A. PAUL.

Yarn Delivery Attachment for Knitting Machines.

No. 201,629. Patented March 26, 1878.

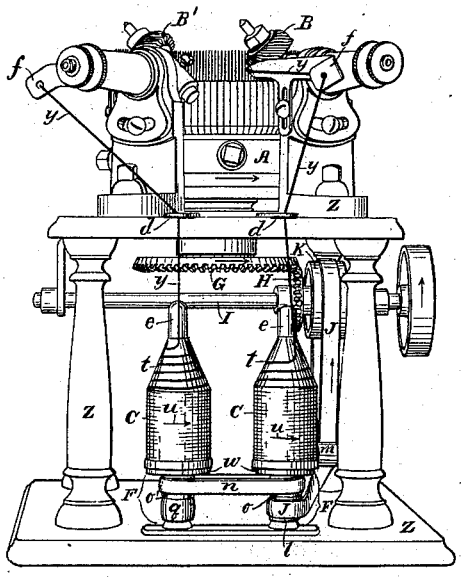

FIG. 1.

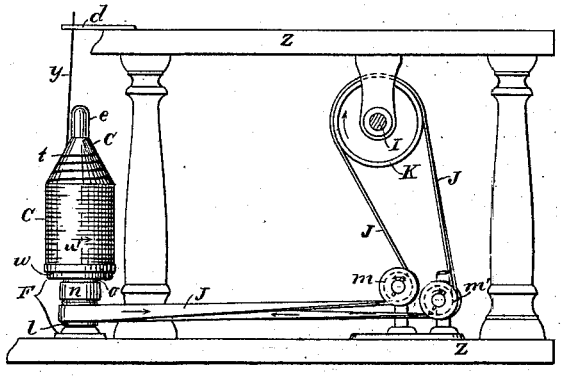

FIG. 2.

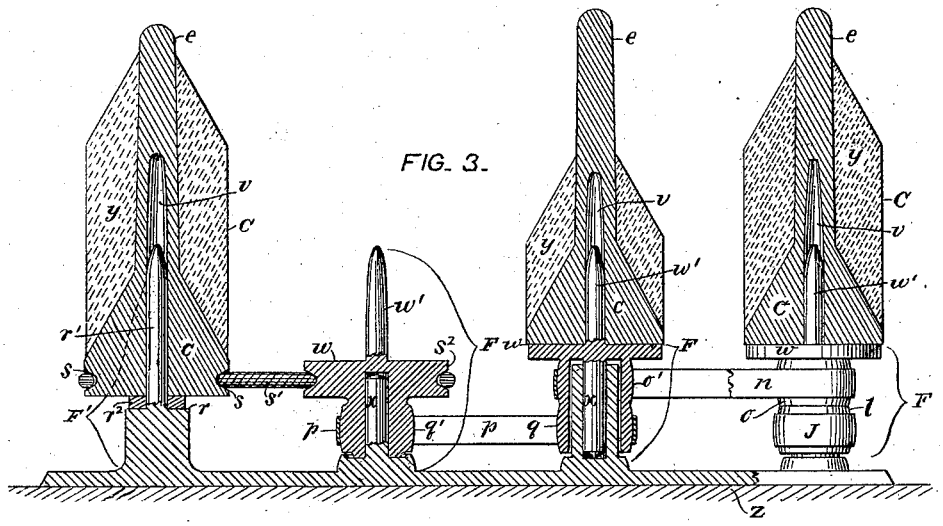

FIG. 3.

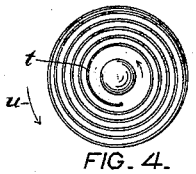

FIG. 4.

WITNESSES:

Isaac Clyte

John B. Swartz

INVENTOR:

Archibald Paul

UNITED STATES PATENT OFFICE.

ARCHIBALD PAUL, OF COHOES, NEW YORK, ASSIGNOR OF ONE-HALF HIS RIGHT TO CAMPBELL & CLUTE, OF SAME PLACE.

IMPROVEMENT IN YARN-DELIVERY ATTACHMENTS FOR KNITTING-MACHINES.

Specification forming part of Letters Patent No. **201,629**, dated March 26, 1878; application filed January 22, 1878.

To all whom it may concern:

Be it known that I, ARCHIBALD PAUL, of the city of Cohoes, in the county of Albany and State of New York, have invented certain Improvements in Yarn-Delivery Attachments for Knitting-Machines, of which the following is a specification, reference being had to the accompanying drawing.

In using a knitting-machine which draws the yarn rapidly from a stationary conical bobbin around and along the stem thereof, in the usual manner, the yarn is liable to often wrap around and bind against the stem of the bobbin, and thereby produce great and uneven tension on the yarn, and sometimes cause the breaking of the latter when it is fine or tender; and at the same time the drawing off of each turn of yarn from the bobbin increases or lessens the twist in the yarn one turn, and thereby alters the yarn, and makes it more liable to kink between the bobbin and the needles of the knitting-machine, and to curl and get out of the needles when placed therein by the sinker-burr or other yarn-feeding device.

To avoid or lessen those defects is the principal object of the primary part of this invention, which consists in the combination, with a knitting-machine, of mechanism for supporting a conical bobbin and connecting it with the knitting-machine, whereby the bobbin is caused to revolve about its own axis at a speed somewhere near, and in a direction contrary to, that in which the yarn is unwound from the bobbin in being drawn therefrom by the knitting-machine.

A further part of this invention consists in the combination, with a knitting-machine, of a support constructed and connected with the knitting-machine substantially as hereinafter described, whereby said support is adapted to hold a conical bobbin and revolve it about its own axis.

In the aforesaid drawing, Figure 1 is a perspective view of a portion of a knitting-machine having one form of this invention combined therewith; Fig. 2, an elevation of a part of the same; Fig. 3, an elevation, partly in section, and on a larger scale, representing the bobbin-supports and bobbins shown in Fig. 1, and other bobbin-supports connected therewith, and all adapted for supplying yarn to an ordinary circular-knitting machine having four yarn-feeding devices; and Fig. 4 is a plan of the top of one of the same bobbins, with lines partially indicating the ordinary spiral winding of the yarn thereon.

A is the needle-cylinder of an ordinary circular-knitting machine, having the supporting-frame Z, and B B′ are the usual sinker-burrs for feeding the yarn into the needles. The conical bobbins C are wound with yarn, *y*, the same as usual for supplying yarn therefrom to knitting-machines. Guides *d*, arranged about in line with the stems *e* of the bobbins, serve to properly direct the yarn as it is drawn off along the stems of the bobbins, and other guides, *f*, conduct the yarn to the sinker-burrs, all substantially as in knitting-machines heretofore used.

Each conical bobbin C is mounted on a support, F or F′, with or upon which the bobbin can be revolved concentrically, or nearly so, to the stem of the bobbin.

G is a gear-wheel fast on the shaft of the needle-cylinder, and engaged with a gear-wheel, H, fast on the rotary shaft I; and J is a belt, which extends around a pulley, K, fast on the shaft I, and around a pulley, *l*, on one of the bobbin-supports F, and also around intermediate guide-pulleys *m m′*, and a belt, *n*, extends around pulleys *o o′*, fast on the first and second rotary bobbin-supports, respectively. By thus connecting the knitting-machine with the bobbin-supports F the latter, with the conical bobbins thereon, will be revolved, and also stopped and started, simultaneously with the needle-cylinder of the knitting-machine.

To indicate a mode of applying this invention to an ordinary large circular-knitting machine having four sets of yarn-feeding and knitting devices, and to illustrate modifications of this invention, I have in Fig. 3 shown a third rotary bobbin-support, with a belt, *p*, extending around a pulley, *q*, fast on the second bobbin-support, and around a pulley, *q′*, on the third one, and have also shown a fourth bobbin-support, F′, which is stationary, and has a seat, *r*, stem r^1, and anti-friction washer

r^2, and thereon a conical bobbin, having a pulley-groove, s, in and around its base part, with a belt, s^1, extending around that pulley-groove, and around a grooved pulley, s^2, on the third bobbin-support, so that suitable conical bobbins on the third and fourth supports will be revolved, and stopped and started simultaneously with the bobbin on the second support.

The spiral manner in which the yarn is commonly wound to and fro on the cone of the bobbin is partially indicated by the spiral lines at t in Figs. 1, 2, and 4; and it will be observed that the mechanism hereinbefore specified, and shown in the drawing, for supporting the bobbins and connecting them with the knitting-machine is so constructed and arranged as to turn the bobbins about their axes in the direction pointed by the arrows u, which direction is contrary or opposite to the direction in which the yarn is unwound from the bobbins in being drawn off along the stems thereof by the knitting-machine. I commonly prefer to have each bobbin thus revolved at a uniform medium speed somewhat faster than the yarn is unwound while being drawn off by the knitting-machine from the largest circumference of the cone of the bobbin, and somewhat slower than the yarn is unwound while being thus drawn off from the smallest circumference of the bobbin next to its stem; but the speed of the bobbin can be considerably greater or less than that preferred rate, and still be of much advantage in preventing or lessening the twisting or untwisting of the yarn and its liability to bind around the bobbin-stem in being drawn off from the bobbin by the knitting-machine.

In case the yarn shall be wound on the bobbins in the opposite direction to that indicated in Figs. 1, 2, and 3, the belt J should be quarter-twisted in the opposite direction from that shown in Figs. 1 and 2, between the pulleys l and m m', so as to then cause the bobbins to revolve in the direction contrary to that indicated by the arrows u.

In carrying out the principal part of this invention any suitable known knitting-machines and conical bobbins are to be used, and each conical bobbin is to be mounted on any suitable support, by, with, or upon which the bobbin can be easily revolved about its own axis; and the same is to be connected with any suitable part of the knitting-machine by any suitable known kind of gearing, belting, or equivalent means for communicating from the knitting-machine or its driving mechanism to the bobbin the proper rotary motion about its own axis. I, however, commonly prefer to mount each conical bobbin, that has in its base part a central tubular socket, v, upon a rotary support, F, having a seat, w, and stem w', concentric with the axis x of the rotary support, and thus adapted to hold and revolve the conical bobbin, substantially as shown in Fig. 3; and I generally prefer to connect such rotary support with the knitting-machine by means of gearing and round or flat belts and pulleys, essentially as shown in the drawing, or by equivalent rotating devices.

What I claim as my invention is—

1. In combination with a knitting-machine, mechanism, substantially as described, for supporting a conical bobbin and connecting it with the knitting-machine, whereby said bobbin is revolved about its own axis in a direction contrary to that in which the yarn is unwound from the bobbin in being drawn off along the stem of the bobbin by the knitting-machine, as set forth.

2. In combination with a knitting-machine, the support F, connected with the knitting-machine by mechanism substantially as described, whereby said support is adapted to hold and revolve a conical bobbin, C, about its own axis, as set forth.

In testimony whereof I hereunto set my hand, in the presence of two subscribing witnesses, this 18th day of January, 1878.

ARCHIBALD PAUL.

Witnesses:

ISAAC CLUTE,

JOHN B. SWARTZ.