

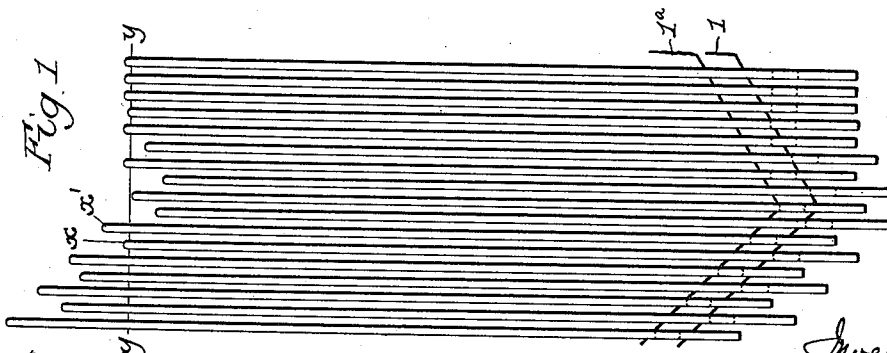
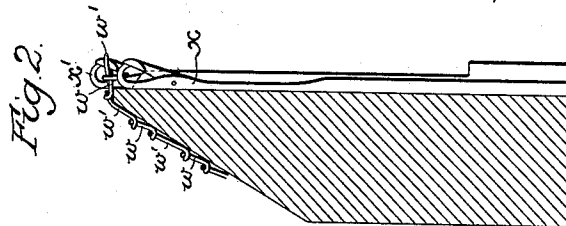
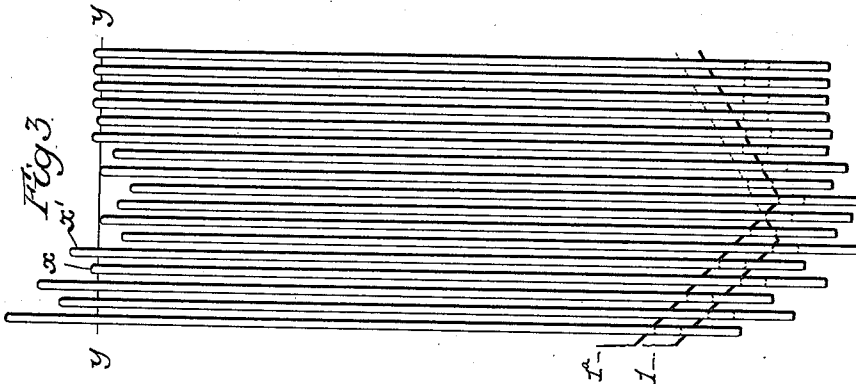
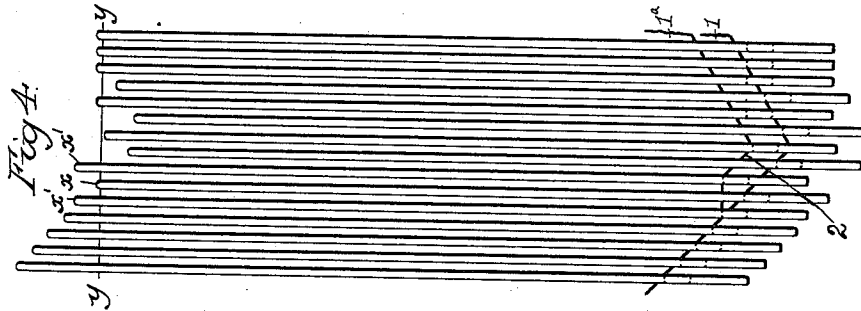
R. W. SCOTT.
KNITTING MACHINE.

APPLICATION FILED JULY 15, 1909.

1,034,521.

Patented Aug. 6, 1912.

2 SHEETS-SHEET 1.



Witnesses
Kamille D. Zimmer
Harry L. Smith

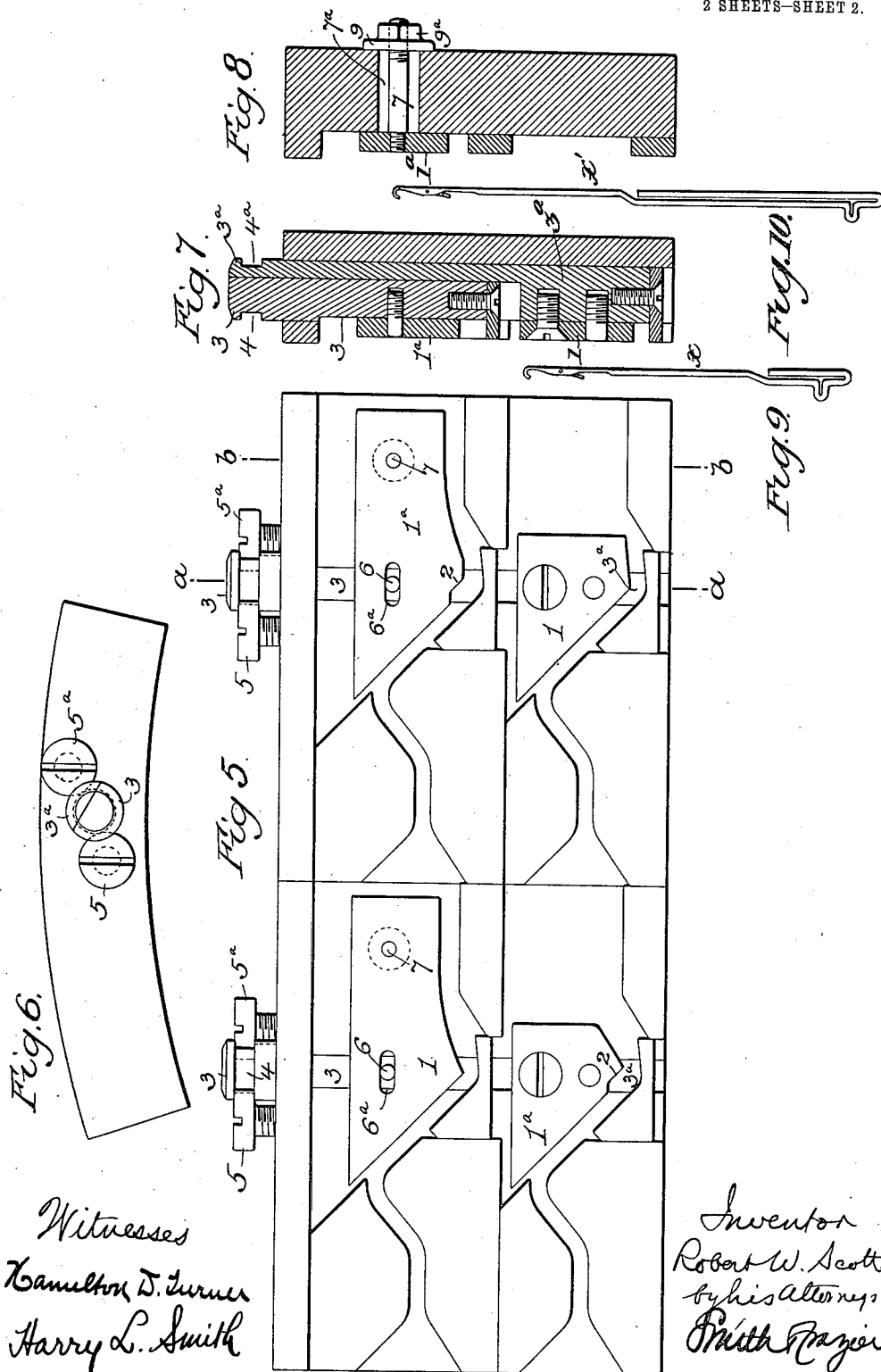
Inventor
Robert W. Scott
by his Attorneys
Smith & Raper

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2 SHEETS-SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

ROBERT W. SCOTT, OF LEEDS POINT, NEW JERSEY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO SCOTT & WILLIAMS, INCORPORATED, OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

KNITTING-MACHINE.

1,034,521.

Specification of Letters Patent.

Patented Aug. 6, 1912.

Application filed July 15, 1909. Serial No. 507,779.

To all whom it may concern:

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

My invention consists in so constructing and combining certain elements of an ordinary knitting machine that the same will be adapted for the production of the peculiar type of fabric forming the subject of my Letters Patent No. 928,221, dated July 13, 1909.

In the accompanying drawings—Figure 1 is a diagrammatic representation of a succession of knitting machine needles and of parts of the draft cams for actuating the same, the view being explanatory of the principal feature of my invention; Fig. 2 is a sectional view of part of the upper portion of a knitting machine cylinder and two adjoining needles illustrating the action of the same in producing the desired result; Fig. 3 is a view similar to Fig. 1 but illustrating a modification of my invention; Fig. 4 is also a view similar to Fig. 1 but illustrating a special conformation of draft cams which is preferred; Fig. 5 is a view representing two sets of needle-actuating cams such as would be employed in an ordinary circular, latch needle knitting machine, intended for the production of the improved fabric, these cams being developed in a flat plane instead of on the arc of a circle as they would actually appear in a circular machine; Fig. 6 is a top or plan view of a section of the cam cylinder carrying one set of cams; Fig. 7 is a transverse vertical section on the line *a—a*, Fig. 5; Fig. 8 is a transverse vertical section on the line *b—b*, Fig. 5. Figs. 9 and 10 are side views of the two different types of needle used in the machine.

In a machine such as that forming the subject of my present invention, the needle cylinder will be 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 have their butts so disposed that they can be actuated independently of the needles of the other set, and at each yarn feed two sets of needle-actuating

cams are employed, one for each set of needles.

If two similar draft cams are placed directly one above the other so that a vertical line will pass through the point of each cam and if greater draft is given to one cam than to the other, the effect will be to advance the working face of the cam having the greater draft. Thus, as indicated in Fig. 1, the working face of the long draft cam 1 is in advance of the working face of the shorter draft cam 1^a. The consequence of this will be to cause the long draft needle *x* to knock over its stitch in advance of the knocking over of the stitch by the preceding short draft needle *x'*, as will be understood in reference to Fig. 1, in which the line *y—y* represents the top of the needle cylinder or the knocking over point of the needles. The result of this action will be that the forcing of the loop *w'* over the inclined plane formed by the closed latch of said preceding needle *x'*, as shown in Fig. 2, will cause such a strain upon the stitch *w*, which has just been knocked over on the following long draft needle *x*, that said stitch will be robbed of its yarn and drawn tight, there being nothing to prevent this action, owing to the fact that the stitch is free from the control of its needle and from all other restraining influences and is not subsequently subjected to any influence tending to enlarge it.

The novelty of my invention, therefore, resides mainly in the fact that, of a given pair of needles, the following needle will knock over its stitch before the like operation is accomplished by the needle in advance. The same effect would be produced if both of the cams had the same draft but the acting face of one was set in advance of the acting face of the other, as will be fully understood in reference to Fig. 3. If, however, both cams are alike and one is set in advance of the other, difficulty sometimes arises in certain gages of machine because of the vertical separation of the hooked ends of the needles from the beginning to the end of the draft. If the hooked ends of the needles of one set are higher than those of the other set at the yarn-receiving point, they may not take the yarn properly, the low needles tending to miss the yarn if the

yarn-guiding eye is set to properly feed the high needles, or, if the yarn-guiding eye is properly set to feed the low needles, the yarn is liable to be trapped by the latches of the high needles. In order to overcome this objection the cams may be so formed as to act in the same manner as a single cam upon both sets of needles during the earlier portion of the draft, when the yarn is being fed to the needles, but when the needles are about to knock over, proper "advance" of the working face of one cam in respect to the other may be effected by virtue of a short displaced working face of one of the cams, as shown, for instance, at 2, in Fig. 4.

In an organized knitting machine it would be impracticable to arrange the draft cams close together as they are shown in the diagrammatic views, such arrangement being there adopted simply for the purpose of conveying a clearer understanding of the essential features of my invention. In such organized knitting machine the needles of one set will, by preference, be sufficiently longer than those of the other set as to provide for the location of the various knitting cams in two planes one above the other, as shown in Fig. 5, the knitting cams of the upper plane acting upon the short needles and those of the lower plane acting upon the longer needles. The disposition of the cams 1 and 1^a will also be reversed at successive yarn feeds, as shown in Fig. 5, so that the needles which produce long stitches in one course will produce short stitches in a succeeding course and vice-versa.

As before indicated, my invention is susceptible of embodiment in a machine in which all of the needles have the same draft, so long as the working faces of the draft cams bear such relation to each other that a needle of one set may knock over its stitch in advance of the preceding needle of the other set, since the relative size of the stitches is due to such relative timing of the needle movements rather than to their relative draft.

In order to provide for independent vertical adjustment of the cams 1 and 1^a, to determine the length of stitch drawn thereby, these cams are carried by a two-part rod or post 3—3^a, suitably guided vertically in the cam cylinder, or other cam carrier, the member 3 of the post carrying the upper draft cam 1 and the member 3^a of said post carrying the lower draft cam, as shown in Figs. 5 and 7, and in order to provide for independent adjustment of these members of the post, that portion of each member which projects above the top of the cam cylinder is grooved or recessed, as shown, respectively, at 4 and 4^a, in Fig. 7, the groove 4 receiving the head of an adjusting screw 5, and the groove 4^a receiving the head of a corresponding adjusting screw 5^a.

It is also of importance that the "lead" of the needles should be controllable, for it has been found that while, in a certain gage of machine, say one having sixteen needles to the inch, straight faced draft cams having their points in direct vertical alinement with each other will operate properly to produce the desired result, the operative conditions are changed when the gage, or space between the needles, is materially altered; the mere difference in vertical adjustment of the cams producing either too much lead or insufficient lead. In order that the lead may be controlled independently of vertical adjustment, I provide means for the circumferential adjustment of one cam in respect to the other, thus, as shown in Figs. 5, 6 and 7, I mount the upper draft cam 1 or 1^a on the post member 3 by providing the latter with a pin 6, which is adapted to a longitudinal slot 6^a in the cam, as shown in Fig. 5, another pin 7 on the cam passing through an enlarged opening 7^a in the cam cylinder and being provided, at its outer end, with a washer 9 and nut 9^a, whereby it may be secured in position after it has been properly adjusted on the cam cylinder.

I claim:

1. A knitting machine having two sets of alternating needles both drawing stitches in the same direction, and means for knitting upon said needles, said means including means for causing a needle of one set to knock over its stitch in advance of the preceding needle of the other set.
2. A knitting machine having two sets of alternating needles both drawing stitches in the same direction, and means for knitting upon said needles, said means including means for causing a needle of one set to knock over its stitch in advance of the preceding needle of the other set, said preceding needles being of different sets at successive yarn feeds.
3. A knitting machine having two sets of alternating needles both drawing stitches in the same direction, and means, including draft cams, for knitting thereupon, said draft cams having acting faces bearing such relation to one another that a needle of one set is caused to knock over its stitch in advance of the preceding needle of the other set.
4. A knitting machine having two sets of alternating needles both drawing stitches in the same direction, and means, including draft cams, for knitting thereupon, said draft cams having acting faces bearing such relation to one another that a needle of one set is caused to knock over its stitch in advance of the preceding needle of the other set, said preceding needles being of different sets at successive yarn feeds.
5. A knitting machine having two sets of

alternating needles both drawing stitches in the same direction, means for knitting thereupon, including draft cams, whereby needles of one set have a longer draft than those of the other set, and means whereby a long draft needle of one set is caused to knock over its stitch in advance of a preceding short draft needle of the other set.

6. A knitting machine having two sets of alternating needles both drawing stitches in the same direction, means for knitting thereupon, including draft cams, whereby needles of one set have a longer draft than those of the other set, and means whereby a long draft needle of one set is caused to knock over its stitch in advance of a preceding short draft needle of the other set, the relative drafts of the sets of needles being reversed at successive yarn feeds.

7. A knitting machine having two sets of alternating needles both drawing stitches in the same direction, and means, including draft cams, for knitting thereupon, said draft cams having acting faces bearing such relation to one another that a needle of one set is caused to knock over its stitch in advance of the preceding needle of the other set, and one of said draft cams being adjustable in respect to the other so as to vary its lead.

8. A knitting machine having two sets of alternating needles both drawing stitches in the same direction, and means, including draft cams, for knitting thereupon, said draft cams having acting faces bearing such relation to one another that a needle of one set is caused to knock over its stitch in advance of the preceding needle of the other set, and being adjustable independently of each other in the direction of the draft, and one of the cams being adjustable in respect to the other to vary its lead.

9. A knitting machine having two sets of alternating needles both drawing stitches in the same direction, and means for knitting thereupon, said means including a draft cam for each set of needles, and a two-part post one member of said post overlying the other and carrying the draft cam for one set of needles and the other member of the post carrying the draft cam for the other set of needles.

10. A knitting machine having two sets of

alternating needles both drawing stitches in the same direction, and means for knitting thereupon, said means including a draft cam for each set of needles, and a two-part post, one member of said post overlying the other and carrying the draft cam for one set of needles and the other member of the post carrying the draft cam for the other set of needles, and the draft cam carried by one member of the post being adjustable transversely thereto.

11. A knitting machine having two sets of alternating needles both drawing stitches in the same direction, and means for knitting thereupon, said means including a draft cam for each set of needles, and a two-part post, one member of said post overlying the other and carrying the draft cam for one set of needles and the other member of the post carrying the draft cam for the other set of needles, and the draft cam carried by one member of the post being adjustable transversely thereto and provided with means for securing it in position after such adjustment.

12. A knitting machine having two sets of alternating needles and means, including draft cams, for knitting thereupon, said draft cams having acting faces which are alike as to both sets of needles throughout the greater portion of their extent, one of the cams having a dwell whereby the retraction of the needles of one set in respect to those of the other set is delayed when they approach the knocking-over point.

13. A knitting machine having two sets of alternating needles both drawing stitches in the same direction, and means, including draft cams, for knitting thereupon, said draft cams having their acting faces so disposed as to operate the needles in the same manner as a single draft cam during the earlier portion of the draft but one of the draft cams having a short retracted working face adjacent to its point.

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

ROBERT W. SCOTT.

Witnesses:

HAMILTON D. TURNER,
KATE A. BEADLE.