B. F. McGUINESS.

THREAD CATCHER FOR LOOMS.

APPLICATION FILED FEB. 24, 1916.

1,220,667.

Patented Mar. 27, 1917.

3 SHEETS—SHEET 1.

Fig. 1.

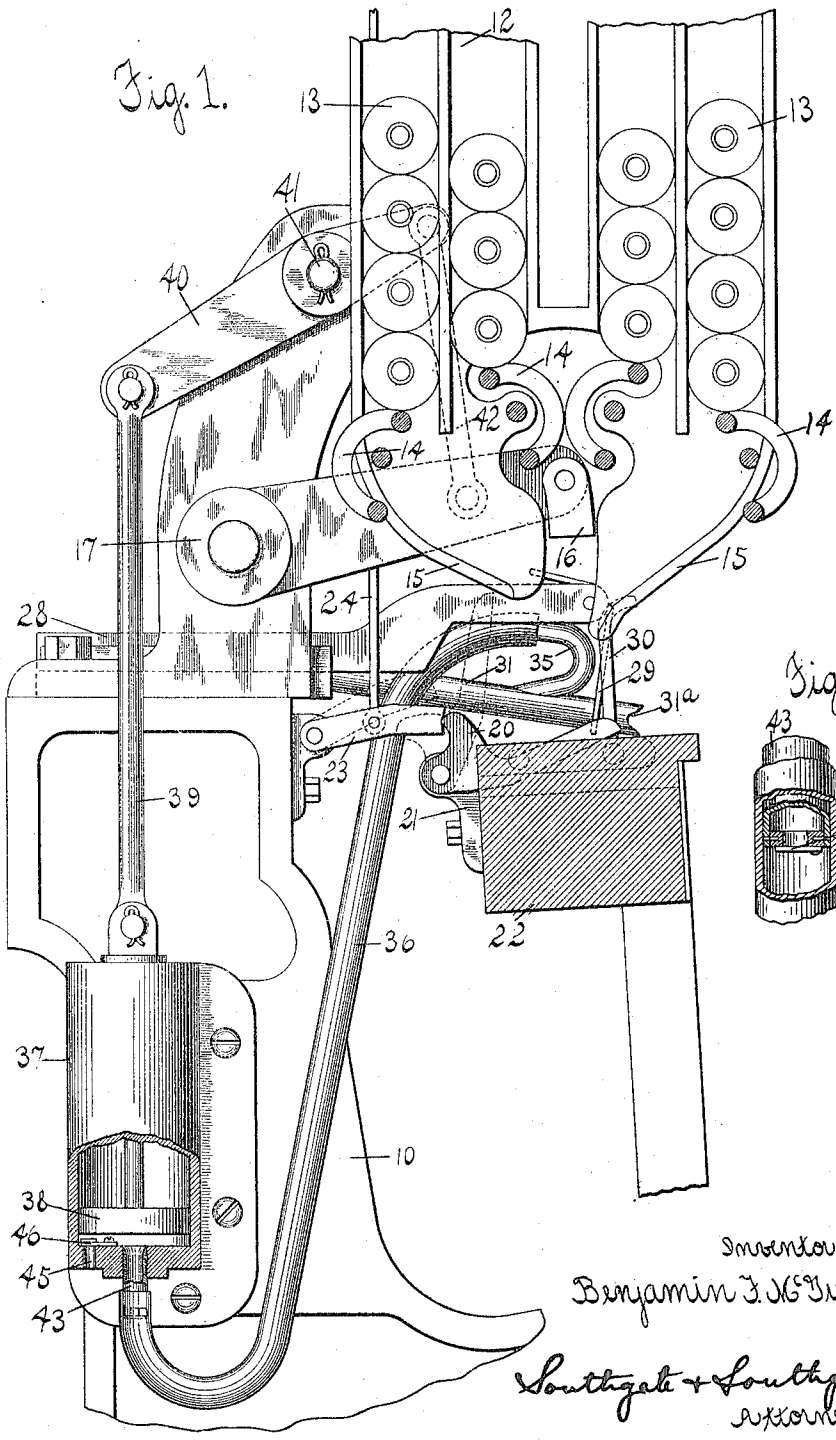


Fig. 2.

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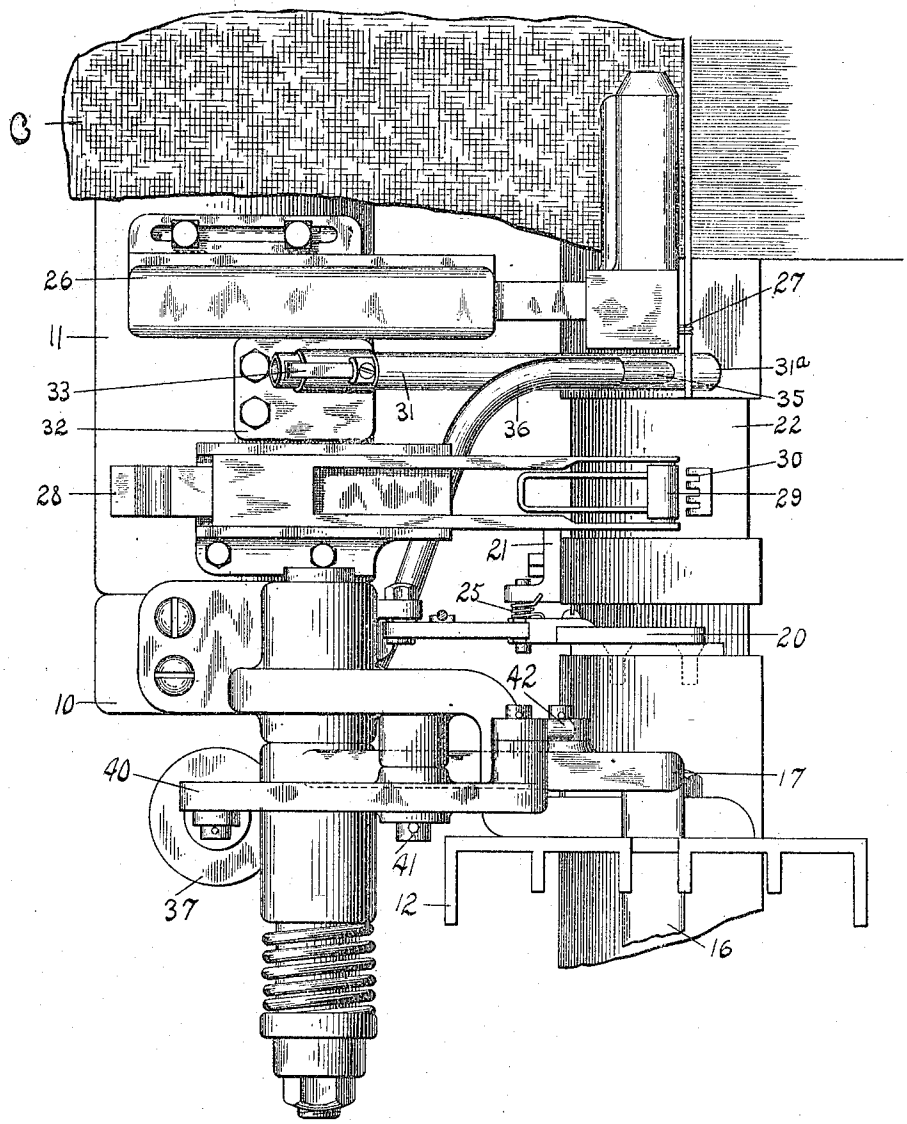
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3 SHEETS—SHEET 2.

Fig. 3.



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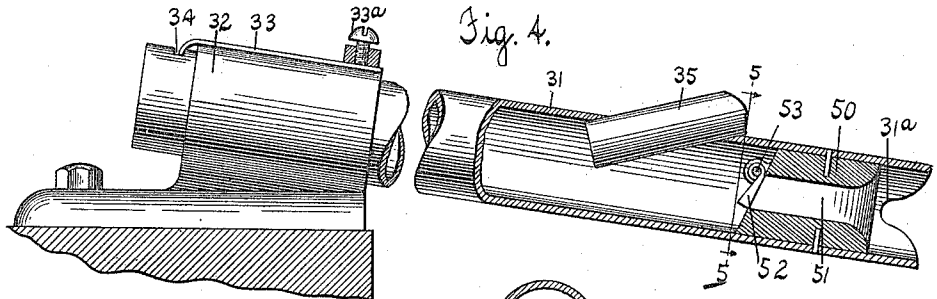
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3 SHEETS—SHEET 3.

Fig. 4.



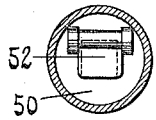


Fig. 5.

Fig. 6.

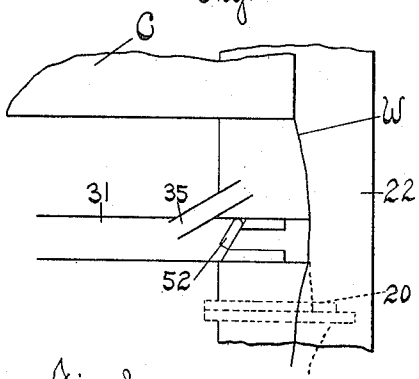


Fig. 7.

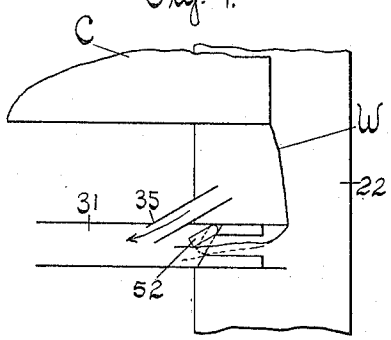


Fig. 8.

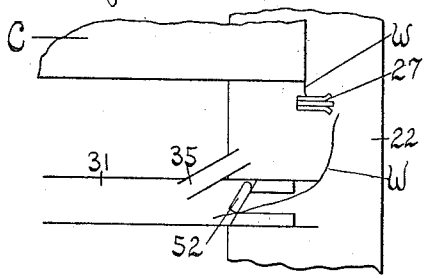
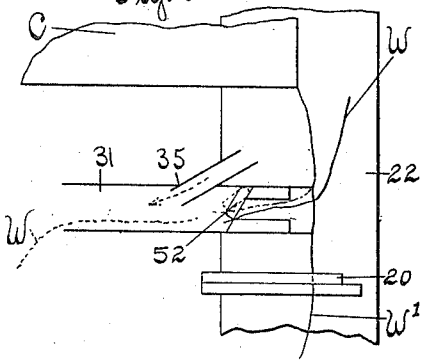


Fig. 9.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. McGUINESS, OF SAUNDERSVILLE, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

THREAD-CATCHER FOR LOOMS.

1,220,667. Specification of Letters Patent. Patented Mar. 27, 1917.

Application filed February 24, 1916. Serial No. 80,276.

To all whom it may concern:

Be it known that I, BENJAMIN F. McGUINESS, a citizen of the United States, residing at Saundersville, town of Grafton, in the county of Worcester and State of Massachusetts, have invented a new and useful Thread-Catcher for Looms, of which the following is a specification.

This invention relates to a thread catcher for looms, particularly designed for use on looms of the weft replenishing type.

When such looms are provided with feeler or weft detecting devices, difficulty is encountered in disposing of the weft thread which extends from the selvage to the ejected bobbin.

It is the present common practice to provide a quick-acting thread cutter adjacent the end of the shuttle box, effective to sever the thread simultaneously with the ejection of the bobbin. This operation, however, still leaves a loose weft end extending from the thread cutter to the selvage. The usual temple is therefore provided with a cutter for severing this weft end close to the selvage, and mechanical devices have been heretofore provided for seizing the severed or detached portion of weft and for transporting the same to a point removed from the fell of the cloth.

Much imperfect cloth has been caused by the unsatisfactory operation of these mechanical devices, the detached or partially detached portions of weft often being carried into the shed after they are severed by the cutters and being woven into the cloth to the great detriment thereof.

It is the general object of my invention to provide an improved device for catching and removing the severed weft ends which shall be more simple in construction and more reliable in operation than the mechanical devices above referred to.

With this object in view, one feature of my invention relates to the provision of a pneumatic thread catcher comprising a suction tube having one end positioned adjacent the path of travel of the weft and effective to draw a weft end therein when severed by the thread cutter. I further provide means for retaining said end in said tube during the operation of the temple cutter and for thereafter ejecting the weft end from the opposite end of the suction tube.

In the preferred form the pneumatic mechanism for producing suction in the tube is connected for simultaneous operation with the weft replenishing mechanism.

A minor feature of my invention relates to the provision of a give-way device connecting the tube to its support which will prevent injury to either the tube or the shuttle, should the shuttle fail to box and be left in line with the tube.

Further features of my invention relate to certain arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of my invention is shown in the drawings in which—

Figure 1 is a side elevation of portions of a loom and weft replenishing mechanism with my improved thread catcher attached thereto;

Fig. 2 is a detail view, partly in section, of a check valve in the pneumatic connections;

Fig. 3 is a top plan view of the parts shown in Fig. 1;

Fig. 4 is an enlarged side elevation, partly in section, of the suction tube;

Fig. 5 is a sectional view of the tube, taken along the line 5—5 in Fig. 4, and

Figs. 6, 7, 8, and 9 are diagrammatic views showing successive steps in the operation of the mechanism.

Referring particularly to Figs. 1 and 3, I have indicated a loom side 10 and a breast beam 11 upon which is mounted a weft magazine 12 of the type shown in Letters Patent No. 933,492 issued to Eppa H. Ryon on September 7, 1909. The weft magazine 12 comprises a series of vertical compartments within which the weft carriers or bobbins 13 are retained and from which they are released by the rocking cradles 14. A bobbin thus released moves downward along guiding ledges 15 into position for engagement by the transferrer 16 carried by the transferrer arm 17, such release and engagement occurring upon substantial exhaustion of the weft carrier in the active shuttle. For a

more complete description of the weft replenishing mechanism reference is made to the patent to Ryon above noted.

A thread cutter 20 (Fig. 1) is pivotally mounted upon a bracket 21 secured to the lay 22 and is effective to sever the weft thread extending to the ejected bobbin at a point adjacent the inner end of the shuttle box. The normal inoperative position of the cutter is indicated in dotted lines in Fig. 1 and the cutter is brought into operation by engagement with an actuating member 23 pivotally supported upon the loom side and positioned by a link 24 actuated by a suitable part of the weft replenishing mechanism. By such engagement the thread cutter is moved from the dotted to the full line position shown in Fig. 1, substantially simultaneously with the operation of the transferrer 16 by which the exhausted bobbin is ejected and a fresh bobbin inserted. The thread cutter 20 is normally maintained in raised position by a spring 25 (Fig. 3).

The thread cutter herein shown and described is merely illustrative, forming no part of my invention, and any other suitable form of thread cutter may be substituted therefor.

Referring to Fig. 3, I have shown a temple 26 mounted upon the breast beam 11 and provided with a temple thread cutter 27. I have also shown a filling fork slide 28 supporting a filling fork 29 which coöperates with a fork brake 30 to detect broken or exhausted filling. Both the thread-cutting temple and the filling fork may be of any usual type.

Between the temple and the filling fork I secure a suction tube 31 having its notched rearward end 31ª positioned adjacent the path of the weft. The tube 31 is slidable in a stand 32 (Fig. 4) and is detachably secured therein by a flat spring member 33 mounted on the stand and projecting into a notch 34 formed near the upper forward end of the tube. The tube is thus normally maintained in operative position, but the spring 33 forms a give-way connection which permits the tube to slide in its support if the shuttle should fail to box and should be left in position to strike the tube as the lay beats up. The spring 33 is held by a screw 33ª and may be adjusted to vary the longitudinal position of the tube.

A short curved pipe 35 (Figs. 1 and 4) projects into the tube at a point intermediate its ends, said pipe being disposed at a slight angle with the axis of the tube and being directed toward the exit or forward end of the tube. The pipe 35 may be conveniently connected by a rubber tube 36 (Fig. 1) to a pump cylinder 37 fixed to the loom side 10. A piston 38 is slidable in the cylinder and is connected by a link 39 to a lever 40 pivoted at 41 to the magazine stand and connected by a second link 42 to the transferrer arm 14. With these connections it will be evident that the piston 38 will move upward as the transferrer arm 17 moves downward to insert a fresh weft carrier.

A nipple 43 (Figs. 1 and 2) is inserted in the lower end of the cylinder 37, to which nipple the rubber tube 36 is connected. At the lower end of the nipple a check valve 44 (Fig. 2) is provided to prevent a back draft through the rubber tube 36 as the piston 38 rises. A port 45 covered by a valve 46 admits air to the cylinder 37 during the upward stroke of the piston.

Referring again to Fig. 4, it will be seen that a bushing 50 is secured within the suction tube 31 at a point adjacent its notched end 31ª, the opening 51 in the bushing being covered at its left-hand or inner end by a latch 52 pivoted at 53 to the bushing 50.

Having described the construction of my improved mechanism, I will now describe the method of operation thereof, reference being made particularly to the diagrammatic Figs. 6, 7, 8, and 9 in which the cloth is indicated by the letter C and the weft extending to the substantially exhausted bobbin is marked W.

In Fig. 6 the parts are in the position which they assume after the boxing of a shuttle containing a substantially exhausted bobbin and just prior to the changing of the bobbins, the weft W being indicated in full lines as extending from the selvage of the cloth C past the thread cutter 20 to the bobbin in the shuttle. As the transferrer 16 descends to insert a fresh bobbin the thread cutter 20 will sever the weft W as indicated in dotted lines in Fig. 6 and at the same time the piston 38 will be raised in the cylinder 37.

As the transferrer returns to its normal position, the piston 38 will descend, forcing a strong blast of air through the rubber tube 36 and the curved pipe 35, said blast being directed toward the open or forward end of the tube 31. This will cause a partial vacuum in the rear or lower end of the tube, resulting in an in-rush of air through the opening 51 in the bushing 50, the latch 52 swinging open as indicated in full lines in Fig. 7. This draft of air through the opening 51 will draw in the severed end of the weft W, the weft being thereby positioned as also shown in full lines in Fig. 7. As the piston 38 reaches its lower limit of travel the suction through the opening 51 will cease and the latch 52 will fall to the dotted line position shown in Fig. 7 thereby moving the weft W to its dotted line position and gripping the weft against the inner edge of the bushing 50, the other end of the weft being still attached to the selvage of the cloth C.

The parts will remain in this position

until the temple thread cutter severs the weft W, after which the detached weft end will remain gripped by the latch 52 as indicated in Fig. 8 until the next actuation of the transfer mechanism.

In Fig. 9 I have shown, in full lines, the weft end W and the succeeding weft W′ in the positions which they occupy just prior to the next operation of the transfer and thread cutting mechanism, while in dotted lines I have shown the wefts W and W′ in the positions which they assume during the second return stroke of the transferrer and the corresponding down stroke of the piston 38. The blast of air thus produced will raise the latch 52 and will forcibly eject the weft end W from the suction tube 31, at the same time drawing in the succeeding weft end W′, thus bringing the parts again in the position shown in Fig. 7.

From this description it will be seen that each weft end is drawn into the suction tube immediately after it is severed by the thread cutter 20, that it is held in the tube while its opposite end is detached by the temple thread cutter and that it is forcibly ejected from the tube at the front of the loom upon the next actuation of the weft replenishing mechanism. The weft end is thus at all times under control and there is no chance for it to be carried into the shed or woven into the cloth.

Having thus described my invention it will be evident that changes and modifications can be made therein by those skilled in the art without departing from the spirit and scope thereof as set forth in the claims and I do not wish to be otherwise limited to the details herein disclosed, but what I claim is—

1. In a loom, in combination, a weft replenishing mechanism, means to sever the outgoing weft at two separated points, and a pneumatic device effective to remove the detached weft end, said pneumatic device comprising a tube having one end positioned adjacent the path of the weft, and means to create intermittent suction therethrough in timed relation to the operation of the thread cutter which severs the weft end from the outgoing bobbin.

2. In a loom, in combination, a weft replenishing mechanism, means to sever the outgoing weft at two separated points, and a pneumatic device effective to remove the detached weft end, said pneumatic device comprising a tube open directly to the atmosphere at both ends thereof having one end positioned adjacent the path of the weft, and intermittently actuated means for introducing a blast of air into the side of said tube intermediate to its ends and for directing the same toward the opposite or forward end of said tube, thereby drawing into one end of said tube the detached weft end, and thereafter forcibly ejecting said weft end from the opposite end of said tube.

3. In a loom, in combination, a weft replenishing mechanism, means to sever the outgoing weft at two separated points, and a pneumatic device effective to remove the detached weft end, said pneumatic device comprising a tube having one end positioned adjacent the path of the weft, means to draw an end of weft into said tube, and means to retain said weft end therein during the operation of the temple thread cutter.

4. In a loom, in combination, a weft replenishing mechanism, means to sever the outgoing weft at two separated points, and a pneumatic device effective to remove the detached weft end, said pneumatic device comprising a tube having one end positioned adjacent the path of the weft, means to draw an end of weft therein, means to grip the same, and means to thereafter eject the weft end from the opposite end of said tube.

5. In a loom, in combination, a weft replenishing mechanism, means to sever the outgoing weft at two separated points, and a pneumatic device effective to remove the detached weft end, said pneumatic device comprising a tube having one end positioned adjacent the path of the weft, means to draw an end of weft into said tube, a latch opening freely inward and effective to grip said weft end, and means to thereafter eject the weft end from the opposite end of said tube.

6. In a loom, in combination, a weft replenishing mechanism, means to sever the outgoing weft at two separated points, and a pneumatic device effective to remove the detached weft end, said pneumatic device comprising a member positioned adjacent the path of the weft, a pump effective to force a blast of air through said member to create suction therein, and means associated with the weft replenishing mechanism for actuating said pump in timed relation thereto.

7. In a loom, in combination, a weft replenishing mechanism, means to sever the outgoing weft at two separated points, and a pneumatic device effective to remove the detached weft end, said pneumatic device comprising a tube having one end positioned adjacent the path of the weft, a pipe entering the side of said tube and directed toward the opposite end thereof, a pump effective to force a blast of air through said pipe, and connections between said pump and the transferrer arm of the weft replenishing mechanism whereby said pump may be actuated in timed relation to the transfer mechanism.

8. In a loom, in combination, a weft replenishing mechanism, means to sever the outgoing weft at two separated points, and a pneumatic device effective to remove the detached weft end, said pneumatic device comprising a tube having one end positioned

adjacent the path of the weft, means to create suction therethrough, and a latch in said pipe effective to prevent return movement of a weft end after once entering said tube.

9. In a loom, in combination, a weft replenishing mechanism, means to sever the outgoing weft at two separated points, and a pneumatic device effective to remove the detached weft end, said pneumatic device comprising a tube having one end positioned adjacent the path of the weft, means to draw a weft end therein immediately after the operation of the thread cutter and to thereafter eject said weft end from the opposite end of said tube upon the next operation of the weft replenishing mechanism, and means to grip and retain said weft end in said tube during the intermediate operation of the temple thread cutter.

In testimony whereof I have hereunto set my hand.

BENJAMIN F. McGUINESS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."