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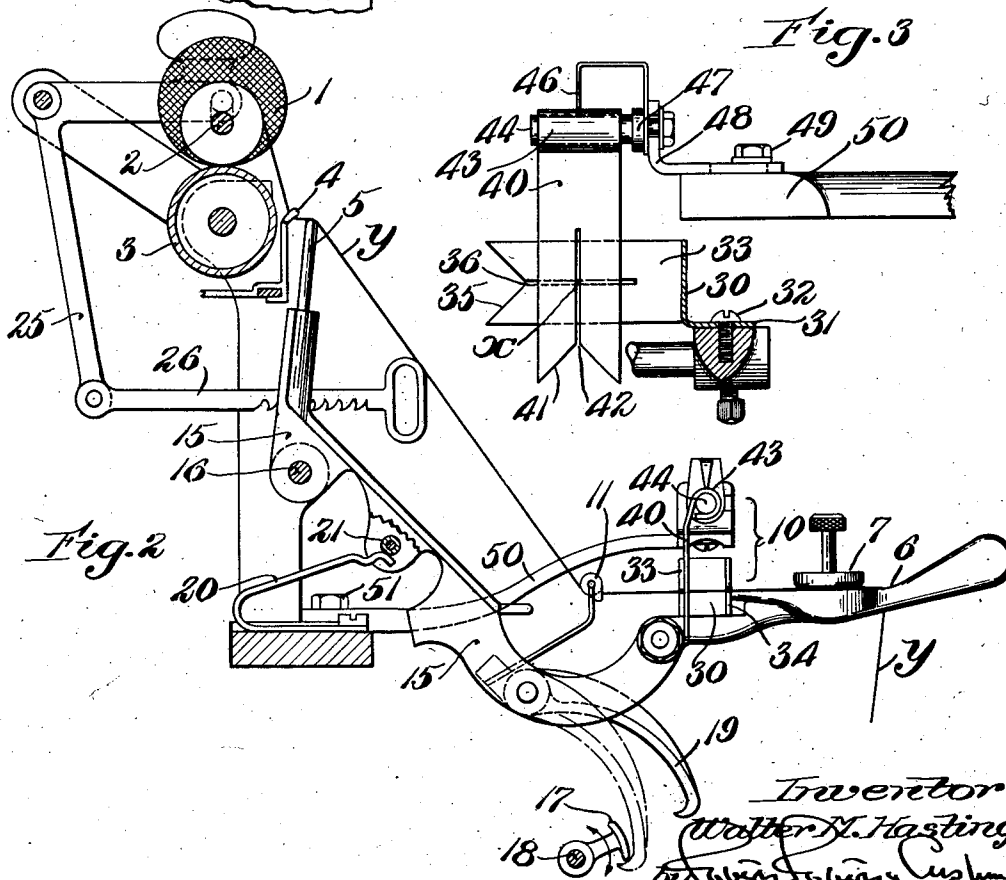
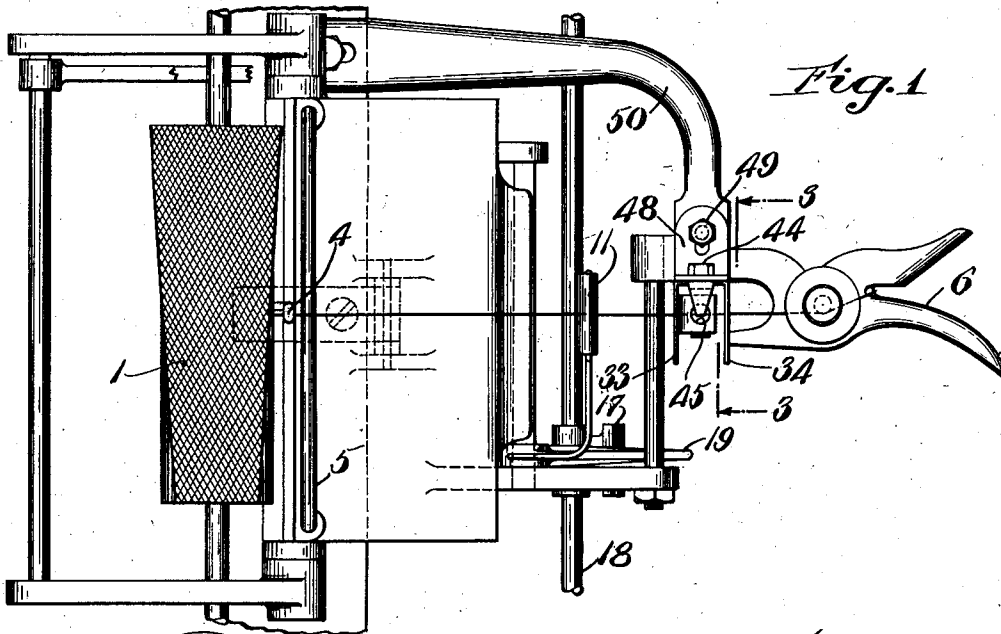
W. M. HASTINGS

1,570,248

CLEARER AND SLUB CATCHER FOR TEXTILE MACHINES

Filed Sept. 29, 1922

2 Sheets-Sheet 1



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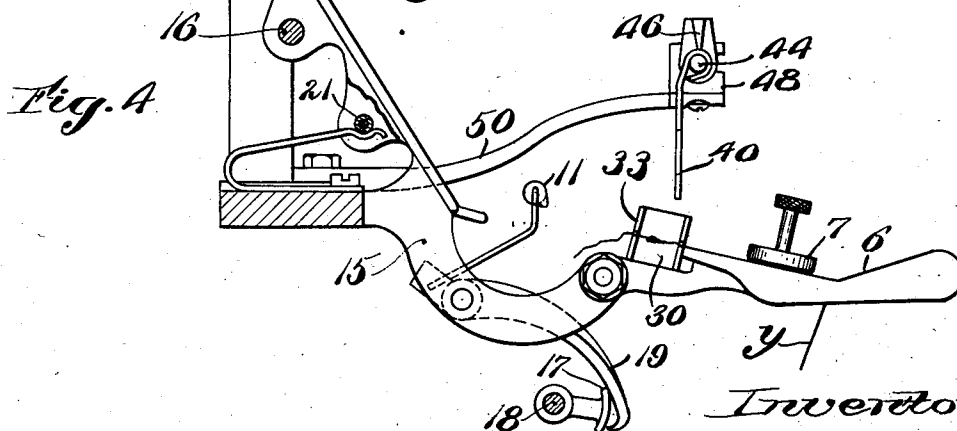
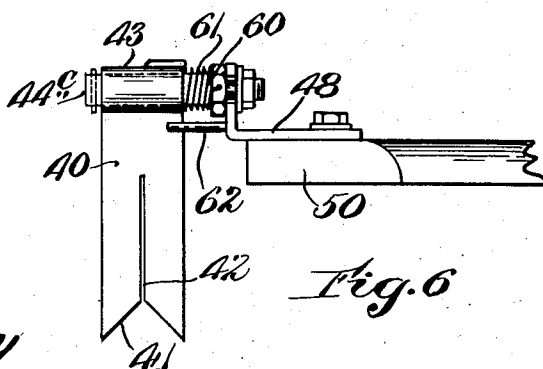
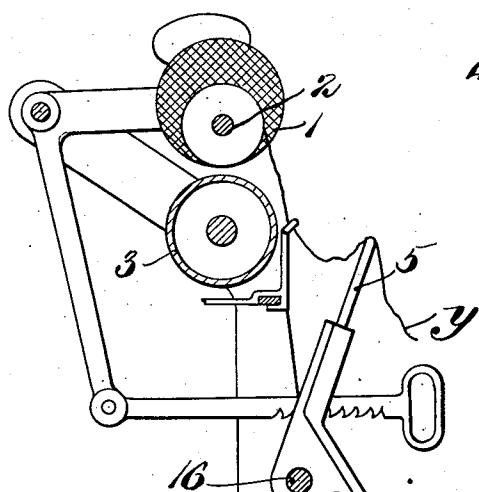
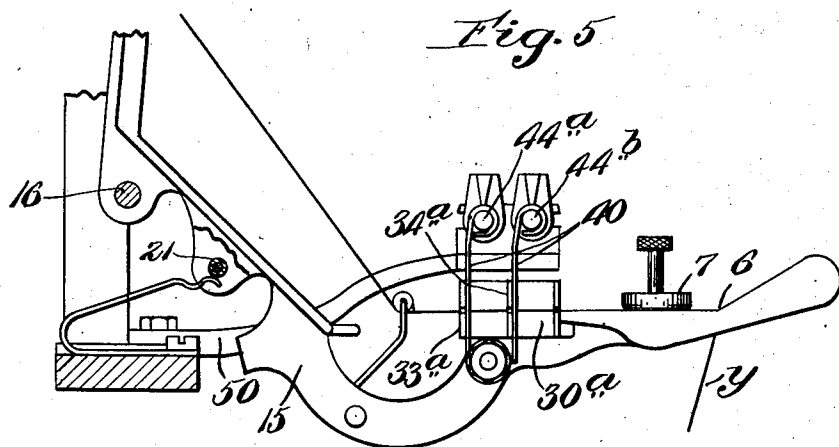
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CLEARER AND SLUB CATCHER FOR TEXTILE MACHINES

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

WALTER M. HASTINGS, OF METHUEN, MASSACHUSETTS.

CLEARER AND SLUB CATCHER FOR TEXTILE MACHINES.

Application filed September 29, 1922. Serial No. 591,301.

To all whom it may concern:

Be it known that I, WALTER M. HASTINGS, a citizen of the United States of America, and resident of Methuen, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Clearers and Slub Catchers for Textile Machines, of which the following is a specification.

This invention relates to yarn clearers, knot or slub detectors and to mechanism employing such devices for use in winding or other machines handling or employing textile or other yarns, cordage or other filaments and adapted to detain a knot, slub, or other obstruction on the running filament.

It is customary to use some form of yarn clearer (for example, in connection with winding machines adapted to wind from the primary packages, such as spinning bobbins, to secondary packages, such as spools, cops or cheeses) for the purpose either of scraping off and removing removable slubs, or of detaining more serious obstructions such as snarls and knots, in order to cause breakage of the yarn prior to embodiment of the defect in the winding package; or both for removing and for detaining. Usually such a slub or knot catcher or clearer is associated with some one of the types of devices employed for automatically stopping winding upon breakage or exhaustion of the yarn. So far as I am aware, none of the devices heretofore employed for this purpose is wholly successful in operation in the sense of certainly causing breakage when a slub knot, snarl or other obstruction (hereinafter referred to as a slub for convenience) passes through the device. Certain types of slub have the capacity to flatten to pass through narrow slits, or have too much hardness to be detained by the brushes or abrasive surfaces sometimes used; in many cases stress on the yarn following the detention of a slub by such a slub-catcher merely results in putting an extra strain on the yarn under which the slub is pulled through the catcher; the yarn does not break, and the defect is carried into the yarn package.

When it is recalled that the rewinding operation is primarily for the purpose of providing yarn or cordage free from obstructions which could cause damage in the weaving, knitting, sewing or other use for

which the cordage of the wound package is intended, it will be perceived that it is highly important to secure the certain operation of the slub catcher to detain the obstruction sufficiently to cause breakage. These conditions also attach to the use of yarn clearers, obstruction or slub catchers as an attachment for or part of the ultimate filament-using machine, such as a sewing machine, a loom, a knitting machine, a braiding machine or a form-winding machine.

A principle object of this invention is to provide an improved means for feeling the yarn or other filament for the purpose of detecting an enlarging obstruction, and adapted to then detain the obstruction, and to provide an improved instrument of this nature in combination with means for causing the stoppage of the yarn handling or yarn using textile machine upon the breakage caused by the detention of the obstruction; and to further provide a slub catcher adapted to be automatically reset after such breakage and stoppage and so constructed as to be rethreaded without skill, care or loss of time; and adapted automatically to receive the yarn or filament for rethreading in proper relation to its operative elements before the resumption of activity of the machine to which it is applied.

In order to explain the invention I have elected to show examples of my new devices illustrating my invention in connection with a winding machine of a well known type for winding traverse wound cops or cones and indicating the numerous applications of which the invention is capable and for which it is intended.

In the accompanying drawings:

Fig. 1 is a plan, and

Fig. 2 a side elevation partly in section of a yarn winding machine showing a preferred form of the device;

Fig. 3 is a detail section in elevation on the line 3—3 of Fig. 1;

Fig. 4 is a view similar to Fig. 2 showing the parts in the position assumed by them after winding has stopped, as the result of detection of a slub and breakage of the yarn;

Fig. 5 is a view similar to Fig. 2 illustrating a modified form of the device;

Fig. 6 is a view similar to Fig. 3 illustrating a further modification.

Referring now to Figs. 1 and 2, let 1 illustrate any situation or machine into which the yarn y is being delivered. As shown, this is a traverse wound cone or cop adapted to be rotated on its spindle 2 by engagement of its surface with a tractor roll 3, the yarn y being laid upon its surface and guided by a reciprocating traverse guide 4, to which the yarn passes over a relatively-fixed polished guide 5.

Between the guide 5 and the supply source of the yarn, the yarn passes successively through a front guide 6, through a tension device 7, through the slub catcher illustrated generally at 10, and through a breakage or exhaustion detector guide 11, adapted upon breakage or exhaustion to cause suspension of rotation of the package 1 until the winding devices are reset.

In the particular type of winding machine shown by way of explanation, the guides 5, 6, a part of the device 10 and the device 11 are all carried by a swinging frame 15 central at 16 and adapted to be thrown downwardly to the position illustrated in Fig. 4, positively, by the action of a striker bar 17 rocking with a constantly oscillated rock shaft 18 and adapted to engage the knock-off hook 19, whenever the detector 11 fails to be supported by the tension of the run of yarn y engaging it. In the knocked-off position these stop motion devices are held in their inoperative position by a spring 20 engaging a roll 21 on the fallen frame 15.

In order to make this motion effective to cease winding on the package 1, the spindle 2 is carried by a bell crank 25 connected by the notched bar 26 to a web of the frame 15, so that the spindle 2 is elevated to lift the package 1 away from the roll 3 whenever the yarn breaks.

Heretofore it has been customary to mount the slub or knot catching device or yarn clearer, if any is used, on the frame 15.

So far as I am aware such devices have heretofore consisted of blades, pieces of card-clothing, abrasive surfaces, or the like having closely approaching surfaces through which the yarn y runs, and between which the slub is supposed to be detained. According to the present invention the yoke 15 carries one member 30 of a slub catcher which may, as shown, be formed as a rectangle open in the direction toward the observer in Fig. 2 or to the left in Fig. 3, having a slot 31 for the attachment screw 32, and having in the ends of the vertically standing horizontally projecting blades 33, 34, flaring openings 35 leading to slots 36 dividing the blades 33, 34 into two tines, the slot 36 being of a suitable width barely to pass a yarn of the diameter being wound. A fixed slub catcher consisting only of the two-tined blades 33, 34, while effective on

a certain class of knots and large slubs, is not fully operative to detain a large class of obstructions desirable to remove from the yarn.

To render the instrument fully effective, and to secure certainly detaining any kind of obstruction increasing the diameter of the yarn unduly, this invention provides means establishing a slot in an opposite sense to the slot 36, and adapted to form with the slot 36 a rectangular opening through which the running yarn passes, and which will certainly detain all of the slubs, knots and obstructions.

In a preferred form best shown in Figs. 1, 2 and 3, a blade 40 having a flaring opening 41 leading to a slot 42 is turned into a loop to form a free bearing at 43 for a stud 44, and a part of the loop 43 is cut away at 45 to give limited freedom of motion of the blade 40 on the stud 44 in respect to a spring finger 46, preferably held between a shoulder 47 on the stud 44 and a slotted bracket 48 adjustably clamped by screw 49 to a fixed bracket arm 50 attached to the machine frame at 51. The effect of these dispositions is to support the blade 40 about its fixed pivot 44, with freedom to swing into contact with the front face of the blade 33, so that the crossed slots 42 and 36 in these respective blades then define between them a rectangular opening x , Fig. 3, for the yarn y . That is to say, this happens when any force such as the drag of the yarn in contact with the blade 40 swings it to the rear into this position, as shown in Fig. 2.

It has been found by experience that merely passing the yarn between a blade in the position of the blade 40 and a blade in the position of the blade 33, but rigidly held separated, will pass many of the most undesirable slubs, including those comprised of a loose unspun mass of fiber held between the opened component fibres or spun members of the yarn or cord. This class of slub particularly is easily moulded by the slots of catcher or clearer blades into a thin mass capable of passing through the slot, and capable of changing its position to pass through successive slots 90° apart, when the blades in which the slots are formed are not in contact.

It is useful to have the cooperating blades 40 and 33 on separable members. By this arrangement, referring to Fig. 4, a slub having been caught by the slub catcher, the yarn having been broken, and the detector 11 having functioned to drop the yoke 15, the element 30 of the slub catcher has been removed from the element 48, 40, and the operator can rethread after having pieced up the yarn merely by entering the yarn in the slot 36 of the member 30. Lifting the yoke 15 to start winding and reset the stop motion then causes the yarn in the

slots 36 automatically to enter the flared portion 41 and the slot 42 of the blade 40, which is entered between the blades 33 and 34 by the same motion by which the machine is restored to operation.

Referring now to Fig. 5, if desirable the member 30 may be replaced by the member 30^a having active blades 33^a and 34^a positioned to cooperate respectively with two depending blades 40, hung as before on studs 44^a and 44^b and a fixed bracket 50. Any further duplication of the useful structure formed by the blade 33 and the depending blade 40 may be used.

It will of course be understood that the parts may be widely varied in construction. For example, as shown in Fig. 6 the stud 44^c for supporting the depending blade 40 may be provided with an adjustable nut 60 having a hole for one end of a spring 61 taking at the other end into a hole in the bearing portion 43 of the blade, and adapted to force the blade 40 forwardly against the stop pin 62 in the bracket 48 with a force adjustably set to yield when an obstruction to be scraped off or detained encounters the blade 40.

By reducing the weight of the depending blade 40, or the tension of spring 61 when such a spring is employed, or both, to reduce the impedance against which the pendulous blade 40 moves, the sensitiveness of the device to imperfections is increased, so that without altering the size of the slots in the blades, the device may be made to remove the obstructions from or to detain and break filaments having any degree of enlarging imperfection, within limits, merely by altering the weight, spring tension or other impedance to motion with the filament of the pendulous blade or blades 40. When the blade 40 is comparatively difficult to move into contact with the blade 33, larger obstructions will pass than when the blade 40 is light and free to swing into contact reducing the filament opening to the described rectangle x .

I claim:

1. A filament clearer and slub catcher having blades with slots therein, and means supporting the blades normally out of contact with each other and with the slots in crossing relation, the blades being adapted to contact with each other.

2. A filament clearer and slub catcher having blades with slots therein, and means supporting the blades with the slots in crossing relation, one of the blades having freedom of motion toward the other, the blades being adapted to contact with each other, in combination with means for guiding a filament to move in the direction of its length and of the freedom of motion of said blade in the space defined by the crossing slots.

3. A clearer and slub catcher having thin flat blades penetrated by slots for the yarn or filament to be cleared or detained at the blades in case of an enlargement or slub, in combination with means for supporting one of the blades with freedom of motion in the direction of travel of the yarn or filament to contact with the other blade, the slots defining a more restricted passage for the yarn when the blades are in contact than when the blades are separated.

4. A filament clearer and slub catcher having a plurality of parts together establishing a passage for the filament, in combination with a fixed support for one of the said parts, means for normally moving the filament in the direction of its length past said parts, and means actuated on breakage or exhaustion of the filament for stopping the motion of the filament and comprising a frame adapted to be moved away from said fixed support, one of the cooperating parts of the clearer and slub catcher device being mounted on said frame to move therewith out of cooperative relation.

5. A yarn clearer and slub catcher for textile machines having a plurality of cooperating slotted blades together establishing a passage for the yarn adapted to obstruct a slub firmly attached to the yarn, in combination with means causing the yarn to run past said blades adapted to break the yarn when detained by the blades, a detector operating on breakage of the yarn, means for supporting one of said blades at a fixed point, and means adapted to be moved away from said point upon operation of the detector, another of said blades being mounted on said movable means.

6. A yarn clearer and slub catcher for textile machines having therein a plurality of cooperating blades having opened slots therein and together establishing a passage for the yarn adapted to obstruct a slub, one of said blades being pendant from a support therefor, and another of said blades extending laterally in respect to an independent support therefor, in combination with means adapted to detect breakage of the yarn, and means operating on the detection of breakage for moving one of said supports and the blade carried thereby away from the other of said supports and blades.

7. A yarn clearer and slub catcher for textile machines having therein a plurality of cooperating blades having open-ended slots therein and together establishing a passage for the yarn adapted to obstruct a slub, one of said blades being pendant from a support therefor, and another of said blades extending laterally in respect to an independent support therefor, in combination with means adapted to detect breakage of the yarn, and means operating on the detection of breakage for moving one of said

supports and the blades carried thereby away from the other of said supports and blades, the direction of said motion being such as to free a yarn engaged in the slots of said blades from the slot of one of them.

8. A yarn clearer and slub catcher for textile machines having therein a plurality of cooperating blades having open-ended slots therein and together establishing a passage for the yarn adapted to obstruct a slub, one of said blades being pendant from a support therefor, and another of said blades extending laterally in respect to an independent support therefor, in combination with means permitting one of said supports to move away from and toward the other support in the direction defined by the slot in the blade on said other support.

9. In a yarn clearer and knot catcher device for textile machines, the combination of blades having clearing slots for the yarn, the blades being independently mounted with their slots in crossing relation on supports, one of which supports is movable to thread a yarn already in the slot in the blade on said movable support into the slot in the blade on the other of said supports.

10. In a yarn clearer and knot catcher device for textile machines, the combination of blades having clearing slots for the yarn, the blades being independently mounted with their slots in crossing relation on supports, one of which supports is movable to thread a yarn already in the slot in the blade on said support into the slot in the blade on the other of said supports, and one

of said blades having freedom of motion toward the other to permit contact of the blades when the supports are in normal position.

11. In a yarn clearer and knot catcher device for textile machines, the combination of blades having clearing slots for the yarn, the blades being independently mounted with their slots in crossing relation on supports, one of said blades having a flared slot and being pivoted on its support, in combination with means for moving the other support and its blade away from said pivoted blade when the yarn breaks, said means permitting returning said other support after piecing the yarn and rethreading the blade carried by said movable support, whereby to cause the yarn to enter the slot in said pivoted blade.

12. In a yarn clearer and knot catcher device for textile machines, a pivoted depending blade having a yarn slot open at its lower end, with a movable support and a blade having a yarn slot therein laterally positioned in respect to said movable support, and adapted to be brought thereby into crossing relation with the slot in the pivoted blade, in combination with means for permitting limited motion of said pivoted blade into contact with said blade having the lateral slot during operation.

Signed by me at Lawrence, Massachusetts, this twenty-sixth day of September, 1922.

WALTER M. HASTINGS.