895.

Application filed October 17, 1894. Serial No. 526,212. (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.

The object of my invention is to provide improved devices for inserting diagonal threads or strips into open mesh cane fabric such as is used in the manufacture of the backs and seats of chairs, but my improvements, as will hereinafter more fully appear, may be used for inserting additional threads into woven fabrics otherwise than diagonally.

Heretofore, diagonal strips have been inserted into open mesh cane fabric by machinery as well as by suitably constructed needles, but these needles heretofore, however, have been so constructed as to necessarily be rotated as they cross the fabric when they are used for opening a passage for the insertion of additional threads.

According to my present invention, I employ a needle which need not be rotated, as it is operated to open channels for the insertion of additional threads; and I employ guides which direct the end of the needle over and under the threads of the fabric in such manner as to open a continuous passage across the fabric into which a strip or thread may be drawn on the backward movement of the needle. It is possible, however, with some of my devices to dispense with a needle, as the guides may be used for directing the threads into and through the meshes of the fabric.

In the accompanying drawings,—Figure 1 is a plan view of a machine embodying my improvements. Fig. 2 is a side elevation thereof, the base or main standard being broken away. Fig. 3 is a view on an enlarged scale of the fabric composed of warp and weft threads with some additional or diagonal threads inserted, showing also a plan view of the lower guide-bar and the needle. Fig. 4 shows a longitudinal section, on the line 4—4 of Fig. 3, through the upper and lower guide-bars, illustrating particularly the sinuous course for the needle, and the way the needle interweaves itself with the threads of the fabric. Fig. 5 is a view, on an enlarged scale,

of the front end of the needle. Figs. 6, 7 and 8 are views of sections of cane cloth, showing, in Fig. 6, the arrangement of the warp and weft threads before the insertion of the diagonal threads; in Fig. 7, the arrangement of the threads with one set of diagonals inserted, and in Fig. 8, the arrangement of the threads in the completed cloth, with two sets of diagonals and hexagonal meshes.

The frame of the machine may be of any suitable form, and any suitable material may be employed for constructing the several parts thereof.

The needle A, the front end of which is shown on an enlarged scale in Fig. 5, is provided with a stiff, straight and preferably flat, shank α , and a hard metal, perforated tip α' , connected to the shank α , by a flexible connection α^2 , which may be of raw hide or similar material.

The fabric X, consisting of warp and weft threads, may be supported in any suitable way. As shown, brackets B, B', at opposite ends of the table C, support guide-rollers D, D', on which the fabric rests. The fabric is wound on a roller E, mounted in hangers e , depending from the table C, and it is received when the diagonals are inserted on a take-up roller F, which may be operated by a crank f , or by other suitable means.

A sliding frame G, is mounted on the table C, and is adapted to move back and forth in guides g . This frame carries a diagonally arranged beam H, which is provided with a dovetailed groove h , in its upper side, in which fits a correspondingly shaped lug on the bottom of a bracket I, to which the heel of the needle A, is secured. The bracket I, with the needle, may be moved back and forth along the guide groove by means of a handle J. Uprights K, K' secured to the beam H, over opposite sides of the frame G, support at their upper ends a shaft L' which is free to turn in suitable bearings in the uprights. On the beam H, between the uprights K and K', is secured the lower guide-bar M. The upper guide-bar N, is arranged immediately over it, and is free to move vertically, being guided by a tongue and groove connection with the uprights. The shaft L, carries cams l , which are connected by straps l' , with the upper

guide-bar N. By means of the crank L' on the shaft, the upper guide-bar may be raised and lowered as described. Positioning pins *m* on the lower guide-bar are arranged to extend through the meshes of the cloth when the upper guide-bar is depressed, and serve to adjust and hold the cloth in proper position to allow the needle to pass in a sinuous course through it.

The arrangement is such, as indicated in Fig. 2, that when the upper guide-bar is elevated, the cloth X, is raised above the positioning pins and may be fed in either direction, as desired, or the guide-bars with their frame, may be moved in either direction.

The needle, it will be observed, extends through a perforation or guide-opening *k*, in the upright K, and is adapted to extend into and through guides formed in the upper and lower guide-bars. These guides consist of recesses suitably shaped in the opposing faces of the upper and lower guide-bars. They are shown in cross section in Fig. 4, and in plan in Fig. 3. They are all highly polished and communicate with each other, and are curved in such manner as to form a sinuous zigzag or spiral passage on opposite sides of the fabric, the arrangement being such that when the needle enters, its stiff, front end or tip abuts against the curved wall of the passage at *x*, and is directed downward into the lower recess at *y*, the flexible portion *a*² permitting it to thus bend. The tip is then deflected along the wall at *z*, and is directed into the adjoining recesses in the upper guide-bar, thence downwardly to the adjacent recess in the lower guide-bar, and so on through from one end of the guide-bars to the other.

The shank *a* of the needle, as before described, is stiff and does not assume the sinuous form of the recesses, but as it is fed over and under the warp and weft strands of the fabric, it deflects or bends them slightly, and opens a practically straight channel across the cloth. The needle, when it has reached the opposite end of the fabric, is threaded with a cane strip of proper length and the needle is rapidly drawn backward, laying the thread in place and interweaving it with the fabric. In this way, the diagonal threads may be successively laid, the frame G, being shifted from one set of meshes to the other progressively. After a sufficient length of cloth has had the diagonals inserted, it is wound up on the take-up roller F, and another length of cloth is provided with additional threads in like manner.

While I have said that the needle need not be rotated, and in this instance have shown it with a flat shank, I do not mean to say that a slight rotary movement may not be given to the needle.

So far as I am aware, no machine heretofore has been employed for inserting additional threads into woven fabrics, in which

guides forming a sinuous passage across the cloth have been used. I prefer always to employ a needle or some kind of a thread-carrier, but the guide-recesses are so arranged and polished that the threads may be guided over and under the warp and weft threads without the use of a needle.

Broadly considered, therefore, the invention resides primarily in the arrangement of the guides, and any means for supporting the cloth and feeding it, or adjusting the guides relatively to the cloth may be employed.

The arrangement of the threads of the fabric in the different stages of its manufacture is shown in Figs. 6, 7 and 8. Fig. 6 shows the warp and weft threads 1 and 2 arranged, as usual, in pairs. After the first set of diagonal strips is inserted, as shown in Fig. 7, the second set is inserted in a similar manner, and arranged as shown in Fig. 8, the cloth, however, being first reversed or turned over, and the second set of diagonals 4 being interwoven with the diagonals 3, as well as with the warp and weft strands 1 and 2.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, with means for supporting a woven fabric, of guides on opposite sides of the fabric, forming a sinuous passage over and under the strands of which the fabric is composed.

2. The combination, substantially as hereinbefore set forth, with means for supporting a woven fabric, of guides on opposite sides of the fabric forming a sinuous passage over and under the strands or threads thereof, and a needle or thread-carrier having a flexible portion adapted to pass through the sinuous passage formed by the guides.

3. The combination, substantially as hereinbefore set forth, of the table, means for supporting a woven fabric carried thereby, upper and lower guide bars mounted on the table arranged diagonally as described, and having opposing recesses forming a sinuous passage over and under the threads of which the fabric is composed.

4. The herein-described crossing needle having a stiff shank, a stiff front end or tip and a flexible portion uniting the tip with the shank.

5. The combination, substantially as hereinbefore set forth, of the upper and lower guide-bars having opposing recesses forming a sinuous passage on opposite sides of the threads of the fabric to which they are applied, and positioning pins on one of the guide-bars which extend through the meshes of the fabric.

In testimony whereof I have hereunto subscribed my name.

EDMUND MORRIS.

Witnesses:

HENRY B. MORRIS,
ARTHUR N. GITTINGS.