No. 625,234. Patented May 16, 1899.

J. ADAMS.

KNITTING MACHINE.

(Application filed Mar. 31, 1898.)

(No Model.)

Fig. 1.

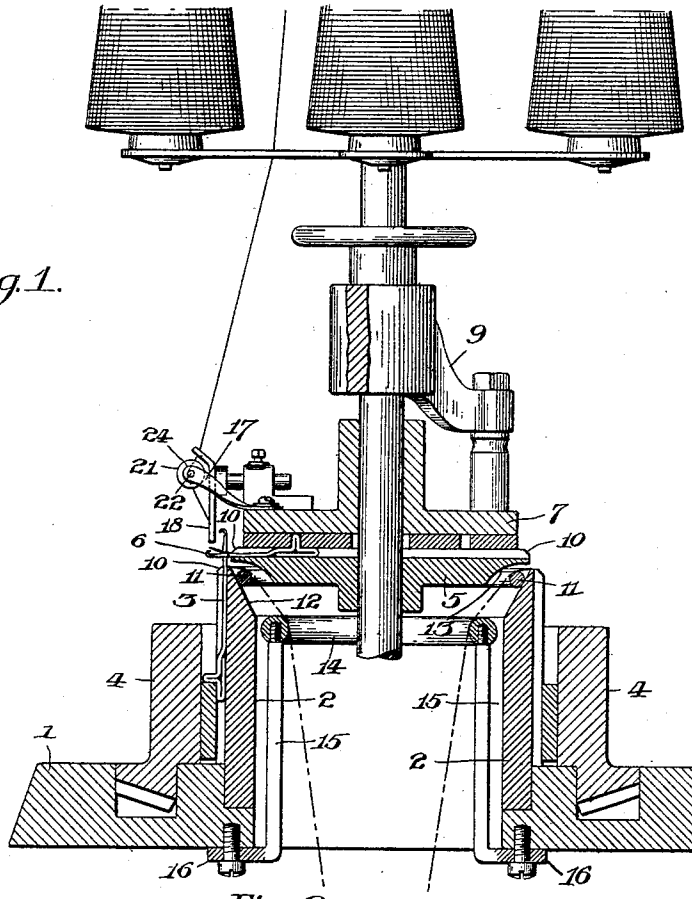


Fig. 2.

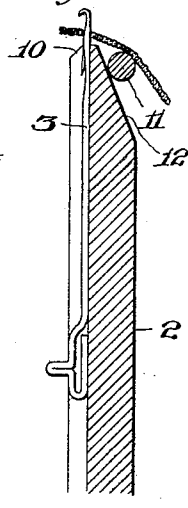


Fig. 3.

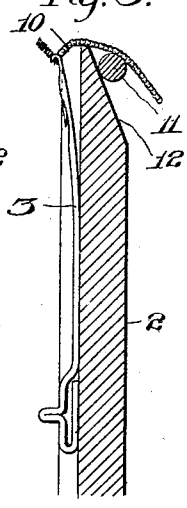


Fig. 4.

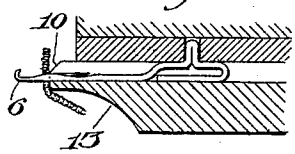


Fig. 5.

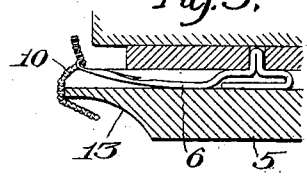
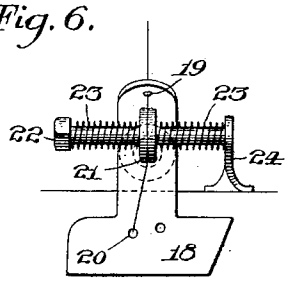


Fig. 6.



WITNESSES:

A. V. Groupe

Walter C. Pusey.

INVENTOR

John Adams

By John R. Nolan

ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN ADAMS, OF PHILADELPHIA, PENNSYLVANIA.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 625,234, dated May 16, 1899.

Application filed March 31, 1898. Serial No. 675,848. (No model.)

To all whom it may concern:

Be it known that I, JOHN ADAMS, a citizen of the United States, residing in the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Knitting-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to rib-knitting machines of the class wherein are employed two sets of needles of which one set works in a vertical cylinder and the other in a horizontal dial, my aim being to provide a certain construction of cylinder and dial whereby is effectually obviated the breaking of the needle-hooks heretofore resulting from the accumulation of defective work on the needles or the feeding of irregular or knotted thread thereto, and also to provide upon the inner edge of the cylinder, adjacent to the dial, a welt-supporting ring which may be applied to or removed from the machine, as convenience or necessity may require, all as will be hereinafter fully described and claimed.

In the drawings, Figure 1 is a transverse vertical section through the head and adjuncts of a rib-knitting machine embodying my invention. Fig. 2 is a section through one side of the cylinder, showing a descending needle therein and an accumulation of thread or defective work in the path of the needle-hook. Fig. 3 is a similar section showing the action of the cylinder upon such accumulation and the manner in which the needle-hook is preserved. Figs. 4 and 5 are sections similar to Figs. 2 and 3, respectively, of the dial and its needle. Fig. 6 is an elevation of the tension device and thread-guide.

The numeral 1 designates the bed of the machine; 2, the vertical needle-cylinder affixed thereto; 3, the needles in the vertical grooves of said cylinder, and 4 the rotatable cam-cylinder carrying the usual cams for actuating such needles.

5 is the stationary dial, in the radial grooves of which the horizontal needles 6 are fitted.

7 is the rotatable dial cam-plate fast to the vertical spindle 8, the latter being secured to the arch 9, which is in turn connected with the cam-cylinder and rotated thereby.

The parts just mentioned are, excepting as hereinafter explained, identical in construction and operation with the like parts of well-known rib-knitting machines.

The main feature of my invention consists in so constructing the walls of the needle-grooves in both the cylinder and the dial that in the event of an accumulation of thread or defective work in the path of the hooks of either the vertical or dial needles or in the event of the delivery of thick or irregular thread thereto the hooked ends of such needles will be drawn or lifted to the outer edges of the respective walls in a manner to relieve the hooks from the undue strain and consequent liability of breakage to which they would otherwise be subjected. Accordingly the outer end of each of such walls at or beyond the point thereon where the thread is drawn by the adjacent needles is beveled or inclined, as indicated at 10. The bevel or incline lies in the path of the thread accumulation as the latter is drawn downward or inward by the receding needle-hook, which accumulation in consequence rides upon the opposing bevel or incline and, perforce, draws the hooked end of the needle outwardly, as illustrated in Figs. 3 and 5. Such bevel or incline thus constitutes, in effect, a cam member. The accumulation just mentioned may be and usually is caused by the breaking of the thread on its passage either to the vertical or the dial needles—that is, upon such breakage the thread may miss several needles before it is reëngaged by succeeding needles, in which case that portion of the web in the intervening space runs off the needles therein and the portion subsequently knit between said needles collects until the tension of the downwardly-moving web is sufficient to draw off the accumulation.

Instead of the needle-cylinder and the dial being beveled or inclined, as above described, only one of them may be so constructed, but, of course, at a disadvantage.

I preferably provide means whereby the body of the welt is uniformly supported as rapidly as it is produced and the knitting of a comparatively wide welt attained. To this end a loose ring 11, preferably circular in cross-section, is supported upon the upper beveled portion 12 of the vertical cylinder,

so as to lie substantially flush with the upper edge of the latter, and the adjacent peripheral portion of the dial is appropriately cut away, as at 13, to afford ample space between the ring and dial for the free passage of the welt as it is produced. (See Fig. 1.) Thus where a wide welt is desired the ring may be applied and under other conditions the ring may be removed if necessary. I also preferably provide within the body of the cylinder a ring 14, so constructed and arranged as to support the knitted web and reduce its diameter as the web passes downward from the needles to the usual take-up mechanism, (not shown,) whereby greater elasticity of the tubular web is insured than heretofore. This ring is suitably supported within the needle-cylinder by vertical posts 15, the upper ends of which are screwed into the ring, while their lower ends are provided with lateral extensions 16, that are secured to the bed-plate by screws or the like.

The tension device 17 is arranged on the dial cam-plate at or adjacent to the usual thread-guide 18, so that the thread is fed to the needles under uniform tension, irrespective of the slackness of the thread above the guide. This guide is supported on the dial-plate in the usual manner and is provided with the upper and lower guide-eyes 19 20, respectively, for the passage and guidance of the thread. The tension device is located between these eyes. In the present instance it comprises two disks 21, of glass or the like, loosely fitted to a horizontal rod 22 in front of the thread-guide and held yieldingly in contact with each other by oppositely-acting springs 23 on the rod. This rod is attached to one end of an arm 24, that is secured to the dial-plate by a screw or other means.

I claim—

1. In a rib-knitting machine, the combination of the needle-cylinder having open needle-ways whereof the walls are beveled or inclined adjacent to and forwardly of the stitch-supporting portions between the needles, to constitute cam members upon which irregular or defective material is drawn as and for the purpose described, the knitting-cams, the carrier therefor, the needle-dial, and the dial cam-plate, together with the needles in said cylinder and dial.

2. In a rib-knitting machine, the combination of the needle-dial having open needle-ways whereof the walls are beveled or inclined adjacent to and above the stitch-supporting portions between the needles to constitute cam members as and for the purpose stated, the dial cam-plate, the needle-cylinder, the cam-carrier and its cams, together with the needles in said dial and cylinder.

3. In a rib-knitting machine, the combination of the needle-cylinder having open needle-ways whereof the walls are beveled or inclined adjacent to and forwardly of the stitch-supporting portions between the needles, to constitute cam members as and for the purpose stated, the knitting-cams, the carrier therefor, the needle-dial having open needle-ways whereof the walls are beveled or inclined adjacent to and above the stitch-supporting portions between the needles in said dial, to constitute cam members, as described, the dial cam-plate, and the needles in said cylinder and dial.

4. The described needle-cylinder for rib-knitting machines, said cylinder having its upper end beveled or inclined forwardly of the stitch-supporting portions between the needle-grooves to constitute cam members upon which irregular or defective material is drawn as and for the purpose described.

5. The described needle-dial for rib-knitting machines, said dial having its outer edge beveled or inclined above the stitch-supporting portions between the needle-grooves to constitute cam members upon which irregular or defective material is drawn as and for the purpose recited.

6. In a rib-knitting machine, the combination, with the needle-cylinder, its needles, the cam-carrier and its cams, the needle-dial, its needles, and the dial cam-plate, the inner upper portion of the cylinder and the adjacent lower portion of the dial being cut away or reduced, of the ring detachably supported upon the reduced portion of the cylinder.

In testimony whereof I have hereunto affixed my signature in the presence of two subscribing witnesses.

JOHN ADAMS.

Witnesses:
WALTER C. PUSEY,
JOHN R. NOLAN.