Jan. 20, 1953 W. H. MILLER 2,626,113

BOBBIN OR SPOOL

Filed April 6, 1950

Fig. 1

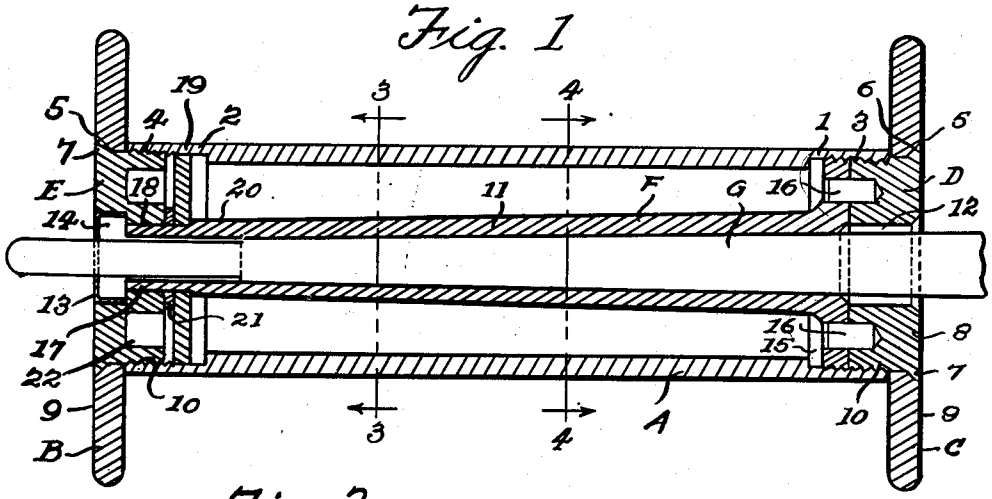


Fig. 2

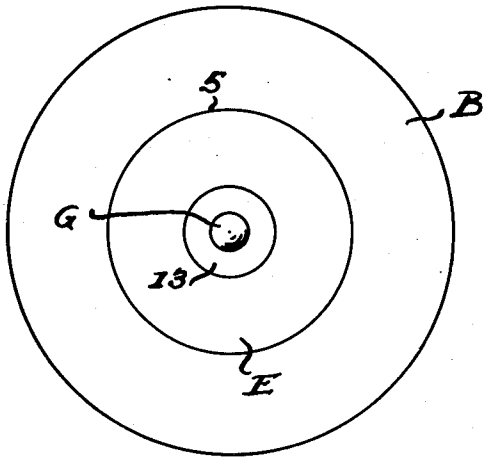


Fig. 3

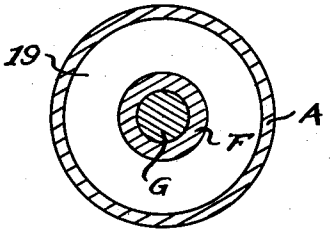


Fig. 4

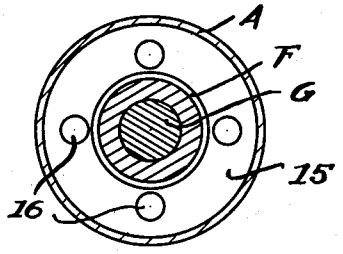




Fig. 6

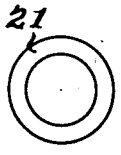


Fig. 5

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BOBBIN OR SPOOL

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6 Claims. (Cl. 242—124)

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The present invention pertains to a bobbin or spool of the general nature disclosed in my Patent 2,542,554, but embodies novel improved features which give to the bobbin or spool, when in use, an improved performance the precise nature of which will be hereinafter set forth.

The present spool or bobbin is intended primarily for use in the textile industry but is not to be limited to any particular use as it is serviceable wherever thread or the like is to be wound or unwound.

One of the objects of the invention is to provision of a bobbin or spool having a core of novel and improved construction mounted in the bobbin barrel in a novel and improved manner.

A further object of the invention is the provision of a bobbin or spool in which tensile stresses are eliminated in the bobbin core.

A still further object of the invention is the provision of a bobbin constructed in a manner to prevent deflection of the spindle upon which it is rotatably supported and to thereby assure that the bobbin and spindle remain concentric and in balance to provide vibration-free operation of the bobbin at high rotative speeds.

Other specific objects will appear and be understood from the following description as will also the advantages attained by a bobbin constructed in accordance with the present invention.

In the drawings:

Fig. 1 is a longitudinal sectional view through a bobbin embodying the present invention.

Fig. 2 is an end view of the left-hand end of the bobbin appearing in Fig. 1.

Fig. 3 is a transverse vertical sectional view on the line 3—3 of Fig. 1 looking in the direction indicated by arrows.

Fig. 4 is a vertical sectional view on the line 4—4 of Fig. 1 looking in the direction indicated by arrows.

Fig. 5 is a plan view of the shake-proof or tension washer.

Fig. 6 is a side view of the washer.

The drawings illustrate a construction embodying the inventive concept but departures can be made therefrom without departing from the invention.

Having reference to the drawings, A is the bobbin barrel and comprises an elongated open-ended tubular member which interiorly of each end is provided with areas or portions 1 and 2 of increased diameter. These portions throughout a portion of their lengths are threaded as at 3 and 4.

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The upper and lower barrel heads B and C respectively are mounted on and abut the ends of the barrel and each is centrally provided with an opening 5 of greater diameter than the internal diameter of the barrel. The walls of these openings are flared to provide in each head a flared seat 6.

A pair of inserts or adaptors D and E are provided one for use at each end of the bobbin. Each of the adaptors is of considerable thickness and of the proper diameter, when inserted through a head opening, to close the same and each is provided with an outwardly flared circumferential shoulder 7 which seats on the flared seat of its head opening. The outer faces 8 of these elements are flush with the outer faces 9 of the heads. Each adaptor is threaded as at 10 for rotative engagement with the threads 3 and 4 of the barrel.

From the construction thus far described it will be seen that the adaptors provide means for quickly and conveniently clamping the bobbin heads to the barrel and equally convenient means for permitting removal of the heads.

A hollow open-ended core F, the major length of which is of much less diameter than the interior diameter of the barrel and composed of a material having specific attributes hereinafter to be described, is disposed interiorly of the barrel and extends between the adaptors D and E. The interior bore 11 of this core is tapered to receive the tapered spindle G which extends inwardly through a central opening 12 in the adaptor D and outwardly through the ferrule 13, perferably composed of stainless steel, in the opening 14 of the adaptor E.

At one end the core is circumferentially enlarged to provide a base 15 disposed in an enlarged portion of the barrel and having abutment with the inner face of the insert D. A plurality of drive pins 16 operatively interconnect the core base and the adaptor. The core is centered in the barrel by having its opposite reduced end 17 disposed for a considerable portion of its length in an opening 18 of the adaptor E which opening is a continuation of the larger adaptor opening 14. To further assure proper centering and stability of the core a disc 19, having a pressed fit with the enlarged portion 2 of the barrel, surrounds the reduced end 17 of the core and abuts the core shoulder 20. A shake-proof or tension washer 21, of the construction illustrated in Figs. 5 and 6 of the drawings, is disposed between the disc 19 and adaptor E. The shake-proof attributes of the washer

are attained by reason of the washer tending to flatten out when subjected to pressure between the disc and the adaptor.

The drive pins have a pressed fit with the openings in the adaptor and the core flange or base.

The materials of which the parts are composed is not critical with the exception of the core. The barrel is preferably composed of plastic or light metal and the heads of Bakelite or fiber. A light metal is recommended for the adaptors and the disc 19 such for instance as aluminum. To lighten the construction the adapter E is provided with a circumferential channel or groove 22.

The core is molded or otherwise suitably fabricated from a plastic or other material which is yieldable or flexible. By utilizing material having a yieldable characteristic deflection of the spindle is eliminated which would otherwise occur in the event the tapered center bore 11 of the core were out of true in relation to the longitudinal axis of the spindle. Were the core rigid and non-yieldable it would, if its central bore be out of true relative to the longitudinal axis of the spindle, cause a deflection of the spindle, that is, it would cause the spindle to be bent or deflected to one side or the other of its longitudinal rotative axis. Such a slight out of true condition can occur through an imperfect spindle hole or bore or wear in use and the instant this condition is present or occurs the spindle is deflected and if deflected even to the slightest degree vibration is set up when the bobbin is revolving at the high speeds at which it operates. The flexibility or yieldability referred to is of the kind or nature which will permit the core to yield to the longitudinal axis of the spindle rather than to force the spindle out of alignment to follow the out of true core bore. This is a very important feature as it eliminates trouble, delay and expense and gives to the bobbin and spindle a longer life in operation.

The core is free of tensile stresses such as are present in the bobbin of applicant's referred to Patent 2,542,554 and other bobbins known and in common use. In explanation reference is made to the patent wherein it will be seen that the core itself is utilized to hold the bobbin barrel heads in place. To accomplish this the core is threadedly connected directly to the top insert, which holds the top head in place, while the base or flange of the core holds the bottom head in place. In other words, the core acts as a clamp for clamping the heads in place and this clamping action puts the core under tensile stresses. In the present application the core is not utilized to hold the heads in place as this function is performed by the adaptors or inserts which are threaded directly into the bobbin barrel so that the tensile stresses are in the barrel itself rather than in the core. Accordingly, as respects a core operating as in applicant's patent, the core of the present bobbin could be said to be a "floating" core by reason of the absence of rigid connections between the core and the adaptors. The core becomes, through the drive pins 16, the drive means to rotate the bobbin on the spindle.

It is to be noted that the barrel enlarged portions 1 and 2 are of sufficient length to provide spaces at the interior sides of the core flange and disc 19 and that the complete length of the threads of these portions of the barrel are not utilized. This construction is provided for a definite purpose and that is to make the bobbin adaptable, for use therewith, of heads of varying thicknesses. It has been found that in some instances the use to which the bobbins are to be put or the customer's requirements would call for heads of different thicknesses as for instance heads of one-eighth inch thickness or of three-sixteenths inch thickness. The construction permits substitution of heads of different thicknesses and still assures the inserts or adaptors to properly seat themselves in relation to the plastic core and the disc.

What I claim is:

1. A bobbin or spool, adapted to be rotatably mounted on an elongated spindle comprising, a hollow open-ended barrel having a head at each end thereof, an adaptor member extending through each head and having detachable connection with the barrel and acting to clamp the heads against the barrel ends, a core having a longitudinally extending open-ended tapered bore disposed within the barrel, one core end having driving connection with one adaptor and the other core end supported on the other adaptor, each adaptor being provided with an open-ended bore in communication with the core bore to provide a spindle reception passageway extending through the length of the bobbin, an elongated spindle extending through said passageway, the bores in the adaptors outward of the core ends being of greater diameter than the diameter of the core bore, the core bore snugly receiving the spindle, and the core being composed of a yieldable material which will permit the core bore to adapt itself to the spindle should the bore be out of alignment with the longitudinal axis of the spindle.

2. A bobbin or spool, adapted to be rotatably mounted on an elongated spindle comprising, a hollow open-ended barrel having a head at each end thereof, an adaptor member extending through each head and having threaded detachable connection with the interior of the barrel and acting to clamp the heads against the barrel ends, a core having a longitudinally extending open-ended tapered bore disposed within the barrel, one core end having driving connection with one adaptor and the other core end supported on the other adaptor, each adaptor being provided with an open-ended bore in communication with the core bore to provide a spindle reception passageway extending through the length of the bobbin, an elongated spindle extending through said passageway, the bores in the adaptors outward of the core ends being of greater diameter than the diameter of the core bore, the core bore snugly receiving the spindle, and the core being composed of a yieldable material which will permit the core bore to adapt itself to the spindle should the bore be out of alignment with the longitudinal axis of the spindle.

3. A bobbin or spool, adapted to be rotatably mounted on an elongated spindle comprising, a hollow open-ended barrel having a head at each end thereof, an adaptor member extending through each head and having detachable connection with the barrel and acting to clamp the heads against the barrel ends, a core having a longitudinally extending open-ended tapered bore disposed within the barrel, pins interconnecting one core end with one adaptor to provide a driving connection between the core and the adaptor and the other core end supported on the other adaptor, each adaptor being provided with an open-ended bore in communication with the core bore to provide a spindle reception passageway extending through the length of the bobbin, an elongated spindle extending through

said passageway, the bores in the adaptors outward of the core ends being of greater diameter than the diameter of the core bore, the core bore snugly receiving the spindle, and the core being composed of a yieldable material which will permit the core bore to adapt itself to the spindle should the bore be out of alignment with the longitudinal axis of the spindle.

4. A bobbin or spool, adapted to be rotatably mounted on an elongated spindle comprising, a hollow open-ended barrel having a head at each end thereof, an adaptor member extending through each head and having detachable connection with the barrel and acting to clamp the heads against the barrel ends, a core having a longitudinally extending open-ended tapered bore disposed within the barrel, one core end having a base of substantially the same diameter as the interior diameter of the barrel, the core base abutting the inner end of one adaptor, driving pins interconnecting the core base and said adaptor, a disc interior of the other end of the barrel and having a pressed fit therewith and provided centrally with a passageway, the other core end being disposed in the disc passageway, said end of the core being centered interiorly of the barrel by said support, each adaptor being provided with an open-ended bore in communication with the core bore to provide a spindle reception passageway extending throughout the length of the bobbin, said passageway being tapered from the lower end of the spool toward the upper end thereof, an elongated tapered spindle extending through said passageway, the bores in the adaptors outward of the core ends being of greater diameter than the diameter of the core bore, and the core being composed of a yieldable material which will permit the core bore to adapt itself to the spindle should the bore be out of alignment with the longitudinal axis of the spindle.

5. A bobbin or spool, adapted to be rotatably mounted on an elongated spindle comprising, a hollow open-ended barrel adjacent each of its ends having an interior diameter greater than the normal interior barrel diameter, a portion of the lengths of each barrel portion of greater diameter being threaded, a head at each end of the barrel and each having a central opening, an adaptor member extending through the opening of each head and having threaded connection with the threaded interior of the barrel and acting to clamp the heads against the barrel ends, a core having a longitudinally extending open-ended tapered bore disposed within the barrel, said core being of much smaller diameter than the interior of the barrel with the exception of a base which is of substantially the same diameter as the larger portion of the barrel interior at its ends, said core head being disposed in a larger end of the barrel and abutting the inner end of an adaptor, driving pins interconnecting the core head with said adaptor, a centrally apertured disc disposed in and having a pressed fit interiorly of the opposite larger end of the barrel, the opposite end of the core being supported in said disc aperture, the enlarged end portion of the barrel within which the core head is disposed extending inwardly beyond the inner face of said head, and the enlarged barrel end in which the apertured disc is disposed extending inwardly beyond the inner face of said disc, whereby heads of different thicknesses can be selectively clamped against the barrel end by the adaptors.

6. A bobbin or spool, constructed as in claim 5 wherein each adaptor is provided with an open-ended bore in communication with the tapered core bore to provide a spindle reception passageway extending throughout the length of the bobbin, an elongated spindle extending through said passageway, the bores in the adaptors outward of the core ends being of greater diameter than the diameter of the core bore, and the core being composed of a yieldable material which will permit the core bore to adapt itself to the spindle should the bore be out of alignment with the longitudinal axis of the spindle.

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