NEEDLE FOR NECKTIE SEWING MACHINE

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Referring now more particularly to the drawings, and specifically to FIG. 1 thereof, the apparatus there generally designated 10 may be similar to that shown in FIG. 1 of Patent No. 2,098,009, and may be mounted on a bench, or other suitable support (not shown). An upstanding plate is generally designated 11 and rotationally supports a pair of horizontally elongated lower and upper endless members or belts 12 and 13. In particular, the lower endless member is mounted for rotation about a pair of generally horizontal, spaced rolls 14 and 15 respectively journaled by shafts 16 and 17, which may be supported at their ends in plate 11 and an additional support means (removed for clarity of illustration).

Similarly, the upper endless belt 13 may be mounted on a pair of horizontally spaced rollers 19 and 20, which are carried rotatably by shafts 21 and 22, respectively, suitably journaled in the plate 11 and other suitable journaling means.

As best seen in FIG. 1, the lower endless member 12 has a generally horizontal upper flight or run 24, and the upper endless member 13 has a lower horizontal flight or run 25; and, the runs 24 and 25 are disposed in longitudinally extending, superposed facing relation with respect to each other.

In addition, a plurality of ribs or crimpers 27 are carried by the endless member or belt 12, extending transversely across the outer face thereof and arranged in spaced relation peripherally thereabout. A similar series of ribs or crimpers 28 are carried by the upper belt 13 on the outer face thereof extending transversely there across and spaced peripherally thereabout. The spacing and phasing of the crimpers 27 and 28 is such that they move into mesh or interdigitated relation, and remain in such relation during movement along the facing runs 24 and 25.

Formed in each crimp or rib 27, laterally medially of the endless member 12, is an outwardly-opening notch, cutout or recess 30. The recesses 30 of the several crimpers 27 are in alignment with each other circumferentially about the endless member 12. Similarly, each transverse rib or crimp 28 is formed with an outwardly opening notch, cutout or recess 31, which recesses are located laterally medially of the endless member 12 and in alignment thereabout longitudinally thereof. Further, the recesses 30 and 31 are all in substantially coplanar alignment, so as to lie in the same generally vertical plane. By this arrangement, the recesses 30 on the upper stretch or run 24 of endless member 12, and the recesses 31 on the lower stretch or run 25 of endless member 13 are all in alignment with each other to define a passage-way or opening extending longitudinally of and between the facing runs.

As seen in FIG. 1, a fabric guide 34 is fixed to the plate 11 for guiding fabric into and out of the nip region between rolls 15 and 20.

A sewing needle, generally designated 35, extends longitudinally between the facing runs 24 and 25, being loosely received in the aligned recesses 30 and 31, while a thread guide 36 may be carried by the plate 11 (at the left-hand side thereof as seen in FIG. 1) to pass thread 27 between the rolls 14 and 19 for extension along the needle 35 through the passageway defined by the aligned recesses 30 and 31 of intermeshing crimpers 27 and 28.

The needle 35 is loosely received in the aligned recesses of meshing crimpers 27 and 28, having its piercing or engaging end 39 free and provided with a hole or eye 40 for receiving the free end of thread 37.

The piercing end region 39 of the needle 35 may be flattened and pointed, as seen in FIGS. 2 and 3, for ease of penetration through a fabric. The needle portion 41, extending leftward in the drawings from the piercing end 39, is advantageously of a minimum diameter to facilitate engagement through a fabric. This portion 41
may be of constant diameter and is referred to hereinafter as the engaging portion of the needle 35. Leftward beyond the engaging portion 41, the needle 35 is provided with a stiffening means 42, which may be in the nature of a thickened portion of greater diameter, which may extend to the leftward end region and there be hooked, as at 43.

The needle is shown in greater detail in FIG. 4, wherein it is seen that the thickened portion or stiffening means 42 includes a tubular part or sleeve engaged about and receiving an extension 51 of the engaging portion 41. Specifically, the extension 51 may be of a constant diameter equal to that of the engaging portion 41, and may be snugly engaged in the stiffening sleeve 42 throughout the entire length thereof. In addition to snug engagement of the extension 51 in the sleeve 43, the assembly is further secured together by the U-shaped bend 45, wherein both the terminal region of the sleeve 42 and its contained extension portion are bent. This construction lends itself to quick and easy assembly out of readily available components and serves to effectively lock the components together while greatly enhancing their strength, as well as durability and useful life of the entire needle.

The needle 35 is mounted in the aligned recesses 30 and 31 of facing runs 24 and 25 for longitudinal shifting or axial reciprocation by mounting means, generally designated 45, which may be fixed to the plate 11 and connected to the needle end region 43. In particular, the mounting means 45 may include an elongate guide or slideway 46 fixed in alignment with the aligned recesses 30 and 31 of the meshing crimpers 27 and 23. A slide 49 is located in the slideway 46 and freely slidable longitudinally therealong between the end walls 47 and 48. Detachably secured to the slide 47 is the hooked end 33 of needle 35, while the thickened or stiffened needle portion 42 extends slidably through the proximate end wall 48.

In operation, the above-described apparatus is substantially the same as that of Patent No. 2,098,009. The upper endless member 13 initially rotates counterclockwise, while the lower endless member 12 is rotating counterclockwise, and a fabric to be sewn is fed leftward between the facing runs 24 and 25. The needle 35 is retracted leftward by leftward movement of the facing runs 24 and 25 so that the piercing needle end 39 is between the facing runs. In this condition, the fabric fed between the facing runs is automatically plented or crimped by passing successively over and under respective crimpers 27 and 28, and is also pierced by the needle end 39. In its crimped and pierced condition, the fabric moves leftward with the facing runs 24 and 25, being penetrated by the engaging portion 41 of the needle. However, before the fabric comes to the stiffened, or thickened needle portion 42, rotation of the endless members 12 and 13 is stopped and reversed. This effects immediate rightward shifting of the needle 35 to its illustrated position of FIG. 1 with the pointed eye region 39 projecting beyond the facing runs 24 and 25. The fabric, together with the thread 39 stitched through the fabric, may then be simultaneously removed from between the endless members 12 and 13 and the needle 35.

Of course, the above-described cycle of operation is repeated, as desired. It is important to observe that the portion of needle 35 having most tendency to bend is the leftward region, which bending is effectively prevented by the reinforcing thickening 42. Further, while the reinforced region 42 may extend between the facing runs 24 and 25, as shown in the projected needle position of FIG. 2, with the possibility of bending existing, the reinforced portion is withdrawn from between the facing runs upon retraction of the needle so as not to interfere with stitching of the fabric by penetration therethrough of the engaging needle portion 41. Indeed, advantage may be taken of this unique needle construction to form the engaging needle portion of smaller diameter, if desired.

From the foregoing, it is seen that the present invention provides a needle-saving mechanism which fully accomplishes its intended objects and is well adapted to meet practical conditions of manufacture and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What is claimed is:

Needle assembly for a sewing mechanism of the type described having a pair of rotary endless members having facing runs with front and rear ends, and a series of crimpers arranged about each endless member and in intermeshing relationship when forming a fabric between the intermeshing crimpers, said crimpers having recesses in alignment with each other when said crimpers intermesh; said needle assembly comprising a longitudinally extending, elongate, tubular guide having front and rear end walls and located rearwardly of said endless members and aligned with said recesses, a slide in said guide and freely longitudinally slidable therein between said end walls, an elongate needle having a thread eye at its front end and extending loosely through said aligned recesses for stitching a pleated fabric, a stiffening sleeve fixedly and snugly mounted upon said needle and extending from the rear end thereof to a point intermediate the ends of said needle, said front end wall having a through bore through which said sleeve extends slidably, and means for attaching the rear end portion of said sleeve to said slide whereby said needle may be moved longitudinally in unison with said slide between the limit positions of said slide, said sleeve extending loosely into the rear aligned recesses in the forward limit position of said slide but being of a length to be substantially clear of said recesses in the rear limit position of said slide and being then clear of fabric pleated by said crimpers.

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