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(54) **Device for measuring thread tension.**

(57) A device for measuring the thread tension, in particular for use when working with a sewing machine (19), said device comprising a clip (12) formed by two legs (11,14) for creating a pick up notch (15) wherein a thread (17,20), of which the tension is to be measured, may be clamped by inserting the thread sideways into said notch, one of the legs (11) of the clip (12) being connected to a resiliently supported carrier element (5), capable of moving against the action of a spring (7) with respect to a housing (1) in which said carrier element (5) and said spring (7) are incorporated and from which the end of said carrier element (5) connected to the clip (12) protrudes said housing (1) at least partially (3) being made of a transparant material to make a graduation (16) visible which is applied on said carrier element (5).

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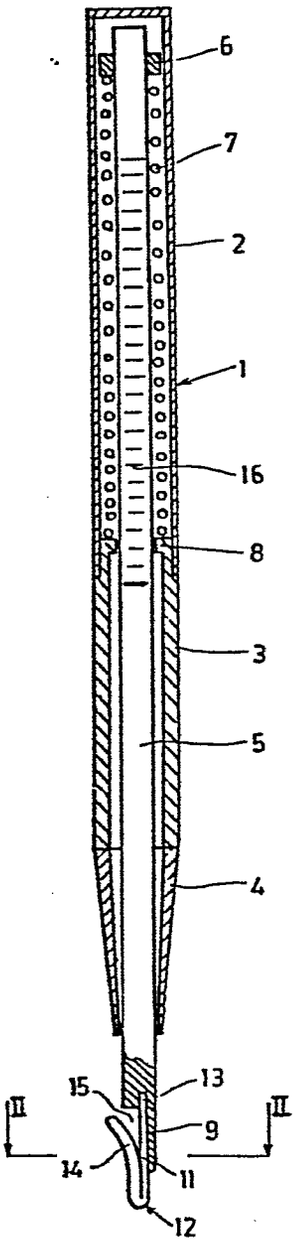
FIG. 1



TITLE MODIFIED
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Device for measuring the thread tension, in particular for use when working with a sewing machine.

When working with a sewing machine the adjustment of the correct thread tension of both the needle thread and the bobbin thread is of utmost importance for obtaining a proper stitching.

For the adjustment of the needle thread each sewing machine is provided with one or another dial, but is has appeared that the device connected therewith frequently causes problems. See in this respect for example the "Consumentengids", 31, no. 11 of November 1983, pages 534 to 539, and in particular page 538.

In addition the tension of the bobbin thread is in most instances adjustable by turning a little screw in the bobbin casing, but an adjustment thereof is hardly possible for the average user and accordingly is not mentioned at all in said article.

The invention has as an object to obviate these disadvantages and provides to that end a device for measuring the thread tension, in particular for use when working with a sewing machine, said device comprising a clip, formed by two legs, which, from a connecting point, are running substantially parallel to one another over a part of their length, whereafter the free end of one leg is turned away from the other leg, thus creating a pick up notch, wherein a thread, of which the tension is to be measured, may be clamped by inserting the thread sideways into the pick up notch between the legs, while the other leg is connected to a resiliently supported carrier element, capable of moving against the action of a spring with respect to a supporting part, which may be taken in the hand

by the user of the device, and whereby a graduation is provided for indicating the distance over which the carrier element has moved with respect to the support part, which distance is a measure for the tension in the thread which is clamped in the clip.

The user of the device may take the support part thereof in his hand and is then able to bring the pick up notch of the clip underneath the thread, which for example is extending from the thread tension device of the sewing machine to the needle thereof. Then the thread is clamped in the clip by displacement sideways thereof, and then the support part is displaced in such a way, that the carrier element, connected with the clip, will start to move along the graduation against the action of a spring. When the thread tension indicated on the graduation will correspond with the actual tension in the thread, the thread will be pulled from the spool via the tension adjustment dial of the sewing machine on further displacement of the support part, thus it being known at what tension the tension adjustment device has been adjusted.

In this way the proper functioning of the tension adjustment device of the sewing machine can be controlled and slackening by aging of the spring, which is responsible for obtaining the thread tension, can be taken into account if necessary.

In substantially the same manner the tension of the bobbin thread can be determined and that one may be adjusted by turning of the relevant little screw in the bobbin casing.

A particular simple device may be obtained when the clip is connected to a rod-shaped element, slidable in a housing against the action of a coil-spring, mounted around the rod-shaped element and within the housing, the graduation being applied on the housing or on the rod-shaped element.

According to a particularly advantageous embodiment the

graduation has been applied on that part of the rod shaped element that is always residing within the housing, the housing, at least partially, being made of a transparent material such as a plastic. In this manner the graduation is protected against damage.

A simple manufacture of the clip can be achieved in that the legs thereof are made of one piece of wire of resilient material and with a circular cross-section, said piece of wire being bent completely for obtaining the connecting point between both legs. It has appeared that the thread of which the tension has to be measured, is easily clamped by such a clip and yet is easily released by the clip as well.

According to an elaboration of the invention the clip is connected to the carrier element for it by inserting the relevant leg of the clip closely into a slot in the carrier element, said slot having a cross-section which is slightly larger than half the circular shape of the cross-section of the leg of the clip.

In this manner it is possible to ascertain that the carrier element clamps around the relevant leg somewhat elastically, and consequently the clip will not be pulled out of the carrier element easily and certainly not when measuring the highest occurring thread tension.

The invention will now be elucidated by means of an example of an embodiment, represented in the drawing, wherein:

Figure 1 shows a longitudinal section and partial elevation of a device according to the present invention;

Figure 2 shows a cross-section at enlarged scale, along the line II-II of Figure 1;

Figure 3 shows the manner wherein the tension of the needle thread of a sewing machine can be determined by means of the device according to the invention;

Figure 4 shows the use of the appliance for determining the tension of the bobbin thread of the sewing machine.

The device shown in Figs. 1 and 2 comprises a housing 1, composed of an upper part 2, a middle part 3 and a lower part 4, which are connected with each other in one way or another. The parts 2 and 4 for example may have been made of a metal and the part 3 of a transparent plastic. Within the housing 1 is a rod-shaped element 5 slidably incorporated. At the one end of the element 5, residing within housing 1, a clampring 6 is positioned, against which a spring 7 may abut of which the other end abuts against the narrowed end section 8 of the housing part 3. The end of the rod-shaped element 5, protruding from the housing 1 is flattened in such a manner that the part 9 is created, as shown in more detail in Fig. 2. In the part 9 is a slot 10 into which the one leg 11 of a clip 12 can be inserted. The leg 11 may extend into a boring 13 in the element 5. In this manner a tight connection is obtained between the leg 11 and the element 5.

The clip 12 in addition comprises a leg 14, which from the top of the clip initially is closely engaging the leg 11 and then is curving away therefrom in order to form the pick up notch 15. The clip 12 is made of a very special material, capable of undergoing the indicated deformation.

In addition a graduation 16 has been applied onto the rod-shaped element 5.

The use of the device is shown in Figs. 3 and 4. According to Fig. 3 the user takes the housing 1 in his hand, positions the pick up notch 15 of the clip 12 underneath a thread 17 of which the tension is to be measured, subsequently pulls the housing 1 upwards, whereby the thread 17 is clamped into the clip 12, then pulls the housing 1 further upwards whereby element 5 is pulled out of the housing 1 against the power of the spring 7, until the thread 17 starts to slide over the tension adjustment

device 18 of the sewing machine 19. The distance over which the element 5 has then been pulled out of the housing 1 provides a measure for the thread tension. Its reading may be carried out by means of the graduation 16, which is then consequently in part in the transparant part 3 of the housing 1. As point of reference may be used for example the lower rim of the non-transparant part 2 of the housing, whereas the graduation 16 can be observed via the transparant part 3 of the housing 1.

Fig. 4 shows the possibility to measure the thread tension of the bobbin thread, i.e. the resistance provided by the bobbin against pulling out the thread. In that case the thread 20 can be brought into the clip 12 via the pick up notch 15, for example by hand, whereafter the measuring device is pulled away and the element 5 is shoved out of the housing 1 until the thread starts to run off the bobbin. In a manner not further shown, the tension of the thread can, if necessary, be adjusted by removal of the bobbin from the machine and turning a screw therein.

It will be apparent that in the drawing only one possible embodiment of the invention is presented and has been described in the above, and that many modifications can be made without leaving the scope of the invention.

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Claims:

1. A device for measuring the thread tension, in particular for use when working with a sewing machine (19), characterized in that said device comprises a clip (12), formed by two legs (11,14), which from a connecting point are running substantially parallel to one another over a part of their length, whereafter the free end of one leg (14) is turned away from the other leg (11), thus creating a pick up notch (15) wherein a thread (17,20), of which the tension is to be measured, may be clamped by inserting the thread (17,20) sideways into the pick up notch (15) between the legs (11,14), while the other leg (11) is connected to a resiliently supported carrier element (5), capable of moving against the action of aspring (7) with respect to a supporting part (1), which may be taken in the hand by the user of the device, and whereby a graduation (16) is provided for indicating the distance over which the carrier element (5) has moved with respect to the support part (1), which distance is a measure for the tension in the thread (17,20) which is clamped in the clip (12).

2. A device according to claim 1, characterized in that the clip (12) is connected to a rod-shaped element (5), slidable in a housing (1) against the action of a coil-spring (7), mounted around the rod-shaped element (5) and within the housing (1), the graduation (16) being applied on the housing (1) or on the rod-shaped element (5).

3. A device according to claim 2, characterized in that the graduation (16) is applied on that part of the rod-shaped element (5) that is always residing within the housing (1), the housing (1), at least partially (3), being made of a transparent material such as a plastic.

4. A device according to one of the preceding claims, characterized in that
the legs (11,14) of the clip (12) are made of one piece of wire of resilient material with a circular cross-section, said piece of wire being bent completely for obtaining the connecting point between the two legs (11,14).

5. A device according to one of the preceding claims, characterized in that
the clip (12) is connected to the carrier element (5) for it by inserting the relevant leg (11) of the clip (12) closely into a slot (10) in the carrier element, said slot having a cross-section which is slightly larger than the semi-circular shape of the cross-section of the leg (11) of the clip (12).

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FIG. 1

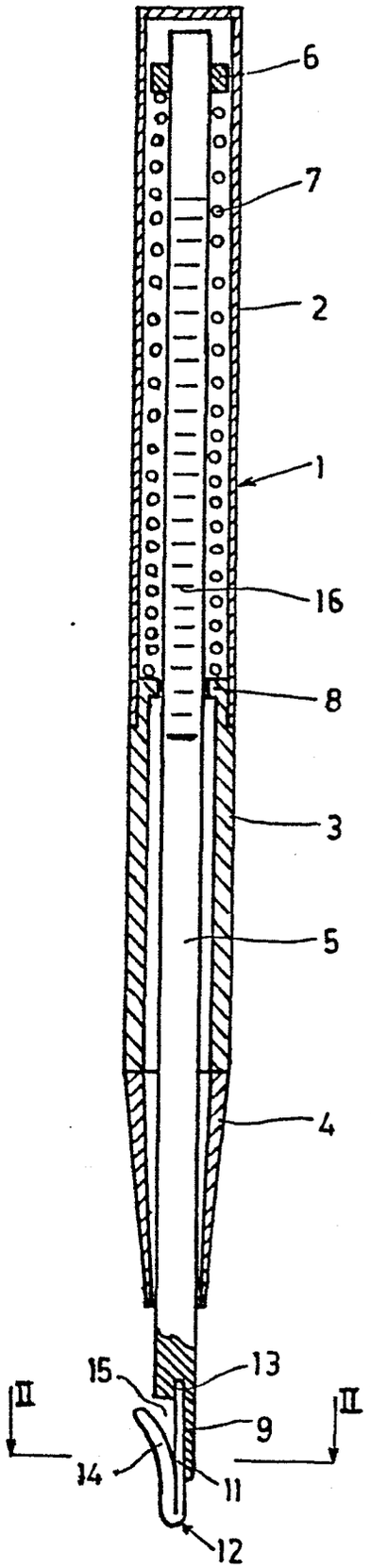


FIG. 2

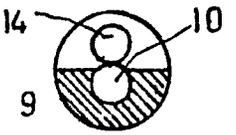


FIG. 3

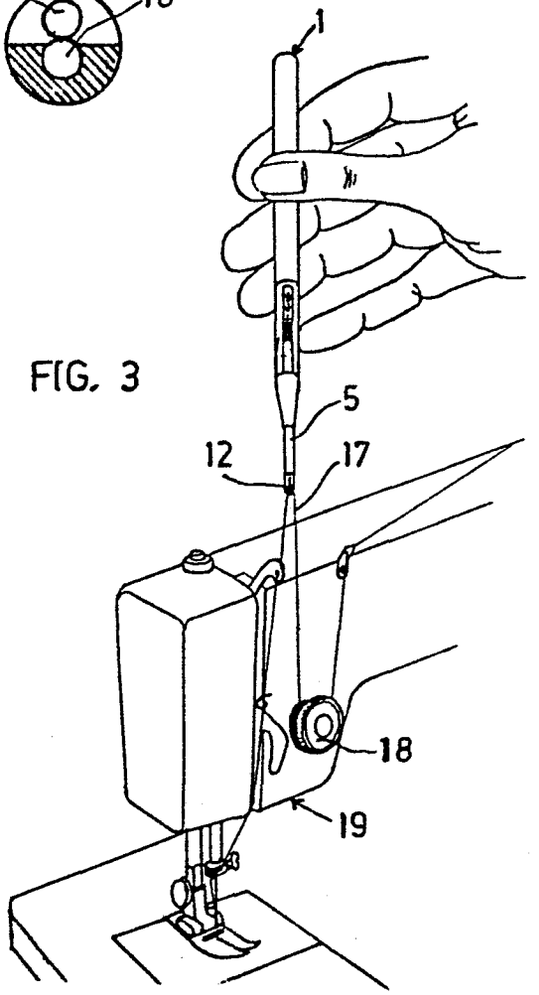
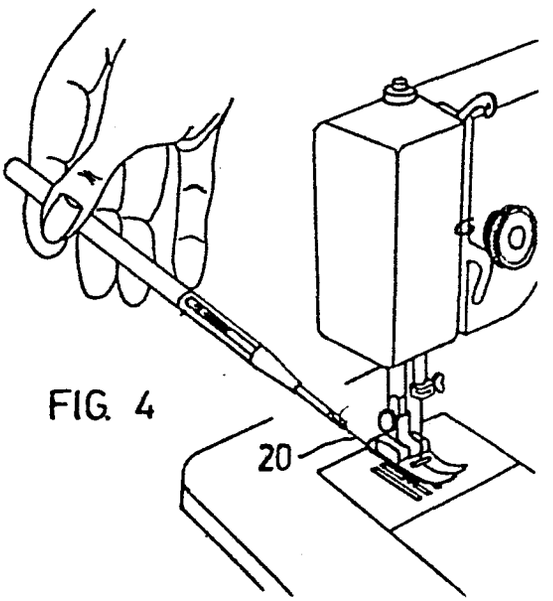


FIG. 4



Maria Beugels-Drenth, DALEN

European Patent Office

EUROPEAN SEARCH REPORT

0149283
Application number

EP 84 20 1930

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int Cl.4)
A	FR-A-2 166 839 (BRAS) * Whole document * ---	1	D 05 C 11/08 G 01 L 1/04 D 05 B 47/00
A	US-A-3 618 541 (SCHRYOCK) * Whole document * ---	1	
A	US-A- 698 370 (BURROWS) * Whole document * ---	1	
A	DE-C- 213 207 (HARDEGGER) * Figure 2 * -----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

D 05 B
D 05 C
G 01 L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	05-03-1985	VUILLEMIN

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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