Jan. 15, 1924. 1,481,243

R. V. SNYDER ET AL

BOBBIN AND METHOD OF PRODUCING THE SAME

Filed June 23, 1923

Fig. 1.

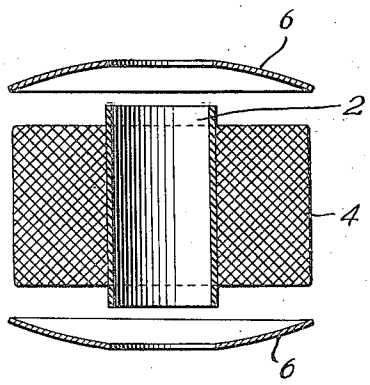


Fig. 2.

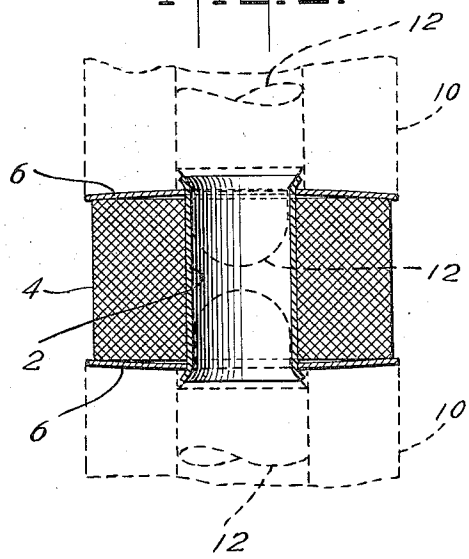


Fig. 3.

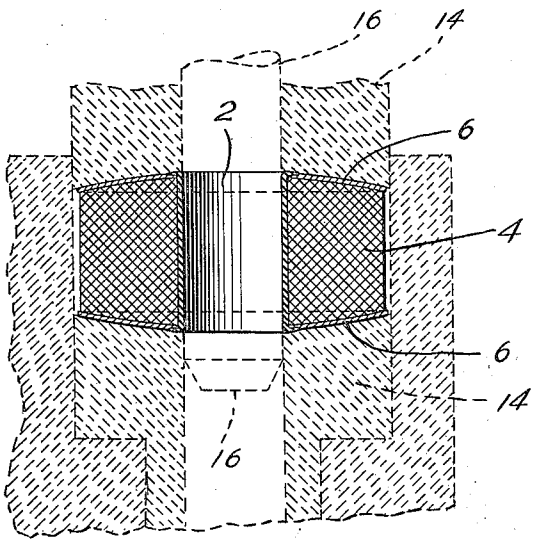
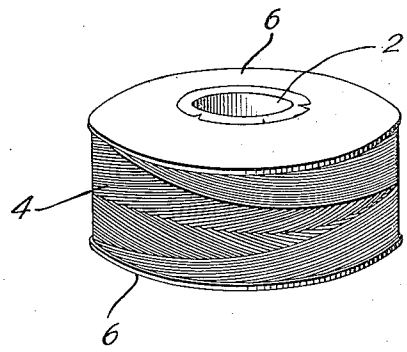


Fig. 4.



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UNITED STATES PATENT OFFICE.

REX V. SNYDER, OF ST. LOUIS, MISSOURI, AND MALCOLM CURRY, OF SCARSDALE, NEW YORK, ASSIGNORS TO THE AMERICAN THREAD COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

BOBBIN AND METHOD OF PRODUCING THE SAME.

Application filed June 23, 1923. Serial No. 647,244.

To all whom it may concern:

Be it known that we, REX V. SNYDER and MALCOLM CURRY, citizens of the United States, residing at city of St. Louis, State of Missouri, and Scarsdale, county of Westchester, State of New York, respectively, have invented a certain new and useful Improvement in Bobbins and Methods of Producing the Same, of which the following is a full, clear, and exact description.

Our invention relates to bobbins for sewing machine shuttles and to a method of producing the same, and has for its object the production of a novel and improved bobbin of this character.

The following is a description of our invention, reference being had to the accompanying drawing, in which—

Fig. 1 is a longitudinal sectional view of the component parts of our improved bobbin in its preferred form, with the parts shown separated, and about to be assembled in accordance with our improved method;

Fig. 2 is a longitudinal sectional view of the bobbin partially formed and also illustrating by dotted lines certain devices that may be used in carrying out certain steps of the method;

Fig. 3 is a longitudinal sectional view of the completed bobbin and also illustrating by dotted lines the operating instrumentalities of a cop press of a common construction that may be employed in performing the final step in my improved method; and

Fig. 4 is a view in perspective of the completed bobbin.

In the complete bobbin shown in Figs. 3 and 4 of the drawings, 2 is a tubular core on which is a cross-wound mass of thread 4. Fitted on the ends of the core and making close contact with the ends of the mass are annular disks 6 of resilient paper. In the preferred form the outer portions of the disks tend to move toward the mass and they are prevented by the mass from so moving, with the result that a tension is maintained insuring a close contact between the disks and the outer portions of the end surfaces of the mass. The ends of the core are upset so as to hold the disks in place. The mass is compressed preferably so as to have its ends slightly rounded and so that its outer portions are more dense than its inner portions and the disks tend to assume a curve of smaller radius than the curve of the rounded ends of the mass.

In carrying out our improved method a tubular core 2 of paper or other swaging material is provided on which thread is cross-wound so as to form a mass 4, the ends of the core projecting a distance beyond the ends of the mass. Annular dish-shaped disks 6 of resilient paper or similar fibrous material whose central apertures are adapted to make a snug fit on the ends of the core, are also provided. These disks are formed of relatively stiff resilient paper that will take a permanent set and are preferably formed from flat stock by means of heated dies having the curvatures desired for the two faces of the disks. The disks 6 are centrally brought against the outer peripheries of the ends of the mass of thread and are forced a distance over the ends of the core, this operation preferably flattening the disks somewhat without materially compressing the ends of the mass. The ends of the core projecting beyond the disks are then swaged sufficiently to hold the disks in place. This operation of applying the disks to the core may be performed by any suitable means such as by co-operating dies 10 that engage the outer faces of the disks, and the swaging of the ends of the core may be accomplished by means of riveting plungers 12 that work through axial apertures in the dies 10.

The bobbin thus partially formed is then subjected to an endwise pressure to press it into its final form. The core is by such pressure reduced lengthwise and its ends swaged to permanently hold the disk in place. The final pressing operation on the ends of the bobbin is such that the disks are somewhat flatter than before application to the core or their initial or normal degree of curvature is reduced so as to be under a certain degree of tension and thus cause them to exert a yielding spring-pressure on the ends of the mass of thread. The final pressing, core reducing and end swaging operations may be accomplished simultaneously by means of the usual cop press having cop engaging members 14 that act on both ends of the bobbin in the usual manner, and a core holding spindle 16 as shown in dots in Fig. 3. The cop engaging members 14 have their work engaging surfaces

shaped to conform to the desired curvature of the ends of the completed bobbin; this curvature being less than that of the separate disks 10 previously to be applied.

In the bobbin thus formed, the resilient tension of the disks, together with the tendency of the outer and most dense portions of the thread mass to expand, results in the maintenance of a close contact between the disks and the outer portions of the ends of the mass, which prevents the thread from "spilling" over and from working down between the flanges of the bobbin and the ends of the mass of thread as it is being unwound. This close contact, together with the small momentum due to the light weight of the bobbin and the consequent practical elimination of "over-running" when the sewing machine stops, practically eliminates the danger of tangling the thread even when the bobbins are used without friction or drag springs, and make the use of such springs with their annoyance, expense and loss of time unnecessary. Moreover, the bobbin will fit with sufficient accuracy shuttles of several different styles or dimensions, small variations in the shuttles causing no practical interference with the actual working conditions of the bobbin. The bobbin is so constructed as to hold a maximum amount of thread for a shuttle of a given size, and as tension or drag springs may be eliminated, the bobbin itself can be made larger so as to fill the space that would be otherwise occupied by such springs.

As will be evident to those skilled in the art our invention permits of various modifications without departing from the spirit thereof or the scope of the appended claims.

What we claim is:

1. A filled bobbin having, in combination, a core having thread cross-wound thereon into a mass, and disks secured on the ends of the core in close contact with the ends of the mass and tending to assume a dish-shaped form of a given curvature toward said mass but being restrained therefrom by the ends of the mass so as to cause said disks to exert a yielding pressure thereon.

2. A filled bobbin having, in combination, a core having thread cross-wound thereon into a mass, and disks of resilient fibrous material secured on the ends of the core and constructed and arranged so as to exert a yielding pressure on the ends of the mass.

3. A filled bobbin having, in combination, a tubular core of fibrous material having thread cross-wound thereon into a mass, the ends of the mass being rounded over, and dish-shaped disks of fibrous material closely engaging the rounded ends of the mass, the ends of the core being swaged so as to permanently hold the disks on the core.

4. A filled bobbin having, in combination, a tubular core of fibrous material having thereon a cross-wound mass of thread, the mass being rounded on its ends and increasing in density toward its periphery, and dish-shaped disks of fibrous material closely engaging the rounded ends of the mass, the ends of the core being swaged so as to permanently hold the disks on the core.

5. The method of forming a filled bobbin which comprises cross-winding thread into a mass on a tubular core, placing dish-shaped annular disks on the ends of the core against the ends of the mass, swaging the ends of the core to hold the disks in place, applying pressure to the ends of the mass and disks when thus assembled, and further swinging the ends of the core to hold the disks more firmly in place.

6. The method of forming a filled bobbin which comprises cross-winding thread into a mass on a tubular core, placing dish-shaped annular disks on the ends of the core against the ends of the mass, swaging the ends of the core so as to hold the disks in place, applying pressure to the ends of the mass and disks when thus assembled, and further swaging the ends of the core to hold the disks more firmly in place, the disks being made of resilient fibrous material and said pressing operation being such as to reduce the curvature of the disks so as to cause them to exert a yielding pressure on the ends of the mass after the completion of said pressing and swaging operations.

7. The method of forming a filled bobbin which comprises cross-winding thread into a mass on a tubular core and forcing dish-shaped annular disks over the ends of the core and against the ends of the mass, and then compressing the mass and swaging the ends of the core to hold the disks in place, the disks being made of resilient fibrous material and said compression operation being such as to reduce the curvature of the disks so as to cause them to exert a yielding pressure on the ends of the mass after the completion of said compressing and swaging operations.

8. The method of forming a filled bobbin which comprises cross-winding thread into a mass on a tubular core, placing annular disks on the ends of the core against the ends of the mass, swaging the ends of the core to hold the disks in place, applying pressure to the ends of the mass and disks when thus assembled, and further swaging the ends of the core to hold the disks more firmly in place.

REX V. SNYDER.
MALCOLM CURRY.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,481,243, granted January 15, 1924, upon the application of Rex V. Snyder, of St. Louis, Missouri, and Malcolm Curry, of Scarsdale, New York, for an improvement in "Bobbins and Methods of Producing the Same," errors appear in the printed specification requiring correction as follows: Page 2, line 4, for the word "be" read *being;* same page, line 82, claim 5, for the word "swinging" read *swaging;* and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 1st day of April, A. D. 1924.

[SEAL.]

KARL FENNING,
Acting Commissioner of Patents.