Dec. 28, 1943. R. J. RICKENBACHER 2,337,770

BOBBIN

Filed May 29, 1940

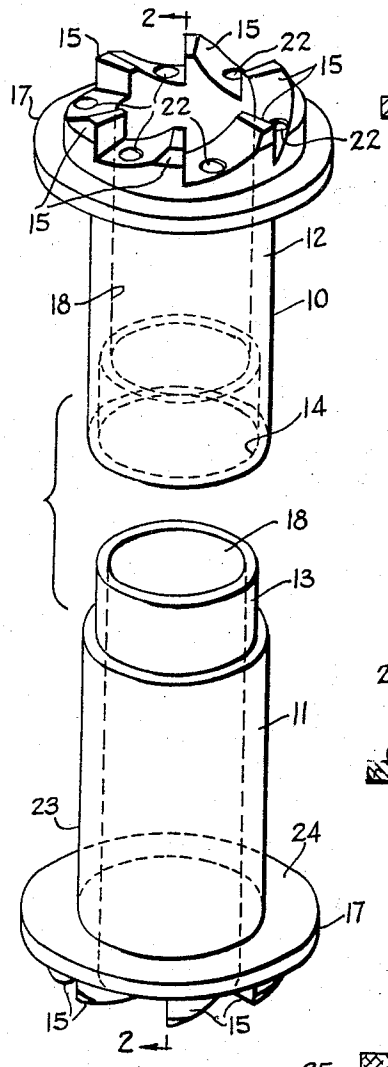


FIG. 1

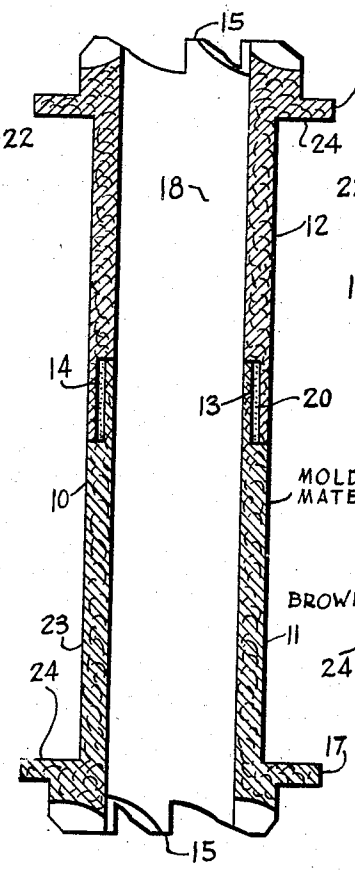


FIG. 2

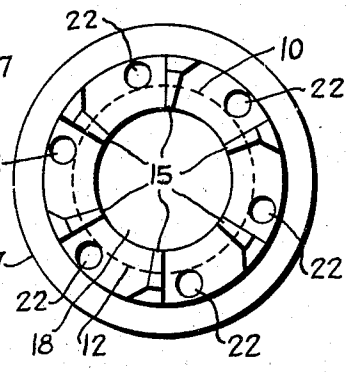


FIG. 3

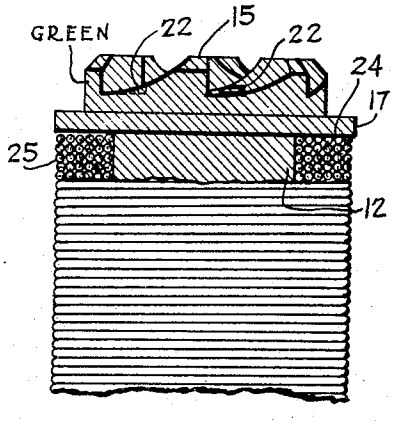


FIG. 4

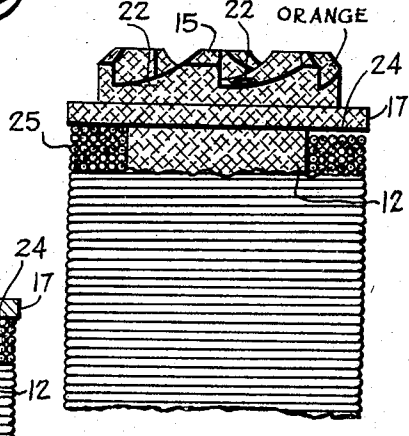


FIG. 5

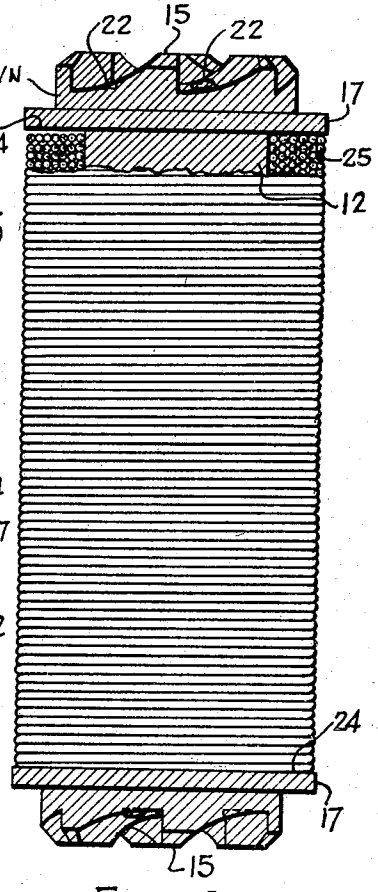


FIG. 6

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BOBBIN

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Application May 29, 1940, Serial No. 337,379

1 Claim. (Cl. 242—118)

This invention relates to bobbins and spools adapted for use in looms and more particularly in braiding machines.

It is an object of this invention to devise a bobbin from moldable plastic material of any desired color which has a smooth, hard, resilient surface for receiving the yarn or fiber wound thereon.

Another object is to provide a bobbin which is substantially non-absorbing of moisture, oil or grease and is durable and economical to manufacture.

Another object is to devise a moldable plastic bobbin having a highly polished surface which will withstand severe treatment without splintering or developing rough uneven surfaces resulting in snagging or damaging the fiber disposed thereon.

Another object is to provide an improved bobbin of moldable plastic material having integral ratchet means formed on one or both ends, as desired, and arranged so that the yarn or fiber can not be wound on the bobbin backwards.

Still another object is to devise a molded plastic bobbin of a desired color which is formed in two pieces whereby it can readily be assembled and fused or otherwise cemented together to form a unitary structure. The two pieces forming the bobbin are firmly cemented together on a surface which does not come in contact with the thread and after it is cemented, it is polished or buffed so that there is a perfectly smooth surface having no crevice or parting line.

In the manufacture of shoelaces, hatbands, lamp cord coverings, decorated braid, or any of the numerous woven or braided materials, many different kinds of yarns are used which are not easily distinguishable. One of the advantages realized by this invention is the provision of bobbins or spools made in the different colors whereby yarns of a particular quality or type can be wound on bobbins of the same color. This simplifies the operation of a braiding or weaving machine, since the operator need only note the color of the bobbin in order to select the proper yarn or fiber. In this way, the danger of using the wrong yarn with resultant spoilage of the product is substantially eliminated.

These and other objects will more fully appear from the following description of the drawing, wherein,

Fig. 1 is a perspective view in elevation of a two-piece bobbin made according to this invention.

Fig. 2 is a sectional view taken substantially on the line 2—2 of Fig. 1 and showing the parts assembled forming a finished bobbin.

Fig. 3 is a plan view of a bobbin as viewed from one end.

Figs. 4 and 5 are fragmentary elevational views partly in section illustrating a bobbin made of different colors and having fibers wound thereon.

Fig. 6 is an elevational view of a bobbin showing yarn or fiber wound thereon and partly broken away and illustrating the bobbin having a particular color.

Referring to the drawing in detail wherein there is illustrated one embodiment of this invention, a hollow bobbin generally designated 10 comprises the cylindrical tubular parts 11 and 12 which are arranged to telescope together forming the bobbin. Member 11 comprises a small diameter section 13 which is adapted to fit in the counterbore portion 14 of the member 12 as shown in Figs. 1 and 2. On the outer ends of each of the bobbin parts 11 and 12 are formed ratchet teeth members 15 which are adapted to be engaged by suitable means to rotate the bobbin. Adjacent the ratchet teeth 15 and forming an integral base therefor are disk-like end portions 17 which form side walls for retaining the yarn or fiber onto the bobbin or spool. The central opening 18 extends throughout the length of the bobbin as shown in Fig. 2 whereby the bobbin can be mounted on a spindle and rotated during use.

In forming the bobbin, the parts are molded from plastic material of the desired color, assembled and cemented or fused together as illustrated at 20 in Fig. 2 to form the finished bobbin. The bobbin has a parting line on the outer edge of the opposed telescoping end portions 12 and 11, as shown in Fig. 2, which never comes in contact with the thread. The two pieces, 12 and 11, forming the bobbin, are firmly cemented together at 20 along the telescoping surfaces 13 and 14 which do not come in contact with the thread or yarn during use of the bobbin. Further, after the parts are cemented together, the surface of the bobbin is polished to a perfectly smooth continuous surface. If desired, heat is applied to the opposed edges of the telescoping portions to soften the plastic and fuse the parts together prior to polishing the surface of the bobbin.

For removing the molded parts from the mold, knockout pin means are positioned to contact the ratchet teeth portions as shown at 22 in Figs. 1 and 3. In this way, no distorted or uneven surfaces are formed on the portions of the bobbin which come in contact with the yarn or fiber

wound thereon. When use is made of thermoplastic resins, the parts forming the bobbin may be readily fused together on assembly with or without the use of adhesive or cementitious material.

The inner surfaces forming the core and side walls of the bobbin as shown at 23 and 24 are molded so as to provide an integral continuous smooth, hard resilient surface for receiving the yarn 25 wound thereon as illustrated in Figs. 4, 5 and 6. Various types of moldable thermosetting or thermoplastic materials may be utilized in making the bobbins. Further, if desired, inorganic material such as glass porcelain or vitreous substances may be used so long as a bobbin is provided having a substantially non-porous smooth, hard surface and which does not fracture easily.

Preferably heat moldable cellulose acetate and similar moldable plastic compositions are used in making the bobbins. Natural or synthetic moldable materials may be utilized.

It will be further appreciated that the bobbins illustrated by this invention may be molded in one piece if desired by using a suitable die.

Plastic bobbins made according to this invention are molded so as to have a highly polished, smooth, substantially non-porous surface for receiving the yarn and require no machining operations. The molded bobbins do not absorb grease or oil, which are very detrimental to delicate fibers or rayon yarn. Due to the highly polished smooth surface formed by the molded plastic material, any dirt or grease which may accumulate on the bobbin is easily removed by wiping or washing the bobbin in soap and water. In general, it has been found that yarns used on braiding machines should contain from 12% to 14% moisture in order to operate at the highest efficiency and to avoid breakage of the yarn due to its becoming brittle when the moisture content of the fiber is low.

Bobbins made of wood and the like porous material tend to absorb moisture from the yarn during storage, dissipating it to the atmosphere which renders the yarn brittle. This tendency has been overcome by molding the bobbins from moisture resistant plastic materials as provided by this invention. Further, wooden bobbins when dry tend to split, warp, or crack along the grain, so that their life is relatively short. Aside from this, bobbins and spools formed of wood develop rough edges during handling which in use snag the yarn and damage the finished braid or woven product. This is not encountered by utilizing the molded bobbins of this invention. Further when the molded bobbins become obsolete, they may be used over again by remolding them.

Bobbins made according to this invention are molded with a ratchet on each end which is arranged so that the bobbins can only be rotated in one direction when the same are placed on the loom winding or unwinding mechanism. If preferred, only one end of the bobbin is provided with a ratchet. Preferably, the ratchet part of the bobbin is so situated that it is in line with the interior or stem part of the bobbin. In this way, the heavy sections of the ratchet do not cause shrinkage during molding which would result if the heavy sections of the ratchet were located on the circumference of the two end pieces at a point beyond the periphery of the inside stem or spool portion of the bobbin.

The design of the bobbin is such as to eliminate shrinkage during molding. This is very important, since undue shrinkage brought about due to the design of the bobbin adversely affects the use of the bobbins in the knitting mills. The bobbins may be made in different colors so that a certain quality or type of yarn or fiber may be placed on similar colored spools, thus simplifying the process of operating braiding or knitting machines.

In the improved bobbin of this invention, the knockout pins on the molding die machine are placed so that they will not become engaged with any surface of the bobbin which is to be contacted with thread during the use of the bobbin. In the improved method of manufacturing the bobbin of this invention, the knockout pins are arranged to directly contact on the ratchet pieces at the outermost end portions of the spool parts 11 and 12, as shown at 22 on Figure 1. By this arrangement, any rough spots formed by engagement of the knockout pins with the spool portions of the bobbin during movement do not in any way affect the efficient operation of the bobbin. Preferably, the knockout pins are placed in line with the long section of the castings and arranged so that no distortion of the parts results when the knockout pins are moved against the parts of the spool to remove them from the mold.

The ratchet portions of the bobbin ordinarily are used when winding the thread on the bobbin, but when they are used for knitting, in some instances, the knitting machine may be arranged to rotate the bobbin so that the ratchet part of it acts as a brake and rides on an irregular surface whereby each time the ratchet goes over one of the irregular points it engages the next one, preventing the ratchet from turning too fast and takes up any backlash during the knitting operations.

It will be understood that this invention is not limited to the particular details of construction of the bobbin and various methods of molding or forming the article of manufacture may be utilized from the spirit and scope of the claim appended hereto.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

As an article of manufacture, a molded hollow bobbin, said bobbin being formed of two pieces telescoped together and united to form a unitary bobbin having a smooth, hard, resilient surface with no perceptible joint for receiving the yarn or fiber, said bobbin being further characterized by having integral ratchet means formed along the inner periphery on at least one end thereof, said ratchet means being provided with sloping cam portions, said sloping cam portions having knock-out pin holes extending axially of the hollow portion of said bobbin.

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