

Aug. 24, 1926.

1,597,230

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METAL BOBBIN

Filed March 9, 1923

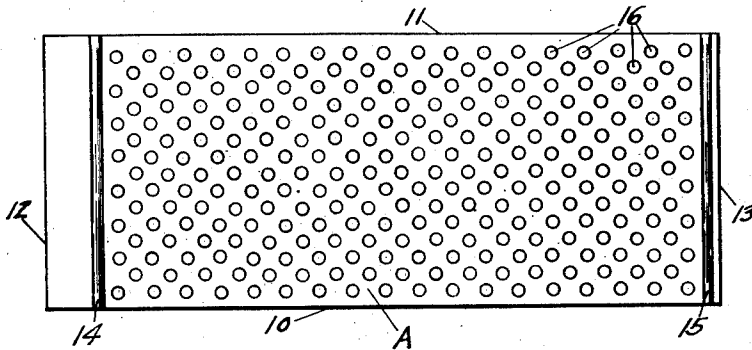


FIG. 1

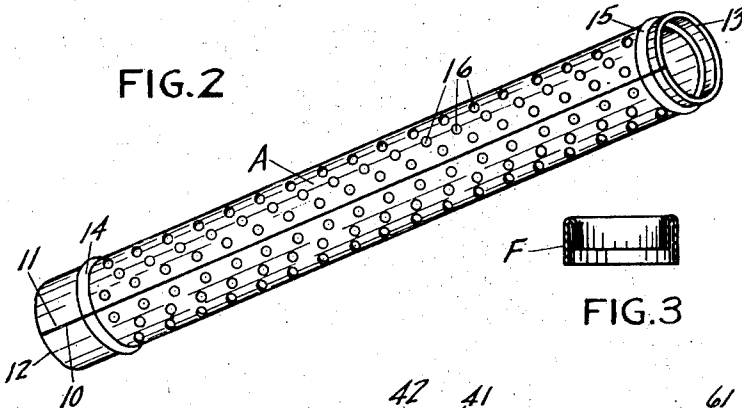


FIG. 2



FIG. 3

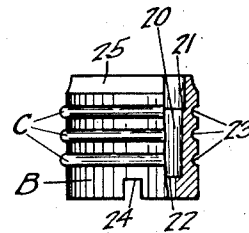


FIG. 4

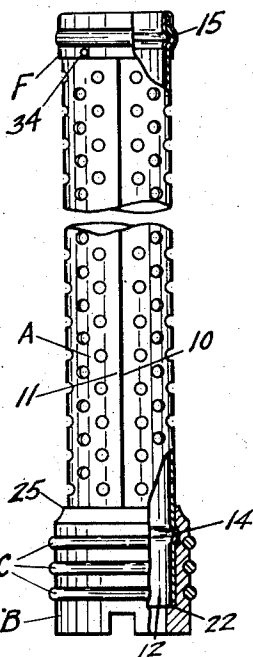


FIG. 5

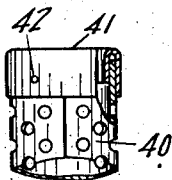


FIG. 6

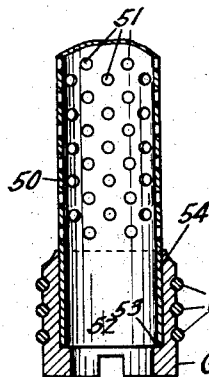


FIG. 7

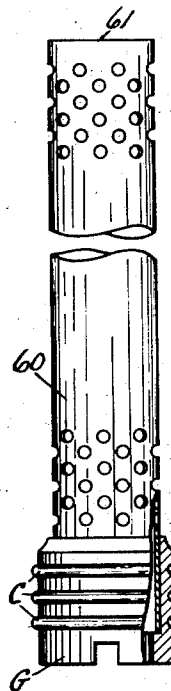


FIG. 8

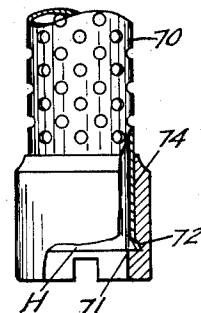


FIG. 9

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Patented Aug. 24, 1926.

1,597,230

UNITED STATES PATENT OFFICE.

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METAL BOBBIN.

Application filed March 9, 1923. Serial No. 623,982.

This invention relates to bobbins such as are used in the textile industries. At the present time wooden bobbins are most generally used in this industry on account of their cheapness and because metal bobbins have not been highly successful. Besides this, wooden bobbins are generally cheaper although not as durable, and metal bobbins as made have a tendency to injure the operatives' fingers.

I am aware that various types of metal bobbins have been proposed, and the object of my present invention is to produce a cheap, durable bobbin which is properly balanced and which will not injure the operatives' fingers.

Other purposes are to provide a bobbin upon which yarn can be spun, twisted or wound, then set and woven without being removed from the bobbin.

The process of setting, either by water, vapor, steam or otherwise, is very hard on wooden bobbins or paper cops, and it is generally necessary or desirable to rewind on to reels or other devices, all of which means rehandling of the goods.

The twist in the spun yarn can be set naturally if the bobbin is left a sufficient time, but this means great storage room and delay so that it is highly desirable to set the yarn rapidly.

Moreover, there are certain hard twisted yarns for the setting of which boiling is preferable to steaming, and there are some soft twisted yarns which are made much stronger by boiling.

A further and most important object of my invention is to provide what might be called an universal metal bobbin upon which yarn can be spun, wound or twisted, and which can then be subjected to steam or plunged into water and boiled, without injury to the bobbin, and which can then be removed, placed in a loom, particularly of the bobbin shifting type such as the Draper, and woven into cloth.

I accomplish this end by using a suitable alloy, preferably of aluminum and preferably heat treated to make it tough, for the barrel, which can therefore be made of thin sheet metal bent around in the form of a cylinder until the edges meet, with parallel walls, such sheet having been perforated before being bent and, preferably, having beads formed near each end.

The bead at the tip end helps to keep the

yarn when it is unwinding from striking the extreme tip which is likely to be injured in case the bobbin is dropped or in case the cap in a cap spinning frame is brought down in contact with it.

I prefer to use a bead at the head end also as it assists in assembling my bobbin, although I can dispense with one or both beads.

I also prefer to use a cap on the tip end, spun around the inside and the outside whereby the end is protected and a split barrel can be used, the cap holding the tip end in place and the head holding the base end in place.

There is a tradition in the industry that where wooden or paper bobbins are used, a tapering form is desirable, although in wooden bobbins embossed rings have been found desirable to keep the yarn from sloughing off in the loom. Various attempts have been made to use a metal bobbin with a tapering form with more or less success.

I claim as the fundamental feature of this invention to have discovered that by using a bobbin with a barrel of cylindrical form with parallel sides and perforated, the yarn can be spun thereon, set, and woven therefrom without sloughing off, and this is the most important feature of my invention.

In addition to this, I have found that the most practical way of making such a bobbin is to bend the sheet of perforated metal and then insert one end in the head, which is substantially solid and made of suitable moisture resisting material, such as an aluminum alloy, holding the barrel in place in any one of various ways.

I have also found that while using steel or ferrous rings positioned in grooves on the outside of the head, where the bobbins are boiled an electrolytic action seems to take place which keeps the head and bobbin perfectly clear and free from rust. Moreover, if by reason of steaming or other rust-forming exposure, a condition of rust is found to exist, this rust can be effectively removed by boiling the bobbins in water without other chemical reagent.

In the drawings, Figure 1 is a flat sheet of moisture resisting metal of rectangular form perforated and having the metal embossed to form rings.

Fig. 2 is a perspective view of the same sheet shown in Fig. 1 bent around to form a cylinder with parallel walls.

Fig. 3 is a sectional elevation of the cap ferrule.

Fig. 4 is an elevation partly in section of the head.

Fig. 5 is an elevation partly in section showing my preferred form of bobbin assembled.

Fig. 6 shows a bobbin tip with a cap but without a bead.

Fig. 7 is a sectional elevation of the end of a bobbin with a split barrel, having no head bead, driven into a head.

Fig. 8 is an elevation partly in section showing a bobbin with a barrel of continuous construction as will be the case with the edges welded.

Fig. 9 shows a perforated barrel inserted in a head in which is an internal annular recess into which the metal of the barrel is extruded.

In the drawings, A represents the rectangular sheet of moisture resisting metal which is, preferably, a heat treated aluminum alloy. This has the parallel sides 10 and 11, the ends 12 and 13 and numerous perforations 16 of a suitable size. Near one end, which is to be the tip, the bead 15 is expressed, and near the other end another bead 14 is expressed.

The next move is to bend up this sheet A into a perfect cylinder, as shown in Fig. 2, whereby the edges 10 and 11 meet.

B represents a head which may be of moisture resisting metal and is, preferably, either cast, machined, or otherwise formed so that it is substantially solid. It has an interior bore 20 and two annular shoulders 22 and 21, the distance between them being the distance from the end 12 to the bead 14. A slot 24 common in a certain type of bobbin is also shown.

Around the outside are the three grooves 23, 23, 23 in which the split rings C of well known form are located.

As shown in Fig. 5, the bobbin is assembled in such manner that the end 12 rests down against shoulder 22 and bead 14 against shoulder 21, while the metal at 25 is spun in and over so as to hold barrel A in place in head B.

The ferrule F is slipped over the tip end and by suitable tools is spun around the inside and the outside so that it conforms to the shape of the tip bead 15. To prevent possible turning, indentations 34 are forced into the metal. It is obvious that the ferrule F and the head B keep the edges 10 and 11 from separating.

In Fig. 6, the perforated barrel 40 is shown as having no tip bead but a ferrule 41 which may be fitted in place and held by indentations 42 so that it will not turn and will not slip off.

In Fig. 7, I show a barrel 50 which may or may not be split but is perforated at 51

and which has no head bead but is fitted so closely into the hole 54 in head G by a drive fit, for instance, that it cannot come out. Preferably, its end 52 comes right up against an annular shoulder 53 in head B.

In Fig. 8, I show a barrel 60 which is not split but is suitably perforated and which has no ferrule at the end 61 as a ferrule is unnecessary although it may be desirable where a split barrel is not used. This barrel is shown as driven into the head G and as having no head bead.

In Fig. 9, I show another method by which the barrel 70 can be firmly held in the head G. At the lower end of the bore 74 at H is an annular shoulder 71 into which the metal at the end of barrel 70 is forced as shown at 72.

Various other methods of fastening the barrel and head together might be used, but I wish it understood that I claim to be first to provide a bobbin with a cylindrical body, especially of split form, the end of which is inserted and fastened into a substantially solid head.

The rings C are, preferably, of steel or other ferrous material.

I claim:

1. The combination in a single headed bobbin for spinning, twisting, winding, setting and weaving textiles, of a barrel made of a perforated sheet of a heat treated aluminum alloy bent into a cylinder so that the edges meet and having an expanded bead near its tip and another expanded bead near its base; with a substantially solid head of aluminum alloy having exterior grooves and an axial hole with an annular shoulder against which the end of the barrel rests and another annular shoulder against which the base bead of the barrel rests, the metal of the head being spun over said bead to hold the barrel in place; steel rings in the head grooves; and a cap ferrule of thin sheet metal spun over the outside of the tip bead and around the inside of the tip and fixed thereto.

2. The combination in a single headed bobbin for spinning, twisting, winding, setting and weaving textiles, of a barrel made of a perforated sheet of a heat treated aluminum alloy bent into a cylinder so that the edges meet and having an expanded bead near its base; with a substantially solid head of aluminum alloy having exterior grooves and an axial hole with an annular shoulder against which the end of the barrel rests and another annular shoulder against which the base bead of the barrel rests, the metal of the head being spun over said bead to hold the barrel in place; steel rings in the head grooves; and a cap ferrule of thin sheet metal fixed around the tip of said barrel.

3. The combination in a bobbin for spinning, twisting, winding, setting and weaving

textiles, of a barrel made of a perforated sheet of a heat treated aluminum alloy bent into a cylinder and having an expanded bead near its tip; with a substantially solid head of aluminum alloy having exterior grooves and an axial hole into which said barrel is fixed; steel rings in said grooves; and a cap ferrule of thin sheet metal spun over the outside of the tip bead and around the inside of the tip and fixed thereto.

4. The combination in a bobbin for spinning, twisting, winding, setting and weaving textiles, of a barrel made of a perforated sheet of a heat treated aluminum alloy bent into a cylinder; with a substantially solid head of aluminum alloy having exterior grooves and an axial hole into which said barrel is fixed; steel rings in said grooves; and a cap ferrule of thin sheet metal fixed around the tip of said barrel.

5. A bobbin for use in spinning, twisting,

winding, setting and weaving, comprising a barrel made of a perforated sheet of moisture resisting metal bent into a cylinder so that the edges meet, and a substantially solid base member of moisture resisting material having an axial bore into which the base end of said barrel closely fits and is permanently fixed, together with a cap ferrule closely fitted around and permanently fixed to the tip end of said barrel.

6. A bobbin for use in spinning, twisting, winding, setting and weaving, comprising a barrel of cylindrical form made of thin perforated moisture resisting metal, and a substantially solid base member of moisture resisting material having an axial bore into which the base end of said barrel closely fits and is permanently fixed, together with a cap ferrule closely fitted around and permanently fixed to the tip end of said barrel.

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