

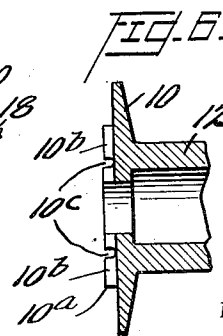
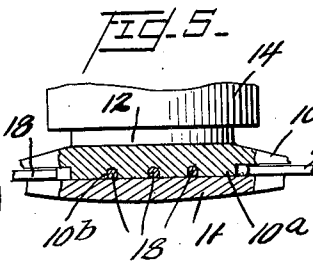
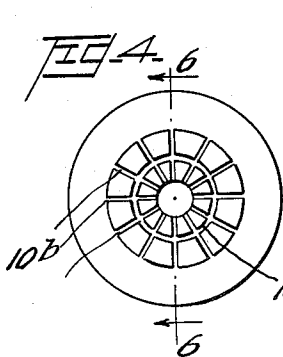
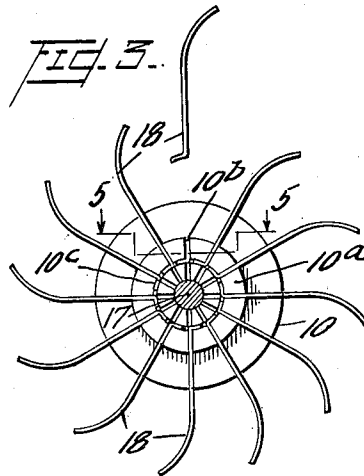
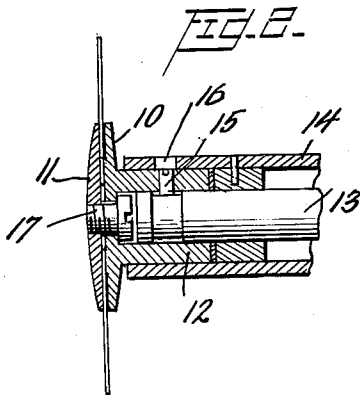
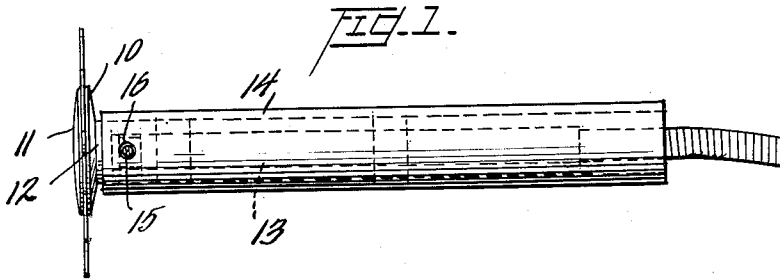
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APPARATUS FOR MENDING HOSIERY

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APPARATUS FOR MENDING HOSIERY

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6 Claims. (Cl. 66—1)

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This invention relates to an apparatus for use in restoring to original position threads of knitted fabrics which have been pulled or displaced.

In application Serial 121,393, filed October 14, 1949, now Patent No. 2,570,637, there is disclosed and claimed a method of and apparatus for mending hosiery, the apparatus comprising a brush-like implement having a circular series of resilient bristle-like elements, the elements being mounted upon a hub adapted to be revolved about an axis by any suitable means, the outer ends of the bristle-like elements comprising the work engaging portions of the implement and being adapted to contact in rapid succession any selected part of a displaced or pulled thread and to advance that part toward the position which it originally occupied. Conveniently the hub upon which the resilient elements are mounted may be driven by a motor so that the linear speed of the work engaging ends of the elements is rather high and is uniform. Implements of the character described are eminently successful in restoring pulled threads to original position in knitted fabrics and large numbers are now in daily use.

The device which comprises the subject matter of the present invention is an improvement upon that disclosed in the application above identified, the purpose of this invention being to place in the hands of the expert hosiery mending operator in a textile plant or elsewhere an implement capable of performing the functions intended but which, in certain of its details, is superior to that disclosed in the aforementioned pending patent application.

Thus the implement of the present invention comprises essentially a two-part hub which serves as a supporting means for the necessary circular series of radiating flexible elements, the inner ends of these several elements being interposed between the two parts of the hub, and engaged by and clamped between these parts, a screw or other securing means being employed to detachably secure the two parts of the hub in clamping engagement with the inner ends of the interposed elements. One part of the hub is grooved to receive the inner ends of the said elements and, because of the provision of such grooves, the elements are held against bodily displacement circumferentially of the implement as it revolves when at work.

For the purpose of protecting the thin elongated radiating elements of the implement the hub is provided with peripheral annular flanges,

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one on each hub part, the flanges extending outwardly in parallel planes normal to the axis of rotation and being disposed, respectively, on opposite sides of the plane in which the elongated work engaging elements are preferably disposed. The distance between the mutually facing surfaces of these flanges is slightly greater than the thickness or diameter of the work engaging elements of the tool so that these flanges, while effectively acting as guards preventing accidental lateral bending of the flexible elements, in no wise hinder flexure of the elements as they successively contact the work. In other words, the flange-like extensions of the hub closely confine those portions of the flexible elements which are immediately adjacent the clamped and secured inner ends thereof, and prevent these elements from being bent laterally out of the plane in which they are originally disposed, without decreasing in any respect the ability of the element to flex. The implement is thus rendered more durable. Should any one of the work engaging flexible elements become bent or otherwise injured, however, or should it be desired to replace one set of flexible bristle-like elements with another having different characteristics, the hub securing device may be readily manipulated and the parts of the hub separated, thus exposing the inner ends of the elements and making it easily possible for the operator to remove one or more of them from the grooves or recesses into which they have been fitted. Replacement of the element or elements, and reassembly of the hub, may be quickly accomplished and it is thus possible, by means of a single hub and with various types of flexible work engaging elements, to easily modify the implement and adapt the same for use with fabrics having different physical characteristics or formed of different kinds of yarn or thread.

One embodiment of the invention, which has been found to be particularly suitable for use in the restoring of pulled threads in nylon and other stockings, is illustrated in the accompanying drawings in which,

Figure 1 is a side elevation of the tool of which the improved implement forms one part;

Figure 2 is an axial section through the implement, upon a scale somewhat larger than the scale of Figure 1, a large part of the handle of the tool having been omitted;

Figure 3 is a plan view of that portion of the hub which is provided with grooves to receive the flexible elements, the second portion of the hub having been removed;

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Figure 4 is a similar view, the flexible work engaging elements having been omitted;

Figure 5 is a section on line 5—5 of Figure 3; and

Figure 6 is a section on line 6—6 of Figure 4.

The hub comprises two principal parts, indicated at 10 and 11 respectively in the drawings, these portions being generally disc-like in appearance and the same in diameter, the member 10 being provided with a tubular projection 12 adapted to receive the end of a driving shaft 13. A tubular handle is indicated at 14 and it is this handle which the operator grasps for the purpose of manipulating the tool to accomplish the repair operation more fully described in the pending application previously mentioned. The power driven shaft 13, which projects into the tubular projection 12, has formed therein an annular groove and a set screw 15, which is accessible through an aperture 16 in the tubular handle 14 and has threaded relation with a radial aperture in the tubular projection 12, serves to attach the hub to the power driven shaft in such manner that it will normally rotate with the shaft but may be detached when desired.

Members 10 and 11 are maintained in the position in which they are shown in Figures 1, 2 and 5 of the drawings by means of a machine screw or the like, indicated at 17, the screw being disposed axially of the hub and passing through a central cylindrical aperture in the part 10 into an aligned interiorly threaded aperture in part 11, the undersurface of the head of the securing screw bearing against the outer face of part 10 adjacent the central aperture formed therein. A central area 10a of that surface of part 10 which normally faces part 11 is raised, as clearly shown in Figures 3 and 6 and it is this raised portion 10a of member 10 which cooperates with a registering portion of the flat surface of member 11 in clamping and securing the inner ends of the flexible elements, a circular series of which are clearly shown in Figure 3, the several elements each being indicated by the numeral 18.

To receive the elements the raised portion 10a of the part 10 is provided with a plurality of radial grooves 10b. All of these radial grooves are intersected by a circular groove 10c and the inner end of each element 18 is laterally extended, as may be seen most clearly in Figure 3, so that that element has a portion at its inner end which lies in one of the grooves 10b and a portion which projects laterally and lies within a short arc of groove 10c. With this arrangement the flexible elements are not only held against outward displacement but are also held against rotation, it being essential in the operation of the implement that the various flexible elements remain in such position that their outer ends are disposed in a circle centered upon the axis of the hub. The elements 18 are preferably fabricated of good quality spring steel and are quite thin and are flexible. That portion of each such element which lies beyond the periphery of the central portion 10a of part 10 is free to flex as the tool is operated. Flexure is not retarded by the annular portions of the disc-like parts 10 and 11 which lie outwardly of the part 10a, the distance between the mutually facing surfaces of these annular portions being greater than the thickness of elements 18. The elements are thus permitted to flex to the fullest extent in the plane in which they are originally disposed but are protected against lateral flexure at an angle to that plane

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to a substantial extent, by the outer annular portions of parts 10 and 11 of the hub, which in reality comprise guard flanges. They may be of larger diameter than that shown should there be need to provide additional protection against lateral flexure. The number of work engaging elements may vary somewhat but should be relatively numerous so that the work will be rapidly contacted by a succession of light blows as the hub rotates. The hub shown embodies twelve work engaging elements each of which makes an angle of 30° with adjacent elements. The speed of rotation of the tool may be varied to suit conditions, a rotational speed of 400 revolutions per minute being suitable when it is employed in the restoration of light weight nylon hosiery.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. Apparatus for restoring to position a displaced thread of a knitted fabric by the application to a portion of such thread of a succession of light rapidly repeated blows, said apparatus comprising a series of elongated, similarly curved, flexible elements disposed in a common plane, the inner of each such element being positioned adjacent a common axis normal to said plane and their outer ends being unconnected and disposed in a circle centered on said axis, and a hub upon which the inner ends of said elements are mounted, said hub including two clamping members and means for releasably maintaining said members in fixed relationship with the inner ends of said elements tightly clamped therebetween.

2. Apparatus for restoring to position a displaced thread of a knitted fabric by the application to a portion of such thread of a succession of light rapidly repeated blows, said apparatus comprising a series of elongated, similarly curved, flexible elements disposed in a common plane, the inner end of each such element being positioned adjacent a common axis normal to said plane and their outer ends being unconnected and disposed in a circle centered on said axis, and a hub upon which the inner ends of said elements are mounted, said hub including two clamping members each having an inner element engaging portion and an outer annular flange portion, and means for releasably maintaining said members in fixed relationship with the inner ends of said elements tightly clamped between the inner element engaging portions thereof and the annular flanges thereof in position to protect the intermediate flexible elements without interfering with the individual flexure thereof.

3. Apparatus for restoring to position a displaced thread of a knitted fabric by the application to a portion of such thread of a succession of light rapidly repeated blows, comprising in combination, a series of elongated, similarly curved, flexible elements disposed in a common plane and generally radially with respect to a common axis, a hub rotatable about such axis, said hub having a central portion within which the inner ends of said elements are secured and annular flanges extending outwardly therefrom, said flanges being disposed upon opposite sides of the series of elements, respectively, and protecting the same while permitting free individual flexure of the outer ends thereof.

4. Apparatus for restoring to position a displaced thread of a knitted fabric by the application to a portion of such thread of a succession of light rapidly repeated blows, comprising, in combination, a series of elongated thin flexible ele-

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ments disposed in a plane and radiating from a common center, and means mounting said elements for movement about an axis transverse to said plane and passing through said common center, said means comprising a hub having a centrally disposed portion for gripping and firmly holding the inner ends of said elements, the outer ends of said elements being unconnected and individually flexible, and two spaced, outwardly extending flange like portions, one on each side of said series of elements, said last mentioned portions comprising lateral guides for said elements while permitting free flexure thereof, the outer ends of said elements extending beyond said guides.

5. The combination set forth in claim 4 in which said hub is formed of two separable parts which together form a clamping means for the inner ends of said elements, and a screw or the like is provided for the purpose of detachably securing said parts in clamping engagement with said elements.

6. The combination set forth in claim 4 in which said hub is formed of two separable parts which together form a clamping means for the

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inner ends of said elements, and a screw or the like is provided for the purpose of detachably securing said parts in clamping engagement with said elements, one of said parts being provided with grooves for the reception of the inner ends of said parts and the other having a flat surface to bear against the inner ends of the elements thus positioned.

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