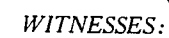


968,083.

2 SHEETS—SHEET 1.



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STOPPING MECHANISM FOR LOOMS.
APPLICATION FILED AUG. 31, 1908.

968,083.

Patented Aug. 23, 1910.

2 SHEETS—SHEET 2.

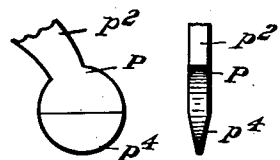


Fig. 6. Fig. 7.

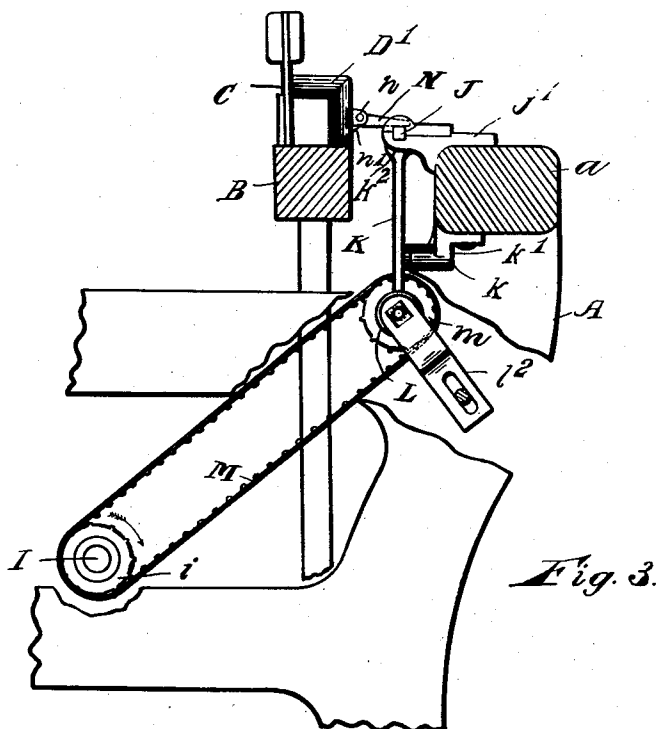


Fig. 3.

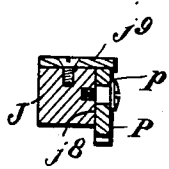


Fig. 5.

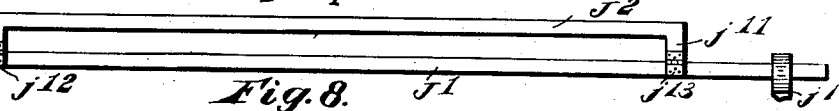
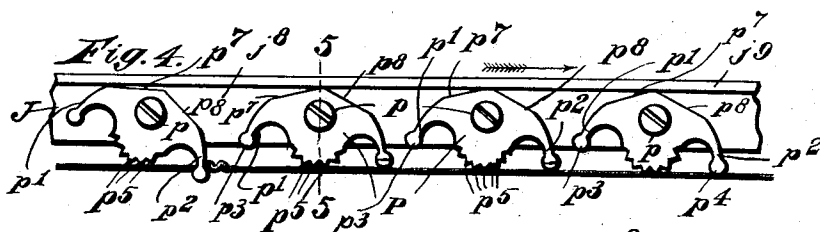


Fig. 8.

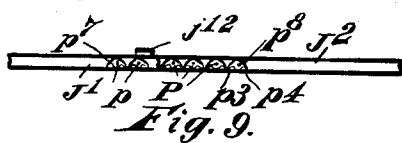


Fig. 9.

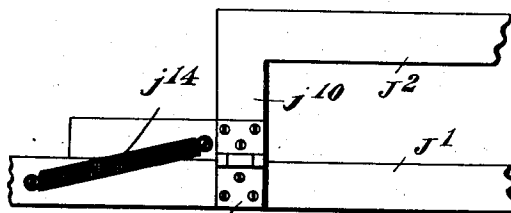


Fig. 10.

WITNESSES:

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UNITED STATES PATENT OFFICE.

ORREN A. SAWYER, OF LOWELL, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THISSELL COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

STOPPING MECHANISM FOR LOOMS.

968,083.

Specification of Letters Patent. Patented Aug. 23, 1910.

Application filed August 31, 1908. Serial No. 450,972.

To all whom it may concern:

Be it known that I, ORREN A. SAWYER, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Stopping Mechanism for Looms, of which the following is a specification.

This invention relates to stopping mechanism for looms, one object of said invention being to stop the loom when the cloth presents the defect of so-called "thin stripes" or transverse thin places, which may be caused in various ways.

Another object of said invention is to stop the loom in case of an analogous longitudinal defect due to a "thread run" or absence of one or more warp threads from the cloth. This mechanism will also stop the loom when there are bunches, kinks or loops in the filling or bunches of sizing on the warps, which rise above the surface of the cloth and engage the point of a detector; when there are draws or puckers in the cloth which may be caused by the warp-threads catching on the lease-rod by reason of knots and then being suddenly released or by anything which holds back the warp-threads and then suddenly releases them; or when by accident or carelessness a finer filling is introduced as the shuttle becomes empty, which makes the cloth looser.

The stopping mechanism herein described may, if desired, be used with the usual stop-motions which act to stop the loom instantly upon the failure of the warp or filling and will detect many cloth defects not remedied by them and diminish the number and amount of pick-outs heretofore required, and may be so adapted as to be operated only by defects which on inspection would place the cloth among "seconds" as in the case of comparatively cheap fabrics, or may be adapted to discover defects less in extent in higher classes of fabrics.

In the accompanying drawing, on two sheets, Figure 1 is a front elevation of so much of a loom provided with said invention as is necessary to the understanding of the same; showing a part of the frame including the breast-beam, parts of the cam-shaft, lay, shipper, holding-plate and knock-off lever; Fig. 2, a plan of the vibrator and connected parts, the breast-beam, holding-plate, lay,

shipper and knock-off lever, the parts being represented as in position to knock off the shipper; Fig. 3, a left side elevation of the stopping devices and the actuating mechanism, showing the lay and breast-beam in vertical section on the line 3 3 in Fig. 1; Fig. 4, a front elevation of a part of the vibrator with detectors; Fig. 5, a vertical section of the same on the line 5 5 in Fig. 4; Figs. 6 and 7, respectively, a front and a side elevation of an end of a detector; Fig. 8, a plan of a modified form of the vibrator and its bearings; Fig. 9, a front elevation of a part of the same; Fig. 10, an enlarged plan of a portion of the vibrator shown in Fig. 8.

A indicates the frame; *a*, the breast-beam; B, the lay; C, the reed; D D¹, shuttle-boxes; E, the holding-plate provided with a notch *e* which holds the shipper F in the operative position of the loom; *f*, the spring which throws the shipper to stop the loom when said shipper is released from the notch *e*; G G¹, the temples; H, the stop-motion fork, mounted on the slide *h*; I, the cam-shaft;—these parts being all of the usual construction.

In suitable brackets *j j*¹, rigidly secured on the breast-beam or other parts of the frame, is mounted parallel with the breast-beam, the vibrator J, the same being a bar capable of longitudinal oscillation in said brackets. The vibrator J is caused to move alternately in opposite directions between the beats of the lay by a forked lever K suitably fulcrumed, as at *k* on a hanger *k*¹ secured to the breast-beam, the upper forked end *k*² of said lever straddling said vibrator between two springs represented as spiral wire springs *j*² *j*³ surrounding said vibrator and compressed between said fork *k*² and stops represented as pins *j*⁴ *j*⁵ driven through and projecting from said vibrator, so that the vibrator may be held from oscillation without stopping said lever K. The stop *j*⁴ and a similar stop *j*⁵ on the vibrator outside of the bracket *j* limit the extreme oscillation of the vibrator. The lower end of the lever K engages a cam *l*, represented as a peripheral ridge on a cylinder L which is free to turn on a horizontal stud *l*¹, supported on a bracket *l*² secured on the frame A; said cylinder being concentric and fast to a sprocket-wheel *m* connected by a chain M to another sprocket-wheel *i* fast on the cam-shaft I,

which is usually driven at half the speed of the crank-shaft which swings the lay. The cam l is so formed and set that the vibrator J is caused to move in one direction before
 5 one beat or forward movement of the lay and in the opposite direction before the next beat of said lay, and said cam is provided with rests l^3 l^4 , so that the vibrator is always at one end or the other of its traverse and at
 10 rest when the lay beats up.

A bunter N is hinged to some convenient part of the lay, preferably as shown, to the front side of the mouth of the shuttle-box D^1 which is nearest the shipper F , in such a
 15 manner that the free forward end of said bunter can, if allowed to do so, rise above or fall into the plane of a knock-off lever O which turns on a vertical stud o^2 secured on the top of the breast-beam, the outer arm o
 20 of said lever reaching in front of the shipper and the inner arm o^1 being adapted to be struck by said bunter if in the same plane therewith, when the lay beats up or swings
 25 forward, and thus cause the shipper to be thrown out of the notch e and the loom to be stopped by the usual means. The free end of the bunter N rises when the lay swings
 backward and when the lay is beating up, descends upon the vibrator, rides upon the
 30 same and is normally held thereby above the knock-off lever when said vibrator is at either end of its traverse but the vibrator is provided in its upper surface with a depression j' of a depth sufficient to allow the for-
 35 ward end of the bunter to descend to the level of the knock-off lever and of such a length that unless the vibrator is at the end of its traverse, the bunter as the lay swings forward falls over and into said depression,
 40 as shown in Figs. 1 and 2, and operates the knock-off lever to throw the shipper F out of the notch e . When the vibrator is at either end of its traverse and the lay beats up, the bunter falls upon the vibrator at the side of
 45 the depression j' farthest from said end and is prevented from striking the knock-off lever. The downward movement of the bunter on its pivot or hinge n is limited by a downward stop projection n^1 on said bunter
 50 which rests against the front of the shuttle-box (Fig. 3) and holds the front end of said bunter high enough to pass first over the top of the vibrator before descending onto said vibrator or into the depression j' .

A series of detectors P turn on horizontal pivots p on a vertical face, preferably on the front face j^8 of the vibrator J where they may be seen and removed or replaced read-
 60 ily. Each detector P is provided with two fingers p^1 p^2 which extend on each side of the pivot in a plane parallel with the face j^8 of the vibrator J , the ends p^3 p^4 of said fingers being rounded and wedge-shaped (see Figs. 6 and 7) and of a size to allow them to
 65 engage the smallest defect or narrowest hole

which is regarded as sufficiently important to stop the loom for, considering the kind and quality of the cloth being manufactured. Each detector is provided in the middle portion with a curved and roughened or
 70 toothed part p^5 which is concentric with the pivot p and in contact with the upper surface of the cloth, so that as the vibrator is reciprocated the detector is turned on its pivot and brings the finger p^1 or p^2 which is
 75 then in advance against the cloth with a sufficient pressure to engage a knot, loop or hole on or in the cloth and to stop the vibrator before the latter reaches the end of its
 80 traverse, allowing the loom to be stopped by the action of the bunter on the knock-off lever at the next beat of the lay. Each detector is provided with two stop projections
 85 p^7 p^8 arranged on opposite sides of the pivot, which strike one at a time against the underside of a stop-ledge j^9 which extends from the top of the vibrator J forward over said
 90 detector and prevents the detectors from turning so far as unnecessarily to enlarge the hole or other defect in the cloth or to remove the part p^5 out of contact with the cloth, which part p^5 must always be in contact with the cloth to keep the finger in ad-
 95 vance in contact with said cloth.

In order that the vibrator throughout the greater part of its length may be as near
 100 as possible to the making edge of the cloth and yet out of the way of the temples G G^1 which yield when the lay beats up, the form of vibrator shown in Figs. 8, 9 and 10, may be used. In those figures the part J^1 is
 105 or may be precisely like the part J shown in Fig. 1, but only a few detectors P are pivoted directly on the bar J^1 , these being arranged in front of the loom-temples, the
 110 other detectors being pivoted on another bar J^2 arranged parallel with the bar J^1 but only long enough to cover the space between the temples and to vibrate between them without striking them. The bar J^2
 115 is provided with forward extensions j^{10} j^{11} which are attached to the bar J^1 preferably by hinges j^{12} j^{13} which allow the bar J^2 to be turned up out of the way if desired. A spiral spring j^{14} acting torsionally and connecting the bars J^1 and J^2 normally holds
 120 said bars in the same horizontal plane. The modified bar or vibrator as shown in Figs. 8-10 is operated precisely as the vibrator J above described and is used in connection
 125 with the same parts.

I claim as my invention:—

1. The combination in a loom, of a detector, arranged between the making edge of the cloth and the front of the loom, a
 125 support on which said detector has a limited movement, arranged transversely of said cloth, said detector normally pressing upon said cloth, means for vibrating said support, said support being prevented from vibration
 130

by the engagement of said detector with a cloth-defect, and means for stopping said loom when said support is stopped.

2. The combination in a loom, of a support arranged transversely thereof, means for moving said support transversely of the loom, a series of detectors carried by said support, and having a limited movement thereon and normally in contact with said cloth, said detectors being adapted, independently of each other, to engage cloth-defects and to stop said support and means for stopping said loom when said support is stopped.

3. The combination in a loom, of a vertically movable support arranged transversely of the cloth in said loom, means for moving said support longitudinally, a series of detectors carried by said support and having a limited movement thereon and normally in contact with said cloth, said detectors adapted to engage independently of each other cloth-defects and to stop said support and means for stopping said loom normally prevented from operation by the vibration of said support but allowed to operate when said support is stopped.

4. The combination in a loom, of a support arranged transversely thereof and capable of being thrown forward out of working position, means for moving said support back and forth across the loom, a series of detectors carried by said support and having a limited movement thereon and normally in contact with the cloth, said detectors adapted to engage independently of each other cloth defects and to stop said support, and means for stopping said loom normally prevented from operation by the movement of said support but allowed to operate when the support is stopped.

5. The combination in a loom, of a lay, a bar, yielding means for moving the same

longitudinally in opposite directions before alternate forward strokes of said lay, detectors pivoted on said bar and having surfaces in frictional contact with the surface of cloth in said loom, said detectors being adapted to be rocked on their pivots by such contact and having fingers on opposite sides of said pivot adapted to engage defects in said cloth and to prevent the further movement of said bar, a shipper, a holding-plate having a shipper-retaining notch, a knock-off lever, a bunter carried by said lay and adapted to ride upon said bar above said knock-off lever when said bar is at either end of its movement, said bar having a notch or depression to allow said bunter at other times to descend into engagement with said knock-off lever.

6. The combination in a loom, of a bar, yielding means for moving the same longitudinally opposite directions between alternate forward strokes of said lay, said bar having a stop-ledge, detectors pivoted on said bar and each having a surface in frictional contact with the cloth in said loom, each detector having stop projections on opposite sides of its pivot adapted to strike said ledge and to limit the movement of said detector on said pivot and each detector having fingers on opposite sides of its pivot adapted to engage defects in said cloth and to stop the movement of said bar, and means for stopping said loom normally prevented from operation by the movement of said detector, but allowed to operate when said bar is stopped.

In witness whereof, I have affixed my signature in presence of two witnesses.

ORREN A. SAWYER.

Witnesses:

ALBERT M. MOORE,
LUDGER A. NICOL.