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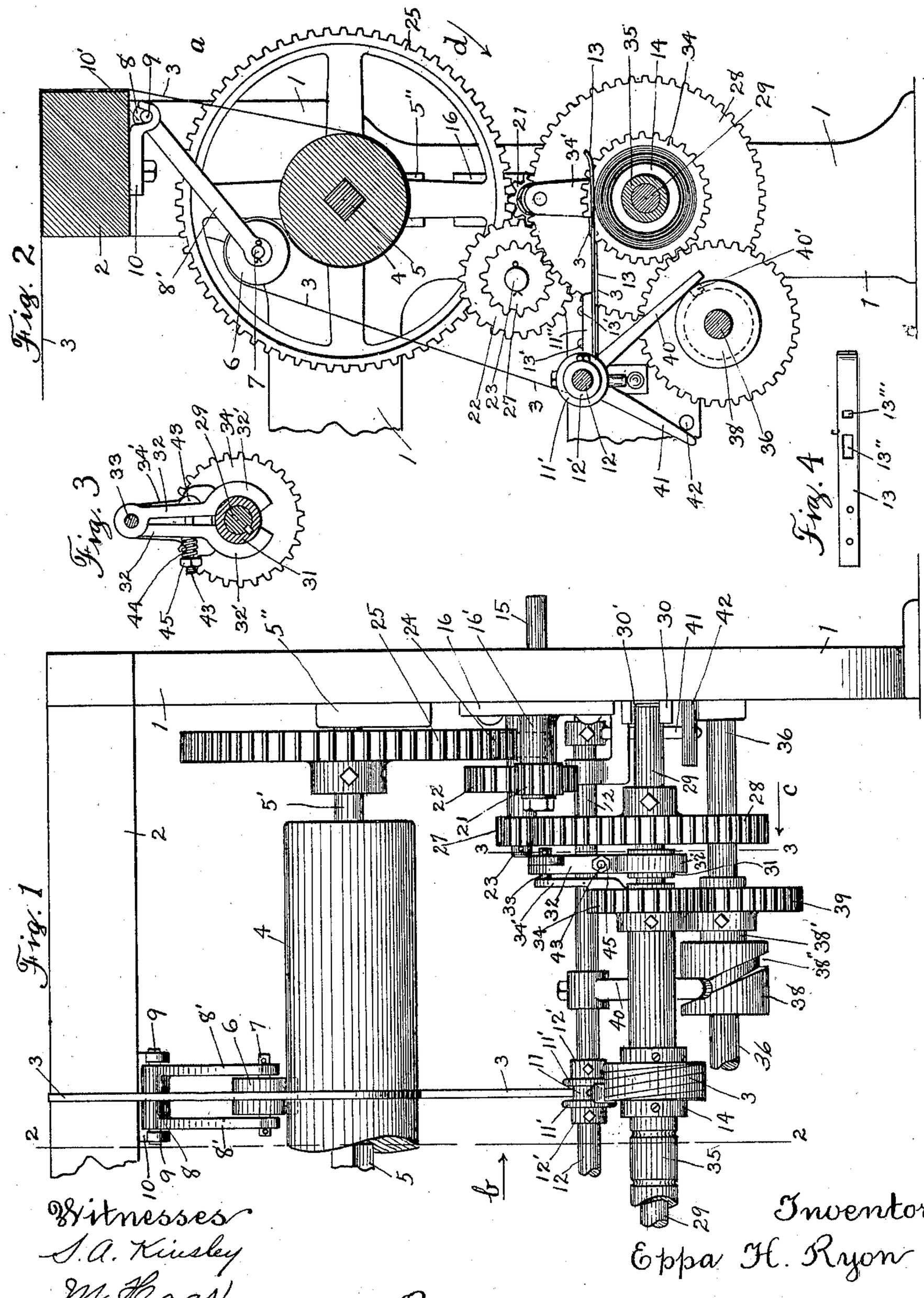
E. H. RYON.

LOOM.

(Application filed Apr. 13, 1901.)

(No Model.)



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EPPA H. RYON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, OF SAME PLACE.

LOOM.

SPECIFICATION forming part of Letters Patent No. 682,429, dated September 10, 1901.

Application filed April 13, 1901. Serial No. 55,606. (No model.)

To all whom it may concern:

Be it known that I, EPPA H. RYON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Looms, of which the following is a specification.

My invention relates to a take-up or winding mechanism for tape, ribbon, &c., adapted to be used on what are termed "narrow-ware looms," which weave narrow-ware goods, as tape, ribbon, &c.

The object of my invention is to provide a take-up or winding mechanism of simple construction and operation and which may be combined with and used on narrow-ware looms of ordinary construction and by means of which the tape, ribbon, or other goods woven on the loom may be wound up in a narrow roll on a spool while the loom is in operation, and particularly to provide means for retarding the rotation of the winding-spool and the lateral movement or travel of the tape-guiding needle or guide as the wound tape on the spool increases in size and for equalizing the retardation of the spool and the needle, as will be hereinafter described.

In my take-up or winding mechanism I employ a guide, extending in this instance over the spool upon which the tape is wound, having holes therein through which the tape passes before passing to the spool. The needle or guide has a lateral or transverse motion or travel in the direction of the axis of the spool on which the tape is wound to carry the tape back and forth on the spool in the direction of its length as the tape is wound thereon by the revolution of the spool. The width or thickness of the wound tape is governed by the amount of travel or movement of the needle. As the tape is wound on the spool the wound tape is constantly increasing in size, and therefore the speed at the outer surface of the wound tape is constantly increasing, and if the spool was fast on a uniformly-driven shaft this speed would be so great that the tape could not be supplied from the loom fast enough. In order to overcome the increasing speed of the wound tape on the spool, I provide means, preferably in the form of a friction device, which will allow the rotation of the spool on which the tape is wound to be retarded as the wound tape increases in size. It is necessary that there should be more retardation of the rotation of the spool the more the wound tape increases in size, so that the take-up of the tape and the let-off of the warps forming the tape shall be always equal. It is also necessary that the speed of the guide which guides the tape as it travels laterally on the surface of the wound tape should be retarded as the wound tape increases in size.

I have shown in the drawings sufficient portions of a take-up mechanism on a loom with my improvements combined therewith to enable those skilled in the art to which my invention belongs to understand the construction and operation of the same.

Referring to the drawings, Figure 1 is a side view of a take-up or winding mechanism looking in the direction of arrow *a*, Fig. 2. Fig. 2 is a section on line 2 2, Fig. 1, looking in the direction of arrow *b*, same figure. Fig. 3 is a sectional detail of the retarding or friction mechanism, taken at a point indicated by line 3 3, Fig. 1, looking in the direction of arrow *c*, same figure; and Fig. 4 is a plan view of the tape-guide needle detached.

In the accompanying drawings, 1 is the loom side or frame.

2 is the breast-beam over which the tape 3 passes after it is woven in the ordinary way on the other parts of the loom. (Not shown in the drawings.) The tape 3 passes under the large rotary roll 4, which is fast on a square shaft 5, having a journal or end 5′, mounted in bearings 5″ on the loom-frame 1, and then up between the roll 4 and the roll 6, and over said roll 6, which bears on the roll 4 and is mounted on the stud 7, having bearings in the arms 8′ of the swinging or pivoted frame 8, having studs 9 extending loosely in open-end slots or recesses 10′ in the bracket 10, fast to the under side of the breast-beam 2. The tape 3 passes over the roll 6 and under the flanged collar 11, having two flanges 11′ thereon, between which the tape 3 passes. The collar 11 is loose on a longitudinal sliding or movable shaft 12 and is held in position thereon to have a rotary motion by collars 12′, fast on the shaft 12. The collar 11 has an extension 11″ thereon

to the lower surface of which is secured, by screws 13′ or otherwise, the guide-needle 13, which extends in this instance over the spool 14 on which the tape 3 is wound. The guide-needle 13 at its free end rests on the wound-tape and is raised as the tape is wound on the spool 14. There are two holes 13″ and 13‴ in the needle 13, and the tape 3 passes under the collar 11 and under the guide-needle 13 and up through the openings 13″ and then down through the openings 13‴ to be wound on the spool 14.

15 is a driven shaft journaled in a hub 16′ on the stand 16, secured to the loom side. On the inner end of the shaft 15 is fast a pinion 21, which engages the gear 22 on the stud 23, secured in the loom side. Also on the stud 23 is a pinion 24, (shown by dotted lines in Fig. 1,) which engages the large gear 25, fast on the journal 5′ of the roll 4, to communicate rotary motion to said roll 4 in the direction of arrow *d*, Fig. 2, and advance the tape around said roll and over the roll 6 as fast as it is supplied by the let-off motion on the loom. On the inner end of the stud 23 is the pinion 27, which engages the gear 28, fast on the shaft 29, which has its bearing in an open-end slot 30′ in the stand 30, secured to the loom side. The three pinions or gears 22, 24, and 27 are fast together, but loose on the stud 23.

Fast on the shaft 29 is the collar 31, which is encircled and engaged by the curved ends 32′ on the two oppositely-arranged jaws or clamps 32, forming in this instance the retarding or friction mechanism above referred to. The two jaws 32′ are held in frictional engagement with the collar 31 on the shaft 29 by means of a bolt 43 extending loosely through openings in the jaws 32 and having a spiral spring 44 thereon intermediate one jaw 32 and a nut 45 on the threaded end of the bolt 43. (See Fig. 3.) The screwing on of the nut 45 on the bolt 43 compresses the spring 44 and increases the friction of the jaws 32′ on the collar 31, but allows the jaws 32 to slip on the collar 31 as it revolves between them. The screwing off of the nut 45 allows the spring 44 to expand to diminish the friction of the jaws 32′ on the collar 31. The two jaws 32 are pivotally mounted on a stud 33, fast in the upper end of an arm 34′ on the side of the gear 34, which gear is fast on a long sleeve 35, loosely mounted on the shaft 29. The spool 14 is fast on the sleeve 35. The turning of the shaft 29 through gears 27 and 28 operates to turn the sleeve 35, and spool 14 through the jaws 32′ engaging the collar 31, said jaws, as above stated, being pivoted on the stud 33 on the arm 34′ on the gear 34, fast on the sleeve 35.

On a shaft 36, secured to the loom side, is loose the grooved cam 38, having a hub 38′ thereon on which is fast the gear 39. Said gear 39 is engaged by the gear 34, fast on the sleeve 35 above described. The turning of the gear 34 as above described operates to turn the gear 39 and grooved cam 38. In the groove 38″ of the cam 38 travels a pin 40′ on an arm 40, fast on the longitudinal moving shaft 12. An arm 41, fast on the shaft 12, near its end, bears against a stud 42 in the loom side to hold the pin 40′ on the arm 40 in the groove 38″ in the cam 38. The revolution of the gear 34, through gear 39, grooved cam 38, and arm 40, causes the shaft 12 to have a reciprocating longitudinal motion and the collar 11 thereon and needle 13 to have a lateral travel or motion in the direction of the axis of the spool 14 to guide the tape as it is wound on the spool.

It will be seen that by the operation of the take-up mechanism through the rotation of the driven shaft 15 as the tape 3 is wound on the spool 14 by the revolution of said spool and the travel of the guide-needle 13, as above described, the circumference or size of the wound tape gradually increases, but the supply from the loom remains constant, and therefore the rotary motion of the spool 14 must be retarded. This is accomplished by adjusting by the nut 45 on the bolt 43 the friction between the jaws 32 and the collar 31 on the shaft 29, so that the ends 32′ of the jaws will slip on the collar 31 under sufficient strain. The slipping of the jaws 32′ on the collar 31 will be constantly accelerated as the wound tape on the spool 14 increases.

The gear 34, operated through the friction device, as above described, operates the gear 39 and the grooved cam 38, so that the rotation of said cam 38 will be retarded proportionately to the retarding of the rotation of the spool 14, and consequently the lateral movement or travel of the guide-needle 13, operated by said cam 38, will be proportionately retarded.

It will be understood that there will be a series of spools 14 and guide-needles 13 extending across the loom in case of my improvements being used on narrow-ware looms of ordinary construction, and the movement of all of them will be governed by the friction or retarding mechanism, which is preferably of the construction shown in the drawings and above described, but may be of any suitable construction.

It will be understood that the details of construction of my improvements may be varied if desired.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a take-up or winding mechanism for tape, ribbon, &c., the combination with a guide, a spool on which the tape is wound, said spool loose on a shaft, and said shaft, of means for communicating a transverse or lateral motion to said guide, and means for rotating said spool, and retarding the rotation of said spool, substantially as shown and described.

2. In a take-up or winding mechanism for tape, ribbon, &c., the combination with a

guide, a spool, on which the tape is wound, on a sleeve loose on a shaft, and means for communicating a transverse or lateral motion to said guide, of means for rotating said spool, and retarding the rotation of said spool, and the transverse movement or travel of the guide, substantially as shown and described.

3. In a take-up or winding mechanism for tape, ribbon, &c., the combination with a guide-needle, a spool on which the tape is wound, fast on a sleeve loose on a shaft, and means for communicating a transverse or lateral motion to said guide-needle to guide the tape onto said spool, of means for rotating said spool, and retarding the rotation of said spool, and the transverse movement or travel of the guide-needle, said means comprising friction or yielding mechanism connected with and intermediate the shaft on which the sleeve and spool are mounted, and a gear for communicating rotary motion to said spool and to the cam which governs the transverse motion or travel of the guide-needle, substantially as shown and described.

4. In a take-up or winding mechanism for tape, ribbon, &c., the combination with a driven shaft, a sleeve loose on said shaft, and a spool on which the tape is wound on said sleeve, and a gear fast on said sleeve, meshing with and driving a gear connected with a cam, and said cam, and connections between said cam and a longitudinal moving shaft, and said shaft, and a flanged collar thereon, and a guide-needle attached to said collar and extending over the spool on which the tape is wound, of mechanism for retarding the rotation of the spool on which the tape is wound, and the transverse movement of travel of the guide-needle, as the wound tape increases in size, said means comprising a friction device, intermediate the driven shaft and the gear fast on the sleeve carrying the spool on which the tape is wound, substantially as shown and described.

5. In a take-up or winding mechanism for tape, ribbon, &c., the combination with a roll under which the tape passes, and means for rotating said roll from a driven shaft, a second roll, over which the tape passes, on a swinging frame and bearing on the first-mentioned roll, a flanged collar under which the tape passes, a guide-needle secured to said collar to guide the tape, and extending over the spool on which the tape is wound, and having an opening or openings therein through which the tape passes, said collar loose on a longitudinal moving shaft, and said shaft, and an arm fast thereon, and having a pin thereon traveling in a groove in a cam, and said cam, of the spool on which the tape is wound, fast on a sleeve loose on a shaft, a gear fast on said sleeve and meshing with a gear fast on the shaft carrying said grooved cam, and mechanism for retarding the rotation of the spool on which the tape is wound, and of the grooved cam for regulating the transverse travel or movement of the guide-needle, as the size of the wound tape on the spool increases, consisting of a friction device, connected with and intermediate the gear connected with the spool on which the tape is wound and the driven shaft on which the sleeve carrying said spool is loose, substantially as shown and described.

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Witnesses:
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