Jan. 14, 1936. R. HRDINA 2,027,776

WEAVING LOOM

Filed April 13, 1934

Fig.1

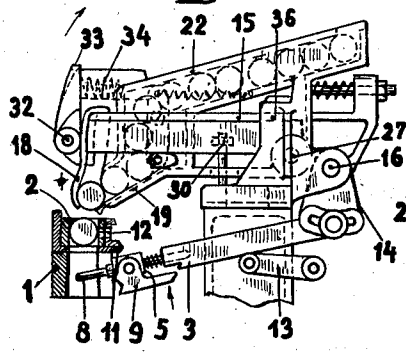


Fig.2

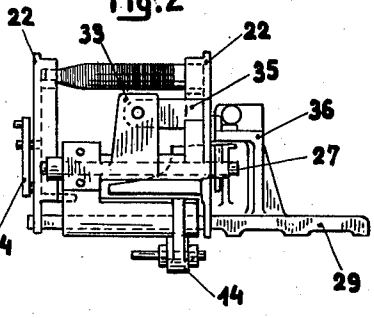


Fig.3

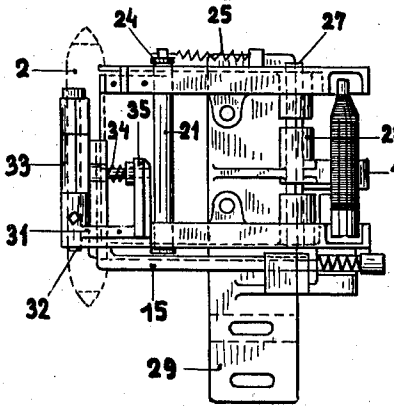


Fig.4

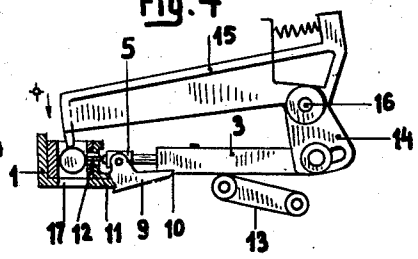


Fig.5

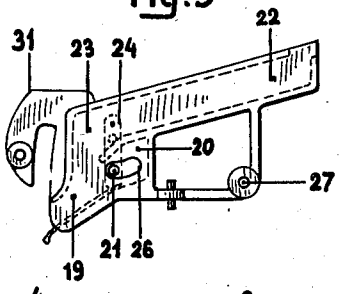
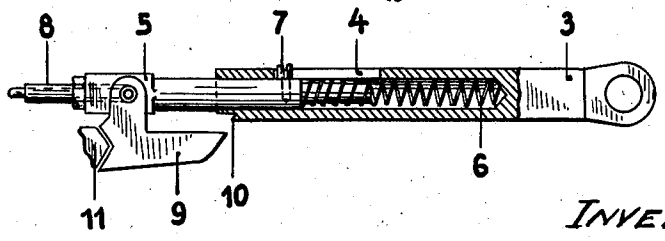


Fig.6



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UNITED STATES PATENT OFFICE

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WEAVING LOOM

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In Czechoslovakia April 20, 1933

8 Claims. (Cl. 139—231)

This invention relates to a device for automatically changing the weft spools of mechanical weaving looms.

Devices for automatically changing the weft spools are known in the most varied constructional forms. In one arrangement the hammer or supplying device for the weft spool is mounted rigidly and the spool supply box rotatably, or on the other hand, the hammer can be movable and the spool supply box fixed. Such devices are very delicate and are easily damaged, if for example a foreign body comes between the frame and supply box in the neighborhood of the spool box or if the driver sticks. Further, devices are also known, in which the hammer as well as the spool supply box are rotated by the frame and the devices of this kind have the disadvantage that when the shuttle does not exactly fill its correct position for the spool-changing operation, the shuttle and possibly the whole spool-changing device is damaged by the hammer, which presses on the frame. Finally, devices are known in which particularly long shuttles of a kind not usually employed are used which have a continuous slot, into which a tongue engages, which by means of its wedge-shaped inclined side surfaces moves the shuttle into the correct position for the spool-changing operation. If the tongue does not find its way into the slot in the shuttle but contacts with a full side wall of the shuttle, then the hammer is rendered inoperative by a complicated lever transmission. This device has the disadvantage that special shuttles must be used and the same require a complicated lever system which also can be the cause of disturbances in operation.

The present invention relates to a device for automatically changing the weft spools of mechanical weaving looms, which does not exhibit the disadvantages of the known devices, which is extremely simple in construction and permits the use of normal shuttles. The principal feature of the invention consists in that the push-rod actuating the hammer is telescopic, one part of the rod carrying a pawl, which prevents telescoping of the push-rods, when the front part of the push-rod enters a corresponding bore in the shuttle. The pawl does not operate when the shuttle does not take up the correct position in the shuttle box, in which case the push-rod is telescoped and the hammer is not actuated. The shuttle or the spool supply box cannot be damaged since according to the invention the forewall of the box is so constructed as to be movable and a part of the spools in the supply box can be pushed back into the supply box along a track separate from the main track for the spools.

The invention is illustrated in the accompanying drawing, in which

Figure 1 is a view in side elevation of a device constructed in accordance with the invention.

Figure 2 a view thereof in rear elevation,

Figure 3 a plan view,

Figure 4 shows schematically the hammer and the push-rod for actuating the hammer, part of the mechanism being omitted for the sake of greater clearness.

Figure 5 shows in side elevation the spool supply reservoir alone and—

Figure 6 shows the telescopic push-rod on an enlarged scale.

In the drawing 1 is the frame, 2 the shuttle and 3 the push-rod which, as shown in Figure 6, consists of the rod 3, which has a slot 4, and the piston-like part 5 which moves axially in the rod 3, the piston 5 being continuously pressed outwardly by the spring 6. The piston 5 is prevented from being forced out of the rod 3 by a stop-screw 7, the head of which moves in the slot 4. The piston 5 carries at its outer end a key-bolt 8, the length of which can be adjusted by means of suitably co-operating screw-threads and nuts. On the piston 5 is also pivoted a pawl 9, which enters a recess 10, as soon as the key-bolt 8 passes through a corresponding aperture or keyway 12 in the shuttle 2 and the stop 11 of the frame 1 rotates the pawl 9, when a lever 13, which is actuated by the weft director in a known manner, lifts the push-rod 3 into the operative position. The push-rod then rotates the arm 14 of the hammer 15, which is rotatable around a shaft 16. The shaft 16 itself is rigidly mounted in a bracket 36. The hammer 15 presses a new spool into the shuttle 2, the empty spool falling through the opening 17 out of the frame (Fig. 4). Upon the return of the frame the hammer 15 is again brought, by spring-action and the like, into its rest position, as represented in Figure 1, and the lever 13 turns again downwards, as a new weft thread comes into action. The push-rod 3 turns downwards and remains in the position shown in Figure 1 until it is again lifted. If it should be again lifted and the shuttle 2 does not lie correctly in the shuttle box, the key bolt 8 pushes against a side wall of the shuttle and presses the piston 5 into the push-rod 3, and the nose of the pawl 9 is moved over the recess 10, since the stop 11 cannot abut against the pawl 9 and in consequence the hammer 15 is not actuated. There

follows no introduction of a new spool and the shuttle or spool cannot be damaged.

If now, by accident, a foreign body comes between the frame and the spool supply reservoir, or in the neighbourhood of the shuttle box and spool supply reservoir, then the fore-wall 18 of the spool supply box is pressed inwards, since it is elastic and rotatable, and the spools which are located behind the fore-wall are pressed on the track 19 backwards into the chamber 20 of the spool supply reservoir (Fig. 1 and Fig. 5). As seen from Figure 1 three spools are located on a lower track 19 of the supply reservoir, while the majority of the spools is located on an upper track 22 and reaches the lower track through a slanting or vertical channel 23. The spools on the lower track 19 are permanently pressed forwards by a push-rod 21, which is secured at one end of a two-armed lever 24, the lever 24 being permanently pressed forwards under the action of a spring 25. Suitable slots 26 are provided in the spool supply casing, through which passes the push-rod 21. The spool supply casing itself is pivoted on a shaft 27, which is mounted in a bracket 28 of the base plate 29, so that the spool supply box can be opened upwards in the direction of the arrow (Fig. 1). By means of a stop-screw 30 the exact distance between the end of the supply box and the shuttle box can be regulated. One side wall of the spool supply reservoir carries a bracket 31, through which passes a shaft 32, on which again a stop 33 is mounted, which is connected with the fore-wall 18, so that the fore-wall 18 can rotate around the shaft 32. The stop 33 is arranged to strike against a spring pressed counter-stop 34, which is carried by an arm 35 and the contact of the stops is thus cushioned when the fore-wall 18 slips back into its normal position after the removal of a foreign body.

Various constructional alterations can be made without exceeding the scope of the invention. The spool supply box, the base plate, as well as the separate stop devices can be altered in various manners as regards their outer forms and mutual arrangements.

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

1. In a device for automatically changing the weft spools of a mechanical weaving loom, a hammer, a two-part telescopic push-rod for actuating said hammer, a pawl on one part of said push-rod, a recess in the other part of said push-rod, and means for causing said pawl to enter said recess when the shuttle is correctly positioned for a spool-changing operation.

2. In or for a device for automatically changing the weft spools of a mechanical weaving loom, a hammer, a telescopic push-rod for actuating said hammer, a shuttle having a key-way, a key-bolt on one part of the push-rod adapted to enter said key-way when the shuttle is correctly positioned for a spool-changing operation, and means rendered operative by the entry of said key-bolt into said key way for permitting the said push-rod not to telescope.

3. In a device for automatically changing the weft spools of a mechanical weaving loom, a hammer, a two-part telescopic push-rod for operating said hammer, a shuttle having a key way, a key bolt on the one part of said push-rod adapted to enter said key-way when the shuttle is correctly positioned for a spool-changing operation, a recess in one part of the said push-rod, a pawl on the other part of said push-rod, and means for causing said pawl to enter said recess when the key bolt enters said key-way.

4. In a device for automatically changing the weft spools of a mechanical weaving loom, a hammer, a telescopic push-rod for actuating said hammer, means for permitting said push-rod not to telescope when the shuttle is correctly positioned for a spool-changing operation, a spool supply reservoir, upper and lower tracks in said supply reservoir, a guide channel through which the spools fall from the upper track to the lower track, and a displacement chamber associated with the lower track.

5. In a device for automatically changing the weft spools of a mechanical weaving loom, a hammer, a telescopic push-rod for actuating said hammer, means for permitting said push-rod not to telescope when the shuttle is correctly positioned for a spool-changing operation, and a spool supply reservoir comprising a rotatable and resilient front wall.

6. In a device for automatically changing the weft spools of a mechanical weaving loom, a hammer, a telescopic push-rod for actuating said hammer, means for permitting said push-rod not to telescope when the shuttle is correctly positioned for a spool-changing operation, a shaft, and a rotatable spool supply reservoir axially immovable on said shaft.

7. In a device for automatically changing the weft spools of a mechanical weaving loom, a hammer, a telescopic push-rod for actuating said hammer, means for permitting said push-rod not to telescope when the shuttle is correctly positioned for a spool changing operation, a spool supply reservoir, and means for adjusting the position of said spool supply reservoir relative to the shuttle.

8. In or for a device for automatically changing the weft spools of a mechanical weaving loom, a hammer, a telescopic push-rod for actuating said hammer, a shuttle having a key-way, a key-bolt on one part of said push-rod adapted to enter said key-way, a recess in one part of said push-rod, a pawl on the other part of said push-rod, means for causing said pawl to enter said recess when said key-bolt enters said key-way, a rotatable spool supply reservoir comprising a rotatable and resilient front wall, upper and lower tracks in said reservoir, a guide channel through which the spools fall from the upper to the lower track, a displacement chamber associated with said lower track, and means for adjusting the position of said reservoir relative to said shuttle.

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