

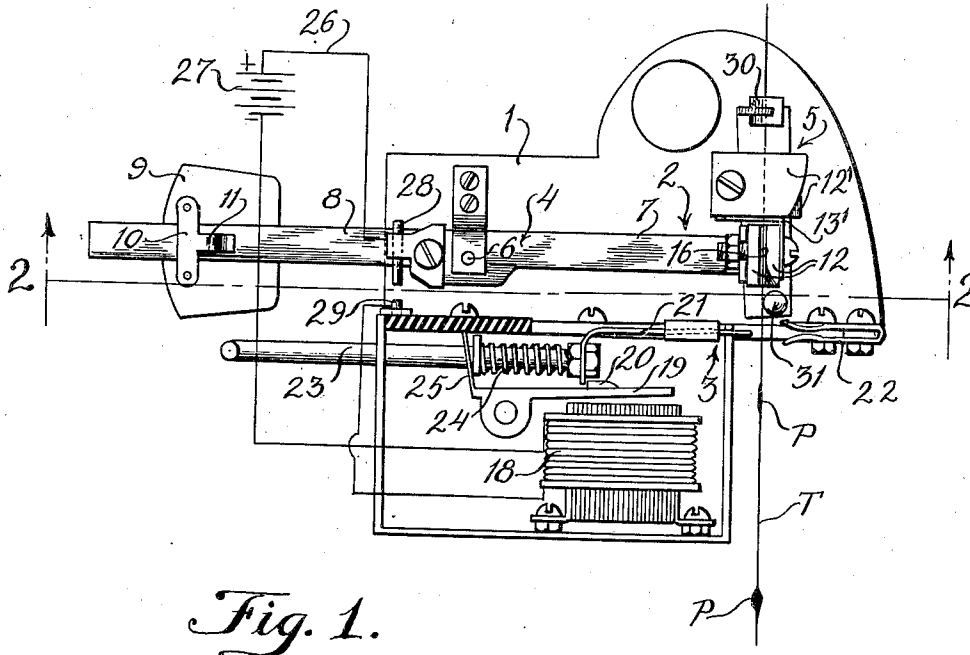
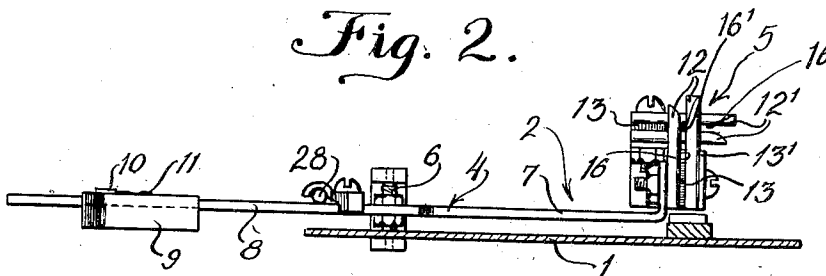
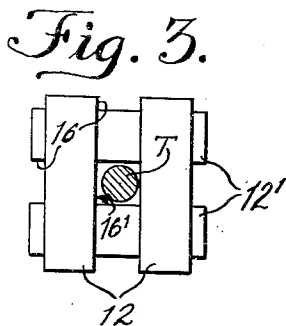
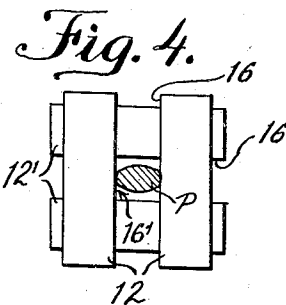
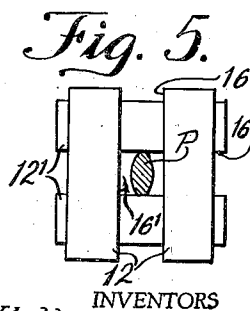
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2,137,613

DEVICE FOR CLEANING STRAND MATERIAL

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2,137,613

DEVICE FOR CLEANING STRAND MATERIAL

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1 Claim. (Cl. 28—64)

This invention relates to a thread cleaner whereby undesirable thick portions in any strand material, such as threads of silk, cotton, rayon, wool, etc., can be removed.

More particularly, the present invention pertains to an improvement upon the device disclosed in our previous Patent No. 2,036,806, dated April 7, 1936.

As stated in our patent aforesaid, the invention in general contemplates a thread cleaning device having a gauge adapted for frictional engagement with imperfections in the thread and associated with an overbalanced arm whereby the movement of the gauge is controlled according to the degree of frictional engagement between the imperfections in the thread and the gauge; the control movement of the gauge being utilized to actuate the device.

It is the primary purpose of this particular invention to improve the construction of the gauge for assuring the proper operation of the device whenever undesirable imperfections, such as objectionable irregularities or unevennesses, occur in the length of the thread.

The invention further proposes to provide a device of the character mentioned having a gauge wherein are formed pairs of thread measuring slots disposed at substantially right angles with respect to one another, whereby the thread will travel between pairs of diametrically opposed walls so that any imperfection appearing at any point about the circumference of the thread will be bound to frictionally contact the gauge and positively assure its operation.

It is also an important object of the invention to provide a gauge for a thread cleaning device, said gauge being constructed to embody two measuring slots arranged in planes relatively disposed at an angle of approximately ninety degrees, using the thread as an axis, said gauge being further mounted to allow its movement in the direction of the thread travel, which movement is utilized to cause the actuation of a suitable mechanism intended to stop the thread for the purpose of inspection or removal of enlarged portions therefrom.

The invention is also characterized by the provision of a thread measuring gauge capable of measuring the thread on a plurality of diametrically opposite points, said gauge consisting of pairs of spaced blocks or plates, each pair being associated to constitute a multi-sided orifice through which the thread may pass, and the blocks or plates of each pair being sufficiently spaced to allow the free passage of ordinary non-

detrimental end knots but to intercept undesirable thicknesses along the continuous surface of the thread.

Other important objects and advantages of the invention will be in part obvious and in part pointed out hereinafter.

In order that the invention and its mode of operation may be readily understood by those persons skilled in the art, we have, in the accompanying drawing and in the detailed description based thereupon, set out a possible embodiment of the invention. In this drawing:—

Figure 1 is a side elevation of our improved thread cleaner.

Figure 2 is a section taken on line 2—2 of Figure 1 looking in the direction of the arrows.

Figure 3 is an enlarged diagrammatic representation of our improved gauge and illustrating a normal portion of the thread in engagement therewith.

Figure 4 is a view similar to Figure 3 illustrating a thread portion enlarged in one lateral direction and in frictional engagement with the corresponding measuring sides of the gauge.

Figure 5 is a view similar to Figures 3 and 4, illustrating a thread portion enlarged in another lateral direction and in frictional engagement with the corresponding measuring sides of the gauge.

Having more particular reference to the drawing, wherein like characters of reference will designate corresponding parts throughout, and as shown in our Patent No. 2,036,806, a support 1 is adapted to be attached to any suitable type of machine for the cleaning of strand material, such as threads or yarns of silk, cotton, rayon, wool, etc., but preferably attached to spooling, skeining, or other thread or yarn packaging machines where the adaptation of the present invention is particularly important for the removal of the thickened portions of threads or yarns being wound.

Mounted upon the support 1 are a control device and a thread stopping device respectively designated in their entirety for convenience herein by the reference characters 2 and 3.

The control device 2 preferably comprises an overbalancing control lever 4 and a thread measuring gauge 5. As shown, the lever 4 is pivoted at its intermediate portion to the support 1 by means of a pin 6 to provide a long arm 7 and a short arm 8, the gauge 5 being removably attached to the long arm 7 while upon the short arm 8 is adjustably mounted a balance weight 9 whereby the degree of overbalancing of the lever and the gauge 5 may be manually adjusted.

A clip 10 is secured to the weight 9 and is provided with a leaf-spring 11 yieldably engaging the lever for frictionally holding the weight in adjusted position.

- 5 The gauge 5 consists of pairs of companion blocks or plates 12 and 12' respectively. As will clearly appear from the drawing, the pairs of blocks or plates are interconnected by means of a suitable bracket 13' and are disposed in substantially right angular relation to provide a multi-sided orifice 16' through which the thread T may pass freely.

- In order that the non-detrimental projections from the thread, such as ordinary single end knots, may pass through the gauge 5 without disturbing the same, the adjacent edges of the associated blocks or plates 12 and 12' are spaced by means of the bracket 13', which for that purpose is suitably formed to provide a separation of approximately $\frac{1}{16}$ ". The separation between the pairs of blocks or plates 12 and 12' produces a slot of adjusted predetermined width which, while allowing the free passage of such necessary imperfections as single end knots will not permit the passage of detrimental thickened portions of the thread. Likewise, the blocks or plates 12 and 12' of each pair are adjustably spaced by means of suitable spacers 13, so that the associated gauge plates may be supported in proper position, to accurately measure the thickness of the thread as it passes through the gauge.

- From the foregoing, it will be understood that a thread of normal size may readily pass between the gauge plates 12 and 12' but when any thickened portions thereof attempt to pass between the gauge surfaces, there will be created a degree of friction great enough to move the gauge upwardly provided the weight 9 has been properly adjusted. This movement of the gauge and lever is relied upon to operate the thread stopping device 3 in the manner hereinafter described for interrupting the travel of the thread so that the irregularity may be inspected and removed if necessary.

- For this purpose, the thread stopping device 3, according to the illustrated showing made herein, consists of an electro-magnet 18 adapted upon energization, to retract a pivoted trigger 19 provided with a catch 20 for removably engaging a movable plate 21 devised for coaction with a spring clip 22. The movable plate 21 is attached to a resetting device illustrated as a rod 23 slidably mounted on the support 1. This rod has mounted thereon a coil spring 24, one end of which engages the blade 21 and the other end presses upon a finger 25 extending from the trigger whereby the coil spring 24 may be utilized to force the blade 21, when released from the trigger, into engagement with the clip 22 and, further, force the trigger 19 towards locking position with the blade 21 when the same has been retracted by the resetting rod 23.

- The electro-magnet 18 is arranged in a circuit 26 including a source of current 27, a movable contact 28, and a stationary contact 29, the former being connected to the lever 4 and the latter mounted upon the support 1. These contacts are adapted to engage each other when the lever has been operated by an imperfection in the thread passing into engagement with the gauge 5. An upper guide 30 and a lower guide 31 are arranged to properly feed the thread T past the blade 21 and associated clip 22 and through the gauge 5.

- In the normal position of the various parts of

the thread cleaner, the gauge 5 is in its lowermost position with the weight 9 in its uppermost position due to the overbalancing of the lever 4, thereby separating the contacts 28 and 29 for de-energizing the electro-magnet. Due to the fact that the electro-magnet is not energized, the trigger 19 is arranged in latching position with the blade 21 for holding the same out of engagement with the clip 22. The parts continue to occupy such a relation as long as the thread passing through the gauge is free of thickened portions, as diametrically shown in Figure 3, but as soon as a thickened portion passes into engagement with the gauge 5, as represented in Figures 4 and 5, they overbalance with each other for closing the circuit of the magnet 18 and thereby energizing the same.

Upon energization of the magnet 18, the trigger 19 is retracted thereby releasing the blade 21 which, through the action of the spring 24 moves into engagement with the thread and then into engagement with the clip 22 for stopping the thread. The operator may then proceed to inspect the thread and remove the imperfection if found necessary, and again start the movement of the thread through the cleaner.

The adjustment of the weight along the short arm 8 of the lever 4 will determine those degrees of frictional engagement between thickened portions of the thread and the gauge which will be required to operate the lever and set the cleaner into operation for the stoppage of the thread. By adjusting the weight upon the lever, that degree of friction between the thread and the gauge necessary to move the latter may be accurately regulated, that is, by moving the weight outwardly of the arm in a direction away from the pivoted point, a lesser degree of friction will be necessary to move the gauge and, upon movement of the weight in the opposite direction, a greater degree of friction will be necessary to cause the movement of the gauge.

Because of the provision of the pairs of thread measuring slots 16 relatively disposed at substantially right angles, it will be appreciated that the thread travels between pairs of diametrically opposed walls defining a multi-sided orifice, with the result that any imperfections of unusual nature, such as undesirable thickened portions P, projecting from any point of the circumference of the thread will frictionally engage said walls and cause the gauge 5, together with the contact carrying lever 4, to move to that position which will energize the electro-magnet 18 to release the blade 21 for forcing the thread into binding engagement with the clip 22 and thus arrest the travel of said thread for the purpose hereinbefore stated.

Manifestly, the construction shown and described is capable of several modifications and those modifications which come within the scope of the sub-joined claim are to be considered within the spirit of the invention.

What we claim is:

In a device for cleaning a travelling thread, the combination with a thread engaging and stopping mechanism, of a thread measuring gauge comprising: a balancing member pivotally mounted for movement with and in the travelling direction of the thread; a first pair of plates secured to said member in parallel facing relation, the facing surfaces of said first pair of plates being spaced for the free passage of a normal portion of the thread, but adapted to be frictionally engaged by a thickened portion ab-

normally projecting from the two diametrically
opposed sides of the thread adjacent thereto,
thereby moving said member; a bracket con-
nected to said member; a second pair of plates
5 mounted on said bracket in parallel facing rela-
tion and so carried thereby that the edges of
said second pair of plates are disposed at right
angles to the edges of said first pair of plates and
spaced therefrom, the facing surfaces of said
10 second pair of plates being spaced for the free

passage of a normal portion of the thread but
adapted to be frictionally engaged by a thick-
ened portion abnormally projecting from the two
remaining diametrically opposed sides of the
thread whereby to move the member; and means 5
controlled by the movement of said member for
actuating said thread engaging and stopping
means.

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