Aug. 11, 1953 D. Y. NOVOTNY 2,648,501

SPOOL HOLDER

Filed Oct. 15, 1949

FIG. 4.

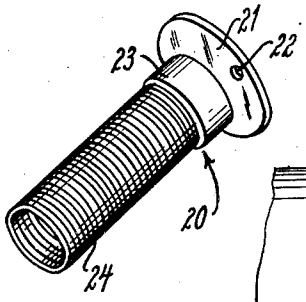


FIG. 1.

FIG. 2.

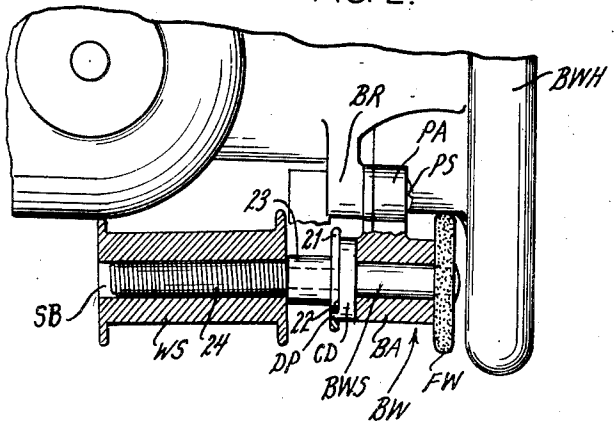
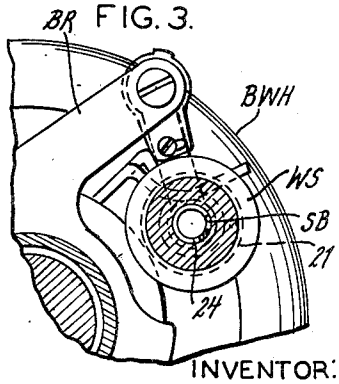


FIG. 3.



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SPOOL HOLDER

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1 Claim. (Cl. 242—20)

1

This invention relates to improvements in spool bobbins, and more particularly to a novel attachment for sewing machines, and which is so designed as to permit the rotation of a standard wood or other thread spool by powered actuation thereof from the bobbin winder usually supplied with and as a part of a sewing machine head.

Incident to machine stitching of the variety of articles of sewing encountered by both domestic and industrial machine operators, there frequently arises a need for substitution of thread of one color, size, grade or material, for another; for example, in the sewing of garments of certain types it may be necessary to shift from the usage of black thread, to white thread, or a transition from silk to cotton, as dictated by the different fabrics encountered in stitching a given product or garment. The present invention accordingly has as its principal objective, the attainment of an improved, simplified, and readily applied attachment for sewing machine heads, particularly the bobbin winder thereof, which will enable removal of the thread from a bobbin and rewinding thereof onto a supply spool.

The present invention may be structurally summarized by reference to an advanced embodiment thereof consisting essentially of an open-end winding arbor adapted to receive a conventional or similar thread spool, and which is conveniently powered from the usual bobbin winder attachment of a sewing machine head.

Additional major objectives of the invention include the provision of a novel spool-receiving and driving arbor or shaft which is susceptible of axial deflection, and which further is susceptible of a diametral reduction under a twisting stress, for the purpose of facilitating the application of a spool thereover, and with an added advantage of augmented frictional retention of the spool when in place.

More particularly expressed in reference to the disclosed embodiment, the invention objectively includes an axially and diametrally resilient spool arbor for the purposes noted, and which may, with many advantages, consist of a coil spring supported on an extension of the axis of the bobbin winder of the machine with which the attachment is utilized.

The foregoing and numerous other objects of the invention will more clearly appear from the following detailed description of a preferred embodiment, particularly when considered in connection with the accompanying drawing, in which:

Fig. 1 is a fragmentary side elevational view of a sewing machine head to which the present improvements are applied and showing the spool bobbin attachment in a position of usage for rewinding purposes;

2

Fig. 2 is a fragmentary horizontal sectional elevation, in which portions of the improved attachment and portions of the bobbin winder are shown in section, the location of this figure being indicated by line 2—2 of Fig. 1;

Fig. 3 is a fragmentary sectional elevation of portions of the structure of Fig. 1, particularly as viewed along line 3—3 of Fig. 1, and

Fig. 4 is a perspective view of the attachment as such, removed from the bobbin winder of the machine.

Referring now by characters of reference to the drawing, that portion of the sewing machine head which is illustrated herein for completeness, includes a right hand pillar P of the head, a balance wheel BWH, a spool post SP, and a bobbin winder generally indicated at BW. As is well known to those skilled in the art, the bobbin winder includes a bearing arm BA which is carried by a pivoted arm PA, the latter being movable about an axis identified with a pivot screw PS, which latter is threaded into or otherwise supported from a bracket BR. As will be understood, the bobbin winder, although shown in operative position, may be swung about the pivot PS, so as to bring it to the inoperative position which it occupies during normal sewing operations. When, however, it is desired to operate the bobbin winder BW it is brought to the position shown by Fig. 1, in which a friction wheel FW engages the hub portion of the balance wheel BWH so as to cause rotation of the bobbin winder shaft BWS, and therewith, a driving disc or crank disc CD. The crank disc is conventionally provided with a drive pin DP which extends through an aperture near the periphery of one of the end plates such as EP of a conventional short type bobbin, one of which is shown by way of example, for completeness, at the lower portion of Fig. 1.

The machine head shown by Fig. 1 is provided with a lower spool post LSP, presently shown as rotatively positioning a supply bobbin BO from which the thread TH is trained over a small guide pulley GP, thence vertically onto either a bobbin, or the spool bobbin constituting the present attachment and generally indicated at 20. It may here be noted that those elements of the combination which either are or may be of known or conventional construction are designated by letters for differentiation from those elements which constitute the present novel attachment per se, which elements are designated by reference numerals as will now be described:

The attachment shown separately by Fig. 4 includes a driven plate 21, preferably circular, and which conforms in diameter to the end plates EP of the bobbin normally utilized with the machine. The end plate 21 constitutes a combined driving and supporting connection to the

bobbin winder BW, the pin DP of member CD snugly interfitting and serving to support, and at the same time will serve rotatively to actuate the attachment, the pin DP interfitting the opening **22** of the plate **20**.

Attached axially to the plate **21** or optionally formed integrally therewith, is a collar, sleeve, or hub **23** which, if a separate element, may be welded or otherwise securely joined to the plate **21**. The member **23** constituting in effect a hub, serves as an attachment piece for connection of the plate **21** to a short shaft which in the present combination and by preference, consists of a coil spring, preferably but without restriction, of a tempered steel wire, in which the adjacent convolutions or turns of the spring are not necessarily contiguous, the spring being so wound and of such specifications that for reasons later appearing, it may be somewhat diametrally reduced under minor torsional stress which when relieved, will enable the spring to expand to original diameter.

Probably the most important requirement of the winding arbor element indicated at **24** and exemplified by the coil spring, is that it have a flexible connection with the hub **23** or otherwise to the driving plate **21**. It is probably of equal importance that the winding arbor or spool shaft, in this case consisting of the member **24**, present a free unjournalled open end so as to facilitate the insertion of a standard wood or other spool over the arbor, with a minimum of delay and without the use of special skill. With this in mind, the normal unstressed diameter of the spring **24** is or may be very slightly greater than the diameter of the bore SB in the wood spool WS.

Further in respect to the elements of the spool bobbin, the plate **21** and hub **23** may with advantages in cost, be formed as an automatic screw machine product. It is preferred as better production practice, to locate the supported end of the spring arbor **24** internally of the hub sleeve **23**. This may be done by introducing a metal filler (not shown) within such end of the spring and the hub, or otherwise as desired, to assure a firm supporting and driving connection between the arbor and the hub.

There exists a two-fold reason for the provision of an axially or angularly flexible winding arbor for support of the spool; such provision has been found by experience to minimize thread breakage, since the spool during winding operations, may be deflected in response to any augmented thread tension which may occur for any reason. A further advantage in the flexible arbor is found in the fact that in certain machines the formation of the machine head is such as to preclude a position of the spool WS with the axis of its bore in true alignment with the operating axis of the bobbin winder. Such a condition, as illustrated by Fig. 2, will necessarily cause some deflection of the arbor away from the produced axis of the winder, a condition which is entirely permissible when employing a flexible winding arbor for the spool.

The operations involved in the usage of the spool bobbin attachment are thought to have been evident from the foregoing description of elements, but it may be noted for completeness that, with the bobbin winder thrown to a position for driving engagement of the wheel FW by the hub of the balance wheel BWH, the attachment is placed to cause a close facing engagement of the plate **21** with the plate CD of the winder and with the drive pin DP snugly interfitting the aperture **22** of plate **21**.

Assuming now that it be desired to remove from one of the machine bobbins, a length of thread, and to rewind same on a supply spool WS, the bobbin is located on the post LSP, the thread therefrom trained over the member GP, thence onto the wood spool, the latter being rotated from the bobbin winder to complete the rewinding operation. In the application of the spool WS over the spring arbor **24**, a slight twisting movement of the spool, as same is applied over the arbor, effects a diametral constriction of the spring which will facilitate movement of the spool to the position shown by Figs. 1 and 2, whereupon the spring will expand to normal diameter within the spool bore and will act frictionally to drive the spool. When the spool is partly or fully loaded, the entire attachment and spool may be readily withdrawn, and an appropriate twisting movement imparted through the disc **21**, so that the arbor is constricted and quickly withdrawn from the bore of the spool.

Although the invention has been described by making detailed reference to a single preferred embodiment, such detail is to be understood in an instructive, rather than in any restrictive sense, many variants being possible within the scope of the claim hereunto appended.

I claim as my invention:

A spool bobbin attachment for use with a sewing machine head including a bobbin winder, the attachment including a plate coupling member normally in operative driving connection with the bobbin winder, the plate being formed to provide with the winder, an axially separable and removable attachment connection, a sleeve projecting axially of the plate coupling, and a coil spring formed of closely wound convolutions of a diameter approximating the internal diameter of the sleeve, one end of the said spring extended into, and being metallically secured within the said sleeve, the opposite end of the spring being free and having no journalling support, the said spring being of a torsionally and angularly flexible character, and of a diameter when unstressed, slightly greater than the bore of a standard spool, the spring diameter being such as to permit insertion of the spring, when torsionally tightened, in the bore of a standard wood thread spool, the sleeve provided with an end face outwardly of the spring, serving as a stop for the spool to limit movement of the spool axially upon the spring, the said sleeve and spring having sufficient longitudinal dimension so that the spool, rotatable with the spring, will not be limited in its angular displacement by a bobbin winder shaft and the spring being wholly open and unobstructed between the sleeve and the free spring end.

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