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J. P. KIERONSKI

3,074,606

TEXTILE APPARATUS

Filed March 21, 1960

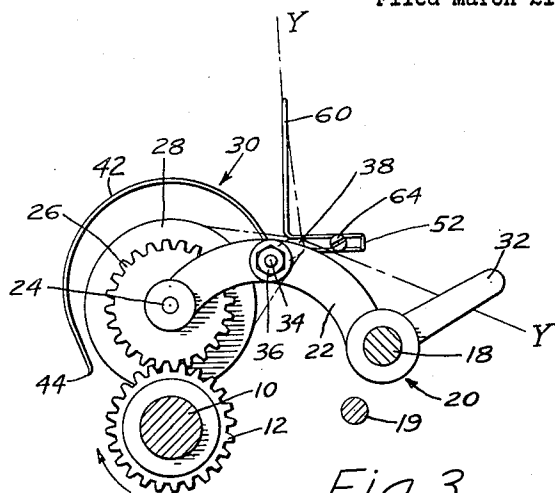


Fig. 3

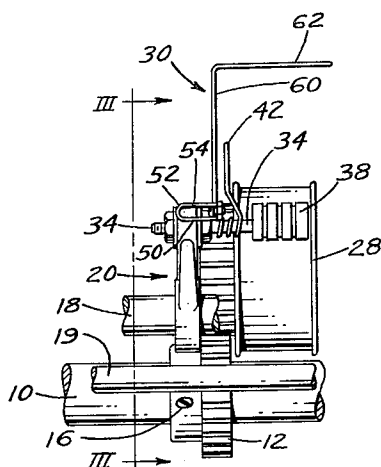


Fig. 2

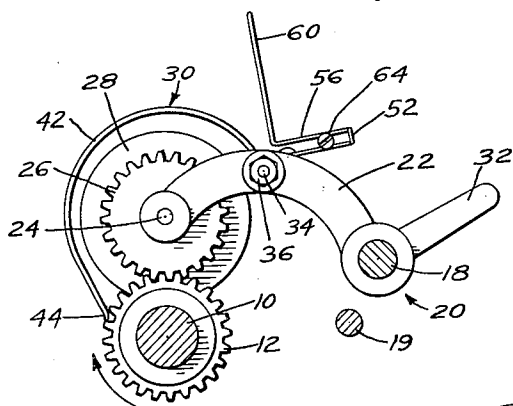


Fig. 4

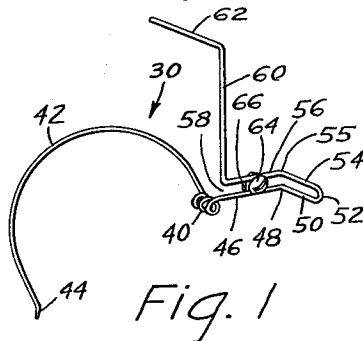


Fig. 1

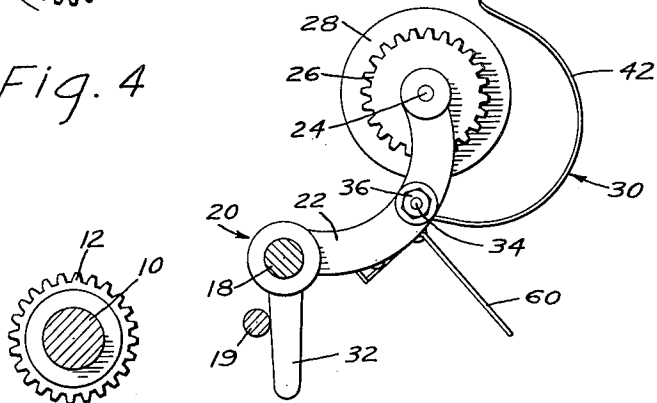


Fig. 5

INVENTOR.
JOHN P. KIERONSKI
BY *Albert P. Davis*
ATTORNEY

1

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John P. Kieronski, Johnston, R.I., assignor to Leeson Corporation, Cranston, R.I., a corporation of Massachusetts

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1 Claim. (Cl. 226—11)

The present invention relates to a textile machine and more particularly relates to a device for rendering a feed roller advancing a winding strand of yarn inoperative when the strand being advanced thereby breaks or the supply thereto becomes exhausted.

It is frequently necessary when processing yarn to withdraw it from a supply thereof and advance it through the processing apparatus under constant, uniform tension and speed. In order to achieve this, one or more positively driven feed rollers are employed to engage and advance the strand at a uniform rate of speed.

A difficulty encountered in the use of feed rollers is that the feed rollers often will continue to withdraw yarn from the supply after a break occurs in the running strand at a point beyond the feed roller. This leads to the undesirable result of the strand becoming entangled in the feed roller and its driving mechanism, resulting in the waste of yarn and frequently in damage to the machinery.

It may also occur that the supply of yarn to a positively driven feed roller will become exhausted. Unless some means is provided to arrest the action of the feed roller it will continue to operate until it can be manually stopped thereby resulting in unnecessary wear on the roller and its driving mechanisms.

It is accordingly one object of the present invention to provide a device which will render a positively driven feed roller inoperative when a break occurs in a strand of yarn being fed thereby.

Another object of the present invention is to provide a device for preventing a broken strand of yarn engaged by a positively driven feed roller from being fed from a supply package associated with said strand.

Another object of the present invention is to provide a device which will render the yarn feed roller inoperative upon exhaustion of the supply of yarn thereto.

Another object of the present invention is to provide a device for rendering a yarn feed roller inoperative by disengaging its driving mechanism when the strand being fed by the roller breaks or is exhausted.

Another object of the present invention is to provide a device adapted to engage a running strand of yarn for rendering a yarn feed roller advancing said yarn inoperative by disengaging its driving mechanism when the strand breaks or is exhausted, said device being provided with a counterweight to control the pressure thereof on the running strand of yarn.

Another object of the present invention is to provide a yarn feed roller stop motion device which is inexpensive to manufacture and durable and reliable in use.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises the apparatus possessing the construction, combination of elements and arrangement of parts which are exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the claim.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings wherein:

FIG. 1 is a perspective view of the feed roller disengaging means of the present invention;

FIG. 2 is a front elevation of a positively driven feed roller embodying the present invention;

2

FIG. 3 is a side elevation taken along lines III—III of FIG. 2 with parts in section;

FIG. 4 is a view similar to FIG. 3 but illustrating the feed roll disengaging means immediately after the strand of yarn has broken; and

FIG. 5 is a view similar to FIG. 3 but showing the feed roller disengaged from its driving mechanism.

Referring now to the drawing wherein there is disclosed a preferred embodiment of the present invention. While the present invention can be adapted to various winding machines that are commercially available it is described, for convenience, in connection with a machine of the type fully disclosed in United States Patent No. 2,899,796, issued August 18, 1959, to D. G. Soussloff et al. The operation of the yarn roller and its driving means are fully disclosed in said Patent No. 2,899,796. Therefore, only so much of it as is necessary to a complete understanding will be described herein.

A horizontal drive shaft 10, suitably journaled for rotation at a constant speed on a winding machine is connected to a power source (not shown) to provide clockwise rotation to said shaft. The power source may be a separate motor or it may be the same power source which operates the machine. Fast on shaft 10 is a drive gear 12 having its hub secured fast to shaft 10 by suitable means such as set screw 16.

Extending parallel with shaft 10 and forwardly thereof, as shown in FIGS. 3, 4 and 5, is a shaft 18 suitably mounted on the frame of the winding machine. Shaft 18 supports a bell-crank 20 for pivotal movement thereon. The longer arm 22 of bell-crank 20 carries a stub shaft 24 which rotatably mounts a spur gear 26 and a yarn roller 28. Spur gear 26 and yarn roller 28, integrally formed to rotate as a unit, are mounted on bell-crank 20 in a manner whereby spur gear 26 will mesh with driver gear 12 when bell-crank 20 is pivoted to the rear but clearance will exist between yarn roller 28 and driver gear 12 when bell-crank 20 is in its rearward position.

Disposed beneath shaft 18 is a horizontal rod 19 which serves as a stop to be engaged by shorter arm 32 of bell-crank 20 to thereby retain yarn roller 28 in its forward position, as shown in FIG. 5.

The longer arm 22 of bell-crank 20 supports a laterally extending stud 34 midway therealong. Stud 34 is fixed in arm 22 by means of a nut 36 threadedly engaged with said stud. A comb-like member 38 is mounted on the outer end of stud 34 to be disposed in alignment with yarn roller 28. Stud 34 also provides a support for the yarn roller arresting element generally indicated by numeral 30.

Element 30 is preferably constructed of a single length of resilient, round wire or rod bent to the desired form. A support section 40, comprised of loops of wire coiled about stud 34, is positioned between arm 22 and comb-like member 38 for rotatable movement on said stud 34. An arcuate leg 42 having a conformation corresponding substantially to the circumference of gear 26 extends rearwardly from support section 40 to be normally spaced upwardly of said gear 26 in vertical alignment with gear 12. Leg 42 terminates in a short rearward bend 44 adapted to engage with gear 12 in a manner to be more completely described hereinafter.

Extending forwardly from support 40 is a length 46 having a right angle 48 inserted therein to direct a portion 50 toward and over arm 22. A U-shaped reverse bend 52 is inserted in portion 50 to direct portion 54 parallel to and above portion 50. A second right-angled turn 55 is inserted in portion 54 to direct a run 56 parallel to and above length 46. A reentrant opening is thereby provided at 58. An upwardly directed arm 60 is bent in run 56 and, in turn, the terminal portion of run 60 is bent to the side to form a bail 62 for engaging a strand of

3

yarn Y. So formed, bail 62 is in alignment with yarn roller 28 as seen in FIG. 2.

A screw 64 and nut 66 are positioned for adjustable movement along opening 58 to provide a counterweight for leg 42 when bail 62 is in its operative position contacting a running strand of yarn.

The above described apparatus operates in the following manner. With strand of yarn Y being drawn from a suitable supply, not shown, said strand Y is passed about yarn roller 28 and comb-like member 38 several times, with each pass of yarn being laid in a different groove of member 38. Strand Y is then passed upwardly of roller 28 to suitable processing or take-up means. With the apparatus so threaded, bell-crank 20 is rotated counterclockwise, as shown in FIGS. 3, 4, to mesh gears 12 and 26. It will be apparent that yarn roller 28 will be caused to rotate at a constant peripheral speed when gears 12 and 26 are in mesh and rotation is imparted to shaft 10. As bell-crank 20 is moved counterclockwise bail 62 will be pivoted into the path of strand Y to contact said strand on the output side of roller 28 as it is advanced by roller 28. Arm 42, in turn, will be held in a raised position radially of roller 28, as shown in FIG. 3. Leg 42 provides a sufficient over-balance to retain bail 62 in contact with strand Y. Preferably the pressure exerted by bail 62 on strand Y is controlled by adjusting screw 64 along slot 58 to permit a minimal over-balance by leg 42, thereby reducing the influence of bail 62 on the tension on strand Y and reducing the wear on said bail.

Upon breaking or exhaustion of strand Y being fed by roller 28, arm 42, no longer supported in its raised position by bail 62, will rock downwardly by gravitational force due to its over-balance, to become engaged in the teeth of gear 12, see FIG. 4, which is rotating in a clockwise direction. As a result, the percussive action of gear 12 rotating against resilient arm 42, will cause bell-crank 20 to be pivoted abruptly clockwise, as viewed in FIGS. 3, 4 and 5. In consequence thereof, bell-crank 20 will be

4

pivoted until arm 32 contacts stop bar 19 as shown in FIG. 5. In this position feed roller 28 is prevented from rotating as gear 26 is disengaged from gear 12 and arm 42 and bail 62 are maintained in their rest positions as U-shaped bend 52 is rocked into contact with arm 22. The foregoing apparatus may be manually shifted into its operative winding position after the yarn supply is replenished or a break in the strand is repaired.

Since certain changes may be made in the above apparatus without departing from the scope of the invention herein involved, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in the limiting sense.

What is claimed is:

Apparatus for advancing a winding strand of yarn comprising in combination yarn engaging means including a roller and an associated spur gear, a rotatable driving gear adapted to engage said spur gear and positively rotate said roller, a pivotally supported arm adapted to shift said yarn engaging means from a first position wherein said spur gear and said driving gear are engaged to a second position wherein said gears are disengaged, rockable means comprising a bail portion adapted to engage said winding strand of yarn when said yarn engaging means is in said first position and a leg portion spaced apart from said driving gear when said bail is engaged by said winding strand of yarn, said leg portion being rockable to engage said driving gear when said bail is not engaged with said winding strand of yarn, and an adjustable counterweight portion associated with said bail and leg portion.

References Cited in the file of this patent

UNITED STATES PATENTS

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