Feb. 3, 1970 R. V. HOARD 3,493,192

SPOOLED THREAD RETAINER

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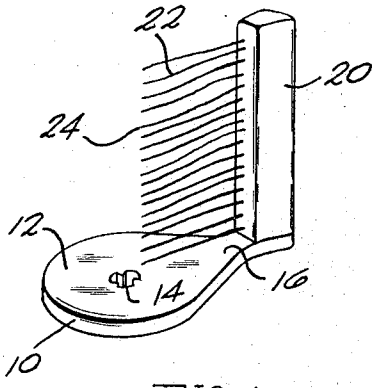


FIG. 1

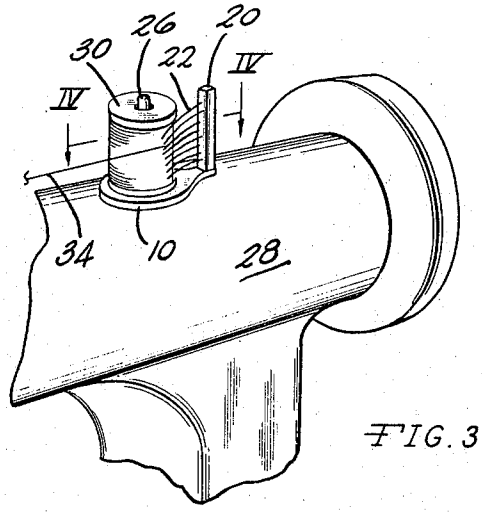


FIG. 3

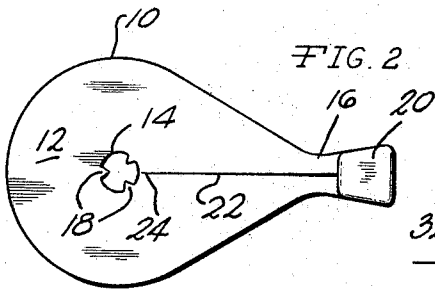


FIG. 2

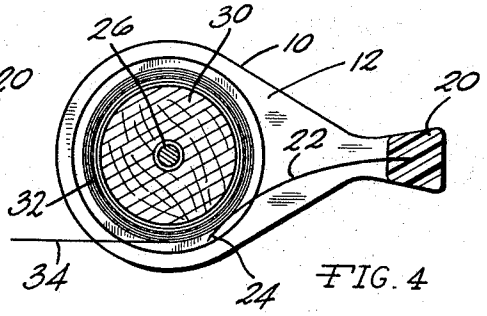


FIG. 4

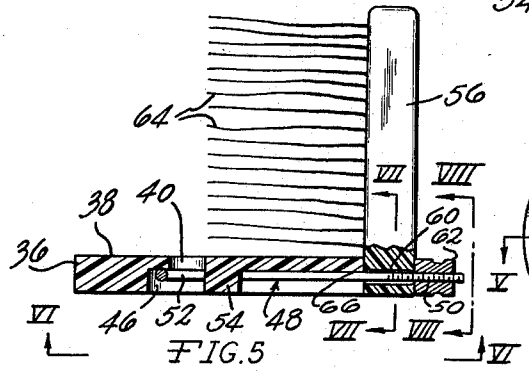


FIG. 5

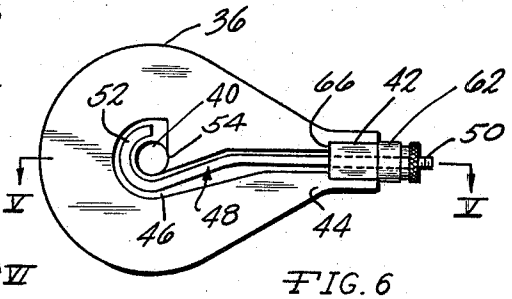


FIG. 6

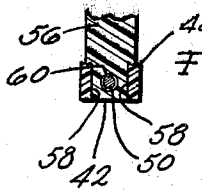


FIG. 7

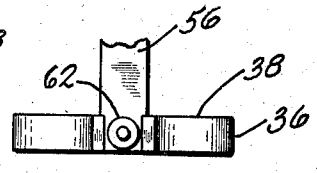


FIG. 8

INVENTOR
ROBERT V. HOARD

BY Beaman & Beaman

ATTORNEYS

United States Patent Office

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SPOOLED THREAD RETAINER

Robert V. Hoard, 604 Garfield St.,
Jackson, Mich. 49203

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ABSTRACT OF THE DISCLOSURE

An accessory for sewing machines or the like employing thread spool supporting spindles which is mounted upon the spindle and includes a plurality of deflectable resilient elements, such as bristles, which engage the spooled thread in a tangential manner and restrain the thread upon the spool from unraveling, inadvertently unwinding and axial displacement.

Background of the invention

The field of the invention lies in the art of controlling the dispensing of thread from a thread spool.

It is common practice to store, handle and dispense thread by winding the thread upon a spool, usually a wood spool. When using the thread on a sewing machine, or the like, the spool is rotatably mounted upon a spindle wherein the spool is free to rotate as the thread is tangentially unwound therefrom.

In most applications using spooled thread, such as sewing machines, the spool spindle is vertically disposed, and the axis of the spool will be vertically related as the thread is being unwound therefrom. Conventional fabric thread, such as formed of cotton, dispenses from a spool having a vertical axis of rotation without problems since the material of the thread has little or no resiliency or internal stresses. However, thread formed of synthetic materials, such as nylon, Dacron, and other manufactured filaments, tends to have a resilient nature, and internal stresses exist within the thread which tend to "unwind" the thread wound upon a spool unless the thread is maintained under tension.

Because of the high strength characteristics, and other advantages of synthetic thread, its use in both industrial and domestic sewing is highly desired. When mounting a spool of synthetic thread upon a vertically oriented spindle, such as on a sewing machine, the tendency for the outer layers or layer of the thread to unwind as soon as the outer end of the thread is freed often causes problems. As the synthetic thread outer layer or layers tend to "unwind" upon the spool the outer spirals of the thread on the spool tend to loosen and these spirals or loops will work their way toward the bottom of the spool under the influence of gravity. As the spool is rotated while the thread is being dispensed, and as the spool is subjected to considerable vibration upon a sewing machine, these "loose" outer loops of thread accumulate at the bottom or lower region of the spool and often become entangled and snarled with each other or the spindle which results in the thread breaking, or the apparatus with which the thread is employed becoming inoperative.

One of the solutions being employed to solve the aforementioned problem with synthetic yarns is to mount the spool spindle in a horizontal manner wherein the thread is fed or "spun" from the end of the spool. While some of the new sewing machines use this type of spool mount, the millions of older existing sewing machines in use are faced with the aforedescribed problem, and many sewing machine users avoid machine sewing with synthetic thread for the aforementioned reasons.

Prior art devices are known for endeavoring to maintain and control the unraveling of an elongated filament or element on a spool. United States Patents 982,361 and 2,869,802 show structure utilized for this purpose. United States Patent 756,163 is directed to a spool holder for sewing machines which eliminates the need for the spindle, but would not solve the problems arising from the use of synthetic thread. To the applicant's knowledge the aforementioned problems arising from the use of synthetic thread have not been successfully solved when dispensing thread from a vertical axis spool.

Summary

It is the purpose of the invention to provide a spooled thread retainer which will prevent the aforementioned problems arising when using synthetic threads or yarns with a sewing machine or other apparatus employing the thread.

Basically, the invention consists of an accessory which may be mounted upon the spool supporting spindle and includes a plurality of flexible elements in the form of bristles which engage the thread wound upon the spool in a tangential manner, and are biased into engagement with the thread. The bristles thereby restrain the self unwinding or unloosening of the outer thread layer and prevent loosened loops or spirals of synthetic thread from being axially displaced on the spool, and prevent the formation or accumulation of thread loops at the lower regions of the spool and spindle.

The engagement of the thread by the bristles tends to restrain unraveling of the thread, and the bristles are of such length that the device may accommodate all of the conventional sized thread spools.

It is another purpose of the invention to provide a spooled thread retainer which is capable of restraining the unwinding and unraveling and axial displacement of thread upon a vertically disposed spool without affecting the ability of the thread to be dispensed from the spool.

In the preferred embodiments the retainer of the invention is mounted upon the spool spindle, and while it would be possible to mount the apparatus of the invention adjacent the spindle without affixing the same to the spindle itself, the disclosed embodiments are directed to the most versatile and easily installable form of the invention. In that the invention is to be usable with a wide variety of makes, sizes and models of sewing machines the similarity in the spool spindles provides a relatively uniform means for mounting the thread retainer of the invention.

It is another object of the invention to provide a spool thread retainer which meets the aforementioned objects, is economical to produce and sell, and may be readily installed and used by unskilled persons.

Brief description of the drawings

The aforementioned objects and advantages of the invention will be apparent from the following description and accompanying drawings wherein:

FIG. 1 is a perspective view of one embodiment of a spooled thread retainer constructed in accord with the invention,

FIG. 2 is a top plan view of the retainer of FIG. 1,

FIG. 3 is a perspective view of the retainer of FIG. 1 as mounted upon a sewing machine and used in conjunction with a thread spool,

FIG. 4 is a sectional view taken along section IV—IV of FIG. 3,

FIG. 5 is an elevational, partially sectioned view, of another embodiment of the invention as taken along section V—V of FIG. 6,

FIG. 6 is a bottom view of the embodiment of FIG. 5,

FIG. 7 is a detailed elevational sectional view taken along section VII—VII of FIG. 5, and

FIG. 8 is a detail view taken along section VIII—VIII of FIG. 5.

Description of the preferred embodiments

A simplified form of the invention is shown in FIGS. 1 through 4. It will be appreicated that the concept of the invention can be practiced in a wide variety of embodiments, and the illustrated embodiments are not to be construed as limiting the invention but for illustrative purposes only.

The spooled thread retainer includes a supporting member or portion **10** which is preferably of a flat configuration including an upper spool supporting surface **12** and a spindle receiving opening **14**. The portion in which the opening **14** is defined may be of a generally circular configuration, as to conform to the circular configuration of a thread spool, and a narrower portion **16** extends radially with respect to the opening.

In the embodiment of FIGS. 1 through 4 a plurality of fingers **18** are defined in the opening **14** and extend radially toward the center of the opening, and are of a relatively small configuration as to be deformable or compressible. The support member portion **10** may be formed of any suitable material, but preferably the support member is formed of plastic in order that an economical, readily formable and attractive device may be provided.

The holder **20** for the bristles or elements which engage the spooled thread is mounted upon the support member portion **16** and extends at right angles to the surface **12**. The holder **20** has a length slightly greater than the axial length of the spools with which the apparatus will be employed, and may be an integral part of the support member **10**, or may be bonded or fastened thereto by conventional means.

The holder **20** is preferably formed of a plastic material and serves to hold the ends of a plurality of elongated, thin, flexible, resilient elements **22** such that the elements are substantially parallel to the support member surface **12**. The elements **22** are preferably formed of bristles or hairs, either natural or artificial, may be of a uniform diameter, or tapered as illustrated in the drawings. The bristles **22** are disposed in the holder **20** in a linear manner as to substantially form a "wall" of bristles having outer ends **24**. The bristles **22** are disposed in the holder such that they extend toward the projection of the axis of the opening **14** under normal conditions. As will be noted, the outer ends **24** of the bristles extend approximately to the axis of the opening **14**.

The spooled thread retainer described above is mounted upon a sewing machine spindle **26**, FIG. 3, which forms a conventional part of the sewing machine **28**. The support member opening **14** receives the spindle **26**, and the fingers **18** are of such construction that they will firmly engage the spindle, and if the spindle is of a great enough diameter, the fingers **18** will deform by compression, or bending, in order to accommodate the spindle, and form a firm connection of the support member with the spindle.

The spindle **26** is disposed in a vertical manner, and the installation of the retainer will position the retainer relative to the spindle as is apparent in FIG. 3 wherein the holder **20** extends upwardly.

The thread spool **30** is placed upon the spindle **26** in the normal manner. As the bristles **22** will be extending toward the spindle prior to the spool being placed upon the spindle the bristles will be bent downwardly upon placing of the spool upon the spindle. However, the operator need merely run a finger between the holder **20** and the spool **30** to position all of the bristles upon a like side of the spool, as apparent in FIGS. 3 and 4. The thread **32** will be unwound from the spool **20** as indicated by thread portion **34**, and, preferably, the bristles **22** will be disposed as in FIG. 4 wherein the bristles are tangentially related to the thread upon the spool at a location adjacent the location where thread portion **34** leaves spool **30**.

Due to the resilient and flexible nature of the bristles **22** the bristles will be engaging the outer layer of the threads **32** wound upon the spool, and be maintained thereon by the natural biasing force within the bristles. Due to the nature of the bristles, and the fact that the bristles **22** extend substantially to the spindle **26** prior to installation of a spool, all conventional sizes of spools may be placed upon the spindle, and in each instance the bristles will biasingly engage the outer layer of threads wound upon the spool. The holder **20** is located from the opening **14** a distance sufficient to permit the retainer to accommodate conventional sized spools.

With the components in the relationship shown in FIGS. 3 and 4, the bristles **22** prevent loose or partially unwound spirals or loops of thread upon the spool from axially moving or being displaced on the spool. In effect, the bristles "hold up" any such loose spirals that often occur when synthetic threads are being used. Thus, even though many, or all, of the loops of thread **20** on the outer layer of the spool **30** partially unwind as to become relatively loose on the spool the thread does not fall to the lower regions of the spool, and the thread may be properly dispensed from the spool by pulling upon the portion **34** without snarling, unraveling or tangles appearing. The engagement of the thread by the bristles **22** does not adversely hinder the rotation of the spool and the dispensing of the thread therefrom.

When it is desired to remove the spool from the spindle it is merely lifted therefrom in the normal manner, and the bristles assume the normal condition as shown in FIG. 1.

In the embodiment of FIGS. 5 through 8 a modified construction is illustrated which includes means for clamping the retainer to the spool spindle, and simultaneously mounting the holder upon the support member.

In this embodiment the support member **36** has a general configuration similar to the support member **10** and includes a spool supporting surface **38**. An opening **40** is defined in the support member and a recess **42** is formed in the panhandle portion **44** intersecting the end thereof. A hook-shaped recess **46** is formed in the underside of the support portion **36** for receiving the hook-shaped clamp **48** which includes a threaded stem **50** extending through recess **42**. The clamp **48** includes a curved or hooked portion **52** which substantially corresponds to the opening **40** and is in opposed relationship to the support member bearing portion **54**.

The bristle holder **56**, as well as the support member **36**, may be formed of plastic, and includes a pair of opposed flat portions **58** defined at the lower end thereof, FIG. 8, which permits the lower end of the holder to be snugly received within the support member recess **42**. Also, the holder **56** includes a hole **60** through which the threaded stem **50** extends. The nut **62** threaded upon the stem **50** is adapted to bear against the holder **56**. The bristles **64** extend from the holder **56** in a manner identical to the previously described embodiment.

In use, the embodiment of FIGS. 5 through 8 is placed upon a spool spindle such as the spindle **26** of FIG. 3. The operator then tightens the nut **62** which will draw the clamp hook portion **52** toward the support member bearing portion **54**, and frictionally clamp the spindle between the hook portion and the support member bearing portion. Simultaneously, the tightening of the nut **62** will firmly locate the holder **56** in the recess **42** and force the holder against the support member abutment shoulder **66**, FIG. 5 to firmly assembly the holder to support member **36**. The operation and cooperation between the bristles **64** and a thread spool of the embodiment of FIGS. 5 through 8 is identical to the embodiment shown in FIGS. 1 through 4.

In the latter embodiment the provision of the clamp **48** provides a very firm, yet universal, connection between

the support member and the spool spindle. Additionally, 66, FIG. 5 to firmly assemble the holder to suport member 36, the retainer may be disassembled into a small flat package for shipping and handling purposes.

From the above description it will be appreciated that the spool thread retainer of the invention accomplishes the purposes and objects stated above, and while it is appreciated that various modifications to the disclosed embodiments may be apparent to those skilled in the art, it is intended that the invention be defined only by the following claims:

What is claimed is:

1. A spooled synthetic thread retainer for use with a thread spool spindle comprising, in combination, a support member adapted to rotatably support a thread spool, means for affixing said support member to the thread spool spindle, an elongated thread retainer element holder fixed upon said support member, and extending thereform in a direction generally parallel to the thread spool spindle when said support member is affixed thereon, a plurality of elongated, flexible, resilient, thread retainer elements mounted on said holder and having a free end portion extending over said support member and of a length to engage a thread spool mounted on the thread spool spindle and support member whereby the outer layer of thread wound on a thread spool mounted upon said support member is engaged throughout its axial length by said elements free end portion and deflects said elements wherein the deflection of said elements biases said elements into engagement with the thread and restrains unraveling and axial displacement of the thread upon the spool.

2. A spooled thread retainer as in claim 1 wherein said thread retainer elements comprise bristles.

3. A spooled thread retainer as in claim 1 wherein said support member includes a spindle receiving opening defined therein, and said means fixing said support member to the thread spindle being located within said opening.

4. A spooled thread retainer as in claim 3 wherein said means fixing said support member to the thread spindle comprises a plurality of spindle engaging fingers defined upon said support member and located within said opening.

5. A spooled thread retainer as in claim 3 wherein said means fixing said support member to the thread spindle comprises an adjustable spindle engaging clamp disposed within said opening and means associated with said clamp adjusting said clamp with respect to said opening.

6. A spooled thread retainer as in claim 5, a recess defined in said support member, said thread retainer element holder being mounted within said recess, a stem receiving opening defined in said holder, said adjusting means for said clamp comprising a threaded stem extending through said recess and said holder stem receiving opening, and a nut threaded on said stem engaging said holder whereby tightening of said nut to tighten said clamp simultaneously maintains said holder in said recess.

7. A spooled synthetic thread retainer comprising, in combination, an elongated thread spool spindle, a support member having a spool supporting surface defined thereon, means carried by said support member mounting said support member on said spindle whereby said spindle extends from said spool supporting surface, a thread retainer element holder fixed on said support member radially spaced from said spindle and generally parallel thereto having a length substantially equal to the length said spindle extends from said spool supporting surface, a plurality of elongated, flexible, resilient thread retainer elements mounted upon said holder, said elements each having ends, one of the elements' ends being mounted in said holder and the other end generally extending toward said spindle, said elements being of a length substantially equal to the radial distance of said holder from said spindle as to tangentially engage the thread of a thread spool mounted on said spindle throughout its axial length and be deflected by the thread whereby the engagement of said elements upon the thread restrains unraveling and axial displacement of the thread upon the spool.

8. A spooled thread retainer as in claim 7 wherein said resilient, flexible, elements comprise bristles.

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U.S. Cl. X.R.

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