Feb. 28, 1939. J. C. GILARDONE 2,148,614

FABRIC HOLDING EQUIPMENT FOR EMBROIDERY MACHINES

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Fig. 1.

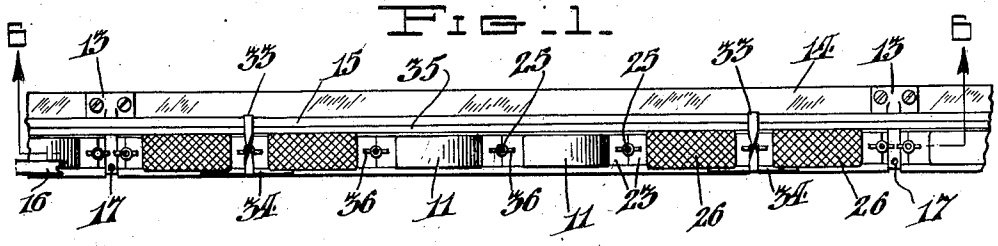

Fig. 2.

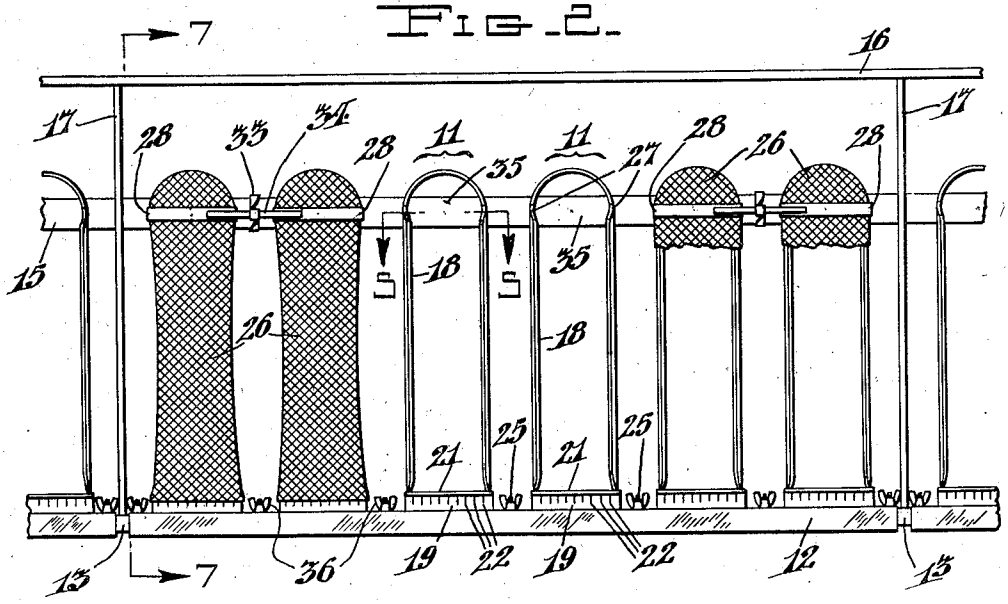

Fig. 3.

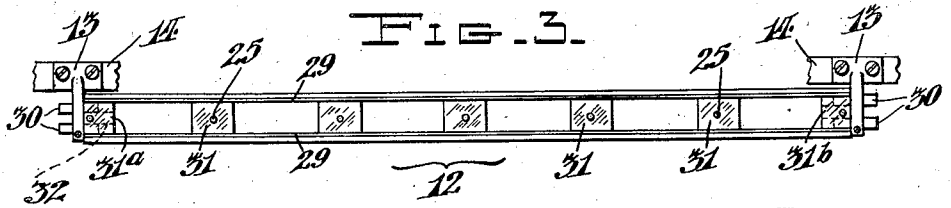

Fig. 4.

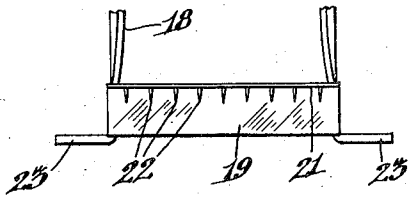

Fig. 5.

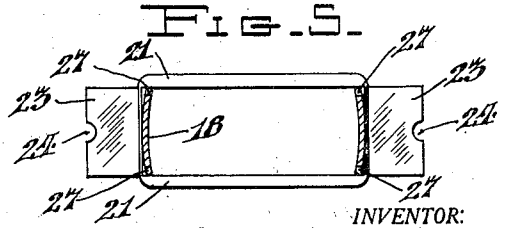

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Fig. 6.

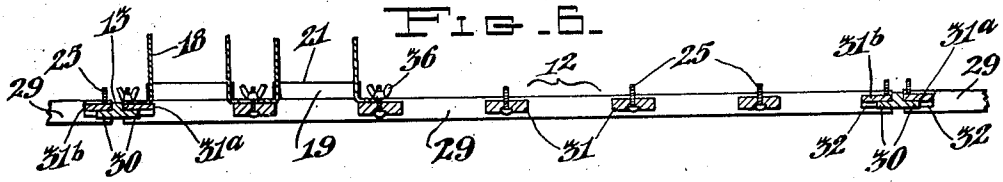


Fig. 7.

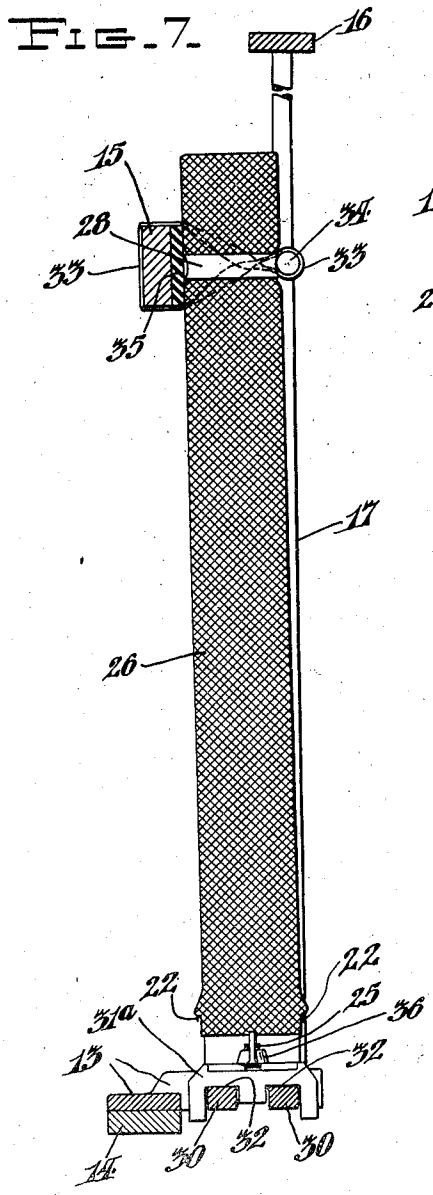


Fig. 8.

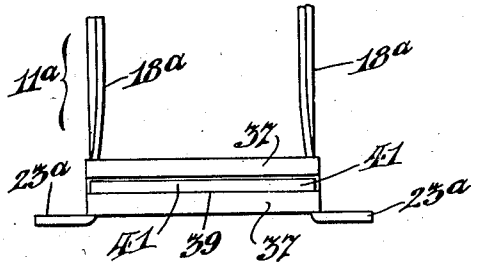


Fig. 9.

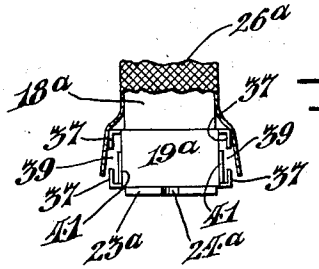
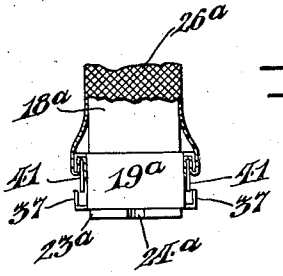


Fig. 10.



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UNITED STATES PATENT OFFICE

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FABRIC HOLDING EQUIPMENT FOR EMBROIDERY MACHINES

Joseph C. Gilardone, Fleetwood, Pa.

Application March 22, 1937, Serial No. 132,379

15 Claims. (Cl. 112—90)

This invention relates to the fabric holding equipment of embroidery machines, and more particularly to such equipment for hosiery embroidering machines of the general type disclosed in my Patent No. 1,482,680, issued February 5, 1924.

One object of my invention is to provide a novel fabric, or hosiery, holding device for embroidery machines.

Another object is to provide a novel fabric, or hosiery, holding frame unit comprising a plurality of fabric holding devices, and a support therefor arranged to be mounted in a plurality of positions in the machine.

Still another object is to provide novel means in embroidery machines for more effectively and efficiently holding the fabric portions to be embroidered in position for cooperation with the embroidery stitching means, than heretofore possible.

A further object is to increase the production speed and efficiency of embroidery machines by the provision of novel means therefor whereby the fabrics to be embroidered can be more quickly and easily manipulated than heretofore, and whereby more uniform results are obtained.

Another object is to provide novel hosiery holding equipment for embroidery machines which can be cheaply manufactured, which is capable of self-adjustment so as to accommodate, with equal effectiveness, hosiery of different size, and which provides other advantages over equipment heretofore available for this purpose.

With these and other objects in view, which will become apparent from the following detailed description of the illustrative embodiments of the invention shown in the accompanying drawings, my invention comprises the novel elements, features of construction and arrangement of parts in cooperative relationship, as hereinafter more particularly pointed out in the claims.

In the drawings:

Figure 1 is a top plan view of my novel fabric, or hosiery, holding equipment for embroidery machines;

Fig. 2 is a front elevational view of Fig. 1;

Fig. 3 is a top plan view of the support for the fabric holding frames or devices, forming part of my invention;

Fig. 4 is a fragmentary front elevational view of the lower portion of one of the fabric, or hosiery holding frames, or devices;

Fig. 5 is a plan sectional view taken substantially as indicated by the arrows 5—5 on Fig. 2;

Fig. 6 is a partial sectional view, taken substantially as indicated by the arrows 6—6 on Fig. 1;

Fig. 7 is an elevational sectional view, on an enlarged scale, taken substantially as indicated by the arrows 7—7 on Fig. 2, certain parts being broken away to show certain features to better advantage;

Fig. 8 is a front elevational view, similar to Fig. 4, but of a modified form of construction;

Fig. 9 is an end elevational view with a stocking portion in position, partly in section; and

Fig. 10 is a view similar to that of Fig. 9, and shows certain parts in another position.

For illustrative purposes, a practical form of my invention will be hereinafter described as applicable to well known hosiery embroidering machines. In such machines, a multiplicity of individual hosiery holding frames or devices, are simultaneously moved as a unit by patterning means with respect to cooperatively associated embroidery stitching mechanism which functions to produce similar clocks, or other ornamentations, in each of the stockings on the frames. The stocking holding frames, or devices, are generally of a rectangular shape and are open at the front, rear and bottom so that they may be positioned vertically over the individual shuttle arrangements of the embroidering mechanism. When a stocking is properly mounted on one of these frames, the portion of the stocking fabric at the front open side of the frame is positioned between the shuttle arrangement and the needle.

When the machine is in operation, all the stocking holding frames are moved in accordance with pattern controlled means, relative to the stitching mechanism which is mounted in fixed position, and in this manner a design is embroidered in the stocking fabric.

After a design has been embroidered in one side of the stocking, each frame is reversed so that the fabric extending over the rear open end of the frame comes between its respective shuttle arrangement and needle, and the embroidering operation is repeated.

My invention is concerned with the stocking holding means of the type referred to.

The well known parts of an embroidery machine have been omitted in the drawings because their illustration is unnecessary to a complete understanding of the construction, function and operation of my invention by anyone

skilled in the art. However, for additional information concerning corelated and associated parts, reference may be had to my above mentioned patent, and my Patent No. 2,094,699, issued October 5, 1937.

Referring now to Figs. 1 to 7 inclusive of the drawings, 11 designates my novel hosiery holding frame members or devices, 12 elongated supports on each of which a plurality of the members 11 are detachably mounted, 13 brackets which are positioned intermediate the ends of adjacent supports 12 and on which the latter are seated, 14 a bar extending the full length of the machine and to which brackets 13 are secured, 15 another bar extending the full length of the machine against which the upper parts of members 11 are held to steady the same, and 16 another bar extending the full length of the machine to which vertically extending bracket supporting rods 17 are secured.

The members 11 comprise an upper frame element 18 which is formed of a flat strip of resilent material, such as spring metal, Celluloid or the like, and a rigid base or frame 19, so formed as to provide an opening centrally and at the bottom of the device 11 to permit the latter to be positioned over a shuttle arrangement, for the purpose mentioned. The base 19, is provided with horizontally extending flanges 21 at the front and rear thereof, along which are secured a plurality of fabric impaling points 22. A foot plate extension 23 projects beyond the base on both sides thereof and these are notched as at 24 to accommodate the shanks of bolts 25 which form part of the means for detachably securing the devices 11 to the elongated supports 12.

The outside surface of the frame member 18 is polished, or otherwise made smooth, in order that a stocking, indicated at 26, may be drawn on and pulled from the same without injury to the fabric. To facilitate the mounting and dismounting of a stocking on the member 11, the upper portion of the frame 18 is rounded or made arcuate in configuration. Four horizontally aligned notches 27 are also formed in the edges of the frame 18 to provide a seat for a rubber band 28, or other flexible fastening means, placed over the stocking 26 at this point, for the purpose of maintaining the stocking fabric, between the rubber band 28 and the impaling points 22, in position and under desired tension.

Each of the elongated supports 12 is preferably made as an integral casting, but it can also be formed of separate parts, and comprises side rails 29 which are joined by reinforcing cross plates or members 31 which are centrally provided with bolt receiving apertures to accommodate the bolts 25. The end members 31*a* and 31*b* are provided at their bottom with grooves 32. These grooves are somewhat wider than lugs 30 on brackets 13 so that the grooves and lugs effect a loose seating arrangement for the supports 12 that permits of limited lateral tilting movement of the latter. This will become clear by reference to Fig. 7 which shows the upper part of a frame element 11 tilted against bar 15 and yieldably held in this position by a tensioned rubber band 33 which is anchored on bar 15, extends between two adjacent devices 11, and is connected at the front of the latter with a retaining element 34 which rests against the flat hosiery fabric holding rubber band 28. The retaining element 34 may be of wood, or other light material and extends partly across two of the devices 11 so as to simultaneously function with rubber band 33 to draw or urge both of said devices toward and against bar 15. It will be noted that the element 34 is actually in contact with the rubber bands 28 on the devices 11, which bands in turn suitably compress and hold the fabric of stockings 26 in the edge notches 27. In this manner a convenient arrangement is provided whereby the stockings 26 are clamped against the upper parts of devices 11 and the latter yieldingly held against the bar 15 without danger of injury to the stocking fabric. As an additional precaution for preventing injury to the fabric a continuous rubber strip, or separate rubber pads 35 are secured to the bar 15 to act as cushion contact means for the fabric when the members 11 are pulled and held against the bar 15 by the rubber bands 33, acting through elements 34.

It will be noted that six of the devices 11 can be conveniently mounted on one elongated support 12 by placing them in aligned arrangement between and along the rails 29 in such manner that the extensions 23 which project from the base of each device 11, meet with those of an adjacent device 11 at the center of cross plates 31 on supports 12. By referring to Fig. 1, it will be apparent that when the devices 11 are so arranged, the bolts 25 on support 12 will be sidewise straddled by the notches 24 of extensions 23 on adjacent devices. Thumb nuts 36 are provided on the threaded portions of bolts 23 to simultaneously clamp two adjacent extensions 23 onto the cross plates 31 and thereby detachably secure the devices 11 to the support 12.

I have shown a support 12 with six devices 11 mounted thereon as comprising a hosiery mounting unit, but, of course, the number of devices 11 can be varied. Such a unit can be conveniently handled and mounted, first in one position, then removed by lifting the two retaining elements 34 over the tops of the last two devices 11 at each end of the unit, then lifting the unit from its end seats on brackets 13, reversing it and again seating it on the lugs of brackets 13. By tilting the entire unit rearwardly and again placing elements 34 over the rubber bands 33 of the two devices 11 at both ends of the unit a quick and easy reversal of six of the devices is effected. Thus, instead of reversing the devices 11, one by one, as heretofore, my invention makes it possible to reverse a multiplicity simultaneously.

Attachment, or removal of the devices 11 from a support 12 is quickly and easily effected by means of the thumb nuts 36 which, except at the ends of the units, in each instance secure the extension members 23 of adjacent devices 11 in place.

Referring now to Figs. 8 to 10 inclusive of the drawings, it will be noted that a modified hosiery fabric holding, or attaching means, is here illustrated as arranged on the base frame or portion of the hosiery mounting devices, designated by the numeral 11*a*. The devices 11*a* correspond in all respects with the devices 11, previously described, except for the fabric attaching means at the base. In view of this, the parts of device 11*a* which correspond with similar parts of devices 11 have similar reference characters applied thereto in these figures with the exponent "*a*" added in each instance.

The modified fabric attaching means comprises four angle pieces 37, one pair at the front and the other at the rear of the base, the two angles of each pair being arranged in opposition to one another so as to form a channel-shaped fabric holder with an opening, or slot 39, extending the

length of the base through which the stocking fabric may be inserted. A flat strip of material, of Celluloid, hard rubber, or the like, is provided as a slide piece 41 in each of these channel-shaped holders, and functions as a fabric wedging or locking means. When a stocking has been mounted on the device 11a, as described in connection with the devices 11, the fabric portion extending to the base 19a, is inserted at the front and rear into the channel-shaped holders by passing the fabric through the slots 39 provided between each pair of angle pieces 37, each of the slide pieces 41 is then moved vertically and upwardly until the fabric is wedged into the upper portion of the channel holders, as shown. By moving the slides 41 downwardly the fabric is released and can be readily removed. Figs. 8 and 9 respectively illustrate the fabric when freed of the base holding means, and when locked or held thereby, both at the front and rear of the device 11a.

It is to be understood that my invention includes all the novel elements and parts which result in advantageous features in fabric holding means in embroidery machines over the prior art.

It is also noted that due to the shape and construction of the frame parts 18 of the devices 11, there is provided a hosiery holding means which is self-adjusting to various sizes of hosiery because of the resiliency and limited yieldability of these frames. This feature is indicated in Fig. 2, wherein the devices 11 having hosiery 26 mounted thereon, are contracted, more or less, intermediate the ends of frame member 18 by the hosiery. The effect is somewhat exaggerated for illustrative purposes.

As previously stated, in hosiery embroidering machines of the type to which my invention may be applied, all the hosiery to be embroidered is simultaneously moved in accordance with patterning means, relative to the embroidery stitching mechanism. Therefore, when my novel fabric, or hosiery holding means, is properly positioned in the machine, and the individual shuttle units are located within the devices 11 in readiness for cooperation with their respective stitching needles, which simultaneously coact with the shuttle units, all the devices 11 are moved in accordance with the usual and well known patterning means of the machine. The parts which are moved in unison by this patterning means include the devices 11, supports 12, bars 14, 15, 16, rods 17 and all associated elements. The movement is mainly a vertical one, but limited sidewise motion is also effected.

Of course, my improvements in fabric, or hosiery holding equipment, as specifically shown and described in connection with hosiery embroidery machines, can be changed and modified in various ways without departing from the invention herein disclosed and hereinafter claimed.

I claim:

1. A fabric mounting device for an embroidery machine, comprising a support; a fabric holding structure on said support including two spaced fabric engaging members each of which is formed of flat resilient strip material and arranged to effect yieldability of the structure in a direction parallel with the plane of the fabric portion to be embroidered and non-yieldability of the structure in a direction at right angles to said plane; projecting means at opposite sides of said support; and a plurality of fabric impaling points depending vertically from said means at a distance from the free edges thereof.

2. A mounting device for a fabric holding frame of an embroidery machine, comprising a pair of rails, one or more cross members connecting the rails, and means for detachably seating the device in the machine.

3. A fabric mounting unit for an embroidery machine, comprising a support including a pair of rails and one or more cross members connecting the rails, a plurality of fabric holding frames detachably secured to said support, and means for detachably seating the support in the machine.

4. A fabric mounting device for embroidery machines, comprising a fabric holding frame, a base member for said frame, and fabric securing means on said member comprising a channel-shaped retainer and a slide element movable in said retainer to effect locking and unlocking of the fabric.

5. A hosiery mounting device for embroidery machines, comprising a hosiery holding frame, a base member for said frame, and fabric securing means on said member comprising two channel-shaped retainers positioned at opposite sides of said member, and a slide element in each of said retainers movable to effect locking and unlocking of the hosiery fabric at both sides of the device.

6. A hosiery mounting device for embroidery machines, comprising a hosiery holding frame formed of a strip of flat resilient material having a smooth outer fabric engaging surface and one or more notches in the edges thereof to provide a seat for an elastic fabric retaining member, and a base for said device.

7. A fabric holding frame unit for an embroidery machine, comprising an elongated support, two separate fabric holding frame members alignedly arranged along said support, and means for removably securing said members to the support comprising a single clamp element intermediate the units arranged to hold both of said units in position on said support.

8. A fabric holding frame unit for an embroidery machine, comprising an elongated support, a series of separate fabric holding frame members alignedly arranged along said support, and means for removably securing said members to the support comprising a plurality of clamp elements each positioned intermediate adjacent pairs of said members and arranged to hold the same in position on said support.

9. A fabric holding frame unit for an embroidery machine, comprising an elongated support, two separate fabric holding frame members alignedly arranged along said support, means for removably securing said members to the support comprising a clamp element intermediate the members arranged to hold both of said members in position on said support, and means on said support arranged to cooperate with means on the machine for mounting the support in one of a plurality of positions.

10. A fabric holding frame unit for an embroidery machine, comprising an elongated support, two separate fabric holding frame members alignedly arranged along said support, means for removably securing said members to the support comprising a clamp element intermediate the members arranged to hold both of said members in position on said support, and means at each end of said support arranged to cooperate with means on the machine for

mounting the support in one of a plurality of positions.

11. In an embroidery machine, the combination of a frame unit comprising one or more fabric holding frame members and a support therefor, mounting means for said support arranged to permit of limited lateral tilting movement of the unit, and means for securing the unit against a fixed member of the machine thereby to prevent lateral movement of said members.

12. In a hosiery embroidery machine, the combination of a frame unit comprising one or more hosiery holding frame members and a support therefor, mounting means for said support arranged to permit of limited lateral tilting movement of the unit, a fixed element adjacent to one of said members, and means for securing said member against said fixed element.

13. In a hosiery embroidering machine, the combination of a frame unit comprising a plurality of hosiery holding frame members adapted to have an article of hosiery mounted thereon with its fabric surface to be embroidered held taut between a rubber band at the top and fabric retaining means at the bottom of the member, a support for said members, mounting means for said support arranged to permit of limited lateral tilting movement of the unit, a fixed element extending along said members and adjacent thereto, yieldable means on said element, and means for securing said members against said yieldable means.

14. In a hosiery embroidering machine, the combination of a frame unit comprising a plurality of hosiery holding frame members and a support therefor, mounting means for said support arranged to permit of limited lateral tilting movement of the unit, a fixed bar extending along the rear of said members and adjacent thereto, yieldable means on said bar opposite to said members, and resilient means for holding said members against said yieldable means.

15. In a hosiery embroidering machine, the combination of a frame unit comprising a plurality of hosiery holding frame members and a support therefor, mounting means for said support arranged to permit of limited lateral tilting movement of the unit, a fixed bar extending along the rear of said members and adjacent thereto, yieldable means on said bar opposite to said members, and means for holding a part of each of a pair of adjacent members against said yieldable means comprising a resilient element connected with each of said pair of members and anchored to said bar.

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