Dec. 11, 1962 L. HAMMINK 3,067,481

FLAW DETECTING AND THREAD TENSIONING DEVICE

Filed Jan. 28, 1959

Fig. 1

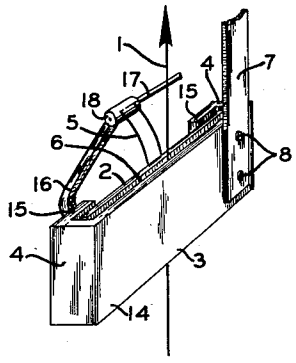


Fig. 2

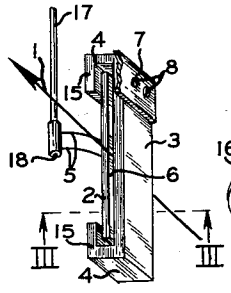


Fig. 3

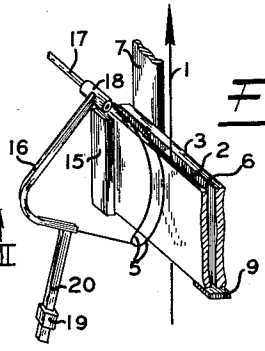


Fig. 4

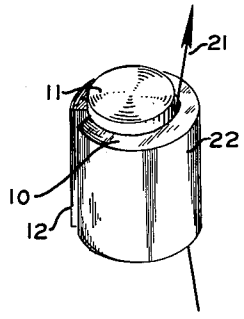
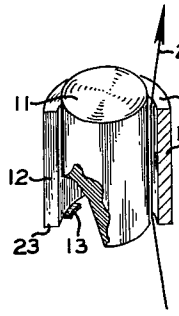


Fig. 5



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FLAW DETECTING AND THREAD TENSIONING DEVICE

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Claims priority, application Netherlands Feb. 4, 1958
3 Claims. (Cl. 28—64)

This invention relates to a flaw detecting device for preventing the occurrence of defects in textile thread or cord packages. More particularly, it relates to a novel slub detector and thread tensioning device for use in conventional forms of thread manipulating mechanisms to expose the presence of knots, broken filaments, slubs and other common defects in textile thread, yarn or cord, to enable the removal of such defects therefrom, and to apply tension, if desired, to such textile thread, yarn or cord.

In the present specification and claims the term "thread" is used in a general sense to indicate any attenuated textile material whether natural or synthetic. In addition, the textile material may be obtained as a continuous filament or spun yarn.

One object of this invention is to provide a simple and inexpensive device which will prevent the passage therethrough of any of the imperfections frequently encountered in the manufacture and manipulation of threads and which will apply tension to these threads.

It is another object of this invention to provide a slub detector and thread tensioning device which is simple to operate and easy to thread.

It is a further object of this invention to provide a device which upon the detection of a slub or similar imperfections will discontinue the passage of thread therethrough and thereby permit easy removal of the imperfection.

These and other objects of this invention will become apparent from a reading of the detailed description of this invention.

Numerous types of slub detectors have been previously used in the textile art to detect and remove slubs or other imperfections from the thread. One such device is that described in Swiss Patent No. 316,071 in which two parallel plate-shaped bodies form a slit through which the thread passes. These bodies are rigidly mounted relative to each other and it is only by way of precision adjustments in the device that the width of the slit may be varied.

No provision in this device is made for tensioning the thread simultaneously with the detection of slubs. In addition, where the bodies are rigidly mounted the vibrations of the machine on which the device is mounted will result in changes in the width of the slit thereby permitting slubs to work through the device.

No such difficulties are experienced in the device of this invention. It has been found that such may be overcome by providing a device which consists of a holder, a freely movable insert within said holder, and means for urging said insert into contact with said holder. The insert and holder form a slit through which the thread passes. Thus the device serves as a tensioning device because the insert is urged toward the holder. The tension may be adjusted by varying the force applied by the urging means. In addition, slubs cannot work through this slit thereby permitting their easy removal.

This invention will be better understood by a reading of the following detailed description in conjunction with the drawings in which:

FIGURE 1 illustrates in perspective view the preferred embodiment of this invention;

FIGURE 2 is a perspective view of the device of FIGURE 1;

FIGURE 3 is a sectional view of the same device along lines III—III in FIGURE 2;

FIGURE 4 illustrates in perspective view another embodiment of the device of this invention; and

FIGURE 5 is a partially cut away view of the device of FIGURE 4.

Referring now to FIGURE 1, reference numeral **1** denotes a moving thread, which thread moves from below the device of this invention to above it. In customary operation, the device of this invention would be placed between the thread package and cone winding point of a cone winding mechanism.

Holder **14** is composed of an elongated base **3** having attached thereto at each end flanges **4**. Attached to the end of each flange **4** are lips **15**. The attachment of lips **15** and flanges **4**, and flanges **4** and base **3** may be by welding or other means, or the entire holder **14** may be molded or cast of suitable material, usually metal. An elongated insert **2** is placed within holder **14** in sliding relationship thereto. The construction of holder **14** is such that insert **2** may move freely between base **3** and lips **15** and move upward in the direction of travel of thread **1**.

Flanges **4** are of sufficient length to receive insert **2** between base **3** and lips **15** and leave sufficient space to form a slit **6** through which thread **1** travels. Slit **6** is of sufficient size to permit the passage of thread **1** but prevent passage of slubs therethrough when pressure is applied to insert **2**. The size of slit **6** may be varied to accommodate threads of different diameters by varying the pressure on insert **2** or by varying the thickness of insert **2**.

Pressure member **18** is utilized to urge insert **2** toward base **3**, thereby permitting it to grip and tension thread **1** moving therebetween. Member **18** is composed of a pressure arm **16**, tensioning bracket **5** formed from wire, rotatable rod **17**, and movable weight **19**. Arm **16** is rigidly connected to rod **17** and tensioning bracket **5** in such a fashion that bracket **5** presses against insert **2**, thereby urging it toward base **3**. Weight **19** may be moved along the lower end **20** of arm **16**, thereby permitting adjustments in the force exerted by bracket **5** against insert **2**. Rod **17** is rotatable about an axis (not shown) attached to the thread manipulating machine (also not shown).

To insure that slubs or other similar imperfections are removed upon their occurrence, it is desirable to stop the movement of thread through the device. This is accomplished by connecting holder **14** to a conventional stop mechanism (not shown) by way of link **7** and screws **8**. The connection between holder **14** and the stop mechanism is such that holder **14** is freely movable.

In operation, thread **1** is passed through slit **6** where tension is applied by the force exerted against insert **2** by pressure member **18**. The amount of force is determined by the amount of tension desired. Should a slub occur it will be stopped by the restrictive action of slit **6**, thereby causing holder **14** to move upward which upward movement is transmitted to the stop mechanism by link **7** thereby stopping the passage of thread.

To prevent insert **2** from passing through holder **14**, plates **9** are provided at both ends of the underside of base **3**.

Referring now to FIGURES 4 and 5, which illustrate another embodiment of this invention, reference numeral **21** denotes a moving thread moving from below the

device of this invention to above it. This device in normal operation is placed along the thread path between the thread package and winding point of a cone winding mechanism.

Holder **10** is a cylindrical piece of material attached to a conventional stop mechanism (not shown). Part of the cylindrical wall **22** of holder **10** is removed in axial direction to form a slit **12** to permit free insertion of thread **21**. A cylindrical insert **11** is placed within holder **10**. Insert **11** may be varied in size to permit use of different size threads in this device. A plate **13** is provided on the lower end **23** of holder **10** to prevent the downward movement of insert **11**.

Pressure means (not shown) are provided to exert force against insert **11** thereby urging it toward holder **10** at the point where thread **21** is passing through the holder. The pressure means are brought into contact with insert **11** by way of slit **12**. Thread **21** is kept in place in holder **10** by mounting holder **10** somewhat out of line with the free path of thread **21**.

Operation of this device would be carried out as is the operation of the preferred embodiment.

Pressure may be exerted against the inserts of this device by additional means, such as springs, magnetic forces, or the force of gravity on the insert when the holder is inclined under the insert. Also, the pressure member **18** as illustrated by the foregoing description may be varied. All that is necessary is that it be subject to adjustment of the amount of pressure exerted by it.

The width of the slit **6** or the space between holder **10** and insert **11** may be varied by varying the thickness of inserts **2** and **11**, or by placing set screws in lips **15** and holder **10**, thereby limiting the movement of the inserts.

This invention has been described as being utilized with a cone winding mechanism wherein single threads are passed through the device. It is also possible to use this with other thread manipulating mechanisms. One possible use is on a warping frame which would only necessitate a much larger holder and insert to permit passage of a web of threads rather than the single one as illustrated.

Thus it has been shown that this device, even though simple in operation and construction, will perform two vital operations in thread manipulations, namely, slub detection and thread tensioning.

While this invention has been described in a certain degree of particularity, it is to be understood that considerable variations from the details disclosed herein may be made without departing from the spirit and scope of this invention. Accordingly, this invention is to be limited only by the following claims.

What is claimed is:

1. A slub detector and thread tensioning device comprising an elongated holder, an elongated insert slidably mounted within said holder, said holder comprising an elongated base, flanges attached at both ends of said base and lips extending from said flanges, said holder being adapted to receive in sliding relationship thereto said insert, and means for urging said insert into contact with the elongated base of said holder, said insert and said holder having substantially conforming faces.

2. A slub detector and thread tensioning device comprising an elongated holder, an elongated insert movably mounted within said holder, said holder comprising an elongated base, flanges attached at both ends of said base and lips extending from said flanges, said holder permitting to free movement of said insert between said base and lips and in the direction of thread movement, and pressure means for urging said insert into contact with said base, said insert and said base of said holder having substantially conforming faces.

3. A slub detector and thread tensioning device comprising an elongated holder, an elongated insert slidably mounted within said holder, said holder comprising an elongated base, flanges attached at both ends of said base and lips extending from said flanges, said holder being adapted to receive in sliding relationship thereto said insert, and means for urging said insert into contact with the elongated base of said holder, said insert and said base of said holder having substantially conforming faces, said means comprising a pressure arm rotatable about an axis and an adjustable weight positioned on said pressure arm.

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CERTIFICATE OF CORRECTION

Patent No. 3,067,481 December 11, 1962

Lucas Hammink

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 18, strike out "to".

Signed and sealed this 21st day of May 1963.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents