This invention relates to improvements in bobbin construction and has more particularly to do with spools or bobbins utilized with synthetic yarn, such as rayon, in which the yarn may be wound on a bobbin in a moist condition.

A primary problem in the construction of such a bobbin is due to the fact that as the yarn dries, great radial stress is placed upon the barrel of the bobbin and the axial resultant of this stress frequently loosens the bobbin heads from the barrel or in some cases deforms the bobbin itself so that it is no longer usable.

Other important requisites in such bobbin construction are the provision of a non-corrosive surface for the barrel and heads which is not subject to rust or other forms of metallic oxidation; furthermore, the bobbin must be light in weight and durable. Although many expedients have been proposed, none has enabled a satisfactory solution of all the problems.

The present invention is characterized by a bobbin having Bakelite heads and a hollow Bakelite barrel. The barrel however, is of laminated construction, the outer layer 11 being a thin wall of Bakelite tubing pressed onto a reinforcing metallic sleeve. The heads are concentrically drilled and counterbored and the metallic sleeve is upset in the counterbore at each end, providing a rigid unitary construction. The metallic sleeve is internally threaded at each end of its bore and a flanged plug of Bakelite, which may be of the laminated cloth base variety, is screwed into each end of the metallic sleeve until the flange on the plug fills the remaining space in the counterbore of each bobbin head. To provide permanent retention, the plugs are cemented into the sleeve. It will thus be apparent that this construction has no exposed metallic surfaces subject to corrosion, and is extremely light, strong and durable.

The flanged plugs are axially drilled and one plug is provided with the conventional recess to accommodate a bobbin spindle, whereas the opposite plug has an additional counterbore at its upper end in which is expanded an annular welch washer adapted to engage the spindle top. A sleeve of plastic material connects the bores of the plugs internally of the barrel in order to facilitate insertion of the bobbin on the spindle.

The term "bobbin" is used in its generic sense since it will be apparent that the construction is adapted for spools, reels, pins or similar devices.

A primary object of the invention therefore, is to provide a rigid bobbin having a synthetic plastic barrel reinforced by means of an internal metallic sleeve.

A further object of the invention is to provide a synthetic plastic plug for opposite ends of the barrel of the bobbin, the plug adapted to serve as a spindle guide and also as a shield to conceal the metallic reinforcing sleeve.

A still further object of the invention is to provide an improved method for fabricating a bobbin.

Further objects will be apparent from the specification and drawings, in which:

Fig. 1 is a side elevation of a bobbin constructed in accordance with the invention;
Fig. 2 is a top view of the structure of Fig. 1;
Fig. 3 is a bottom view of the structure of Fig. 1;
and
Fig. 4 is a section along the line 4—4 of Fig. 2.

Referring now more particularly to the drawings, the barrel construction of the bobbin comprises a non-metallic sleeve 10 which is preferably formed from a synthetic plastic material such as Bakelite. A metallic sleeve 11 is pressed into the bore of sleeve 10 and is provided with internal threads 12 and 13 at each end thereof. Inner sleeve 11 is somewhat longer than outer sleeve 10 and is adapted to be inserted through the bores in upper head 14 and lower head 15 which are counterbored at 16, 16. When the sleeve 11 has been inserted in the bores of heads 14 and 15, the sleeve is upset or rolled into counterbores 16, 16 to axially compress the heads against the ends of outer sleeve 10.

Upper plug 17 is constructed preferably of a canvas base laminated Bakelite material and has an axial bore 18 of sufficient diameter to provide a free-running fit on the top of a standard spindle (not shown). Plug 17 is also provided with concentric counterbores 19 and 20 at its outer end. The shank of the plug is externally threaded to engage threads 12 and sleeve 11 and the lower end of the plug is counterbored at 21 to provide a seat for spindle guide sleeve 22. Flange 23 on plug 17 has a diameter and thickness which provide a tight sealing fit in the counterbore 16 of head 14 when plug 17 is turned into sleeve 11.

The lower plug 24 is constructed in a similar fashion to plug 17 except that the bore 25 of plug 24 is of somewhat larger diameter than the bore 18 of plug 17. The bore of bushing 22 is substantially the same diameter as bore 25 of plug 24 and the bore 18 flares outwardly at 26 to provide a funnel-shaped guide for the spindle to enter bore 18. Plug 24 is counterbored at 27 to accommodate the opposite end of bushing 22 in a manner similar to inner counterbore 21 on plug 17.

A radially milled slot 28 at the bottom of plug 24
is adapted to receive the conventional lugs on the spindle base for turning the bobbins as may be desired. Plug 13 is likewise externally threaded to engage threads 12 on sleeve 12 and flange 29 on the plug completely fills the remainder of counterbore 16 in lower head 15 when the plug is threaded and cemented in place in sleeve 11.

An annular washers 31 is adapted to be expanded into counterbore 18 of head 14 and serves as a bearing contact between plug 17 and the upper end of the spindle. The depth of counterbore 18 provides the necessary relief for the expanding of washer 31 in counterbore 28, assuring retention during steaming of yarn.

It will thus be apparent that I have provided bobbin construction of light weight which will not come apart in service. The barrel of the bobbin is both non-corrosive and incompressible. The lightweight spindle guide in the barrel permits a hollow construction which will at the same time provide means for readily inserting the bobbin on the spindle. The cemented plugs reinforce the barrel and the heads and completely seal the metallic sleeve within the barrel and heads. Furthermore, the construction enables satisfactory bobbins to be made which are extremely inexpensive and durable.

I claim:
1. In bobbin construction, a barrel comprising a thin outer sleeve of synthetic plastic material, a metallic reinforcing sleeve on which said barrel is mounted, the reinforcing sleeve being longer than the outer sleeve and having internal threads at each end thereof, a pair of externally threaded plugs adapted to engage the threads in the sleeve, a flange on each plug, and a pair of counterbored bobbin heads adapted to fit over the sleeve.
2. A bobbin construction in accordance with claim 1, in which the heads and the plugs are constructed of a synthetic plastic material.
3. In bobbin construction, a barrel comprising a thin outer sleeve of synthetic plastic material, a metallic reinforcing sleeve on which the barrel is positioned, said reinforcing sleeve being longer than the outer sleeve and having internal threads at each end, a pair of externally threaded plugs adapted to engage the threads on the reinforcing sleeve, a flange on the plugs, a pair of counterbored bobbin heads adapted to fit over the reinforcing sleeve, and guide means axially connecting the bores of said plugs.
4. A bobbin construction in accordance with claim 3, in which one of the plugs is provided with two counterbores at one end, and an annular washers adapted to be expanded into one of said counterbores.
5. A bobbin construction in accordance with claim 3, in which the lower plug is provided with an upper counterbore, the upper plug is provided with a lower counterbore, and a guide bushing axially positioned in said plug counterbores.
6. The method of constructing a bobbin, which comprises inserting a metallic sleeve in a hollow plastic sleeve, positioning a pair of counterbored bobbin heads on said metallic sleeve to abut the ends of the plastic sleeve, upsetting the metallic sleeve ends in the counterbores of the flanges, turning a pair of threaded plugs into the opposite bores of the sleeve, and expanding a Welch washer in a counterbore in one of said plugs.
7. A bobbin assembly comprising a pair of concentrically counterbored bobbin heads, a reinforced bobbin barrel formed of a non-corrosive outer sleeve and a metallic inner sleeve, the ends of the outer sleeve adapted to abut the inner faces of the bobbin heads and the ends of the metallic sleeve adapted to be upset in the counterbores of the bobbin heads, and a pair of plugs fitted in opposite ends of the metallic sleeve adapted to position the bobbin on a spindle.
8. A bobbin assembly in accordance with claim 7 in which the plugs are provided with flanges to fit in the counterbores of the heads and conceal the upset ends of the metallic sleeve.
9. A bobbin assembly in accordance with claim 7 in which the heads, outer barrel sleeve, and plugs are constructed of Bakelite, and a Bakelite bushing positioned between and cemented in internal counterbores in the plug.

REFERENCES CITED
The following references are of record in the file of this patent:

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,922,565</td>
<td>Hathaway et al.</td>
<td>July 13, 1926</td>
</tr>
<tr>
<td>2,352,156</td>
<td>Bencourt</td>
<td>May 5, 1942</td>
</tr>
</tbody>
</table>

FOREIGN PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,149</td>
<td>Great Britain</td>
<td>1859</td>
</tr>
<tr>
<td>380,208</td>
<td>Great Britain</td>
<td>Sept. 15, 1932</td>
</tr>
<tr>
<td>690,754</td>
<td>France</td>
<td>June 24, 1930</td>
</tr>
</tbody>
</table>