Nov. 3, 1959 W. IRMSCHER 2,910,951

SEWING MACHINE THREAD FEED INTERRUPTING DEVICE

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FIG. 1

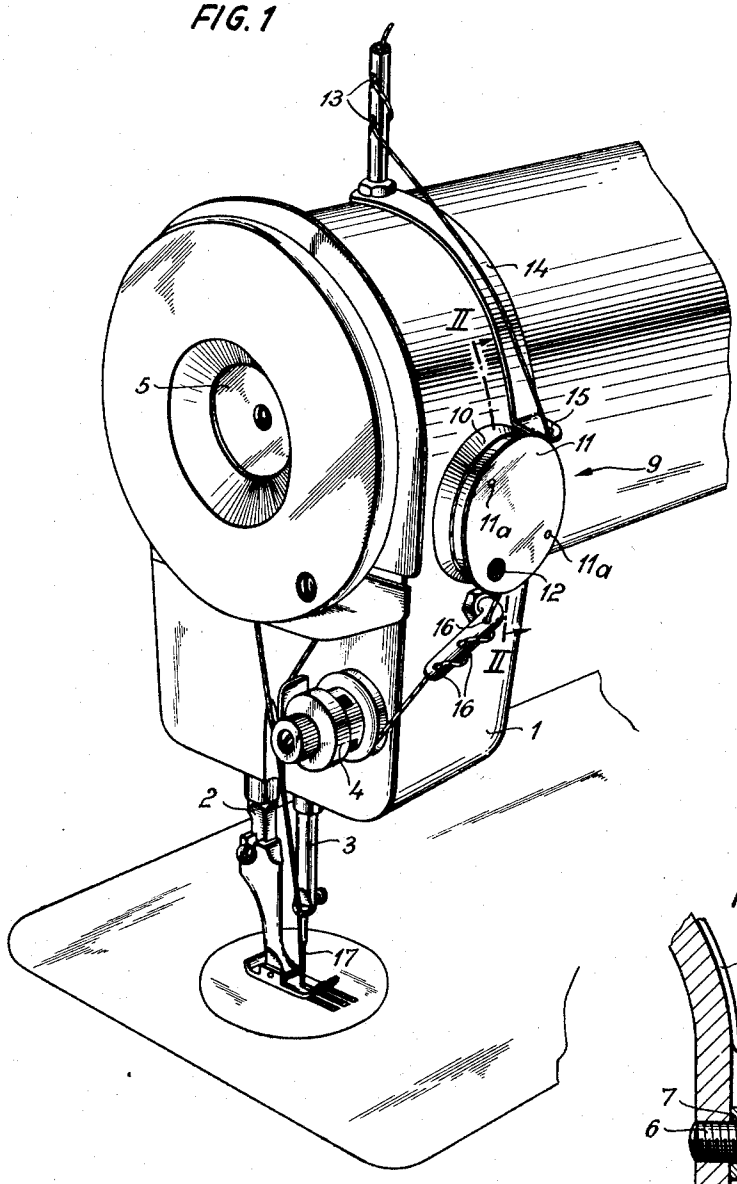
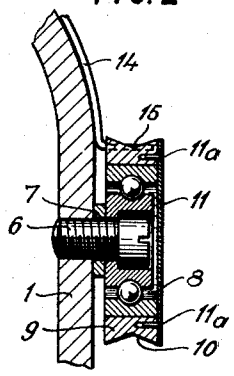


FIG. 2



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SEWING MACHINE THREAD FEED INTERRUPTING DEVICE

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3 Claims. (Cl. 112—242)

The invention relates to sewing machines and is particularly concerned with the thread feeding system of such machines.

More in particular, the invention relates to means adapted to interrupt the feeding of the thread in a sewing machine which is fed by way of a tensioning device to the thread feeder, when the thread between the feeder and the needle is broken.

Many sewing machines are provided with a rotating thread feeder. If, in such machines the thread between the thread feeder and the needle breaks, there arises the problem that the thread is carried along by a rotating part of the thread feeder and is wound thereon. This causes losses in material and time because the wound up thread has to be removed in a cumbersome manner from the part upon which it is wound.

Arrangements are already known which, if the thread is spooled on the rotating thread feeder, interrupt the further supply from the thread supply spool. For this purpose one or several cutters are provided which are arranged in such a manner that the thread does not move within their range when the thread feeder operates normally, but as soon as spooling develops as a result of thread breaking, the thread is guided into the proximity thereof.

Devices of this type do not operate satisfactorily because the thread is not guided to the cutting blades in each case of trouble because they have been arranged in such a manner that during normal operation they cannot contact the thread. Thus the thread supply, especially after the blades have already been in operation for some time, is either not interrupted at all or only after a considerable amount of thread has been consumed.

It is therefore an object of the invention to provide a means which upon breaking of the thread immediately and reliably interrupts the thread supply without use of cutting blades and which during normal operation does not unfavorably affect the thread feed in any manner.

In accordance with the invention this is accomplished in that the means for interrupting the thread supply is arranged in the path of the thread ahead of an impeding device for thread tensioning which tensions the thread independently of the feeding speed of the thread and is formed in a manner that the thread rotates a part thereof by frictional engagement, which part resists any increase in its speed of rotation and thus an increase of the pulling force of the thread which has been caught and spooled by the thread feeder and which is effective to cause the breaking of the thread.

A particularly simple and advantageous embodiment of the invention provides for the use of a fly roller journalled for low friction movement which has a threaded groove presenting a wedge shaped cross section and which is encompassed by the thread over more than 360° so that the thread is located upon a part of the circumference of the roller in a double layer. Such an arrangement retards the thread with sufficient force as soon as its feeding speed is increased suddenly by the spooling effect of

the thread feeder so that it tears between the interrupting device and the thread feeder.

The fly roller may also serve during sewing as a result of the slow rotation as an indicator showing whether the thread is being pulled normally or whether it is torn. For that purpose it is provided with a readily seen marking away from its axis of rotation along the side of the machine which faces the operator.

Further details and objects of the invention will become apparent from the following description of an embodiment of the invention which is illustrated in the accompanying drawings in which:

Fig. 1 is a perspective view of the sewing machine head, and

Fig. 2 is a vertical cross section through the fly roller along line II—II of Fig. 1.

The head of a sewing machine which serves in a known manner for supporting the presser bar **2** of needle bar **3** and of the driving mechanism for these components has a thread tensioning device **4** at its front surface and a rotating thread feeder **5**. The device **4** for tensioning the thread in the rotating thread feeder **5** may be of any desired construction in accordance with known examples.

A shoulder screw **6** and a spacing ring **7** support a ball bearing **8** at a distance from the machine head. A roller **9** is mounted on the ball bearing **8** and presents a thread groove **10** having a wedge shaped cross section. A cover plate **11** is secured to the fly roller **9** by means of pins **11***a* which is marked at **12** eccentrically with respect to its axis of rotation.

The thread is supplied from a spool of thread (not shown) and is drawn through the thread guiding conformations **13** by way of slide member **14** and through eyelet **15**, whereupon it is placed in a loop in clockwise direction around the fly roller **9** so that it comes to rest in the thread groove **10**. Upon being pulled through the thread guiding conformations **16** it is brought around the thread tensioning device **4** and the rotating thread feeder **5** to the needle **17**.

Under normal operating conditions the fly roller **9** rotates slowly. Inasmuch as the eyelet **15** and the thread guiding conformations **16** are arranged in a manner that the thread encompasses the roller **9** more than 360° the thread lies in the thread groove partly in a double layer. This insures that the fly roller **9** is carried along and thus sliding of the thread and of the roller relative to one another cannot take place and, accordingly treatment of the circumference of the roller to increase the friction is unnecessary.

If the thread tears for any reason along the way between the thread feeder **5** and needle **17** it may happen that the rapidly rotating parts of the feeder **5** carry along the thread and tend to wind it up. Such a spooling effect leads to considerably greater thread consumption than normal sewing operations. This suddenly arising large thread consumption would result in an equally sudden increase of the rotating speed of the fly roller **9**. The thread, however, is not able to withstand the pull which this requires and it tears between the roller **9** and the thread feeder **5**. Thus the further thread pulling is interrupter. On the other hand, the increase in the rotational speed of the fly roller **9** as the machine continues to run remains so small that the thread is not subjected to an increased pull.

The marking **12** makes the rotation of the fly roller visible so that a glance reveals whether extra thread is being pulled or whether the machine operates in a normal manner.

Having now described my invention with reference to the embodiment illustrated in the drawing, I do not wish to be limited thereto but what I desire to protect by

Letters Patent of the United States is set forth in the appended claims.

I claim:

1. In a sewing machine having a needle bar supporting a needle supplied from a source of thread, a thread tensioning device and a rotatable thread feeder disposed along the path of thread travel, intermediate said tensioning device and said needle, resisting means adapted to interrupt the feeding of the thread by way of said tensioning device to said thread feeder upon breaking of the thread between said feeder and said needle, said resisting means being disposed along the path of thread travel in a position preceding control means including said tensioning device and adapted to impede the thread travel independently of the pull through speed thereof, and said resisting means comprising a rotatable member frictionally engaged by the thread and rotated thereby and adapted to resist any sudden increase of the speed of rotation and thereby of the pulling force of the thread pulled along by the thread feeder.

2. In a sewing machine having a needle bar supporting a needle supplied from a source of thread, a thread tensioning device and a rotatable thread feeder disposed along the path of thread travel, intermediate said tensioning device and said needle, resisting means adapted to interrupt the feeding of the thread by way of said tensioning device to said thread feeder upon breaking of the thread between said feeder and said needle, said resisting means being disposed along the path of thread travel in a position preceding control means including said tensioning device and adapted to impede the thread travel independently of the pull through speed thereof, and said resisting means comprising a rotatable member frictionally engaged by the thread and rotated thereby and adapted to resist any sudden increase of the speed of rotation and thereby of the pulling force of the thread pulled along by the thread feeder, said rotatable member being an antifriction roller having a circumferential thread groove of wedge shaped cross section adapted to receive the thread over a distance corresponding to more than 360° of the circumference of the roller.

3. In a sewing machine having a needle bar supporting a needle supplied from a source of thread, a thread tensioning device and a rotatable thread feeder disposed along the path of thread travel, intermediate said tensioning device and said needle, resisting means adapted to interrupt the feeding of the thread by way of said tensioning device to said thread feeder upon breaking of the thread between said feeder and said needle, said resisting means being disposed along the path of thread travel in a position preceding control means including said tensioning device and adapted to impede the thread travel independently of the pull through speed thereof, and said resisting means comprising a rotatable member frictionally engaged by the thread and rotated thereby and adapted to resist any sudden increase of the speed of rotation and thereby of the pulling force of the thread pulled along by the thread feeder, said rotatable member being an antifriction roller having a circumferential thread groove of wedge shaped cross section adapted to receive the thread over a distance corresponding to more than 360° of the circumference of the roller, and said means being provided in a location away from its axis of rotation and in a circular area thereof with a speed indicating marking.

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