Feb. 2, 1954 C. K. DUNLAP 2,668,020

YARN SHIPPING CORE

Filed Oct. 25, 1950 2 Sheets-Sheet 1

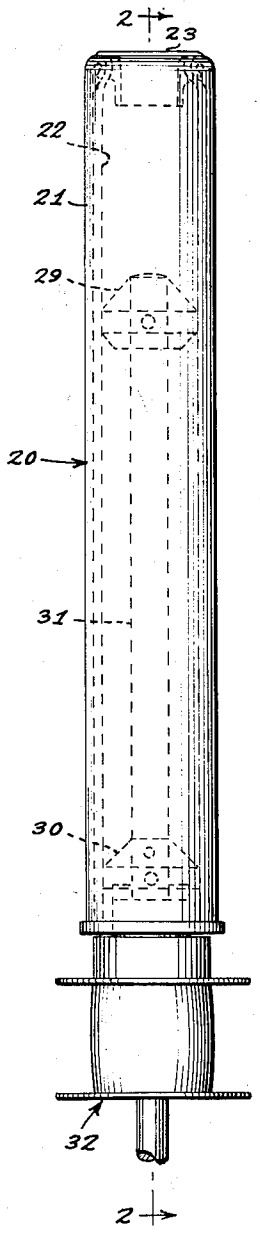


Fig. 1

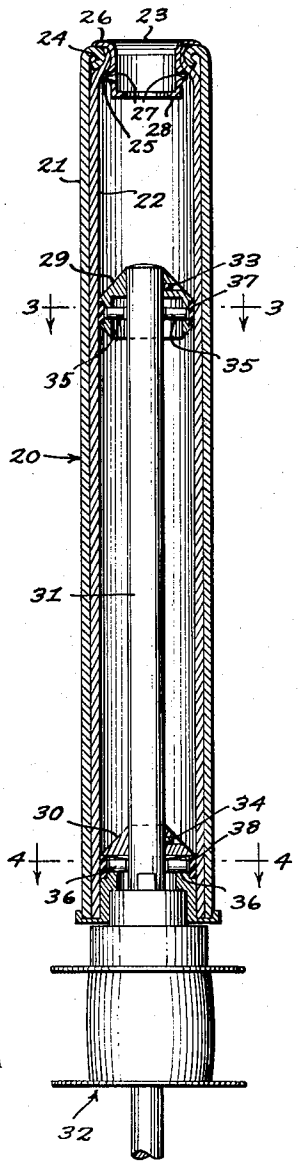


Fig. 2

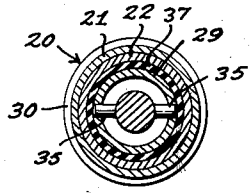


Fig. 3

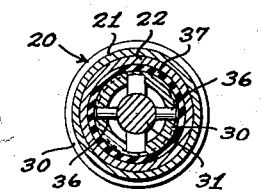


Fig. 4

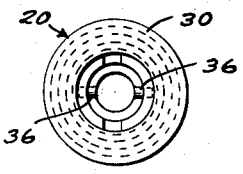


Fig. 5

INVENTOR.
CHARLES K. DUNLAP

BY

Parrott, Richards & Sims
ATTORNEYS

Feb. 2, 1954

C. K. DUNLAP

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2 Sheets-Sheet 2

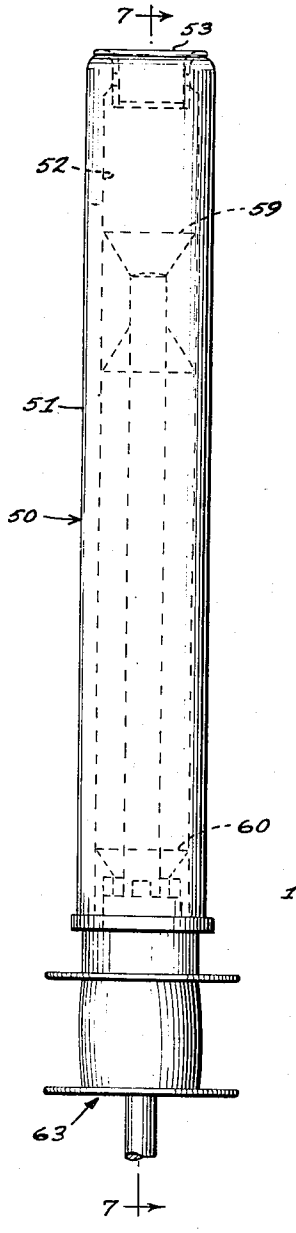


Fig. 6

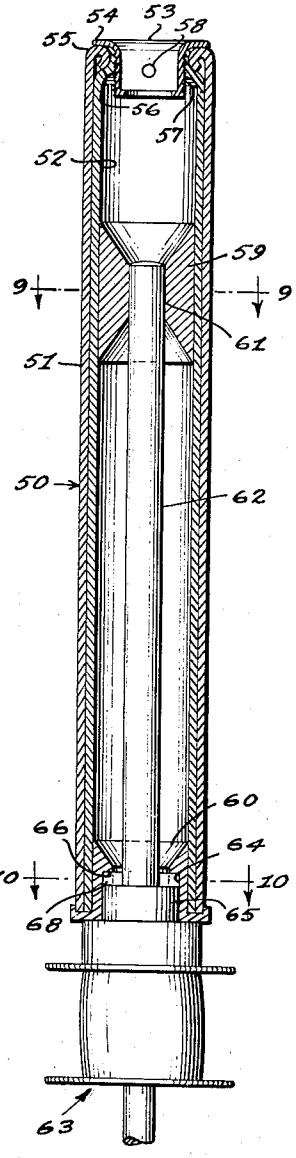


Fig. 7

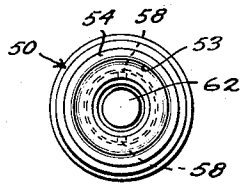


Fig. 8

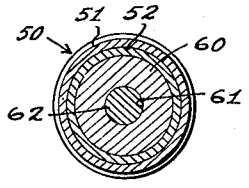


Fig. 9

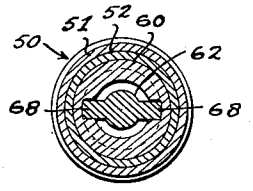
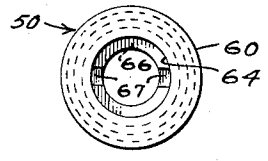


Fig. 10

Fig. 11



INVENTOR.
CHARLES K. DUNLAP
BY

Parrott, Richards & Sims
ATTORNEYS

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YARN SHIPPING CORE

Charles K. Dunlap, Hartsville, S. C., assignor to Sonoco Products Company, a corporation of South Carolina

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11 Claims. (Cl. 242—46.2)

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This invention relates to textile bobbins, and more especially to bobbins of this sort that are particularly adapted for use as shipping cores for yarn packages.

According to the present invention an improved bobbin construction is provided for this purpose which is characterized by an outer tubular member of paper or the like forming a bobbin barrel that is expendable, an inner reenforcing tube for supporting this bobbin barrel with adequate strength, and a detachable retaining member by which the bobbin barrel may be held in assembled relation on the reenforcing tube and at the same time arranged for removal and replacement readily when necessary. A specially adapted spindle arrangement is also provided by the present invention for use with a bobbin incorporating this construction, or the bobbin may be constructed in accordance with the present invention for use on a conventional type of spindle, as desired. These and other features of the present invention are described in detail below in connection with the accompanying drawing, in which:

Fig. 1 is an elevation of a bobbin embodying the present invention;

Fig. 2 is a sectional detail taken substantially on the line 2—2 in Fig. 1;

Fig. 3 is a sectional detail taken substantially on the line 3—3 in Fig. 2;

Fig. 4 is a sectional detail taken substantially on the line 4—4 of Fig. 2;

Fig. 5 is a bottom plan view of the lower adapted bushing for the spindle shown in Figs. 1 and 2;

Fig. 6 is an elevation of a further embodiment of the present invention;

Fig. 7 is a sectional detail taken substantially on the line 7—7 in Fig. 6;

Fig. 8 is a top plan view of the bobbin shown in Figs. 6 and 7;

Fig. 9 is a sectional detail taken substantially on the line 9—9 in Fig. 7;

Fig. 10 is a sectional detail taken substantially on the line 10—10 in Fig. 7; and

Fig. 11 is a bottom plan view of the bobbin shown in Figs. 6 and 7.

Referring now in detail to the drawings, and more particularly at first to Figs. 1 to 5, the embodiment of the present invention shown in these figures of the drawing comprises a bobbin indicated generally by the reference numeral 20, which is formed of an outer tubular bobbin barrel member 21 and an inner reenforcing tube 22 that are held in assembled relation at their top ends by a retaining member or cap 23.

The outer tubular member 21 forming the

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barrel for the bobbin 20 may be made of any material adapted to provide a suitable winding surface for a yarn package on the bobbin 20. Usually a laminated paper tube, formed by convolutely winding a paper sheet, for example, will be found most satisfactory for this purpose, because paper tubes of this sort can be formed very inexpensively so that they are expendable and may feasibly be replaced when necessary as they become damaged from attrition through use. These paper tubes might also be formed by other methods such as molding, and there are other materials such as plastics that might be used instead of paper if desired or required in particular instances.

The inner reenforcing tube 22 is employed in the bobbin construction of the present invention for providing the bobbin 20 with adequate strength, and is preferably formed of metal. In most cases a light metal such as aluminum can be used to the best advantage, although other metals such as steel may be used if desired.

The retaining cap 23, which is provided as mentioned above for holding the outer tubular member 21 and the inner reenforcing tube 22 in assembled relation, and which may be formed of either metal or plastic as desired, is arranged according to the present invention so that it is easily detachable for replacement of the expendable outer tubular member 21 whenever necessary. The assembly of the bobbin 20 in this manner is accomplished by forming the outer tubular member 21 with an inturned upper end as at 24 which is adapted to seat on an annular shoulder formed by crimping the top end of the inner reenforcing tube 22 as at 25, so that the reenforcing tube 22 may be inserted inside the outer tubular member 21 in coextensive relation as illustrated best in Fig. 2.

With the outer tubular member 21 and the reenforcing tube 22 interfitted in this relation, the retaining cap 23 is adapted by means of an outwardly extending flange 26 to be disposed in covering relation with respect to the inturned upper end 24 of the outer tubular member 21 for maintaining it seated on the annular shoulder 25 of the reenforcing tube 22, the remaining cylindrical body of the retaining cap 23 being arranged to extend interiorly of the reenforcing tube 22 and being formed, as by dimples 27, for engagement with the internal face of the annular shoulder 25. These dimples 27 in the retaining cap 23 provide for a snap fit with the annular shoulder 25 so that the retaining cap 23 is rendered easily detachable.

This retaining engagement of the retaining cap

23 with the annular shoulder 25 may also be accomplished by other means if desired as by a screw fit such as will be mentioned presently in connection with the further embodiment of the invention shown in the drawings. Also, adequate retaining engagement can be obtained by forming the retaining cap 23 with an entirely plain cylindrical body and simply pressing it into position. It will usually be desirable, in addition, to form the retaining cap 23 with an inwardly extending bottom flange, as at 28, to provide a seat for an identification disc such as is commonly used for identifying the yarn comprising a package wound on bobbin 20.

In view of the fact that the bobbin of the present invention is intended for use particularly as a shipping core for yarn packages, a specially adapted spindle arrangement is also provided by this invention so that the bobbin may be used without equipping it with spindle bearings such as are commonly required. This spindle arrangement comprises the provision of upper and lower adapter bushings 29 and 30 formed for mounting directly on the spindle blade 31 of a conventional winding spindle such as is indicated generally by the reference numeral 32, each of the adapter bushings 29 and 30 being fitted with set screws as at 33 and 34 for securing them in spaced relation on the spindle blade 31 as shown.

Each of these adapter bushings 29 and 30 are further fitted with weighting members or pins 35 and 36 which are slidably disposed in the bushings 29 and 30 for shifting radially with respect to the spindle blade 31 under the action of centrifugal force. A resilient retaining means such as an elastic band of rubber or the like is arranged exteriorly on both of the bushings 29 and 30 as at 37 and 38 for maintaining the weighting members 35 and 36 normally in a retracted position so that disposition of the bobbin 20 on the spindle 32 is allowed freely when the spindle 32 is at rest.

Upon rotation of the spindle 32, however, the action of centrifugal force causes the weighting members 35 to move radially outward and thereby displace the resilient retaining bands 37 and 38 into gripping engagement with the inner wall of the reenforcing tube 22 so that the bobbin 20 will thereby be driven with the spindle 32, until rotation of the spindle 32 ceases upon completion of the winding operation at which time the weighting members 35 and 36 will be returned to a retracted position by the resilient bands 37 and 38 to release the bobbin 20 for removal readily from the spindle 32.

Figs. 6 to 11 of the drawing illustrate a further embodiment of the bobbin construction of the present invention incorporating spindle bearings for use in instances where it is desired to employ conventional winding spindles without change. The bobbin of this embodiment is indicated generally by the reference numeral 50, and as in the previous instance comprises an outer tubular member 51 forming a bobbin barrel, an inner reenforcing tube 52, and a retaining cap 53, which has an outwardly extending flange 54 for retaining an inturned top end 55 on the bobbin barrel 51 seated on an annular shoulder 56 at the top end of the reenforcing tube 52. The retaining cap 53 in this instance, however, is arranged to illustrate the use of a screw fit for retaining engagement of the retaining cap 53 with the reenforcing tube 52. For this purpose, the cylindrical body of the retaining cap 53 is formed exteriorly with screw threads as at 57, and the interior face of the annular shoulder 56 on the reenforcing tube 52 is similarly threaded to receive the body of the retaining cap 53, suitable indentations or apertures as at 58 being provided in the retaining cap 53 for receiving a spanner wrench or the like by which the retaining cap 53 may be installed and removed.

The spindle bearings for the bobbin 50 are secured according to the present invention inside the inner reenforcing tube 52 as at 59 and 60. The upper spindle bearing 59 consists of a molded insert formed in situ to secure it to the inner wall of the reenforcing tube 52. Suitably this insert may consist of a resin impregnated paper preform which may be molded in the reenforcing tube 52, before the annular shoulder 56 is formed, under pressure from heated mandrels extended inwardly from both ends of the reenforcing tube 52 to compress this insert and set the resin with which it is impregnated, such as a Bakelite type resin, to obtain the form of upper spindle bearing desired, as at 59, and bond it securely to the inner wall of the reenforcing tube 52. This upper spindle bearing 59 is formed as shown with a bore 61 for receiving the tip of the spindle blade 62 of a conventional spindle as indicated generally by the reference numeral 63.

The lower spindle bearing 60 may also consist of a resin impregnated paper body, although in this case it is formed to be secured by a press fit in the bottom end of the reenforcing tube 52. This lower spindle bearing 60 is formed with a bore at 64 to fit over the acorn 65 of the spindle 63, the bore 64 terminating in a shoulder 66 in which grooves or slots as at 67 are formed to engage the spindle drive lugs 68 in the usual manner.

I claim:

1. A bobbin particularly adapted as a shipping core for yarn packages comprising an outer tubular member forming a bobbin barrel and having an inturned upper end, an inner reenforcing tube within said outer member and having an inwardly crimped upper end abutting the inturned upper end of said outer tubular member from within said member, and retaining means overlying the inturned upper end of said outer member outside said member and detachably engaging the inwardly crimped upper end of said inner tube for clamping said outer member to said inner tube and thereby maintaining said outer member in assembled relation on said inner reenforcing tube.

2. A bobbin particularly adapted as a shipping core for yarn packages comprising an outer tubular member forming a bobbin barrel and having an inturned upper end, an inner reenforcing tube within said outer member and having an inwardly formed upper portion abutting the inturned upper end of said outer member from within said member, and a retaining member mounted on said inwardly formed upper portion of said inner tube and formed with an outwardly extending flange overlying the inturned end of said outer member outside said member and thereby serving to clamp said inturned upper end against said upper portion and maintain said outer member in assembled relation on said inner reenforcing tube.

3. A bobbin particularly adapted as a shipping core for yarn packages comprising an outer tubular member forming a bobbin barrel of sub-

stantially cylindrical shape with an inwardly crimped upper end, an inner reenforcing tube substantially coextensive with said outer tubular member and having an upper annular shoulder abutting the crimped upper end of said outer tubular member, and a retaining member engaging said upper annular shoulder and overlying said inwardly crimped upper end for clamping said crimped upper end against said upper annular shoulder and thereby maintaining said outer tubular member in assembled relation on said inner reenforcing tube.

4. A bobbin as defined in claim 3 in which said retaining member is adapted for a screw fit with said reenforcing tube.

5. A bobbin as defined in claim 3 in which said retaining member is adapted for a snap fit with said reenforcing tube.

6. The combination of a bobbin adapted as a shipping core for yarn packages comprising an outer tubular member forming a bobbin barrel of substantially cylindrical shape, and having an inturned upper end, an inner reenforcing tube having an upper shoulder abutting the upper end of said outer tubular member, and retaining means detachably holding the upper end of said outer member against said upper shoulder and thereby maintaining said outer tubular member in assembled relation on said inner reenforcing tube, with a spindle for said bobbin comprising a spindle blade, upper and lower adapter bushings mounted in spaced relation on said spindle blade, each of said adapter bushings being slidably fitted with weighting members disposed for shifting radially with respect to said spindle blade under the action of centrifugal force, and resilient retaining means mounted on said bushings for maintaining said weighting members normally in retracted position and thereby allowing disposition of said bobbin freely on said spindle, but yieldable for displacement by said weighting members upon rotation of said spindle to grip the inner wall of said bobbin and thereby drive said bobbin with said spindle.

7. The combination of a bobbin adapted as a shipping core for yarn packages comprising an outer tubular member forming a bobbin barrel of substantially cylindrical shape and having an inwardly crimped upper end, an inner reenforcing tube substantially coextensive with said outer tubular member and having an upper annular shoulder abutting the crimped upper end of said outer tubular member, and a retaining member mounted on said upper annular shoulder for pressing said crimped upper end against said upper annular shoulder and thereby maintaining said outer tubular member in assembled relation on said inner reenforcing tube, with a spindle for said bobbin comprising a spindle blade, upper and lower adapter bushings mounted in spaced relation on said blade for disposition internally of said bobbin, each of said adapter bushings being slidably fitted with weighting members disposed for shifting radially with respect to said spindle blade under the action of centrifugal force, and a resilient retaining band mounted on said bushings for maintaining said weighting member normally in retracted position and thereby allowing disposition of said bobbin freely on said spindle, but yieldable for displacement by said weighting members, upon rotation of said spindle to grip the inner wall of said bobbin and thereby drive said bobbin with said spindle.

8. A spindle for supporting a bobbin during winding of a yarn package thereon comprising a spindle blade, upper and lower adapter bushings mounted on said spindle blade for supporting a bobbin thereon, each of said adapter bushings being slidably fitted with weighting members disposed for shifting radially with respect to said spindle blade under the action of centrifugal force, and a resilient retaining band mounted on said bushings for maintaining said weighting members normally in retracted positions and thereby allowing disposition of said bobbin freely on said spindle blade, but yieldable for displacement by said weighting members upon rotation of said spindle to grip the inner wall of said bobbin and thereby drive said bobbin with said spindle.

9. A bobbin as defined in claim 3 and further characterized in that upper and lower blade bushings are carried by said inner tube for receiving a spindle blade, said upper blade bushing comprising a molded insert formed in situ and thereby secured to the inner wall of said reenforcing tube.

10. A bobbin as defined in claim 3 and further characterized in that upper and lower spindle bearings are carried by said inner reenforcing tube, said upper spindle bearing comprising a resin impregnated fiber insert molded in situ and thereby secured to the inner wall of said reenforcing tube.

11. The combination of a bobbin having a cylindrical bore throughout the major portion of its length with a spindle for supporting said bobbin during winding of a yarn package thereon, said spindle comprising a spindle blade, upper and lower adapter bushings mounted on said spindle blade for supporting said bobbin by spaced disposition in the cylindrical bore thereof, each of said adapter bushings being slidably fitted with weighting members disposed for shifting radially with respect to said spindle blade under the action of centrifugal force, and a resilient retaining band mounted on said bushings for maintaining said weighting members normally in retracted positions and thereby allowing disposition of said bobbin freely on said spindle blade over said adapter bushings, but said retaining band being yieldable for displacement by said weighting members upon rotation of said spindle to grip the inner wall of said bobbin bore and thereby drive said bobbin with said spindle.

CHARLES K. DUNLAP.

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