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2,089,494

MECHANISM FOR MEASURING YARN

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2 Sheets-Sheet 1

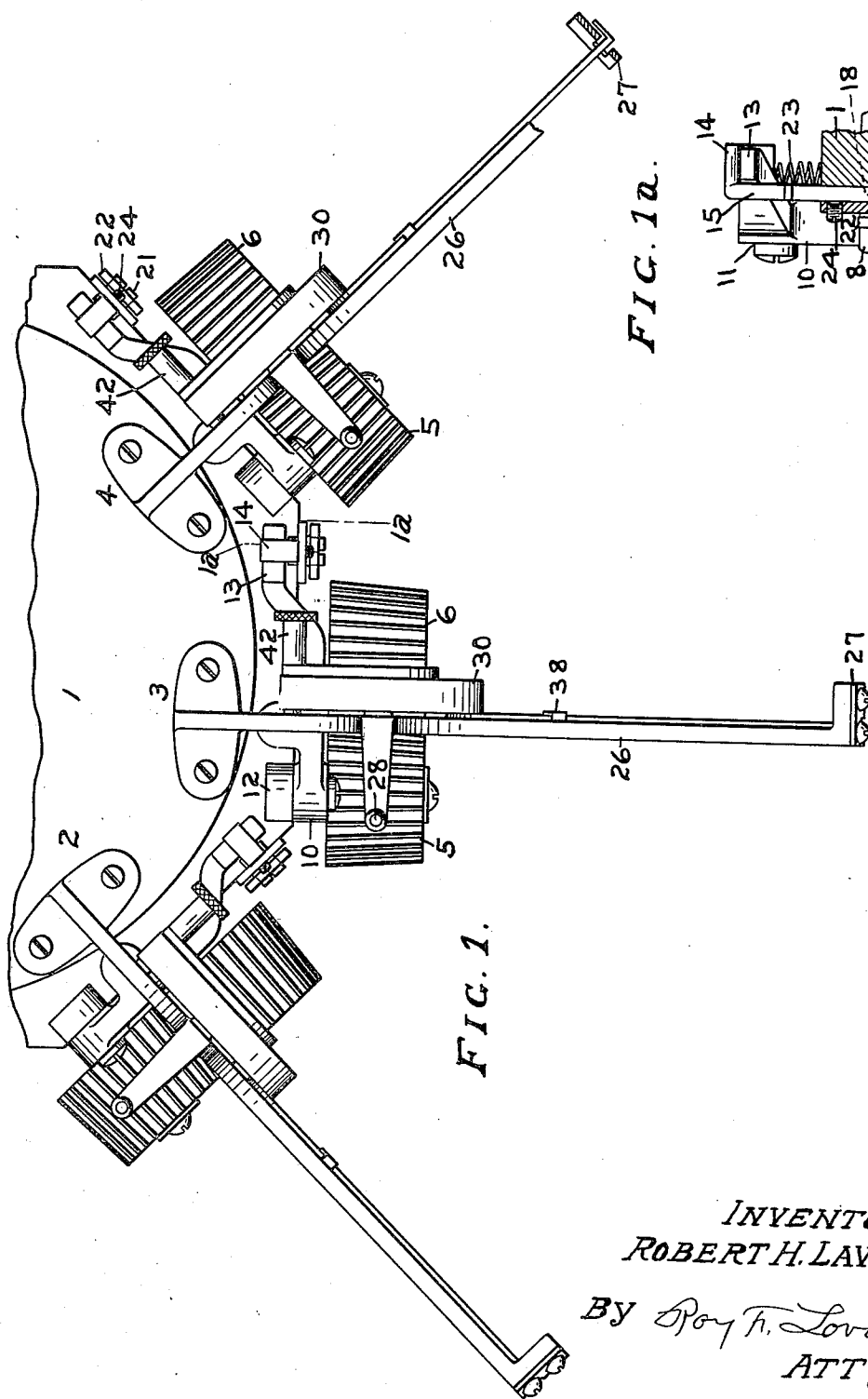


FIG. 1a.

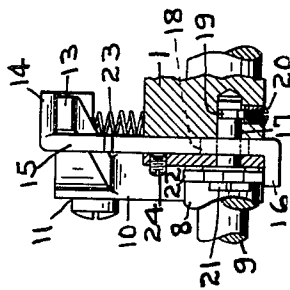


FIG. 1.

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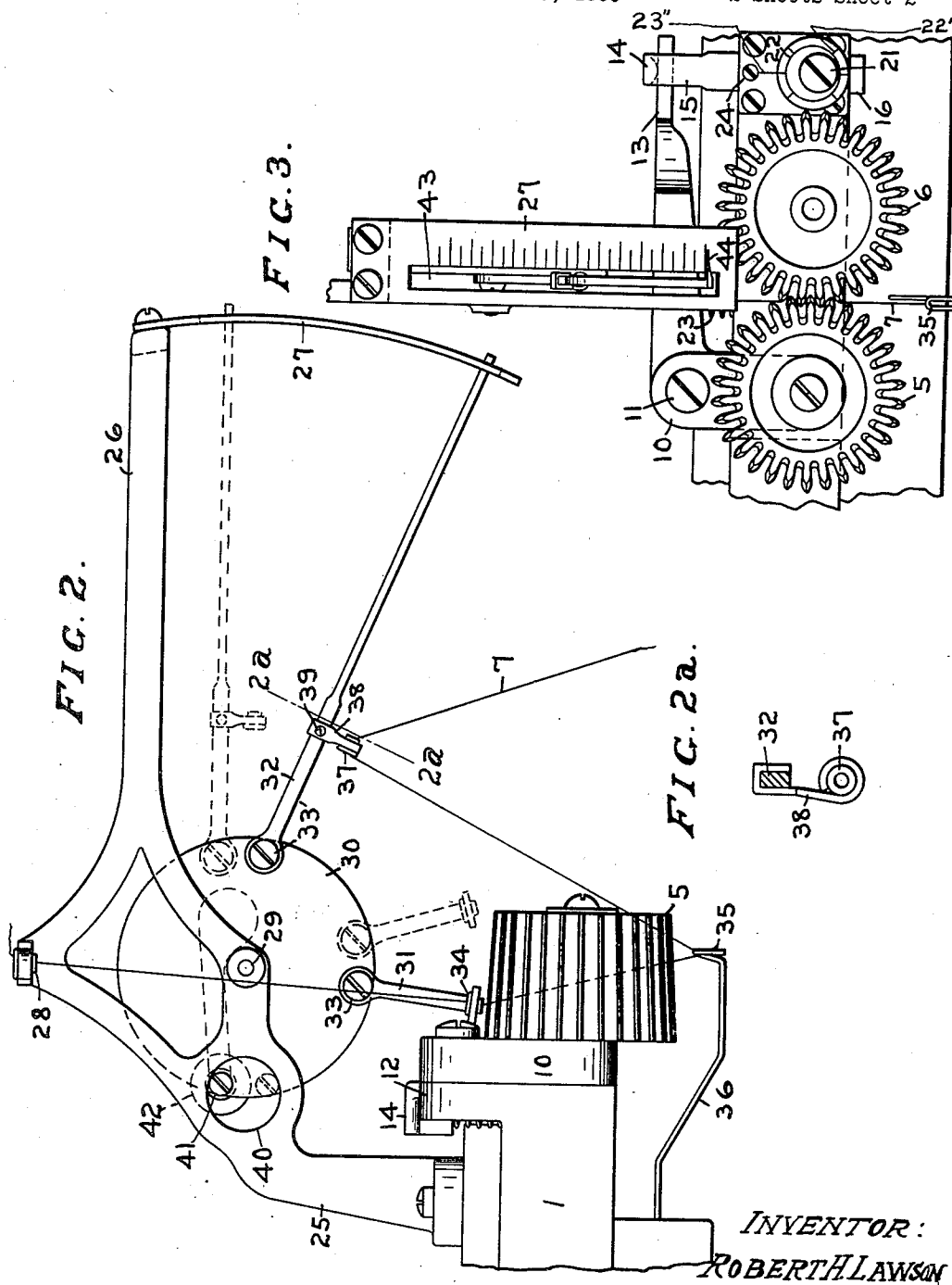
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MECHANISM FOR MEASURING YARN

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9 Claims. (Cl. 66—132)

This invention pertains to yarn measuring or yarn controlling devices applicable to textile machines and more particularly to knitting machines having a plurality of feeding stations at each of which one or more threads or yarns are knitted into the fabric. The improvements constituting this invention are, for illustrative purposes, shown as applied to the yarn furnishing or measuring mechanism shown in the patent to Howie 1,562,829, November 24, 1925, and some of the parts shown in the drawings of the present application are duplicates of the parts shown in the said Howie patent.

In the drawings:

Fig. 1 is a fragmentary plan view showing three adjacent feeding stations each of which is equipped with the present improvements for effecting the knitting of uniform fabric;

Fig. 1a is a fragmentary view partly in section taken along the line 1a—1a, Fig. 1;

Fig. 2 is a fragmentary view in side elevation showing the yarn furnishing or controlling means associated with each feeding station;

Fig. 2a is a detail view taken along the line 2a—2a, Fig. 2; and

Fig. 3 is a fragmentary view in front elevation of the parts shown in Fig. 2.

Mounted upon the frame 1 of the machine at 2, 3 and 4 are three yarn controlling mechanisms each of which is associated with a feeding station (not shown). As the yarn controlling mechanisms 2, 3 and 4, etc. are identical, the following detailed description of one only of such yarn controlling means will be given.

At 5 and 6 are shown two conical, intermeshing yarn furnishing wheels by the rotating teeth of which a yarn 7 is drawn from its source of supply and led to the needles of a knitting machine (not shown) in a manner hereinafter to be more fully described. The wheel 6 is mounted on a shaft 8 and constantly rotated by gearing all as disclosed in the Howie Patent 1,562,829. The wheel 6 drives the wheel 5 through the intermeshing teeth of the two wheels, the wheel 5 being loosely mounted on a shaft or stud 9. The shaft or stud 9 and wheel 5 are mounted on one arm of a right-angled lever bracket 10 which is pivoted intermediate its ends at 11 to an ear or lug 12 upstanding and integral with the frame 1. The other arm of the lever 10 adjacent to its free end 13 engages under an over-hanging bracket arm 14 of the bracket 15 which adjacent to its other end passes through a vertically disposed slot in the frame 1 terminating in an angularly disposed toe portion or lug 16. Adja-

cent to the toe 16 a pin 17 passes through a longitudinally disposed slot 18 in the bracket 15 and into a recess in the frame 1. The pin adjacent to its inner end has an annular groove 19 within which seats the end of a terminal portion of a screw 20 which prevents endwise movements of the pin 17 but permits rotary movements thereof. The other end of the pin 17 is slotted as at 21 to be engaged by a screw driver or other implement for the purpose of imparting turning movements to the pin 17. An eccentric 22 is fixedly mounted on the shank of the pin 17 between the head thereof and the frame 1 and is in engagement with the toe or lug 16. As will be evident from an inspection of the drawings, turning movements imparted to the head 21 of pin 17, Fig. 3, will cause the eccentric 22 to engage the toe or lug 16 and move the bracket 15 downwardly within the limits of the pin and slot connection 17—18 and against the tension of a spring 23 which bears against the upper surface of the frame 1 and against the under surface of the end 13 of the lever 10. Turning of the eccentric 22 causes graduations 22' thereon to register with a line or nick 22'' in the frame 1, or in a plate attached to and forming part of the said frame. A few only of the graduations 22' are shown in Fig. 3 although it will be evident that there may be as many graduations or divisions as desired and permitted by the peripheral extent of the eccentric 22. From the foregoing it is evident that fine adjustments of the intermeshing of the wheels 5 and 6 can be readily effected, thus making it possible so to adjust the respective pairs of wheels 5 and 6 at each of a plurality of feeding stations as initially to cause the several pairs of feeding wheels 5, 6 to tend to feed the same amount of yarn to the needles at one feeding station as at another. To readjust the position of the gear 5 with respect to the gear 6: turning movements imparted to the shaft 17 which cause the bracket 15 to be lowered move the arm 13 of the lever 10 downwardly and against the tension of the spring 23; and turning movements imparted to the shaft 17 in the opposite direction permit the spring 23 to raise the arm 13 and maintain its upper face in contact with the bracket arm 14. Prior to readjusting just described, the position of the gear 5 with respect to the gear 6, a set screw 24 is turned to release engagement thereof with the bracket 15, and subsequently to the turning of the eccentric 22 the set screw 24 is again turned to retain the bracket 15 in the adjusted position desired.

Mounted upon the upper surface of the frame 1 is a bracket 25, an arm 26 of which extends out over and beyond the gears 5 and 6 and has attached at its end an arcuate calibrated plate or scale 27. The bracket 25 may have a porcelain or other eyelet 28 through which the yarn 7 passes from the source of yarn supply to and between the gears 5 and 6. Mounted to turn freely on the bracket 25 as at 29 is a disc-like element 30 to which are attached arms 31, 32. The arms 31, 32 are adjustably fastened to the disc 30 as at 33, 33'. Arm 31 normally depends from the disc 30 to such a position as to permit the yarn 7 to pass through an eyelet 34 in the said arm 31 and from there between the yarn furnishing wheels 5, 6. The yarn 7 after leaving the wheels 5 and 6 passes through an eye 35 provided in a wire arm 36 attached to the frame 1. From the eye 35 the yarn 7 passes upwardly and through an eyelet 37 carried by an arm 38 adjustably fastened as at 39 to the arm 32. After passing through the eyelet 37 the yarn 7 is led downwardly and to the needles (not shown) of the knitting machine.

The bracket 25 has a recess 40 therein within which a pin 41 is received, the said recess limiting the movements of the pin and consequently the swinging movements of the disc 30 to which pin 41 is attached, as indicated in Fig. 2. Attached to the pin 41 is a counter-balancing weight 42 which, when the yarn 7 is not passing through the eyelet 37, causes the arm 31 to assume the dotted line position, Fig. 2.

The plate 27 is slotted as at 43 and through the slot the end of the arm 32 passes, said end being turned at right angles as shown at 44 thereby to indicate to the observer readings of the scale markings on the plate 27.

In utilizing the present invention, the wheels 5 and 6 at the several feeding stations are adjusted by turning eccentric 22 and moving bracket 15, as described, so that their respective teeth intermesh exactly to the same extent. Thereafter the several yarns 7 are threaded through their respective eyelets 28, 34, 35, 37 and engaged by the hooks of the needles and knitted into the fabric. Then at one feeding station the stitch knitting cams may be adjusted (either those acting on the needles or those acting on the sinkers) until the pointer 44 arrives at a predetermined position at which the needles are knitting the desired number of stitches per inch of fabric. This done the operator of the machine adjusts the stitch drawing cams at another feeding station until the corresponding pointer 44 gives the same reading as that shown at the first feeding station, the stitch drawing cams being adjusted at the remaining feeding stations in the same manner.

Ordinarily when, due to wearing of the stitch drawing cams or other causes or when a finer or coarser fabric is to be knitted, necessary adjustments are effected by changing the intermeshing of the teeth of the wheels 5 and 6 and/or changing the positions of the stitch drawing cams at the several feeding stations so as to knit uniform fabric. This frequently requires "spotting" the several yarns and noting the lengths of yarn thereafter knitted at the several feeding stations after which appropriate adjustments of the stitch drawing cams are made to effect uniform knitting of the several yarns at the several feeding stations.

The movements of the arm 32 along the scale markings on the plate 27 cause corresponding

movements of the disc 30 and arm 31 so that the thread 7 is moved along the rolls 5 and 6 which taper toward their outer ends and as a consequence thereof when the thread 7 is in the position shown in Fig. 2, more yarn is fed to the needles by the said rolls than when the arm 31 moves to the right. Movements of the arm 31 and the yarn 7 along the rolls 5 and 6 is brought about by adjusting the stitch drawing cams, e. g. when the stitch drawing cams are adjusted to draw shorter stitches than before the arms such as 31 move to the right, Fig. 2.

Obviously while the weight 42 serves as a convenient means for urging the disc 30 and arms 31, 32 to the dotted line position, Fig. 2, other means such as a spring can be utilized.

Although in the foregoing description several parts have been described more or less specifically, it will be understood that it is not the intention to limit the invention otherwise than by the terms of the claims themselves.

I claim:—

1. In a knitting machine having a plurality of feeding stations, intermeshing wheels for engaging the yarns and drawing the same from a source of supply, in combination with a movable yarn guiding means through which the yarn is adapted to pass to and between the intermeshing wheels, means movable with the said yarn guiding means for indicating to the operator the relative rates at which two yarns are being fed to the needles of the knitting machine, whereby ready adjustments may be effected so that yarns fed to the needles at two or more feeding stations shall be knitted into loops or stitches of substantially the same length to effect the knitting of uniform fabric.

2. In a circular knitting machine of the independent needle type having a plurality of feeding stations at each of which a yarn is knitted by the needles of a knitting machine, opposed conical rolls or wheels for engaging yarn and drawing the same from a source of supply to be fed to the needles of the knitting machine, a movable yarn guiding means located in operative relation with respect to the rolls or wheels, means for relatively adjusting the wheels at each feeding station so that the said wheels at all of the feeding stations shall tend to draw the same amount of yarn during the same interval of time, the amount of yarn fed to the needles at each feeding station depending upon the position of the yarn guiding means with respect to the conical rolls or wheels, and means for readily indicating to the operator which of two yarns is being fed to the needles at the faster rate so that adjustments can be readily effected to knit fabric the stitches of which are of substantially the same length to effect the knitting of uniform fabric.

3. In a knitting machine having a plurality of feeding stations, intermeshing wheels for engaging the yarns and drawing the same from a source of supply, means for varying the degree of intermesh so that relative adjustment of the intermeshing wheels at each feeding station will cause the said intermeshing feeding wheels at the several feeding stations to tend to feed the same amount of yarn during the same interval of time, and a movable yarn guiding means through which the yarn is adapted to pass to and between the intermeshing wheels, means movable with the said yarn guiding means for indicating to the operator the relative rates at which two yarns are being fed to the needles of the knitting machine,

whereby ready adjustments may be effected so that yarns fed to the needles at two or more feeding stations shall be knitted into loops or stitches of substantially the same length.

5 4. In a circular knitting machine of the independent needle type having a plurality of feeding stations at each of which a yarn is knitted by the needles of the knitting machine, opposed, meshing conical rolls or wheels for engaging yarn
10 and drawing the same from a source of supply to be fed to the needles of the knitting machine, means for varying the degree of intermesh so that relative adjustment of the intermeshing wheels at each feeding station will cause the said
15 intermeshing feeding wheels at the several feeding stations to tend to feed the same amount of yarn during the same interval of time, and a movable yarn guiding means located in operative relation with respect to the rolls or wheels, the
20 amount of yarn fed to the needles at each feeding station depending upon the position of the yarn guiding means with respect to the conical rolls or wheels, and means for readily indicating to the operator which of two yarns is being
25 fed to the needles at the faster rate so that adjustments can be readily effected to knit fabric the stitches of which are of substantially the same length.

5 5. In a multi-feed knitting machine pairs of opposed rotary rolls between which the yarns pass and by which they are drawn from the source of supply, means for adjusting one roll of each pair so that relative adjustment of the rolls at each feeding station will cause the said rolls at the
30 several feeding stations to tend to feed the same amount of yarn during the same interval of time, in combination with means for indicating to the operator of the machine whether or not the several pairs of rolls are feeding the same amount
35 of yarn so that adjustments can be readily made to effect the knitting of uniform fabric.

6. In a multi-feed knitting machine pairs of rotary rolls between which the yarns pass and by which the yarns are drawn from the source of
45 supply, means for adjusting one roll of each pair so that relative adjustment of the rolls at each feeding station will cause the said rolls at the several feeding stations to tend to feed the same amount of yarn during the same interval
50 of time, movable yarn guides and means movable therewith for indicating to the operator of the machine whether or not the several pairs of rolls are feeding the same amount of yarn to the

needles so that adjustments can be readily made to effect the knitting of uniform fabric.

7. Yarn feeding means for a multi-feed knitting machine containing pairs of opposed, toothed, conical rolls between which the yarns pass and by means of which they are drawn from the source of supply, means for adjusting one roll of each pair with respect to its companion roll so that relative adjustment of the rolls at each feeding station will cause the said rolls at the several feeding
10 stations to tend to feed the same amount of yarn during the same interval of time, a movable yarn guide associated with each pair of feeding rolls and means movable therewith indicating to the operator of the machine which pair of any
15 two pairs of rolls is drawing the greater amount of yarn from the source of supply so that adjustments can be readily made to effect the knitting of uniform fabric.

8. A yarn furnishing device for knitting machines including a pair of intermeshing, conical feeding wheels, means for varying the degree of interengagement between said wheels and for accurately indicating the degree of interengagement, means for guiding yarn between the feeding wheels and for automatically moving the yarn axially of the feeding wheels to vary the rate of feeding in accordance with length of stitch tending to be drawn and an indicator movable there-
20 with to indicate the relative length of stitch which is being drawn for a given setting of the intermeshing wheels so that adjustments can be readily made to effect the knitting of uniform fabric.

9. The combination in a multi-feed knitting machine of a plurality of yarn furnishing devices, means for adjusting said devices to feed different amounts of yarn and indicating means for showing when all such devices are set to feed like amounts, guide means for guiding the yarn to the feeding device and to knitting instrumentalities
40 of the machine, said guide means being arranged to vary the rate at which the yarn is fed as required by the instrumentalities, an element movable with said guide means and indicating means between which and the said movable element there are relative movements, said indicating means being associated with said movable element for showing the relative rate at which each yarn is being taken by the said instrumen-
50 talities so that adjustments can be readily made to effect the knitting of uniform fabric.

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