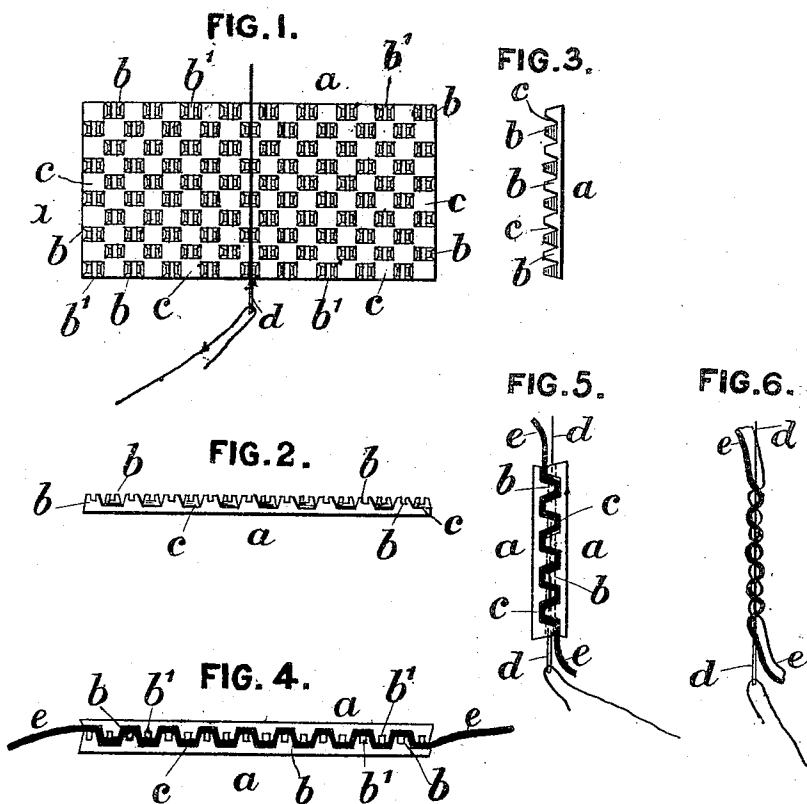


(No Model.)

H. CARDWELL.
DARNING APPARATUS.

No. 511,681.

Patented Dec. 26, 1893.



Witnesses—
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UNITED STATES PATENT OFFICE.

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DARNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 511,681, dated December 26, 1893.

Application filed May 22, 1893. Serial No. 475,016. (No model.)

To all whom it may concern:

Be it known that I, HOLME CARDWELL, a subject of the Queen of Great Britain, residing at Rome, in the Kingdom of Italy, have invented an Improved Darning Apparatus, of which the following is a specification, reference being had to the accompanying drawings, and to the letters marked thereon.

The invention has for its object an improved apparatus to be used in darning, and relates to an improved construction of clamping plates for holding between them the part of the article to be darned and for permitting the darning needle or needles to be passed through passages arranged for the same and at the same time through the material to be darned. Heretofore the material to be darned has been held in a gathered or corrugated state to enable a needle or row of needles to be passed through a number of such gathers or corrugations at a time; this however results in the darning stitches appearing side by side in straight lines across the darn. Now according to the present invention, the clamping plates are so constructed as to hold between them the material to be darned in a series of short depressions and rises alternating with each other so that the stitches appear on the material in a quincuncial arrangement.

In the accompanying drawings Figure 1 is a plan, Fig. 2 a longitudinal edge view and Fig. 3 a transverse edge view, of a darning plate constructed according to the invention. Fig. 4 is a longitudinal edge view and Fig. 5 is a transverse edge view of two of such plates in juxtaposition with material to be darned between them, the darning needle being shown in its working position in Fig. 5, and Fig. 6 is an edge view of the material being darned as it would appear separate from the plates.

According to the invention each clamping plate *a* is made with series of alternate short rises *b* and depressions or spaces *c* in parallel lines, but with the rises *b* of one line opposite the depressions or spaces *c* of adjacent lines, and the said rises *b* are formed with grooves *b'* across their centers to enable a needle *d* to be passed therethrough. Two plates *a a* thus constructed are placed together, the fabric being between them, so that the rises *b* of each plate *a* pass into the depressions or spaces *c* of the other plate *a*;

then, with the fabric *e* held firmly between them, a needle *d* or a row of needles can be passed down the grooves *b'* and the rises *b* and through the material *e* as it is held by the combined action of the rises *b* and depressions or spaces *c* of the clamping plates *a a*. After the darning stitches have been made in one direction across the material to be darned, the said material is re-arranged at right angles to its former position between the clamping plates *a a* and darning stitches are passed through the same at right angles to those first made.

The clamping plates *a a* above described may be made either flat as shown or slightly curved in one direction on their acting faces.

The clamping plates above described may be used when darning by hand or they may be arranged in any suitable form of darning machine.

The quincuncial arrangement of rises imparts to the material an imitation of hand-work as the result is a better arrangement of the darning threads and an absence of distortion of the material darned. In my apparatus the material to be darned is held in a series of small hillocks and cavities on each side thereof, so arranged that the hillocks and cavities of one line are respectively opposite the cavities and hillocks of adjacent lines thereby causing the darning threads to be passed through the material in a similar arrangement to plain weaving threads, that is to say, the stitches formed by the threads appear alternately on opposite sides of the material, thereby causing the strength and the drag of the darning threads to be equally distributed over the material and the fabric to be retained flat.

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

A darning apparatus consisting of a pair of plates each having a series of alternate short rises and depressions or spaces arranged quincuncially and transverse grooves across said short rises for the passage of the needle or needles therethrough, substantially as herein shown and described and for the purpose stated.

HOLME CARDWELL.

Witnesses:

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