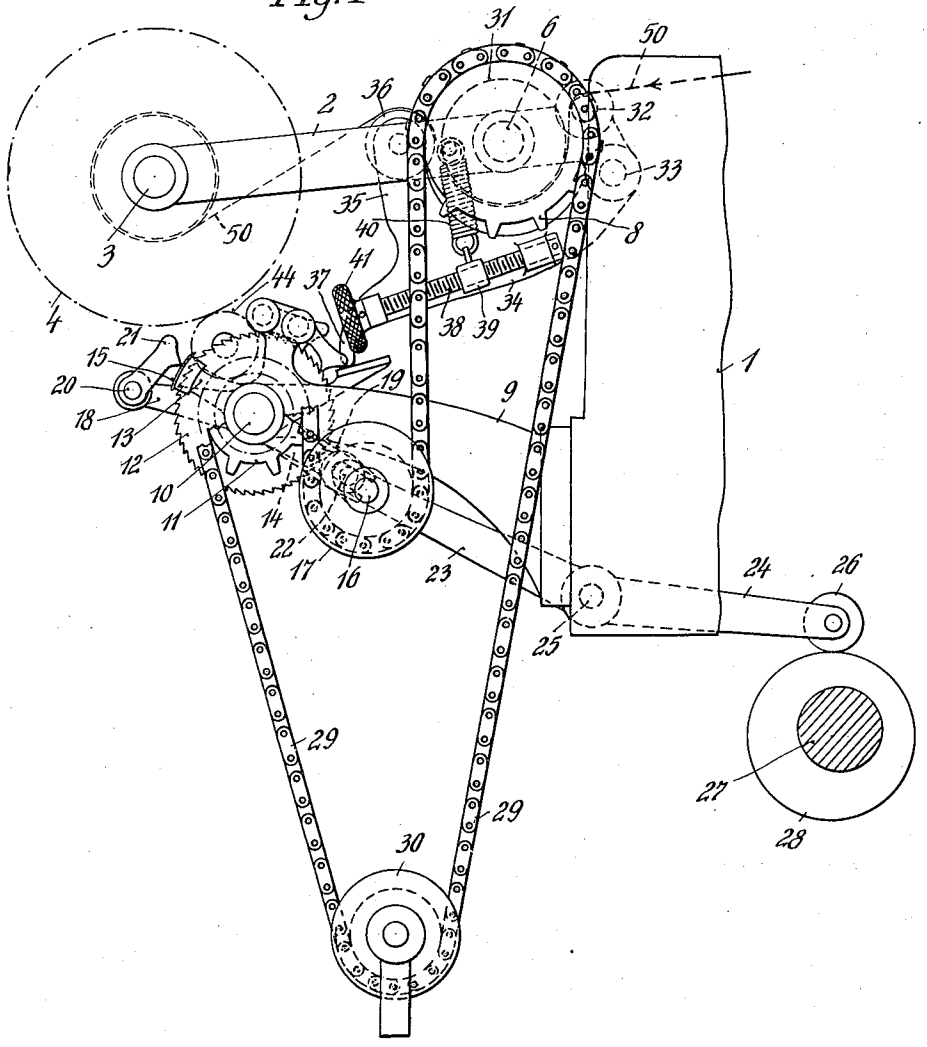
Dec. 15, 1936. H. WIRTH 2,064,710

FABRIC TAKE-UP DEVICE FOR FLAT WARP KNITTING MACHINES

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Fig. 1



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Fig. 2

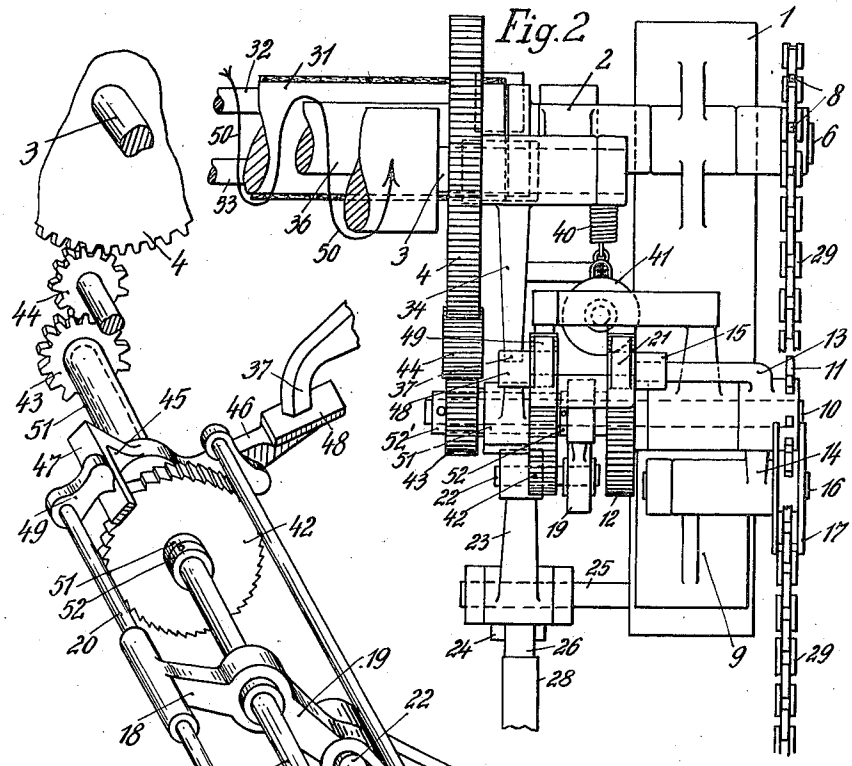
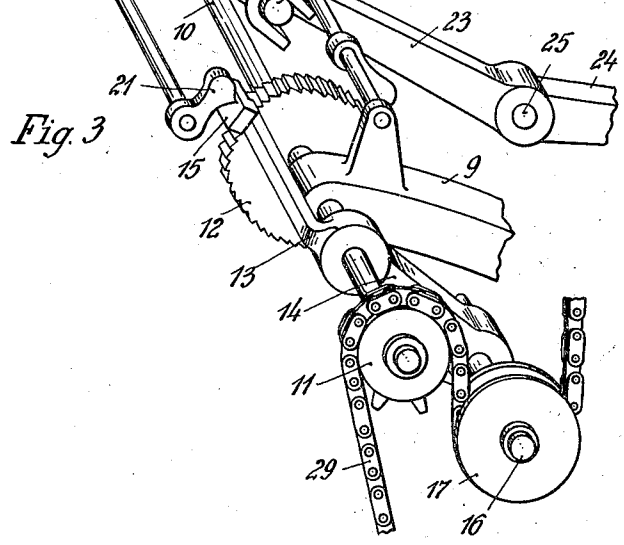


Fig. 3



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2,064,710

FABRIC TAKE-UP DEVICE FOR FLAT WARP KNITTING-MACHINES

Herbert Wirth, Hartmannsdorf, near Chemnitz, Germany

Application March 28, 1936, Serial No. 71,484
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3 Claims. (Cl. 66—149)

The present invention relates to flat warp knitting machines and more particularly refers to a mechanism driven by an endless chain, rope, cord or the like for winding the fabric into a roll in flat warp knitting machines. According to the present invention, the chain or the like is passed over a sprocket wheel or cable drum associated with the take-up roller and over a sprocket wheel or cable drum actuated by a ratchet wheel to maintain a substantially constant length of chain or the like between said sprocket wheels and the roller on which the fabric is wound is driven by a separate and automatically regulable mechanism.

It has already been proposed to obtain an automatic take-up of the fabric in that the chain or the like which is loaded by a take-up weight or a spring is passed over a sprocket wheel or cable drum influencing the roll on which the fabric is wound and over a sprocket wheel or cable drum actuated by a ratchet wheel, which compensate for the length of the chain which becomes free.

With this arrangement it is necessary to check or verify the strength of the fabric because the tension of the fabric alters with the variation in the diameter of the roll on which the fabric is wound.

This disadvantage is avoided by the arrangement forming the subject of the present invention. This is attained in that the actual roll on which the fabric is wound is mounted independently of the fabric take-up roll and is driven by way of gear trains actuated by a pawl and ratchet mechanism.

The roll on which the fabric is wound is rotated mechanically from the cam shaft under the control of the take-up.

By means of this arrangement the tension of the fabric is constantly under control. The tension of the fabric does not vary. A uniform tension is attained automatically in the take-up so that it is only necessary for it to be adjusted initially by the operator, whereafter it requires no further adjustment.

In the accompanying drawings one embodiment of the invention is shown by way of example.

In these drawings:

Fig. 1 shows a side view,

Fig. 2 is a front view, and

Fig. 3 shows a perspective representation of the arrangement in which for the sake of clarity the individual parts are shown more widely spaced.

Mounted in arms 2 on the frame 1 of the machine is a shaft 6 carrying a sprocket wheel 8. The shaft 3 carrying the roll on which the fabric is wound is mounted on the ends of the arms 2. At the end of this shaft 3 is a gear wheel 4. Also mounted on the shaft 6 carrying the sprocket wheel 8 is a roller 31 which is covered with rough material, felt or the like. Disposed in front of the roller 31 is a roller 32 over which the fabric 50 coming from the machine and indicated by a broken line in Fig. 1 is fed to the roller 31.

A bent arm 34 is pivotally mounted on the shaft 33. The arm 34 is bent in such manner as to embrace approximately half of the roller 31. The upwardly directed end 35 of the arm 34 carries a control roller 36. The arm 34 has also a downwardly directed extension 37. Mounted on the arm 34 is a screw 38 on which is carried the internally threaded slide block 39. Secured to the threaded slide block is a spring 40 which at the other end is anchored to the arm 2 so that the roller 36 carried in the arm 34 is held in a definite position. The screw 38 is provided with a head 41 by the rotation of which the threaded slide block 39 can be displaced on the screw 38 in order to alter the point of engagement of the spring 40.

Carried in a second arm 9 mounted on the frame 1 of the machine is a shaft 10 on which a sprocket wheel 11 and a ratchet wheel 12 are secured.

Freely carried on the shaft 10 adjacent the ratchet wheel 12 is a double-armed lever 13, 14. The arm 13 carries a plate 15 extending above the ratchet wheel 12. Mounted in the arm 14 is a shaft 16 carrying a roller 17 provided with a flange on each side.

Also positioned on the shaft 10 is a double-armed lever 18, 19. Secured to the arm 18 is a bolt 20 which carries at one end a pawl 21 which can operate on the ratchet wheel 12.

The arm 19 is provided with a slotted guide. A roller 22 which is carried on the arm 23 of a double-armed lever 23, 24 mounted on the frame of the machine at 25, runs in this slotted guide. The other arm 24 carries a roller 26 disposed in the path of a cam 28 arranged on the shaft 27.

An endless chain 29 is passed over the sprocket wheels 8 and 11. Instead of the chain, a cord, cable or the like could be employed. Between the two sprocket wheels 8, 11, the chain is passed beneath the flanged roller 17. A flanged roller 30 is also supported by the chain and is attached either to a weight or to a spring which draws the roller 30 downwardly.

The plate 15 provided on the arm 13 is located in the vicinity of the pawl 21. By means of the cam 28 the double-armed lever 23, 24 and thereby

the double-armed lever 18, 19 is rocked. A pawl 21 carried on the bolt 20 on the arm 18 advances the wheel 12. The sprocket wheel 8 is moved by means of the chain 29 running over the tensioning roller 30 and passing over the sprocket wheel 11 connected with the wheel 12.

Also freely mounted on the shaft 10 is a ratchet wheel 42 having an extended hub or sleeve 51 carrying a gear wheel 43. The ratchet wheel 42 and gear wheel 43 are held against longitudinal displacement by collars 52, 52'. The gear wheel 43 is in engagement with the gear wheel 4 by way of an interposed gear wheel 44, the gear wheel 4 being mounted on the shaft 3 carrying the roll on which the fabric is wound. A double-armed lever 45, 46 loosely mounted on the sleeve 51 carries on its arm 45 a plate 47 extending over the ratchet wheel 42. The other arm 46 is provided with an abutment surface 48 on which rests the extension 37 of the above-mentioned arm 34 which is pivoted to the frame 1 of the machine at 33.

On the other end of the bolt 20 carrying the pawl 21 is a pawl 49 operating on the ratchet wheel 42. The plate 47 on the arm 45 of the double-armed lever 45, 46 is in the vicinity of the pawl 49.

As shown in Fig. 1 the finished fabric 50 passes over the roller 32 under the roller 31, and then over the regulating roller 36 to the winding roll carried on the shaft 3.

The winding of the fabric is effected under a certain tension.

By means of the regulating roller 36 held up by the spring 40, the fabric 50 passing from the roller 32 is urged against the roller 31 which is covered with rough material or the like. As the fabric is passed over the regulating roller 36, the take-up tension is kept constant. The take-up tension can initially be regulated by added weights which are secured to the flanged roller 30 suspended in the chain 29.

The roller 31 is rotated by the endless chain, the motion of which is controlled by the pawl 21 operating on the ratchet wheel 12, in the following way:

If the take-up of the fabric exceeds the rotation of the shaft 10 as occasioned by the cam 28, the double-armed levers 23, 24 and 18, 19 and the ratchet wheel mechanism 12, 21, and thus exceeds the motion of the chain and sprocket mechanism 29, 11, 8 and the roller 31 resulting from this rotation of the shaft 10, then the flanged roller 17 is raised by the chain. Due to this displacement, the double-armed lever 13, 14 carried on the shaft 16 of the roller 17 is also displaced so that the plate 15 carried by the arm 13 is moved relatively to the pawl 21. The pawl thus passes beyond the range of the plate 15 more quickly and can advance the ratchet wheel by more teeth.

If due to the rocking of the plate 15 the ratchet wheel is advanced by a number of teeth, then the roller 17 is lowered due to the motion imparted to the chain 29 by the cam 27 being greater than the take-up. Due to the resultant displacement of the double-armed lever 13, 14 the plate 15 is moved relatively to the pawl 21 in the opposite direction to the motion when the roller 17 is raised. Thus the pawl 21 does not operate on the ratchet wheel 12 until a later stage in its travel and thus advances the ratchet wheel by fewer teeth or by one tooth only.

The shaft 3 carrying the roll on which the fabric is wound is rotated by way of the gear wheels 4, 44, 43 by means of the pawl 49 moved simultaneously with the pawl 21 and operating on the ratchet wheel 42 which also is carried freely on the shaft 10.

The winding is regulated by the regulating roller 36. If insufficient fabric is supplied to the roll on which winding is effected, then the regulating roller 36 is urged downwardly by the fabric against the action of the spring 40. The downwardly directed extension 37 of the arm 34 thereby depresses the abutment surface 48 on the lever arm 46 whereby the double-armed lever 45, 46 is rocked and the plate 47 carried on the lever arm 45 is displaced so that the pawl 49 does not come into operatve engagement with the ratchet wheel 42 until a later instant of time and advances it by a smaller extent or by only one tooth so that the roll on which the fabric is wound is rotated to a correspondingly smaller extent and the winding is adapted to the supply of fabric.

When the take-up fabric by the roller 31 is again satisfactory, the regulating roller 36 is restored to its original position by the spring 40 so that the position of the plate 47 again alters and the ratchet wheel can again be advanced by a number of teeth.

What I claim is:

1. In a flat warp knitting machine, a fabric take-up roller, a cloth roll, a sprocket wheel associated with said take-up roller, a second sprocket wheel, an endless chain passing over said sprocket wheels, a ratchet mechanism actuating said second sprocket wheel, a separate automatically regulable mechanism and a gear train between said last mentioned mechanism and said cloth roll.

2. In a flat warp knitting machine, a fabric take-up roller, a cloth roll, a sprocket wheel associated with said take-up roller, a second sprocket wheel, an endless chain passing over said sprocket wheels, a ratchet mechanism actuating said second sprocket wheel, a swingably mounted bent lever, partially surrounding said take-up roller, rollers carried by upwardly extending arms of said bent lever, cooperating with said cloth roll, a separate automatically regulable mechanism and a gear train between said regulable mechanism and said cloth roll.

3. In a flat warp knitting machine, a fabric take-up roller, a cloth roll, a sprocket wheel associated with said take-up roller, a second sprocket wheel, an endless chain passing over said sprocket wheels, a ratchet wheel mounted coaxially with said second sprocket wheel, a pawl adapted to cooperate with said ratchet wheel, a cam actuated lever system for moving said pawl relatively to said ratchet wheel, a double-armed lever, swingably mounted in coaxial relation to said second sprocket wheel and said ratchet wheel, a flanged roller carried by one arm of said double-armed lever, and engaging said endless chain, a plate provided at the other arm of said double-armed lever and located in the vicinity of said pawl, a swingably mounted bent lever, partially surrounding said take-up roller, a regulating roller carried by an upwardly extending arm of said bent lever, a screw rotatably connected to said bent lever, an internally threaded block shiftably mounted on said screw, a spring fixed with one end to an arm supporting said cloth roll and with its other end to said internally threaded block, a sleeve rotatably mounted upon a shaft carrying said ratchet wheel and said second sprocket wheel, a second ratchet wheel fixed to said sleeve, a second pawl adapted to cooperate with said second ratchet wheel and partaking in the movement of said first mentioned pawl, a double-armed lever, swingably

arranged on said sleeve, a plate provided at one arm of said last mentioned double-armed lever and located in the vicinity of said second pawl, an abutment surface carried by the other arm of said last mentioned double-armed lever, a downwardly extending projection on said bent lever cooperating with said abutment surface, a gear wheel fixed to said sleeve and an intermediate gear wheel engaging with said gear wheel on said sleeve and a gear wheel coaxially arranged with and rotating said cloth roll.

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