J. BARNES.

DARNING MACHINE.

APPLICATION FILED APR. 29, 1910.

1,010,112. Patented Nov. 28, 1911.

Fig. 1.

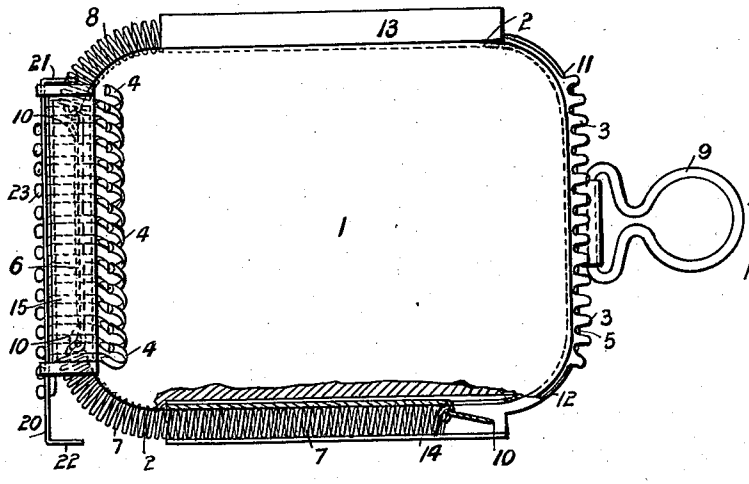


Fig. 3.

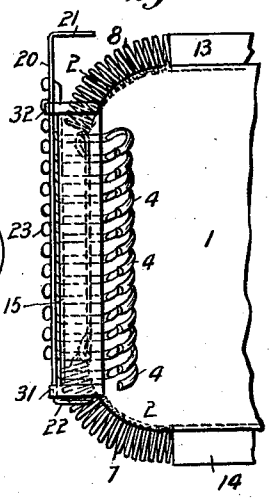


Fig. 2.

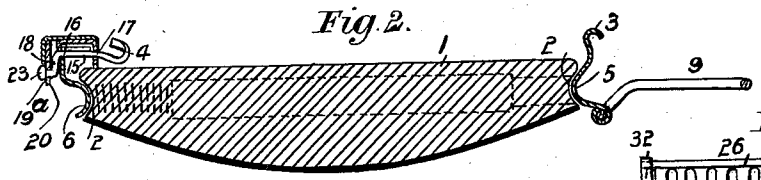


Fig. 4.

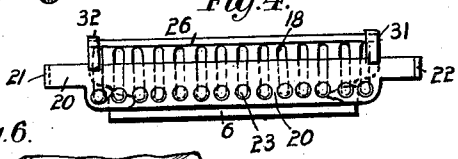


Fig. 6.

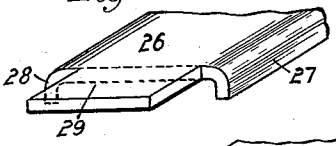


Fig. 5.

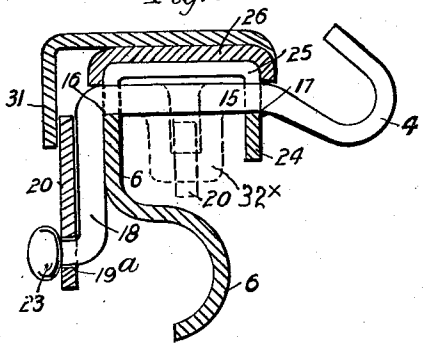
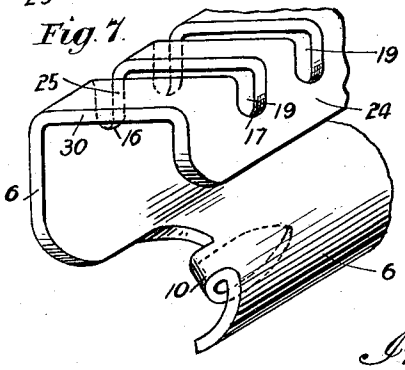


Fig. 7.



Witnesses

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JABEZ BARNES, OF BIRMINGHAM, ENGLAND.

DARNING-MACHINE.

1,010,112. Specification of Letters Patent. Patented Nov. 28, 1911.

Application filed April 29, 1910. Serial No. 558,477.

To all whom it may concern:

Be it known that I, JABEZ BARNES, a subject of His Majesty the King of Great Britain and Ireland, residing at 237 Broad street, Birmingham, in the county of Warwick, England, manufacturer, have invented new and useful Improvements in Darning-Machines, of which the following is a specification.

This invention has reference to machines for darning stockings, table cloths, and other fabrics.

In the particular type of darning machine to which this invention relates there is a wooden block or pad on which the fabric to be darned is held in a stretched condition by an endless spring band entering a groove in the edges of the block or pad and pressing the fabric therein. Attached to the fabric on the pad there are two frames furnished with pins which stick into felt strips in the top surface of the block or pad. These frames carry two rows of hooks around which the warp threads are passed. These hooks of one frame are fixed and stationary and the hooks in the other frame are made with upwardly projecting tappets for turning the hooks either to right or left to change the position of the warp threads. The machine is used by passing the weft in a needle between the upper and under warp threads and reversing the tappets after every stitch to bring the under warp threads to the top and vice versa. So far this construction of darning machine is well known.

In practice it is found that the attachment of the hook frames to the pad by the pins is not satisfactory as the said frames are not very secure, and moreover they cannot readily be fixed in their proper positions. Also when turning the hooks by moving the finger across the tappets, it sometimes happens that all the hooks are not properly turned as some of them may be accidentally turned back again in the wrong direction. These defects are overcome by this invention which is carried out as I will describe by referring to the accompanying drawings on which—

Figure 1 is a plan partly in section of a darning machine constructed in accordance with this invention: Fig. 2. is a longitudinal sectional elevation of the same: Fig. 3. is a plan of the end portion of the same machine showing the hooks turned to the opposite position to that shown in Fig. 1. so as to change the position of the warp threads; Fig. 4. is an end elevation of part of the machine looking from the left hand of Figs. 1 and 3; Fig. 5. is a cross sectional elevation on an enlarged scale of that end of the machine which is furnished with the turning hooks; Figs. 6—7 are projected views of portions of this end part of the machine separately.

1 is the usual wooden or other block on which the fabric to be darned is stretched and which has a groove 2 around its periphery and in which the fabric to be darned is gripped and secured by the detachable spring band. The fixed hooks around which the warp threads pass at one end of the machine are marked 3 and those hooks which hold the warp threads at the other end of the machine and are adapted to turn through a certain angle to change the position of the warp threads, are marked 4.

According to this invention the end frame which has the upwardly projecting hooks 3, and the end frame or bar 6 which carries the hooks 4 are fixed to and combined with the detachable spring band by which the fabric to be darned is secured stretched around the block 1. This spring band is by preference made with two end bars 5, 6 of which the end bar 5 forms also the end frame which has the hooks 3, and the other end bar 6 forms part of the other end frame which, as hereinafter described, carries the turning hooks 4. These two bars 5, 6, are secured together by side springs 7, 8 which with the end bars 5, 6 fit in the groove 2 around the periphery of the block or pad 1. Thus the combined two hook frames and the spring band are removable from the block 1 together and can readily be sprung over and affixed thereto and to facilitate this the end bar 5 is furnished with a loop or suitable device 9 by which the said end bar 5 can be pulled outwardly from the end bar 6 clear of the groove 2 in the block. The side springs 7, 8, can conveniently be fixed to the ends of the bar 5 and to the ends of the end bar 6 by tongues 10 which are formed on the ends of these bars and pass through end coils of the springs 7, 8, and are bent over the same. The end bar or frame 5 is by preference bent at 11, 12 around the rounded corners of the block 1 and continued along the sides of the block in the form of tubular casings 13, 14, to inclose portions of the springs 7, 8, as shown in Fig. 1.

In order to turn all the hooks 4 of the end frame simultaneously the shank parts 15 of the hooks which turn in bearings 16, 17, of the end bar or frame 6, are bent into the form of cranks 18 which pass through holes 19^a in a horizontal connecting bar 20 the ends 21, 22, of which project beyond the ends of the frame 6 at the sides of the block 1. The said cranks 18 are by preference made as overhanging end parts of the hook 4 as shown outside the bearings 16, 17, and the connecting bar 20 is secured on the cranks by the latter having knobbed ends 23, which are larger than the holes in the connecting bar 20 in which the cranks fit. To turn the hooks 4 to change the position of the warp threads as required when the machine is in use, it is only necessary to push the connecting bar 20 in one direction as in Fig. 1, or in the other direction as in Fig. 3 when all the hooks 4 will be turned simultaneously by reason of all their cranks 18 being connected to the connecting bar 20. The ends 21, 22, of the connecting bar 20 are turned at right angles therewith to abut against the ends of the frame and form stops to prevent the hooks from being turned too far in either direction. The said end frame 6 which carries the turning hooks 4 as aforesaid can conveniently be made of a sheet metal blank which is bent into an inverted trough shape in cross section as shown more clearly by Figs. 5, and 7 thus forming 2 cross bars 6, 24, and a top bar 25 in which are cross slots 19 continued for a certain distance down the cross bars 6 and 24 so as to form bearings in which the shank parts 15 of the hooks 4 will lie and turn and here the hooks are secured by a top strip or cover plate 26 made with downwardly turned side edges 27, 28, to just clear the tops of the shanks 15, and this top plate 26 is secured to the top 25 of the frame above the hooks by any convenient means as by the ends 29 of the cover plate 26 being bent and closed over the ends 30 of the frame 6 so as to allow sufficient freedom for the hooks 4 to turn as aforesaid. Fixed on the top cover plate 26 there are two downwardly projecting brackets 31, 32, which keep the connecting bar 20 in position against the faces of the cranks 18.

As a modification of this invention instead of the shanks 15 of the hooks being made with end cranks 18 as above described and illustrated on my drawings said shanks may as indicated by dotted lines in Fig. 5, each be bent to form a crank 32 x intermediate between the cross bars 6 and 24 with which the connecting bar will then engage for turning the hooks as above described.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a darning machine, in combination, a block provided with a groove in its periphery, rigid end bars provided with portions adapted to engage the end portions of said groove, a pair of side springs connected to said end bars and extending therebetween, said springs being adapted to engage the side portions of said groove, one of said end bars being provided with upwardly-extending hooks, said hooks being in substantially the same vertical plane as the plane of said end bar, a plurality of hooks rotatably mounted on the other of said end bars and actuating means connected with said second-mentioned hooks for simultaneously rotating the same.

2. In a darning machine, in combination, a block provided with a groove in its periphery, rigid end bars provided with portions adapted to engage the end portions of said groove, a pair of side springs connected to said end bars and extending therebetween, said springs being adapted to engage the side portions of said groove, one of said end bars being provided with upwardly extending hooks, the other of said bars being provided with a plurality of bearings, hooks rotatably mounted in said bearings and actuating means connected with said second-mentioned hooks and positioned below said bearings for simultaneously rotating the same.

3. In a darning machine in combination, a block provided with a groove in its periphery, end bars provided with portions adapted to engage the end portions of said groove, side springs connected to said end bars and adapted to engage the side portions of said grooves, one of said end bars being provided with upwardly-extending hooks, the other of said end bars being provided with a plurality of bearings, hooks rotatably mounted in said bearings, each of said hooks being provided with a downwardly-extending portion, and actuating means connected with the downwardly-extending portion of said hooks for simultaneously rotating said hooks, said actuating means being positioned below said hooks.

4. In a darning machine, in combination, a block provided with a groove in its periphery, end bars provided with portions adapted to engage the end portions of said groove, side springs connected to said end bars and adapted to engage the side portions of said groove, one of said end bars being provided with upwardly-extending hooks, the other of said end bars being provided with a plurality of slots, hooks rotatably mounted in said slots, a cover plate attached to said bar and extending across said slots to retain said hooks in position, and actuating means connected with said hooks and positioned below said cover plate for simultaneously rotating the same.

5. In a darning machine, in combination, a block provided with a groove in its pe-

riphery, end bars provided with portions adapted to engage the end portions of said groove, side springs connected to said bars and adapted to engage the side portions of said groove, one of said end bars being provided with upwardly extending hooks, a plurality of hooks rotatably mounted on the other of said bars, each of said second mentioned hooks being provided with a downwardly extending portion overhanging the end of the block, and actuating means connected with said downwardly extending portion for simultaneously rotating the hooks.

6. In a darning machine, in combination, a block provided with a groove in its periphery, end bars engaging the end portions of said groove, each of said end bars being provided with a series of hooks, a pair of side springs connected to said end bars and extending therebetween along the sides of said block, and tubular members inclosing the portions of the springs which extend along the sides of the block.

7. In a darning machine, in combination, a block provided with a groove in its periphery, end bars engaging the end portions of said groove, each of said end bars being provided with a series of hooks, and a pair of side springs connected to said end bars and extending therebetween along the sides of said block, one of said end bars being provided with tubular extensions inclosing the portions of the springs which extend along the sides of the block.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JABEZ BARNES.

Witnesses:
SIDNEY HOOPER,
PERCY WRIGHT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."