Dec. 15, 1936. H. E. SMYTH 2,064,697

THREAD STOP MOTION

Filed Dec. 24, 1935

Fig. 4.

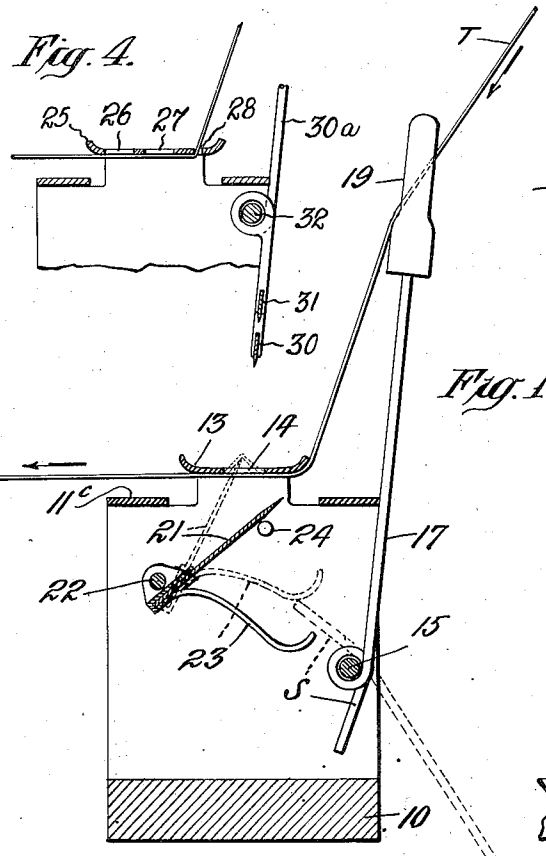


Fig. 1.

Fig. 2.

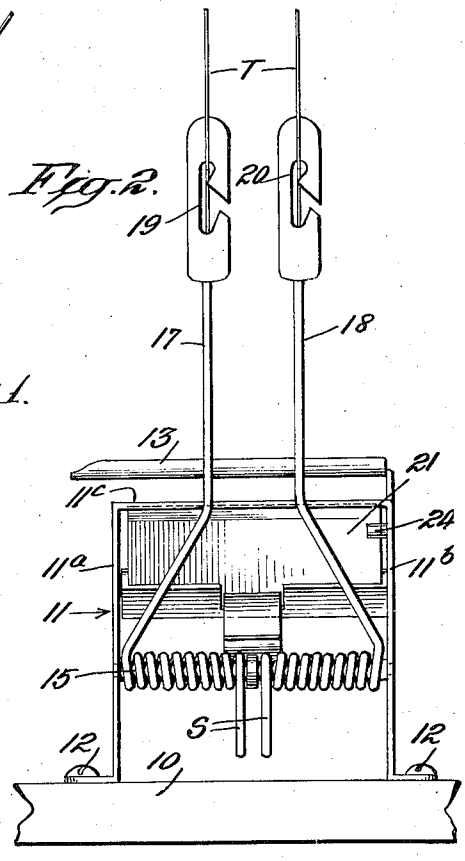
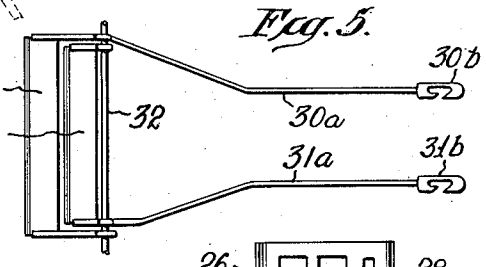


Fig. 5.



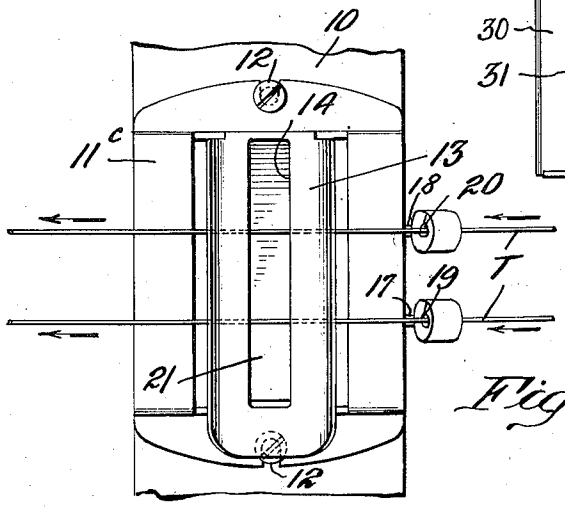
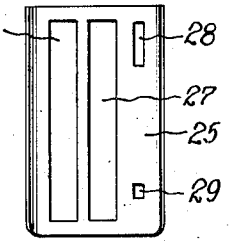


Fig. 3.

Fig. 6.



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THREAD STOP-MOTION

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13 Claims. (Cl. 117—32)

The invention relates to a thread-cutting device for preventing the remainder of two or more threads from continuing to run after one of their number has been broken. The invention is described herein in connection with two embodiments of the invention employing two threads.

The term "thread" is used herein in a very broad sense to include any single or multiple strand, fiber or yarn.

The invention is particularly applicable when two or more threads are being twisted together. If one thread breaks and the other threads continue to run, the product obtained will be non-uniform in character, making it necessary to unwind from a take-up roll, or otherwise gather and discard the non-uniform product.

By my invention I provide improved means for overcoming this difficulty, thereby eliminating a great deal of wasted time and material. An advantage of my device over those previously suggested is its simplicity and the relatively few parts required for its operation.

The invention will best be understood if the following description is read in connection with the accompanying drawing in which

Figure 1 is a side view of my device partly in section.

Figure 2 is a front elevation of the device.

Figure 3 is a top plan view.

Figure 4 is a fragmentary view similar to Figure 1 showing another and preferred embodiment of my invention.

Figure 5 is a perspective view of a unitary thread engaging and cutting means used in the modification shown in Figure 4.

Figure 6 is a top plan view of the thread guide used in the embodiment of the invention shown in Figure 4.

Referring now to the drawing, number 10 indicates a supporting base upon which the frame 11 is secured by any suitable means such as the screws 12. The frame 11, as illustrated herein, includes the sides or upright portions 11*a* and 11*b*, and a top portion 11*c* which is partly cut away, the cutaway portion being somewhat elevated to form a deflecting bar or guide 13, under which the threads T are led. The bar 13 is provided with a central slot 14 for the purpose stated hereinafter.

Rotatively mounted within the frame 11 in a position to project through the slot 14, is the thread-cutting member or knife 21 mounted on the shaft 22, supported between the uprights 11*a* and 11*b*. Also, rotatively supported between the uprights 11*a* and 11*b* of frame 11, on shaft 15, are the pivoted levers or fall members 17 and 18. These members are adapted to assume the position shown in dotted lines in Figure 1, unless supported in upright position as shown in Figure 2. In the embodiment of the invention in Figures 1 to 3 each of the lever members are formed from a wire wound around the shaft 15 intermediate its ends. At the upper ends of members 17 and 18 there are provided the thread engaging means or eyes 19 and 20 respectively, while the lower extremities S of each of the members 17 and 18 are extended to form contact members for actuating the thread-cutting means 21.

The upward rotation of the knife 21 is limited by the side of the slot 14. A stop 24 is provided to limit the downward rotation of the knife 21, and as illustrated herein, the knife 21 is provided with a depending member 23, which is of a size and length such that when the knife is at rest against the stop 24, the member 23 will lie in the path of the extensions S of the lever members 17 and 18 as said members rotate around the axis 15. After contacting with the member 23 during its rotation around the axis 15, each of the extensions S will rotate the knife 21 on its axis until it moves into operative cutting position within the slot 14, and comes to rest against the far edge of the slot.

Each of the threads T is initially inserted in one of the eyes 19 and 20 of the members 17 and 18, and is then led below the slotted guide 14, and thence to a take-up roll, twisting means, or any other means, as may be desired. The knife 21 is mounted to rotate in the direction of travel of the threads T so that as it is raised into operative position the movement of the threads T will facilitate and aid the positive action of the knife.

In the operation of my device, each of the members 17 and 18 will ordinarily be supported in a substantially upright position by the threads T inserted in their respective eyes illustrated herein at 19 and 20. When a thread becomes broken, the member previously supported by it will fall, thereby rotating about shaft 15 as an axis, causing the extension S to move through an arc upwardly and to contact the blade depending member 23, thereby actuating the cutting means 21 and raising it into contact with the remaining threads passing under the guide 13. The remaining threads will aid the operative movement of the knife 21 and will be severed thereby as the knife moves upwardly through the slot 15.

In the embodiment of my invention illustrated in Figures 4, 5, and 6 I have shown a modified

form of the invention, which as I am now advised I believe to be the preferred form of the invention. The frame of this modification may be substantially the same as the frame of the modification described above, but the thread guide, or, as illustrated herein the top portion of the device, 25 is provided with a plurality of slots 26 and 27, and smaller openings 28 and 29 serving as thread positioned means.

As illustrated in Figure 5 a plurality of thread cutting members 30 and 31 are provided, each formed with the integral arms 30*a* and 31*a* respectively, having at their free ends thread engaging portions 30*b* and 31*b* respectively. Both of the cutting members 30 and 31 and their thread engaging arms are pivoted in the frame, and may be supported on the same pivot 32, as shown in Figure 4. As illustrated, in the drawing, the blades 30 and 31 are of different size and upon rotation are adapted to be projected into the slots 26 and 27 respectively.

The blades 30 and 31 are ordinarily maintained in inoperative position due to the engagement of the portions 30*b* and 31*b* with their respective threads. When either thread breaks disengaging the thread engaging portion 30*b* or 31*b*, the arm 30*a* or 31*a* connected therewith will drop causing the cutting member 30 or 31 integral therewith to swing upwardly until its cutting edge projects into the slot 26 or 27 thus severing the remaining thread.

To insure that the threads run within the cutting range the members 28 and 29 are provided. These may be punched out and bent downwardly until they contact the top of the frame 11*c*. The member 29 may be hinged permitting it to swing inwardly and at the same time serving to prevent threads from running too far toward the outside of the frame.

It will be apparent that my device has the advantages of extreme simplicity, combined with positiveness and dependability in operation. The exact position and arrangement of the parts used in carrying out my invention may be varied without departing from the scope of my invention which is defined in the following claims.

What I claim is:

1. A device for severing the second of two threads when one of said threads becomes severed comprising a slotted thread guide, cutting means adapted to enter and extend through the slot in said guide, and actuating means for said cutting means.

2. A device for severing a plurality of threads when one of said threads becomes severed comprising a slotted thread guide, cutting means and a plurality of fall members each having a thread engaging portion and another portion adapted to actuate said cutting means upon release of said thread engaging portion to enter and extend through the slot in said guide to cut said threads.

3. A thread cutting device comprising a frame carrying a thread guide, under which a thread may be led, a slot in said guide, cutting means mounted in the frame so that its cutting edge can move into the said slot, and a plurality of members pivoted intermediate their ends each having a thread engaging portion and means for actuating said cutting means.

4. A thread cutting device comprising a frame having a stationary slotted member, cutting means pivoted in the frame so that its cutting edge can move into said slot, said frame being cut away so that a plurality of threads may extend under said member between said cutting means and said slot, and a plurality of members positioned adjacent to said cutting means each having a thread engaging portion and a cutting means actuating portion operative upon disengagement of said thread engaging portion.

5. A thread cutting device comprising a frame carrying a slotted thread guide, cutting means pivoted in the frame so that its cutting edge can move into said slot, a member pivoted in said frame intermediate its ends having an extension at one end, and means adapted to be supported by a thread adjacent its other extremity, said cutting means having an arm projecting into the rotary path of said extension.

6. A thread cutting device comprising a plurality of oscillatably mounted unitary fall members each having a thread engaging means and a thread cutting means and a guide member having a plurality of slots across which said threads are led, each of said cutting means being projectable into one of said slots.

7. A thread cutting device comprising a plurality of members pivoted intermediate their ends each having a thread engaging means and a cutting means, and a thread guide having a plurality of slots each adapted to receive one of said cutting means.

8. A thread cutting device comprising a frame having a plurality of slots under which one or more threads may be led, and a plurality of members rotatably mounted in said frame intermediate their ends, each having a thread engaging portion, and a cutting portion adapted to enter one of said slots.

9. A thread cutting device comprising a plurality of members pivoted intermediate their ends each having a thread engaging means and a cutting means, a thread guide having a plurality of slots each adapted to receive one of said cutting means and thread positioning means associated with said slots respectively.

10. A device for severing the second of two threads when one of said threads becomes severed comprising a thread guide having a slot across which the threads normally extend, cutting means positioned on the same side of said guide as the said threads and projectable into said slot and means for actuating said projectable means when either of said threads becomes severed.

11. A thread cutting device comprising a plurality of rotatably mounted members each having means adapted to be supported by a thread, and a cutting portion and a thread guide having a plurality of slots positioned so that the cutting portion of each of said members may be projected into a respective slot.

12. A thread cutting device comprising a frame having a member with a plurality of slots, a plurality of fall members pivoted in said frame, each of said members having a thread engaging means, and a cutting means projectable into one of said slots.

13. A device for severing a plurality of threads when one of said threads becomes severed comprising a slotted thread guide, cutting means and a plurality of all members each having a thread engaging portion and another portion adapted to actuate said cutting means upon release of said thread engaging portion to enter and extend through the slot in said guide to cut another thread.

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