May 22, 1945. R. G. TURNER 2,376,738

BOBBIN CHUTE FOR WEFT REPLENISHING LOOMS

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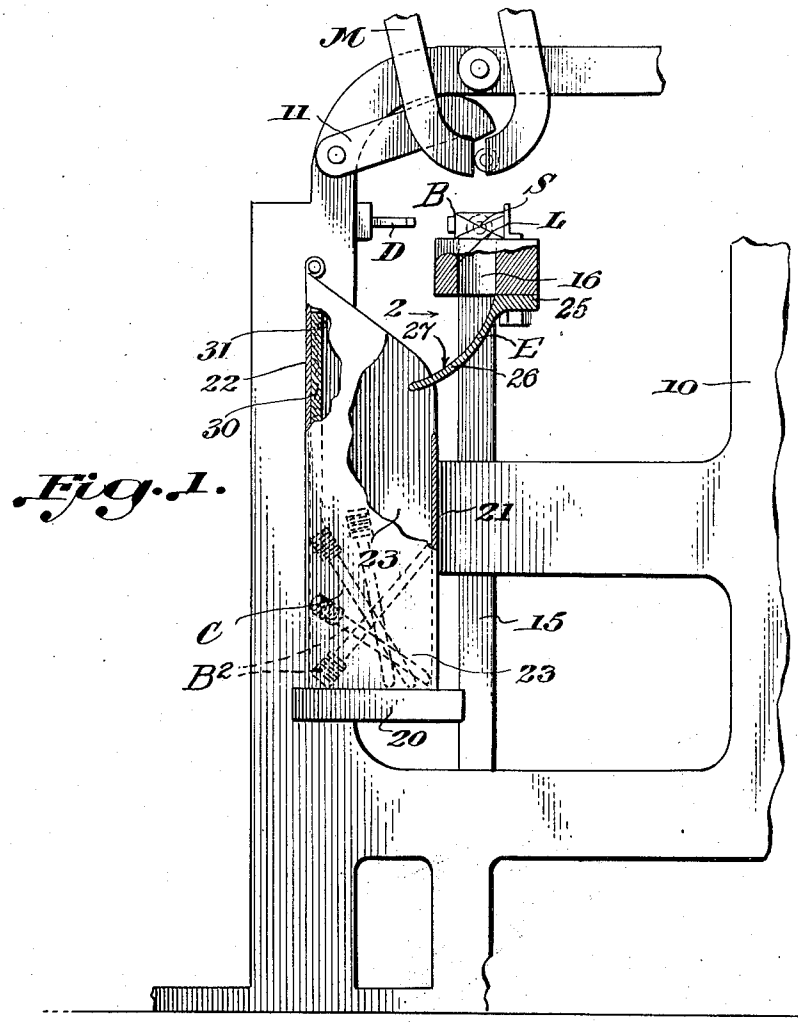
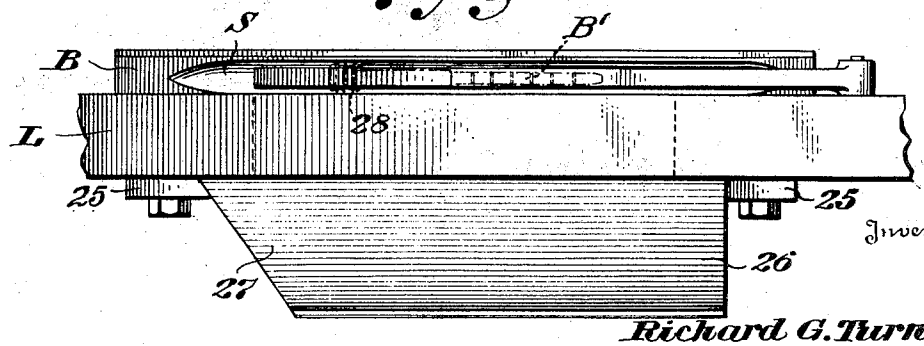


Fig. 1.

Fig. 2.



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Fig. 3.

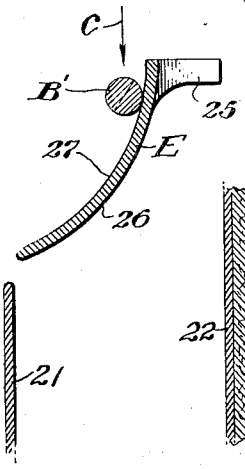


Fig. 4.

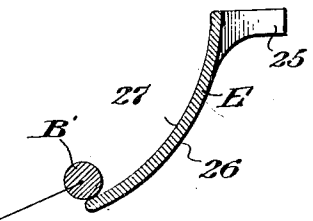


Fig. 5.

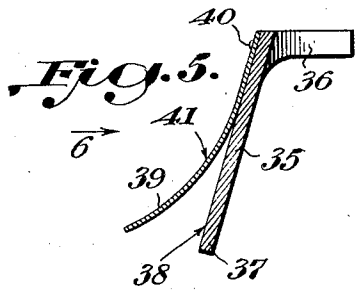


Fig. 7.

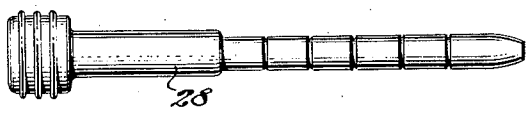
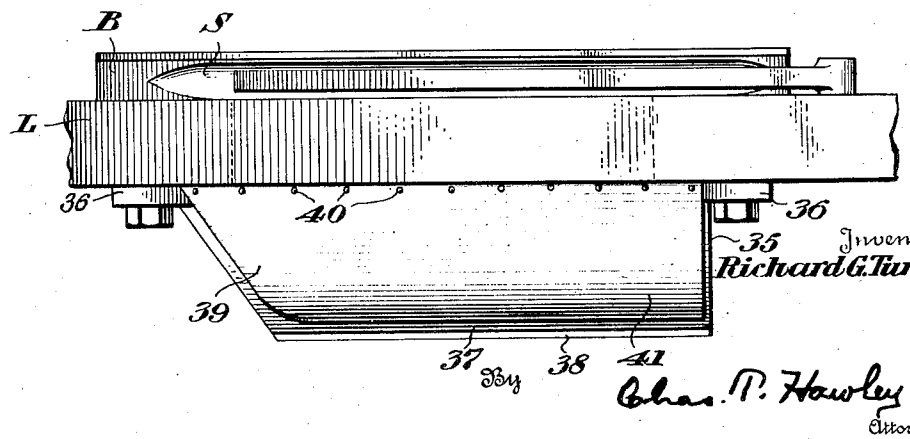


Fig. 6.



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Patented May 22, 1945

2,376,738

UNITED STATES PATENT OFFICE

2,376,738

BOBBIN CHUTE FOR WEFT REPLENISHING LOOMS

Richard G. Turner, Worcester, Mass., assignor to Crompton & Knowles Loom Works, Worcester, Mass., a corporation of Massachusetts

Application February 26, 1944, Serial No. 523,996

16 Claims. (Cl. 139—255)

This invention relates to improvements in bobbin chutes for weft replenishing looms and it is the general object of the invention to provide a chute so constructed that it will direct the outgoing bobbin along a path away from other bobbins which may be in the bobbin can.

When electrical weft detectors are employed it is customary to provide the bobbins with metallic ferrules which upon being uncovered at the time of weft exhaustion complete an electric circuit through the detector to set the loom for a replenishing operation. The ferrules are necessarily light and thin and are easily damaged, particularly if struck by the rings on the bobbin butts. A badly dented ferrule may fail to establish proper contact with the electrodes of the weft detector with resultant failure to set the replenishing mechanism.

When the bobbins are expelled from the shuttles they collect in a bobbin can at the front of the loom under the shuttle box. Loom lays have customarily been provided with chutes having flat surfaces which are deflected downwardly and forwardly toward the bobbin can. As heretofore constructed, however, these chutes have not been successful in directing the outgoing bobbin away from the group of bobbins in the bottom of the can, and the bobbin in motion has struck the other bobbins and produced dents in their ferrules. It is an important object of my present invention to provide a bobbin chute having a curved surface concave to the path of the outgoing bobbin and so constructed as to cause the bobbin to leave the bottom of the curved surface along a path which is well above the group of bobbins in the bottom of the can.

The ordinary chute is so constructed that the expelled bobbin strikes it at an angle and is likely to rebound without traveling down along the surface of the chute. The speed of the bobbin therefore suffers very little if any retardation by its contact with the chute. It is a further object of my present invention to form the chute with a surface so shaped that the bobbin will strike the upper part of it at a very slight angle to minimize rebound and then roll down along the lower part of the chute and be retarded by frictional contact with the chute.

It is another object of my present invention to provide a chute having a forwardly concave surface the lower edge of which is tangential to a line leading to the front wall of the bobbin can. With a chute of this form the bobbin will have a forwardly directed path as it leaves the lower edge of the chute and will strike a shock absorber preferably placed along the inside of the front wall of the can to prevent excess rebounding of the bobbin after it reaches the can.

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

In the accompanying drawings, wherein two forms of the invention are set forth,

Fig. 1 is a side elevation of a loom provided with my improved bobbin chute,

Fig. 2 is a front elevation looking in the direction of arrow 2, Fig. 1,

Fig. 3 is a diagrammatic view showing the relation of the bobbin chute, the can and the descending bobbin when the latter strikes the upper part of the curved surface of the bobbin chute,

Fig. 4 is a view similar to Fig. 3 but showing the direction of the path of the bobbin when the latter leaves the bottom of the curved surface of the bobbin chute,

Fig. 5 is a view similar to a portion of Fig. 1 but showing a modified form of bobbin chute having a forwardly concave surface on a resilient plate which can yield to adapt itself somewhat to the force of the descending bobbin and thereafter act by its resilience to direct the bobbin forwardly,

Fig. 6 is a front elevation looking in the direction of arrow 6, Fig. 5, and

Fig. 7 shows the type of bobbin used with my invention.

Referring particularly to Figs. 1 and 2, I have shown a loom frame 10 and a lay L having a shuttle box B to receive a shuttle S. The magazine M for the reserve bobbins is mounted above the lay and includes in its construction a transferrer arm 11 by means of which a bobbin may be moved from the magazine into the shuttle S.

The lay L is mounted on lay swords 15 one of which is shown in Fig. 1 and is swung back and forth in the usual manner by driving mechanism not shown. The lay is provided with a vertical slot 16 through which the depleted bobbin passes at the time of replenishment.

The outgoing bobbins are received by a bobbin can C which may be supported on a bracket 20 carried by the side of the loom. Except as noted hereinafter the bobbin can is of usual construction and has a rear wall 21 shorter than the front wall 22 and has the customary side walls 23. A weft detector D may be employed to call the replenishing mechanism into operation one effect of which is to force the empty bobbin B'

in the shuttle S down through the slot 16 toward the bobbin can C.

There is generally an accumulation of depleted bobbins B2 in the bottom of the can and when the weft detector D is of the electrical type the bobbins are likely to be provided with ferrules 28, see Fig. 7, in the form of thin metallic sleeves fitted over the barrels of the bobbin for contact with the detector electrodes. Damage to these ferrules results when the expelled bobbin strikes them with full force and it is for the purpose of preventing this last effect that I have developed a bobbin chute having a curved surface.

In carrying the preferred form of my present invention into effect I provide an improved bobbin chute E comprising feet 25 secured to the under side of the lay and having a web 26 the forward or left surface 27 of which as viewed in Fig. 1 is curved downwardly and forwardly. The chute is so constructed that its lower end can pass over the rear wall 21 of the bobbin can as the lay approaches front center position.

Fig. 3 shows diagrammatically the relation of the descending depleted bobbin B' and the surface 27 early in the descent of the bobbin. It will be seen from this figure that the downward path of the outgoing bobbin as it leaves the shuttle, indicated by arrow C, Fig. 3, is almost parallel to a tangent to the surface 27 at the point of contact between the bobbin and the chute. There is therefore little force acting to cause forward rebounding of the bobbin. As the bobbin moves downwardly along surface 27 its direction of movement is changed and when it ultimately reaches the bottom of the chute it is moving forwardly along some such path as that indicated by arrow *a*, Fig. 4 toward a point on the front wall of the bobbin can above the previously expelled bobbins B2. The full force of the bobbin B' is therefore spent before it strikes any of the other bobbins.

In order to absorb the shock of bobbin B' I provide the inner surface of the front wall of the bobbin can with a strip of soft material 30, such as felt or the like, which absorbs a good deal of the energy of the moving bobbin. This strip 30 may be secured as at 31 to the upper part of the front wall of the bobbin can and hangs down far enough to be struck by the bobbin.

In Fig. 5 I show a modified form of chute in which the usual form of chute 35 has feet 36 secured to the lay. Chute 35 has a straight downwardly and forwardly extending apron or web 37, having a flat front surface 38 such as customarily employed. To the front of chute 37, however, I secure a strip of resilient sheet metal 39 the upper part of which is secured as at 40 to the web 37 and the lower part of which is curved forwardly away from the surface 38. The strip has a front surface 41 which is of the same general form as the surface 27 shown in Figs. 1 and 3.

As the descending bobbin strikes the upper part of sheet 39 it follows down along a path somewhat similar to that of the preferred form of the invention, but as the bobbin rolls along the intermediate part of sheet 39 the latter is bent rearwardly or to the right, Fig. 5, by a force exerted by the moving bobbin. As the latter continues downwardly its path is deflected forwardly by curved surface 41 and by the time the bobbin is at the lower end of the sheet 39 the latter recovers from its previous bending and moves forwardly, thereby giving the bobbin a forward motion toward the wall 22 in addition to that derived from the curvature of surface 41.

From the foregoing it will be seen that I have provided simple means for preventing damage to bobbins in the can by directing the outgoing bobbin at the time of transfer along a forwardly directed path well above the bobbins. It will further be seen that this result is accomplished by providing the chute with a curved surface which is concave with respect to the path of the bobbin and the lower part of which is so disposed as to cause the bobbin to move toward the front wall of the can. Furthermore, it will be seen that the curved surface of the chute either eliminates or greatly minimizes rebounding of the bobbin when the latter first contacts the chute and for this reason the bobbin will remain in contact with the chute and the lower part of the latter is thereby enabled to give the bobbin its proper direction of movement. Also, it will be seen that in the modified form of the invention the curved surface is formed on a resilient member which acts to move the bobbin forwardly not only because of its curved shape but also because of its inherent resilience.

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 weft replenishing loom, having a lay and a shuttle box thereon from which a depleted bobbin is ejected downwardly, a bobbin chute secured to the lay and extending downwardly and forwardly therefrom behind the path of the ejected bobbin and having a bobbin engaging surface which is concave with respect to a point in front of the lay and over the bottom of the chute.

2. In a weft replenishing loom having a lay and a shuttle box thereon from which a depleted bobbin is ejected downwardly, a bobbin chute secured to the lay and extending downwardly therefrom in front of the path of the ejected bobbin, said chute having a curved surface for engagement with the ejected bobbin so constructed that the major component of a tangent to the lower part of the curved surface is horizontal.

3. In a weft replenishing loom having a lay and a shuttle box thereon from which a depleted bobbin is ejected downwardly toward a bobbin can having a front wall and depleted bobbins in the bottom thereof, a bobbin chute secured to the lay and extending downwardly and forwardly therefrom toward the bobbin can and having a curved surface behind the path of the ejected bobbin, the upper part of the curved surface near the lay extending downwardly generally in the direction of the path of the bobbin as the latter is ejected from the shuttle box and the lower part of said surface being curved toward a point on said front wall above the bobbins in the can.

4. In a weft replenishing loom having a lay and a shuttle box thereon from which a depleted bobbin is ejected downwardly toward a bobbin can having a front wall and depleted bobbins in the bottom thereof, a bobbin chute secured to the lay under the shuttle box and having a surface behind the path traversed by the ejected bobbin which is concave with respect to said path, said curved surface being so shaped that the ejected bobbin after sliding down along said surface leaves the latter and moves forwardly toward a part of said wall above the bobbins in the can.

5. In a weft repenishing loom having a lay and a shuttle box thereon from which a depleted bobbin is ejected downwardly toward a bobbin can having a front wall and depleted bobbins in the bottom thereof, a bobbin chute secured to the under side of the lay and having a surface behind the path of the ejected bobbin which is curved downwardly and forwardly so that a forwardly projected tangent to the bottom of the curved surface extends toward a part of said front wall above the bobbins in the can.

6. In a weft replenishing loom having a lay and a shuttle box thereon from which a depleted bobbin is ejected downwardly, a bobbin chute formed of resilient material depending from the lay in front of the path of the ejected bobbin, said chute being of such form as to present a downwardly and forwardly extending concave surface for engagement with the ejected bobbin.

7. In a weft replenishing loom having a lay and a shuttle box thereon from which a depleted bobbin is ejected downwardly, a bobbin chute member secured to the lay and extending downwardly therefrom, and a strip of resilient material having the upper end thereof secured to said chute member and having the lower end thereof spaced forwardly from said member, said resilient strip having a surface in front of the path of the ejected bobbin concave with respect to the path.

8. In a weft replenishing loom having a lay and a shuttle box thereon from which a depleted bobbin is ejected downwardly, a resilient bobbin chute extending downwardly from the lay behind the path of the ejected bobbin and having a bobbin engaging surface which is concave with respect to the path of the ejected bobbin, said chute being deflected rearwardly by the ejected bobbin and thereafter moving forwardly while still in contact with the bobbin, said chute being operative because of the curved surface thereof and also because of the resilience thereof to direct the ejected bobbin forwardly.

9. In a weft replenishing loom having a lay and a shuttle box thereon from which a depleted bobbin is ejected downwardly, a resilient bobbin chute extending downwardly from the lay behind the path of the ejected bobbin and having a surface which is concave with respect to said path, a tangent to the upper part of said surface being substantially parallel to the path traversed by the ejected bobbin when the latter first engages said chute, said chute being deflected rearwardly with respect to the lay from normal position by the bobbin during part of the descent of the latter and said chute thereafter returning to normal position with respect to the lay while still in contact with the bobbin, said chute effective due to the curvature thereof and also return movement thereof to normal position to direct the bobbin along a forwardly directed path.

10. In a weft replenishing loom having a lay and a shuttle box thereon from which a depleted bobbin is ejected downwardly toward a bobbin can having a front wall and containing depleted bobbins, a resilient bobbin chute extending downwardly from the lay behind the path of the ejected bobbin and formed with a surface concave to said path and so formed that the lower part thereof extends toward a part of said wall above the bobbins in the can.

11. In a bobbin chute for a loom having a lay, said chute having means for attachment to the lay and having a concave bobbin engaging surface which is curved downwardly and forwardly.

12. In a bobbin chute for a loom having a lay, said chute having attaching means for connection to the lay and having a curved surface which is concave with respect to a point in front of said attaching means and above the bottom of the chute.

13. In a bobbin chute for a loom having a lay, said chute having attaching means for connection to the lay and having a resilient part curved downwardly and forwardly with respect to said attaching means, said resilient part being capable of movement backwardly and forwardly relatively to said attaching means.

14. In a resilient bobbin chute for a loom having a lay and a bobbin can in front thereof, said chute having provision for attachment to the lay and including in its construction a resilient part having a front bobbin engaging surface which curves downwardly from the lay and forwardly toward the bobbin can.

15. In a resilient bobbin chute for a loom having a lay and a bobbin can in front of the lay, said chute having attaching means for connection to the lay and including in its construction a resilient part having a bobbin engaging surface which is concave with respect to a point in front of said attaching means and above the bottom of the chute.

16. A loom lay bobbin chute having a body of resilient material formed with a downwardly and forwardly curved bobbin engaging surface.

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