No. 878,451. PATENTED FEB. 4, 1908.

T. BENTLEY.

DEVICE FOR PREVENTING SINGLES IN ROVING AND SIMILAR FRAMES.

APPLICATION FILED APR. 11, 1906.

2 SHEETS—SHEET 1.

Fig. 1

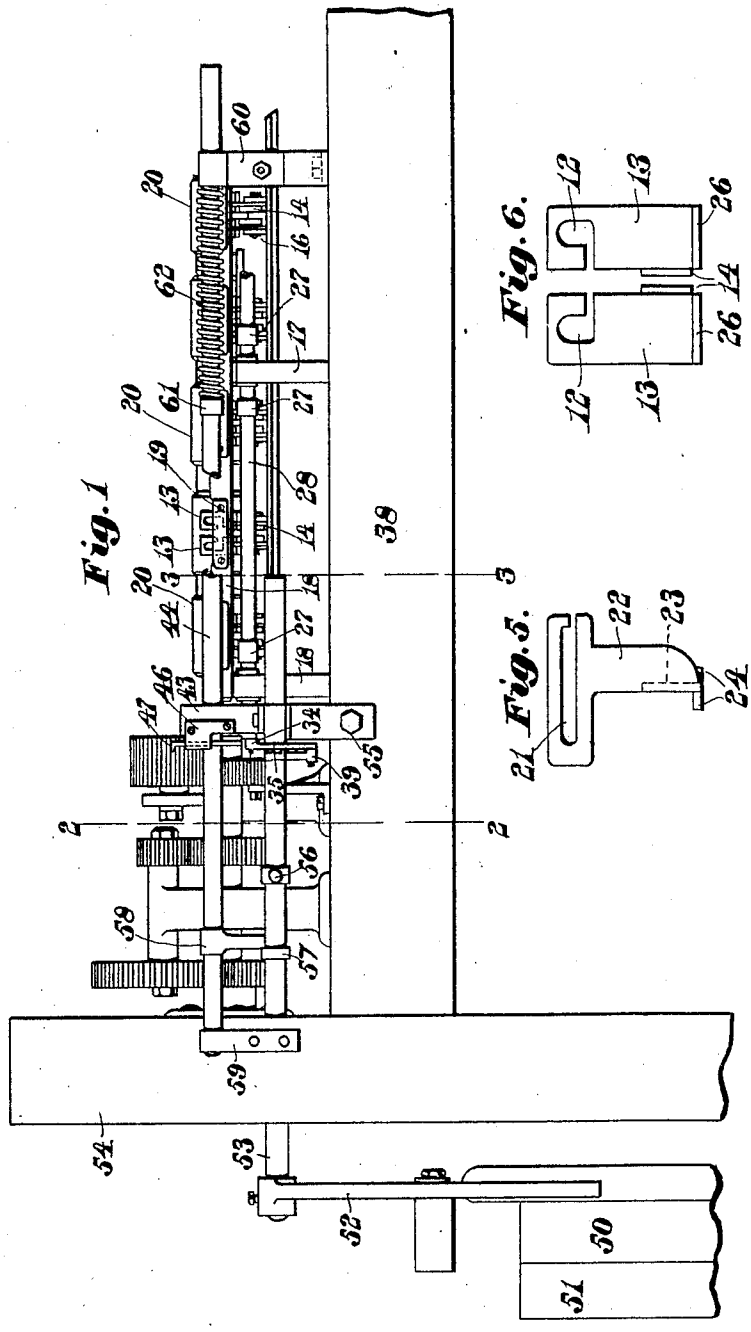

Fig. 6.

Fig. 5.

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Fig. 2.

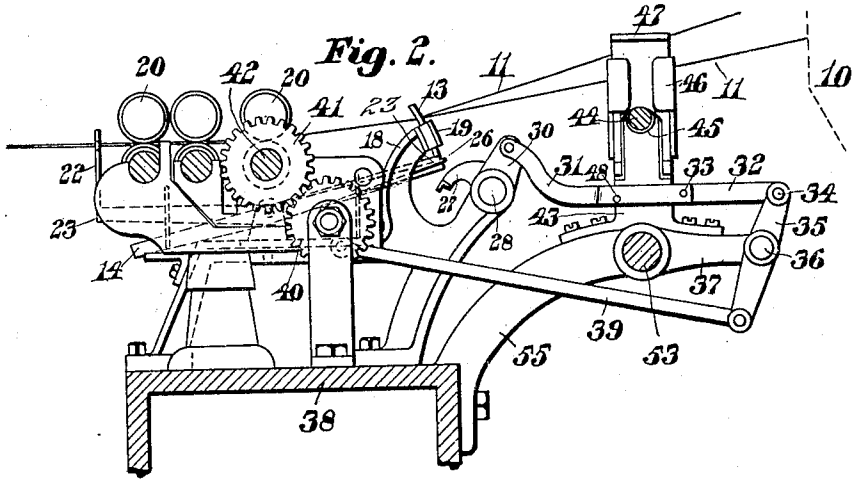


Fig. 3.

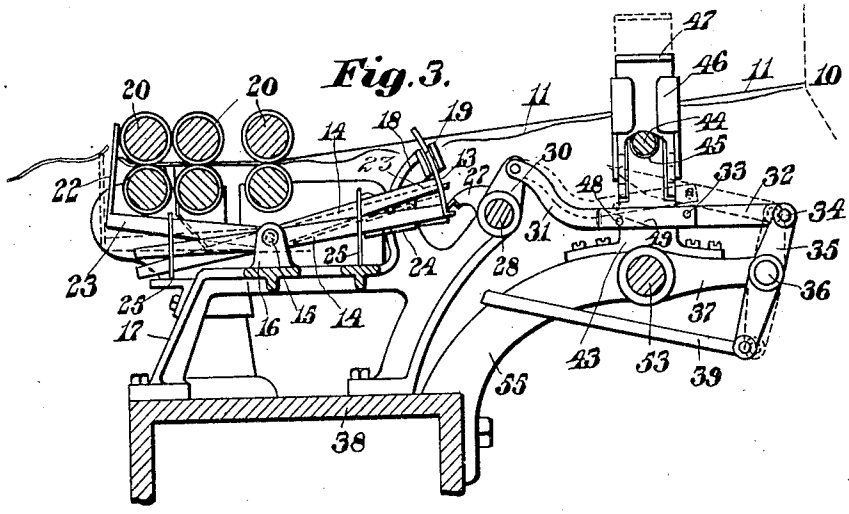
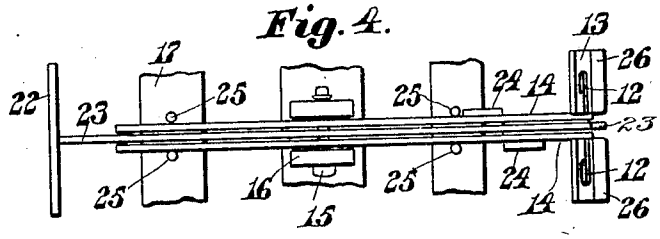


Fig. 4.



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UNITED STATES PATENT OFFICE.

THOMAS BENTLEY, OF HOPKINTON, MASSACHUSETTS, ASSIGNOR OF ONE-FOURTH TO MARTIN V. PHIPPS, OF HOPKINTON, MASSACHUSETTS, AND ONE-FOURTH TO SAM K. PAIGE, OF BROOKLINE, MASSACHUSETTS.

DEVICE FOR PREVENTING SINGLES IN ROVING AND SIMILAR FRAMES.

No. 878,451. Specification of Letters Patent. Patented Feb. 4, 1908.

Application filed April 11, 1906. Serial No. 311,022.

To all whom it may concern:

Be it known that I, THOMAS BENTLEY, a citizen of the United States of America, and a resident of Hopkinton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Devices for Preventing Singles in Roving and Similar Frames, of which the following is a specification.

This invention relates to roving frames and similar apparatus in which a plurality of slivers are led through suitable guides and united into one roving by suitable drawing rolls and particularly to the stopping mechanism therefor whereby the operation of the frame will be stopped upon the breaking of a sliver.

The object of the present invention is to secure a breakage of the united slivers in advance of the drawing rolls whenever a sliver has accidentally become broken thereby preventing the single unbroken sliver from being fed from the drawing rolls.

Heretofore as far as is known whenever a sliver becomes accidentally broken the stopping mechanism operated by the breakage effects a stoppage of the machine and causes the other slivers to be broken but before the machine can be stopped on account of the high rate of speed at which it is running a considerable quantity of single unbroken slivers will be wound upon the bobbin. With careless or dishonest operators this is liable to remain thereon to the injury of the cloth in which the product is used. It also interferes with the proper operation of the looms in which it is used.

The purpose of the present invention is to prevent any singles from being wound upon the bobbins, this being accomplished by the severing of the entire roving of any affected set, thus obliging the operator to pass between the drawing rolls new slivers to replace the broken ones and properly unite them with the disconnected ends.

The invention for accomplishing these objects consists in certain novel features of construction and arrangement of parts which will be readily understood by reference to the description of the drawings and to the claims to be hereinafter given.

Of the drawings: Figure 1 represents a rear elevation of a portion of a roving or similar frame equipped with a device embodying the features of this invention. Fig. 2 represents a transverse section on line 2—2 on Fig. 1, looking toward the right to show more clearly the means for effecting the oscillation of the feeler and the parts cooperating therewith. Fig. 3 represents a transverse section of the same, the cutting plane of the left side therof being on line 3—3 on Fig. 1, and the right side thereof being on line 2—2 on Fig. 1. Fig. 4 represents a plan view of the detectors and breaking devices. Fig. 5 represents an end elevation of the breaking device, and Fig. 6 represents an end elevation of the detector devices.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawings, 10 represents, in dotted lines, a portion of a series of bobbins from which the slivers 11 are drawn through eyes 12 in suitable detectors such as the plates 13, secured to or forming a part of the members 14, pivoted at 15 to the standard 16 forming a part of or secured to the frame 17. The frame 17 is provided with an upwardly extending arm 18 having formed thereon, or secured thereto, at 19, a suitable guideway for the detector plates 13.

The slivers 11 pass from the eyes 12 between the drawing rolls 20, and then pass from between said drawing rolls, through the eye 21 in a breaking device 22, secured to the end of the lever 23 pivoted to the standard 16 at 15, and extending beyond said pivoted lever intermediate of said members 14. The eye or slot 21 is provided with an extension in the nature of a narrow slit extending to the edge of the plate forming the breaking device 22. The end of said lever 23 opposite to the breaking device 22 is provided with outward projections 24 extending beneath the members 14 so that any downward movement of either of the members 14 about the pivot 15 will act upon the projections 24 to cause an upward movement of the breaking device or plate 22.

On either side of the members 14 are vertical guides 25 extending upwardly from the frame 17 these guides preventing lateral movement of said members. The detector plates 13 are provided at their lower ends

with toes or shouldered projections 26, which are adapted to be engaged, when a sliver 11 breaks permitting the fall of a detector, by a feeler 27, secured to a shaft 28, about the axis of which it is oscillated by means of suitable positively driven mechanism.

When the detector plates are in the position shown in Fig. 2 the feeler 27 is free to oscillate without engaging said plates or performing any function. Should, however, a sliver break and permit the fall of the detector plate into a lower position, as shown in Fig. 3, the forward movement of the feeler 27 will engage with the toe 26 and cause a further downward movement thereof which will operate through the projections 24 and the lever 23 to move the breaking plate 22 upwardly and sever the united slivers passing from the drawing rolls. This is a very important feature as by means of the severing of the slivers at this particular point no singles are permitted to pass from the drawing rolls thereby effecting a uniformity of the output of the frame. This device insures a great saving both to the master and to the operator as the severed ends are more readily picked up and joined together absolutely preventing any singles in the output while at the same time a much better product is assured.

The feeler 27 extends lengthwise of the frame parallel to the rocker shaft 28 to which it is secured by suitable arms and is driven by means of an arm 30, secured to said shaft 28. To the end of this arm 30 is pivoted a two-part connector 31—32, said parts 31—32 being pivoted to each other at 33 while the outer end of the member 32 is pivoted at 34 to a lever 35 which in turn is pivoted at 36 to a rearwardly extending arm 37 secured to the rail or frame 38. The lower end of the lever 35 is connected, by means of the link 39, to a gear 40 meshing with the gear 41, on the shaft 42 of one of the drawing rolls. It is obvious from an inspection of the drawings that as the shaft 42 is continuously rotating a continuous oscillation is imparted to the feeler 27 through the instrumentalities just described.

To the arm 37, is secured an upwardly extending bracket 43, in which is mounted the controlling rod 44, provided with a groove 45 therein. The bracket 43 is provided with guideways 46, in which is slidably mounted an inverted U-shaped member 47 the lower concaved portion of which engages the groove 45 of the controlling rod and prevents lateral movement thereof. The forked ends of the U-shaped member 47 extend downwardly to a point just above the two-part connector 31—32 which operates, without interference therewith, to oscillate the feeler 27, when the parts are in their normal position. As soon, however, as the detector 13 is moved downwardly into the path of the feeler 27, so that the oscillation of the feeler 27 is limited and said feeler is prevented from moving to the extreme of its movement, the joint in the two-part member 31—32 will be broken to cause these parts to assume the position shown in dotted lines in Fig. 3 thereby contacting with the lower extremity of the U-shaped member 47 and lifting it into the position shown in dotted lines in said figure. This limitation of the movement of the feeler 27 is effected by the lever 23 contacting with the drawing rolls 20 and preventing, by means of the projections 24, any further downward movement of the pivoted member 14 which carries the projecting lip 26. It is this lip 26 with which the feeler 27 contacts and which limits the movement thereof.

In order to accomplish the breaking of the joint in the connector 31—32 the member 31 is provided with a pin 48 which coöperates with the inclined face 49 of the member 32 when the movement of the rocker shaft 28 is restricted, this pin 48 co-acting with the inclined surface 49 to cause the joint to be broken and raised into the position shown in Fig. 3 as and for the purpose heretofore described.

Normally the inclined surface 49 is held in contact with the pin 48 and causes the connector 31—32 to remain in fixed relation to each other during the oscillation of the arm 30, the strain on said parts 31—32 being such as to retain them in this position until the movement of the feeler 27 is limited by its contact with the lip 26. This normal fixed relation of the parts 31—32 during the oscillation of the feeler 27 is provided for by the relative positions of the pivot 33 and the stop pin 48, the former being at a higher point than the latter, thereby insuring the contact between the inclined surface 49 and said stop pin as already described.

When the bifurcated or forked member 47 is lifted into the position shown in dotted lines in Fig. 3 it is withdrawn from contact with the controller rod 44 so that said rod may be moved longitudinally thereof to effect a stoppage of the machine. The mechanism for accomplishing this is shown in Fig. 1 in which 50 and 51 indicate a portion of the usual fast and loose pulleys while 52 is the usual belt fork or shipper depending from and secured to the shipper rod 53, mounted in suitable bearings in the end frame 54 of the machine and in a second bearing formed in a bracket 55 secured to the top of the frame or side rail 38. By means of a suitable handle 56, secured to said shipper rod 53, the latter can be moved, by hand, longitudinally to shift the belt from the fast to the loose pulleys when it is desired to stop the frame manually. The shipper rod 53 is provided with a collar or other annular enlargement 57 which is en-

gaged by a depending lug or arm 58 fast on the controller rod 44. This controller rod 44 is mounted to slide in a bearing 59 on the end frame and a stand 60 erected upon the top of the frame or rail 38 and between said stand 60 and a collar 61 secured to said controlling rod is a coiled spring 62 the tension of which moves the controlling rod to the left of Fig. 1 when the bifurcated member 47 is lifted to release it from engagement with the groove 45 in said controlling rod. This movement of the controlling rod 44 operates through the medium of the arm 58 and collar 57 to move the shipper rod 53 and stop the driving mechanism until the breaks have been mended, when the mechanism is again set in motion by the operator. By means of this mechanism, the movement of all the sets of slivers is stopped when a single is prevented in any particular set, thereby preventing the intact sets of slivers from gaining on the broken set and insuring a uniform product.

The slot or eye 21 on the breaking device 22 is of such a width as to permit perfect rovings to pass from between the drawing rolls through said slot but is sufficiently narrow to prevent knots and lumps from passing through. This is a very important feature of the invention as sometimes the roving passes from the drawing rolls knotted up with lumps therein which are liable to interfere seriously with the operation of the loom in which the product may be used and make imperfect cloth which has to be sold at a loss. By this device these objections are entirely obviated for as soon as a lump or knot in the roving reaches the breaker and is unable to pass through the slot or eye 21 the roving is broken by the knot or lump coming in contact with the rear face of the breaker and as soon as the roving is severed by this means the breaking device 22 will move upwardly into the position shown in full lines in Fig. 3, owing to the fact that the opposite end of the lever 23 is heavier than the end of said lever in front of the pivot 15. When in this position the rear edge of the lever 23 will be in the path of the feeler 27 and will limit its downward movement thereby causing the stopping mechanism to operate in the manner heretofore described. As soon as the frame is stopped in this manner the operator is obliged to reunite the severed slivers, first removing the objectionable knots or lumps therefrom before he starts the machine again.

It is believed that from the foregoing the operation of the invention will be thoroughly understood without any further description.

Claims.

1. In an apparatus of the class described, the combination with a pair of drawing rolls adapted to move a set of slivers, and mechanism adapted to stop said rolls, of a movable detector for each sliver, means for breaking all the slivers of the set at a point in advance of the drawing rolls, and mechanism between said breaking device and each detector whereby the accidental breakage of either sliver will effect the breakage of the other slivers at the point mentioned and operate said stopping mechanism.

2. In an apparatus of the class described, the combination with a pair of drawing rolls adapted to move a set of slivers, of a pair of pivoted members, a detector secured to the end of each of said members and engaging with a sliver, a pivoted lever intermediate said members provided with projections thereon in the path of said pivoted members, and a breaking device secured to the opposite end of said pivoted lever engaging the slivers when united and adapted to break the same when actuated by the operation of either of said pivoted members due to the breakage of a disunited sliver.

3. In an apparatus of the class described, the combination with a pair of drawing rolls adapted to move a set of slivers, of a pair of pivoted members, a detector secured to the end of each of said members and engaging with a sliver, a breaking device engaging with the united slivers in advance of the drawing rolls, and means between and parallel to said pivoted members provided with a projection in the path of movement of each pivoted member whereby the accidental breakage of one of said slivers will cause an operation of said breaking device through said pivoted member to sever said united slivers.

4. In an apparatus of the class described, the combination with a plurality of drawing rolls adapted to move and unite a set of slivers passing between the same, of a pair of pivoted members, a detector secured to one end of each of said members and engaging with each of said slivers upon one side of said drawing rolls, and a breaking device engaging with the united slivers on the other side of said drawing rolls, and means connected to said breaking device movable in a plane intermediate and parallel to the plane of movement of said pivoted members and provided with a projection in the path of movement of each pivoted member whereby the breaking device will be operated by either of said detectors when the sliver breaks with which said detector is engaging.

5. In an apparatus of the class described, the combination with a pair of drawing rolls adapted to move and unite a set of slivers, of a movable detector for each sliver, means for breaking all the slivers of the set at a point in advance of the drawing rolls, mechanism between said breaking device and each detector, a projecting member on each detector, and a normally oscillating feeler to engage and positively move a released detector for a limited distance to thereby positively move the breaking device to cause the united

slivers passing from the drawing roll to be severed.

6. In an apparatus of the class described, the combination with a pair of drawing rolls adapted to move and unite a set of slivers, of a device provided with a lateral projection from each side thereof and adapted to engage the united slivers passing from said drawing rolls and to be moved to break the same, and a detector engaging each of said slivers before passing between said drawing rolls adapted upon the breakage of one of said slivers to contact with one of said projections and operate said breaking device.

7. In an apparatus of the class described, the combination with a pair of drawing rolls adapted to move and unite a set of slivers, of a device engaging the united slivers passing from said drawing rolls and adapted to be moved to break the same, a detector engaging each of said slivers before passing between said drawing rolls, mechanism adapted upon the breakage of one of said slivers to operate said breaking device by the movement of said detector, and a positively driven oscillating feeler adapted to engage a released detector and thereby positively operate the breaking device.

8. In an apparatus of the class described, the combination with a pair of drawing rolls adapted to move and unite a set of slivers and stopping mechanism therefor, of a device engaging the united slivers passing from said drawing rolls and adapted to be moved to break the same, a detector engaging each of said slivers before passing between said drawing rolls adapted upon the breaking of one of said slivers to operate said breaking device, a positively driven oscillating feeler adapted to engage a released detector and thereby positively operate the breaking device, and means for limiting the movement of said feeler when in engagement with a detector and thereby operating the stopping mechanism.

9. In an apparatus of the class described, the combination with a pair of drawing rolls adapted to move a set of slivers, of a pivoted member provided at one end with a device adapted to sever a plurality of slivers and at the other end with a plurality of lateral projections, and a plurality of detector members each adapted to engage a projection and each provided with a slot for the passage of one of said slivers.

10. In an apparatus of the class described, the combination with a pair of drawing rolls adapted to move a set of slivers, of a pivoted member provided at one end with a device adapted to sever a plurality of slivers and at the other end with a plurality of lateral projections extending in opposite directions, a pair of detector members each adapted to engage a projection and each provided with a slot for the passage of one of said slivers.

11. In an apparatus of the class described, the combination with a pair of drawing rolls adapted to move a set of slivers, of a pair of pivoted members, a detector secured to the end of each of said members and engaging with a sliver, a pivoted lever intermediate said members provided with projections thereon in the path of said pivoted members, and a breaking device secured to the opposite end of said pivoted lever engaging all of the slivers and adapted to break the same when actuated by the operation of either of said pivoted members due to the breakage of any single sliver.

12. In an apparatus of the class described, the combination with a pair of drawing rolls adapted to move a set of slivers, of a pair of pivoted members, a detector secured to the end of each of said members and engaging a sliver, a pivoted lever intermediate said members provided with projections thereon in the path of said pivoted members, a breaking device secured to the opposite end of said pivoted lever engaging all of said slivers, an oscillating feeler, and a projection on each of said pivoted members adapted to be moved into the path of said feeler to stop its movement upon the breaking of either sliver.

13. In an apparatus of the class described, the combination with a pair of drawing rolls adapted to move a set of slivers, of a pair of pivoted members, a detector secured to the end of each of said members and engaging a sliver, a pivoted lever intermediate said members provided with projections thereon in the path of said pivoted members, a breaking device secured to the opposite end of said pivoted lever engaging all of said slivers, a positively oscillating feeler, and a projection on each of said pivoted members.

Signed by me at Boston, Massachusetts, this 6th day of April, 1906.

THOMAS BENTLEY.

Witnesses:
EDNA C. CLEVELAND,
WALTER E. LOMBARD.