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PICK OUT DEVICE FOR LOOMS

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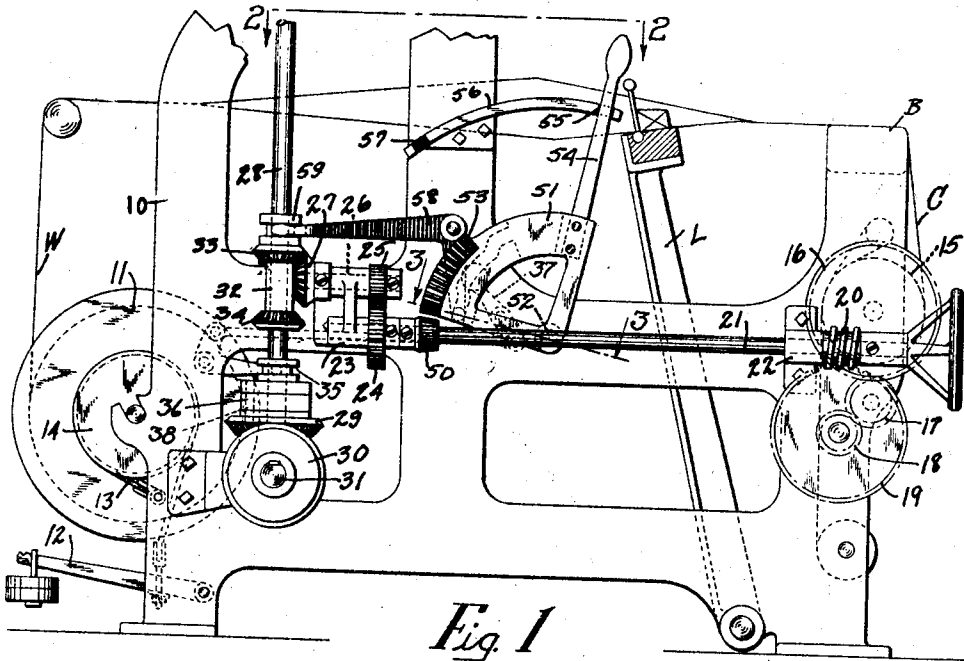


Fig. 1

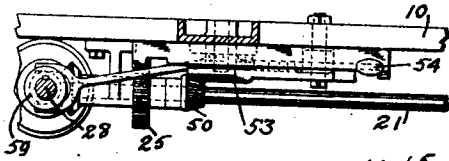


Fig. 2

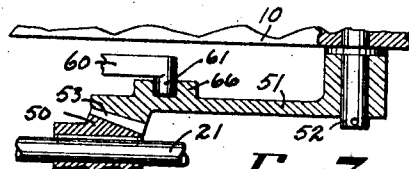


Fig. 3

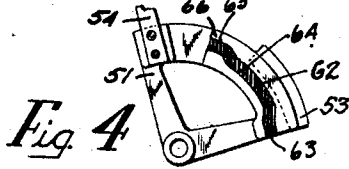


Fig. 4

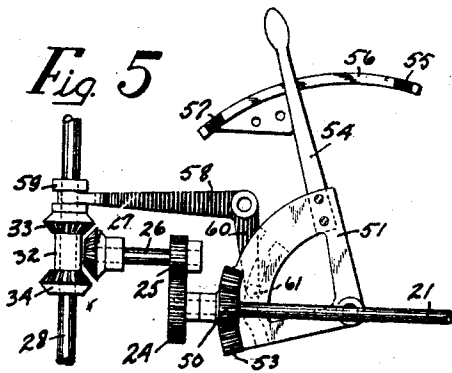


Fig. 5

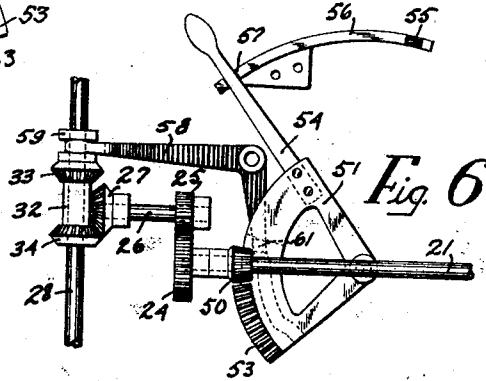


Fig. 6

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PICK-OUT DEVICE FOR LOOMS.

Application filed March 2, 1927. Serial No. 172,156.

This invention relates to improvements in let-back motions for loom take-ups and it is the general object of the invention to provide means for letting the warp and cloth back a definite amount prior to pick-out operations and then to take up this same amount of slackness after the pick-out operation so as to restore the original tension.

It is usual practice for a weaver to begin picking-out operations by reversing the take-up motion to cause slack in the cloth, after which the picks laid subsequent to a mispick are taken out one at a time by reversing the harness motion. After removing the last faulty pick the weaver advances the take-up until the tension on the cloth appears to be that originally existing before the pick-out. The weaver must depend upon his judgment in establishing the tension and unless the cloth is subjected to the original strain prior to the pick-out there will be either a thick or a thin place in the cloth depending upon whether the restored cloth is too slack or too tight.

It is an important object of my present invention to provide means preferably manually operated for automatically producing a given amount of slack after which the take-up will be driven reversely during the picking out operation to keep the fell behind its normal position by the same number of picks. After removing the last pick the cloth is advanced the amount by which it was originally slackened.

It is a further object of my invention to provide a positive reverse take-up of the type shown in patent to Ryon No. 810,680 for a loom such as that shown in Reissue Patent No. 7,784, the take-up having a rack and gear arrangement normally inoperative but effective at the time of pick-out to reverse the take-up a given amount, the rack then passing beyond the gear to free the take-up for further reverse movements in time with the harness motion.

Picking-out operations are ordinarily carried on in one of two ways, depending on the extent of the pick-out. If only a few picks are to be removed the weaver will usually leave the cloth tight and reverse the head to open the sheds in an order the reverse of that in which they opened while weaving. When a positive reverse take-up is used the take-up roll will turn back an

amount substantially equal to the picks removed. In certain classes of work, such as silk, the fell of the cloth after the pick-out is not exactly where it was before the pick-out, due to lost motion in the reversing mechanism.

When a large number of picks are to be taken out, on the other hand, the cloth is slackened and the harnesses evened so that all the warps lie in the same plane. The filling is then loosened one pick at a time by means of a comb and withdrawn, the take-up not being reversed. After the faulty picks are removed the take-up roll is advanced to absorb as much of the original slack as will be necessary to give the new fell its proper position, after which the warp beam is reversed to tighten the warps. This operation requires skill and much time is consumed in reestablishing the original tension. It is found that the cloth between the take-up roll and the breast beam can absorb a certain amount of slackness or tension which is not passed on to the cloth between the breast beam and fell until weaving under power is resumed. It is an important object of my invention to insure an advance movement of that part of the cloth between the take-up roll and breast beam similar to that which occurs under weaving conditions.

My invention further relates to the method of making a pick-out, and more particularly to the step in the method which requires the cloth to be subjected to an advance movement before weaving can be resumed.

With these and other objects which will appear as the description proceeds, my invention relates to combinations and arrangements of parts hereinafter set forth, and more particularly pointed out in the claims.

In the accompanying drawings, wherein a convenient embodiment of my invention is shown,

Fig. 1 is a side elevation showing a loom with my invention applied thereto and the parts in normal running position,

Fig. 2 is a horizontal section on line 2—2 of Fig. 1,

Fig. 3 is an enlarged detailed section on line 3—3 of Fig. 1,

Fig. 4 is a reverse view of the segment member showing the cam groove,

Fig. 5 is a view similar to a portion of Fig. 1 but showing the parts in the position

they assume while the device is being put into operation, and

Fig. 6 is a view similar to Fig. 5 but with the device moved completely to reversing position.

Referring to the drawings loom frame 10 has supported on the rear end thereof a warp beam 11 from which extends the warp W. Any approved let-off mechanism may be employed, a friction type being shown herein and comprising a weighted lever 12, a flexible friction band 13 and a friction drum 14.

The take-up motion may include a take-up roll 15 around which the cloth C is wound, said roll moving with a gear 16 which meshes with a pinion 17. The latter in turn meshes with another pinion 18 fast with a large worm gear 19. The latter co-operates with a worm 20 secured to a horizontal shaft 21 rotatable in front and rear bearings 22 and 23, respectively. A spur gear 24 secured to the shaft 21 meshes with a pinion 25 secured to a short shaft 26 to the rear end of which is secured a bevel gear 27.

An upright shaft 28 has loosely mounted on the lower end thereof bevel gear 29 which meshes with another bevel gear 30 secured to a horizontal shaft 31. The latter shaft is driven by mechanism not shown but well understood, from the bottom shaft of the loom (not shown), and said shaft 31 receives a rotation every pick of the loom to drive a pattern mechanism which may be similar to the well known Knowles head as shown in Reissue Patent No. 7,784.

The horizontal shaft 21 is driven positively from the upright shaft 28 by means of a sleeve 32 slidable along but keyed to the shaft 28. Said sleeve has fastened thereto spaced upper and lower bevel gears 33 and 34 which move together as the sleeve slides. Under normal conditions bevel gear 33 is in mesh with the bevel 27 so that the latter through gears 24 and 25 will drive the shaft 21 to cause such a rotation of worm 20 as will give the take-up roll 15 a slight advance movement every pick of the loom. Under these conditions bevel gear 34 is out of mesh with bevel gear 27.

In order to disconnect the upright shaft 28 from shaft 31 I use the ordinary clutch indicated in Fig. 1. Said clutch has a collar 35 fastened to the shaft 28 and a slide 36 movable vertically by a manually operable lever 37. The slide has a pin 38 which normally extends through the collar and into driving connection with bevel gear 29. When the slide is raised the pin moves away from gear 29 and the shaft 28 is free to move independently of shaft 31. This driving connection is similar to that shown in patent to Knowles No. 134,992. The matter thus far described is old and may be substantially

the same as shown in the aforesaid patent to Ryon.

In carrying my improvements into effect I secure a bevel pinion 50 to the shaft 21 and provide a segment 51, which is pivoted to the loom frame at 52. Said segment has a rack 53 normally out of engagement with the pinion 50 but adapted for cooperation therewith. A handle 54 is secured to the segment 51 and is normally sprung into the forward notch 55 of an arcuate guide 56 secured to the loom frame, and having a second handle receiving notch 57 at the rear end thereof.

A bell crank lever 58 is pivoted to the frame of the loom and has a horizontal arm which cooperates with a grooved collar 59 secured to the sleeve 32 to cause movement of the latter. The depending arm 60 of said lever 58 has a laterally projecting stud 61 which enters a cam groove 62 formed in the segment 51. Said groove has a low run 63, an intermediate dwell 64, and a higher run 65. Said groove is formed in a portion of the segment which stands upwardly from the body of the latter as at 66 of Fig. 3.

When the weaver is to make a pick-out the connection between the upright shaft 28 and the loom will be thrown out of operation in the well known manner by lifting slide 36. The handle 54 will then be sprung out of notch 55 and moved rearwardly, assuming during this operation an intermediate position such as that indicated in Fig. 5. During the first part of this movement the stud 61 will be moved from the low to the intermediate part of the cam groove, thus raising the gear 33 away from engagement with bevel gear 27. At the same time segment 53 engages pinion 50 and causes a rotation of horizontal shaft 21 in a reverse direction. As the handle 54 is moved rearwardly the stud 61 will remain in the intermediate or dwell portion of the cam groove, and the rack 53 will continue to produce reverse movement of shaft 21. The result of this operation is to reverse the take-up roll so as to let the cloth back and slacken the same a definite predetermined amount to facilitate the picking-out operation. As the handle 54 nears the end of its rearward movement, stud 61 will enter the high portion of the cam groove so as to complete the upward movement of slide 32 and cause engagement between mitre gear 27 on the shaft 26 and the lower mitre gear 34 on the sleeve. As this happens the rack 53 will move out of engagement with pinion 50 and control of the horizontal shaft 21 will pass from the segment 51 to the upright shaft 28. In this way the cloth is let back a definite amount and the weaver may proceed with the picking-out operation.

By mechanism not shown herein but indicated in the aforesaid patent to Ryon, the

pattern mechanism is reversed one pick at a time causing the harnesses to open the sheds in reverse order so that the picks of filling may be removed. Each time a pick of filling is taken out shaft 28 will be given a complete rotation, and the take-up roll will therefore be given a reverse movement equal to one pick. In this way the take-up roll 15 is moved backwardly an amount corresponding to the number of picks removed. At the end of the pick-out operation therefore the relative difference between the take-up roll and the fell of the cloth will be the same number of picks as the take-up roll was originally reversed by the segment 51.

In order to restore the parts to normal position the weaver will spring the handle 54 out of the rear notch 57 and move the same to its extreme forward position, during which movement the sequence of movements will be the reverse of that previously described. Mitre gear 27 will be returned to its normal operative position with respect to mitre gear 33 as the sleeve 32 moves downwardly. During the return movement of the segment 53 horizontal shaft 21 is given an advance angular movement to move the take-up roll 15 forwardly a distance equal to the amount by which it was reversed during the first part of the pick-out operation. For this reason the slack in the cloth is taken up and the cloth and warp are subjected to the same tension as existed prior to the pick-out operation. In this way assurance is given that the cloth between the breast beam B and the roll 15 will be advanced so that any tendency of the cloth to hold back while going around the breast beam which might otherwise occur will be eliminated.

The Knowles worsted loom to which the invention more particularly relates has a friction let-off and the operator would be required to turn the loom back manually after the pick-out operation. It is thought sufficient for the purposes of the present disclosure to state that the warp beam will be turned back in the usual manner, that is, by hand after the defective picks have been removed.

From the foregoing it will be seen that I have provided means for producing a definite amount of slack in the cloth prior to the pick-out operation, and that the take-up roll is reversed in timed relation with the loom as the latter is turned backwardly pick by pick to remove the defective filling. In this way I am enabled to restore the cloth to its original tension merely by a reverse movement of the parts which produced the slack. It will further be seen that the production of the slack is automatically attended by a reversal of the driving connections for the take-up roll, thus insuring

that the take-up and fell of the cloth will be kept in step with each other and that the interval represented by the number of picks between the fell of the cloth and the reverse position of the take-up roll will be preserved constant during the picking-out operation. Furthermore, it will be seen that I have introduced the step in the method of making a pick-out which requires the weaver to advance the cloth after a pick-out to place that part of the cloth nearest the take-up roll under the same tension as existed before the pick-out.

Having thus described my invention it will be apparent that changes and modifications may be made without departing from the scope and spirit of the invention and I do not wish to be limited to the details herein disclosed, but what I claim is:

1. In a take-up for looms, a take-up roll, means always in operative connection with said roll to rotate the same either forwardly or backwardly, and a device acting conjointly with said means to give the roll a predetermined reverse movement when changing from forward to backward rotation while the means is operatively connected to the take-up roll.

2. In a take-up for looms, a take-up roll, means to drive the take-up roll forwardly, additional means to drive the roll backwardly, and means to give the take-up roll a predetermined reverse movement and to thereafter connect the roll operatively with the additional means.

3. In a take-up motion for looms, a take-up roll, a member moving constantly in the same direction, means connected to the member to drive the roll forwardly, additional means capable of operative relation with the member to drive the roll rearwardly, and control mechanism for said additional means effective to give the roll a predetermined reverse movement and at the same time disconnect the means from the member and establish operative relation between the additional means and the member.

4. In a take-up for looms, a take-up roll, a driving means capable of assuming two positions in one of which said means is operative to drive the roll forwardly and in the other position of which said means is operative to drive the roll backwardly, and devices for changing the position of said means to render the same effective to drive the roll backwardly and simultaneously giving said take-up roll a predetermined reverse movement.

5. In a take-up for looms, a take-up roll, a constantly moving driving member, connections between the roll and the driving member operative when in one position to drive the roll forwardly and when in another position to drive the roll back-

wardly, and when in an intermediate position to disconnect the driving means from the roll, and manually operable means for moving said device from forward to backward driving position and to effect a predetermined reverse movement of the roll when the driving means is disconnected from said device.

6. In a take-up mechanism for looms, a take-up roll, a constantly moving driving member, connections between said member and the roll, said member and connections capable of assuming three relative positions in one of which said member is operative to drive the roll forwardly, in another of which said member is effective to drive the roll backwardly, and in the intermediate position being out of operative contact with the roll, means manually operable to give said member and connections the aforesaid three relative positions and effective to give the take-up roll a predetermined reverse movement while the member and connections are in intermediate position with respect to each other.

7. In a take-up mechanism for looms, a take-up roll, means to drive said roll forwardly, additional means to drive said roll backwardly, a manually operated means effective to give the take-up roll a predetermined reverse movement before said roll is moved backwardly by the additional means, and effective also to give said take-up roll a predetermined forward movement after

said roll has been moved backwardly by the additional means and before said roll is moved backwardly by the first-named means.

8. In a take-up mechanism for looms, a take-up roll, means to drive said roll in opposite directions by power, means movable to effect a reversal of the direction of rotation of the roll, and manually operable means to effect a predetermined movement of said roll while said member is moving to effect reversal of the direction of rotation of said roll.

9. In a take-up mechanism for looms, a take-up roll, means to drive the take-up roll forwardly and backwardly by power, means to effect a predetermined reversal of the take-up roll prior to a pickout operation, said means being also effective to produce a forward movement of the take-up roll equal in amount to the predetermined reverse movement after the completion of the pickout operation.

10. In a take-up for looms, a take-up roll, means always in operative connection with the roll to rotate the same either forwardly or backwardly, and an auxiliary device acting through said means to give the roll a predetermined reverse movement when changing from forward to backward rotation while the means is operatively connected to the take-up roll.

In testimony whereof I have hereunto affixed my signature.

OSCAR V. PAYNE.