June 26, 1934. A. W. ATWOOD ET AL 1,964,377

SUPPORT FOR THREAD GUIDES

Filed Aug. 23, 1930

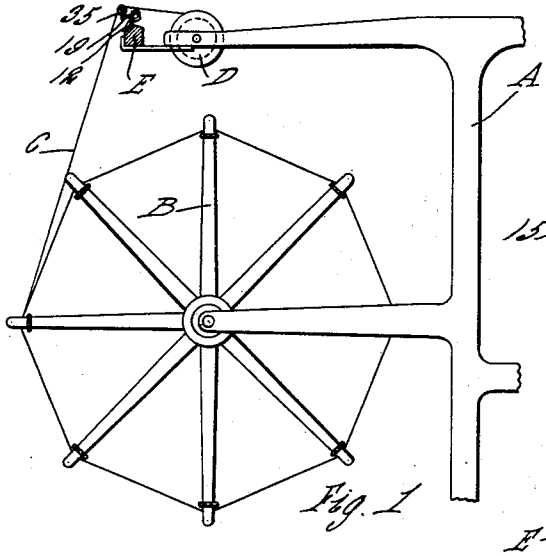


Fig. 1

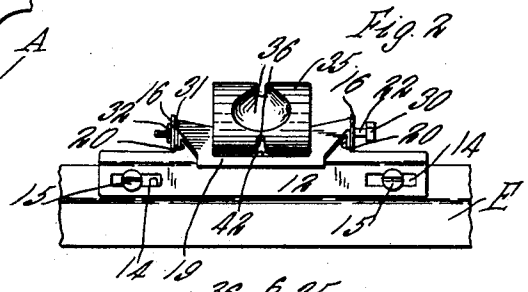


Fig. 2

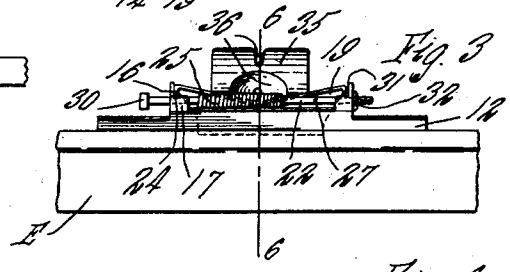


Fig. 3

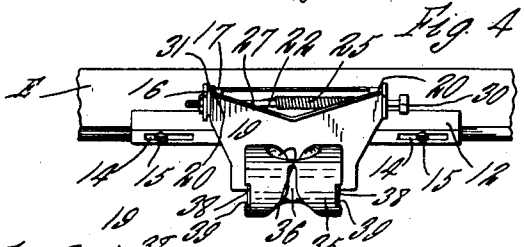


Fig. 4

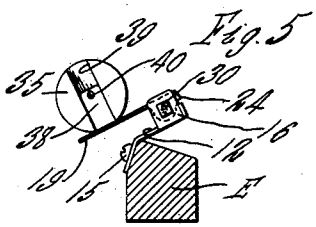


Fig. 5

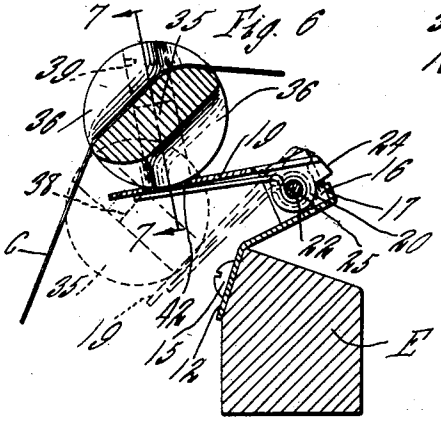


Fig. 6

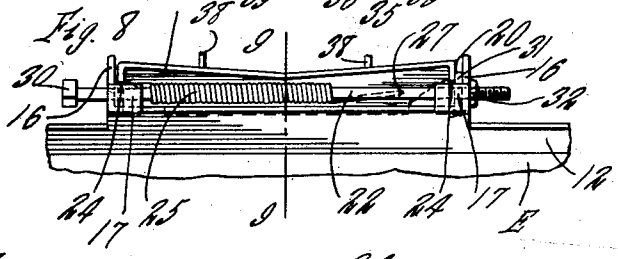


Fig. 8

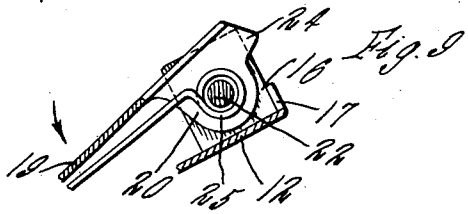


Fig. 9

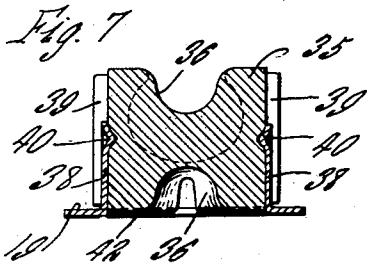


Fig. 7

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Patented June 26, 1934

1,964,377

UNITED STATES PATENT OFFICE

1,964,377

SUPPORT FOR THREAD GUIDES

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Application August 23, 1930, Serial No. 477,196

13 Claims. (Cl. 242—157)

This invention relates to improvements in thread guiding devices such as are used in various types of machines employed in connection with the textile industry.

The objects of the invention are to support a thread guide by spring tension in such a manner as to readily yield when the thread is subjected to an increased tension without subjecting the thread to excessive strain; also to provide a thread guide of this kind in which the weight of the guide block or member is opposed by a spring, so that any tensioning of the thread causes the guide block to move downwardly against the action of the spring, so that the weight of the guide block and supporting parts thereof do not act to place strains upon the thread; also to provide a thread guide which is removably mounted on the yielding part of the guide support so that the guide can readily be removed and replaced by another guide without requiring adjustment of the guide; also to provide a device of this kind with a thread guide having a plurality of thread guide grooves formed therein, and formed to be readily mounted on and removed from its support; also to provide improved means for supporting a grooved thread guide on a traverse bar; also to provide a thread guide of this kind with means for adjusting the tension of the spring for varying the amount of tension which is placed on the thread; and also to improve the construction of thread guiding devices of this kind in other respects hereinafter specified.

The thread guiding device is shown in the accompanying drawing as applied to a machine for unwinding raw silk from the skeins in which it is usually sold, and winding the same on spools or bobbins for further treatment. In this operation, the thread usually includes about from three to five fibers or filaments of silk, and if for any reason these threads are subjected to excessive tension, as might be the case if the thread in the skein is slightly tangled or underlies other threads, this tension, even though it may not tear the thread, stretches the same beyond its elastic limit, so that it becomes easily torn and thus produces a defect or weak point in the material into which the thread is eventually incorporated. While this invention is shown in the accompanying drawing for relieving such tension on threads of this kind, it will be understood that it is not intended to limit the invention for use in connection with machines of this kind, since the invention is readily applicable for use in connection with any other kind of machine, in which a thread may be wound or unwound and passed over a thread guide, and this invention may be used in connection with textile fibers other than silk.

In the accompanying drawing:

Fig. 1 is a fragmentary side elevation of one type of winding machine having a thread guide embodying this invention applied thereto;

Fig. 2 is a front elevation of the thread guide, showing the same mounted on a traverse bar;

Fig. 3 is a rear elevation thereof;

Fig. 4 is a top plan view thereof;

Fig. 5 is an end view thereof;

Fig. 6 is a transverse sectional elevation thereof, on an enlarged scale, on line 6—6, Fig. 3;

Fig. 7 is a fragmentary section thereof, on line 7—7, Fig. 6;

Fig. 8 is a rear elevation of the thread guide support, the guiding member for the thread being omitted from the same;

Fig. 9 is a fragmentary transverse sectional view thereof, on line 9—9, Fig. 8.

Referring to Fig. 1, A represents the frame of a winding machine and B a swift upon which a skein of silk may be supported, and from which the thread C is unwound. D represents a bobbin or spool, which is driven in any suitable or usual manner to cause the thread to be wound thereon. The machine is provided with the usual traverse bar E upon which the thread guides are mounted, the traverse bar moving back and forth in the direction of its length to cause the thread to be evenly wound on all portions of the spool D. All of these parts have heretofore been used in connection with winding machines and of themselves constitute no part of this invention, and are illustrated merely to show one example of a machine in connection with which our improved thread guide support may be used.

The thread guide support includes a frame member 12, which may be suitably mounted upon the traverse bar E. In the particular construction shown, the frame member is provided with slots 14 through which screws 15 extend, the screws being secured in the traverse bar E. These screws permit of the correct positioning of the thread guide and support with reference to the traverse bar and to the spool or bobbin D. The frame member 12 may be of any suitable or desired construction, that shown being formed of sheet metal, which may be bent to any desired shape, and which includes upwardly extending ears or lugs 16 on which may be mounted other parts of the thread guide support, and one or more upwardly extending flange or stop mem-

bers 17, the purpose of which will be hereinafter explained.

19 represents a yieldingly mounted member of the thread guide support, which may be pivotally or otherwise movably connected with the frame member 12 in any suitable or desired manner. In the particular construction shown, the yieldingly mounted member 19 is also made of sheet metal, but it will be obvious that this member, as well as the frame member 12, may be made of other material, if desired. The member 19 is provided at opposite sides with downwardly extending lugs or parts 20 arranged adjacent to the upwardly bent parts 16 of the frame member 12 and pivotally connected thereto in any suitable or desired manner, for example, by means of a pivot pin 22. The depending parts 20 may be provided with rearwardly extending stop shoulders 24, arranged to engage with the stop flanges 17 of the frame member 12 when the yielding member 19 moves into its upper position.

Any suitable or desired means may be employed for yieldingly supporting the yielding member 19 on the frame member 12. In the particular construction shown, a coil spring 25 is arranged with the coil portion thereof extending around the pivot pin 22. One end of the coil spring 25 may be secured through an aperture 27 in the pivot pin 22, and the other end 28 of this spring may bear against the undersurface of the pivoted member 19 to press against the same in a direction to swing the stop shoulder 24 against the stop flange 17. The pivot pin 22 may also serve for the purpose of adjusting the tension of the spring 25, and for this purpose, the pin 22 is provided at one end thereof with a head 30 by means of which the pin may be turned into any desired position. At the other end, the pin is provided with a washer or part 31 secured on the pin against movement lengthwise thereof, and a nut 32 engaging the threaded end of the pin may be used to clamp the pin in its adjusted position, this nut engaging the upwardly extending part 16 of the frame member 12. Consequently, by turning the adjusting screw, the tension of the spring may be varied as desired, and may be locked in the desired position by the nut 32.

The thread C passes over and contacts with a groove in a thread guide 35 which is mounted on the swinging member 19. The thread guide may be of any suitable or desired form, and in the particular construction shown, the thread guide is in the form of a block which is approximately cylindrical in shape and has a plurality of thread guide grooves 36 formed therein, two of these grooves being shown in the particular construction illustrated, but it will be obvious that one or more than two of these grooves may be employed, if desired. The thread guide may be made of porcelain or other suitable material.

The means for mounting the guide block on the pivoted member 19 are preferably such that the guide block may be readily removed from the pivoted member and replaced by another guide block. Also it is desirable that the guide block be held in a definite relation to the pivoted member, so that when the thread guide support has once been correctly positioned on the traverse bar E by means of the screws 15, no further positioning of the thread guide support is necessary when the guide block is replaced by another guide block. Any suitable means may be employed for accomplishing this result, and in the particular construction shown by way of example, the pivoted member 19 is provided with upwardly extending arms 38, which are adapted to engage in grooves 39 formed in the opposite ends of the thread guide 35. Preferably, the arms 38 are also provided with centering projections 40 which are adapted to enter into and engage with corresponding depressions in the thread guide 35 so that the projections 40, together with the arms 38 entering in grooves 39, will definitely position the thread guide 35 on the pivoted member 19. When two thread guide grooves 36 are employed, it is possible to remove the thread guide 35 from engagement with the arms 38, and then replace it into engagement with these arms after turning it through 180° about its axis. If a larger number of thread guide grooves are provided, the depressions 39 in the ends of the guide blocks must be arranged in accordance with the thread guide grooves.

It is desirable to form the arms 38 by striking them out of the metal of the pivoted member 19, thus leaving a recess 42 in this member and in order to securely hold the thread guide 35 in correct position with reference to the pivoted member 19 the projections 40 on the arms are preferably so spaced that a portion of the thread guide 35 will enter into the recess 42, thus securely holding the thread guide in correct relation to the pivoted member 19 without depending upon the rigidity of the arms 38.

By means of the construction and arrangement described, it will be noted that the spring 25 acts in opposition to gravity acting on the thread guide 35 and the movable part of the support, and that a thread passes over the guide. Consequently, any tightening on the thread C will tend to move the thread guide downwardly. Consequently, the inertia of the thread guide is counteracted by gravity, so that practically only the action of the spring resists movement of the thread guide. In winding raw silk threads, which may include only three filaments or fibers of silk, and which threads consequently are very easily broken or stretched beyond their elastic limit, extreme care must be used to avoid subjecting these threads to any strains which would break or weaken the thread, since a weakened thread will soon cause a defect in the fabric of which the thread forms a part. By means of the construction described, any resistance of the thread to unwinding from the skein on the swift B will exert a force in a downward direction on a thread guide, and since this force acts approximately in the same direction as gravity, this force will be resisted only by the action of the spring, so that the thread guide yields as a result of such a pull without subjecting the thread to any damaging strain. In moving in the reverse direction upon release of the strain, the spring must lift the weight of the thread guide against gravity, thus preventing a sudden and rapid upward movement of the thread guide, which might cause releasing of the thread from the swift more rapidly than is required by the spool or bobbin D. Consequently, in the normal operation of winding, the thread guide support maintains an approximately constant tension on the thread and absorbs severe pulls and jerks on the thread which result when the thread guide is rigidly mounted on the traverse bar, and which would result if the thread were obliged to overcome the inertia of weights acting on the thread guide.

Consequently, by means of the arrangement described, the thread is not only relieved of

strains by the mounting of the thread guide, but in case of a sudden release of the strain, a substantially uniform pull is maintained on the thread. If a break in the thread occurs, the thread guide will be moved into its uppermost position, which will readily indicate to the attendant that the particular thread is broken.

We have also found that in order to produce the least variation in upward pressure exerted by the spring upon the thread guide, it is desirable to arrange the spring 25 in the manner clearly shown in Fig. 9 so that the application of pressure to the thread guide tends to uncoil the spring, and in cases where very delicate threads are being worked upon, this arrangement of the spring is preferred. A spring operating in the opposite manner, namely, in the direction to coil up the spring rather than to uncoil it, may be used, if desired.

We claim as our invention:

1. A support for mounting a thread guide on a traverse bar, including a frame member mounted on the traverse bar, a member pivoted on the frame member, a thread guide on said pivoted member, and a spring interposed between said members to subject the thread to a yielding tension.

2. A support for mounting a thread guide on a traverse bar, including a frame member secured to the traverse bar, a member pivoted on the frame member to swing upwardly and downwardly, a thread guide mounted on the pivot member and over which the thread passes during winding of the same, and a spring interposed between said members to yieldingly hold said thread guide in an upper position and to yield when the tension of the thread increases to permit the thread guide to move downwardly.

3. A support for mounting a thread guide on a traverse bar, including a frame member secured to the traverse bar, a member pivoted on the frame member to swing upwardly and downwardly, a thread guide mounted on the pivot member and over which the thread passes during winding of the same, a spring interposed between said members to yieldingly hold said thread guide in an upper position and to yield when the tension of the thread increases to permit the thread guide to move downwardly, and cooperating stops on said members to limit the upward movement of said thread guide.

4. A support for mounting a thread guide on a traverse bar, including a frame member secured to the traverse bar, a member pivoted on the frame member to swing upwardly and downwardly, a thread guide mounted on the pivot member and over which the thread passes during winding of the same, and a coil spring having one of its ends engaging said pivoted member to yieldingly hold the same in an upper position against the tension of the thread, said spring being arranged so that when the same is deflected by the tension of the thread, the spring is uncoiled.

5. A support for mounting a thread guide on a traverse bar including a frame member mounted on a traverse bar, and a member pivoted on said frame member, a pivot pin connecting said members, a thread guide mounted on said pivoted member, a spring coiled about said pivot pin and having an end thereof engaging said pivoted member, said spring being arranged so that the movement of the pivoted member by increased tension of the thread causes the spring to be deflected in a direction to uncoil the same.

6. A support for a thread guide block having a plurality of guide grooves formed therein, said support including spring members adapted to engage the ends of said block, and parts on the ends of said guide block adapted to be engaged by said spring arms and so located with reference to said grooves as to correctly position said block lengthwise of said support to place any groove therein in correct operative relation to said support, and cooperating parts on said block and said arms for yieldingly holding said block in correct relation lengthwise of said arms.

7. A support for a thread guide block having a plurality of thread guide grooves therein, said guide block having recesses on the ends thereof located in definite relation to said grooves, spring arms forming a part of said support and adapted to enter into said recesses to yieldingly hold said block in operative position lengthwise of said support with a thread guide groove correctly placed with regard to said support, and co-operating parts on said block and said arms for yieldingly holding said block in fixed relation lengthwise of said arms.

8. A support for mounting a thread guide on a traverse bar including a frame member mounted on a traverse bar, and a member pivoted on said frame member, a pivot pin connecting said members, a thread guide mounted on said pivoted member, a spring coiled about said pivot pin and having an end thereof engaging said pivoted member, and the other end thereof secured to said pin, and means for securing said pin in different positions about its axis to vary the tension of said spring.

9. A support for a thread guide block having a plurality of guide grooves formed thereon, recesses in the ends of said block and arranged in definite relation to said guide grooves, said support including spring arms adapted to enter into the grooves in said block and having portions near their ends which project toward said block, said block having depressions in said recesses into which said projecting portions of said arms enter when said spring arms have entered said recesses to the desired extent to hold said block in correct relation to the support.

10. A thread guide block having a pair of thread guide grooves arranged at opposite sides of said block, a diametrically extending recess in each end of said block and located in fixed relation to said guide grooves, and a depression in each recess in the axial portion of the guide block, said recess and depression being adapted to cooperate with parts in the traverse bar to support the block in position to place either thread guide groove into an operative position.

11. Means for winding threads including a traverse bar, a member pivoted on said bar and having a base portion and a pair of yielding arms extending away therefrom, a guide block disposed between said arms and having thread guide grooves extending across its periphery at opposite sides thereof and having its ends operatively connecting with said arms for positioning said block on said member with a guide groove facing away from said base member to receive the thread, and the latter having a slot extending between said arms and into which a peripheral portion of said block with another of said grooves therein extends with said peripheral portion engaging with the sides of said slot and with the ends of said block abutting the ends of said slot to hold said block against turning or endwise movement, and whereby said block can be reversed to permit said second grooved pe-

ripheral portion thereof to extend away from said member with said second groove in operative position to receive the thread.

12. A thread guide block for a winding machine, said block having a plurality of thread guide grooves arranged thereon in peripheral alinement, said block also having opposite transverse ends in each of which is formed recesses corresponding in number and each disposed in a predetermined relation to said guide grooves for the reception of means on a traverse bar for supporting said block on said bar so as to dispose any one of said guide grooves in a selected position, and a depression in each end of said block which is in common relation to all of said guide grooves and to the adjacent recesses to receive a part on said supporting means for retaining said block with a selected guide groove in the same relation as with any other selected groove to said traverse bar.

13. In a thread winding machine having a traverse bar reciprocable in a horizontal direction, a thread guide movably mounted upon said traverse bar and over which said thread is drawn, spring means for yieldingly supporting said guide normally in an upper position against gravity and yielding to permit said guide to move downwardly upon an increase in tension upon said thread, and means for causing said guide to move in a prescribed path in its up and down movements with respect to said traverse bar in any position assumed thereby during its reciprocatory movements.

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