FILLING DETECTING MECHANISM FOR LOOMS.
APPLICATION FILED NOV. 1, 1905.
To all whom it may concern:

Be it known that I, Everett S. Wood, a citizen of the United States, and a resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Filling-Detecting Mechanism for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention has for its object the production of improved mechanism for detecting the presence or absence of the filling as laid by the running-shuttle in a loom.

In the usual construction of such mechanism the filling detector or fork is tilted by the filling when the latter is present, the fork-tail being lifted while the shouldered hook of the vibrator or weft-hammer moves forward.

The fork-tail then drops back onto the hook behind the shoulder thereof, the hook completing its forward movement. On the return stroke of the vibrator the fork-tail slides over the upper surface of the hook until it reaches the shoulder and then drops onto the lower part of the hook, the fork then being in detecting position.

The surface of the hook over which the fork-tail slides is very apt to be rough or to become roughened, and after the hook has been used for some time a slight bur is formed at the top of the hook-shoulder over which the fork-tail must drop.

The roughness, and especially the bur referred to, tends to agitate the fork and in some cases to throw it upward or tilt it at the time when it should be dropping into position for its next detecting action with relation to the filling. This tendency of the fork-tail to be thrown up at the moment it should be falling off the edge of the hook-shoulder was particularly noticed in the operation of a loom forming the subject-matter of United States patent to Northrop, No. 759,291, dated May 9, 1905. In such structure the vibrator-hook at the left-hand side of the loom is provided with an overhanging guard which extends toward the notch or shoulder which engages the fork-tail.

The lifting tendency just referred to would cause the fork-tail to fly against or sometimes on top of this guard, in either case preventing the proper action of the filling-fork.

Manifestly the trouble ensuing from such jumping of the fork will be much less where the guard of the Northrop double-fork structure is not used; but in any case it must and does exist and without question is undesirable and objectionable as tending to interfere with the proper action of the fork.

In accordance with my present invention the fork after being lifted or tilted by engagement with the filling returns promptly to the detecting position, and on the return or inward stroke of the weft-hammer the fork-tail neither rises nor falls, the fork remaining quiescent. Thus the jumping or agitation of the fork is eliminated, together with the objectionable features attendant thereupon.

I have also provided for rapidly and effectually absorbing any vibration in the fork on the return stroke of the weft-hammer, as will be described.

The various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a top plan view of a sufficient portion of the filling-detecting mechanism of a loom embodying one form of my invention, the parts being in position for filling detecting. Fig. 2 is a side elevation, showing the usual construction, the fork being adapted to be tilted by the intact filling on the forward detecting beat of the lay.

Referring to the drawings, the fixed guide or stand 1, the fork-slide 2, slotted or bifurcated at its rear end to present separated sides 3 at its rear end and slidably mounted in the stand, the vibrating weft-hammer 4, moving in the same direction on alternate picks, and the filling-fork body 5, provided with tines 6, fulcrumed at 7 on the slide, may be and are of usual construction, the fork being adapted to be tilted by the intact filling on the forward detecting beat of the lay.

In the present embodiment of my inven-
tion the fork-tail is substantially T-shaped, having a straight shank 8 and a lateral extension or enlargement 9 at its free end. (Clearly shown in Fig. 1.) The hook 10 is of peculiar shape, it having two opposite upright projections 11 thereon undercut on their adjacent sides at 12 to form a passage wide enough for the free travel of the end 9 of the fork-tail, the front sides of the projections being transversely notched at 13 near their tops. The hook is pivotally connected with the vibrator or weft-hammer 4 at 14, and it slides back and forth on a cross-bar 15, forming a part of the slide.

The upper surface or top of the hook forms a continuous elongated rest portion 16, extending fore and aft beyond the projections, as clearly shown in Fig. 2, and slightly convexed longitudinally, so that when the end of the fork-tail rests thereupon on the return movement of the weft-hammer no movement of the fork will be caused.

As shown in Fig. 2, the overhanging tops 17 of the undercut portions 12 are curved or flared rearwardly to absorb or prevent any chance vibrations of the fork on the return stroke of the weft-hammer. In order to present the end 9 of the tail to the notches 13 upon absence of filling, I attach to the hook a light resilient or spring guide 18, (see Fig. 6,) having an attaching-shank 19, the guide being upwardly inclined against the front side of one of the projections 11, the guide being laterally offset from the shank, as shown. By this construction the lower edge of the guide normally rests on the rest portion 16 of the hook in the path of the end 9 of the fork-tail.

Referring now to Fig. 2, if filling absence occurs the fork will not be tilted, the end of its tail lying in front of the guide, and as the weft-hammer moves forward the guide lifts the tail end (see Fig. 3) into the notches 13 of the hook projections and cooperation is thereby established between the tail and the hook and the fork-slide 2 is moved outward in usual manner. Upon return movement of the weft-hammer the fork-tail slides down over the guide and onto the rest portion 16 of the hook.

Now supposing the filling is intact, on the detecting pick it engages the fines 6 and tilts the fork, lifting the tail, so that its shank passes upward between the projections 11, the end 9 of the tail clearing the latter as the hook moves outward, and when the fork drops back the tail falls onto the rest portion 16, but behind the projections.

The weft-hammer and hook now make the return stroke or movement, the end of the tail sliding along the surface 16 and through the undercut portions 12 until the tail end strikes the guide 18, and, as shown in Fig. 4, the guide yields or springs upward, allowing the end of the tail to slide under and past the guide to the position shown in Fig. 2.

When the fork-tail drops onto the rest portion 16 of the hook, the fork is restored to detecting position and no movement of the fork occurs during the entire return movement of the weft-hammer, so that no jumping or agitation of the fork can occur.

So long as the filling remains intact the operation just described will occur after each detection by the fork of the presence of filling and no movement of the fork will be caused by the weft-hammer or its hook until filling absence occurs.

I prefer to use two projections, as thereby a more even and straight pull is given to the fork-tail upon filling absence; but if the fork-tail is sufficiently rigid and strong one projection may be dispensed with.

My invention is not restricted to the precise construction of the practical embodiment herein shown and described, for various modifications may be made by those skilled in the art without departing from the spirit and scope of my invention.

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

1. In a loom, in combination, a filling-fork to engage and be moved by intact filling, a vibrating weft-hammer, and means to prevent change in the position of the fork by or through movement of the weft-hammer until absence of filling is detected by the fork.

2. In a loom, in combination, a filling-detector to intermittently engage and be moved by intact filling, a vibrating member to cooperate with the detector upon detection thereby of filling absence, and means to prevent movement of the detector by or through the said member until filling absence occurs.

3. In a loom, in combination, a filling-fork having a tail and adapted to engage and be tilted by intact filling, a vibrator having a hook to cooperate with the fork-tail upon absence of filling, and means to prevent filling movement of the fork by or through movement of the vibrator and its hook until filling absence is detected by the fork.

4. In a loom, in combination, a tilting filling-fork having a tail, and a vibrating actuator having a hook provided with a projection to engage the fork-tail upon detection of filling absence, said hook having an elongated, continuous rest portion for the fork-tail, laterally offset from and extending fore and aft beyond the projection, whereby movement of the fork by the hook on its return stroke is prevented.

5. In a loom, in combination, a filling-fork having a tail and adapted to be engaged and tilted by intact filling, a vibrating weft-hammer, a hook connected therewith and provided with a projection to engage the fork-tail upon detection of filling absence, and means to sustain the fork-tail and maintain the fork in detecting position during the return movements of the weft-hammer.
6. In a loom, in combination, a tilting filling-fork having a tail laterally extended at its extremity, a vibrating weft-hammer, a hook connected therewith having a notched projection to engage the tail extension upon detection of filling failure, the inner side of the projection being undercut, an elongated, continuous rest portion on the hook to sustain the fork-tail on the inward movement of the weft-hammer, the undercut side of the projection overhanging such rest portion, and a yielding guide adjacent the notch, permitting the tail extension to pass thereunder, and to slide over the same into the notch upon detection of filling absence by the fork.

7. In a loom, in combination, a filling-fork to engage and be moved by intact filling, a vibrating weft-hammer adapted to move in one direction on alternate picks, and means to prevent movement of the filling-fork from detecting position during the return movement of the weft-hammer.

8. In a loom, in combination, a filling-fork to engage and be moved by intact filling, a vibrating weft-hammer adapted to move in one direction on alternate picks, and adapted to cooperate with the filling-fork upon detection of filling absence thereby, and means to render return movement of the weft-hammer ineffective to move the filling-fork.

9. In a loom, in combination, a tilting filling-fork having a T-shaped tail, a vibrating weft-hammer, its attached hook having opposite projections undercut on their adjacent sides, and notched on their front sides to engage the tail upon filling absence, the hook having a continuous-tail-supporting portion between and extending fore and aft beyond the projections, the tail sliding over such portion without movement on the return movement of the weft-hammer, and a spring-guide to direct the end of the fork-tail into the notches upon detection of filling absence and permitting such end of the tail to slide thereunder on the return movement of the weft-hammer when filling is present.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EVERETT S. WOOD.

Witnesses:

GEORGE OTIS DEAPHER,
ERNEST W. WOOD.