H. A. FELTON.

TENSION DEVICE.

APPLICATION FILED MAY 2, 1918.

1,319,520.

Patented Oct. 21, 1919.

2 SHEETS—SHEET 1.

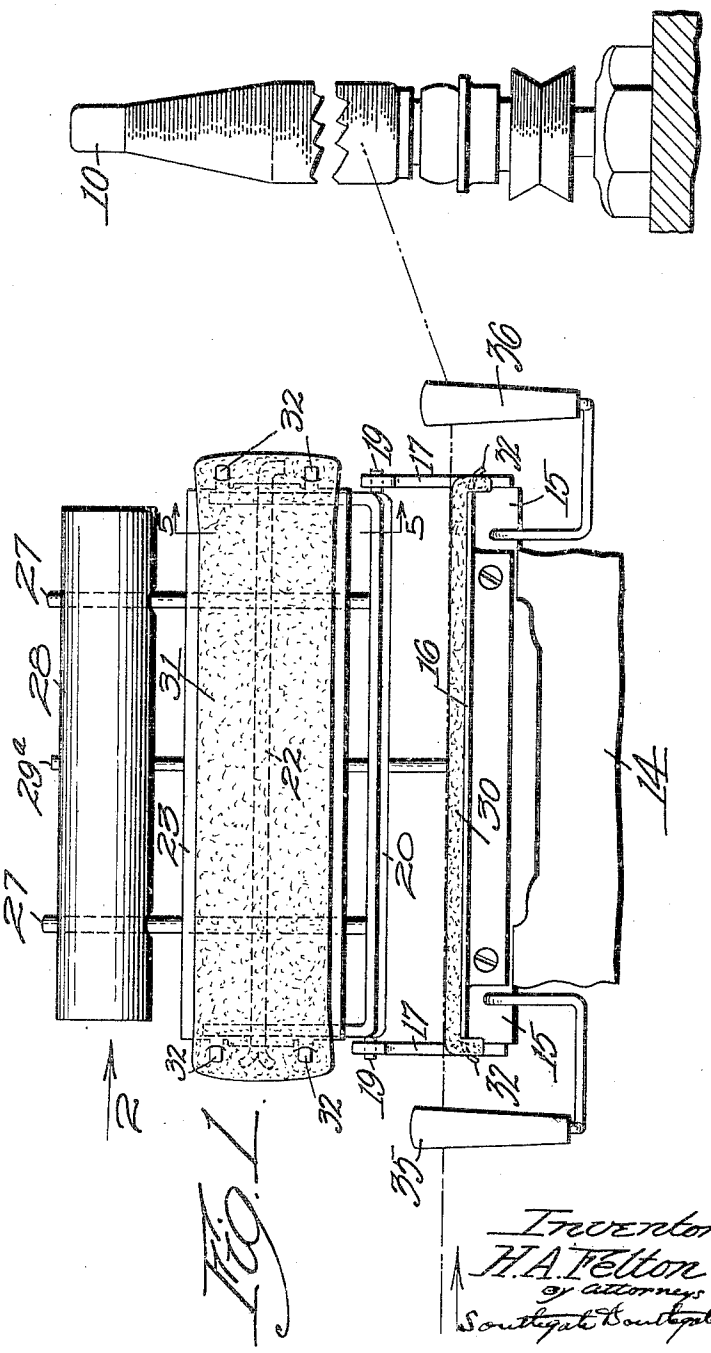

FIG. 1.

Witness
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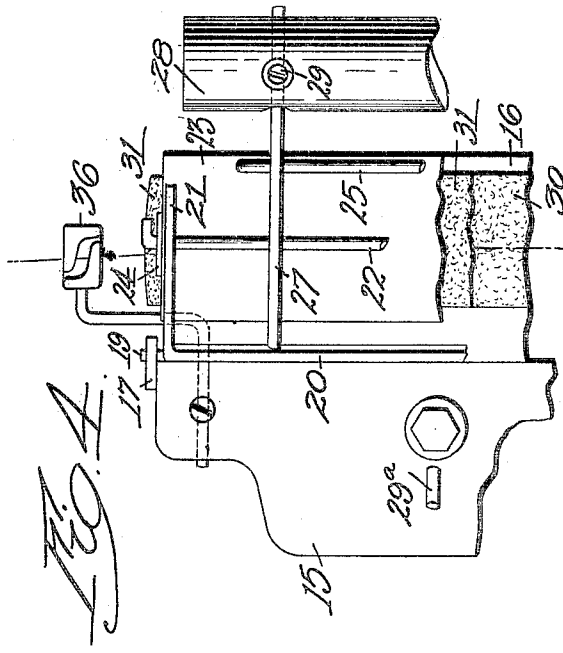

Fig. 4.

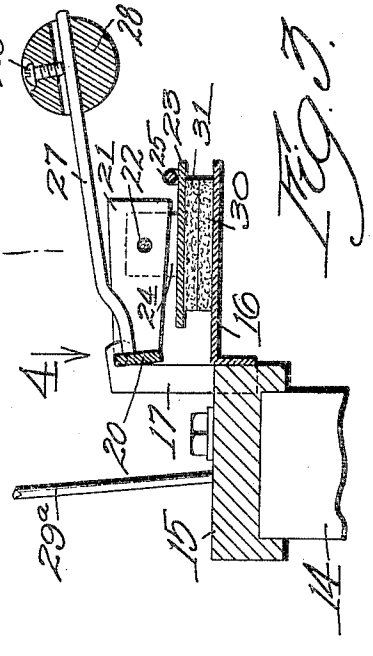

Fig. 3.

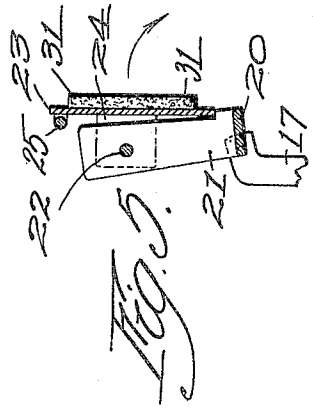

Fig. 5.

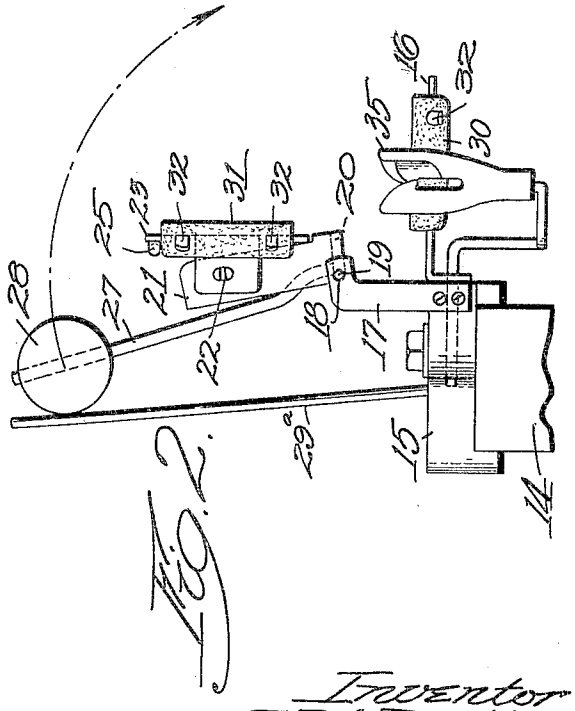

Fig. 2.

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UNITED STATES PATENT OFFICE.

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TENSION DEVICE.

1,319,520. Specification of Letters Patent. Patented Oct. 21, 1919.

Application filed May 2, 1918. Serial No. 232,147.

To all whom it may concern:

Be it known that I, HIRAM A. FELTON, a citizen of the United States, residing at Orange, in the county of Franklin and State of Massachusetts, have invented a new and useful Tension Device, of which the following is a specification.

This invention relates to a tension device capable of general use, but particularly designed for tensioning silk thread or yarn as it is delivered to a bobbin or cop for winding thereon.

The principal objects of the invention are to provide an improved tensioning surface which, while providing the necessary tension, will avoid the common tendency of ordinary tension devices to cause breaks; to provide a construction in which the tension can be varied easily but will not vary unless adjusted intentionally; to provide a tensioning device in which all parts can be adjusted readily for the purpose of adjusting the tension and changing the course of the yarn through the tension device; and more especially to provide for tensioning the yarn between a pair of flat surfaces, one movable relatively with respect to the other in such a way that wherever the yarn is placed between them it will receive the same tension and will be capable of being placed in different locations so as to follow different paths and prevent wearing the tension surface in any one spot, and to provide an improved tensioning surface that in addition to its tensioning function will clean the yarn. Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is an elevation of a tension device constructed in accordance with this invention, but shown open;

Fig. 2 is an end view of the same showing the parts in the same position;

Fig. 3 is a transverse sectional view of the same showing the parts in operative position;

Fig. 4 is a plan with the parts in the same position, and Fig. 5 is a sectional view on the line 5—5 of Fig. 1.

I find that while there are numerous tension devices on the market for various kinds of thread and yarn, those that are employed in winding of silk on bobbins are far from satisfactory. They do not have full control over the tightness of the winding and for that reason certain complicated compensating devices are employed in addition to the tension device itself. I find also that it is impossible to wind the bobbin as soft and loose with these devices as it ought to be in order to work to the best advantage when it is employed in the loom, or as uniformly hard as some mill people desire. This invention is designed to remedy these difficulties and to provide a tension surface which will not only effect the usual tension operation, but will remove the bunches and pieces of waste that inevitably cling to yarn, and under ordinary circumstances are wound on the bobbin with it.

Referring to the drawings it will be seen that the invention is shown as used in connection with the winding of a bobbin 10 with silk yarn. For this purpose the usual guide and vertically reciprocating traveler are employed.

The tension device itself is shown as mounted on the frame 14 of the machine and comprises a base 15 to which is attached a plate 16. This base supports a pair of brackets 17 each provided with a pivot socket or hole 18 for reciving a pivot 19 on a pivoted frame 20. In the form shown, this pivot consists of an integral arm extending outwardly from the frame on each end and engaging in the hole 18. One of the brackets 17 is shown removable and both can be if desired.

The frame 20 is provided with a pair of arms 21 adapted when in use, as shown in Fig. 3, to extend out over the plate 16 or at least substantially parallel with it. These arms support a longitudinal pivot shaft 22 on which is pivotally mounted a plate 23 by means of up-turned ends 24 which have perforations receiving the pivot shaft. The ends of this shaft are enlarged or shaped so as to retain the plate 23 on the shaft, but allow it to swing freely. This plate is provided with a small weight 25 on the outer edge which extends back under the arms 21 so that the lower surfaces of these arms form stops to limit the pivotal motion of the plate due to the weight 25.

The frame 20 is provided with arms 27 on which is adjustably mounted a weight 28 held in position by screws 29. This weight extends out beyond the plate and can be adjusted as desired to hold the weight down

with any desired degree of force. Furthermore the perforations through the weight 28 for receiving the arms 27 are considerably larger than these arms so that the weight can be shifted to an angular position if desired to provide more tension at one end than at the other so that the thread can enter or leave the long tension surface under reduced pressure if desired. A stop-rod 29[a] is mounted on the base 15 for engaging the weight and holding the parts in the open position shown in Figs. 1 and 2.

The two plates 16 and 23 are provided with means for holding two pieces of soft textile material 30 and 31 on their surfaces. I find felt to be the best material for this purpose. Preferably, it is held by integral lugs 32 on the ends of the plates which engage in perforations through the felt to hold the felt pieces stretched in position on the surfaces of their respective plates. The lugs on each plate are spaced apart so as to present a wide surface of flat stretched felt. The yarn or thread is intended to pass between these two strips of felt when the upper plate is held down by the weight 28 as shown in Figs. 3 and 4.

The reason for pivoting the plate 23 is to prevent any difference in tension between its outer and inner edge. On account of the weight 25, whenever the plate 23 is brought down its outer edge will engage the outed edge of the plate 16 first, or rather the felt will, and in this way the two bodies of felt are brought together in a simple manner without rubbing against each other or rubbing over the yarn so as to roll or displace it. It is to be observed that as the weight 28 can be adjusted to any desired distance from its pivot the force with which the tension is applied can be adjusted readily and that it will retain its adjustment. In this way any desired degree of pressure can be secured and a uniform distribution over the surface of the felt is insured. The latter feature is of special importance because obviously if the thread or yarn passed over the felt always at the same point it would eventually wear a furrow there. It is intended to make adjustments so that the thread will pass along the surface of the felt in different directions at different times so as to avoid this difficulty and permit the felt to be used for a long period of time. This adjustment is secured by mounting the porcelain guides 35 on arms 36 which are adapted to be adjusted back and forth. They are made adjustable by simply passing their ends through holes in the base 15 and securing them in adjusted positions by means of set screws or the like.

I find in practice that the tensioning of the yarn by means of felt surfaces is a useful advance in this art not only because is furnishes soft surfaces engaging the thread or yarn, but because the latter is drawn through comparatively a long course throughout which it is engaged all the time by the surface of the felt, and this tends to remove the waste and irregular portions clinging to it that otherwise would be wound on the bobbin. This way of tensioning is particularly valuable because by means of it the bobbin can be wound much softer than has been the case heretofore and yet an even tension maintained on the yarn so that it will be wound uniformly from one end to the other. Or, if desired, it can be wound very hard by this device. I find that bobbins can be wound so soft by this mechanism that experienced weavers are unable to believe that they will operate properly in a loom and yet no difficulty is met with in weaving from them for the reason that they are wound under such uniform tension. The pieces of felt can be used for a long time and when too much worn on the surface can be taken off and reversed so that they have a long durability. The function of cleaning the thread is especially important.

Although I have illustrated and described only a single form of the invention, I am aware of the fact that modifications can be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited to all the details of construction herein shown and described, but what I do claim is—

1. In a yarn tensioning device, the combination of two tension members between which the yarn is adapted to be drawn, said members having continuous felt surfaces for engaging the yarn between which the yarn passes from end to end without moving out of contact with said surfaces, yarn guides at the ends of said surfaces adjustable substantially in the plane along which said felt surfaces engage each other to change the course of the yarn along said surfaces, and means for holding one of said members against the other with a uniform pressure.

2. In a tension device, the combination of a stationary member, a pivoted frame adjacent thereto, and a plate pivotally mounted on said frame and free to swing on its pivot, said plate and first member having coöperating tension surfaces for receiving the yarn between them, said plate having a weight on it for holding its outer edge down.

3. In a tension device, the combination of a horizontal member and a pivoted frame above it, a plate pivotally depending from said frame at a distance from the pivot on which the frame is mounted and free to swing on its pivot, whereby it will exert uniform pressure throughout its area, said

plate and first named member having cooperating flat felt surfaces for receiving the yarn between them.

4. In a yarn tension device, the combination of a stationary member having a flat tension surface and a movable member having a coöperating tension surface between which surfaces the yarn to be tensioned is adapted to be run, means for holding the movable member against the stationary member with yielding pressure, yarn guides at the ends of said surfaces, and means whereby said yarn guides can be adjusted substantially in the plane of said surfaces and transversely to the direction of the yarn to change the direction which the yarn takes in passing along said surfaces.

5. In a tension device, the combination of a member and a pivoted frame adjacent thereto, a plate connected with said frame, said plate and first named member having coöperating felt surfaces for receiving the yarn between them, a weight and means supported by said frame at each end for supporting the weight, said weight being capable of being adjusted toward and from the frame independently at both ends to vary the pressure from end to end.

6. In a tension device, the combination of a stationary member and a pivoted frame adapted to rest on it, said frame having a plate connected therewith, said plate and first named member having coöperating felt tension surfaces for receiving the yarn between them, means for holding the plate against the first named member with a yielding pressure and means for providing different degrees of tension at the two ends of the friction surfaces.

7. In a tension device, the combination of a member and a pivoted frame adjacent thereto, a plate connected with said frame, said plate and first named member having coöperating tension surfaces for receiving the yarn between them, arms projecting from said frame, and a weight supported by said arms, said weight capable of being adjusted toward and from the frame at either or both ends.

8. In a tension device, the combination of a stationary member and a pivoted frame adjacent thereto, a plate pivotally mounted on said frame at a distance from the pivot on which the frame is mounted and free to swing on its pivot, whereby it will exert uniform pressure throughout its area, said plate and first named member having cooperating tension surfaces for receiving the yarn between them, and means for forcing the frame toward the first named member.

9. In a tension device, the combination of a stationary member and a pivoted frame adjacent thereto, a plate pivotally mounted on said frame and free to swing on its pivot, said plate and first named member having coöperating tension surfaces for receiving the yarn between them, said plate having a weight on it for holding its outer edge down, and a stop for preventing it from swinging down beyond a certain limit.

In testimony whereof I have hereunto affixed my signature.

HIRAM A. FELTON.