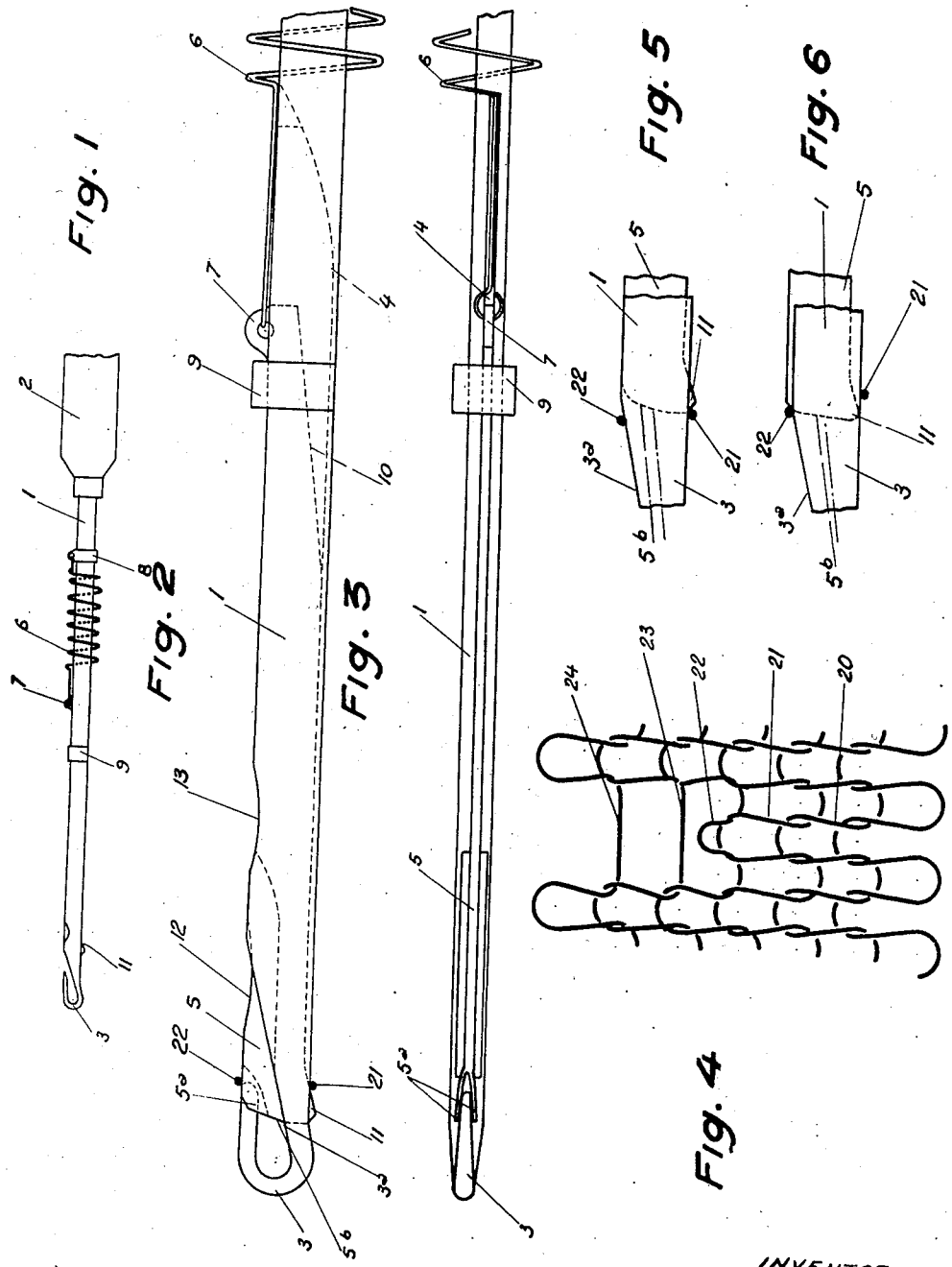
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NEEDLE FOR REPAIRING KNITTED ARTICLES

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NEEDLE FOR REPAIRING KNITTED ARTICLES

Application filed March 1, 1930, Serial No. 432,298, and in France March 29, 1929.

The object of the invention is a needle for repairing knitted article, chiefly stockings, of the kind, according to which the needle comprises a rod terminating in the form of a hook, in which rod a movable member or latch slides, such latch alternately opening and shutting the hook of the needle and being displaced by the threads of the knitting being repaired, such for example, as described in the applicant's United States patent application S. No. 315,675, filed October 29, 1928; Patent No. 1,790,611.

The repairing needle forming the object of the invention offers advantages in relation to needles already known, the object of which is to render the construction more simple and consequently less costly, and also to ensure a more convenient manipulation and a more certain functioning of the needle, at the same time reducing to a minimum the risks of deterioration of the article to be repaired.

These improvements consist mainly in that:

a. The sliding latch is controlled by a return spring, which tends constantly to bring it back to its opening position, the advantage of which is to avoid any strain upon the threads, which alone, had to take charge in the known devices of this kind, to push back the latch to the rear so as to open it, this being of particular advantage when fine gauge knitted fabrics of delicate thread is being repaired. Moreover, this device has the advantage of preventing the inadvertent closing of the latch at the wrong time through its own weight, so that the operator need not intervene to open the latch, either at the commencement of her work to take up the first mesh or loop, or in course of the repair.

b. The sliding latch is simply placed in the longitudinal mortise or slot in which it is displaced, and is only held towards its extremity opposite to the hook by a strap encircling the rod of the needle. By virtue of this arrangement, the latch is precisely guided, and is forced to take the correct position in relation to the hook. Moreover, it becomes easy by giving an appropriate shape to the extremity in question, i. e. the rear extremity of this latch, to withdraw it so as to facilitate cleaning operations, which may be rendered necessary by the accumulation of dust which interferes with, or prevents, the normal functioning of the latch.

c. The overlapping of the point, of the needle by the front extremity of the latch to enable the loops of thread to slide freely over the hook is effected in a simple manner by providing a slit in the upper extremity of the latch, and opening out the sides or lips of the said slit, which, apart from the economy in manufacture, presents the advantage of reducing to a minimum the width of the needle which passes through the meshes or loops and thus making it possible to repair finer articles, while only leaving scarcely perceptible traces.

d. The form given to the head of the latch and the extreme rear position of the latch are such that by virtue of the free way in which it is guided, a slight oscillating or swinging movement can be given to the latch to facilitate the passage of the loops over its head.

The invention will be better understood by the detailed specification of the repairing needle forming its object, and by reference to the drawings annexed to the present specification, which represent diagrammatically, and by way of example, an embodiment of the said needle. In these drawings—

Figure 1 is a general view, in elevation, of the repairing needle.

Figure 2 is an elevation of the needle on a larger scale, the latch being shown in its closed position.

Figure 3 is a plan corresponding to Figure 2.

Figure 4 is a diagrammatic view of a portion of the article to be repaired; and

Figures 5 and 6 are diagrammatic views showing details of functioning.

According to these figures, 1 is the rod of the needle, which can be set or mounted in a handle 2, and terminating in a hook 3. The rod is provided axially with a longitudinal slot 4 in which slides the flat latch 5.

The latch 5 is controlled by a return spring 6, fitted in a projection 7, provided on the rear extremity of the said latch, the spring 6 being also attached to a fixed point of the needle,

such as a projection of the fixed ring 8, which is integral with the rod of the needle 1.

The spring 6 tends constantly to bring back the latch 5 to the rear, that is to say, in its open position, so that the latch cannot close again of itself through its own weight.

The latch 5 is simply placed between the walls of the longitudinal slot 4, in which it can slide, and it is merely held in position by a strap 9, encircling the rod of the needle, and the rear extremity of the latch 5, in front of the projection 7. This extremity is cut on its lower edge so as to form a sloping surface 10, to facilitate the removal of the latch. On the front extremity, the flat blade forming the latch 5 is slit by a kind of knife in its upper part, and the slit widened out so as to form two lips 5^a, leaving between them a space in which can engage the point of the hook 3, which comes level with the two lips, thus reducing to a minimum the width of the needle which has to pass into the meshes or loops.

In the lower part, this extremity of the latch is provided with a heel 11, with opposite inclines or slopes, and the front edge 5^b of the latch is inclined so that the heel 11 is in front of the top point of the latch 5. Moreover, the latch 5 is provided with a hollow 12 which, when in its rear or opening position, comes opposite corresponding hollows 13 in the rod 1 of the needle. These hollows constitute locations enabling the threads to take up their correct position again on the return of the needle when the thread of the loop, which is on the rod, as a result of the thrust of the needle, passes under the thread of the following loop.

As the functioning of this class of needle is well known it only remains to describe in principle the functional features of the present device.

Let us suppose that the article shown in Figure 4 is in course of repair, 20 and 21 being the loops which were undone and have been taken up again by the needle, 22 being a loop which has just been reformed by the needle and 23 and 24 threads left by undone loops. The reformed loop 22 is on the hook 3 (the material being stretched in the ordinary manner), the needle 1 is pushed forward across the knitted article, the spring 6 having brought back the latch 5 to the rear. Towards the end of the movement of the needle 1 to the front, the heel 11 of the latch 5 comes up against the loop 21, and this meeting takes place (Figure 5) before the loop 22 which slides on the inclined part or slope 3^a of the hook 3 has reached the upper point of the latch 5, so that by virtue of the free way in which the latch is guided and of the fact that the loop 22 does not rest on the latch 5, the loop 21 slightly raises the latch 5 and passes on the other side of the heel 11. The thread of the loop 22 can then easily lower the point of the latch 5 when it comes into contact therewith, provided that the thread of the loop 21 has, at this moment, passed beyond the heel 11.

A swinging movement is thus produced which renders extremely easy the passage of the loop 22 above the head of the latch 5, this facility being due to the form of the head of the latch 5 and also to the position which the latch takes when it is completely open, i. e. behind the angle formed by the slope 3^a and the body of the needle 1.

The loop 22 being placed on the body of the needle 1, the needle is then drawn backwards, the heel 11 comes against the loop 21, the latch is held between the thread of the loop 22 and that of the loop 21; the latch 5 cannot, therefore, rise up and it closes again (Figures 1, 2 and 3) without exercising additional pressure against the base of the slot 4. During this time, the hook holds the thread 23. In the known way one continues to draw backwards the needle 1 towards the rear until a new loop is formed in the thread 23, and this new loop is drawn by the loop 22 which, being set up again, easily slides over the closed hook 3.

The removal of the latch 5 for cleaning the needle is most simple. It is only necessary to unhook the spring 6 from the eye of the projection 7 and to swing the latch 5 by pressing on the projection 7, the slope 10 permitting this oscillating movement and the passage of the projection 7 underneath the strap 9.

It is understood that, without departing from the scope of the invention, variations and improvements in the detail of the needle which forms its object can be devised and also that certain elements therein may be replaced by equivalent means.

What I claim is:

1. A sliding latch needle for repairing knitted articles, comprising, in combination, a rod terminating in a hook, a movable latch within a longitudinal slot of said rod, said latch alternately opening and closing said hook, a strap surrounding said rod and rigidly connected therewith, and resilient means connecting said latch with said rod, said latch being also displaced by the threads of the knitted article in a direction perpendicular to the longitudinal axis of said rod, this displacement being limited by the bottom of said groove and by said strap.

2. A sliding latch needle for repairing knitted articles, comprising, in combination, a rod terminating in a hook, a movable latch within a longitudinal slot of said rod, said latch comprising a sloping surface at the extremity furthest from said hook, a strap surrounding said rod and rigidly connected therewith, and resilient means connecting said latch with said rod, said latch being also displaced by the threads of the knitted article in a direction perpendicular to the longitudinal axis of said rod, this displacement

being limited by the bottom of said groove and by said strap.

3. A sliding latch needle for repairing knitted articles, comprising, in combination, a rod terminating in a hook, a movable latch within a longitudinal slot of said rod, said latch comprising a heel and a sloping surface at the extremity facing said hook, said heel being situated nearer to the adjacent end of said latch than the edge formed by said sloping surface and the side surface of said latch, a slight swinging movement of said latch being produced when said sloping surface and heel come into contact with the threads of the knitted article, a strap surrounding said rod and rigidly connected therewith, and resilient means connecting said latch with said rod, the swinging movement of said latch being limited by said strap.

4. A sliding latch needle for repairing knitted articles, comprising, in combination, a rod terminating in a hook, a movable latch within a longitudinal slot of said rod, said latch alternately opening and closing said hook and being displaced by the threads of the knitted article, a strap surrounding said rod and rigidly connected therewith, and a spring connecting said latch with said rod and adapted to bring said latch back to its opening position.

5. A sliding latch needle for repairing knitted articles, comprising, in combination, a rod terminating in a hook, a movable latch within a longitudinal slot of said rod, said latch comprising two lips adapted to embrace the bent extremity of said hook, a strap surrounding said rod and rigidly connected therewith, and resilient means connecting said latch with said rod.

In testimony whereof I affix my signature.

MARCEL VITOUX.