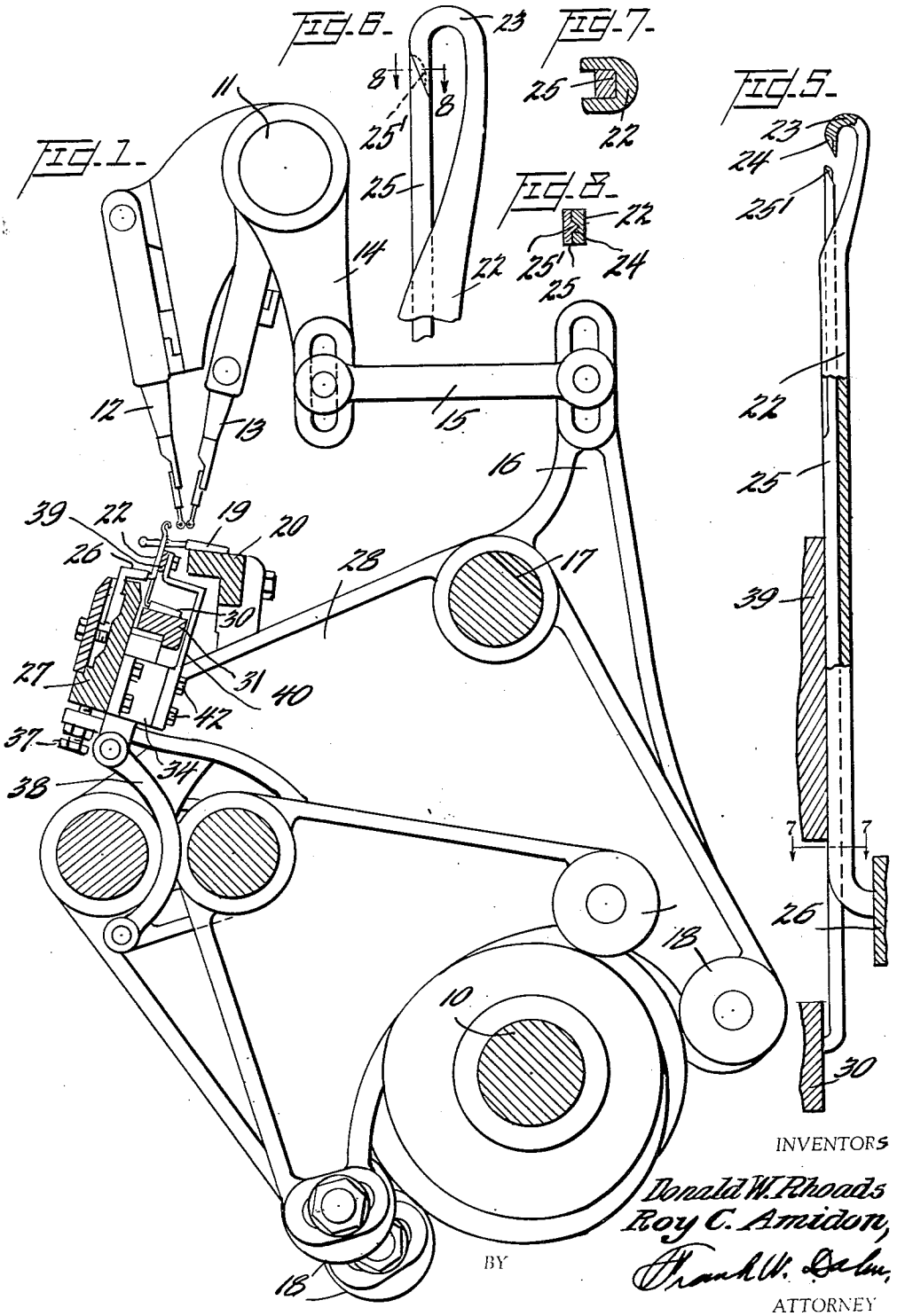
June 18, 1957 R. C. AMIDON ET AL 2,796,606

KNITTING MACHINE NEEDLE

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FIG. 2.

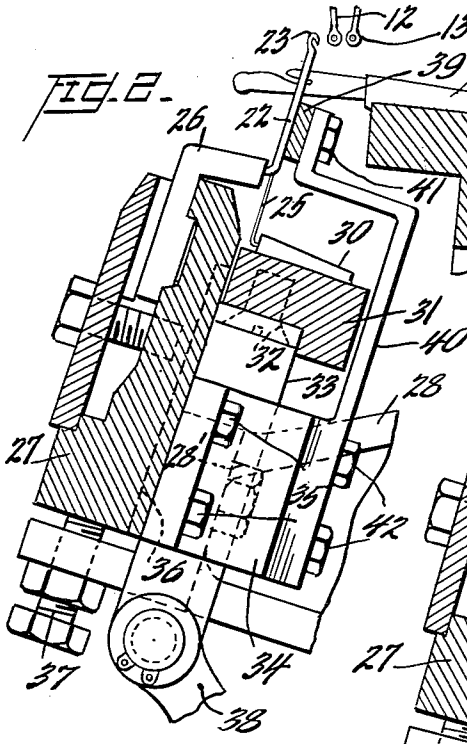


FIG. 3.

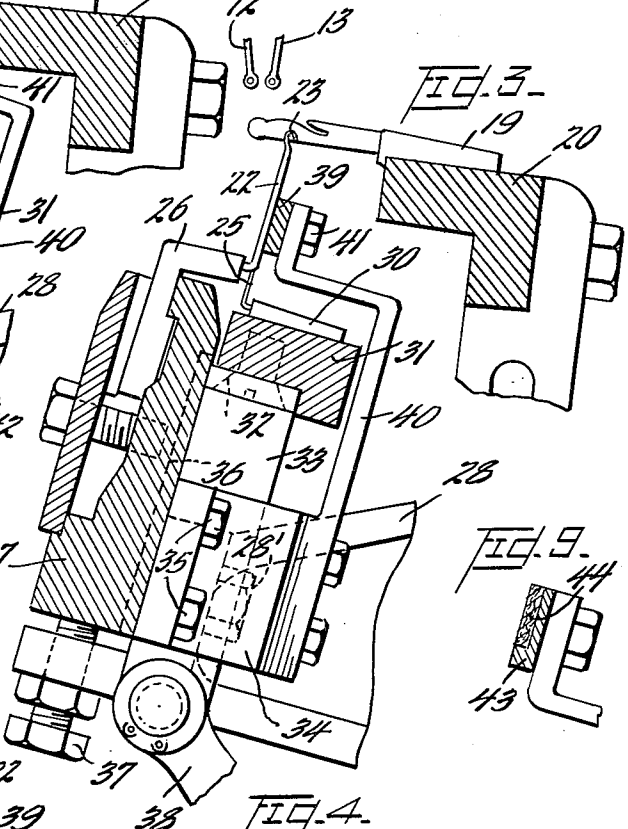
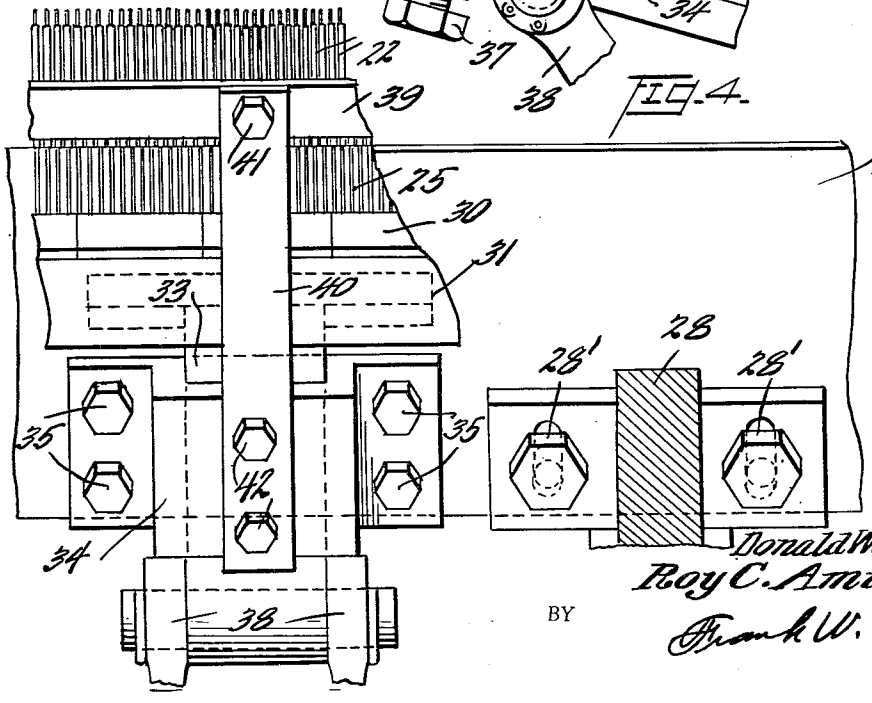


FIG. 5.

FIG. 4.



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KNITTING MACHINE NEEDLE

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12 Claims. (Cl. 66—120)

Our invention relates to a knitting machine and a needle therefor of the type having a grooved hook element and a tongue element slidable in the groove of the hook element, and it is an object of the invention to provide a needle of this type that shall have increased speed and certainty in action over those now known, and which shall be less liable to damage the yarn that is being knitted than is the case with needles now in use.

Another object is to provide a needle in which the tongue shall mate very exactly with the hook, so as to avoid any failure to produce exact registry between the hook and the tongue.

Another object is to provide a needle having complementary beveled edges in the tip of the hook portion and on the coacting part of the tongue, so located and arranged as to tend to bring the hook and the tongue into precise registry, such that no edges thereof will extend outside the perimeter of the needle head in a manner to damage the yarn, and so as to insure certainty in the opening and closing movements of the needle elements.

Another object is to provide a machine utilizing sliding tongue needles and having means pressing uniformly against the tongues of all the needles to maintain them in place in the grooves of the needle hooks with uniform pressure.

Another object is to provide improved means for lubricating the contacting surfaces of the hooks and the slidable tongues.

Referring now to the annexed drawings, which are made a part of this application and in which similar reference characters indicate similar parts:

Fig. 1 is a cross section of a knitting machine with parts omitted,

Fig. 2, an enlarged view of parts shown in Fig. 1,

Fig. 3, a view similar to Fig. 2, but with parts in a different position,

Fig. 4, a rear elevation of the needle supporting means and certain cooperating parts,

Fig. 5, a side elevation of the improved needle, with parts broken away,

Fig. 6, an elevation of the upper end portion of the needle, in closed position,

Fig. 7, a section on line 7—7 of Fig. 5,

Fig. 8, a section on line 8—8 of Fig. 6, and

Fig. 9, a modification of oiling means, in cross section.

In the drawings, reference character **10** indicates the main camshaft of a tricot knitting machine, it being understood that the needle of our invention may be used either in tricot or warp knitting machines or in other knitting machines of known varieties to which it may be suited. A series of cams of suitable or conventional types are mounted on the camshaft to rotate therewith and they may actuate knitting instrumentalities such as those shown in the drawings. The principal parts of the machine are of conventional variety or may be so. Among such parts there is a shaft **11** carrying the usual swingable yarn guides **12** and **13**. The shaft **11** carries a rockarm **14**

connected by a link **15** to a lever **16** pivoted on a shaft **17**. The lever **16** is oscillated by means of one or more of the cams on the shaft **10** through the medium of rollers such as shown at **18**. Sinkers **19** on a supporting bar **20** are moved to and fro in known manner by means of similar cams and levers; and like connections are provided for bars that carry the hooks and the slidable tongues but conventional details of such cams and the linkages that connect them to the actuated parts are not shown as they are in general use and well understood by those skilled in the art of knitting.

The grooved needle hook elements **22** are best shown in Figs. 5 to 7 and each one of them consists of a shank terminating at its upper end in a hook **23**, having an indentation **24** in the side facing toward the upper end of the tongue **25**. The said end of the tongue is beveled at opposite sides, as shown in Fig. 8, to form a ridge **25'**. The indentation **24** has its opposed faces beveled to form a groove that is V-shaped in cross section (see Fig. 8) and the oppositely-inclined faces at the end of the tongue fit closely against the oppositely inclined faces of the indentation **24**, so that the tongue tends to cam itself toward a position where the rounded crest of the ridge **25'** fits into the deepest part of the indentation **24** with its oppositely beveled faces mating with the opposite faces of the V-shaped slot. Because this ridge fits in the depression, with the registering edges inclined relatively to the length of the needle and, of course, to the length of the tongue, the joint between the parts at the meeting line of such edges is very smooth and such smoothness is insured by the camming action whereby the ridge tends to ride to the deepest part of the indentation, so that danger of any fraying of the yarn is minimized.

The hook elements **22** have their lower ends bent and cast into lead holders **26**, and the lead holders are clamped on a bar **27**, which bar is fixed to a lever **28** by screws **28'**. The lever is pivoted at **17** and is operated by one or more of the cams on the camshaft **10**.

The tongue elements **25** are likewise bent at their lower ends and cast into lead holders **30** that are secured to a bar **31** that is mounted to slide up and down on the lever **28** near the lefthand end of the lever, so as to make it possible to move the hook and tongue elements either together or separately in forming stitches. To this end the bar **31** is fastened to a block **33** by screws **32**. The block is guided by a yoke **34** that is fastened at its ends to a fixed part of lever **28** by means of screws **35**. The block **33** slides on a hardened steel wear plate at **36**, and the bar **27** with the tongue elements is adjustable vertically by means of screws **37**. At its lower end the block is attached to a link **38** carried by a lever operated from a cam on the camshaft.

For holding the tongues in place at the rear of the grooves in the hook elements and also to lubricate them in simple and effective manner, we provide means comprising a bar **39** that extends across a long series of needles at the open side of the grooves in the hook elements. The bar is preferably made of oilite but any suitable material can be used for holding the tongues in place, and preferably the bar will embody means for applying a lubricant of suitable character to the needles. This bar is supported on a fixed part of the lever **28** by means of upright brackets **40** fastened at the lower end to yoke **34** by bolts **42** and fixed at their upper ends to the bar **39** by screws **41** to hold the bar in place.

In operation the bars for the needle tongues and hooks are moved up and down, and the sinkers are moved to and fro across the path of the needles, as are also the yarn fingers, all in a manner familiar to those skilled in the art. The bar **39** which is preferably but not necessarily made of oil-impregnated wood used for bearings for

shafts and the like, and known commercially as oilite, will function to lubricate the parts of the needle and to keep the parts in place.

In Fig. 9 we have shown a modification consisting in a bar **43** having a recess at **44** in its upper front part, which contains a pad or wick **44** that may be saturated with oil or otherwise supplied with any suitable lubricant for greasing the needles.

It will be obvious that many variations may be made in the devices herein disclosed, all without departing from the spirit of the invention; and therefore we do not limit ourselves to what is shown in the drawings and described in the specification, but only as indicated in the appended claims.

Having thus fully described our invention, what we claim is:

1. A knitting machine needle of the sliding tongue type comprising a shank with a longitudinal groove therein, a hook at one end of the shank with a longitudinal slot in its tip portion, a tongue slidable in said groove, and a terminal ridge on the tongue shaped to mate with the slot when the needle is closed.

2. A device as in claim 1, wherein the slot in the hook is V-shaped in cross section.

3. A device as in claim 1, wherein the opposite sides of the slot lie in intersecting planes.

4. A device as in claim 1, wherein the inner and outer faces of the tip portion of the hook lie approximately parallel to each other, and the slot extends approximately from one of said faces to the other.

5. A device as in claim 1, wherein the slot is V-shaped and the opposed faces of the slot are inclined from the front of the needle toward the rear thereof.

6. A device as in claim 5, wherein the slot in the hook is V-shaped in cross-section.

7. A device as in claim 1, wherein the inner and outer faces of the tongue are approximately parallel, and the ridge extends from one of said faces to the other.

8. A device as in claim 7, wherein the crest of the ridge is rounded from front to rear of the needle.

9. A device as in claim 8, wherein the crest of the ridge mates with the bottom of the slot in the closed position of the needle.

10. A device as in claim 8, wherein the terminal portion of the tongue has a face oblique to the body of the needle, and the hook has a slot shaped to mate with said face when the needle is closed.

11. A device as in claim 10, said slot in the hook having oppositely inclined faces to mate with the diverging lateral faces at the upper end of the tongue.

12. A device as in claim 1, wherein the opposed faces of the slot and the ridge are inclined from the front of the needle toward the rear and the opposed faces of the ridge are inclined oppositely laterally of the needle while those of the slot are inclined toward one another laterally of the same.

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