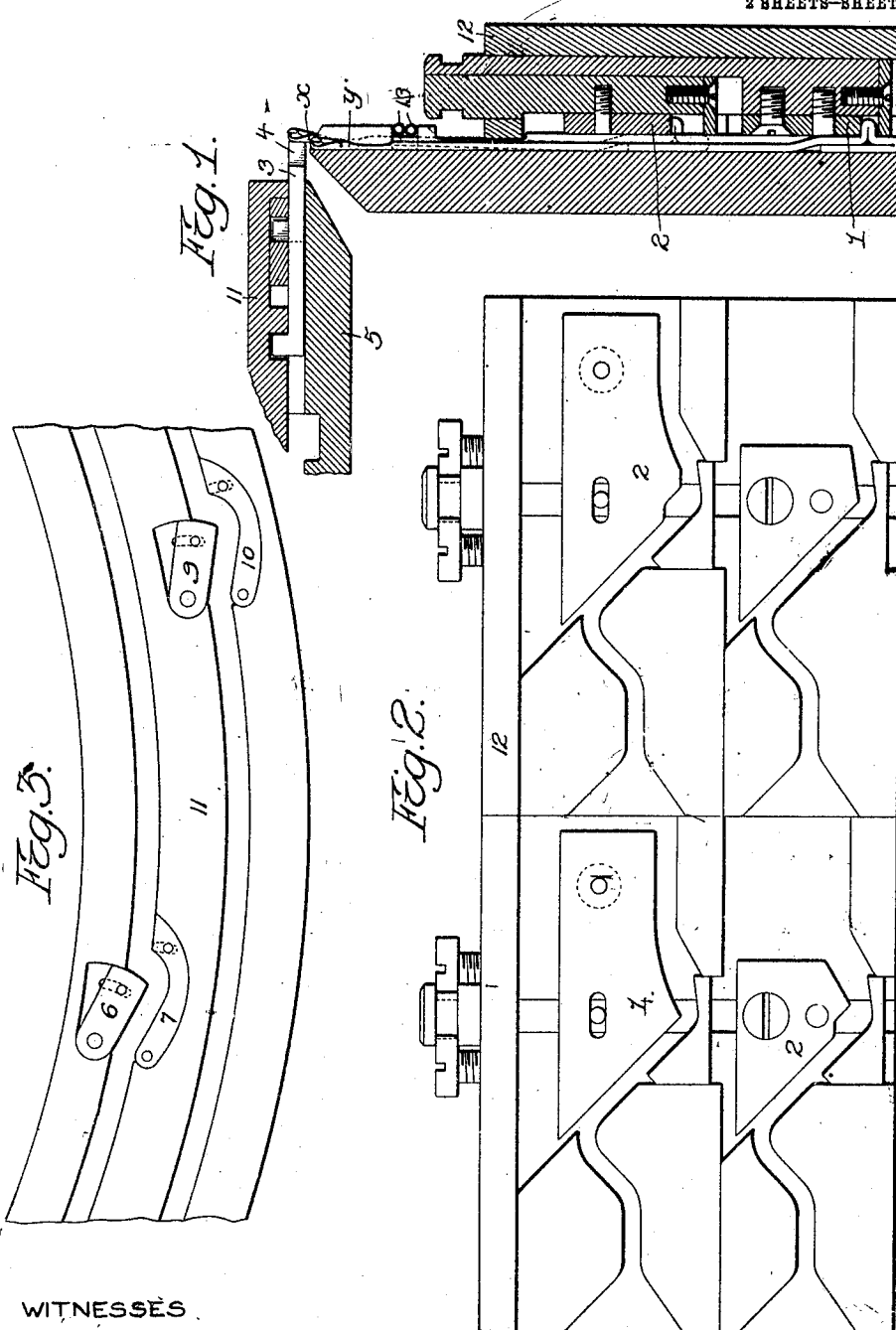


Patented June 3, 1913.

2 SHEETS-SHEET 1.

1,063,743.



WITNESSES

Hamilton D Turner
Elsie Fullerton

INVENTOR ROBERT W. SCOTT
BY HIS ATTORNEY

Harry Smith

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R. W. SCOTT.
KNITTING MACHINE.
APPLICATION FILED JUNE 28, 1911.

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2 SHEETS—SHEET 2.

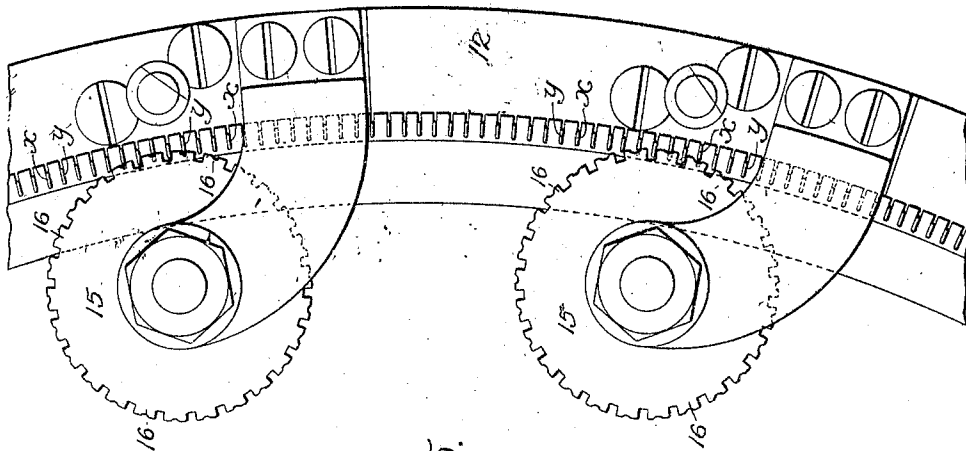


Fig. 5.

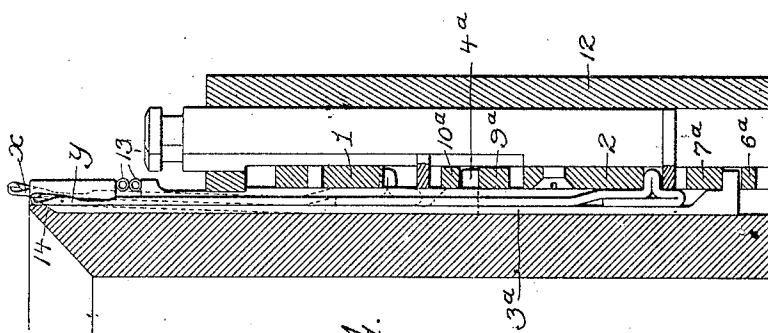


Fig. 4.

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KNITTING-MACHINE.

1,063,743.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed June 28, 1911. Serial No. 635,880.

To all whom it may concern:

Be it known that I, ROBERT W. SCOTT, a citizen of the United States, residing at Leeds Point, Atlantic county, New Jersey, have invented certain Improvements in Knitting-Machines, of which the following is a specification.

My invention consists of a certain improvement in the knitting machine forming the subject of my application for patent filed July 15, 1909, Serial No. 507,779, and intended for the production of the fabric forming the subject of my Letters Patent No. 928,221, dated July 13, 1909, the object of my invention being to increase the distinction between the long and short stitches of which said fabric is composed.

In the accompanying drawings Figure 1 is a sectional view of sufficient of a knitting machine of the type to which my invention relates to illustrate the said invention; Fig. 2 is a view showing, as developed in a flat plane, two sets of needle-actuating cams such as would be employed in the cam ring of an ordinary circular latch needle knitting machine intended for the production of my improved fabric; Fig. 3 is an inverted view of part of the cam cap for operating the jacks of the jack ring or dial which is employed in connection with the needle cylinder of the machine; Fig. 4 is a view similar to Fig. 1, but illustrating a modification of my invention, and Fig. 5 is a plan view illustrating another modification of the same.

In the machine shown in the application before referred to the needle cylinder was equipped with needles disposed in two sets, a needle or needles of one set alternating with a needle or needles of the other set throughout the machine, the needles of one set having their butts so disposed that they were actuated independently of the needles of the other set at each yarn feed, two sets of needle-actuating cams being employed, one for each set of needles. In said machine the draft cams were so disposed that at one feed the needles of one set were caused to knock over their stitches in advance of the knocking over of the stitches by the preceding needles of the other set with the result that the forcing of the loops over the inclined planes formed by the closed latches of said preceding needles caused such a strain upon the stitches which had been knocked over

on the following needles that the latter stitches were robbed of yarn and drawn tight, there being nothing to prevent this action owing to the fact that the stitches were free from the control of the needles and from all other restraining influences. At a succeeding feed the conditions were reversed, the needles of the set which at the preceding feed drew long stitches, being now the first to knock over and consequently producing the shorter stitches.

In practice I have found that it is not sufficient to depend upon the inclination of the latches of the needles to cause the tightening of the previously knocked over stitches, for if the hook of a needle is made sufficiently large to impose the necessary strain, it then becomes difficult to knock the preceding or short stitch over the enlarged hook, so that while the needle with the enlarged hook serves to assist the tightening of the stitch previously knocked over, the object is defeated to a certain extent by the fact that the stitch is knocked over with difficulty and hence there is danger of the full strain being imposed before the preceding stitch leaves its needle.

Manifestly, the smaller the hook of the needle the easier the stitches are knocked over, and, on the other hand, the larger the hook the greater the strain imposed. In knitting fine gage web, needles with small hooks are used and in devising my present machine I have therefore adopted the plan of tightening the knocked over stitch by displacing the hooked end of the preceding needle in order to impart the desired abnormal strain to the stitch which is formed upon said needle.

In Fig. 2 of the drawing, 1 represents the draft cam for one set of needles, in this case the short needles *x*, and 2 the draft cam for the other set or long needles *y* at one feed, the character of these cams being reversed at the second feed where the cam 1 acts on the long needles *y* and the cam 2 on the short needles *x*. Acting upon the hooked upper ends of the needles are two sets of jacks 3 and 4, which are guided radially in the jack ring or bed 5, the jacks 3 being in line radially with the long needles *y* and the jacks 4 being in line radially with the short needles *x*, the jacks 3 being acted upon by cams 6 and 7 and the jacks 4 being acted upon by similar cams 9 and 10 in a cam ring 11

which surmounts the jack bed or ring 5, and is caused to rotate by connection with the same mechanism which rotates the ring 12 carrying the needle-actuating cams 1 and 2 if the machine is one of the stationary cylinder type, or the cam ring being held stationary and the jack ring or bed 5 being caused to rotate with the cylinder if the machine is one of the rotating cylinder type. At the first feed, therefore, where the short needles knock over in advance of the long needles, said long needles will be displaced radially by the action of the jacks 3 upon their hooked upper ends so as to stretch or impart strain to the stitches upon said long needles and thereby cause said stitches to rob the preceding stitches which have been knocked over on the short needles and thus contract or shorten said stitches, while at the second feed, where the long needles are first to knock over, the short needles will be acted upon by the jacks 4 with like results upon the stitches upon said short needles.

The needles are acted upon by the usual encircling spring bands 13 as shown in Fig. 1, so that when the jacks are retracted the needles which have been displaced thereby will be restored to their normal position in the needle cylinder and the knocking over of the stitches upon said displaced needles can thus be easily accomplished, the strain upon the stitches being independent of this knocking over action. The cams which actuate the jacks 3 and 4 are adjustable, as shown in Fig. 3, so that the extent of projection of either set of jacks can be readily governed to accord with the desired displacement of the needles acted upon thereby, the desired elongation or enlargement of the stitches produced upon said needles, and the consequent contraction or shortening of the stitches previously knocked over upon adjacent needles.

Various means other than those which I have previously described may be adopted in accordance with my invention for effecting the desired result. For instance, in Fig. 4, I have illustrated a construction in which jacks 4^a are located in the needle grooves behind the short needles *x* and jacks 3^a are located in the needle grooves behind the long needles *y*, these jacks being controlled, respectively, by cams 9^a and 10^a and by cams 6^a and 7^a carried by the cam ring 12 and being acted upon at their upper ends by a cam surface 14 at the top of the needle cyl-

inder, so that when either jack is raised vertically its upper end will be pushed outward by engagement with this cam surface and will consequently push outward the top portion of the needle behind which the jack is disposed, the jacks which cooperate with the short needles being actuated at one feed and those which cooperate with the long needles being actuated at a succeeding feed, or instead of using reciprocating jacks I may employ, at each feed, a rotating wheel 15 having projecting bits 16 which act upon alternate needles so as to radially displace the upper ends of the same, the wheel at one feed being constructed to act upon the short needles only and that at the other feed being constructed to act upon the long needles only, as shown in Fig. 5.

I claim:

1. A knitting machine having two sets of needles alternately disposed, means for knitting upon said needles, means for causing needles of one set to knock over their stitches in advance of preceding needles of the other set, and means for displacing said preceding needles in a direction transverse to that of their reciprocation so as to cause the stitches upon them to draw upon the stitches knocked over by the other needles.

2. A knitting machine having two sets of needles alternately disposed, means for knitting upon said needles, means for causing needles of one set to knock over their stitches in advance of preceding needles of the other set, and reciprocating jacks acting upon said preceding needles so as to cause the stitches upon them to draw upon the stitches knocked over on the other needles.

3. A knitting machine having two sets of needles alternately disposed, means for knitting upon said needles, means for causing needles of one set to knock over their stitches in advance of preceding needles of the other set, a jack bed having therein reciprocating jacks for acting upon the upper portions of the needles and displacing them from their normal position in the needle cylinder, and a cam carrier having cams for actuating said jacks in alternation.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ROBERT W. SCOTT.

Witnesses:

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HAMILTON D. TURNER.