June 5, 1934. A. PERRET 1,961,429

LATCH NEEDLE AND METHOD OF MAKING THE SAME

Filed June 15, 1931

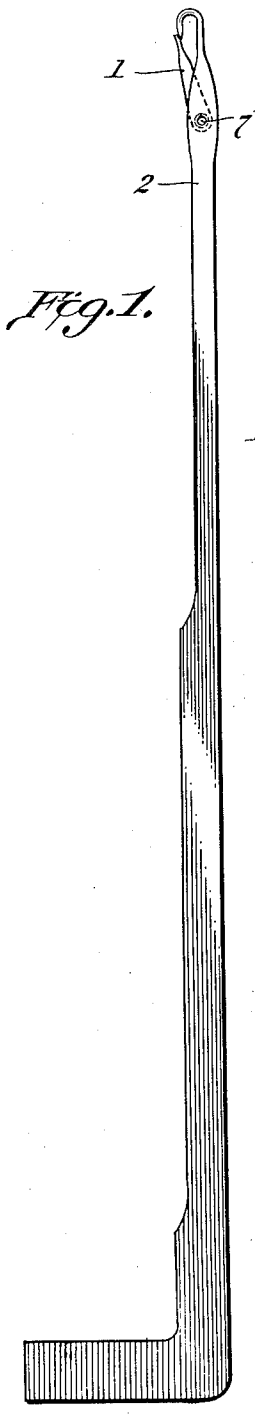


Fig. 1.

Fig. 2.

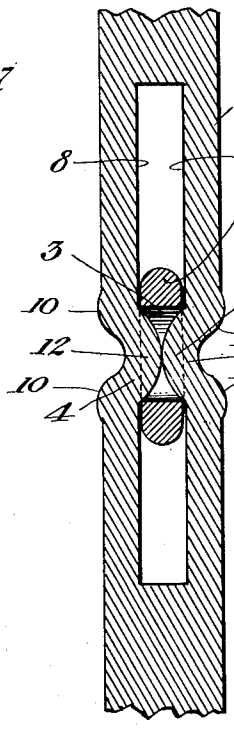


Fig. 3.

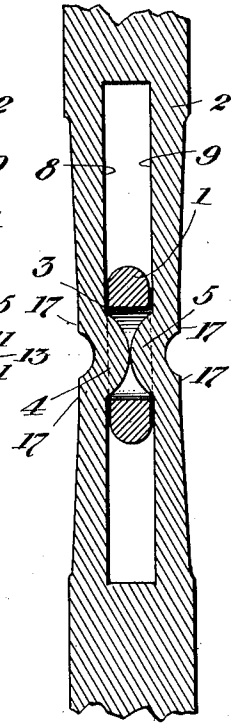
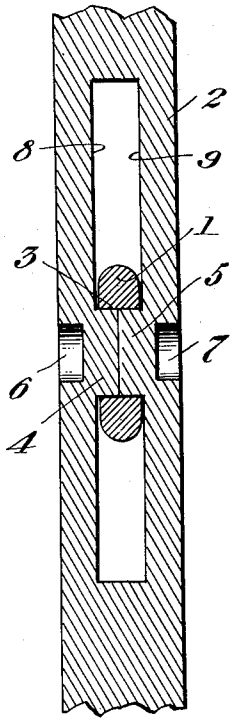


Fig. 4.



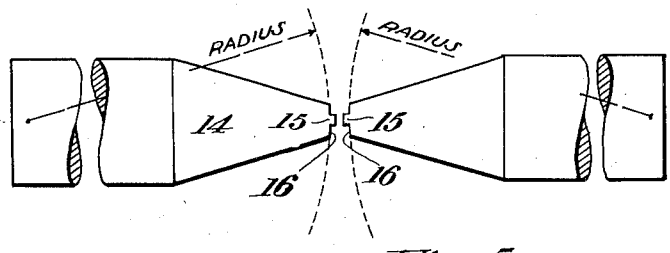
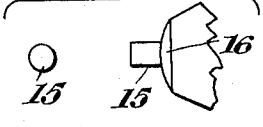


Fig. 5.

Fig. 6.



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LATCH NEEDLE AND METHOD OF MAKING THE SAME

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4 Claims. (Cl. 163—3)

In the usual manufacture of latch needles the latch has been secured to the needle at the base of the shank of the hook by applying thereto between the sides of the groove in which the latch operates, a pivot, and riveting said pivot. In the prior art needles, as thus constructed, after awhile the pivots through the opening in the latch wear and looseness of the latch takes place.

It has also been proposed more recently to use two opposite so-called dimpling tools, the working faces of which come to a rounded point, and in the operation of these tools on opposite sides of the needle, the material of the needle on either side of the latch recess is crowded into the usual pivot opening of the latch. In making a needle according to this method there are various objections; for example, some of the metal of the needle is swelled out around the tool used making the needle too thick at this point for the slots on the knitting machine in which they run; again the metal forced out into the opening in the latch is apt not to fill the opening sufficiently to cause a firm bearing leaving the latch too free, and thus permitting the needle to wear out prematurely. Furthermore, in this method of making needles the swelled-out metal of the needle adjacent the latch pivot must be ground or otherwise cut away, thus weakening the needle at the latch point.

An object of the present invention is to provide a method of operating on the metal of the needle to fill the hole in the latch as completely as a solid bar, thus obtaining a perfect fit of the latch and giving more metal to resist the wear.

With the present invention the above difficulties are avoided by forming on each of the sides of the needle groove adjacent the opening of the needle latch, trunnions formed of the metal of which the sides of the needle are composed, which trunnions are forced together through the hole in the latch resting against each other, they form a complete closing-up of the pivot hole in the latch thus forming a trunnion bearing upon which the latch has pivotal movement. They also afford a maximum bearing area for the latch and the latter is amply supported against lateral play.

Another object of the invention is to provide a special tool or cooperating dies for carrying out this method of making the new needle.

The invention is illustrated in the accompanying drawing, in which

Figure 1 represents a somewhat enlarged view of a completed needle constructed in accordance with my invention.

Figs. 2 and 3 are greatly enlarged views partly diagrammatic showing what I have above referred to as the prior art dimpling operation, Fig. 3 illustrating how the sides of the needle have been reduced in taking off the metal.

Fig. 4 is a section similar to Figs. 2 and 3 showing the needle constructed in accordance with my present invention.

Fig. 5 represents an enlarged view of the two opposite tools or dies for carrying out my improved method.

Fig. 6 is a detail view showing more clearly the shape of the tenon and the end of the die, the small figure at the left being a projection of the tenon.

In the drawing, and referring particularly to Fig. 4, 1 represents the latch to be applied to the needle 2, and 3 is the opening in the latch into which the trunnions 4 and 5 are pressed from opposite sides by reason of the indentation of the needle at opposite sides 6 and 7, the metal displaced by extrusion from the points 6 and 7 passing into the opening in the latch until the two inwardly displaced trunnions abut against one another and cause an outward flow of the metal to form a substantially cylindrical bearing for the latch. The sides of the needle 8 and 9 are left in the original full size condition giving the needle exceptional smoothness and full strength.

The tool for carrying out the method of making this improved needle is illustrated in Fig. 5. In this figure the tool is represented at 14. 15 are the punches or tenons which make the indentations 6 and 7 when forced into the sides of the needle. Each tool is formed with convex shoulders as shown at 16, which shoulders are adjacent the tenons or punches 15. By reason of the convexity of these shoulders adjacent the tenons, the sides of the needle when finished are not bulged out but the metal of the side of the needle operated upon by these convex shoulders retains its normal surface contour and diameter and no material has to be removed which latter would require a further operation and would have the effect of weakening the needle.

In Figs. 2 and 3 is illustrated the construction of the needle made with the so-called dimpling punches 10 and 11 illustrating the metal raised up by the ordinary punch and forcing the metal 12 and 13 into the hole in the latch as shown in Fig. 2. This raised metal 10 and 11 must be removed by some means of grinding or cutting as is shown at 17 in Fig. 3, thus greatly weakening the needle and causing sharpness and roughness at the edges which of course is objectionable in its

action on the yarn in the knitting operation.

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

1. The method of securing a latch in a needle having a latch recess, which comprises locating the latch in the recess, and bodily moving portions of the outer needle wall surrounding the axis of the latch opening inwardly and thereby producing a depression having walls substantially parallel to said axis and of less cross-sectional area than the cross-sectional area of the opening in the latch, until the inner faces of the moved portions are in bodily contact, and then pressing the external needle walls inwardly to restore the needle substantially to its initial diameter and to cause a flow of the metal into the opening to fill the same.

2. The herein-described method of forming a knitting machine latch needle which consists in making a needle blank with a slot receiving latch, forming a pivot hole in the latch, inserting the latch in the needle slot, locally depressing a dimple within the hole in the latch and continuing the depression of the dimples into contact to produce lateral displacement by reciprocal resistance of the dimples and then depressing the needle metal adjacent the dimples to remove the ridges around the dimples and force the metal into the hole for producing trunnions.

3. The method of forming a knitting machine latch needle comprising making a needle blank with a slot to receive a latch, forming a latch with a pivot hole, inserting said latch into the said needle slot, exerting an initial pressure upon the walls of the needle slot over the pivot hole and over a smaller surface area than the cross section of the pivot hole in the latch to form opposite trunnions in face contact in said pivot hole, and exerting a final pressure upon the walls of the needle slot and over a larger surface area than the cross section of the pivot hole in the latch to cause radial enlargement of the trunnions to fill the hole and form a solid pivot.

4. The method of forming a knitting machine latch needle comprising making a needle blank with a slot to receive a latch, forming a latch with a pivot hole, inserting said latch into the said needle slot, exerting an initial pressure upon the walls of the needle slot over the pivot hole and over a smaller surface area than the cross section of the pivot hole in the latch to form opposite trunnions in face contact in said pivot hole, and exerting a final pressure upon the walls of the needle slot and over a larger surface area than the cross section of the pivot hole in the latch to cause radial enlargement of the trunnions to fill the hole and form a solid pivot, said final pressure being exerted along a convex surface to clamp the walls of the needle slot and prevent their bulging.

ALI PERRET.