April 28, 1959 H. BECHTER 2,884,015

TENSIONING ROLLER FOR WEAVING LOOMS

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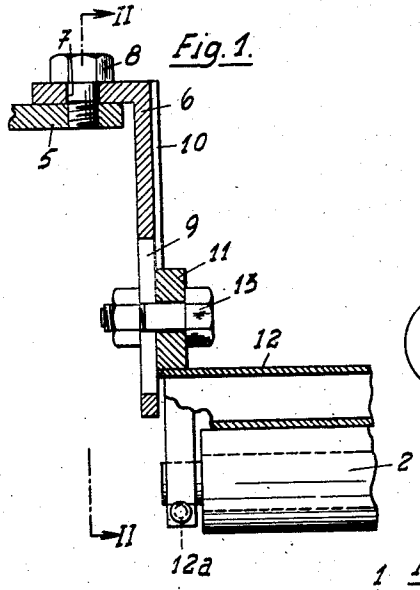


Fig. 1.

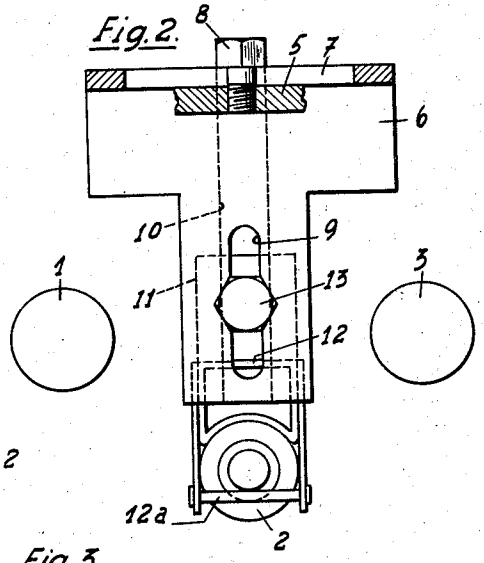


Fig. 2.

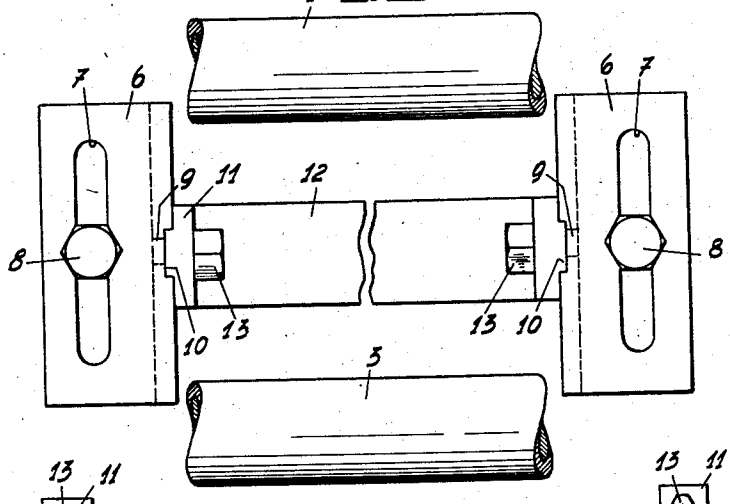


Fig. 3.

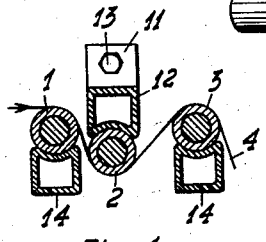


Fig. 4.

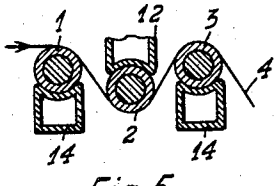


Fig. 5.

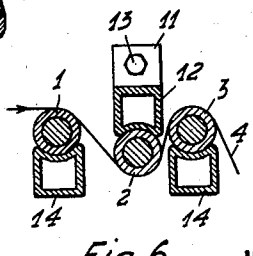


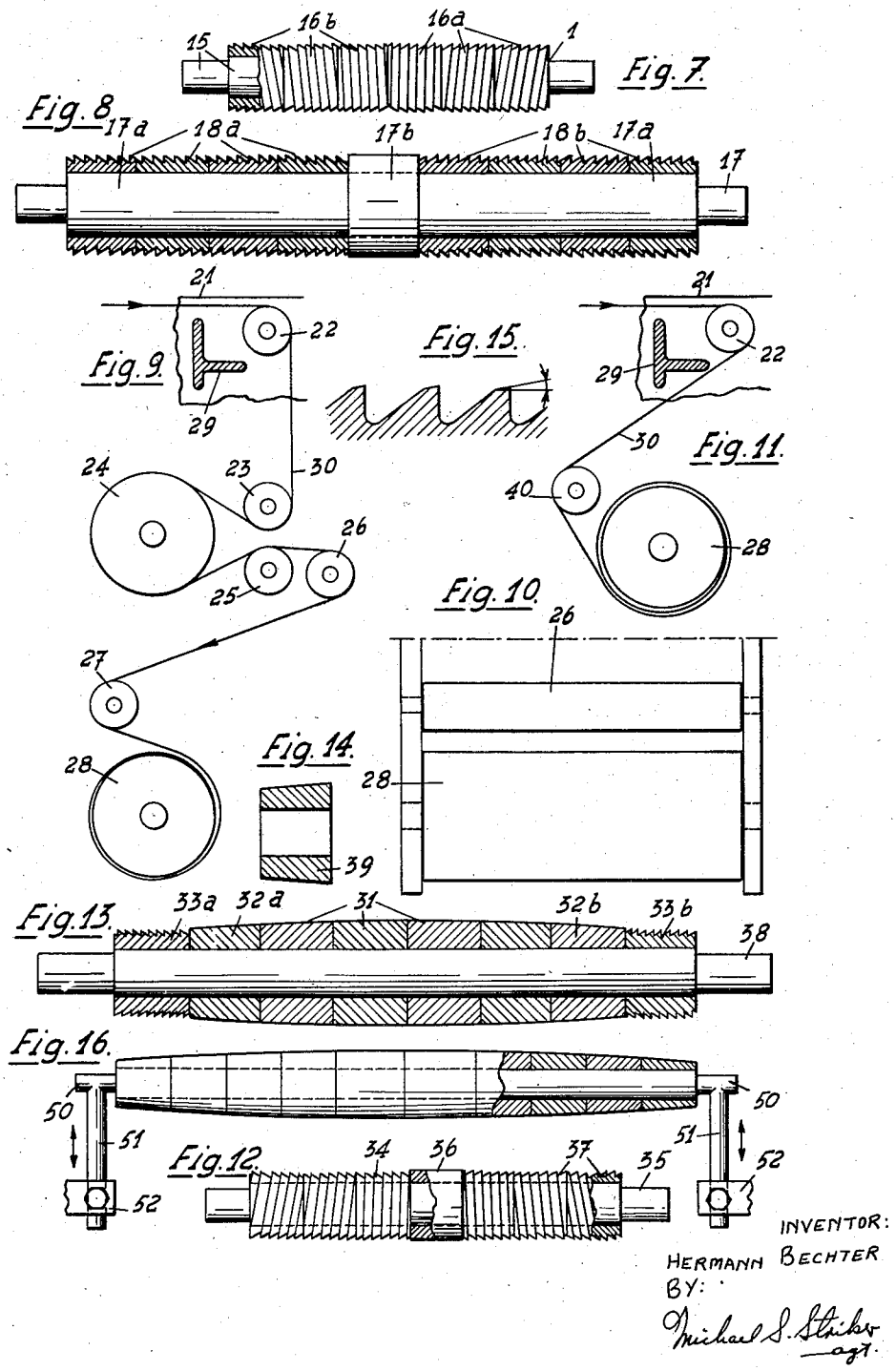
Fig. 6.

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TENSIONING ROLLER FOR WEAVING LOOMS

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TENSIONING ROLLER FOR WEAVING LOOMS

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1 Claim. (Cl. 139—291)

The present invention relates to a tensioning roller for the device on weaving looms for stretching the web of material in the direction of the weft, which device has at least one tensioning roller. Such tensioning rollers are known, but they have the disadvantage that they are produced from one piece, and do not permit of partial alterations on the roller. The disadvantage is overcome by the tensioning roller which is the object of the invention in that it comprises a support shaft, upon which interchangeable tubular elements are arranged, over which the web of material is guided and is stretched in this guiding.

Now the present invention discloses an especially expedient improvement of such a device. It is characterized in that the tensioning roller possesses a support shaft, upon which tubular elements are arranged, the surfaces of which are provided with threads or—in place thereof—equally large empty curved tubular elements are arranged.

Examples of forms of embodiment and applications of the object of the invention are illustrated in the accompanying drawing, wherein:

Figure 1 shows a part of a device according to the invention in section;

Figure 2 shows a section along the line II—II in Figure 1;

Figure 3 shows a plan view of the device according to Figures 1 and 2;

Figures 4 to 6 show, on a smaller scale and in section, an example of a form of embodiment of the invention, in various positions of adjustment of the middle roller;

Figure 7 shows a first example of embodiment of a tensioning roller for the device in accordance with the invention, partially in axial section;

Figure 8 shows a second form of embodiment of a tensioning roller, in axial section;

Figure 9 shows a further example of embodiment of the invention, as an indirect cloth-unwinding device, in elevation;

Figure 10 shows the form of embodiment according to Figure 9, in partial lateral elevation;

Figure 11 shows a third example of embodiment of the device according to the invention as a direct cloth-unwinding variant;

Figures 12 and 13 show two examples of embodiment of tensioning rollers in a device according to the invention, and

Figure 14 shows a detail of the form of embodiment according to Figure 13;

Figure 15 shows flattened threads, rising conically;

Figure 16 shows a device for regulation of the curved surface of the tensioning roller.

As shown in Figures 1–6 the device for stretching the web of material in the direction of the weft possesses a frame arranged between the breast beam and cloth beam (not shown) of a weaving loom, in which frame, in the case of the example as illustrated, a tensioning roller 1 and two slide tensioning rollers 2 and 3 are mounted, over which rollers the web of material is guided.

The middle slide tensioning roller 2 is adjustable in both the horizontal and vertical directions. For this purpose an angle bracket 6 is arranged on each side of the roller 2, on a frame part 5. In the horizontal arm of the bracket 6 there is provided a slot 7 running transversely of the axis of the roller 2, through which slot there extends a set screw 8 screwed into the frame part 5, by means of which the bracket 6 is thus secured to this frame part 5 in horizontally adjustable fashion. In the vertical arm of the bracket 6 there is provided a vertical slot 9, and a vertical guide groove 10. Into the guide groove 10 there is engaged a correspondingly dimensioned projection of a flange 11, on which a box-shaped transverse support 12 is secured. On the transverse support 12 the slide tensioning roller 2 is suspended by means of a bolt 12*a*, while the transverse support 12 itself is secured in vertically adjustable manner to the bracket 6, by means of set screws 13, which lead through a bore in the flanges 11 and through the slot 9 in the vertical arm of the bracket 6.

As shown in Figures 4 to 6, the slide tensioning rollers 3 and the tensioning roller 1 are similarly mounted on box-shaped transverse supports 14, which are secured in a manner not shown to the frame of the device. The web of material leads from the breast beam (not shown) over the tensioning roller 1, then loops round the slide tensioning roller 2 and is led by way of the second slide tensioning roller 3 to the cloth beam. It will be understood that devices are also possible which have only one tensioning roller, but no slide tensioning rollers.

The tensioning roller 1 illustrated in Figure 7 possesses a support shaft 15, upon which two sets of tubular elements 16*a*, 16*b* are arranged. The tubular elements 16*a* are provided on their periphery with right-hand threads, while the tubular elements 16*b* have left-hand threads. The pitch of the thread of each individual tubular element is constant, but reduces from the middle of the roller towards the two ends of the roller, from one tubular element to the next. Furthermore the number of threads of the threading similarly increases from the middle of the roller towards both ends of the roller, from tubular element to tubular element. Thus for example the threading of the two inner tubular elements 16*a*, 16*b* of each set may have four threads, while the threading of the middle tubular elements has five threads and that of the outer tubular elements has six threads.

A further form of embodiment of a tensioning roller is illustrated in Figure 8. This tensioning roller similarly has a support shaft 17. Upon the shouldered parts 17*a* of the support shaft 17 there is mounted in each case a set comprising a plurality of tubular roller elements 18*a* and 18*b* respectively, there being four each in the present case. The unthreaded middle part 17*b* of the support shaft 17 has the same diameter as the tubular roller elements 18*a*, 18*b*. The pitch of the threading on a tubular element is constant, but increases from one tubular element to the next from the inner tubular elements 18*a*, 18*b* towards the ends of the roller. However it is also conceivable to have the thread pitch increase even within one tubular element towards one side, which produces a more uniform stretching of the web of material. It is further understood that the tensioning roller may also have sets of tubular elements comprising only three, for example, or more than four tubular elements.

The individual tubular elements are removably arranged on the support shaft of the tensioning roller, so that they can be interchanged. According to the desired tensioning of the material thus another set of tubular elements can be set on in a simple manner. Thus it is no longer

necessary to keep a number of complete rollers, but only a number of sets of tubular elements, in stock. Even with the wear of the threads which necessarily occurs during operation, the entire tensioning roller does not have to be replaced, but it is sufficient to interchange the individual threaded tubular elements.

The main object of the device as described is the relief of the tension of the temples. As experiments have shown, this relief may amount to up to 90%. It has appeared, more especially, that tearing of the material by the temples, when the latter are so greatly saturated with cotton fluff, for example on the automatic cotton loom, that the rings with the pointed needles can no longer rotate, that is to say are condemned to complete stoppage, and therefore the material commences to tear from that moment, cannot possibly occur any more where the tensioning rollers as described are used.

The small oval holes which have occurred hitherto in the material on both sides, due to the temples, and which also remain visible very largely in the material even after finishing and dyeing, will disappear completely when the rollers as described are used.

The cloth hitherto became darker in all fabrics in the outer parts, which display greater shrinkage, especially in the case of light colors, than in the middle. This disadvantage also disappears.

The reed is very greatly preserved at the end parts, so that no more reed wires can be damaged, and without the reed wires cutting off the end threads, as now still occurs often.

Even with dyed articles on the loom it occurs that rubber temples, as antidote to great shrinkage, leave glossy parts, which can not be removed. This disadvantage will also be avoided where the device as described is used.

In the device according to Figures 9 and 10, which is adapted not only for stretching the web of cloth but also for preventing the formation of creases and folds in the web of cloth, 22 designates a tensioning roller for stretching the web of cloth arranged on the forwardly projecting end 29 of the breast beam 21, this roller being such as has been described hereinbefore and illustrated by way of example in Figures 7 and 8. 30 is the web of cloth, 23 a smooth, threadless roller, 24 a sand beam, 25 a further ordinary roller, while 26 and 27 are tensioning rollers. 28 is the cloth beam. The web of material 30 is led from the tensioning roller 22 towards the roller 23, over the sand roller 24 and the roller 25 to the tensioning rollers 26 and 27, and thence is wound on to the cloth roller 28. The tensioning rollers 26 and 27 serve to prevent the arising of creases and folds in the web of cloth 30. These rollers are expediently removably arranged, so that they can be interchanged. The two rollers 26 and 27 may be designed, for example, as illustrated in Figures 12 and 13. The tensioning roller according to Figure 12 is designed similarly to that according to Figure 8: the tubular elements 34 and 37 are arranged on both sides of a threadless middle part 36, on a support shaft 35, and are provided towards the two roller ends with rising right-hand and left-hand threads respectively. An especially expedient form of a tensioning roller for the prevention of the formation of creases and folds is shown in Figure 13. In the middle part, curved, tubular parts 31, without threads, are arranged on the support shaft 38, and are adjoined on both sides, towards the roller end, in each case by a threadless, curved, tubular part 32*a* and 32*b* respectively, the maximum diameter of which conforms to the external diameter of the middle parts 31. The external diameter of the tubular parts 32*a* and 32*b* decreases towards the roller end, along a line of curved section, as shown in Figure 13. The decrease of diameter may take place, however, according to another form, for example uniformly, that is to say according to a line of straight section, as is illustrated by way of example in Figure 14. The two tubular parts 32*a* and 32*b* are followed by the tubular elements 33*a* and 33*b*, which are provided with threads, namely one with a left-hand thread and the other with a right-hand thread, a thread rising towards the end of the roller being used with advantage in this case also.

It is entirely possible to construct only one of the two rollers 26 and 27 as tensioning roller according to Figures 12 and 13. Furthermore it may be advantageous for various purposes to make one of the rollers 26, 27 as a tensioning roller according to Figure 12, and the other as a tensioning roller according to Figure 13, when it may be expedient to use as roller 27 one according to Figure 13.

Naturally the web of material 30 can also be transported in a different manner from that illustrated in Figure 9. Similarly the tensioning rollers 26 and 27 can be differently arranged. The device as illustrated in Figure 9 is conceived for the so-called indirect take-up of the cloth. In the case of a direct take-up of the cloth a device will advantageously be selected such as is illustrated diagrammatically in Figure 11. In this device there are present behind the tensioning roller 22 only one further tensioning roller 40 and the cloth beam 28, upon which the web of material 30 is taken up.

With regard to the tensioning rollers 26 and 27 still further possible embodiments are similarly also conceivable. Thus for example a tensioning roller can be used which has a smooth curved outer surface, the maximum diameter thereof amounting to at least 55 mm. in the middle of the length of the roller, but tapering in curved fashion towards the end of the roller to at least 35 mm. On each side of this tubular part then a tubular part with thread may adjoin.

Where tubular parts with thread are used at the ends of the roller it has proved to be expedient to cut away the sharp edges of the thread, as shown in Figure 15, so that a smooth surface is produced, which rises towards the ends of the roller. This smooth surface may have a length of at least 0.5 mm. and a rise of at least 0.1 mm., for example.

In Figure 16 a device is provided so that the two end journals 50 can be displaced vertically This device has the object that the tensioning roller is more or less curved, which has a regulating action upon the tension of the cloth. To this end the two end journals 50 are secured to support arms 51, which are displaceable upwards and downwards and securable in a stand 52.

I claim:

A composite roller comprising, in combination, a shaft; and a plurality of roller elements on said shaft, at least some roller elements adjacent to each end of said shaft being threaded, each of said threaded elements being formed throughout its entire axial length with a constant external thread, the threads of all of the threaded elements on one side of a median plane normal to the axis of said shaft being of the one hand and all of the threads of the threaded elements on the other side of said median plane being of the opposite hand, the pitch of the thread of each element being greater than the pitch of the thread of the element immediately thereadjacent and nearer to and on the same side of said median plane, and the crest portion of the threads of at least the two outermost elements being substantially flat and tapering toward said median plane.

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