June 16, 1959 W. H. MILLER 2,890,521

HEAD AND CAP FOR BOBBINS OR SPOOLS AND METHOD OF SECURING SAME IN PLACE

Filed Jan. 28, 1954 2 Sheets-Sheet 1

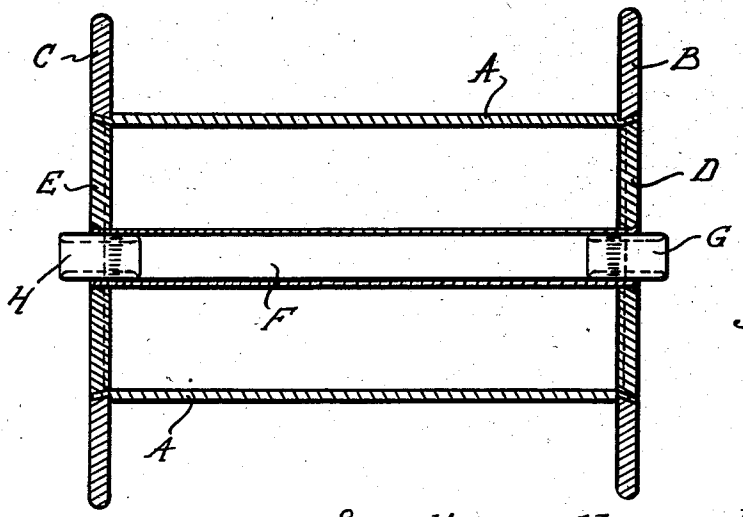


Fig. 1

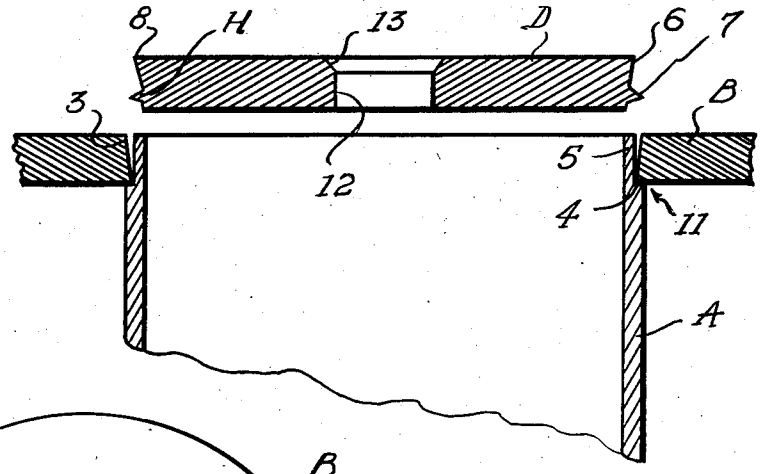


Fig. 3

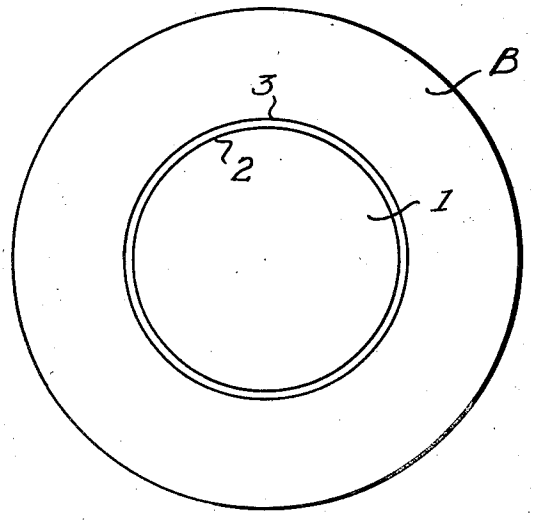


Fig. 2

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HEAD AND CAP FOR BOBBINS OR SPOOLS AND METHOD OF SECURING SAME IN PLACE

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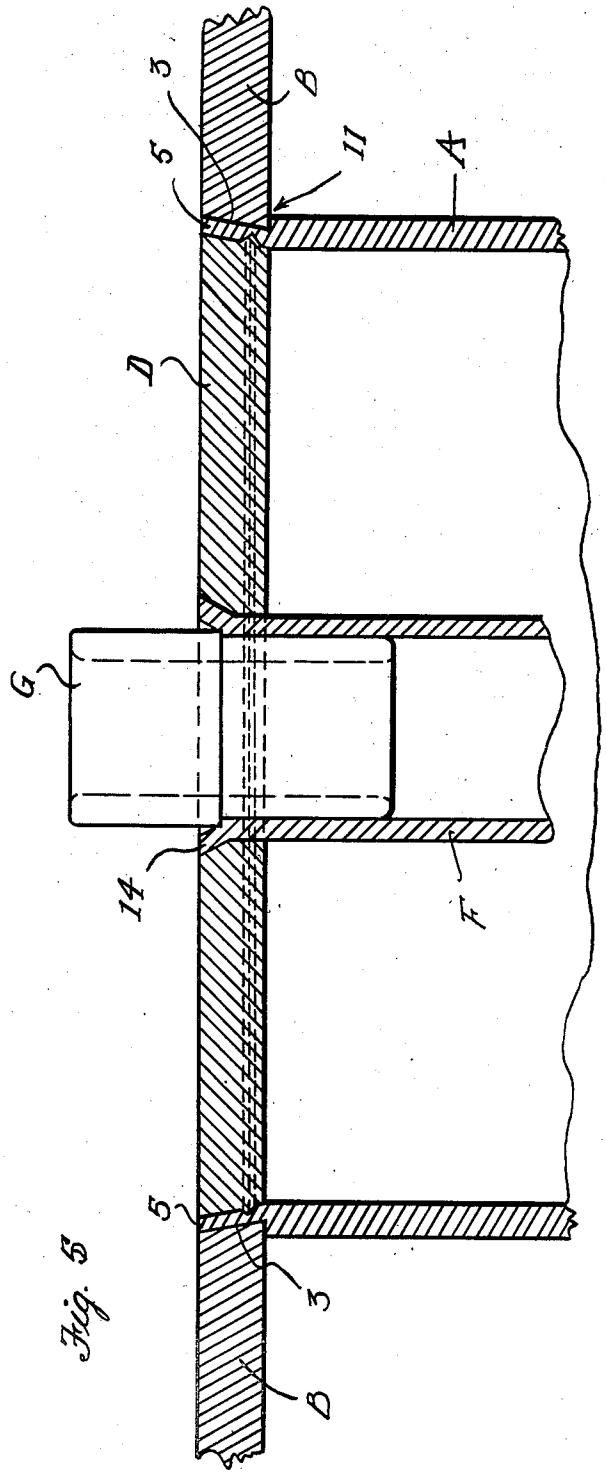


Fig. 5

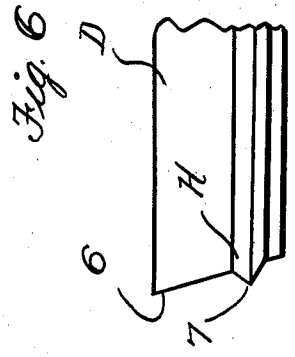


Fig. 6

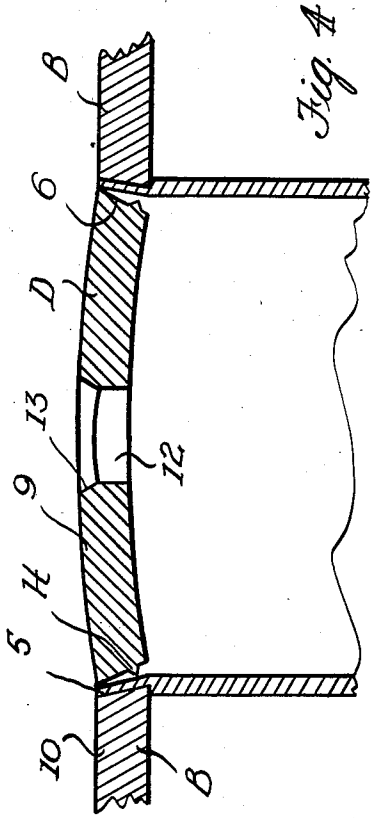


Fig. 4

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HEAD AND CAP FOR BOBBINS OR SPOOLS AND METHOD OF SECURING SAME IN PLACE

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1 Claim. (Cl. 29—522)

This invention relates to bobbins and spools or devices of a similar nature, but pertains more particularly and specifically to an improved construction for and method of securing heads and caps to the ends of a bobbin barrel.

In bobbins or similar devices the heads are ordinarily of a single piece the center portions of which close the open ends of the barrel.

An object of the invention is the provision of a novel construction and method of locking the heads and caps in the ends of the bobbin barrel.

A further object of the invention is an improved construction and method of securing the heads proper to the ends of the bobbin barrel.

Another and still further object of the invention is an improved construction and method wherein the caps or inserts function to rigidly secure the heads proper in place and to do so in a manner to assure that there is no trapping at the point of contact between the bobbin heads and the barrels of yarn or thread due to the pressure of the yarn or thread against the inner faces of the opposite bobbin heads.

Another and still further object of the invention is the provision of a low cost, light, durable and highly efficient metal bobbin or spool.

Other objects, novel features of construction as well as benefits from the practice of the invention will appear from the following description when read in the light of the accompanying drawings which illustrate a practical embodiment of the inventive concept, but specific departures can be made therefrom without departing from the inventive concept.

In the drawings:

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

Fig. 2 is an end view of one of the bobbin heads.

Fig. 3 is an enlarged sectional view through one end of the bobbin illustrating one of the steps of the method.

Fig. 4 is an enlarged sectional view of one end of the bobbin showing a further step in the method.

Fig. 5 is an enlarged sectional view through one end of the bobbin, as it appears in Fig. 1, illustrating the position of the parts upon a completion of the method.

Fig. 6 is an enlarged fragmentary side view of a portion of the cap or insert.

It is highly desirable to provide a metal bobbin or spool which has a comparatively low cost of production and is lighter than metal spools or bobbins as now commonly in use. To this end it is intended that all parts of the bobbin, with the exception of the gudgeons which are preferably made of stainless steel, be made of aluminum. The use of aluminum, however, is neither mandatory nor critical of the invention, but due to the manipulation of certain parts of the bobbin, the exact nature of which will be hereinafter explained, it is necessary that the metal used be malleable.

Another highly desirable attribute of a bobbin or spool is the provision of a construction which avoids the trapping of yarn or thread between the barrel ends and the adjacent inner faces of the barrel heads, which trapping in bobbins occurs due to the pressure of the yarn or thread against the opposite heads of the barrel. As will appear hereinafter, the heads of the present bobbin are pressed or clamped so tightly against the barrel ends as to prevent any possibility of yarn or thread trapping.

Another desirable attribute in a bobbin of the type embodying barrel caps or inserts is the provision of practical yet simple and low cost means of securing the barrel caps or inserts in place. The present bobbin provides for this highly desirable attribute in a manner which is hereinafter specifically described.

Having reference to the drawings and identifying each of the elements of the bobbin, A is an open ended barrel, B and C the two bobbin or barrel heads, D and E the two barrel caps or inserts, F the ordinarily provided center tube, and G and H the bobbin supporting gudgeons.

Ordinarily the head constructions at the two ends of a bobbin barrel are identical but it is to be understood that the present construction and method could be utilized, should it be desired, at one end of the barrel only. In the drawings the opposite ends of the bobbin are illustrated as being of identical construction, and hence description of one end of the bobbin will suffice to describe its similar opposite end.

As clearly appears in Fig. 2, the bobbin head B is circular in configuration so that when mounted upon an end of the bobbin barrel it provides a flange therefor. Centrally the head is cut out or formed with an opening or passageway 1 the defining edge 2 of which is beveled outwardly as at 3. The degree of this bevel is not critical and a ten percent bevel or inclination has been found to be adequate and suitable in use in a practical embodiment of the invention. Although it is intended that this head be made of aluminum this likewise is not mandatory nor critical of the invention as the head could be composed of some other material and not necessarily metal.

The barrel on the outer face of its end is cut away or otherwise suitably formed to provide a circumferential shoulder 4 which is positioned inwardly from the barrel end a distance substantially the same as the thickness of the barrel head. This formation provides at the end of the barrel an extension or band 5 which as respects the remaining portion of the barrel is of reduced thickness.

The passageway or opening 1 in the barrel head is of like diameter to the external diameter of the barrel end band portion 5 and in the assembly of the bobbin the head is pressed onto the barrel end until the peripheral edge of the inner face of the head abuts the barrel shoulder 4, as clearly appears in Fig. 3 of the drawings.

The next step in the assembly of the bobbin is illustrated in Fig. 5 wherein it will be seen that the barrel band or extension 5 is swedged or bent outwardly into tight abutting relationship with the beveled edge 3 of the barrel head opening 1.

The barrel cap or insert D is of a thickness substantially identical to that of the barrel heads, but variations in the thickness of the cap can be used, and its side face is beveled as at 6 to agree with the inclination of the outwardly swedged or bent barrel ends extension or band portion 5 as it appears in Fig. 5 of the drawings. If this were the entire construction of the cap it could be forced into the open end of the barrel, but this operation is not possible due to the fact that the cap intermediate the height of its tapered side wall is provided with an outwardly extending circumferential bead H which is of a V-shape in cross sectional configuration so that it has a sharp knife-like edge 7. The exact distance which this

bead extends outwardly beyond the side face of the cap is not critical but must be enough at all times to imbed itself sufficiently into barrel extension 5 to lock disc D into position.

The next step in the assembly and fabrication of the bobbin is that of bowing the cap and positioning it in the barrel and in the manner illustrated in Fig. 4 of the drawings. It will here be seen that the convex of the cap is faced outwardly and that the bowing permits the insertion of the cap in the barrel end notwithstanding the fact that the diameter of the cap through the bead would not permit the insertion of the cap in its flat condition or state, such as is illustrated in Fig. 3. With the cap bent or bowed and positioned as in Fig. 4, pressure is exerted upon the outer face of the cap so as to flatten it out and position its outer face 9 in the same plane as the outer face 10 of the head. The cap and bobbin then have the appearance and construction illustrated in Figs. 1 and 5 of the drawings. It will be understood of course that with identical constructions at each end of the bobbin the method would be to simultaneously position the heads and caps and simultaneously apply pressure to the outer faces of the caps to bring the outer faces in alignment with the outer faces of the barrel heads.

From the description thus far given it will be seen that upon flattening out the caps or inserts, two things will simultaneously occur. Due to the fact that the end extensions or bands 5 of the barrel are of malleable metal the cap beads will bite into the inner faces of these extensions, as is clearly illustrated in Fig. 5, and thus securely lock the caps or inserts in place. Simultaneously this will exert an outward expanding force or pressure on the barrel extensions which will transmit itself to the inclined extensions or bands, the bevel engagement of which with the beveled edge of the barrel heads will force the barrel heads against the barrel shoulders 4 under great pressure, with the result that there is no opening or gap at the point 11 where the outer face of the barrel meets the inner face of the head. Thus there is no possibility of yarn or thread being trapped between the barrel and the head. By actual test a pressure of 4,000 pounds has been applied against the heads and they have satisfactorily withstood this high pressure.

Attention is directed to the fact that although the cap bead H is shown to be of continuous length about the cap, this bead could be non-continuous and made up of a series of comparatively short spaced bead lengths if this should for any purpose be desirable.

Ordinarily bobbins or spools are provided with a center bearing tube and in some instances with gudgeons. The nature and construction of these elements can vary, and accordingly although these elements are illustrated in the drawings and are hereinafter described, it is to be understood that their specific construction and arrangement is not critical to the present invention.

The caps are provided with aligned openings, one of which 12, is illustrated in Figs. 3 and 4. These openings are of the proper size to snugly receive the center tube F. At their outer ends the openings are flanged and flared outwardly to provide an outwardly inclined surrounding wall 13. In assembly the tubes F are inserted through the cap openings and their outer ends are swedged or bent downwardly as at 14 to hold the tubes securely in place against movement. When this construction is used it will be seen that the tube constitutes a means of further holding the barrel caps or inserts against displacement, but use of the tube is not necessary for this purpose as the locking connection between the caps and the barrel ends is sufficiently strong of itself.

When it is desirable to have gudgeons on the bobbin the gudgeons G and H are pressed into the center tube following the assembly of the bobbin by the steps and method hereinbefore described.

From the foregoing description it will be seen that the caps or inserts are actually expanded into the barrel ends. Although the caps or inserts are not expanded in the sense that their sizes are increased above their sizes when they are flat, they are expanded after they have been bowed into the convex shape into which they are bent to enable their initial insertion into the barrel ends. Accordingly, in the following claims reference is made to expanding the caps or inserts into the barrel ends.

Although it is not believed at this time that it would be practical, nevertheless mention is made of the fact that the entire length of the barrel might not be composed of malleable metal and that malleable metal be limited to the barrel extensions or band portions 5.

Departures from the specific constructions illustrated in the drawings and specifically described is possible without departure from the inventive concept, and the invention is to be limited therefore only by the scope of the hereinafter appended claim.

What I claim is:

The method of securing a head provided with an aperture having an outwardly inclined surrounding wall at the outer face side of the head to the outer malleable metal end of an open-ended bobbin or spool barrel comprising telescoping the barrel end into the head aperture, swedging the barrel end outwardly into abutment with the outwardly inclined portion of the barrel head, placing into the open end of the barrel a circular shaped disc-like insert which is convex in form and having on its side wall an outwardly extending protrusion, and after said insert is in the barrel end, flattening the insert to simultaneously cause the insert protrusion to imbed itself into the inner face of the barrel end and to exert on the barrel end an outward radial force.

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