June 12, 1951 F. G. DE SANTIS 2,556,684

PENDULOUS BOBBIN HOLDER

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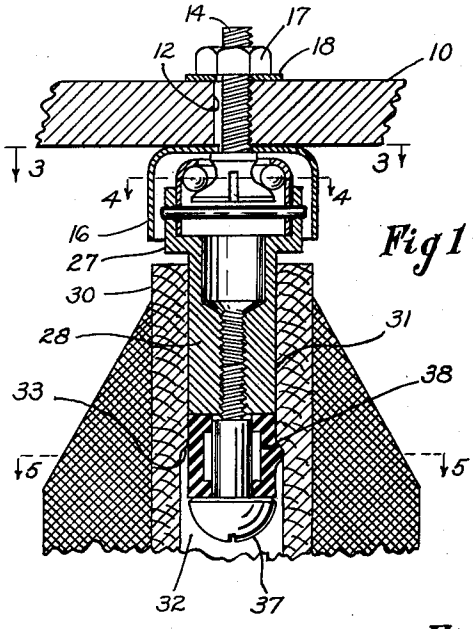


Fig 1

Fig 2

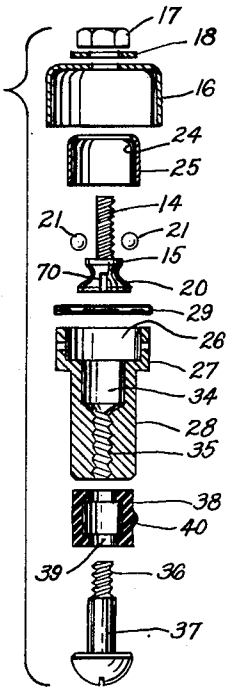


Fig 7

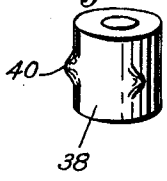


Fig 4

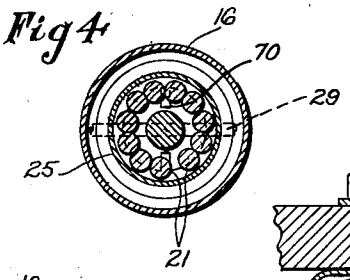
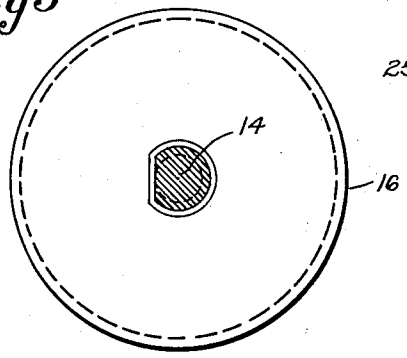


Fig 3



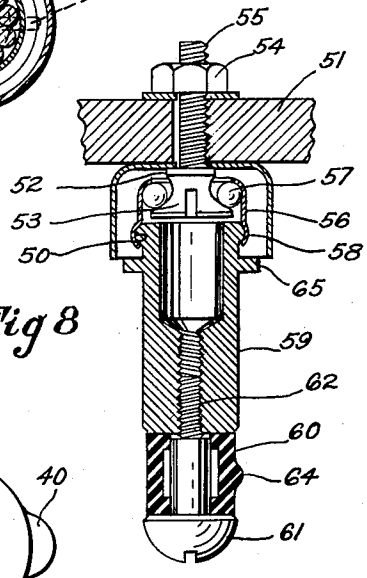
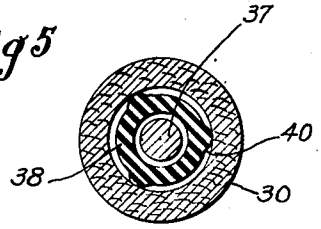


Fig 8

Fig 5



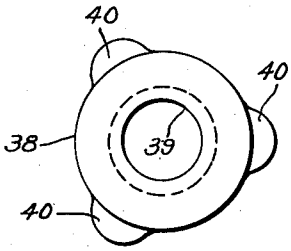


Fig 6

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PENDULOUS BOBBIN HOLDER

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Application April 26, 1949, Serial No. 89,747

3 Claims. (Cl. 242—130)

1

This spring relates to anti-friction bobbin holders applicable to the creels of spinning or roving frames for pendulously supporting the bobbins of roving or sliver by their top end, and more particularly to an improved retaining means for detachably connecting the bobbin with the pendulous support.

On spinning frames having commercial forms of bobbin holders of the pendulous type such as disclosed in the Hasbrouck Patent No. 1,821,706 and in the Sayles et al. Patent No. 2,217,922, the yarn carrying bobbin is pressed onto the bobbin holder from below, and there held in a suspended position by a bifurcated expansive detent spring, or as disclosed in the Garey Patent No. 2,445,849 by a cluster of spring fingers, which spring devices expand within the bore of the bobbin and frictionally engage an inner shoulder in said bore. Since the sizes of the bore openings in commercial bobbins often vary widely, it has been found necessary to employ quite stiff detent spring members to take care of the oversize bobbin openings, and also to prevent the bobbin from dropping off the holder particularly when the creel board is jarred by the forcible application of an adjacent bobbin, that considerable exertion and force is required of the operator to remove and replace bobbins having small openings on such bobbin gripping members. Furthermore, in course of time and steady use of these prior bobbin supports, it is found that sliding action of the stiff detent spring members wear the edges of the openings of the bobbins, which action contributes to non-uniformity in the retaining action thereof.

An object of the present invention is to provide a bobbin holder which will be devoid of the above mentioned detent springs previously incorporated in such a device for attaching a bobbin to the pendulous support and to effect the detachable connection of the bobbin on the holder by a resilient or elastic bobbin gripping element which bears frictionally in the bore of the bobbin and engages an inner shoulder in said bore at a plurality of radially extended portions of its periphery.

Another object of the invention is to provide such a device in which the resilient or elastic attaching means for the bobbin to the pendulous support is arranged to frictionally engage the bore of the bobbin and an inner shoulder in said bore at at least three points of contact.

A further object of the invention is to provide a simple, inexpensive and easily assembled construction which will have long life and will

2

avoid such wear to the edges of the bore openings of the bobbins hitherto experienced when detent springs were employed.

The various objects and advantages of this invention will be more apparent by reference to the following detailed description of the two embodiments of the invention illustrated in the accompanying drawings, and the novel features of the invention will be particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a side elevation, partly in section, of a preferred form of bobbin holder embodying the invention and showing a yarn carrying bobbin mounted in normal operating position on the pendulous support;

Fig. 2 is an exploded view, partly in section, of the bobbin holder shown in Fig. 1;

Fig. 3 is a section, on enlarged scale, taken substantially on the line 3—3 of Fig. 1 showing the non-rotatable mounting arrangement of the dust cap on the supporting bolt for the holder;

Fig. 4 is a section taken substantially on the line 4—4 of Fig. 1;

Fig. 5 is a section taken substantially on the line 5—5 of Fig. 1 but showing an emptied bobbin mounted in place on the holder;

Fig. 6 is a top plan view of the novel resilient chuck or bobbin gripping member of the invention for attaching and supporting a bobbin on the holder;

Fig. 7 is a perspective view of the resilient chuck or bobbin gripping member of the invention; and

Fig. 8 is a side elevation partly in section of a second embodiment of the invention.

In Fig. 1 of the drawings, there is illustrated a portion of a creelboard 10 of a spinning frame or the like having a vertical opening 12 through which is inserted the threaded flat sided shank of a supporting bolt 14 having an intermediate shoulder 15 of cylindrical shape which clamps a dust cap 16 mounted on the bolt against the underside of the creelboard 10 by tightening of a nut 17 and a washer 18 carried by the bolt 14 in clamping engagement with the top side of the creelboard 10. The lower end of the bolt 14 beneath the shoulder 15 is provided with a partially spherical head 20 forming an inner race for a set of ball bearings 21, the outer race for which is formed by the curved inner wall portion of the annular lip portion 24 at the upper end of the tubular casing member 25.

The casing member 25 has its lower end portion mounted within the counterbored axial open-

ing 26 in the enlarged annular cup-like flange 27 (see Fig. 2) formed at the upper end of the cylindrical body portion 28 of the bobbin holder. The casing member 25 is secured to the cup portion 27 by a pin 29 which extends diametrically of the cup and has its ends extending through suitable diametrically opposed holes provided in the opposite walls of the casing member 25 and flange 27 and suitably anchored to the latter.

If desired, suitable braking devices may be provided such as one or more slots 70 of the character shown in the expired U. S. Patent to Mann, No. 1,821,656, arranged so as to provide a slight drag on the ball bearings 21 and control the rotation of a yarn loaded bobbin carried by the holder.

The bobbin 30 is shown as being of conventional form and construction comprising a tubular body or barrel made of wood having an axial cylindrical bore 31 which is counterbored from its lower end as at 32 to provide an inner shoulder 33 in said bore at its upper portion.

The cylindrical body portion 28 of the bobbin holder has an axial opening therethrough the upper portion of which is counterbored from the axial opening 26 in the cup 27 and is of smaller diameter, as indicated at 34. The lower end portion of the opening 34 is provided with internal screw threads 35 which threadingly receive the exteriorly threaded end portion 36 of the stepped button-headed shoulder screw 37 by which the resilient or elastic bobbin gripping member or chuck 38 is clamped firmly against the lower end of the body portion 28 of the holder.

The chuck 38 for attaching and detachably connecting a hobbin onto the body member 28 of the bobbin holder, comprises a tube-like molded body of a wear-resistant rubber-like material of generally cylindrical shape having an axial passage 39 therethrough the ends of which are of smaller diameter to fit the shoulder portion of the screw 37. Carried exteriorly of the chuck 38 and formed integrally therewith are a plurality of circumferentially spaced projections or buttons 40, preferably three or more, for frictionally engaging the shoulder 33 and the inner wall extremity of the counterbore 32 of the bobbin 30 at at least three points of contact around the bore and shoulder when the bobbin support is in use. In practice, the chuck member 38 is composed of either solid natural or synthetic rubber compounds having Durometer A hardness in the range of from 50 to 80 durometer depending on the tensile strength, resilience, abrasion resistance and tear resistance desired.

In use of this embodiment of the invention when the bobbin 30 is pushed upward onto the holder, the rubber projections or buttons 40 of the elastic chuck member 38 are compressed by the walls of the bore 31 of the bobbin to produce inward flexure of the side walls of the chuck member 38 associated with such buttons until the projections or buttons 40 pass beyond the shoulder 33 in the bobbin whereupon the buttons and their associated wall support expand and hold the bobbin 30 suspended by its top end by contact with said shoulder. The strength and stiffness of the rubber composition making up the chuck member 38 and the buttons 40 are made sufficient to reliably hold the heaviest bobbin load which it is desired to employ yet being sufficiently resilient so as not to impose too great resistance to withdrawal of the bobbin from the holder by a downward pull exerted thereon by the operator. The underside of the flanged cup 27 forms a shoulder which serves as a thrust receiving stop for taking up the impact of the top end of the bobbin when the latter is violently and suddenly pushed onto the holder by the operator.

The body portion 28 is of such external diameter as to loosely fit within the bore of a selected size of standard bobbin 30, and is of such length as to permit the resilient buttons 40 of the elastic chuck 38 to engage the inner shoulder 33 formed by the counterbore 32 in the bobbin 30 while providing adequate clearance between the top of the bobbin 30 and the flanged cup 27 for take-up of the axial thrust of the bobbin in pressing it on the holder, as above mentioned, and also to compensate for any dimensional variations in the distance of the shoulder 33 from the top end of the bobbin between bobbins of the selected and standard size. It will be understood, of course, that when bobbins of larger standard size are to be used that the external diameters of the body portion 28 and of the elastic chuck 38 will be correspondingly larger and made such as to loosely fit within the top bore 31 of the larger bobbin, and the overall length of the body portion 28 and the attached elastic chuck will be correspondingly increased as to permit the resilient buttons 40 to engage and bear against the top walls of the counterbore 32 and the inner shoulders 33 thereof when the holder body portion 28 and the chuck 38 are inserted within the bore opening 31 of the larger bobbin to attach it to the bobbin holder.

In the embodiment of the invention illustrated in Fig. 8, the dust cap 50 is shown clamped against the underside of the creelboard 51 by shoulder 52 of the cone bolt 53 upon tightening of the nut 54 on the threaded shank 55 of the cone bolt. The tubular casing member 56 forming the outer race member for the ball bearings 57 has its lower end portion crimped or spun over and beneath a rounded exterior flange or bead as indicated at 58 formed at the upper end of the cylindrical body portion 59 of the bobbin holder. Affixed to the body portion 59 is a resilient rubber-like chuck member 60 for detachably connecting a bobbin (not shown) with the body member, the chuck member 60 being clamped against the lower end of the body member 59 by means of a stepped button-headed shoulder screw 61 which has threaded connection with the threaded bore 62 of the body member 59. The chuck member 60 is substantially identical with the chuck member 38 and comprises a generally cylindrical wear-resistant tube-like molded rubber body, of solid natural or synthetic rubber compounds having Durometer A hardness in the range of 50 to 80 durometer, and presenting spaced exterior projections or buttons 64 around its periphery. A flange 65 serves as a stop for receiving the impact of the end of a bobbin when the latter is suddenly and violently pressed onto the bobbin holder by the operator.

The type A durometer, which is the most widely used of hardness measuring instruments is the pocket size Shore Durometer. This is a device incorporating a spring that imposes a 2-pound load on the indentor having a point in the shape of a truncated cone 0.031 inch in diameter at the tip and 0.052 inch diameter at the shank, with a taper of 35 degrees. In using the instrument the operator merely presses it against the rubber until the bearing plate, through which the indentor operates, makes contact with the

surface of the rubber body, and then reads the hardness indicated by the pointer. The time at which the reading is taken is usually the instant at which the pointer shows the maximum or "instantaneous" value of hardness.

It will be seen that there is here provided a simple and effective bobbin holder capable of being manufactured at low cost and adaptable to being made in several sizes to accommodate the standard range of bobbin sizes commonly employed in the textile industry. It will be observed that the cylindrical support member carrying at its lower end the elastically compressible chuck element is pendulously suspended at its upper end from the creelboard in a swiveled fashion on an anti-friction bearing so as to have freedom for rotation and limited universal movement.

Although but two embodiments of the invention have been shown and described in detail, it will be understood that other forms of the invention are possible and changes may be made in the proportions and arrangement of the parts without departing from the spirit of the invention as defined in the appended claims.

What is claimed is:

1. In a bobbin holder, the combination of a pendulous, swivelly-arranged, cylindrical body member having a threaded axial bore portion at the lower end thereof; a flanged clamping member having a cylindrical shoulder portion adjacent its flange and a threaded end portion; and a hollow, generally cylindrical, compressible chuck member of molded resilient material having flexible side walls provided externally with a plurality of integral circumferentially-spaced projections for engaging the interior shoulder and resiliently gripping the inner wall extremity of the usual counterbore of a roving bobbin for detachably connecting the bobbin onto said body member of the bobbin holder, said chuck member being affixed to said body member by said flanged clamping member and having its side walls surrounding but spaced substantially from the shoulder portion of said clamping member and in engagement with the shoulder thereof only at their inner ends, said threaded flanged clamping member being rotatably mounted in said chuck member and engaging said threaded bore portion in said body member to move the flange of said clamping member into and out of compressive contact with said chuck member.

2. In a bobbin holder, the combination of a pendulous, swivelly-arranged, cylindrical body member having a threaded hole at the lower end thereof; a flanged shoulder screw; and a hollow, generally cylindrical compressible chuck member of molded resilient material having flexible side walls carrying externally thereon a plurality of integral circumferentially-spaced projections for engaging the interior shoulder and resiliently gripping the inner wall extremity of the usual counterbore of a roving bobbin for detachably connecting the bobbin onto said body member of the bobbin holder, said chuck member being affixed to said body member by said flanged shoulder screw and having its side walls surrounding but spaced substantially from the shoulder portion of said screw and in engagement with the shoulder of said screw only at their inner ends, said screw being rotatably mounted in said chuck member and screwed into engagement with the threaded hole in said body member to move the flange of said screw into and out of compressive contact with said chuck member.

3. In a bobbin holder, the combination of a pendulous, swivelly-arranged, cylindrical body member having a threaded hole at the lower end thereof; a flanged shoulder screw; and a compressible chuck member comprising a generally tubular molded resilient rubber body having flexible side walls provided externally at substantially equally spaced positions around its periphery with a plurality of buttons projecting radially outwardly from said side walls and in conjunction therewith adapted to engage the interior shoulder and resiliently grip the inner wall extremity of the usual counterbore of a roving bobbin for detachably connecting the bobbin onto said body member of the bobbin holder, said chuck member being affixed to said body member by said screw and having its side walls surrounding but spaced substantially from the shoulder portion of said screw and in engagement with the shoulder of said screw only at their inner ends, said screw being rotatably mounted in said chuck member and engaging said threaded hole in said body member to move the flange of said screw into and out of compressive contact with said chuck member, the rubber buttons being in a state of radial compression to produce inward flexure of the associated resilient side walls of said chuck member for frictionally gripping the inner surface of a hollow bobbin when the bobbin is held thereby on the holder.

FAUSTO G. DE SANTIS.

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