

J. D. MORLEY.
RIB KNITTING MACHINE.
APPLICATION FILED JULY 27, 1909.

Patented Aug. 15, 1911.

2 SHEETS—SHEET 1.

1,000,837.

Fig. 4.

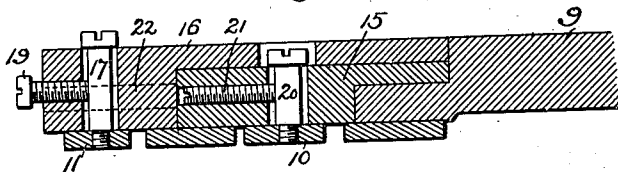
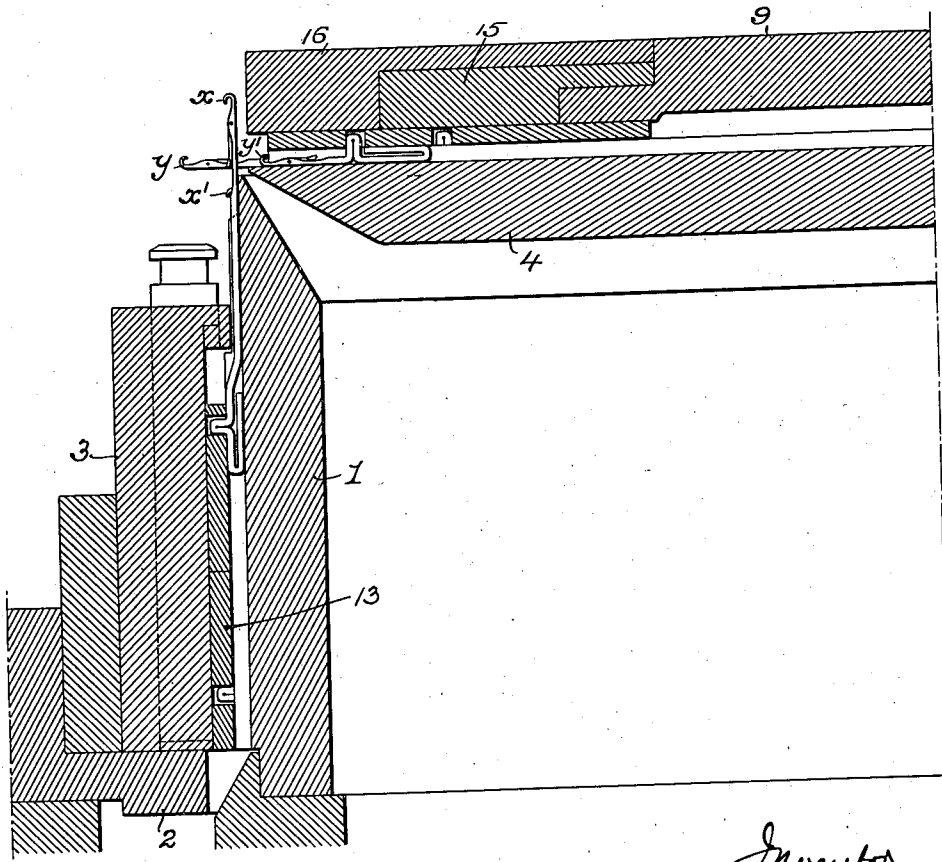
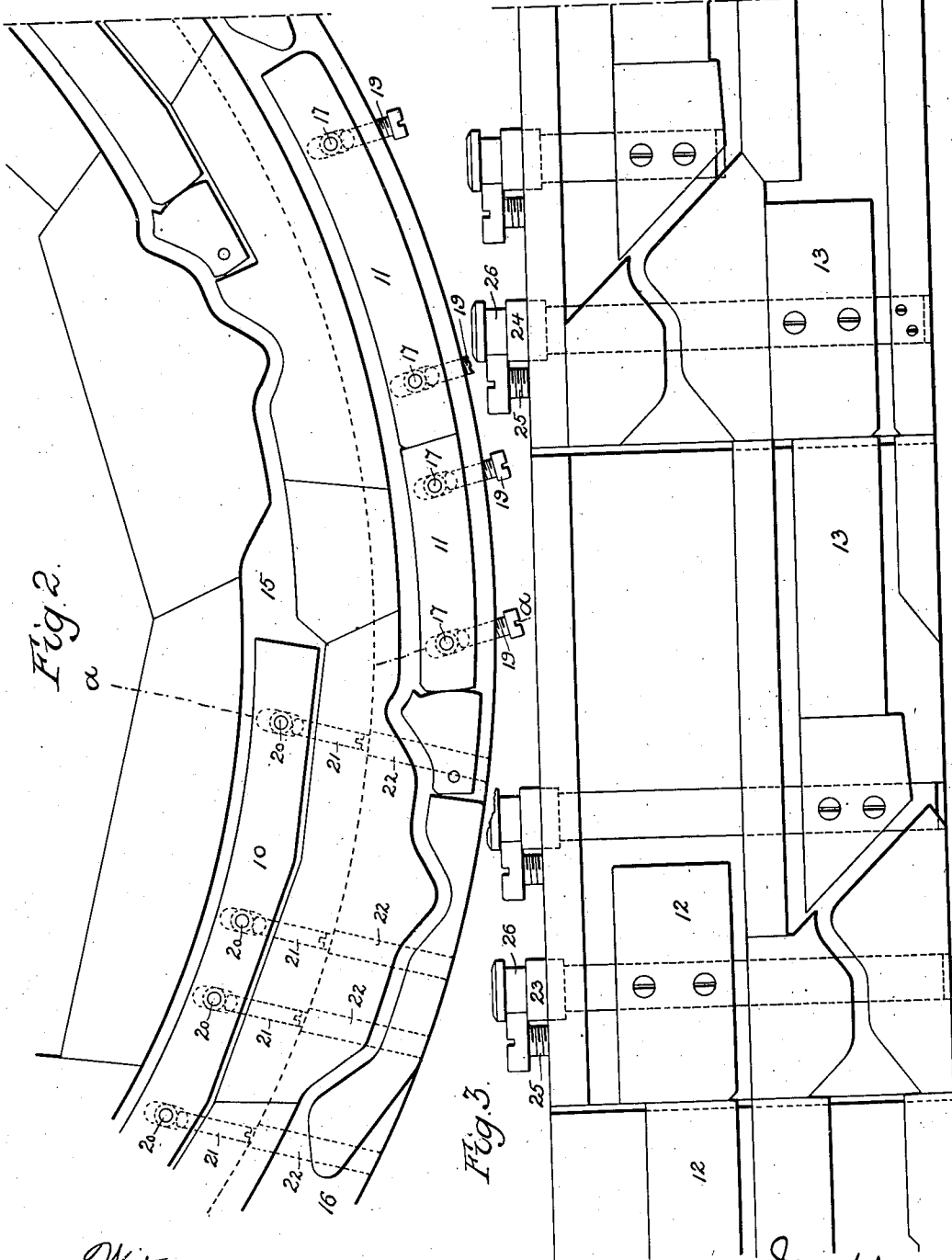


Fig. 1.



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UNITED STATES PATENT OFFICE.

JOSEPH D. MORLEY, OF UTICA, NEW YORK, ASSIGNOR TO GENERAL KNIT FABRIC COMPANY, OF UTICA, NEW YORK, A CORPORATION OF NEW YORK.

RIB-KNITTING MACHINE.

1,000,837.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed July 27, 1909. Serial No. 509,838.

To all whom it may concern:

Be it known that I, JOSEPH D. MORLEY, a citizen of the United States, residing in Utica, New York, have invented certain improvements in Rib-Knitting Machines, of which the following is a specification.

My invention consists of certain improvements in the rib knitting machine forming the subject of R. W. Scott's Letters Patent No. 925,393, dated June 15, 1909, the object of my present invention being to prevent displacement of the stitches upon the needles of the idle set in each needle carrier when the needles of the active set in the other carrier are being advanced so as to engage the knitting yarn. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of sufficient of a knitting machine of the type to which my invention relates to illustrate the position of the needles of the two sets at the time that one set of needles is being employed for knitting the web and the other set of needles is idle or out of action; Fig. 2 is an inverted plan or bottom view of part of the dial cam ring of the machine, illustrating two of the sets of cams with which said dial cam ring is provided; Fig. 3 is a view showing two sets of cams of the cylinder cam ring developed in a flat plane, and Fig. 4 is a transverse vertical section on the line $a-a$, Fig. 2.

The machine, like that of the patent before referred to, is intended for the production of a fabric comprising two ribbed webs interlocked by the crossing of their sinker wales, a needle wale or wales of one web alternating with a needle wale or wales of the other web on each face of the fabric.

The invention is applicable to either straight or circular machines and in the present instance I have illustrated it as applied to a machine of the circular type as in the former patent.

In Fig. 1 of the drawing, 1 represents the needle cylinder which is vertically grooved for the reception and guidance of its needles and is suitably secured to the fixed base or bed plate of the machine. Surrounding the needle cylinder is a cylindrical cam ring 3 upon whose inner face are mounted cams for imparting reciprocating movement to

the cylinder needles, said cam ring being secured to a rotatable ring 2 to which power may be applied in any of the usual ways.

The needle dial 4 may be mounted as in the machine of the former patent, or in any other suitable way, and held in stationary relation with the needle cylinder 1 either by the means shown in said patent or other available means, and above the dial is located the dial cam ring 9 upon whose under face are mounted the cams whereby reciprocating movement is imparted to the needles which are guided in the radially grooved upper face of the dial, said dial cam ring being caused to rotate with the cylinder cam ring in any ordinary way.

While I have selected, for the purpose of illustrating my invention, a machine of that type in which the needle cylinder and dial are stationary and cooperate with a rotating cylinder cam ring and a rotating dial cam ring, my invention is equally applicable to that type of machine in which these conditions are reversed, the cylinder cam ring and dial cam ring being the stationary elements and the needle cylinder and dial the rotating elements, and the invention is, as before indicated, applicable to machines having straight needle beds and reciprocating cam carriers.

Both the needle cylinder and dial are equipped with two sets of needles, one set for producing one of the ribbed webs and the other set for producing the other ribbed web, the needles of each set in each needle carrier being disposed with respect to the needles of the corresponding set in the other carrier in accordance with the character of the ribbed fabric which is to be produced, thus, if each of the ribbed webs is to be a one-and-one web, single needles of each set in one carrier will alternate with single needles of the corresponding set in the other carrier, while if each ribbed web is to be a two-and-two web, pairs of needles of each set in one carrier will alternate with pairs of needles of the corresponding set in the other carrier, other forms of rib requiring a corresponding change in the grouping of the needles and their disposal in respect to one another.

In Fig. 1 of the drawing x represents one of the needles of one set in the cylinder and y represents one of the needles of the corre-

sponding set in the dial, x' and y' representing needles of the other set in the cylinder and dial, respectively. As in the former machine, the needles x and y cooperate at one yarn feed to produce one of the ribbed webs and the needles x' and y' cooperate at a succeeding yarn feed to produce the other ribbed web, each set of needles being inoperative at the time that the other set is knitting.

It has been found in practice that when the needles of one set in one needle carrier are being projected at the knitting point to receive the yarn for knitting one web, they have a tendency to roll the stitches of the other web over the hooks of the inactive needles of the other carrier so that the latter, when in turn projected at their knitting point, sometimes pass through a stitch of a preceding course and thus produce defective web. I find, however, that this tendency can be overcome if the hooks of the idle needles are drawn some distance inwardly from the edge of the needle carrier in which they are mounted, as shown in Fig. 1, and my invention therefore consists mainly in providing each of the cam rings or cam carriers with means for effecting this retraction of the idle needles during the time that the needles of the other set are being projected so as to knit.

In Fig. 2, a hold-back cam for one set of dial needles is represented at 10 and a hold-back cam for the other set of dial needles is represented at 11, a hold-back cam for one set of cylinder needles being represented at 12 in Fig. 3 and a hold-back cam for the other set of said cylinder needles being represented at 13 in said figure. It is also preferable to render the hold back cams adjustable either wholly as at 10 and 11 in Fig. 2, or as to that part which is acting upon the idle needles at the time when the needles of the other set are knitting, as, for instance, at 12 and 13 in Fig. 3, and, to facilitate the construction of the cam ring I make the latter in sections, the ring comprising the central member 9, an intermediate member 15 and an outer member 16, as shown in Fig. 4, the outer member 16 carrying the outer hold-back cam 11, and the intermediate member 15 carrying the inner hold-back cam 10, both the outer and the intermediate members being secured to the central member 9 in such a manner as to insure the desired rigidity of the ring. The outer hold-back cam 11 is of sectional construction and each of these sections is secured to the outermost member 16 of the cam ring by means of a bolt 17 passing through a slot in said member 16 and having a head bearing upon the back of the latter, adjustment being effected by means of a screw 19 adapted to a threaded opening in the outer ring member. In like manner the inner hold-back cam 10 is secured

to the intermediate member 15 of the cam ring by means of bolts 20 and is adjusted by means of screws 21 suitably disposed, the outermost member 16 of the cam ring having openings 22 registering with said screws in order that the latter may be readily accessible without the necessity of removing the outermost member of the ring. The adjustable members of the hold-back cams 12 and 13 of the cylinder cam ring are carried by posts 23 and 24 suitably mounted in said cylinder cam ring and adjusted by means of screws 25 which have heads engaging with grooved portions 26 of said posts, as shown in Fig. 3. The adjustment of the hold-back cams, or portions of the same, provides for the proper control of the position of the idle needles irrespective of the character of yarn which is being used or the length of stitch which is being drawn by said needles when they are in action.

While I have shown in the drawings the cams for actuating the needles so as to cause them to knit, I have not considered it necessary to describe these cams as they constitute no essential part of my invention and may be modified in many different ways without affecting the performance of their proper functions by those parts of the machine to which my invention actually relates.

I claim:

1. The combination, in a knitting machine for producing ribbed fabric, of two needle carriers each having two sets of needles, needle-operating mechanism and a yarn supply cooperating with the needles of one set in each carrier to produce stitches, needle-operating mechanism and a yarn supply cooperating with the needles of the other set in each carrier to produce other stitches in the spaces between those first produced, and means for withdrawing the hooks of the idle needles in one carrier inwardly beyond the edge of said carrier at the time when the needles of the other carrier are being projected whereby the latter needles are prevented from rolling the stitches over the hooks of the retracted needles of the other set.

2. The combination, in a knitting machine for producing ribbed fabric, of two needle carriers each having two sets of needles, needle-operating mechanism and a yarn supply cooperating with the needles of one set in each carrier to produce stitches, needle-operating mechanism and a yarn supply cooperating with the needles of the other set in each carrier to produce other stitches in the spaces between those first produced, and means for withdrawing the hooks of the idle needles in one carrier inwardly beyond the edge of said carrier at the time when the needles of the other carrier are being projected, whereby the latter needles are prevented from rolling the stitches over the

hooks of the retracted needles of the other set, said means being adjustable to vary the extent of said retraction of the needles.

3. The combination, in a knitting machine
5 for producing ribbed fabric, of two needle carriers each having two sets of needles, needle-operating mechanism and a yarn supply cooperating with the needles of one
10 set in each carrier to produce stitches, needle-operating mechanism and a yarn supply cooperating with the needles of the other set in each carrier to produce other stitches in the spaces between those first produced,
15 a hold-back cam for acting upon the idle needles of one carrier at the time that the needles of the other carrier are being projected, whereby the latter needles are prevented from rolling the stitches over the
20 hooks of the retracted needles of the other set and means for adjusting said hold-back cam so as to vary the position of the hooks of the idle needles in respect to the edge of their carrier.

4. The combination, in a knitting machine
25 for producing a ribbed fabric, of two needle carriers each having two sets of needles, needle-operating mechanism and a yarn supply cooperating with the needles of one set in each carrier to produce stitches,
30 needle-operating mechanism and a yarn supply cooperating with the needles of the other set in each carrier to produce other stitches in the spaces between those first produced, a hold-back cam for actuating upon the
35 idle needles of one carrier at the time that the needles of the other carrier are being projected, whereby the latter needles are prevented from rolling the stitches over the hooks of the retracted needles of the other

set and means for adjusting said hold-back
40 cam so as to vary the position of the hooks of the idle needles in respect to the edge of their carrier, said means comprising adjusting screws for shifting the position of the hold-back cam and locking bolts for
45 securing said hold-back cam in its adjusted position.

5. The combination, in a knitting machine for producing ribbed fabric, of two
50 needle carriers each having two sets of needles, needle-operating mechanism and a yarn supply cooperating with the needles of one set in each carrier to produce stitches, needle-operating mechanism and a yarn
55 supply cooperating with the needles of the other set in each carrier to produce other stitches in the spaces between those first produced, hold-back cams for retaining the
60 idle needles in one carrier when the active needles in the other carrier are being projected, whereby the latter needles are prevented from rolling the stitches over the
65 hooks of the retracted needles of the other set and a cam ring comprising members detachable from one another, one member carrying the holdback cam and adjusting
70 devices for one set of needles and the other member carrying the hold-back cam and adjusting devices for the other set of needles.

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

JOSEPH D. MORLEY.

Witnesses:

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