Feb. 21, 1939. J. CRYAN 2,148,339

NONCOLLAPSIBLE THREAD TUBE OR BOBBIN

Filed May 17, 1937

Fig.1.

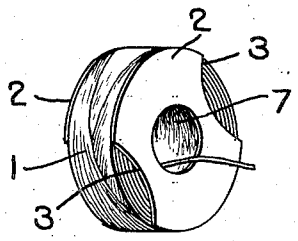


Fig.2.

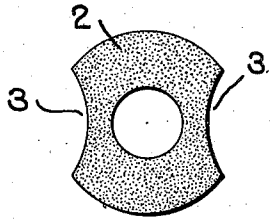


Fig.3.

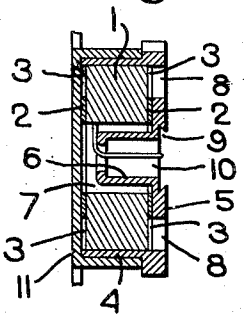


Fig.4.

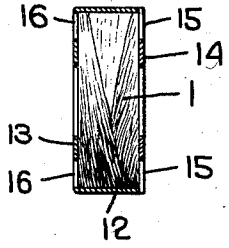


Fig.5.

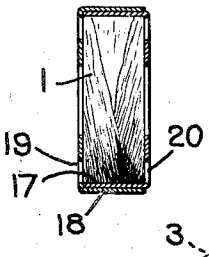


Fig.7.

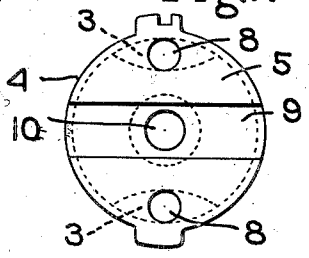
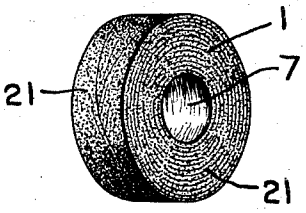


Fig.6.



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UNITED STATES PATENT OFFICE

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NONCOLLAPSIBLE THREAD TUBE OR BOBBIN

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6 Claims. (Cl. 112—251)

This invention relates to improvements in central delivery thread tubes, and the principal object of the invention is to provide a thread tube or bobbin having means for preventing collapsing of the windings of the tube as the thread is progressively unwound outwardly from the center of the tube.

More particularly the invention relates to improvements in bobbins for use in shoe sewing machines which have a cylindrical bobbin case having an open end which fits within the shuttle, the bobbin being in the form of a tightly wound cylindrical central delivery thread tube of waxed thread which fits within the bobbin case.

In shoe sewing machines of this type the stitch forming mechanism is subjected to considerable heat for the purpose of softening the wax on the thread, so that the thread will run smoothly during the formation and setting of the stitches, and inasmuch as the shuttle is within the heated field the wax, with which the thread is impregnated, frequently becomes sufficiently softened or liquefied as to release contiguous windings of the thread from its adhesive action, thereby resulting in the collapsing of the windings of the bobbin.

I have discovered that if the portions of the windings, which form the outer surface of the bobbin and particularly the flat faces thereof, are retained in their normal positions, collapsing of the thread tube will be obviated and all of the thread properly delivered from the bobbin.

Any suitable means may be employed for causing the portions of the windings, which form the surface of the bobbin, particularly those of the flat heads, to adhere to each other, notwithstanding the melting of the wax of the thread, thereby preventing bunching of the thread or collapsing of the windings of the bobbin.

This may be accomplished in any desirable manner, as, for example, by coating the flat faces of the bobbins and if desired also the cylindrical surfaces thereof, with a suitable heat-resistant adhesive, such, for example, as sodium silicate.

I prefer, however, to apply to the flat end faces of the bobbin, and if desired also the cylindrical surface thereof, a suitable covering, preferably of fibrous material, and to secure the same to the entire area of the contiguous surfaces of the bobbin by a suitable adhesive, such as pyroxylin cement, rubber cement, or glue, of such heat-resistant character as will maintain the windings forming the surface portions of the bobbin in their normal position, thereby preventing collapsing of the windings during the unwinding of the thread.

By employing such covering or coverings of fibrous material which is not a good conductor of heat, direct conduction of heat from the bobbin case to the adjacent surfaces of the bobbin is avoided, and the tendency to melt the wax in the surface windings of the bobbin correspondingly reduced.

Illustrative embodiments of the invention are shown in the accompanying drawing, in which,

Fig. 1 is a perspective view of a bobbin or thread tube having disks adhesively atached to the ends thereof;

Fig. 2 is an underneath face view of one of the disks illustrating the adhesive covering the entire area thereof, certain portions of the disks being provided with recesses adapted to register with the sight openings in the bobbin case;

Fig. 3 is a diametrical sectional view showing a bobbin embodying the invention mounted in the bobbin case which is inserted into the shuttle of the sewing machine;

Fig. 4 is a view showing in elevation a bobbin embodying the invention enclosed in a cylindrical casing, the flat end and cylindrical wall of which are secured to the bobbin tube throughout their areas by adhesive, and showing a disk adhesively secured to the other flat face of the bobbin;

Fig. 5 is a similar view of a bobbin embodying the invention enclosed in complementary telescopically arranged cylindrical casing members which are secured to the respective surfaces of the bobbin and to each other by adhesive;

Fig. 6 is a perspective view of a thread tube or bobbin in which the windings forming the outer surfaces thereof are coated with heat-resistant adhesive; and

Fig. 7 is a face view of the flat end of a metal bobbin case.

The thread tube or bobbin illustrated in the accompanying drawing comprises a coreless, tightly wound short tube of thread 1 presenting flat end faces and a cylindrical periphery which are formed by portions of the winding, the thread tube being of such size as to fit within the bobbin casing of a sewing machine of the type above described. Disks 2, preferably of fibrous material, and of substantially the same diameter as the thread tube, are secured to the flat end faces of the bobbin by a suitable heat-resistant adhesive. The disks 2 desirably are provided with recesses 3 adapted to register with the usual sight openings in the bobbin cases of such machines.

The thread tube or bobbin illustrated in Fig. 1 is mounted in a bobbin casing, such as that illustrated in Fig. 3, which comprises a cylindrical

casing 4 having an integral flat end 5 provided centrally with a hollow stud 6 which projects into the central opening 7 of the coreless thread tube or bobbin. The bobbin casing is provided with a usual sight opening or openings 8 to enable the operator to observe the depletion of the thread when the bobbin approaches exhaustion.

The flat face of the bobbin casing is provided with a usual dovetail recess 9 and the thread is led from the bobbin through the central aperture 10 in the hollow stud 6, thence downwardly through the recess 9 to the thread concatenating mechanism.

The bobbin casing 4 fits within a cylindrical shuttle member 11 in the well known manner.

The disks 2 of fibrous material, which are adhesively secured to the opposite heads of the bobbin as illustrated in Fig. 1, are interposed between the ends of the bobbin and the metal surface of the bobbin case and the shuttle and serve to reduce the heat transmitted from the metal parts of the bobbin case and shuttle to the faces of the thread tube. The adhesive cement, which secures the disks to the ends of the bobbin, is of such heat-resistant qualities as to retain the surface windings of the bobbin in normal position during the entire unwinding of the thread.

A modified form of the invention is illustrated in Fig. 4 in which the tube of thread or bobbin 1 is partially enclosed in a cylindrical casing of fibrous material, the cylindrical peripheral wall 12 of which tightly fits upon the bobbin and a flat end wall 13 of which fits against one of the heads of the bobbin. A disk 14 of suitable diameter fits upon the opposite end of the bobbin and the surfaces of the cylindrical casing and disk are secured by an adhesive of the character above mentioned to the contiguous surfaces of the bobbin.

The disk desirably is provided with recesses 15 and the flat face 13 of the cylindrical casing is provided with recesses 16 adapted to be positioned in registry with the sight openings 8 in the bobbin casing.

Another modified form of the invention is illustrated in Fig. 5 which comprises telescoping cylindrical casings 17 and 18 in which the inner casing tightly fits the bobbin 1 and the outer casing member 18 closely fits the cylindrical wall of the casing 17. All of the surfaces of the inner and outer casings, which engage the surfaces of the thread tube, are secured to the thread tube throughout their entire area by an adhesive of the character above described. In this construction, as in the other, the casing 17 is provided with recesses 20 and the casing 18 with recesses 19 adapted to register with the sight openings 8 in the shuttle casing.

Fig. 6 illustrates a modified embodiment of the invention in which the ends of the thread tube, or if desired the periphery also thereof, are coated with a heat-resistant adhesive 21, such as sodium silicate.

It will be understood that the embodiments of the invention disclosed herein are of an illustrative character and although specifically described as applied to tubes of thread which are used as bobbins for shoe sewing machines the invention is also applicable to central thread delivery tubes of any desired length which are used under circumstances in which maintenance of the integrity of the windings forming the surfaces thereof is required.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A central thread delivery bobbin for shoe sewing machines and the like in which the bobbin is subjected to heat comprising a tightly wound tube of waxed thread having such portions of the winding which form an outer surface thereof secured together by a heat resistant adhesive material which acts to prevent collapsing of the windings during the unwinding of the thread when subjected to heat.

2. A central thread delivery bobbin for shoe sewing machines and the like in which the bobbin is subjected to heat comprising a tightly wound cylindrical tube of waxed thread having a heat resistant adhesive coating securing together the windings forming the flat end surfaces of the tube and acting to prevent collapsing of the windings during the unwinding of the thread when subjected to heat.

3. A central thread delivery bobbin for shoe sewing machines and the like in which the bobbin is subjected to heat comprising a tightly wound cylindrical tube of waxed thread having a heat resistant adhesive coating securing together the windings forming the flat end surfaces of the tube and also having a coating of said heat-resistant adhesive securing together the windings forming the cylindrical surface of the tube and acting to prevent collapsing of the windings during the unwinding of the thread when subjected to heat.

4. A central thread delivery bobbin for shoe sewing machines and the like in which the bobbin is subjected to heat comprising a tightly wound cylindrical tube of waxed thread presenting flat end faces and having flat disks of heat-resistant fibrous material of approximately the same diameter as the thread tube secured to the windings forming said flat faces by an adhesive which will not liquefy in the presence of heat covering the contiguous surfaces of said flat faces and disks.

5. A central thread delivery bobbin, for shoe sewing machines and the like in which the bobbin is subjected to heat, comprising a tightly wound cylindrical tube of waxed thread presenting flat end faces and having a cylindrical casing of fibrous material fitting one end and the cylindrical periphery of the thread tube and secured to the windings forming said end and periphery of the tube by an adhesive coating which will not liquefy when subjected to heat, and a disk of like fibrous material secured by said heat-resistant adhesive to the other end of the tube throughout substantially its entire area.

6. A central thread delivery bobbin, for shoe sewing machines and the like in which the bobbin is subjected to heat, comprising a tightly wound cylindrical tube of waxed thread presenting flat end faces and having a cylindrical casing of fibrous material fitting one end and the cylindrical periphery of the thread tube and secured to the windings forming said end and periphery of the tube by an adhesive coating which will not liquefy when subjected to heat, and a reversely disposed complementary cylindrical cover of fibrous material telescopically fitting over said cylindrical casing and having its head secured by said heat-resistant adhesive to the windings forming the other flat face of said thread tube.

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