No. 855,316. PATENTED MAY 28, 1907.

D. HURLEY & W. T. BARRATT.

YARN MEASURING AND FEEDING DEVICE FOR KNITTING MACHINES.

APPLICATION FILED MAR. 29, 1905.

2 SHEETS—SHEET 1.

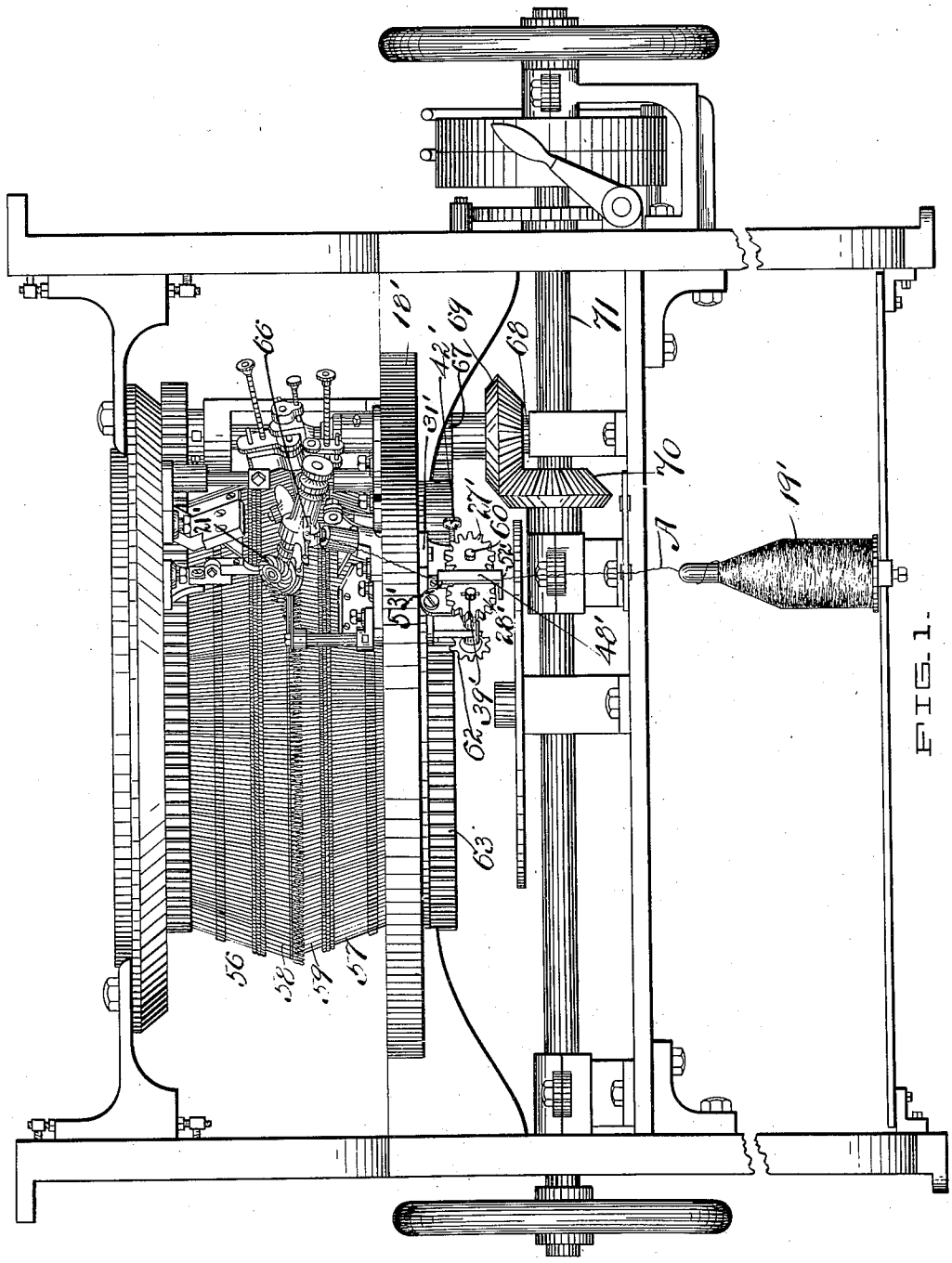


FIG. 1.

WITNESSES.

Louis A. Jones.

Franklin & Low.

INVENTORS:

Daniel Hurley

and William T. Barratt,

by their attorney, Charles S. Gooding.

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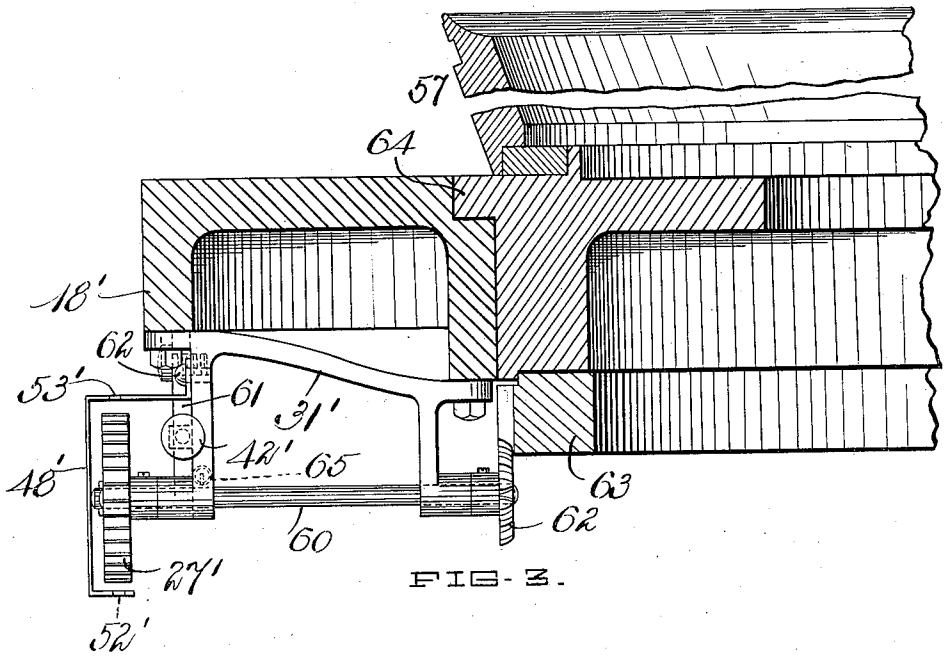


FIG. 3.

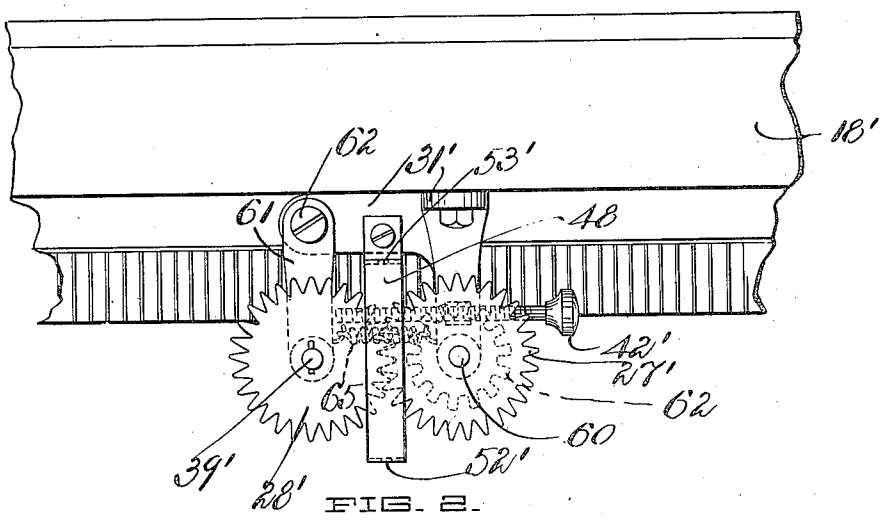


FIG. 2.

WITNESSES:

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UNITED STATES PATENT OFFICE.

DANIEL HURLEY AND WILLIAM T. BARRATT, OF BENNINGTON, VERMONT, ASSIGNORS TO CHARLES COOPER, OF BENNINGTON, VERMONT.

YARN MEASURING AND FEEDING DEVICE FOR KNITTING-MACHINES.

No. 855,316. Specification of Letters Patent. Patented May 28, 1907.

Application filed March 29, 1905. Serial No. 252,775.

To all whom it may concern:

Be it known that we, DANIEL HURLEY and WILLIAM T. BARRATT, citizens of the United States, residing at Bennington, in the county of Bennington and State of Vermont, have invented new and useful Improvements in Yarn Measuring and Feeding Devices for Knitting-Machines, of which the following is a specification.

This invention relates to a device for measuring and feeding yarn from a bobbin or other suitable yarn holder to the needles of a knitting machine.

The object of the invention is to provide a device of the character described which may be adapted to different styles of knitting machines, employing either spring or latch needles, and which is particularly adapted to measure off the yarn by means of feed gears which are so constructed and arranged that one of said gears is movable toward and away from the other, a spring acting to move said gear toward the other and positive means being supplied to move the same away from the other, whereby any inequality in the yarn or bunches will not result in damage to the yarn for the reason that said spring-actuated gear will yield slightly to allow said inequality or said bunches to pass between the gears without injury to the yarn.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings: Figure 1 is a front elevation of a circular rib knitting machine having two oppositely arranged conical cylinders with our improved feed gears attached thereto. Fig. 2 is an enlarged end elevation of said feed gears showing the same attached to the bed of the machine, said bed being broken away to save space in the drawings. Fig. 3 is a side elevation of said gears and the mechanism by which they are driven as viewed from the right of Fig. 2, the same being shown attached to the table, and said table, cylinder, ring and gear being shown in section, and broken away.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, our improved yarn measuring and feeding device is illustrated as attached to a circular rib knitting machine having two oppositely arranged conical needle cylinders. Said machine is substantially the same as that illustrated in the patents to Daniel Hurley Nos. 572,679, December 8, 1896, and 607,798, July 19, 1898, and it is, therefore, not necessary to enter into a detailed explanation of the construction and operation of said machine other than to say that it consists of an upper and a lower conical needle cylinder 56 and 57, respectively, each provided with grooves in its periphery and with a series of needles 58 arranged to slide in the grooves of said upper cylinder and a series of needles 59 arranged to slide in the grooves of said lower cylinder. A single set of stitch forming devices well known to those skilled in the art is illustrated in connection with the cylinders, Fig. 1.

The feed gears 27′ and 28′ mesh into each other for the purpose of measuring and feeding the yarn before it is led to the needles 59. The feed gear 27′ is fastened to a shaft 60 journaled to rotate in bearings formed in the bracket 31′ fast to the under side of the bed-plate 18′. The gear 62 fast to the shaft 60 meshes into a gear 63 fast to the annular cylinder ring 64 to which the lower cylinder 57 is fastened. The feed gear 28′ is journaled to rotate upon a stud 39′ fast to an arm 61 pivoted at 62 to the bracket 31′. A spiral spring 65 draws the arm 61 and the gear 28′, rotatably mounted thereon, toward the gear 27′, and an adjusting screw 42′ regulates the location of said gear 28′ with relation to said gear 27′, said adjusting screw 42′ having screw-threaded engagement with the bracket 31′, so that by rotating the screw 42′ the teeth of the gears 28′ and 27′ may be made to mesh to a greater or less extent with each other, thus regulating the amount of yarn fed to the needles by said gears.

A yarn guide 48′ is fastened to the bracket 31′ and is provided with two thread-eyes 52′ and 53′ which guide the thread as it approaches and recedes from, respectively, the feed gears 27′ and 28′. The yarn passes from the measuring and feeding gears 27′ and 28′ through the thread-eye 53′, through suitable yarn guides 66 to a stitch wheel 21′, Fig. 1, and by said stitch wheel is led to the needles 59 of the lower cylinder 57. The stitch forming operation is then performed by suitable cams and pressers in a manner well known to those skilled in this art.

The operation of our improved feed gears in connection with a machine of the type illustrated in Figs. 1 to 3 inclusive is as follows: The yarn A passes from the bobbin 19′ through the thread-eye 52′ between the feed gears 27′, 28′, thence through the thread-eye 53′ to the yarn guides 66, by which guides it is led to the stitch wheel 21′ and by said stitch wheel laid in the form of loops between the needles 59 of the lower cylinder 57. It will be understood that the feed gears 27′ and 28′ are rotated by the rotation of the annular gear 63 which meshes into the gear 62 fast to the shaft 60, said shaft 60 being fastened to the measuring gear 27′. The annular gear 63 is rotated by the gear 67 fast to a vertical shaft 68 which is rotated by bevel gears 69 and 70, the gear 70 being fast to the main driving shaft 71. The yarn as it is fed between the gears is measured in the form of loops or bends of the proper length to be laid between the needles by the stitch wheel 21′.

The advantages secured from our improved yarn feeding and measuring gears as far as hereinbefore described are as follows: The length of loop required by each of the needles to perform its completed stitch can be measured off to a nicety by said gears and different lengths of stitches may be measured by the adjustment of said gears with relation one to the other, as hereinbefore described. The strain upon the yarn when it is being laid between the needles by the stitch wheel or its equivalent on a spring needle machine, or when it is being drawn from the bobbin by the latch needles in a latch needle machine is almost entirely removed and the strain upon said yarn necessary to draw it off the bobbin and feed it to the needles from said bobbin is taken by the feed gears, so that said latch needles, in a latch needle machine, or the stitch wheel in a spring needle machine, are relieved of the tension and strain necessary to draw the same from the bobbin, and said yarn passes around and between the smooth and rounded corners of gear teeth, which are much larger and which handle the yarn much more easily and tenderly than would be the case were said yarn fed from the bobbin by the stitch wheel or its equivalent or drawn from the bobbin by the latch needle, for the reason that during the time when said yarn is being measured between the needles and around the thin blades of the stitch wheel, in the case of a spring needle machine, or when it is being drawn across the barbs of the latch needles in a latch needle machine, the yarn is subjected to much greater strain if it is under the tension necessary to draw the yarn from the bobbin and through the guides than it would be if it was simply necessary to feed the yarn in the form of loops to its proper position between the needles from the feed gears, while the tension upon the yarn necessary to pull it off the bobbin is taken by the feed gears.

It will be noted that the spring 65 holds the gear 28′ toward the gear 27′ with a yielding pressure, so that if there are any irregularities or bunches in the yarn, said spring will yield without injuring the yarn, while the screw 42′ serves as a means to move the gear 28′ positively away from the gear 27′.

It is evident that the feed gears may be driven by a variety of mechanism without departing from the spirit of our invention.

Having thus described our invention what we claim and desire by Letters Patent to secure is:

1. In a knitting machine, a pair of yarn feed gears meshing into each other and adapted to measure the yarn between them before it is led to the needles of said knitting machine, means to guide the yarn between said gears, one of said gears journaled to rotate upon a stationary support, a pivotally supported arm upon which the other of said gears is rotatably supported, a spring acting to rock said arm to move said last named gear toward the other of said gears, and an adjusting screw adapted to move said arm to move the gear supported thereon away from the other of said gears.

2. In a circular knitting machine, a rotary cylinder, a series of needles mounted thereon, a yarn holder, means to lead the yarn to said needles, a pair of yarn feed gears meshing into each other and adapted to measure said yarn between them before it is fed to said needles, one of said gears movable toward and away from the other, a spring acting to move one of said gears toward the other, and means to positively move said movable gear away from the other of said gears.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

DANIEL HURLEY.
WILLIAM T. BARRATT.

Witnesses:
CHARLES S. KEHOE,
EARL A. SMITH.