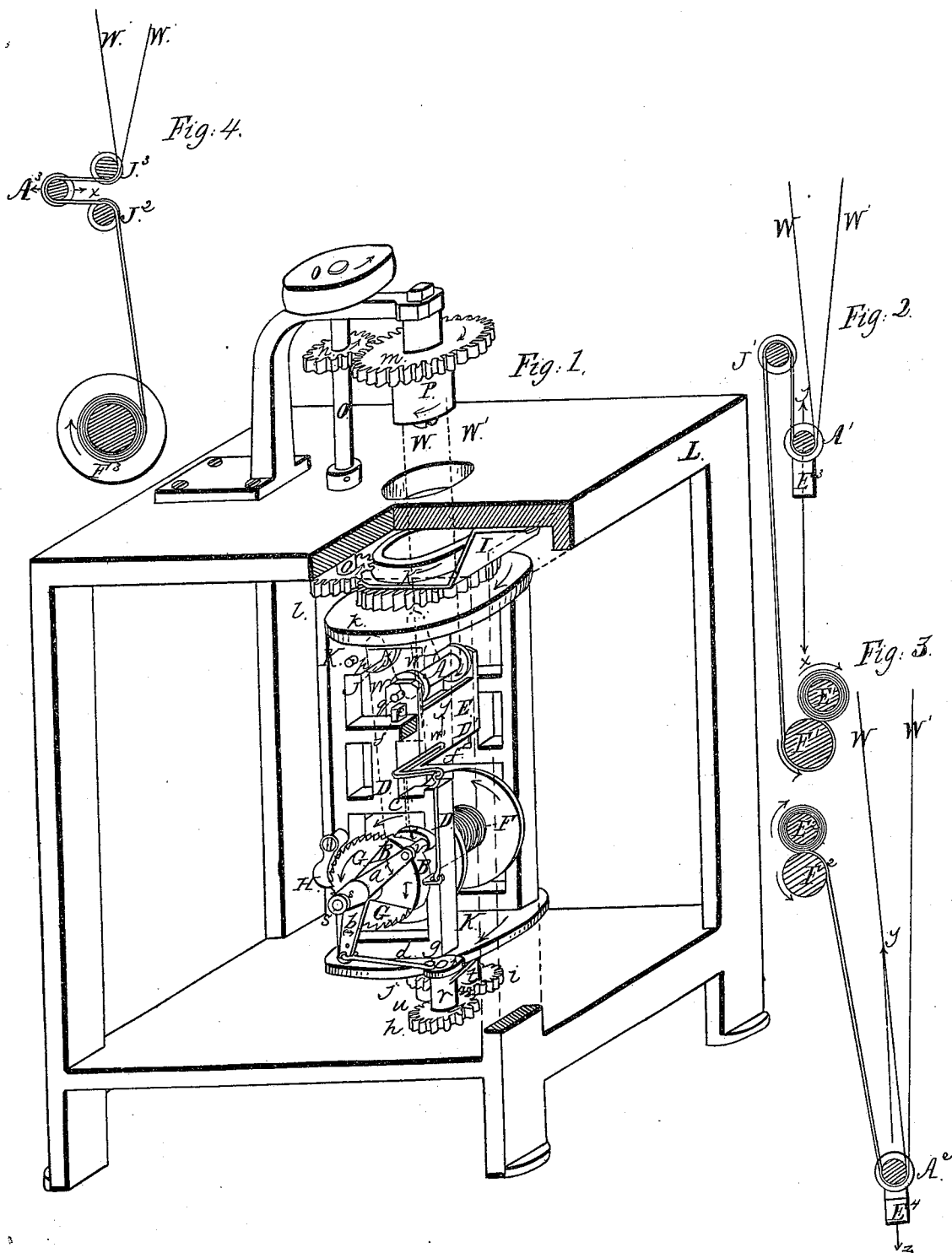


Tompkins & Johnson. Knitting Mach.

N^o. 14,975.

Patented May 27, 1856.



UNITED STATES PATENT OFFICE.

CLARK TOMPKINS AND JOHN JOHNSON, OF TROY, NEW YORK.

IMPROVEMENT IN ROTARY KNITTING-MACHINES.

Specification forming part of Letters Patent No. 14,975, dated May 27, 1856.

To all whom it may concern:

Be it known that we, CLARK TOMPKINS and JOHN JOHNSON, each of Troy, in the county of Rensselaer and State of New York, have jointly invented certain new and useful Improvements in the Take-Up Mechanisms of Rotary Knitting-Machines; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is an isometrical drawing; and Figs. 2, 3, and 4 exhibit modifications of our invention.

The same letters refer to like parts in all the figures.

It is customary to so attach a weight to the revolving web of rotary knitting-machines as to draw off the web as produced with an even tension on the needles; but we believe that no mechanism has heretofore been used to take up the revolving web at the same time it is being drawn off by a weight. Various contrivances have been employed for positively taking up the web with a certain uniform motion approximately corresponding with the production of the web; but in all such cases it often happens that the web is taken up a little too fast, and hence after awhile pulls too hard on the needles, or the web is taken up a little slower than it is made, and then the web gradually becomes too slack to knit good. Modes of driving the take-up beam or rollers by a belt which will slip when too great tension is attained on the web have been used, but with failure to secure the desired regularity of tension.

Our invention in part consists in so combining a movable weighted roller with the common take-up mechanisms of rotary knitting-machines that while the revolving web is taken up, as heretofore, nearly as fast as knit, the exactly uniform tension required for knitting evenly shall at the same time be given to the web by the weighted roller if the web is wound up fast or slow. We will now illustrate this combination of a roller weighted and the revolving take-up mechanisms.

L is the stand for the entire knitting and take-up machinery.

P is the needle-cylinder, and K the take-up

frame made to revolve simultaneously, as heretofore, by appropriate gearing, as shown in Fig. 1.

F is the take-up beam, which is made to revolve on its axis when K is turned by means of the stationary gear-wheel *j*, the planet-wheels *i h*, the crank *g*, connecting-rod, and elbow-lever turning on the shaft *s* of F and having arms *b a*, with a driving-click C, acting on the ratchet-wheel G, fastened to the shaft of F, or F may be slowly rotated with a motion nearly corresponding with the production of the web in any of the known modes.

The red lines W W' represent the circular revolving web extending from the needle-cylinder P down under the movable weighted roller A and up over the stationary roller J, so as to suspend the weighted roller A by the web, and then down to and around the take-up beam F. The roller A is held by its journals in the frame-weight E, which weighted frame E has a guide *e* on each end, which guides slide in ways *f f* in the take-up frame K, to not only increase and regulate the degree of tension given by the roller A to the fabric and to make that roller to positively revolve with K and the web, but especially to always keep the axis of the roller A at right angles to the direction in which the web is drawn off, or so that the roller shall be prevented from becoming inclined to one side or end in such manner that the web will slip to one end of the roller, for the rotation of the take-up frame would cause the roller to be so inclined if the roller was attempted to be kept in place by merely allowing its journals to rise and fall within ways or slots in the take-up frame. It will be seen that about one-half of the weight of A is constantly supported by the web as it comes directly from the needles, and that an exactly even tension is given to the web, even if the web is wound on the beam too fast or too slow, the weighted roller meanwhile gradually descending or rising in the frame accordingly. To accommodate this movement of A, we make the take-up frame with ways *f f* longer than shown in Fig. 1, so that, as in Figs. 2 and 3, the weighted roller A' A² can have considerable movement; and instead of using a single take-up beam F, we prefer to use, as shown

in Figs. 2 and 3, the well-known rough roller F' F^2 and its incumbent take-up roller E' E^2 , for they can be easily arranged to constantly take up the web very nearly as fast as produced, so that the weighted roller shall not require adjustment by the operative only at long intervals or distant periods of time. We add small weights to or take them from E to produce the exact tension required in knitting various kinds of goods.

The weighted roller and the take-up beam or rollers may be variously arranged in the frame, as seen in Figs. 2 and 3.

H is a stop-click to prevent F from turning back.

To avoid using a long take-up frame and also to entirely dispense with the necessity for occasionally readjusting the weighted roller in the proper position in the frame to act, we have made a further improvement, which consists in so connecting the movable weighted roller (when it is suspended by the web and made to revolve with the take-up frame, as above described) to the mechanism which drives the take-up beam or rollers as to thereby cause the web to be continually taken up just as fast as knit, and the movable weighted roller to therefore perpetually remain in the proper position to give the exactly even tension to the web during the whole time of filling the take-up beam or roller or other receiver of the knit fabric.

To illustrate, in Fig. 1 D' is a bent arm fastened to the weight E , and D is a rod or cord fastened at one end to D' , and at the other to the shield B , which turns on s . Now in this case the take-up beam is geared so as to wind up the web a little faster than is required; but as the weighted roller consequently begins to rise, the shield E is so raised as to lift the click C out of G , and thus prevent the further taking up of the web until A descends, and thus carries B back, so as to let C act on G again. So it will be seen that the weighted roller can only rise in the frame to a certain point, and that by allowing the roller A only a very short movement it will continually produce an exactly even tension on the web until the take-up beam is filled. The shield B may be dispensed with by connecting the click C directly with D' , as by a cord or rod c . Since the roller A , when connected with the driving mechanism of the take-up beam, as now described, requires but a short sliding movement, a common spiral or other spring may be used instead of the weight E to give the proper tension to the roller A , and should be employed when our now described arrangement of the tension-roller A is introduced into the take-up mechanisms of machines wherein the revolving web is drawn off horizontally, and in vertical machines this roller, as A^3 in Fig. 4, may be arranged so as to act in a horizontal direction; the tension being given by springs. The application of this arrangement of the tension-roller is not

confined to those mechanisms in which the web is at last wound on a beam or roller, but is equally appropriate to those wherein the revolving web is drawn off by rollers and deposited in a revolving can or vessel. We also apply the tension-roller, substantially as above described, to such machines as have their take-up mechanisms arranged above their knitting machinery.

We know that in stationary or flat web-knitting looms an even tension of the knit fabric on the needles has heretofore been effected by causing the knit fabric as it is taken up to pass under or to support a loose rod or roller previous to being wound on the take-up beam; but none of these arrangements are applicable to give the proper tension to the revolving web of rotating take-up frames, for in such cases the roller would by the rapid rotary motion of the take-up frame be so thrown out of place, especially in taking up knit tubes of only two or three inches diameter, as not to act on the fabric evenly.

We are also aware that certain modes of connecting the tension-rod with the mechanism which drives the take-up beam are in use in knitting-machines which produce flat or non-revolving circular webs, by which connection the falling and rising of the tension rod or roller is made to regulate the motion of the take-up beam, so that while an even tension is given to the needles the fabric is taken up as fast as produced; but these modes of connection are not of use in rotating take-up frames, for such modes would allow, and in some cases would assist, the jarring and centrifugal action of the revolving frame to throw the tension rod or roller out of its place, whereas by our mode of connecting the roller A with the mechanism which drives the take-up beam or rollers by the intervention or use of the sliding frame E the roller acts with certainty as a governor of the motion of the take-up beam however fast the take-up frame is revolved.

We do not claim any arrangement of a tension rod or roller to give an even tension to the stationary or non-revolving fabrics of knitting looms or machines at the same time the said fabrics are taken up; nor do we claim any mode of connecting such tension rod or roller with the mechanism which drives the take-up beam in stationary take-up frames to cause the webs thereof to be taken up as fast as produced.

We claim as our invention and desire to secure by Letters Patent—

1. Combining the movable weighted roller A with the revolving take-up mechanism of a rotary knitting-machine, as herein described, to give the proper exactly uniform tension to the revolving web for knitting evenly, whether the web is being taken up too fast or too slow or somewhat slower than it is produced.

2. Connecting the said roller A , or its equivalent,

lent, when arranged to give tension to the web, as herein set forth, to the mechanism which drives the take-up beam or rollers, as herein described, to cause the revolving web to be taken up exactly as fast as it is produced, and thereby continually keep the said tension-roller in the proper position to give the uniform tension to the web during the whole time

of filling the take-up beam or roller or other receiver of the knit fabric.

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Witnesses:

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