Oct. 31, 1950 J. J. BLISS 2,527,519

FLANGED BOBBIN WITH SNAP ON PROTECTED EDGE

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FIG. 4

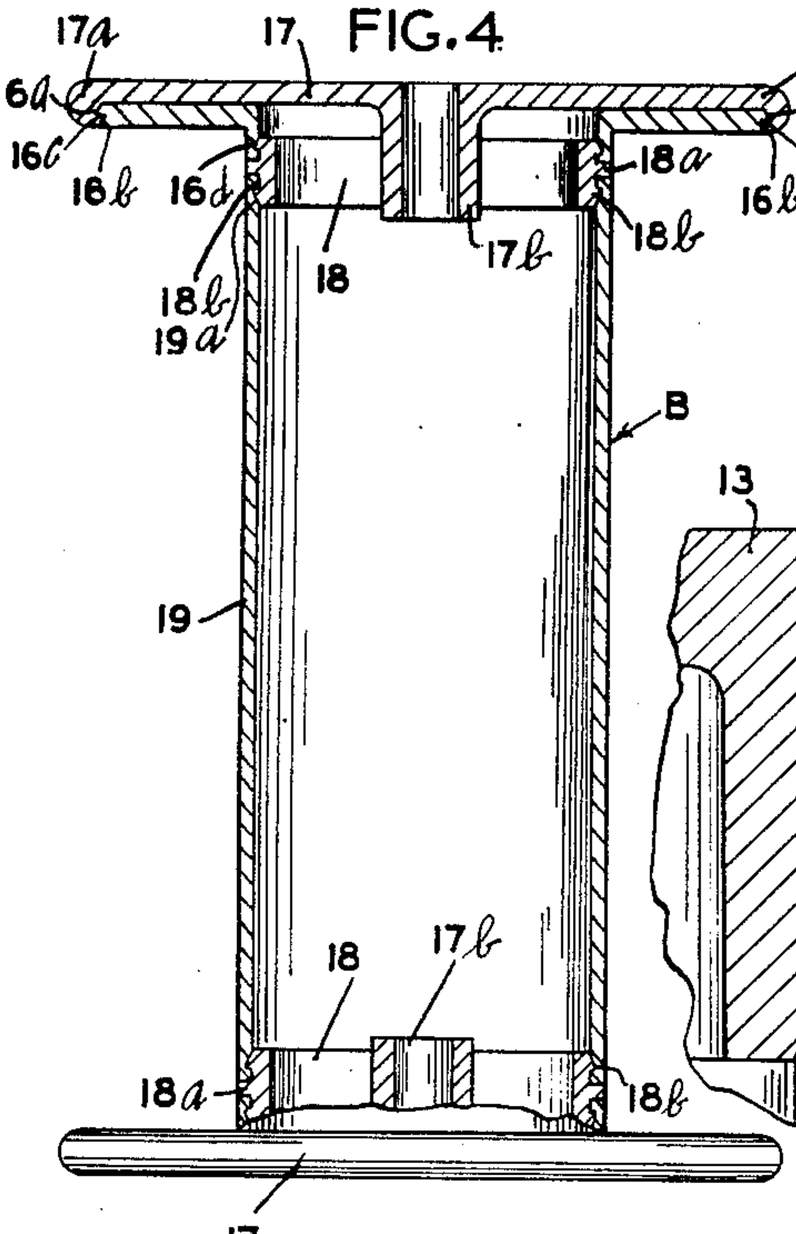



FIG. 1

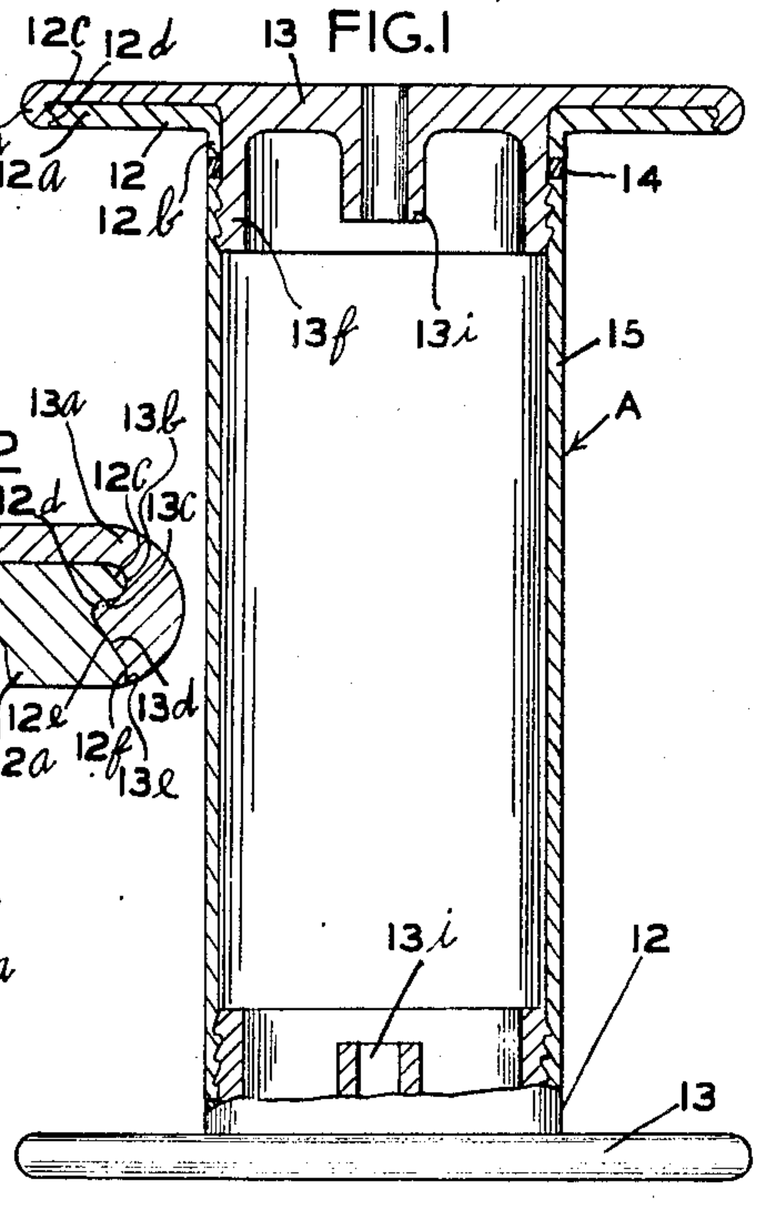



FIG. 2

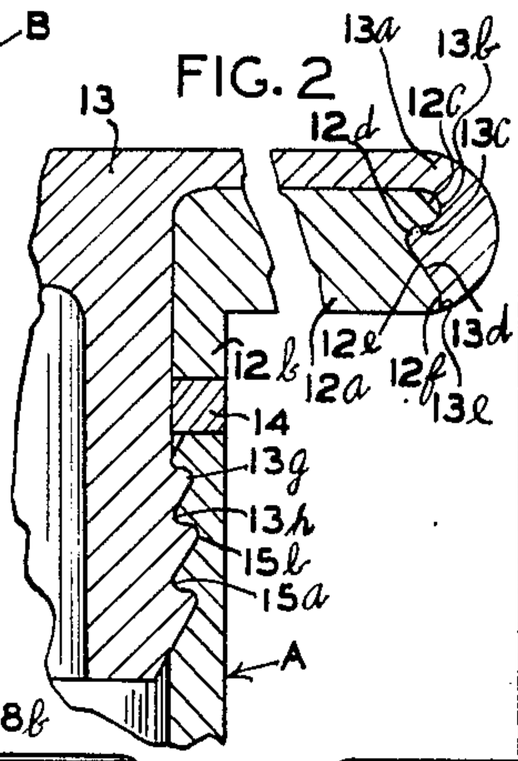



FIG. 6

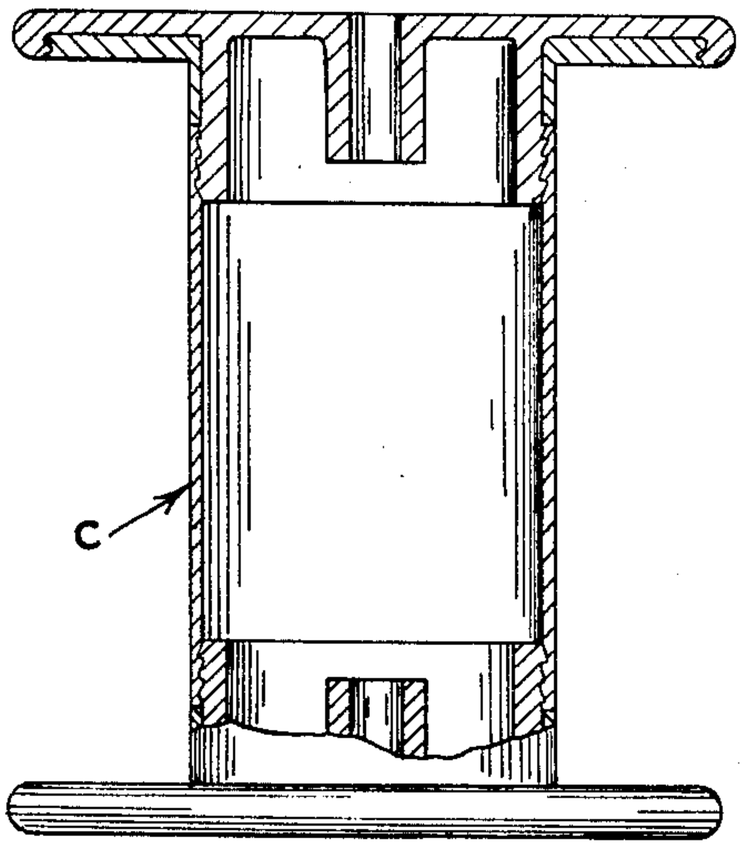



FIG. 5

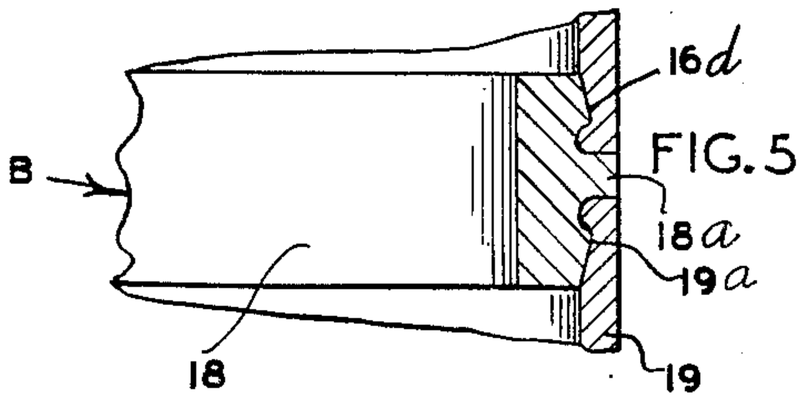
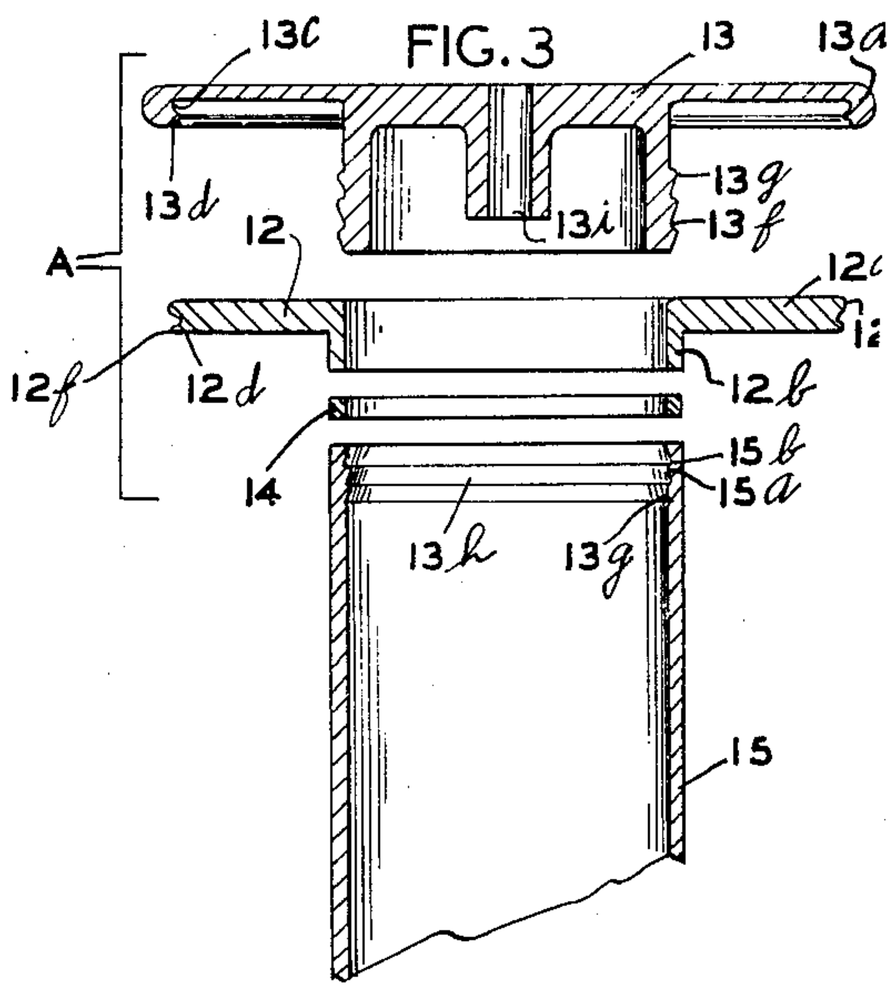



FIG. 3

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FLANGED BOBBIN WITH SNAP ON PROTECTED EDGE

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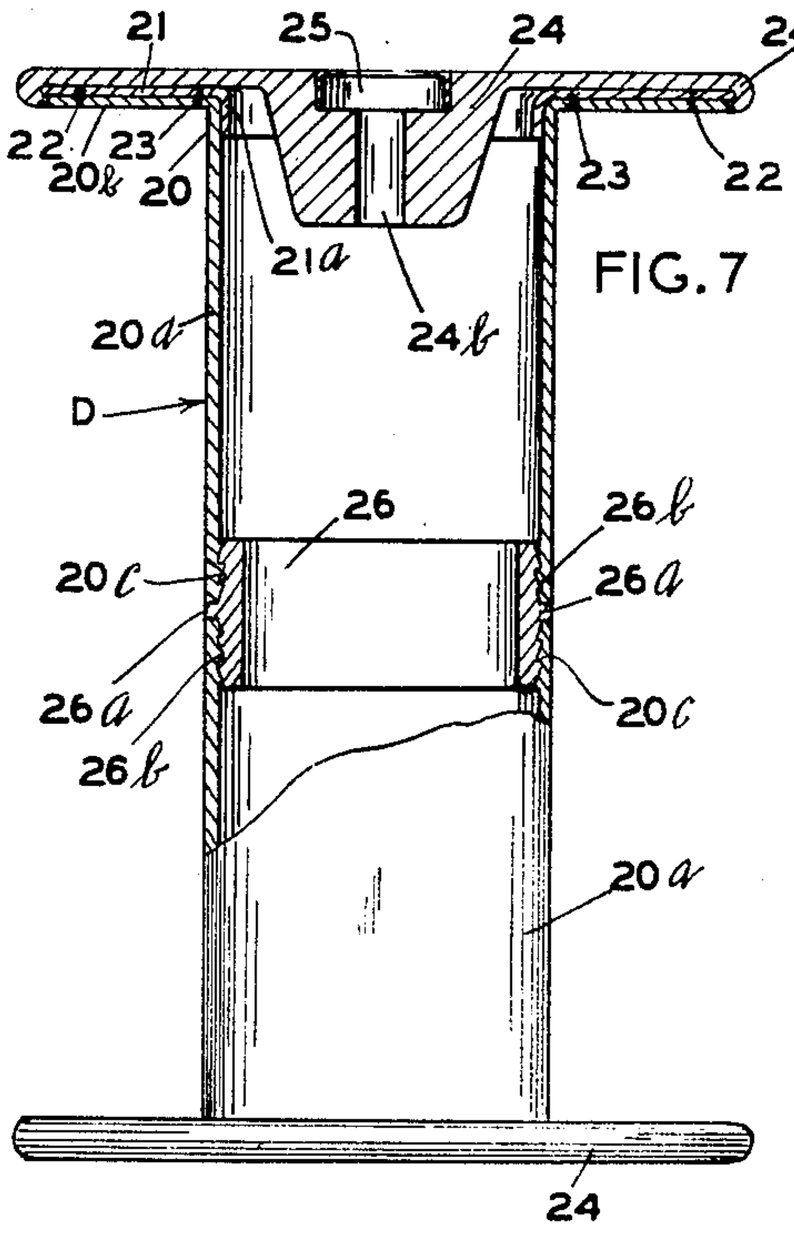



FIG. 7

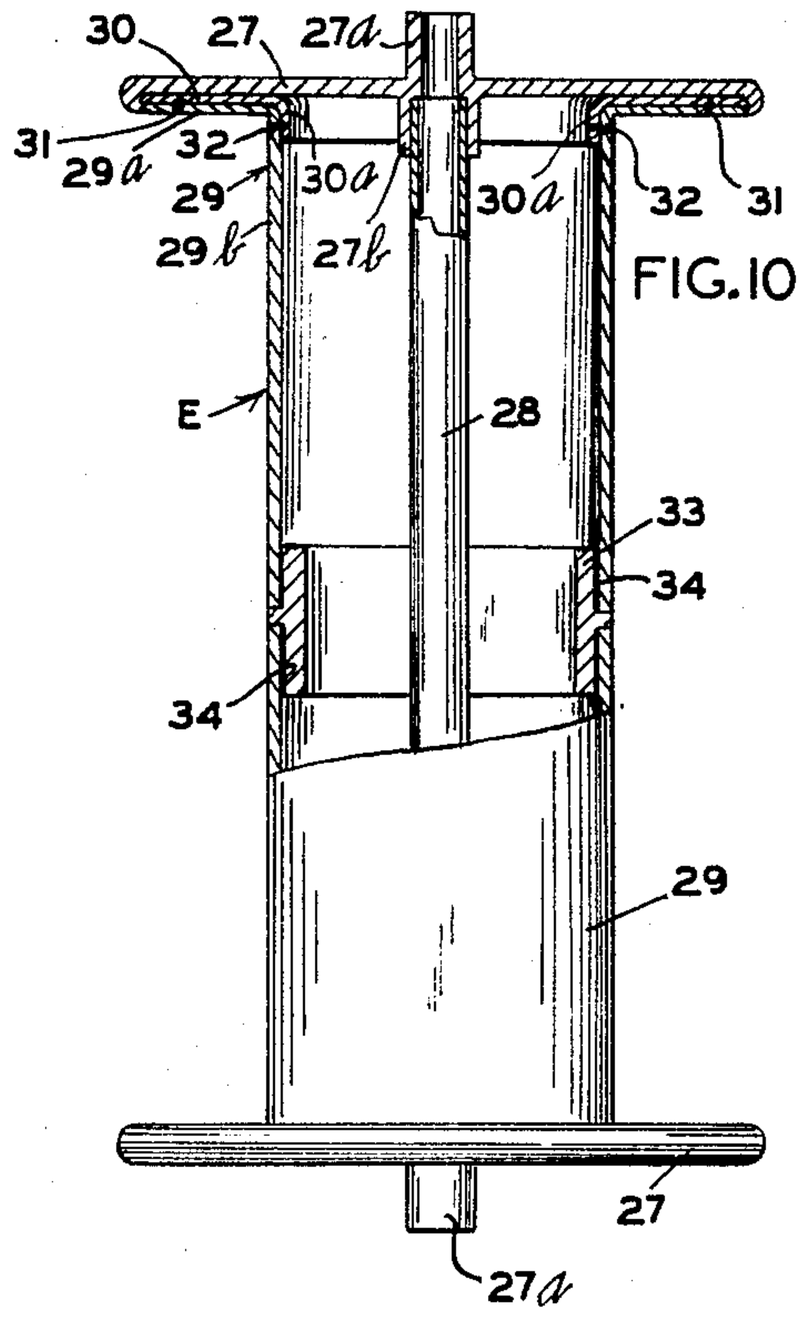



FIG. 10

FIG. 9

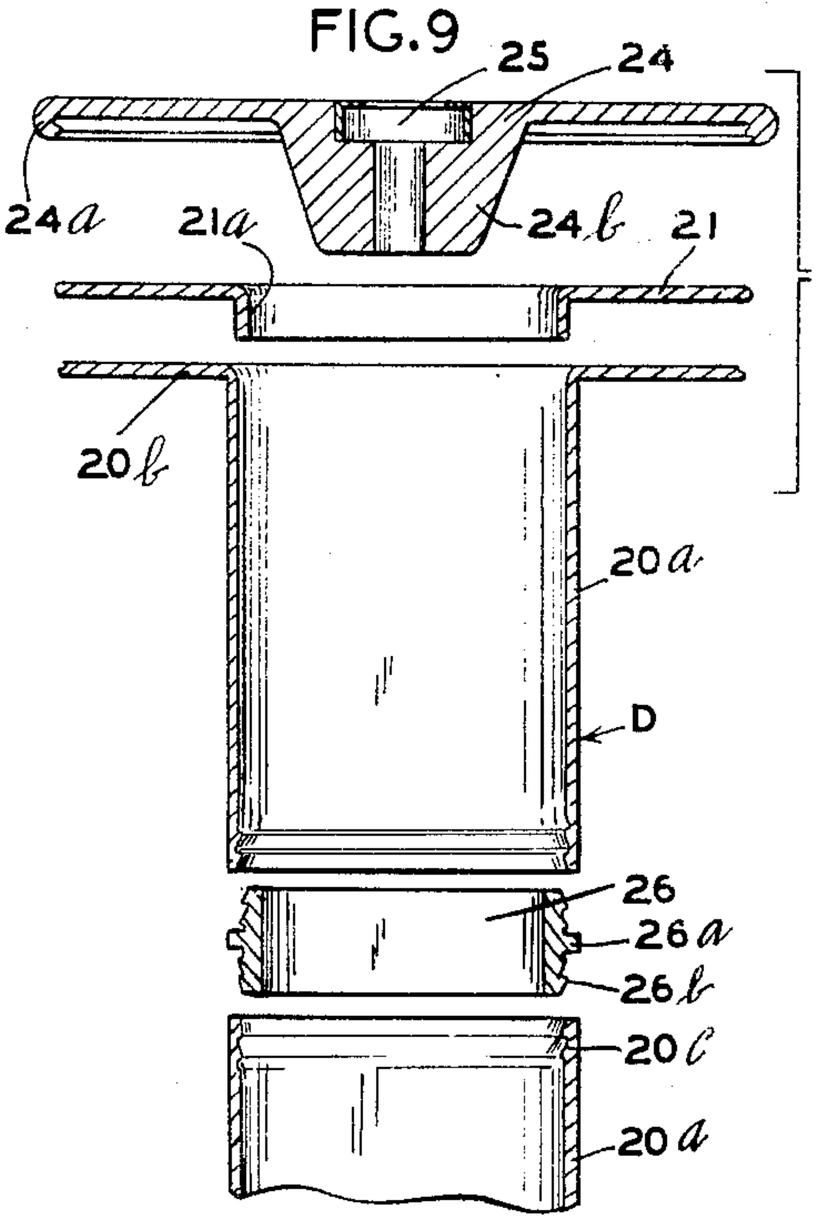



FIG. 8

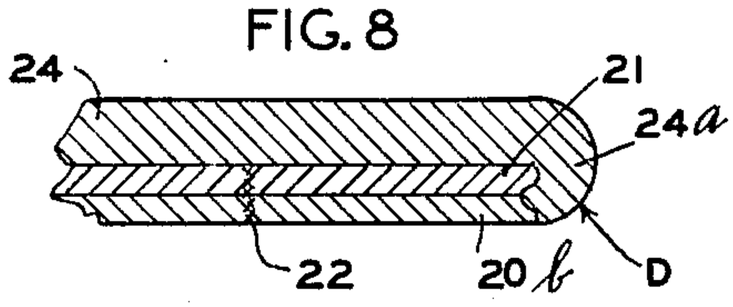
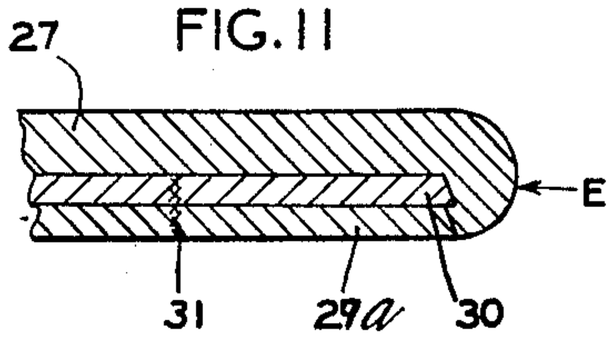



FIG. 11

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Patented Oct. 31, 1950 2,527,519

# UNITED STATES PATENT OFFICE

2,527,519

## FLANGED BOBBIN WITH SNAP ON PROTECTED EDGE

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Application June 3, 1949, Serial No. 96,847

20 Claims. (Cl. 242—118)

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This invention relates to bobbins, spools, or drums, hereinafter generally classified as bobbins, on which textile thread or wire may be wound, and it relates particularly to such bobbins wherein the flanges are protected by snap on heads formed of tough, resilient non-metallic material, the edges of which cannot be readily nicked, marred, dented or cut.

This application is a companion application to my application entitled "Flanged Bobbin with Protected Edge," Serial No. 96,849 filed June 3, 1949, the said companion application being generic respective to common subject matter disclosed in that application and in the present application.

This application also discloses but does not claim subject matter similar to that disclosed and claimed in my companion application entitled "Tubular Snap Joint," Serial No. 96,848 filed June 3, 1949.

The usual textile bobbin now employed includes a central wooden barrel on which the thread is wound and separate end flanges formed of fiber and attached to the outer ends of the barrel. A great many difficulties are experienced in the use of such bobbins. The thread is wound on many of these bobbins under high tension and the thread exerts both high crushing tension on the barrel of the bobbin and end thrust against the flanges of the bobbin. The wooden barrel, although originally accurately cylindrically formed, is not strong enough to continuously resist the crushing strain imposed upon it and often quickly becomes misshapen and must be discarded for the reason that it will not run true and in proper balance at high speeds when so misshapen, and the roughness of the barrel, due to the imperfections in the shape thereof, often results in the tearing or cutting of strands of thread wound thereon. Also, due to the end pressure exerted on the fiber bobbin flanges which are separate from the barrel, these flanges tend to bow outwardly and spread from the barrel, thereby producing crevices or cracks between the ends of the barrel and the flanges within which thread may be caught to become frayed or torn during the winding or unwinding operation. The bowing out of the bottom flanges also tends to cause the bobbin to run imperfectly as it is being rotated.

If, to give the bobbin adequate strength and to prevent the formation of thread catching cracks between the barrel and end flanges, there is substituted for the usual wooden barrel bobbin equipped with separate fiber end flanges a metal bobbin wherein metal end flanges are provided,

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other difficulties result. In drawing off the thread from the bobbin the thread is often drawn off from one end of the bobbin and the thread thus rides against the peripheral edge of the end flange, and if this end flange is nicked, marred, dented or cut so as to be otherwise than perfectly smooth, strands of the thread are liable to catch on the roughened portion of the end flange, causing the tearing of one or more strands of the thread. If bobbins having unprotected metal end flanges are provided these end flanges are subject to rapid deterioration through nicking, marring, denting or cutting during the handling of the bobbins, and thus bobbins having unprotected end flanges integral with the barrel portions are not a solution to the problem.

There is a disadvantage in employing cast bobbins made of metal or plastic due to inaccuracies that will result in the barrel and flanges in such cast bobbins. Also, if such cast bobbins are made from synthetic resins or other plastics, they do not have sufficient strength to resist the tremendous pressure to which the bobbins are subjected by the thread wound thereon. If the bobbins are made from the heavier metals, there is a disadvantage in their use inasmuch as many of these bobbins must be rotated at very high speeds, and in bringing the bobbins up to speed there is a decided disadvantage in a heavy bobbin. Also, slight inaccuracies in the formation of the bobbin when made of heavy material give rise to difficulties in maintaining the bobbin in proper balance at high speeds to greater extents than is the case when lighter bobbins are employed.

To overcome the various disadvantages in the bobbins now employed, and as disclosed in my first application above referred to, I have developed flanged bobbins having metal drum members forming barrels and flanges at the outer ends of the barrels, and I have provided heads formed of tough, resilient, non-metallic material having the property of being shaped to form a smooth edge incapable of being readily nicked, marred, dented or cut, and I have provided these heads with recesses receiving the respective metal flanges, the heads having circumferential portions overlying the edges of the flanges and being of smooth exterior formation, the inner sides of the circumferential portions of the heads lying flush with the inner sides of said flanges. In my above referred to application, one method of attachment of such heads is by bonding the heads to the flanges by use of an adhesive such as an adhesive made from synthetic resins.

The present invention relates to such bobbins

wherein heads are employed made of such a tough, elastic, non-metallic material that the heads at their circumferential portions may be curled inwardly and snapped over stepped edges of the metal flanges so as to interlock and hold the heads on to the flanges whether the heads are bonded to the flanges or secured thereto by other means.

It is accordingly an object of the invention to provide a light weight exceedingly strong flanged bobbin including a metallic drum member having a barrel portion and an outer flange, and a tough elastic head formed at its inner side to receive the metal flange, the edge of the flange being stepped and the head having a circumferential portion which will overlie the edge of the flange and interlock with the step thereof by snapping the head on to the flange, the material used for making the head being such that the outer peripheral edge of the head will form a smooth surface which cannot be readily nicked, marred, dented or cut.

A further object is to provide such a bobbin wherein the flange of the drum member is formed of a single thick piece of metal or of two laminations spot welded or otherwise secured together.

Another object is to provide such a bobbin wherein the head forms an interlocking collar for joining the barrel to a metal tube forming a continuation of the barrel.

The objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the different views, and in which

Fig. 1 is a view partly in side elevation and partly in longitudinal section illustrating a bobbin embodying the invention;

Fig. 2 is a detail in enlarged scale showing portions of certain of the parts illustrated in Fig. 1;

Fig. 3 is an exploded view in longitudinal section showing the parts of the bobbin illustrated in Figs. 1 and 2 as they will appear prior to assembly;

Fig. 4 is a view similar to Fig. 1 but illustrating a modified form of bobbin;

Fig. 5 is a detail in enlarged scale showing in vertical section the tubular joint between the drum member and the barrel tube;

Fig. 6 is a view similar to Fig. 1 but showing a bobbin illustrating another modification of the invention;

Fig. 7 is a view taken partly in side elevation and partly in vertical section illustrating another form of bobbin embodying the invention;

Fig. 8 is a detail in section on enlarged scale showing portions of certain of the parts illustrated in Fig. 7;

Fig. 9 is an exploded view showing the parts of the bobbin illustrated in Figs. 7 and 8 prior to assembly;

Fig. 10 is a view partly in side elevation and partly in vertical section illustrating another form of bobbin embodying the invention; and

Fig. 11 is a detail in enlarged scale showing in vertical section portions of the bobbin illustrated in Fig. 10.

Referring first to the form of the invention illustrated in Figs. 1, 2, and 3, there is there shown a bobbin A including a pair of drum members 12 made of metal and preferably a metal such as aluminum or aluminum alloy, a



pair of heads 13 formed of special non-metallic material, a pair of rings 14 formed of non-metallic material and preferably of the same type as the heads 13, and a tubular core 15 formed of metal and preferably a light weight metal such as aluminum or aluminum alloy.

Each drum member 12 includes a heavy circular flange 12*a* and a barrel portion 12*b* which in the form of the invention illustrated is integrally formed with the flange, preferably of approximately half the thickness of the flange and projecting inwardly from the central portion of the flange 12*a*.

Each head 13 is formed of a tough, resilient, non-metallic material capable of being formed or shaped to provide a smooth tough edge which cannot be readily nicked, marred, dented or cut through rough handling. While this material must be resilient, its resistance to deformation must be such that it will retain its form and position without deformation under very heavy pressure. It is possible that other materials may be used for forming a head 13 than plastic Nylon, and, hence, I do not wish to be limited to the use of plastic Nylon alone for the purpose. However I have found that plastic Nylon is an ideal material for use in forming the heads 13, as this material has all the characteristics required. Each head 13 has an outer disc portion of somewhat greater diameter than the flange 12*a* to which the head is to be connected and it has an incurled circumferential portion 13*a* shaped to receive and overlie the edge of the flange 12*a* of the drum member to which the head is to be connected. The inner surface of the circumferential portion is shaped to lie flush with the inner surface of the flange 12*a*. The peripheral surface of the circumferential portion 13*a* is very smoothly formed and is preferably rounded as shown so as to provide a smooth hard tough edge which cannot be readily nicked, marred, dented, or cut to catch on the strands of thread or wire which may run over this peripheral edge.

The internal surface of the incurled circumferential portion of the head 13 and the peripheral surface of the flange 12*a* are matingly formed to provide interlocking steps for holding the head 13 assembled to its adjacent drum member 12. Thus considering the peripheral edge of the flange 12*a* from the outer side of the flange inwardly to the inner side thereof the peripheral edge of the flange is first provided with a semicircular convex rib or step 12*c* and then inwardly from this rib or step the periphery of the flange is provided with a semicircular concavity or groove 12*d* as best shown in Fig. 2. Inwardly from the groove 12*d* the periphery of the flange 12*a* is smoothly inclined to form the truncated conical surface 12*e* which joins the innermost portion 12*f* of the periphery of the flange 12*a*, this innermost portion being of equal circumference to the outer circumference of the rib 12*c* and being a cylindrical surface. In similar manner, considering the internal surface of the incurled circumferential portion 13*a* of the head 13 inwardly from the disc portion of the head, this surface is provided with an outer concave groove 13*b* to receive the step or rib 12*c* of the cooperating drum member. Inwardly from the groove 13*b* the internal surface of the curled in portion of the head is provided with a convex step or rib 13*c* which mates with the groove 12*d* and is received within said groove. Inwardly from the step or rib 13*c* the internal surface of the incurled circumferential portion of the head is

provided with a truncated conical surface 13*d* which mates with the surface 12*e* and inwardly from the truncated conical surface 13*d* the internal surface of the incurled circumferential portion of the head is provided with a cylindrical portion 13*e* which mates with and snugly receives the cylindrical portion 12*f* of the periphery of the flange 12*a*. It should be stated that all of the various surfaces, 12*c*, 12*d*, 12*e*, 12*f*, and 13*b*, 13*c*, 13*d* and 13*e* are concentric relative to the longitudinal central axis of the head 13 and the drum member 12.

When the head 13 is concentrically aligned with its cooperating drum member 12 and heavy pressure is applied to bring the two parts together the curved rib 12*c* will first strike the truncated conical surface 13*d* of the head and the incurled circumferential portion 13*a* of the head will be cammed outwardly against the tough resistance offered by the said circumferential portion, causing the surface 13*d* and the rib 13*c* to ride over the rib 13*b*. As the rib or step 13*c* rides over the rib or step 12*c* during the bringing of the two parts together, the circumferential portion 13*a* of the head snaps inwardly carrying the rib 13*c* into the groove 12*d* and the rib 12*c* into the groove 13*b* with the surfaces 12*e* and 13*d* in abutment and with the surfaces 12*f* and 13*e* in abutment. The head 13 thereby becomes interlocked with the flange 12*a* of the drum member and cannot be removed except under very heavy pressure and then only by stripping at least a portion of the step or rib 13*c* from the head or the step or rib 12*c* from the drum member. The material employed for the composition of the head 13 while resilient is so resistant to deformation and compression that a very strong interlock is obtained to tightly hold the two parts together with the flange 12*a* of the drum member received within the recess formed at the inner surface of the head in tight engagement. Also, the material of the head is put under sufficient compression and frictionally grips the periphery of the flange 12*a* so tightly that it becomes impossible to rotate the head 13 relative to the drum member 12 after the two parts are engaged.

Each head 13 is also provided with an inwardly extending cylindrical flange 13*f* which will project inwardly well beyond the inner edge of the barrel portion 12*b* of the drum member. The exterior surface of the inner portion of the cylindrical flange 13*f* is provided with one or more ribs or steps 13*g* (three in the form illustrated) and grooves 13*h* between the adjacent steps for interlocking engagement with steps or ribs 15*a* and grooves 15*b* formed on the interior surface of the metal tube 15 adjacent the end thereof. These ribs or steps 13*g* and the mating ribs or steps 15*a* and 15*b* formed in the tube 15 are inclined as shown and rounded as shown to permit of the camming inwardly of the ribs 13*g* and the snapping into place of the steps 13*g* within the grooves 15*b* as the heads are assembled to the outer end portions of the tubular core 15. Of course, both ends of the tubular core 15 are provided with the ribs and grooves 15*a* and 15*b*.

Interposed between the inner edge of the barrel portion 12*b* and the adjacent end of the tubular core 15 is a ring 14 which is also preferably made of plastic Nylon or a non-metallic material which is tough and resilient. As the head 13 is brought into interlocking engagement with the tubular core 15 this ring 14 is compressed under heavy compression, and thus due to the tough resilient character of the material forming



the ring 14 it becomes impossible for the joint to open up between the ring and the drum member 12 or between the ring and the tubular core 15 even though there be some expansion or contraction of the parts after assembly.

The central portions of the heads 13 are bossed inwardly and apertured to provide tubular trunnions 13*i* for reception of a spindle on which the entire bobbin may be mounted. Variations in the shape of this trunnion structure may be made to accommodate the bobbin to fit spindles of different types and shapes.

In assembling the different parts of the bobbin together, all the parts are assembled at one time. Suitable fixtures are provided for the two heads 13 and the drum members 12. The ring 14 and the tubular cores 15 having been concentrically aligned, the two heads 13 are forced toward each other under very high pressure. As the two heads move toward each other the incurled circumferential portions 13*a* of the heads are snapped on to the flanges 12*a* of the drum members 12, while at the same time the cylindrical flanges 13*f* of the heads are forced into and snap into engagement with the outer portions of the tubular core 15, the ring 14 being simultaneously compressed.

It is usually desirable to anodyze the exterior surfaces of the metallic drum members 12 and of the tube 15. As the rings 14 are placed under compression as the parts are assembled, the exterior surfaces of these rings project slightly out beyond the anodyzed surfaces of the adjacent parts and may be buffed off smoothly to align directly with the surfaces without forming any irregularities in the core portion of the bobbin. Also, if there are slight discrepancies between the thicknesses of the inner ends of the barrel portions 12*b* of the drum members 12 and the outer ends of the tubular core 15 the rings 14 will take up for these variations.

When the bobbin has been assembled, it is of exceedingly strong construction and, of course, the tubular core member 15 forms an aligned continuation of the barrel portions 12*b* of the two drum members. This core portion of the bobbin has terrific strength to withstand the enormous pressures that will be exerted on the core portion of the barrel as thread or wire is wound thereon or as the thread shrinks after wetting to set the twist made in the thread. By reason of the fact that the barrel portions 12*b* of the drum members 12 are made integral in the illustrated embodiment with the flanges 12*a* of the drum members it becomes impossible for the flanges 12*a* to pull away from the barrel portions 12*b* as the thread or wire wound on the drum exerts terrific pressures against the flanges and thus no cracks or crevices can develop between the barrel portions 12*b* and the flanges 12*a* for the catching of the thread or wire or strands thereof. The joint between the head and the tubular core member 15 is such that it will not pull out under the terrific pressures exerted against the bobbin flanges. The bobbin, if made of aluminum or aluminum alloy and plastic Nylon as is preferred, will be of comparatively lightweight structure relative to other bobbins, and this is of material advantage in bringing the bobbins up to speed and in maintainance of the static and dynamic balance of the bobbins when rotated at very high speed. The edges of the flanges of the bobbin will be protected by the heads 13 so that even though the bobbin is very roughly handled or is dropped on the floor, the

edges of the flanges cannot become roughened or dented or cut to cause the catching of the thread or strands thereof as it rides over the peripheral edges of one or both of the heads 13. The Nylon trunnions 13*i* which are formed integral with the heads 13 are ideal for reception of the spindles.

Referring now to the bobbin shown in Figs. 4 and 5, this bobbin is designated as an entirety by the letter B. This bobbin includes drum members 16, heads 17 and connecting collars 18, and a tubular core 19. The drum members 16 and the tubular cores 19 are preferably made of aluminum or aluminum alloy as in the case of the bobbin A, while the heads 17 and the connecting collars 18 are preferably made of a tough resilient non-metallic material of the same type as are the heads 13 and the rings 14 of the bobbin A. The peripheral edges of the flanges of the drum members 16 are provided with two truncated conical surfaces 16*a* and 16*b* with a radial surface 16*c* between these two surfaces, whereby the surface 16*a* forms a step or rib at the peripheral surfaces of the flange of the drum member. Similarly, each head 17 is provided with an inwardly curled circumferential portion 17*a*, the central surface of which is stepped in complement to the peripheral edge of the flange of the drum member. With this arrangement it will be seen that the head 17 may be forced on to the flange of the drum member in much the same manner as in the previously described construction and the incurled circumferential portion 17*a* of the head will snap over the stepped peripheral edge of the flange of the drum member to interlock therewith.

Instead of equipping each head 17 of the bobbin B with an inwardly projecting flange as in the case of the bobbin A, no such flange is provided in the head 17. However, each head is provided with an inwardly projecting trunnion portion 17*b* as in the previously described construction. Each collar 18 has a central exterior projecting flange 18*a* which will be received between the inner end of the barrel portion of the adjacent drum member and the outer end of the tubular core 19 and placed under compression as the drum members 16 are assembled to the collars 18 and the collars 18 are assembled to the ends of the tubular core 19. At either side of the flange 18*a* the collar at its exterior surface is provided with a step or rib 18*b* which will be received within corresponding grooves 16*d* and 19*a* formed at the adjacent end portions of the respective barrel portions of the drum members and the end portions of the tubular core 19.

Referring now to Fig. 6, there is there shown another alternative form of bobbin embodying the invention, this bobbin being designated by the letter C. The bobbin C is identical to the bobbin A previously described with the exception that the rings 14 employed in the bobbin A are eliminated and the outer ends of the tubular cores are brought into direct engagement with the inner ends of the barrel portions of the drum members. The bobbin C can be employed particularly when it is not desired to anodyze the exterior surfaces of the metal parts and, of course, this bobbin is of a cheaper construction than the bobbin A but lacks some of the advantages of the bobbin A.

Referring now to the form of the invention shown in Figs. 7, 8, and 9, the bobbin there shown is designated by the letter D. This bobbin differs principally from the bobbin previously described in that the flanges of the drum members of the bobbin are of laminated construction and the barrel portions of the drum members are made of considerably greater length than are the barrel portions of the previously described drum members.



The bobbin D includes a pair of drum members 20 preferably formed of sheet metal such as aluminum or aluminum alloy and having long barrel portions 20*a* and flanges 20*b* outturned from the outer ends of the barrel portions and integrally connected therewith. The material from which the drum members 20 are formed is relatively soft so that it can be easily drawn. Fitting against the outer portions of the drum member 20 is a reinforcing disc or lamination 21 having an inturned flange 21*a* which is received within the outer part of the barrel portion 20*a*. The reinforcing disc 21 will preferably be made of hard heat treated aluminum or aluminum alloy having greater strength than the material forming the drum member 20, and, therefore, incapable of being drawn to the same extent as is the drum member 20. The reinforcing disc 21 is secured to the flange 20*b* of the drum member as by two lines of spot or seam welds 22 and 23, one line being spaced inwardly from the outer edge of the flange 20*d* and the other line being spaced from but adjacent to the jointure of the flange 20*b* with the barrel portion 20*a*. Each head 24 is formed of the same material as that employed for making the other heads referred to and it has an inwardly curled circumferential portion 24*a* shaped and formed as in the case of the circumferential portion 13*a* of the bobbin A. The laminated flanges of the bobbin D produced by the flanges 20*b* and the disc 21 are shaped and formed at their peripheries as in the case of the periphery of the flange 12*a* of the bobbin A, and, of course, the head 24 is snapped over and interlocked with the laminated flange as in the case of the previously described constructions. The central portion of each head 24 forms a trunnion 24*b* which is recessed at its exterior side to receive a metal apertured cup member 25 of the type employed on certain types of bobbins.

The inner ends of the barrel portions 20*a* are interconnected by a collar 26 having on its exterior surface a central flange 26*a* which is received under compression between the two inner ends of the barrel portions 20*a*. Also, the collar 26 is provided at either side of the flange 26 with a number of steps or ribs 26*b* which are received within grooves 20*c* formed at the interior sides of the end parts of the barrel portions 20*a*. The collars 26 are preferably made of the same type of non-metallic material as the heads 24.

Referring now to the bobbin E shown in Fig. 10, the heads 27 of this bobbin are shown as being formed quite similarly to the heads 17 of the bobbin B with the exception that the heads are provided with outwardly extending hubs 27*a* and inwardly extending hubs 27*b* inwardly rabbetted to receive the ends of a strut-like tube 28 preferably made of metal and projecting between the two heads of the bobbin. The drum members 29 of the bobbin E are generally quite similar to the drum members 20 of the bobbin D and they are provided with laminated flanges formed by the flanges of the drum members and reinforcing discs 30 similar to the discs 21 previously described. The drum members 29 are secured to the reinforcing discs 30 by two lines

of spot or line welds 31 and 32, the welds 31 being located inwardly from the peripheral edges of the flanges 29*a* of the drum members, and the welds 32 connecting the barrel portions 29*b* of the drum members to the inwardly extending flanges 30*a* of the reinforcing discs 30. The inner ends of the two drum members are interconnected by an exteriorly flanged collar 33 formed preferably of synthetic resins, fiber, or metal and adhesively bonded to the inner parts of the barrel portions of the drum members by an adhesive 34 formed preferably of synthetic resin.

It will be seen that highly efficient bobbin structures have been provided.

It will, of course, be understood that various changes may be made in the form, details, arrangement, and proportions of the various parts without departure from the scope of the present invention, which, generally stated, consists in the matter shown, and described, and set forth in the appended claims.

What I claim is:

1. A flanged bobbin comprising a metal drum member having a tubular barrel portion and a circular flange, the peripheral edge of said flange being stepped, and a circular head formed of a tough, resilient non-metallic material, the circumferential portion of said head being curled inwardly and overlying the peripheral edge of said flange with the inner surface of said circumferential portion of the head lying flush with the inner side of said flange, the internal surface of the inwardly curled portion of said head being stepped in complement to the peripheral edge of said flange and the material from which said head is formed having sufficient resiliency that the inwardly curled portion of the head will snap over the periphery of the flange to interlock therewith as the head is forced on to the flange, the periphery of the circumferential portion of said head forming a smooth, tough edge which cannot be readily nicked, marred, dented or cut.

2. The structure defined in claim 1, said head having a central trunnion portion formed therein.

3. A flanged bobbin comprising a metal drum member having a tubular barrel portion and a circular flange, the peripheral edge of said flange being ribbed and grooved, and a circular head formed of a tough, resilient, non-metallic material, the circumferential portion of said head being inwardly curled and overlying the peripheral edge of said flange with the inner surface of said circumferential portion of the head lying flush with the inner side of said flange, the internal surface of the inwardly curled portion of said head being grooved and ribbed in complement to the peripheral edge of said flange, and an inner portion of the internal surface of the curled portion of said head being shaped to ride over the rib of said flange causing the rib of said flange to cam said inwardly curled portion of the head outwardly as said drum member and head are forced together, thereby permitting the rib of said head to snap over the rib of said flange to interlock therewith, the periphery of said head being formed to produce a smooth tough edge, which cannot be readily nicked, marred, dented or cut.

4. A flanged bobbin comprising a metal drum member having a tubular barrel portion and a circular flange, the peripheral edge of said flange from the outer side of the flange to the inner side thereof being provided with first a circumferential rib and then a circumferential groove, and a circular head formed of a tough, resilient, non-metallic material, the circumferential portion of said head being curled inwardly and overlying the peripheral edge of said flange and the inner surface of the circumferential portion of the head lying flush with the inner side of said flange, the internal surface of the inwardly curled portion of the head being provided with a circumferential groove receiving said circumferential rib of the flange and being also provided inwardly from the groove formed therein with a circumferential rib received within the circumferential groove of the flange, the periphery of the circumferential portion of said head being smoothly formed to provide a surface which cannot be readily nicked, marred, dented or cut.

5. The structure defined in claim 4, the inner portion of the rib of said head being sloped from adjacent the inner surface of said circumferential portion to ride over the rib of said flange as said head is forced on to said drum member causing the inwardly curled portion of said head to expand outwardly and the snap in place on said flange in interlocked relation therewith.

6. A flanged bobbin comprising a metal drum member having a tubular barrel portion and a circular flange, said flange projecting from the outer end of said barrel portion and the flange being considerably thicker than said barrel portion, the peripheral edge of said flange having an outer circumferential rib and a circumferential groove inwardly therefrom, and a circular head formed of a tough, resilient, non-metallic material, the circumferential portion of said head being curled inwardly and internally circumferentially grooved and ribbed to mate with the rib and groove at the peripheral edge of the flange, the circumferential portion of said head overlying the periphery of the flange and the inner surface of said circumferential portion lying flush with the inner surface of said flange, the periphery of said head being smoothly formed to form a surface which cannot be readily nicked, marred, dented or cut.

7. A flanged bobbin comprising a metal drum member having a tubular barrel portion and a laminated circular flange, means fastening the laminations of said flange together, the peripheral edge of the laminated flange being provided with a circumferential rib and a circumferential groove inwardly therefrom, and a circular head formed of a tough, resilient, non-metallic material, said head having an inwardly curled circumferential portion overlying said laminated flange and the inner surface of which lies flush with the inner surface of said flange, the internal surface of the inwardly curled portion of said head having a circumferential groove and a circumferential rib respectively complementary with the rib and groove of said flange, the periphery of the circumferential portion of the head being smoothly formed to provide an edge which cannot be readily nicked, marred, dented or cut.

8. The structure defined in claim 7, the outer lamination of the flange of said drum member having an inturned flange received within the outer part of said barrel portion.

9. The structure defined in claim 8, the outer lamination of said flange being formed of a hardened metal which cannot be readily drawn, and the inner lamination of said flange and said barrel portion being formed of a softer metal which can be readily drawn.

10. A flanged bobbin comprising a metal drum member having a tubular barrel portion and a circular flange which projects from the outer end of said barrel portion, a circular head formed of a tough, resilient, non-metallic material, the circumferential portion of said head overlying the periphery of said flange and the inner surface of said circumferential portion being flush with the inner surface of said flange, the periphery of said head being smoothly formed to provide a surface which cannot be readily nicked, marred, dented or cut, said head having a central cylindrical portion projecting through and inwardly from said tubular barrel portion, the exterior surface of said cylindrical portion inwardly from said barrel portion being circumferentially ribbed and grooved, and a tubular core member having its internal surface grooved and ribbed in complement to the ribbing and grooving of said cylindrical portion and matingly receiving the ribbed and grooved part of said cylindrical portion of said head.

11. The structure defined in claim 10, and a ring formed of tough, elastic material located between the inner end of said barrel portion and the outer end of said core member and placed under compression.

12. A flanged bobbin comprising a metal drum member having a tubular barrel portion and a circular flange which projects from the outer end of said barrel portion, the peripheral edge of said flange being ribbed and grooved, a circular head formed of a tough, resilient, non-metallic material, the circumferential portion of said head being curled inwardly and overlying the periphery of said flange with the inner surface of said circumferential portion of the head lying flush with the inner side of said flange, the internal surface of said curled in portion of said head being grooved and ribbed in complement to the ribbing and grooving of the peripheral edge of said flange to receive the same in interlocking relation therewith, the peripheral edge of said head being smoothly formed to provide a surface which cannot be readily nicked, marred, dented or cut, said head having a central inwardly projecting cylindrical portion projecting inwardly through and beyond said barrel portion and the exterior surface of the inner part of said cylindrical portion of the head being circumferentially ribbed and grooved, and a tubular metal core member aligned with and forming a continuation of said barrel portion and receiving the inner part of said cylindrical portion of said head, the outer end portion of said core member being internally circumferentially grooved and ribbed in complement to the ribbing and grooving of said cylindrical portion to receive and interlock therewith.

13. The structure defined in claim 12 and a ring formed of tough, resilient, non-metallic material held under compression between the inner end of said barrel portion and the outer end of said core member.

14. The structure defined in claim 12 and a spindle receiving trunnion formed by said head centrally of said cylindrical portion.

15. A flanged bobbin comprising a metal drum member having a tubular barrel portion and a circular flange projecting from the outer end of said barrel portion, the outer portion of the peripheral edge of said flange forming a circumferential rib, the intermediate portion of the peripheral edge of said flange forming a circumferential groove, the portion of said peripheral edge of said flange inwardly from said groove being of truncated conical shape with its larger base located toward the inner side of said flange, and the extreme inner portion of the peripheral edge of said flange being of cylindrical contour, the surface of which is radially spaced from the axial center of the flange the same distance as said rib, and a circular head formed of a tough, resilient, non-metallic material, the circumferential portion of said head being curled inwardly and overlying the peripheral edge of said flange with the inner surface of said circumferential portion of the head lying flush with the inner side of said flange, the internal surface of the curled in portion of said head being complementary to the periphery of said flange and interlocking therewith, the periphery of said head being smoothly formed to provide a surface which cannot be readily nicked, marred, dented or cut, and a tubular metal core member joined to the inner end of said barrel portion in alignment therewith.



16. The structure defined in claim 15, said head having a central cylindrical portion projecting inwardly through said tubular barrel portion and received within the outer part of said core member, the exterior surface of the inner part of said cylindrical portion and the internal surface of the outer part of said core member being ribbed and grooved in complement to form an interlocking connection.

17. A flanged bobbin comprising a metal drum member having a tubular barrel portion and a circular flange which projects from the outer end of said barrel portion, the peripheral edge of said flange being stepped, and a circular head formed of plastic Nylon, the circumferential portion of said head being curled inwardly and overlying the peripheral edge of said flange with the inner surface of said circumferential portion of the head lying flush with the inner side of said flange, the internal surface of the inwardly curled portion of said head being stepped in complement to the peripheral edge of said flange to interlock therewith, the peripheral edge of the circumferential portion of said head forming a smooth edge.

18. A flanged bobbin comprising a drum member of aluminum alloy having a tubular barrel portion and a circular flange which projects from the outer end of said barrel portion, the peripheral edge of said flange being stepped, and a circular head formed of plastic Nylon, the circumferential portion of said head being curled inwardly and overlying the peripheral edge of said flange with the inner surface of said circumferential portion of the head lying flush with the inner side of said flange, the internal surface of the inwardly curled portion of said head being stepped in complement to the peripheral edge of said flange to interlock therewith, the periphery of the circumferential portion of said head forming a smooth edge.

19. A flanged bobbin comprising a drum member of aluminum alloy having a tubular barrel portion and a circular flange which projects from the outer end of said barrel portion, the peripheral edge of said flange being stepped, and a circular head formed of plastic Nylon, the circumferential portion of said head being curled inwardly and overlying the peripheral edge of said flange with the inner surface of said circumferential portion of said head lying flush with the inner side of said flange, the internal surface of the inwardly curled portion of said head being stepped in complement to and interlocking with the peripheral edge of said flange, the periphery of the circumferential portion of said head form-

ing a smooth edge, said head having a central inwardly projecting cylindrical portion projecting through said barrel portion and being stepped at its external side inwardly from said barrel portion and a tube formed of aluminum alloy within the outer end of which the stepped portion of said cylindrical portion is received, the end portion of said tube being stepped in complement to the step of said cylindrical portion to interlock therewith.

20. The structure defined in claim 19, and a Nylon ring interposed in compressed relation between the inner end of said barrel portion and the outer end of said tube.

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