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METHOD OF MAKING BOBBINS

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Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

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The present invention relates to an improvement in method of making bobbins. In the bobbin construction illustrated and described in the patent granted to me May 25, 1926, No. 1,585,637, I have shown a reinforcement for the spindle hole in the butt of a bobbin in which the ferrule has an outwardly extended flange having teeth or projections which penetrate the end of the bobbin to prevent the ferrule from turning, and in which the body of the ferrule is provided with an enlargement which enters a recess in the wall of the bobbin hole. This bobbin required the enlargement to be forced through a smaller portion of the hole in order to reach its holding recess, and required considerable care in its manufacture in order to avoid cracking the bobbin butt.

The object of the present invention is to produce a bobbin having a reinforcing ferrule for the hole in the butt in which one means is provided both for holding the ferrule from turning, as well as for holding the ferrule in the movement of the bobbin. A further object of the invention is to produce a method of making the bobbin. To the above ends the invention consists in the bobbin and method of making the same hereinafter described.

In the accompanying drawing illustrating the bobbin and method of making the same, Figs. 1, 2 and 3 show successive steps in the formation of the ferrule; Fig. 4 shows a longitudinal section of the bobbin butt with the ferrule in place; and Figs. 5 and 6 illustrate modifications of the construction illustrated in Fig. 4.

The illustrated embodiment of the invention is described as follows: The body of the bobbin 1 is provided with a blade 2 and a butt 3. The butt of the bobbin has an enlarged end. It receives the reinforcing rings 4 sprung into grooves formed in the exterior surface of the butt of the bobbin. These reinforcing rings serve not only as devices to strengthen the butt of the bobbin and to prevent it from being split but also as the holding means by which the bobbin is held in the shuttle of a weft replenishing loom.

The butt of the bobbin is provided with a concentric recess or spindle hole which is reinforced with ferrule 5. This ferrule has a cylindrical body of a size to fit the inside of the butt recess 6. The outer end of the ferrule is provided with a flange 7 which extends outwardly and engages the end of the bobbin. The inner end of the ferrule is provided with a series of hooks 8, which penetrate the wall of the recess 6. This ferrule is ordinarily made of brass or other metal, and is hard, stiff and strong relatively to the strength of the bobbin, which, being made of wood, ordinarily is relatively soft and yielding in character. The hooks or projections on the inner end of the ferrule hold the ferrule from turning in the bobbin butt recess, and at the same time prevent its being moved in either direction therein. The repeated donning and doffing of bobbins subjects the ferrule to blows and stresses which tend to move it in the bobbin, and the hooks prevent such movement.

In the modified form shown in Figs. 5 and 6, the outwardly extended flange 10 of the ferrule extends across the bottom of the butt of the bobbin and up on the outer side thereof at 11. The portion of the flange on the bottom of the bobbin is provided with stamped up projections 12, which reduce the area of contact of the butt of the bobbin with the surface with which the bobbin engages.

The method of making the bobbin consists in first preliminarily forming a ferrule for use in the making of the bobbin, of a form which, by the act of insertion in the bobbin, is changed. Thus, in Fig. 1 is shown the ferrule having the cylindrical body 15, and the bottom 16 with the serrated hole 17 punched therein; in Fig. 2 the bottom of the ferrule 15 is shown as having been operated upon to force the central part of the bottom carrying the serrations outwardly, as shown; then in Fig. 3 these serrations are shown as bent to form the hooks 18, which, it will be observed, curve radially outward below the bottom 16 of the ferrule, but not beyond the diameter of the body 15. The preliminary ferrule, therefore, shown in Fig. 3, is at this time ready for association with the bobbin. This is accomplished by supporting the bobbin in a convenient support and then forcing the ferrule into the hole by a mandrel 20. This mandrel, entering and filling the inside of the ferrule, engages the shoulder formed by the bottom 16 of the preliminary ferrule and forces the whole ferrule into the bobbin until the flange 7 engages with the butt of the bobbin, and thereafter the further movement of the mandrel into the ferrule straightens out the bottom flange and thus causes the hooks to be bent from the position shown in dotted.
lines in Fig. 4 to the position shown in full lines therein, thereby forcing the hooks outwardly into the relatively soft material of the bobbin, and securely uniting the ferrule and bobbin together so that the ferrule cannot be turned or moved longitudinally with relation to the bobbin.

While the present invention is illustrated in a bobbin for use in a weft replenishing loom, it is to be understood that the invention may be employed in any form of bobbin provided with a central opening which it is desired to reinforce, or in the manufacture of spools, or other things having a central opening which is reinforced; the claims, therefore, are to be read and understood in the light of this statement, as embracing any article of manufacture made of soft material such as wood, which is provided with a hole and reinforced by a ferrule having the features of construction defined in the claims, and any method of manufacturing any such article involving the steps defined in the claims.

Having thus described the invention, what is claimed is:

1. The method of making bobbins which consists in making a bobbin of soft material provided with a cylindrical hole in its butt end, in making a ferrule having a cylindrical body whose length at least equals its inside diameter to form a shield to protect the soft material of the bobbin butt, provided at one end with an outwardly-extended flange and at the other end with an inwardly-extended flange forming an annular shoulder, this flange being provided with a plurality of holding hooks located entirely within the outside diameter of the body and directed outwardly, placing the ferrule in the hole in the bobbin with its flange abutting the end of the bobbin, and then, while holding the ferrule in position in the bobbin butt, driving a cylindrical mandrel, fitting the ferrule into the same to cause the end of the mandrel to press against said annular shoulder and straighten out said flange and thus cause the hooks to penetrate the wall of the bobbin hole so as to leave the inside of the entire ferrule cylindrical to engage the spindle over a large area.

2. The method of making bobbins which consists in making a bobbin of soft material provided with a cylindrical hole in its butt end, making a sheet-metal ferrule having a cylindrical body provided at one end with an outwardly-extending flange and at the other end with a bottom wall having cut out of its center a serrated hole, then bending the central part of the bottom outwardly to thereby leave an internal shoulder, then bending the backwardly-extending flange thus formed radially-outwardly to thus curl the serrations into hooked form, then placing the ferrule in the hole in the bobbin with its flange abutting the end of the bobbin, and then driving a cylindrical mandrel, fitting the ferrule, into the same to cause the end of the mandrel to press against said annular shoulder and flatten out said flange to thus cause the hooks to penetrate the wall of the bobbin-hole so as to leave the inside of the entire ferrule cylindrical and immovably attached to the bobbin.

In testimony whereof I have signed my name to this specification.

JOHN NORMAN ANDERSON.