T. J. HAYES.
THREAD DELIVERING MECHANISM.
APPLICATION FILED AUG. 20, 1917.

1,367,387.

Patented Feb. 1, 1921.

Fig. 1.

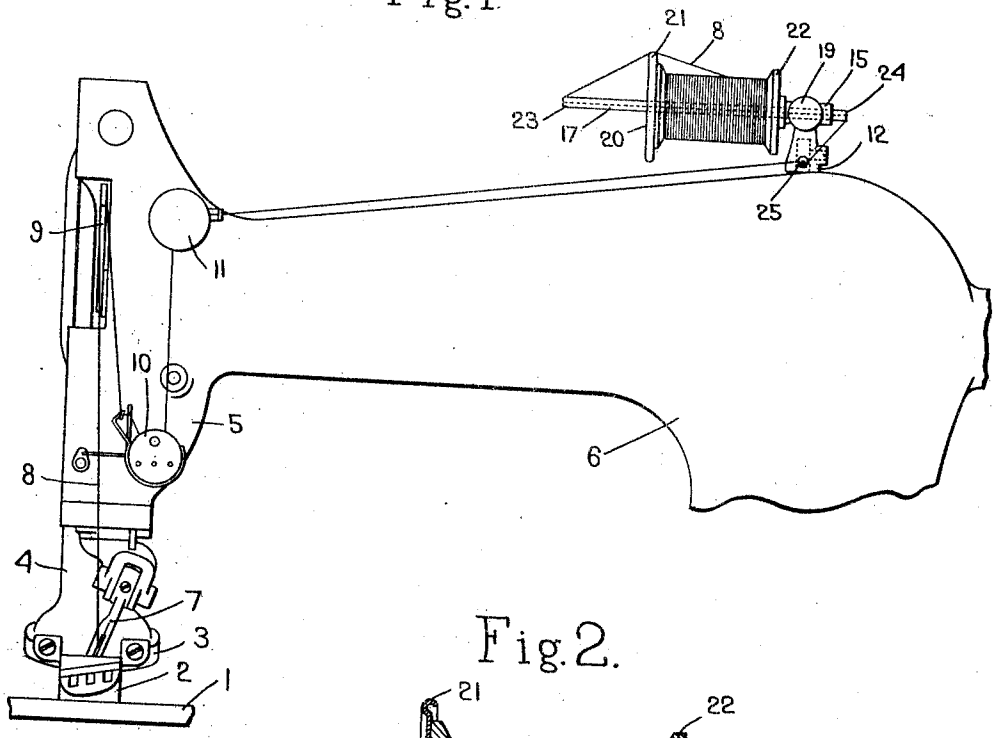


Fig. 2.

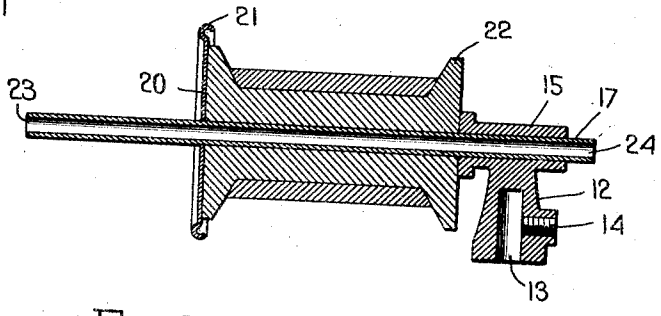
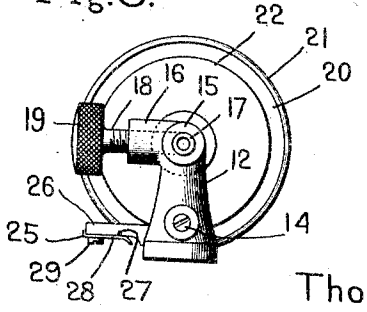


Fig. 4.



Fig. 3.



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UNITED STATES PATENT OFFICE.

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THREAD-DELIVERING MECHANISM.

1,367,387. Specification of Letters Patent. Patented Feb. 1, 1921.

Application filed August 20, 1917. Serial No. 187,058.

To all whom it may concern:

Be it known that I, THOMAS J. HAYES, a citizen of the United States, and resident of Roslindale, county of Suffolk, State of Massachusetts, have invented an Improvement in Thread-Delivering Mechanism, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to improvements in thread delivering mechanisms, particularly adapted for sewing machines and other machines in which thread is unwound from a spool or other form of thread carrier and the object of the invention is to provide a thread delivery mechanism from which the thread may be drawn by any suitable mechanism without producing kinks or knots in the thread.

In many forms of thread delivering mechanisms, and particularly those forms in which the thread is pulled from the thread carrier over the end of the spindle or spool upon which the thread is wound, the spirals of thread which are successively drawn off form kinks or knots which, when drawn into guiding mechanism for directing the thread to the instrumentality which pulls it off, causes the breakage of the thread or at least an undesirable tension upon it. This action also occurs to a considerable extent in mechanisms in which the thread is drawn off of a rotating spool. The object of the present invention is to provide means which will permit the thread to be drawn off from a stationary yarn carrier and delivered to the instrumentality which draws it off, whether the same be the stitch forming mechanism of the sewing machine, a spinning machine or other device in which threads or yarns are used, without danger of knotting or kinking.

Another object of the invention is to provide a spool holding device which may be adapted to various lengths of spools and which will hold the same properly while the thread is being drawn off.

Other objects of the invention will more fully appear from the following description and the accompanying drawings and will be pointed out in the annexed claims.

A preferred embodiment of the invention is illustrated in the accompanying drawings as applied to the arm of a sewing machine of the blind stitch type in which a reciprocating or oscillating needle and complemental stitch forming mechanism are located and operated above the work support, but it is to be understood that the invention may be used with any sort of thread manipulating device for which it is adapted.

In the drawings;

Figure 1 is a view showing a portion of the sewing machine arm and head with a preferred embodiment of my thread delivering mechanism supported upon the said arm,

Fig. 2 is a longitudinal vertical sectional view of the standard and spool carrier supported thereby,

Fig. 3 is an end elevation of the standard and spool carrier, and,

Fig. 4 is a view of a hook for drawing the thread through the hollow spindle of the thread delivering device.

The sewing machine which is partly illustrated herein is of the "Arbetter" type of blind stitch sewing machine and comprises a base 1 through which projects the work support 2 which coöperates with a presser foot 3 carried by a hook bracket 4 depending from the sewing machine head 5 which is carried by the usual overhanging arm 6. The stitch forming mechanism which is carried by the head comprises an oscillating needle bar 7 carrying a curved needle which is actuated by suitable mechanism (not shown) within the arm and head of the machine, the complemental stitch forming mechanism preferably being a rotary hook carried by and revolving within the hook bracket 4 in operative relation to the needle.

The thread 8 which runs to the needle is engaged by the arm 9 of the take-up mechanism, which may be of any usual form and is drawn by the action of the needle and take-up through a slack thread take-up 10 and tension device 11 from the spool. These parts of the sewing machine may be of any usual type.

It is customary in delivering thread to the stitch forming mechanism of sewing machines to draw the same directly from the spool, said spool being usually rotatably mounted upon a suitable spindle supported at a convenient point upon the sewing machine, as for example, the top of the sewing machine arm.

When the thread is drawn from the spool by the intermittent action of the needle and take-up mechanism, the momentum of the spool often causes the throwing off of an excessive amount of thread during the time the take-up mechanism has ceased to draw upon it and this thread, by reason of the twist in it curls up into the form of kinks or knots which are drawn into the tension device and sometimes cause the breakage of the thread but more often interferes with the proper tension used in setting the stitch.

The present invention is designed to obviate this kinking and knotting of the thread. In the preferred embodiment of the invention illustrated herein the thread delivering device comprises a bracket 12 having a vertical aperture 13 to receive a stud extending from any suitable part of the sewing machine, as the top of the arm, said standard being secured to said stud by a set screw 14. The standard is provided at its top with a transversely extending journal 15 with a laterally extending boss 16. The journal 15 is longitudinally bored to receive a hollow spindle 17 which may be adjustably secured therein by a set screw 18 threaded into the boss 16 and abutting at its end against the spindle, the outer end of said set screw preferably being provided with a suitable milled head 19.

A disk 20 having a smooth peripheral guiding surface is secured to the spindle 19 at suitable distance from the ends thereof by solder, sweating or any other desirable manner. This disk may be made of sheet metal and its periphery beaded to present a curved or partly spherical surface 21 which will serve as a thread guide without abrading the thread which runs over it.

In the use of the device the spool 22 is clamped between the disk 20 and the end of the journal 15 and thereby prevented from rotation. The thread 8 from the spool is carried over the curved surface 21 of the periphery of the disk 20, thence through the receiving end 23 of the spindle, then from the delivery end 24 of the spindle is led through a tension instrumentality and thence through the usual tension 11, the slack thread take-up 10 and take-up 9 to the needle.

The tension instrumentality 25 through which the thread passes from the delivery end 24 of the tubular spindle serves to maintain the thread taut between it and the tension device 11 or the instrumentality which draws the thread from the spool.

This tension instrumentality 25 preferably is located quite closely to the delivery end 24 of the tubular spindle so that the thread running from the spindle to it will not in any event be likely to obtain sufficient slack to permit its kinking. This tension instrumentality 25 also prevents the thread from kinking between itself and the tension device 11 or the operating mechanism which draws the thread from the spool.

The tension instrumentality 25 may be of any suitable character. As illustrated herein the standard 12 is provided with a laterally extending arm 26 having on its under surface a thread guiding groove 27, the thread being clamped in said groove and a slight tension applied thereto by a spring plate 28 which is secured to said arm by a screw 29.

In the operation of the device the thread manipulating instrumentality, which is illustrated herein as a reciprocating needle sewing machine, intermittently draws upon the thread pulling the same through the tension instrumentality and the tubular spindle 17. As the thread is thus drawn longitudinally the portion which extends from the receiving end 23 of the tube over the periphery 21 of the disk 20 revolves in the form of a broad loop around the spindle following the spirals in which it is coiled upon the spool.

As the thread is drawn at substantially right angles to the spirals and is lifted from the body of the spool by the guiding surface 21 of the disk 20 it is drawn off smoothly with no momentum produced which would cause the discharge of whole spirals or loops from the spool, consequently the thread runs smoothly from the spool through he tubular spindle, to the tension instrumentality 25, the latter being located sufficiently near the delivery end 24 of the spool to prevent kinking of the thread due to the twist in the thread itself.

The thread running from the tension instrumentality 25 to the mechanism which draws it off is maintained taut in the manner aforesaid so that there is no possibilty of loops or kinks being drawn into the tension device or other thread engaging or manipulating members.

It will be understood that while my invention is particularly designed for sewing machines of any type whether chain or lock stitch it is adapted for other uses such as in connection with spinning machines, spoolers or other machines in which thread is unwound from a thread carrier and delivered to an instrumentality for manipulating the same.

It will also be understood that my invention is not limited to the use of a stationary thread guiding device for causing the thread to unwind from the spool in the form of a broad loop but that any device or instrumentality which will serve the purpose may be used within the spirit and scope of the following claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. Thread delivery mechanism comprising a stand, a spool supporting member consist-

ing of a tubular spindle having secured thereto a disk of larger diameter than the end of the spool and provided with a smooth periphery, means for adjustably securing said spindle to said stand whereby the spool may be clamped between said disk and said stand and means for guiding the running thread from said spool over the periphery of said disk and through said spindle whereby the thread will be unwound from said spool in a broad loop.

2. Thread delivery mechanism comprising a stand, a spool supporting member consisting of a tubular spindle having secured thereto a disk of larger diameter than the end of the spool and provided with a smooth periphery, means for adjustably securing said spindle to said stand whereby the spool may be clamped between said disk and said stand, said spindle being extended beyond said disk whereby the running thread may be carried from said spool over the periphery of said disk and through said spindle to cause the thread to be unwound from the spool in a broad loop.

3. Thread delivery mechanism comprising a stand, a spool supporting member consisting of a tubular spindle having secured thereto a disk of larger diameter than the end of the spool and provided with a smooth periphery, means for adjustably securing said spindle to said stand whereby the spool may be clamped between said disk and said stand, means for guiding the running thread from said spool over the periphery of said disk and through said spindle whereby the thread will be unwound from said spool in a broad loop and means located in proximity to the delivery end of the spindle for applying tension to the thread.

In testimony whereof I have signed my name to this specification.

THOMAS J. HAYES.