Jan. 18, 1938. H. E. GOSLING 2,106,146

YARN SPEED INDICATING MEANS

Filed April 30, 1936

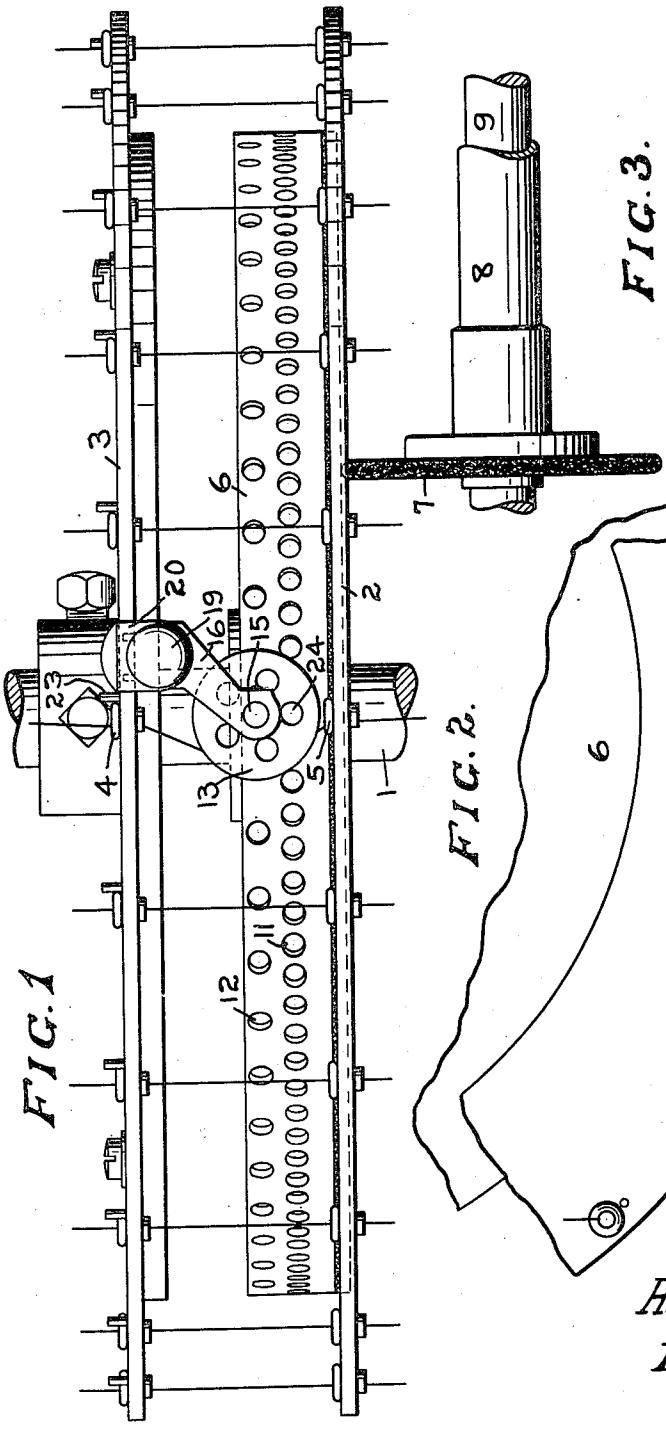


FIG. 1

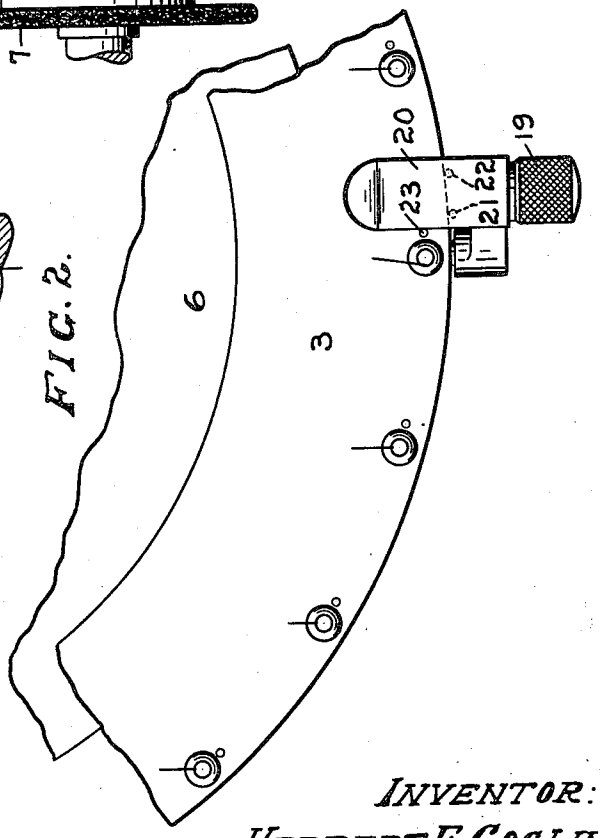


FIG. 2.

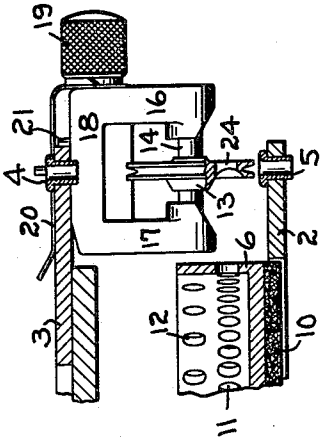


FIG. 3.

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Patented Jan. 18, 1938 2,106,146

UNITED STATES PATENT OFFICE

2,106,146

YARN SPEED INDICATING MEANS

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Application April 30, 1936, Serial No. 77,172

9 Claims. (Cl. 66—125)

The present case concerns mechanism for indicating relative speeds of yarn or filaments or the like passing through textile or analogous machines. This case involves an improvement over the subject matter of British Patents 425,182 and 425,197.

In the drawing:

Fig. 1 is an elevation showing the invention as applied to a multi-feed knitting machine;

Fig. 2 is a plan of a fragment of the device shown in Fig. 1; and

Fig. 3 is a sectional view showing a portion of the mechanism in greater detail.

In the cases mentioned in the paragraph above, mechanism was disclosed and claimed whereby it was possible to simultaneously indicate the relative speeds at which a plurality of yarns or filaments were passing through a knitting machine or through any textile machine to which the principle of the invention might apply. In those cases each of the running yarns or filaments was provided with an individual element, driven by the yarn, and continuously in a position and continuously acted upon in such a manner that the machine operator might observe the speed of the yarn at any time. It is a purpose of this invention to disclose a simplified mechanism which will accomplish the same purpose as those which form the subject matter of the first cases and which will in many respects prove more satisfactory in actual operation. The device herein shown is of simpler construction, much cheaper to manufacture, and does not subject the yarn driven element or elements to continuous wear nor does it subject the several yarns or filaments to the additional duty of continuously driving an indicating disc. Where an individual yarn driven disc is furnished for each of the yarns the speed of which is to be indicated, the weight and balance of the discs as well as the adjustment and friction in the bearings thereof are bound to vary through some extent even under exercise of the greatest care. This difference will be accentuated after some of the grooves in the discs have gathered lint or dirt and also after some lint or dirt has clogged the bearings, these conditions being unavoidable and necessarily affecting certain ones of the units more than others. With the present mechanism each of the yarns has its speed measured relative to a single standard and even if the single movable unit does have its character somewhat changed, this change applies equally to the measurement of all the yarns.

With the construction illustrated a master disc is continuously driven at a speed according to a particular number of stitches which are to be knitted per unit of length and for a particular size of yarn, and a unit carrying one disc mounted in jeweled bearings is movable from one position to another to engage and be driven by any one of the yarns which it is desired to test for speed so as to assure that each course of knitted fabric contains an equal amount of yarn. Means has been provided so that the unit will engage at a precise location with respect to each yarn whereby the disc will be uniformly driven by any yarn engaged and whereby each yarn will have a similar amount of drag imposed thereon by the measuring instrumentality. When the unit is not being used none of the yarns will have any additional encumbrance imposed thereon and they will run through their guides under exactly the same conditions they would in machines having no mechanism provided for the purpose of indicating yarn speed.

With the mechanism in this case there is no continuous movement to subject the parts to wear and the movable part of the measuring unit should wear throughout the life of the machine. There will be no reason to inspect a series of individually driven discs as in the previous construction and no need to make adjustments nor to clean or renew any of the parts at intervals.

Now referring to the figures, a post 1 is shown as carrying a pair of fixed rings 2 and 3 which have a plurality of porcelain eyelets 4 and 5 for each of the yarns passing down from a supply which would be located and supported above the mechanism shown to the needles of a knitting machine or any other yarn consuming instrumentalities of a textile machine, these elements not being shown since they form no particular part of the present invention. A reference to the patents above mentioned will give a clear idea of the manner in which this device is applied to a knitting machine for knitting a plurality of yarns. A so-called master indicator disc or element 6 being formed with an upturned flange as illustrated, Fig. 3, is driven by means of a friction wheel 7 fixed to a sleeve 8 which is in turn driven by shaft 9 and is slidable thereon to engage a cooperating friction surface 10 beneath the disc 6 at different points away from the center of the same. As disclosed in the previous case, this friction drive is varied as to position for the purpose of driving disc 6 either faster or slower to afford a basic comparison against which the speeds of the yarn may be measured and their speeds altered to accomplish the knitting of any desired number of stitches per inch of fabric. A chart will

be prepared so that proper setting of the sleeve 8 may be made for different movements of stitches per inch for different sizes of yarn. All this has been explained in the previous cases and will not receive further consideration in this case.

A series of openings 11 has been provided at one level of the flange on disc 6 and these openings will be used for comparing speeds throughout certain limits of stitch size and of yarn diameter. Another series of openings 12 has been provided at another level, these openings being spaced differently from those at the first level and for certain extreme conditions of stitch length and yarn size it will be necessary to compare the speed with respect to this series of openings. It is understood, of course, that disc 6 is mounted on suitable bearings for location on the shaft or spindle 1 and that it is continuously driven by means of elements 7, 8 and 9 and other driving connections to the drive of the machine itself so that a definite ratio of drive always prevails in accordance with any setting of the sleeve 8 along the shaft 9.

A disc 13 formed of light metal or any other suitable material is fixed to a small spindle 14 which operates in jeweled bearings 15 adjustably fixed in each arm 16 and 17 of a small U-shaped bracket 18. A knurled-headed screw 19 is threaded into the bracket 18 and maintains a spring clip 20 in place as well as providing a means for grasping this movable unit and placing it on the machine. The bracket 18 has a pair of pins 21 and 22 fixed to project from the top surface thereof which are carefully positioned to engage the outer surface of ring 3 so that the groove in the disc 13 will aways align with the center of the porcelain eyelets 4 and 5. Another pin 23, one of which is provided adjacent each guide where the yarn passes through ring 3, limits the movement of the unit toward the yarn so that said yarn will be properly passed about a segment of disc 13 to drive the same while being measured. These pins 21—23 always assure that the movable part of the measuring means is engaged in precisely the same relationship to whichever yarn it is applied. The spring clip has sufficient restraining force as it engages over the ring 3 to hold the unit in place while any particular yarn is being tested and adjusted for speed. The disc 13 has a plurality of equally spaced holes 24 therein, these holes being so spaced relative to the diameter of the groove in the disc and to the spacing of the holes of disc 6 that the two operating together give a visual indication of the speed at which the yarn is running in accordance with the principles of the stroboscope. The speed of the running yarn will be varied preferably by an adjustment of the position of an appropriate stitch cam or other cam controlling the knitting function until at the point at which their pathways intersect, the holes in both elements 6 and 13 appear to remain stationary or substantially so.

At such times as it is desired to test the speed of all or any of the yarns or whenever it is desired to change stitch length, or for any other reason, this movable unit will be applied to those yarns to be tested and after suitable adjustments have been made will be withdrawn from engagement with any yarn and placed in such a position that it will not become damaged or will not gather lint or dirt. Such use of the device for brief periods at extended intervals will not in any way tend to cause noticeable wear nor will the functioning of the device be interferred with as might be possible with permanent units such as formed the subject matter of the previous case. All measurements will be taken relative to a single standard and thus a maximum of accuracy will be realized.

In the preferred form of the invention I have employed a master indicator element which is fixed to the machine and is rotated from some driving connection or connections upon the machine itself. It is quite evident that such a construction would not be absolutely necessary and I contemplate the employment of a master indicator element driven from some other source of power and supported by some other means.

The device has been described with respect to one particular embodiment of the same and relatively to an application to a multi-feed knitting machine, but it is equally applicable to all similar textile machines and obviously is subject to many changes without departing from the original concept. The invention is defined in the following claims.

I claim:

1. In a knitting machine having means for knitting a plurality of running yarns, means for indicating the relative rates at which the several yarns are being drawn including a master indicator element and a single, yarn driven element for cooperating therewith to effect an indication, said single element being movable from one yarn to another whereby indications are taken under uniform conditions.

2. In a knitting machine having means for knitting a plurality of running yarns, means for indicating the relative rates at which the several yarns are being drawn including a master disc having a series of openings therein and being driven at a predetermined speed relative to the speed at which the machine is driven, a movable element for engaging each of the yarns and for cooperating with the master disc, said movable element having means for temporarily fixing its position relative to each yarn and for being quickly detached and having a rotating disc for engagement with the yarns, said disc having a plurality of openings therein for cooperating with the openings in the master disc.

3. Means for indicating the relative speeds at which a series of yarns or the like are running including means driven at a predetermined rate so as to set up a definite standard of comparison, means cooperating therewith and quick detachable and bodily movable from one yarn to another for being driven by a yarn, said means being so constructed that in cooperation with said first mentioned means it will present an indication of the speed of a yarn being tested relative to said standard.

4. Means for indicating the relative speeds at which a series of yarns or the like are running including means driven at a predetermined rate so as to set up a definite standard of comparison, means cooperating therewith and readily movable from one yarn to another for being driven by a yarn, said means being so constructed that in cooperation with said first mentioned means it will present a visual indication of the speed of a yarn being tested relative to said standard.

5. In a knitting machine, means for knitting a plurality of yarns into a fabric, a master disc driven at a predetermined but variable speed relative to the speed at which the machine is driven, a plurality of openings in said disc, a bracket readily and quickly movable from one yarn to another and means for temporarily positioning

said bracket in a definite relationship to each of the yarns, bearings in the bracket and a disc rotating in said bearings, a groove in said disc whereby it will be driven by a yarn and a plurality of openings in the disc for cooperating with those in the first mentioned disc.

6. In a knitting machine, means for knitting a plurality of yarns into a fabric, guide means fixed upon said machine for guiding each of the yarns in a definite pathway, a driven disc having flange with a series of equally spaced openings therein, a bracket for ready engagement with and quickly detachable from said guide means, positioning means on the bracket and the guide means for assuring proper relative position of the bracket to a yarn, a disc rotating in bearings in the racket and having a plurality of equally spaced openings therein for cooperating with those openings in the first mentioned disc whereby an indication of yarn speed will be effected whenever said bracket and disc will be moved into position adjacent a yarn so that the yarn will drive the disc.

7. Indicating means for observing the relative rates at which a plurality of yarns are running including a stroboscope, one element of said stroboscope being driven at a predetermined speed and the other element of said stroboscope being driven by the yarn, said last mentioned element being so constructed that it is quickly and readily movable from one yarn to another and engageable therewith to be driven, and means for positioning said movable part of the stroboscope at a definite location relative to each yarn.

8. Means for indicating relative speeds at which a plurality of yarns are running including a driven stroboscope element and associated therewith a cooperating stroboscope element to be driven by a yarn, the construction of said element being quickly detachable and such that the yarn driven element may be applied to any yarn whereby it will automatically align with the other element and will present a correct visual indication of the speed of that particular yarn.

9. Yarn speed indicating means for a plurality of yarns knitting at a plurality of feeding stations including a driven master disc, a quick detachable and bodily movable, yarn driven disc for cooperating therewith, said disc being movable from one yarn to another, and means associated with said movable disc constructed and arranged for permitting its ready removal and for holding it in operative position, said movable disc and master disc having means associated therewith for presenting a visual indication of yarn speed relative to some standard.

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