Nov. 17, 1953 W. B. BROADBENT ET AL 2,659,547

BOBBIN

Filed April 21, 1948

Fig. 1

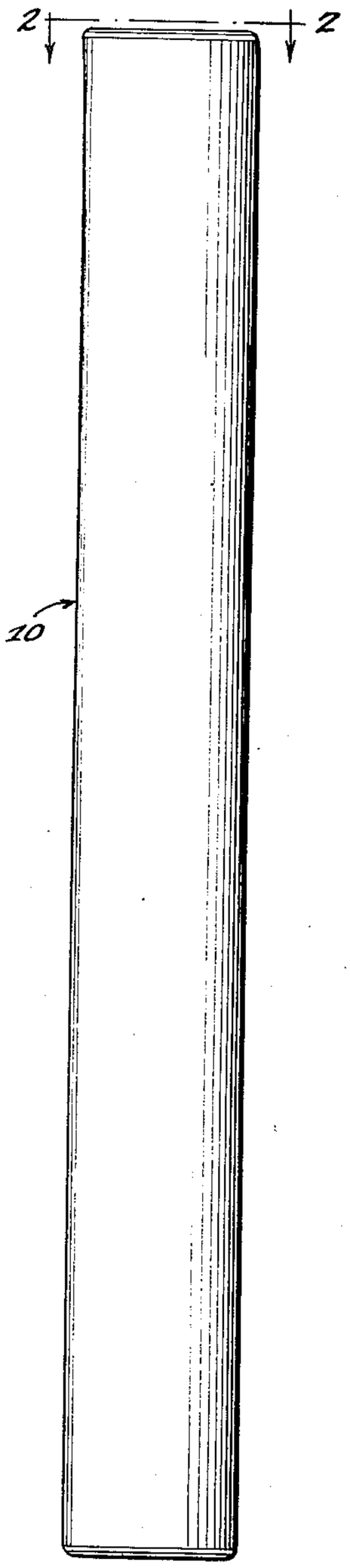
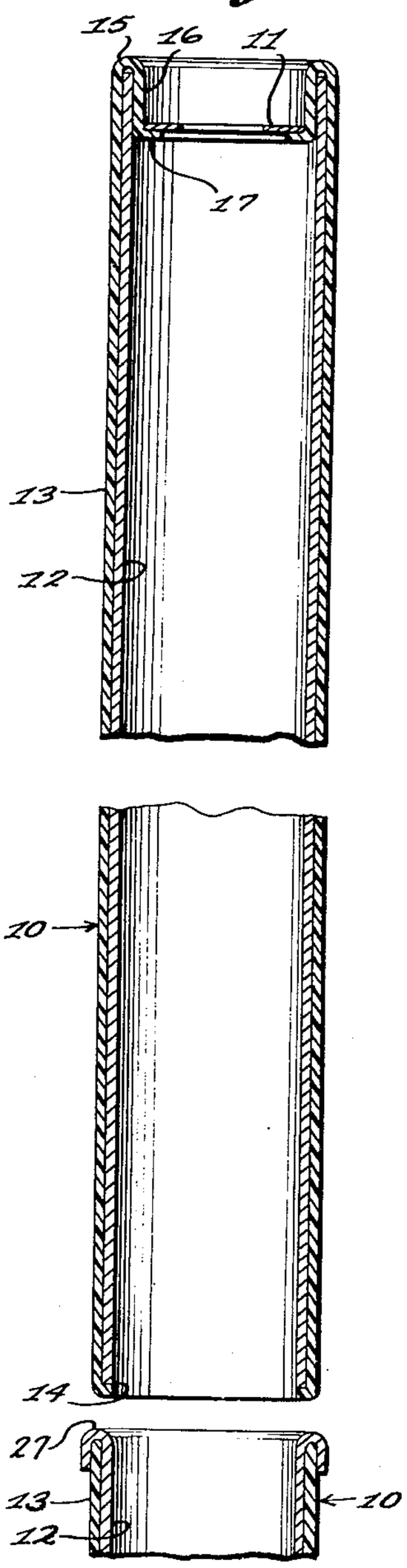


Fig. 3



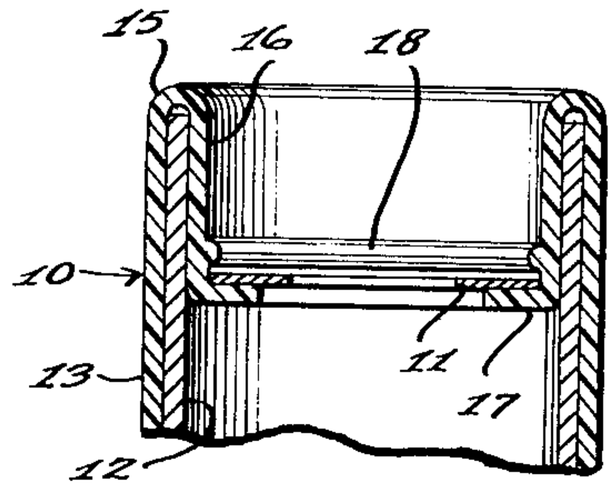


Fig. 4

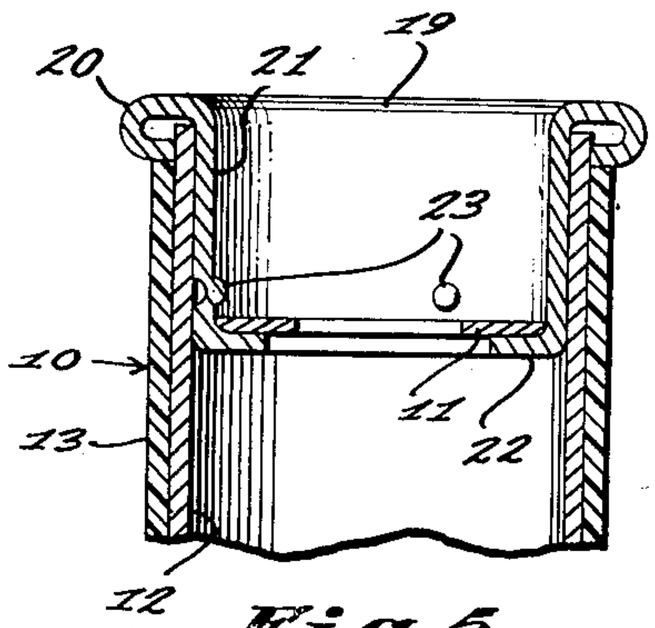


Fig. 5

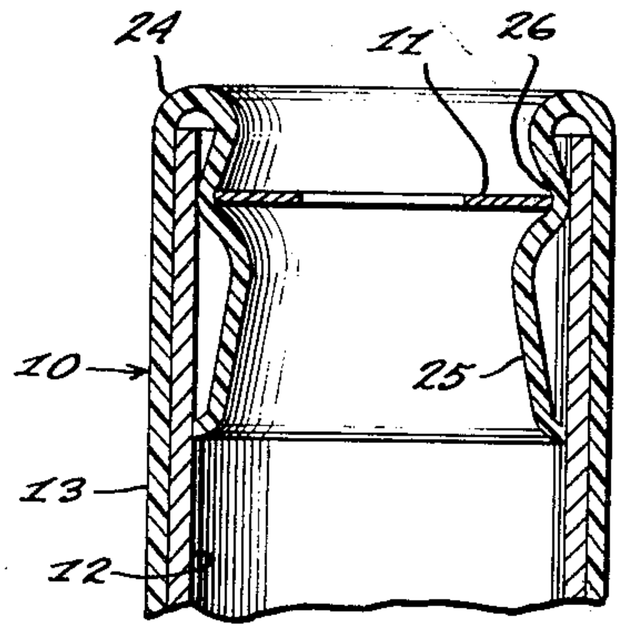


Fig. 6

Fig. 2

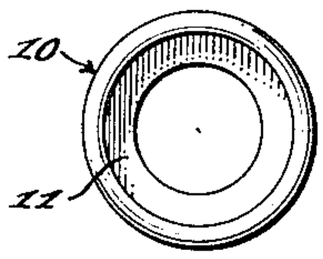


Fig. 8

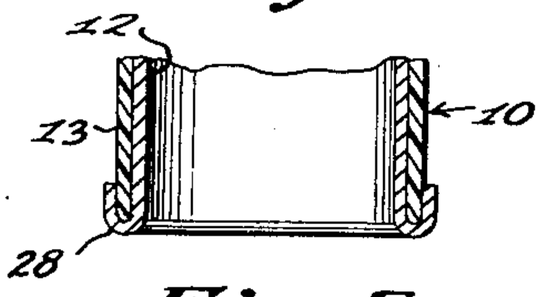


Fig. 7

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BOBBIN

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12 Claims. (Cl. 242—119)

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This invention relates to bobbins such as are used in the textile industry as a supporting core for yarn packages, and more particularly to a twister bobbin adapted for carrying packages of synthetic yarn such as nylon, which is the familiar commercial name for the synthetic polyamide filaments now being widely used in the textile industry.

In the manufacture of nylon and other synthetic yarns, it is usual practice to wind the spinneret material on bobbins in a twister frame. The yarn shrinks after it is wound on the bobbins in this manner, and in the case of nylon, particularly, the bobbins are subjected to tremendous compressive stresses by this shrinkage, and the usual bobbin constructions are entirely inadequate to withstand these stresses. Wood bobbins, for example, are easily crushed when wound with a nylon package.

In view of this circumstance, various metal reenforced bobbin constructions have been proposed for use in winding the synthetic yarns. In using a bobbin construction of this type, however, it has been necessary to cover the metal parts at the winding surface so as to prevent rust or corrosion which would contaminate the yarn, and this has required some arrangement for securing the covering means in place, which has resulted in relatively complicated bobbin constructions. Also, it has been difficult to provide a suitable covering for the metal reenforced bobbins having adequate wear resistance.

According to the present invention, a twister bobbin for nylon and other synthetic yarns is provided which eliminates the above noted difficulties. The bobbin in the present invention is formed with a unitary body structure comprising a cylindrical metal barrel member and a plastic sleeve member shrunk in covering relation over the entire exterior surface of the barrel member. With this construction, the metal barrel member can be provided with adequate strength for withstanding the compressive stresses imposed by the yarn packages, and the plastic sleeve member provides an excellent smooth slick winding surface which has good wear resistance, and which, in addition, is easily buffed or ground to remove any nicks or other defects resulting from ordinary use. Also, when the plastic sleeve is damaged or worn beyond repair, it may be readily removed and replaced by a new plastic sleeve.

The bobbin of the present invention is described further below in connection with the accompanying drawing in which:

Fig. 1 is a side elevation of a bobbin formed in accordance with the invention;

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Fig. 2 is a corresponding top view;

Fig. 3 is an enlarged vertical section of the bobbin shown in Fig. 1;

Fig. 4 is a fragmentary sectional detail showing a modified arrangement of the sleeve member at the top of the bobbin;

Fig. 5 is a fragmentary sectional detail showing a modification in which a metal bushing is fitted in the top of the bobbin;

Fig. 6 is a fragmentary sectional detail showing a modification in which the sleeve member is formed to provide a tapered driving seat at the top end of the bobbin; and,

Figs. 7 and 8 are fragmentary sectional details showing an arrangement in which the barrel member is formed to provide a protective bead at each end.

Referring first to Figs. 1 and 2 of the drawing, the bobbin 10 of the present invention is of cylindrical form and has an uninterrupted plain smooth exterior surface. The top end of the bobbin 10 is arranged to receive an identification label 11 as described further below.

The unitary structural arrangement of the bobbin 10 is shown more in detail in Fig. 3 in which the cylindrical metal barrel member is indicated by the reference numeral 12 and the plastic sleeve member by the reference numeral 13. As previously mentioned, the metal barrel member 12 is provided to reenforce the bobbin 10 so that it has adequate strength to withstand the compressive stresses of a wound nylon package, and the plastic sleeve member 13 is shrunk in covering relation over the entire exterior surface of the barrel member 12.

The sleeve member 13 may be arranged on the barrel member 12 in this manner by forming the sleeve 13 from plastic tubing having an inside diameter slightly smaller than the exterior diameter of the barrel member 12, and then heating the sleeve member 13 in hot water or the like to expand it sufficiently for disposition on the barrel member 12. Upon cooling, the sleeve member 13 will shrink to a tight fast fit on the barrel member 12 to provide the unitary structure characteristic of the present invention. If desired, the plastic tubing forming the sleeve member 13 may be extruded directly on the barrel member 12, or the sleeve member 13 might also be formed or invested by dipping the barrel member 12 in molten or liquid plastic, or by spraying the plastic on the barrel member 12 as a lacquer or the like. In the usual case, we find it desirable to form the barrel member 12 of steel and use a thermoplastic material such as acetate-butyrate for the sleeve member 13.

After the sleeve member 13 is disposed on the barrel member 12 as described above, the sleeve member 13 is formed inwardly at the bottom of the bobbin 10 in covering relation over the bottom end of the barrel member 12 as indicated at 14 in Fig. 3, which provides a protective cover for the ends of the barrel member 12 and thus lessens the possibility of damage to other bobbins through striking these ends during use. Similarly, at the top of the bobbin 10, the sleeve member 13 may be turned inwardly in covering relation over the top end of the barrel member 12 as shown at 15, and may be further formed to extend internally as at 16 in the barrel member 12 to a terminal annular flange 17 providing a seat for the previously mentioned identification label 11. The portion 16 of the sleeve member 13 extending internally in the barrel member 12 may also be formed if desired with a raised circumferential bead 18 spaced in relation to the annular flange 17 for retaining the identification label 11 in the seat provided by the flange 17 as illustrated in Fig. 4.

An alternative arrangement of the top end of the bobbin 10 for receiving the identification label 11 is shown in Fig. 5 in which a metal bushing 19 is fixed at the top of the bobbin 10. This bushing 19 is rolled as indicated at 20 in covering relation over the top end of the barrel member 12 and is extended internally as shown at 21 in the barrel member 12 to a terminal annular flange 22 which provides a seat for the identification label 11. The portion 21 of the bushing 19 extending internally in the barrel member 12 is preferably dimpled as at 23 in spaced relation to the annular flange 22 for retaining the identification label 11 in the seat provided by the flange 22.

A further modification of the arrangement of the sleeve member 13 at the top of the bobbin 10 is illustrated in Fig. 6 in which the sleeve member 13 is turned inwardly at 24 in covering relation over the top end of the barrel member 12 in the same general manner as before, but extends internally in the barrel member 12 with a tapered configuration as shown at 25 which is adapted as a top driving seat for the bobbin 10 for use as disclosed in U. S. Patent No. 2,288,966, issued July 7, 1942, to J. E. A. Blanchet. The inturned portion of the sleeve member 13 may be further formed adjacent the tapered configuration 25 with a circumferential groove 26 to provide a seat for the identification label 11.

Figs. 7 and 8 illustrate another arrangement in which the barrel member 12 extends beyond the plastic sleeve member 13 and is rolled to form an outside bead as indicated at 27 and 28 at both the top and bottom ends of the bobbin 10. This arrangement provides rounded ends on the barrel member 12 which have little tendency to damage other bobbins during use, and which are very sturdy.

The bobbing construction of the present invention is also well adapted for use in forming spinning bobbins. In the case of spinning bobbins the high strength factor necessary to withstand the compressive stresses imposed by nylon at the twister frame is not required, so that any light metal might be used for the bobbin barrel. The use of a metal bobbin barrel, however, provides a sturdy, serviceable bobbin construction, while a plastic cover placed on the barrel in the nature of a sleeve, or invested by spraying or dipping as previously mentioned, provides a winding surface that will not burr or nick like metal and which is smooth and slick so that it is well suited for winding and delivery of yarn. Also, a plastic cover is easily removed from a metal bobbin barrel for replacement when it becomes worn.

We claim:

1. A bobbin adapted as a supporting core for yarn packages comprising a seamless metal barrel member invested with a seamless covering member of plastic over its entire exterior surface, one of said members extending beyond and being turned over the other at at least one end of said bobbin and thereby providing for interlocking said members.

2. A bobbin adapted as a supporting core for packages of synthetic yarn, such as nylon, and having a unitary body structure comprising a seamless cylindrical metal barrel member, and a seamless plastic sleeve member disposed tightly in covering relation over the entire exterior surface of said barrel member, one of said members extending beyond and being turned over the other at at least one end of said bobbin and thereby providing for interlocking said members.

3. A bobbin as defined in claim 2 and further characterized in that said barrel member extends beyond said sleeve member and is rolled to form an outside bead at each end of said bobbin.

4. A bobbin adapted as a supporting core for packages of synthetic yarn, such as nylon, and having a unitary body structure comprising a seamless cylindrical metal barrel member, and a seamless plastic sleeve member disposed in tightly fitting covering relation over the entire exterior surface of said barrel member, one of said members extending beyond and being turned over the other at at least one end of said bobbin and thereby providing for interlocking said members.

5. A bobbin adapted as a supporting core for packages of synthetic yarn, such as nylon, and having a unitary body structure comprising a seamless cylindrical barrel member formed of steel, and a seamless sleeve member formed of a thermoplastic material disposed in tightly fitting covering relation over the entire exterior surface of said barrel member, one of said members extending beyond and being turned over the other at each end of said bobbin for interlocking said members.

6. A bobbin as defined in claim 4 and further characterized in that said sleeve member is formed inwardly at the bottom of said bobbin in covering relation over the bottom end of said barrel member.

7. A bobbin as defined in claim 4 and further characterized in that said sleeve member is turned inwardly at the top of said bobbin in covering relation over the top end of said barrel member and extends internally in said barrel member to a terminal annular flange providing a seat for an identification label.

8. A bobbin as defined in claim 7 and further characterized in that the portion of said sleeve member extending internally in said barrel member is formed with a raised circumferential bead spaced in relation to said annular flange for retaining an identification label in the seat provided by said flange.

9. A bobbin as defined in claim 4 and further characterized in that a metal bushing is fixed at the top of said bobbin, said bushing being rolled in covering relation over the top end of said barrel member and extending internally in said barrel member to a terminal annular flange providing a seat for an identification label, and the portion of said bushing extending internally in said barrel member being dimpled in spaced relation

to said annular flange for retaining an identification label in the seat provided by said flange.

10. A bobbin as defined in claim 4 and further characterized in that said sleeve member is turned inwardly at the top of said bobbin in covering relation over the top end of said barrel member and extends internally in said barrel member with a tapered configuration adapted as a top driving seat for said bobbin.

11. A bobbin as defined in claim 10 and further characterized in that the portion of said sleeve member extending internally in said barrel member is further formed with a circumferential groove providing a seat for an identification label.

12. A bobbin adapted as a supporting core for yarn packages comprising a tubular member forming a winding surface for said yarn packages and having an inturned end portion, said inturned end portion being formed with a terminal annular flange providing a seat for an identification label, and said inturned end portion being further formed with a circumferential groove immediately adjacent said flange for retaining an identification label in the seat provided by said flange.

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