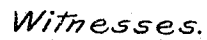


1,045,508.

2 SHEETS—SHEET 1.



Thomas J. Drummond
Warren Ont.

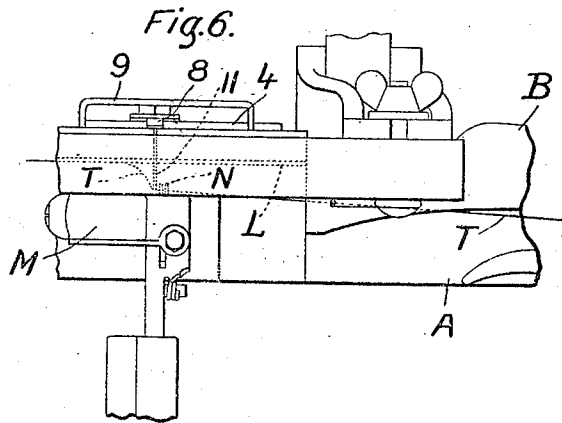
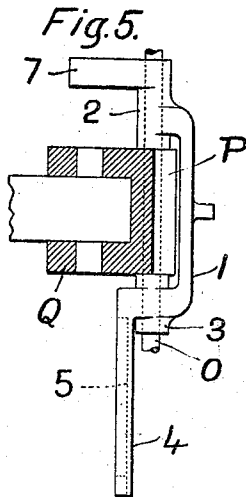
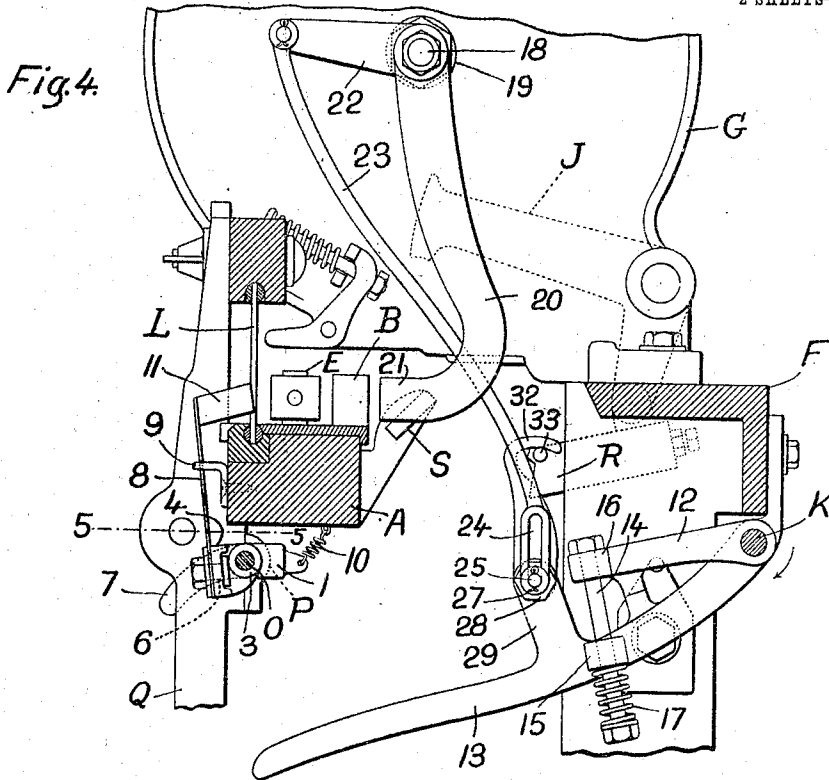
Inventor.
Louis S. Burbank.
by Edward Ward Smith,
Attys.

L. S. BURBANK.
 THREAD PARTING MECHANISM FOR LOOMS.
 APPLICATION FILED MAY 4, 1912.

1,045,508.

Patented Nov. 26, 1912.

2 SHEETS-SHEET 2.



Witnesses.

Thomas J. Drummond,
 Warren O'Neil

Inventor.
 Louis S. Burbank,
 by Edward H. Smith

Attys.

UNITED STATES PATENT OFFICE.

LOUIS S. BURBANK, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY,
OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

THREAD-PARTING MECHANISM FOR LOOMS.

1,045,508.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed May 4, 1912. Serial No. 695,017.

To all whom it may concern:

Be it known that I, LOUIS S. BURBANK, a citizen of the United States, and resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Thread-Parting Mechanism for Looms, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to looms of the type wherein the working shuttle is replenished automatically with filling while the loom continues in operation, and it has for one of its objects the production of novel means for parting the filling-end extending from the selvage of the cloth to the replenishing shuttle-box when replenishment is effected.

The parting of this filling-end adjacent the cloth is conveniently effected by a temple thread-cutter operated by or through the lay on the beat up, such a device being shown in United States Patent No. 765,687 granted July 26, 1904, to Stimpson.

Sometimes the action of such a thread-cutter is delayed, if for instance the filling-end is not brought promptly into the field of action of the cutter, and to obviate such undesirable delay I have provided a device to cooperate with the filling-end and position it properly with relation to the temple thread-cutter whenever filling replenishment is effected. By this arrangement the filling-end is parted immediately and before the fresh filling is laid in the shed.

I have provided herein a novel form of shuttle-feeler to detect improper positioning of the shuttle for filling-replenishment, and the shuttle-feeler is arranged to prevent the operation of the replenishing mechanism if the shuttle is boxed improperly.

The device for positioning the filling-end with relation to the temple thread-cutter is brought into action only when filling replenishment is effected, as will appear hereinafter.

Another object of my invention is the production of means to effectually clear the parted filling-end from the shuttle, so that the filling-end will not be carried back into the cloth by the flight of the shuttle, nor will it foul or become entangled with the thread of the fresh filling supply inserted in the shuttle.

The various novel features of my inven-

tion 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 portion of the replenishing side of an automatic filling replenishing loom of a well known type, with a thread-cutting temple, and with one practical embodiment of my present invention shown in operative relation to the other parts, but for convenience I have shown the picker as in its inward position in the replenishing shuttle-box; Fig. 2 is a front elevation and partial section of a portion of the apparatus shown in Fig. 1; Fig. 3 is a transverse sectional detail through the lay and replenishing shuttle-box on the line 3-3, Fig. 2; Fig. 4 is a transverse section on the line 4-4, Fig. 1, looking toward the right, the temple being omitted; Fig. 5 is a detail in plan view and part section, taken on the line 5-5, Fig. 4, looking down, to be referred to hereinafter; Fig. 6 is a detail top plan view showing the thread-positioning device in action, presenting the filling-end to the temple thread-cutter to be parted thereby.

Referring to the drawings, the lay A having at one end a shuttle-box B, open at its bottom at C above the cutaway part of the lay, for the passage therethrough of the filling-carrier ejected from the shuttle; the shuttle D of the automatically self-threading type, picker-stick E, breast-beam F having a stand G rigidly mounted thereon; the hopper, partly indicated at H, for the reserve supply of filling-carriers and rotatably mounted on the horizontal stud I carried by the stand G, the transferrer J, and the starting or controlling rock-shaft K which governs the operation of the filling replenishing mechanism, are and may be all of well known construction and operate in a manner familiar to those skilled in the art.

The lay carries the usual reed L, and in Figs. 1 and 6 a thread-cutting temple M is shown, the movable blade N of the thread-cutter being shown as normally projected, in readiness to engage the thread to be parted, the retraction of the blade being effected by or through the lay on the beat up, as in the Stimpson patent referred to.

Herein I make use of the protector rock-shaft O to sustain the main portion of the thread positioning means, said rock-shaft being sustained in suitable bearings, as P, 110

carried by the lay-swords Q. A peculiarly shaped casting is mounted loosely on said rock-shaft, to support the thread-positioning device, the casting comprising an elongated yoke 1 having aligned bearing hubs 2, 3, Fig. 5, through which the rock-shaft is extended, the hubs receiving between them the bearing P referred to. Hub 3 has a horizontal, lateral extension 4 longitudinally grooved, and slotted at 5, for the reception of a clamping bolt 6, while hub 2 has a depending and rearwardly turned finger 7 extended from it. A flat, resilient metal carrier 8 is clamped at its lower end to the extension 4 by means of the bolt 6, and the carrier may be adjusted laterally upon the extension, as will be manifest, the carrier extending through a loop-like elongated stop 9 fixedly attached to the back of the lay, the stop limiting rearward movement of the carrier induced by the spring 10. The adjustment thus provided enables the positioning device to be set in the best place with relation to the thread-cutter, as will be manifest. Said spring connects the bottom of the lay and a lug on the yoke 1 of the support, and normally acts to keep the support and the carrier in the position shown in Fig. 4, with the thread-positioning device 11 retracted. This positioning device is made as a thin, flat and upright metal blade located between two adjacent dents of the reed L, the blade being rigidly secured to the carrier 8 and projecting forward therefrom. The positioning device is movable in a vertical plane across and transverse to the lay raceway, when the support is rocked on the shaft O, but when the member 11 is retracted by the spring 10 its front edge is held within the reed and out of the shuttle path. When the support is rocked against the action of spring 10 the carrier 8 will be moved forward and upward and the positioning device 11 will be moved forward into and across the shuttle path, as shown in Fig. 6, and the front edge of the blade 11 will be very close to the movable cutting blade N of the temple.

The operative movement of the parts referred to is effected by or through rotative movement of the controlling or starting shaft K in the direction of the arrow, Fig. 4, such movement of the shaft elevating an arm 12 fixed upon it and thereby raising into operating position an elongated, rearwardly extended bunter 13 fulcrumed on the shaft K to rock upon it and relatively thereto. Said bunter thus moves in an upright plane and when its free end is elevated to operative position it will lie in the path of movement of the finger 7 as the lay beats up, so that the yoke-like support 1 will be rocked and the positioning device 11 will be moved toward the front of the lay on the beat-up, as shown in Fig. 6. The bunter

is connected with the arm 12 by a link 14 passing loosely through ears 15, 16 on said arm and bunter, Fig. 4, and a spring 17 is interposed between the ear 15 and the nut on the lower end of the link, so that in case of necessity the spring will yield should upward swing of the bunter be prevented when shaft K is turned to bring about filling replenishment. The hopper stud I is reduced in diameter and extended beyond the inner side of the stand G, as at 18, Fig. 1, to receive upon it an elongated hub 19 from which depends a shuttle-feeler 20, clearly shown in Fig. 4. The lower end or tip of the feeler is turned rearward at 21 and normally occupying the position shown in Figs. 1 and 4, so that as the lay beats up the tip will pass across the lay adjacent the mouth of the shuttle-box B, provided the shuttle is properly boxed therein or is at the other end of the lay. If the shuttle should be improperly boxed at the replenishment side it will hit the tip of the feeler 20 and will swing the latter frontward as the lay beats up, and by means to be described the operation of the replenishing mechanism will be prevented, even if called for in usual manner.

The hub 18 has an attached and rearwardly extended arm 22 to which is pivotally attached the upper end of a link 23, said link at its lower end having an elongated slot 24, Fig. 4, which embraces loosely the reduced end 25 of a headed screw stud 26, Fig. 1, a washer and cotter-pin 27 retaining the slotted end of the link in place.

The head 28 of the stud is interposed between the link and the adjacent face of an upturned ear 29 on the bunter 13, said ear having projecting from its opposite face a conically bored hub 30 which receives the correspondingly tapered end of a lateral branch rod 31, Fig. 1, said branch rod being secured rigidly in the boss by the screw stud 26. At its outer end the branch rod carries an upturned, hooked detent 32 which co-operates with a pin 33 on the usual notched dog R operatively connected with the transfer J, the detent acting normally to maintain the dog in the position shown in Fig. 4 and out of the path of the usual bunter S on the lay. The operation of the dog and bunter is well known, the elevation of the dog so that its notched end is engaged by the bunter S effecting the operation of the replenishing mechanism.

Referring to Fig. 4, it will be understood from the foregoing that movement of the shuttle-feeler 20 to abnormal position is effected only when the shuttle fails to be boxed properly in the box B, and if such movement of the feeler occurs during the normal operation of the loom the link 23 will be moved downward, the slotted lower end thereof sliding over the stud end 25, and

the detent 32 will be drawn down, depressing the dog R below the position shown. Such depression of the dog is of no moment, however, and no other change in the parts shown will follow. If, however, filling replenishment is called for the rod K is turned in a well known manner and the arm 12 is elevated, thereby lifting the bunter 13 into position to cooperate with the finger 7 to actuate the thread-positioning means, (before referred to) and as the bunter 13 rises the detent 32 also rises, permitting the dog R to move into operative position, provided the shuttle is properly boxed for replenishment. Should it be improperly boxed the shuttle-feeler 20 is engaged by the shuttle and moved forward to abnormal position and the link 23 will be moved downward, the upper end of the slot 24 engaging the stud end 25 and depressing the bunter 13, the spring 17 permitting such action. The depression of the said bunter causes the detent 32 to engage the pin 33 and pull the dog R downward out of the path of its bunter S, and there will be no operation of the replenishing mechanism, even though it was called for. So, too, the depression of the bunter 13 lowers its free end below the path of the finger 7, and consequently there will be no movement of the thread-positioning member 11 from its normal, inactive position shown. This is as it should be, manifestly, for unless the filling in the working shuttle is replenished it would be improper to bring the old filling end into the range of the temple thread-cutter. The weight of the depending shuttle-feeler 20 is sufficient to maintain it and the link 23 in the position shown in Figs. 1 and 4 under normal conditions, and to return such parts thereto after they have been positioned abnormally.

When filling replenishment is effected the old filling end, indicated at T, Fig. 6, should be severed adjacent the selvage of the cloth, and at such time the said filling end is engaged by the positioning device 11 and pushed toward the front of the lay, adjacent the usual cutting blade N on the temple. While the filling end is thus engaged and positioned the continued forward movement of the lay effects the retractive movement of such blade, in well known manner, and the filling end is thereby drawn against the usual fixed blade and severed as the lay completes the beat-up. It will be apparent that the parting of the filling end T by the temple thread-cutter is effected on the beat-up on which filling replenishment is effected, and only when replenishment is effected, and that curling, kinking or twisting of the filling cannot prevent its accurate and positive presentation to the prompt action of the temple thread-cutter.

When the spent bobbin is ejected from the shuttle the severed piece of filling will not

always be drawn completely out of the shuttle eye as the bobbin drops from the lay, and may be carried back into the cloth when the shuttle is picked, or it may foul the fresh filling and break it, or make a bad place in the cloth. To obviate this I have provided simple means to clear this loose filling end from the shuttle if the ejection of the spent bobbin fails to effect the removal of the filling end from the shuttle eye.

Referring to Figs. 1, 2 and 3, I attach to the underside of the race plate 34 at the front side of the bobbin discharge opening C, two parallel and slightly separated plates 35, 36, the rear edges of which are below the front edge of the opening C, and project slightly thereinto, and preferably the said edges of the plates are toothed or serrated, as at 37, Figs. 1 and 3. The plates constitute a device to catch the filling end below the race plate and between the interior of the shuttle and the ejected bobbin, and such thread engager or catcher is located a slight distance inward from the shuttle eye 38 when the shuttle is boxed, see Fig. 2.

To cooperate with the catcher I attach to the picker stick E a clearer, shown as a thin, resilient plate 39 projecting inward from the stick below the race plate 34 and at such a height that its free inner end will sweep between the plates 35, 36 of the catcher when the picker stick is swung inward to pick the shuttle. When the picker stick is at its outward position the inner end of the clearer will be located adjacent the thread-catcher, Fig. 2, and the filling between the shuttle and the ejected bobbin, will hang over the transverse edge of the clearer or against the catcher.

As shown in Fig. 1 the inner end of the clearer is widened to form a frontwardly projecting prong 40, and concaved at 41 on its leading edge, this prong, as it sweeps along toward the inner end of the shuttle-box B, engaging the bight of the filling end between the parts 35, 36 of the catcher and pulling the loose end completely out of the shuttle-eye, the filling being caught by the lower one of the serrated edges 37 and held thereby as the clearer prong 40 moves inward and draws the loose end of filling over the upper serrated edge and out of the shuttle.

The catcher does not interfere with the proper discharge of the bobbin from the shuttle, and the ordinary pull of the filling end as the bobbin drops will usually draw it against the serrated edges of the catcher, to be engaged by the clearer on the active stroke of the picker stick as described, the clearer being so located when the picker stick is retracted that it will not present an obstacle to discharge of the spent bobbin. If the filling end does not engage the serrated edges 37 at the time the bobbin

is ejected from the shuttle the concave edge 41 of the clearer will push the filling end frontward into engagement with the catcher.

The thread clearing device herein shown and described is very simple in its construction, it effectually clears the parted filling end from the shuttle after filling replenishment, and it is not in the way of other parts of the loom structure.

Changes or modifications in various details of construction and arrangement may be made by those skilled in the art without departing from the spirit and scope of my invention as set forth in the claims hereunto annexed.

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

1. In a loom provided with automatic filling replenishing mechanism, and with a rock-shaft to bring about the operation of said mechanism, a thread-cutter to part the old filling-end by or through the lay on its forward beat, and a shuttle-feeler to prevent the operation of said mechanism when the shuttle is improperly boxed, in combination, a thread-positioning device carried by the lay and movable transversely thereof across the shuttle path, means to move said device transversely of the lay adjacent and at one side of the thread-cutter, and a bunter on the said rock-shaft to engage and actuate said means when the shaft is turned to effect filling replenishment, whereby the thread-positioning device is caused to engage the filling-end and position it for action thereupon by the thread-cutter as the lay beats up, the shuttle-feeler acting directly through said bunter to prevent engagement thereof and the actuating means for the thread-positioning device when the shuttle is boxed improperly.

2. In a loom provided with automatic filling replenishing mechanism, and with a temple having a thread-cutter, actuated by or through the lay on the beat-up, to part the old filling-end adjacent the cloth when filling replenishment is to take place, in combination, a blade-like thread-positioning device movable through the reed transversely of the lay at a point adjacent and at one side of the thread-cutter, a resilient carrier for said device, a spring-controlled support pivotally connected with the lay and having an elongated portion lengthwise of the lay, upon which said carrier is attached and adjustable longitudinally, the support maintaining the thread-positioning device normally inoperative, and means to act upon and rock said support to thereby place said device in operative position in front of the reed when filling replenishment is to be effected; adjustment of the positioning device accommodating lateral adjustment of the thread-cutting temple.

3. In an automatic filling replenishing loom having a temple thread-cutter, and a shuttle-feeler maintaining its normal position when filling replenishment is called for and the shuttle is properly boxed, in combination, means operated independently of the shuttle-feeler, when filling replenishment is called for, to engage and position the old filling-end to be acted upon by the thread-cutter provided said feeler is normally positioned at such time, an instrumentality to prevent the operation of said means if the shuttle-feeler is positioned abnormally by improper boxing of the shuttle, and a spring to return said means to normal, inoperative position after the operation thereof.

4. In an automatic filling replenishing loom having a temple thread-cutter, the lay adapted to operate said cutter, and the reed on the lay, in combination, a blade-like member movable through the reed at a point nearly opposite the thread-cutter, to engage and position at one side of said cutter the filling-end to be acted upon by the thread-cutter, means to support the said member on and in a position adjustable lengthwise of the lay and to move it transversely of the lay into and out of operative position at the front of the reed, a spring to retract the thread-positioning member, a stop to limit retractive movement thereof, said stop being elongated lengthwise of the lay to accommodate adjustment of said member, and means to actuate said supporting means and render said member operative when filling replenishment is called for and is to be effected.

5. In a loom provided with automatic filling replenishing mechanism, in combination, a lay, a normally quiescent shuttle-feeler mounted independently thereof and assuming the shuttle feeling position on the beat up when the shuttle is boxed properly, improper boxing of the shuttle causing movement of the shuttle-feeler to abnormal position as the lay beats up, means to govern the time of operation of the replenishing mechanism, and a controlling connection between said means and the shuttle-feeler, to prevent the actuation of the replenishing mechanism when said feeler is positioned abnormally.

6. In a loom provided with filling replenishing mechanism, including a rotatable hopper, and also provided with a lay having a shuttle-box at the replenishing end, in combination, a normally quiescent shuttle-feeler depending from the hopper axis and assuming feeling position at the mouth of the said shuttle-box on the beat up when the shuttle is properly boxed, and means, operatively connected with the shuttle-feeler, to bring about the operation of the replenishing mechanism if the feeler remains quiescent and in its normal position, improper boxing of the shuttle causing it to engage

and move the feeler to abnormal position on the beat up.

7. In an automatic filling replenishing loom having a thread-cutter mounted independently of and in front of the lay, and the lay adapted to operate said cutter on the beat-up, in combination, a normally inoperative device carried by the lay and adapted to present positively the old filling end to said thread-cutter to be cut thereby, means to sustain said positioning device in a laterally adjustable position upon the lay, and means to effect the actuation of said device only when filling replenishment is effected.

8. In an automatic filling replenishing loom having a temple provided with a thread-cutter, and the lay adapted to operate the cutter on the beat-up, in combination, a rocking support on the lay, having an elongated, lateral extension, a device attached to and adjustable laterally on said extension, to engage and present the old filling end to the thread-cutter to be cut thereby, an elongated stop to limit retractive movement of said device, a spring to act upon the support and maintain the said positioning device normally retracted, and means to rock the support and render said positioning device operative only when filling replenishment is effected.

9. In a loom having automatic filling replenishing mechanism, and means to part the old filling end between the cloth and the shuttle, in combination, a thread-catcher on the lay below the shuttle at the time of replenishment and adapted to engage the parted filling end between the shuttle-eye

and the discharged bobbin, a picker-stick, and a clearer mounted thereon and adapted to engage the filling end between the catcher and the shuttle on the active stroke of the picker-stick, to draw the loose end of the filling out of the shuttle-eye.

10. In a loom having automatic filling replenishing mechanism, and means to part the old filling end between the cloth and the shuttle, in combination, the lay slotted for the discharge of a bobbin from the shuttle when replenishment is effected, a picker-stick reciprocating in the slot of the lay, and means to clear the parted filling end from the shuttle, said means comprising a member mounted on the lay adjacent the slot, and a second member carried by the picker-stick, simultaneous engagement of the filling end by said members operating to draw it from the shuttle.

11. In a loom having automatic filling replenishing mechanism, and means to part the old filling end between the cloth and the shuttle, in combination, thread-clearing means movable with the lay and including a member movable also longitudinally of the lay relatively thereto, to engage the parted filling end between the shuttle and the ejected bobbin and draw such filling end from the shuttle.

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

LOUIS S. BURBANK.

Witnesses:

FRED R. DANIELS,
E. D. OSGOOD.