June 8, 1937. O. V. PAYNE 2,082,903

INTERMITTENT THREAD HOLDER

Filed May 9, 1936

FIG. 1

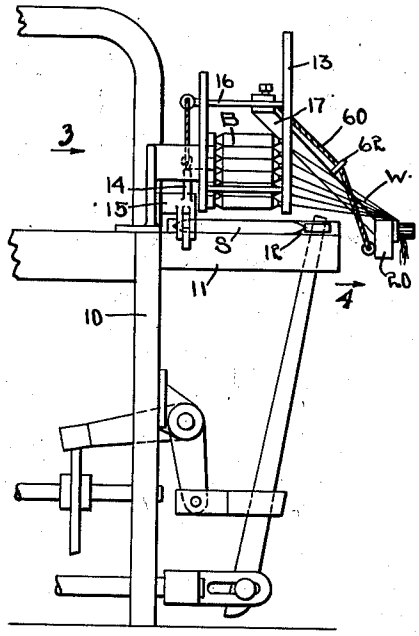



FIG. 2

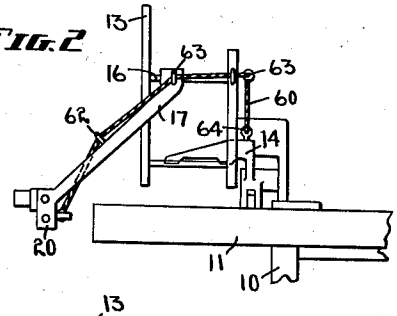



FIG. 3

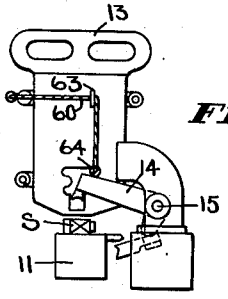



FIG. 4

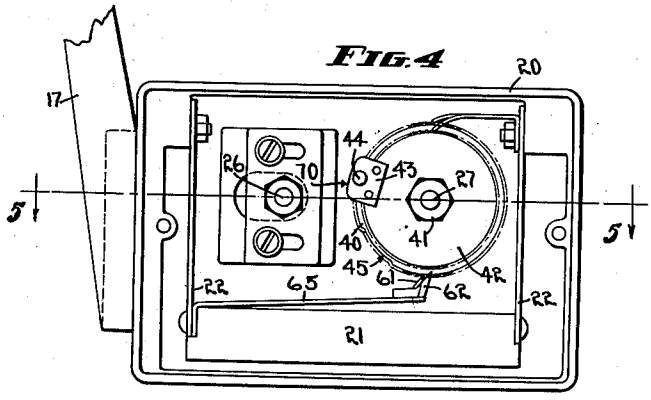



FIG. 5

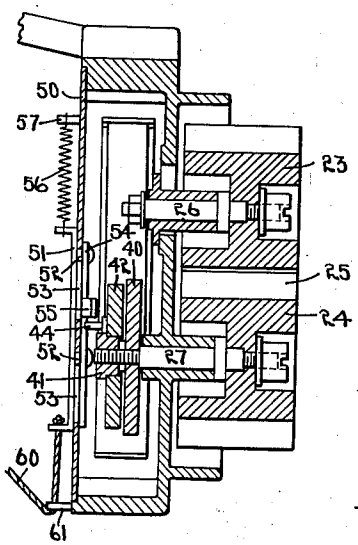



FIG. 6

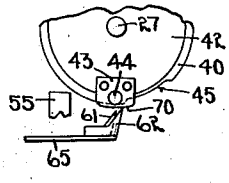



FIG. 7

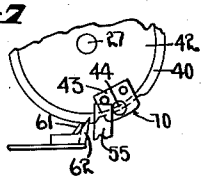
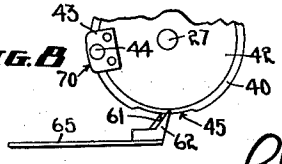



FIG. 8




Inventor
Oscar V. Payne

Chas. T. Hawley
Attorney

Patented June 8, 1937 2,082,903

# UNITED STATES PATENT OFFICE

2,082,903

## INTERMITTENT THREAD HOLDER

Oscar V. Payne, Leicester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass., a corporation of Massachusetts

Application May 9, 1936, Serial No. 78,886

14 Claims. (Cl. 139—247)

This invention relates to improvements in thread holders for weft replenishing looms and it is the general object of the invention to adapt a well-known thread holder for use with very fine yarns.

I have heretofore proposed a thread holder embodying a pair of fluted rolls driven by a vibration motor actuated by jarring or vibration of the loom. As these thread holders have been used heretofore the fluted rolls have been driven constantly during loom operation, but where very fine yarns are used there is the likelihood that the constant flexing of the threads back and forth as the rolls rotate will cause breakage. It is an important object of my present invention to provide means for actuating the rolls at periodic intervals between which they are at rest, thus sparing the yarns unnecessary wear.

In multicolor bobbin changing looms the reserve weft is arranged in vertical stacks and is fed downwardly by gravity. At the time of transfer the bobbins fall, resulting in slackness of the weft ends. It is a further object of my present invention to provide a thread holder having a period of activity which is called at the time of transfer and lasting sufficiently long to tighten the weft ends, after which there is a period of inaction.

It is another object of my present invention to provide a pair of feed disks so related that a plurality of rotations of one disk are necessary to complete a rotation of the other disk, and wherein said other disk is provided with a shield or dwell which temporarily disables the feed pawl for the disks. During normal loom operation prior to transfer the shield will hold the pawl out of driving relation with both disks, but at the time of transfer the shield is moved away from the pawl to permit the latter to feed the disk fast with the fluted rolls. The fast disk must rotate several times to effect a complete rotation of the loose disk and thereby place the shield again under the pawl. The fast disk may if desired have a low area of teeth which when arriving at the feed pawl will permit the latter to give a partial feed to the loose disk carrying the shield. This low area is the means which requires the fast disk to rotate several times in order to effect one rotation of the loose disk, the number of rotations depending upon the length of the low area or zone. The larger the zone the shorter will be the period of activity of the thread holder rolls.

With these and other objects in view which will occur as the description proceeds, my invention resides in the combination and arrangement of parts hereinafter described and set forth in the claims.

In the accompanying drawing, wherein a convenient embodiment of my invention is set forth,

Fig. 1 is a front elevation of the end of a loom having my invention applied thereto,

Fig. 2 is a detail rear elevation of a part of the structure shown in Fig. 1,

Fig. 3 is a detail end elevation of the magazine taken in the direction of arrow 3, Fig. 1,

Fig. 4 is a view of the thread holder taken in the direction of arrow 4, Fig. 1, on an enlarged scale, having the cover removed,

Fig. 5 is a horizontal section on line 5—5 of Fig. 4, and

Figs. 6, 7 and 8 are detailed diagrammatic views showing the parts in different positions.

Referring to the drawing, the loom frame 10 has a lay 11 and shuttle box 12 moving back and forth under a magazine 13. The latter may be of the standard multicolor type, such as set forth in prior Patent No. 1,030,748, and includes in its construction a transferrer arm 14 pivoted as at 15 and called into action by mechanism not shown but well understood to effect transfer of one or another of the reserve bobbins B into a shuttle S. The magazine includes in its construction a tie rod 16 on which is secured a holder arm 17 extending downwardly and outwardly with respect to the center of the loom, as shown in Fig. 1.

A carrier box 20 is mounted on the lower end of arm 17 and has mounted therein a weight 21 suspended on spring links 22 the upper ends of which are secured to the box. Two fluted rolls 23 and 24 are mounted for rotation and have intermeshing teeth 25 between which the weft ends W of the reserve bobbins extend. Roll 23 rotates on shaft 26, while roll 24 is fastened to shaft 27 which rotates in the box. Both rolls rotate when shaft 27 is turned by mechanism to be described and actuated by the weight 21.

In the matter thus far described the transfer arm 14 will descend at the time of transfer to insert a bobbin drawn from one or another of the stacks of the magazine into shuttle S, and at this time all of the bobbins in the stack corresponding to that from which the reserve bobbin is drawn will descend, hence their weft ends W will be slackened to an extent rendering tightening desirable. As the loom vibrates during operation the arm 17 swings back and forth and imparts vibratory motion to the weight 21 through the suspension links 22, the result of

which is to cause a relative reciprocating motion between the weight 21 and the box 20. The matter thus far described is well-known and for a further description reference may be had to Patents Nos. 1,842,731 and 1,979,765.

In carrying my invention into effect, I introduce between the weight 21 and shaft 27 means for rotating the rolls during a period immediately following transfer, after which the rolls come to rest to hold the weft ends taut until transfer is again called. To accomplish this result I secure a toothed ratchet disk 40 to shaft 27 by means of a nut 41, said shaft and disk rotating in unison. A second ratchet disk 42 is rotatable loosely about shaft 27 and carries a dwell or shield plate 43 from which projects pin 44. The disk 40 has a short area or zone of low teeth 45, as shown in Fig. 4, while the toothed periphery of disk 42 is of the same radius throughout its length.

The cover 50 for the box has mounted on the outside thereof a slide 51 carrying two screws 52 which extend through slots 53 in the cover and into an actuating plate 54 lying against the inside of the cover. Extending up from the plate is a trip 55 in alignment with the pin 44, and a spring 56 between the slide 51 and a fixed pin 57 serves to hold the slide to the rear as viewed in Fig. 5 with the screws 52 acting as stops against the ends of slots 53 to position the plate 54 with the trip 55 out of the path of pin 44.

In order that the slide 51 may be moved relatively to the plate I attach thereto a cord or cable 60 which extends through an eyelet 61 on the box through another eyelet 62 on the arm 17, and through other eyelets 63 on the magazine, being fastened to a clip 64 on the transferrer arm 14. By reason of this cable end motion of the slide 51 forward as viewed in Fig. 5 is effected when the transferrer arm 14 descends, the purpose of this sliding being to force the trip 55 against pin 44 and effect partial rotation of the loose disk 42.

The weight 21 has secured thereto a spring pawl 60 having two teeth 61 and 62, the former of which is for engagement with the tight ratchet disk 40, while the latter is arranged for engagement with the loose ratchet disk 42.

During normal loom operation prior to a transfer the shield or dwell 43 will be in the position shown in Fig. 6 so that as the pawls 61 and 62 reciprocate they slide along the shield, engaging surface 70 thereof which is located far enough from shaft 27 to hold the pawls out of contact with their respective disks. The latter therefore remain at rest and hence there is no rotation of the fluted rolls, the weft ends remaining taut without being subjected to abrasive action. At the time of transfer, however, the slide 51 is moved forward as viewed in Fig. 5 and the trip 55 engages the pin 44 to move the same from the position shown in Fig. 6 to that shown in Fig. 7, thereby permitting the feed pawls to move toward their ratchet disks. Pawl 61 will move against a part of disk 40 of large diameter while the pawl 62 will be spaced a short distance from its ratchet disk 42. Movement of the pawls to the right as viewed in Fig. 4 as weight 21 vibrates will therefore effect a left hand feed of disk 40 until the low zone 45 arrives at the pawl 61, at which time the pawls will rise because of the resilience of the spring 65 and disk 42 will be given a partial rotation by its pawl 62 as indicated in Fig. 8. This condition will continue until the end of the low zone 45 is reached, after which the pawl 61 will again engage the large diameter of disk 40 and depress pawl 62 out of engaging relation with respect to its disk 42. Running of the loom will cause vibration of the weight 21 with reciprocations of pawl 61 and the disk 40 will continue to rotate although disk 42 will remain at rest. As the tight disk rotates it causes the fluted rolls 23 and 24 to turn on their axes in a direction to take up slack in the weft ends W.

When the low teeth 45 again arrive at pawl 61 the disk 42 is given another partial rotation, and this partial feeding of the loose disk continues until the shield or dwell arrives at the left of pawl 62. The next ensuing partial rotation of disk 42 will move the shield to a position over the pawl 62 to move the pawls away from their disks, restoring the condition shown in Fig. 6. Thereafter the disks and rolls remain at rest until the next transfer, and the rolls are stationary. In this way the rolls are active for a period immediately following transfer, and then are inactive until the next transfer.

The transferrer arm is down only momentarily, hence spring 56 is able to move the trip 55 back to normal position out of the path of pin 44 before the next operation is called. The action of the shield in the position shown in Fig. 6 is therefore not interfered with in any way by the transferrer arm, slide 51, or cable 60.

From the foregoing it will be seen that I have provided simple means for driving the slack take-up rolls 23 and 24 for a period immediately following transfer by a control exercised by a part which moves at the weft replenishing operation of the loom. While I have shown the transferrer arm as the means for initiating this period, yet I do not wish to be limited to this construction. Provision is also made for retaining the rolls at rest during a period prior to transfer. It will also be seen that I have provided a pair of disks one of which has a low zone or area of ratchet teeth and the other of which carries a shield, together with a pair of feed pawls, one of which operates to turn the tight disk throughout the active period and the other of which gives a relatively small angular motion to the loose ratchet disk for each rotation of the tight disk, these partial rotations of the loose disk eventually placing the shield so that it disables both pawls to initiate a period of rest or inaction on the part of the fluted rolls 23 and 24.

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

1. In a thread holder for a weft replenishing loom operating with a plurality of reserve bobbins from which extend weft ends, a pair of meshing fluted rolls between which the weft ends lie, said rolls to have periods of activity and periods of rest, an element movable at the time of a weft replenishing operation of the loom, means controlled by the element to cause said rolls to have a period of activity, and means dependent upon rotation of the rolls to terminate the period of activity and start the period of rest.

2. In a thread holder for a weft replenishing loom operating with a plurality of reserve bobbins from which extend weft ends, a pair of meshing fluted rolls between which the weft ends lie, said rolls to have a period of activity followed by a period of inactivity, an actuator for the rolls,

means controlled by a weft replenishing operation of the loom to connect the actuator with the rolls for the period of activity of the latter, and means operative at the end of the period of activity to disconnect said actuator from the rolls and initiate the period of inactivity.

3. In a thread holder for a weft replenishing loom operating with a plurality of reserve bobbins from which extend weft ends, a pair of rolls between which the weft ends extend, said rolls to have a period of activity to take up slack in the weft ends followed by a period of inaction, an element movable at the time of a weft replenishing operation of the loom, means controlled by the element to move the rolls during their period of activity, and mechanism to disconnect the means from the rolls to terminate the period of activity and initiate the period of inaction.

4. In a thread holder for weft replenishing looms having reserve weft ends, a vibrating element, a pair of meshing fluted rolls to receive the weft ends, a ratchet disk rotating with one of the rolls, a second ratchet disk concentric with the first disk and rotatable independently thereof, a pawl movable by the element and normally tending to turn the first disk, a shield on the second disk to hold the pawl out of engagement with said first ratchet, and means to move the shield away from the pawl.

5. In a thread holder for weft replenishing looms having reserve weft ends, a vibrating element, a pair of meshing fluted rolls to receive the weft ends, a shaft rotatable with one of the rolls, a ratchet disk secured to the shaft, a feed pawl movable by the element and normally tending to rotate the ratchet disk when the element moves in one direction, a shield for the pawl, means to move the shield against the pawl to render the latter ineffective to rotate the ratchet disk, and means to move the shield away from the pawl.

6. In a thread holder for weft replenishing looms having reserve weft ends, a vibrating element, a pair of meshing fluted rolls to receive the weft ends, a shaft rotatable with one of the rolls, a ratchet disk secured to the shaft, a feed pawl movable by the element and normally tending to rotate the ratchet disk when the element moves in one direction, a shield for the pawl, means actuated by the element as the latter vibrates to move the shield against the pawl to render the latter ineffective to rotate the ratchet disk, and means to move the shield away from the pawl.

7. In a thread holder for weft replenishing looms having reserve weft ends, a vibrating element, a pair of meshing fluted rolls to receive the weft ends, a ratchet disk rigid with one of the rolls, a pawl movable by the element and normally tending to rotate the disk, a shield capable of holding the pawl out of driving relation with the disk, means to effect a step-by-step motion of the shield toward the pawl and cause the shield to move the pawl out of driving relation with the disk, and means to move the shield away from the pawl.

8. In a thread holder for weft replenishing looms having reserve weft ends, a vibrating element, a pair of meshing fluted rolls to receive the weft ends, a pair of concentric ratchet disks, the first disk rigid with one of the rolls and the second rotatable independently of the first, a pawl moved by the element and tending normally to rotate the first disk, a shield for the pawl carried by the second disk, means controlled by the first disk to give the second disk a step-by-step rotation to move the shield against the pawl and move the latter out of driving relation with respect to the first disk, and means to move the second disk independently of the first disk to move the shield away from the pawl.

9. In a thread holder for a loom operating with a plurality of reserve bobbins from which extend weft ends, a pair of meshing fluted rolls between which the weft ends lie, a ratchet disk secured to one of the rolls and having a zone of low ratchet teeth, a second disk having ratchet teeth, a pawl to engage the first disk, a second pawl movable with the first pawl and capable of engaging the second disk, means to give said pawls working strokes during loom operation, the first pawl when engaging other than the low teeth of the first disk effective to hold the second pawl out of engagement with the second ratchet, means to move the second pawl into driving relation with respect to the second ratchet when the first pawl moves into said zone, a shield on the second disk to hold both pawls inoperative with respect to their disks, and means to move the shield away from the pawls.

10. In a thread holder for a loom operating with a plurality of reserve bobbins from which extend weft ends, a pair of meshing fluted rolls between which the weft ends lie, transfer mechanism, an actuator having operative movements during loom operation, transfer mechanism, and means operated by the transfer mechanism to establish driving connection between the actuator element and the rolls for a predetermined number of rotations only of said rolls.

11. In a thread holder for a loom operating with a plurality of reserve bobbins from which extend weft ends, a pair of meshing fluted rolls between which the weft ends lie, an actuator having operative movements during loom operation, transfer mechanism, means called into action by the transfer mechanism to establish driving connection between the actuator element and the rolls, and additional means dependent upon rotation of the rolls and operative at some time subsequent to transfer to disconnect the actuator element from the rolls.

12. In a thread holder for a loom operating with a plurality of reserve bobbins from which extend weft ends, a pair of meshing fluted rolls between which the weft ends lie, an actuator element having operative movements during loom operation, a transferrer element, mechanism interposed between the actuating element and the rolls tending normally to drive the latter in a direction to take up slack of the weft ends, means normally operative to render the actuator incapable of driving the rolls, mechanism operative at the time of operation of the transferrer elements to establish driving connection between the actuator and the rolls, and means operative by rotation of the rolls and effective after a plurality of rotations of said rolls subsequent to transfer to render the actuating element again incapable of driving the rolls.

13. In a thread holder for a loom operating with a plurality of reserve bobbins from which extend weft ends, a pair of meshing fluted rolls between which the weft ends lie, a shaft fast with one roll, a ratchet disk fast with the shaft and having a depressed zone of teeth, a second ratchet disk rotatable about the shaft, a shield carried by the second disk, a suspended weight subject to vibration during loom operation, a pair of re-

siliently mounted pawls carried by the weight and normally tending to move toward the disks, one pawl for each disk, the pawl for the second disk being out of contact with the latter when the pawl for the first disk is in engagement with any part of the latter except the depressed zone, the pawl for the second disk moving into engagement with the latter when the first pawl is in the depressed zone, movement of the weight in one direction causing the first pawl to move the first disk independently of motion of the second disk until the first pawl enters the depressed zone of teeth, whereupon both pawls are operative to move their respective disks, movement of the second disk advancing the shield to a position to move both pawls out of engagement with their respective disks, and means to move the shield away from the pawls.

14. In a thread holder for a loom operating with a plurality of reserve bobbins from which extend weft ends, a pair of meshing fluted rolls between which the weft ends lie, a shaft fast with one roll, a ratchet disk fast with the shaft and having a depressed zone of teeth, a second ratchet disk rotatable about the shaft, a shield carried by the second disk, a suspended weight subject to vibration during loom operation, a pair of resiliently mounted pawls carried by the weight and normally tending to move toward the disks, one pawl for each disk, the pawl for the second disk being out of contact with the latter when the pawl for the first disk is in engagement with any part of the latter except the depressed zone of teeth, the pawl for the second disk moving into engagement with the latter when the first pawl is in the depressed zone of teeth, movement of the weight in one direction causing the first pawl to move the first disk independent of motion of the second disk until the first pawl enters the depressed zone, whereupon both pawls are operative to move their respective disks, movement of the second disk advancing the shield to a position to move both pawls out of engagement with their respective disks, and a slide member having a part movable against the shield to move the latter away from the pawls.

OSCAR V. PAYNE.