(Model.)

R. KIRKPATRICK.

NEEDLE FOR KNITTING MACHINES.

No. 491,117. Patented Feb. 7, 1893.

Fig. 1. Fig. 2. Fig. 4. Fig. 5. Fig. 7. Fig. 9.

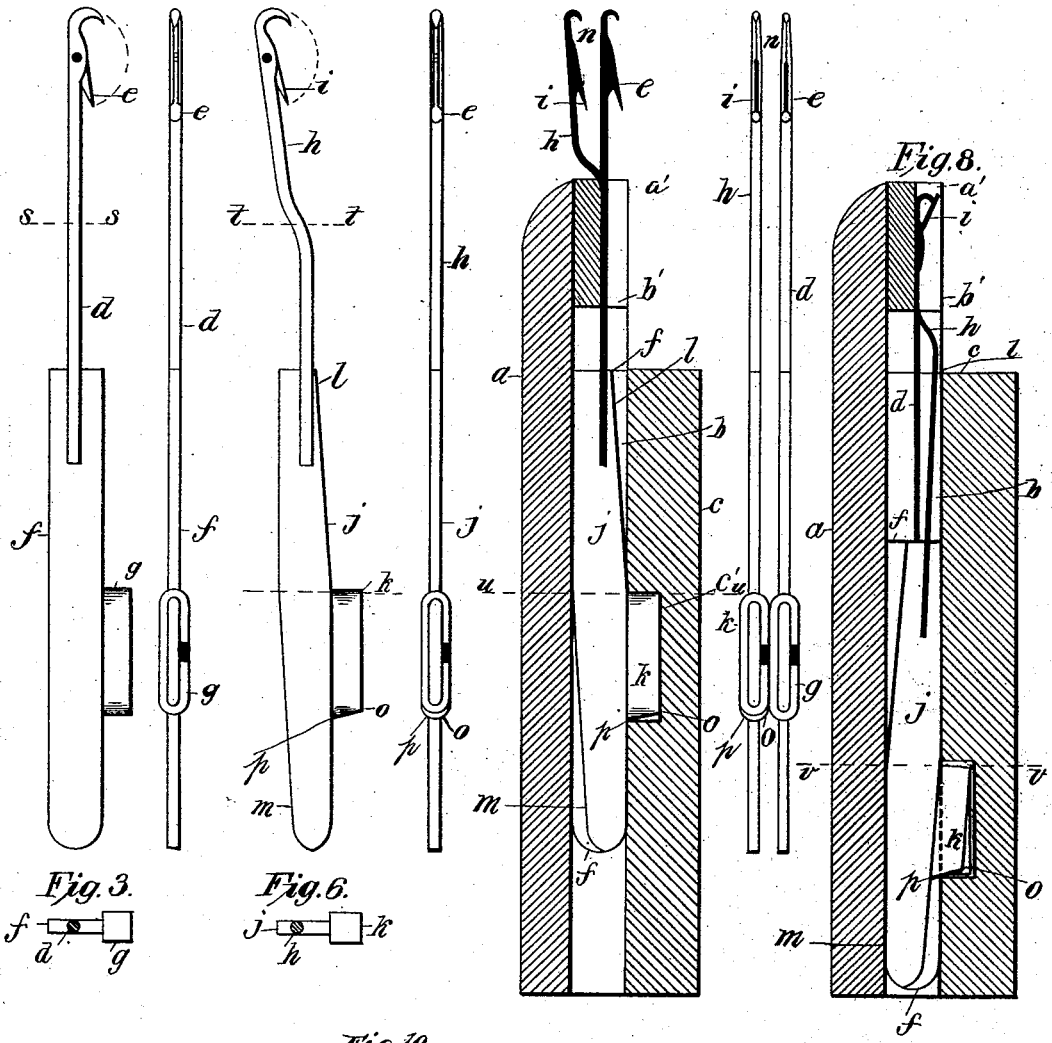
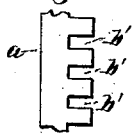


Fig. 8.

Fig. 3.

Fig. 6.

Fig. 10.



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NEEDLE FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 491,117, dated February 7, 1893.

Application filed May 31, 1890. Renewed November 12, 1891. Again renewed July 6, 1892. Serial No. 439,184. (Model.)

To all whom it may concern:

Be it known that I, ROGER KIRKPATRICK, a British subject, residing in the city of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Needles for Knitting-Machines, of which invention the following is a specification.

The object of my invention is so to construct the jacks of the bent needles, used with straight needles in machines of the kind above mentioned, that the bringing of the bent needles into line with the straight needles after the introduction of the weft thread, preparatory to casting off, shall occasion little, if any, friction on the needle cylinder, or cam cylinder, while at the same time I am enabled to use a crooked needle of uniform thickness from its latch to its jack.

My invention consists (first) in beveling off the front upper portion and the diagonally opposite or rear lower portion of the bent needle-jack sufficiently to allow said jack to rock to and fro in its cam groove without springing the needle; (second) in combining with the jack so constructed a bent needle of uniform thickness from its latch to its jack.

In the annexed drawings, Figure 1 is a side elevation and Fig. 2 a front elevation of a straight needle with its latch, jack, and cam groove projection or crank; Fig. 3 a section of the same on the line *s s* of Fig. 1; Fig. 4 a side elevation and Fig. 5 a front elevation of a bent needle of uniform thickness provided with its latch, beveled jack, and cam groove projection or crank; Fig. 6 a section of the same on the line *t t* of Fig. 4; Fig. 7 is a sectional elevation of parts of the needle cylinder and cam cylinder showing the relative positions of the straight needle jack and of the bent needle jack in the needle groove *b*, when the two needles are elevated to form the ordinary open space *n* for the reception of the weft thread; Fig. 8 is a similar view showing the relative positions of the same parts when the needles have come into their most depressed positions preparatory to casting off; Fig. 9 is a front view of the straight and of the bent needles with their respective jacks, showing that these two needles with their jacks work in the same sized needle groove. Fig. 10 is a plan of a portion of the ring *a'* attached to the top of the needle cylinder around the outside of the same.

a represents a portion of a needle cylinder; *b* a jack race; *b'* needle races; *c* a portion of a cam-cylinder; *d* a straight needle provided with its latch *e*, jack *f* and crank *g*. All these parts are in the ordinary form.

h represents a bent needle provided with the usual latch *i* and with its peculiarly constructed jack *j* and crank *k;* the upper front portion *l* and the lower back portion *m* of jack *j* being beveled off as shown in Figs. 4, 7 and 8 to allow jack *j* to oscillate to and fro in the jack race *b* and cam race *c'* on a pivotal point indicated by the dotted lines *u*, *u* and *v*, *v;* the lower face of the crank *k* from its front *o* to its rear *p* is slightly beveled, as shown in Figs. 4, 7 and 8 to admit of the free oscillation of the jack *j* as aforesaid, without affecting the length of the stitch.

a' Figs. 7, 8 and 10 represents the ring attached to the outside of the needle cylinder *a* at the top thereof.

b' represents the needle races in ring *a'*.

The bent needle being of the same thickness as the straight needle and of uniform thickness throughout from its latch to its junction with the jack and being free to oscillate in its race, the stitches formed on the bent needle are not stretched but are uniform in size with the stitches formed by the straight needle. When the needles rise to take the threads, the bent needles move backward thus forming the space between them and the straight needles for the weft thread. The stitches cause the backward tip of the bent needles by holding the jacks of these needles against the backs of the grooves while the respective bends or crooks are above the upper edge of the needle cylinder. In the descent of the bent needles when their backward bends come down to the upper edge of the ring *a'* this ring acts as a cam and tips the bent needles forward to the extent of their bends and thus brings the bent needles into line with the straight needles.

I claim:

1. A bent needle having a jack which is beveled off at its front upper and its diagonally opposite or back lower portion substantially as and for the purposes set forth.

2. A bent needle having a jack which is beveled off at its front upper and its diagonally opposite or back lower portion and provided with a beveled crank *k* substantially as and for the purpose set forth.

3. A bent needle uniform in thickness from its latch to its junction with the jack in combination with the jack which is beveled off at its front upper and diagonally opposite or back lower portion and provided with a beveled crank *k* substantially as and for the purpose set forth.

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