

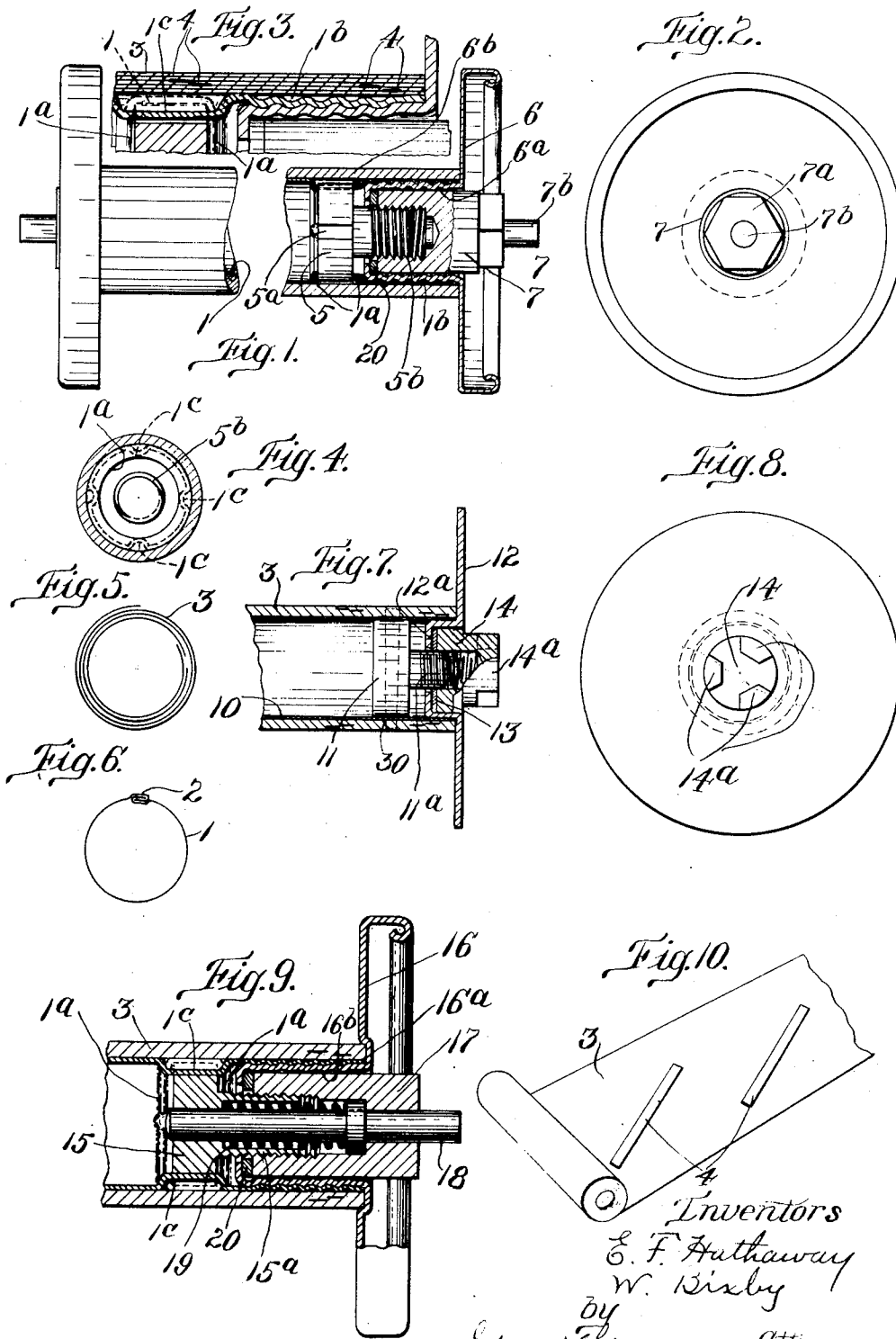
July 13, 1926.

E. F. HATHAWAY ET AL

1,592,565

YARN SPOOL

Filed July 19, 1924



Inventors
E. F. Hathaway
W. Bixby
by
Geo. N. Goldard, Atty.

UNITED STATES PATENT OFFICE.

EDGAR F. HATHAWAY, OF WELLESLEY, AND WALTER BIXBY, OF BOSTON, MASSACHUSETTS, ASSIGNORS TO SHAWMUT ENGINEERING COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

YARN SPOOL.

Application filed July 19, 1924. Serial No. 726,921.

This invention relates to spools for carrying supplies of yarn, and is particularly intended for use in connection with tube frames employed in tuft weaving in the production of Axminster carpets and similar pile fabrics.

It is highly desirable that these spools should be of light construction and at the same time capable of enduring the rather rough handling to which they are often subjected, while affording a good yarn-adhering surface for the barrel of the spool on which the yarn is wound.

With these objects in view the invention, generally speaking, comprises a spool characterized by a barrel portion of tubular wood construction having an interior tubular metallic reinforcement constructed and arranged to form an interlocking connection with the disks or heads at each end of the spool.

This and other characteristic features of the invention will be described in the following specification and will be defined in the claims hereto annexed.

In the accompanying drawings we have illustrated several forms embodying different specific applications of the principle of this invention, in which:

Figure 1 is a side elevation of a complete spool one end of which is shown in cross section to illustrate the interior construction thereof.

Figure 2 is an end elevation of the same.

Figure 3 is an enlarged detail of the end portion of the spool in cross section.

Figure 4 is an end view showing the head attaching stud anchored inside the open barrel, the head itself being removed.

Figure 5 is a diagrammatic end view illustrating the coiled veneer construction of the wooden portion of the barrel.

Figure 6 is an end view of the tubular metallic lining which acts as a reinforcement inside the tubular wooden barrel.

Figure 7 shows a modified construction for attaching the spool head, and is a central longitudinal section of one end thereof.

Figure 8 is a modification of the end elevation shown in Figure 7.

Figure 9 is a central longitudinal section of an end portion of another modified construction.

Figure 10 is a diagrammatic view illus-

trating the application of the interior reinforcing strips inserted in the coiled wood veneer to prevent longitudinal tearing or splitting of the same.

In the practice of this invention the tubular wooden barrel is preferably made of thin wood veneer which is coiled upon itself to form a half dozen plies, more or less, held together by an adhesive spread on the surface. This veneer may be coiled on a mandrel in any suitable way, and while still wet from the adhesive coating is telescoped over an interior lining of metallic tubing, or it may be coiled around the metallic tubing using the latter as a mandrel. In either case when the wood thoroughly dries out the drying will cause it to shrink upon the tubular reinforcement so tightly as to effectively prevent longitudinal slip between the wooden portion of the barrel and the interior metallic tube.

Before the tubular reinforcement 1, and the wooden tube 3, are assembled together one inside the other, an attaching member 5 is placed inside the metallic tubing a proper distance from its end, and on either side of the large diameter or head of the attaching member 5 the metal of the surrounding tube 1 is spun in to form two annular ribs 1^a embracing opposite sides of the head 5 of the attaching member so as to secure it against endwise play or movement.

To prevent rotation of the attaching member, longitudinal ribs 1^c are countersunk into the axially extending recesses or notches 5^a formed on the periphery of the head 5 so as to interlock therewith. The order of steps in building this structure may be varied since the longitudinal ribs 1^c may be formed before the outer annular rib 1^a is formed and the attaching member inserted with its notches 5^a registering with the previously formed ribs 1^c.

The reinforcing metallic tube in the form shown in Figure 1 has its extreme end portion spun or died to form a coarse thread to receive and retain the threaded flange 6^a of the disk or head 6 of the spool.

To securely lock the head against accidental rotation and displacement, the attaching member or locking member 5 is provided with a central outwardly projecting stud 5^b which is screw threaded, preferably with a finer and closer thread than the rela-

tively coarse thread 1^b, formed in the end of the metallic tube. On this threaded stud 5^b is screwed a journal member 7 which is formed into a hexagonal nut toward its outer end to permit the application of a wrench, and which terminates in the form shown in Figure 1 in a reduced portion 7^b forming a journal for the spool. It will therefore be seen that the journal member forms a locking nut which secures the head against accidental loosening.

The washer 20 is interposed between the inner end of the journal member 7 and the inturned flange 6^b of the tubular portion 15 of the head to aid in resisting the inward thrust of the journal member when it is turned tightly to its locking position.

This construction permits the easy removal of the spool head so as to allow the substitution of plain disks like that shown in Figure 7, or rimmed disks like that shown in Figure 1. The differential pitch of the threads forms a positive lock against the unscrewing of the head when subjected to the friction of the spool brake such as is commonly used in tube frames.

In the form of spool shown in Figure 7, the countersinking and threading of the tubular lining or reinforcement 10 is omitted entirely. In this case the attaching member 11 has its larger portion or head of cylindrical form fitting snugly inside the tubular lining, and a dowel pin 30 is driven transversely through the barrel and attaching member to lock the latter against longitudinal or torsional movement. In this form the disk or head 12 is cupped to form a relatively short angular flange 12^a and a journal member 14, serving as an interiorly threaded nut, is turned on to the central threaded stud 11^a of the attaching member until the inner face of the nut engages the inwardly turned portion of the flange 12^a or the interposed washer 13, thus serving to force or draw the head 12 tightly against the end face of the barrel. The outer end face of the journal nut 14 is cut away to leave three symmetrically arranged segmental teeth 14^a separated by segmental spaces of equal area so that when two such journal members are brought together they will overlap and interlock one with the other. While any desired number of such segmental interlocking teeth or projections may be used, we have found that the triple tooth construction shown in Figure 8 has advantages in respect to easy machining of the parts since, as will be seen upon consideration of Figure 8, three transverse cuts of a milling cutter will form the three symmetrical teeth and leave proper intervening spaces for the reception of similar teeth if the cutter be made of appropriate width.

The tubular lining or reinforcement may extend the whole length of the barrel, as in-

dicated in Figure 1, or it may terminate at any convenient distance inwardly from the end of the barrel.

In Figure 9 we have shown another modification in details of construction in which form the barrel construction, embracing the tubular wooden outer member and the metallic inner member with its threaded end portion and counter-sunk ribs, is identical in construction with the form shown in Figure 1. In this case, however, the attaching member 15 has its threaded stud 15^a inwardly bored to form a seat for a helical spring 19 and to form a passage for a journal pin 18 which is normally thrust outward by said spring against the shoulder or end wall of a recess formed in an elongated nut 17 which has threaded engagement with the stud 15^a and acts, by its thrust against the inturned lip of the flange 16^b of the head 16, to lock the head against loosening, the thrust being supported in part by an interposed washer 20.

In this form the disk-like portion of the head 16 is formed with an annular counter-sunk recess 16^a surrounding the tubular threaded flange 16^b so that the main disk portion 16 of the head overhangs slightly the end of the barrel when the parts are assembled.

As the coiled wood veneer is subject to longitudinal splitting, we make provision for preventing this by interposing one or more thin strips of metal, as shown at 4, between successive plies or layers of the wood veneer. This is done by laying such strips somewhat obliquely near the edge of the sheet of veneer before it is coiled so that the protective strips of metal 4, are wound in different successive layers or coils of the veneer as the veneer is wound up on its mandrel, such coils of veneer extending one or two complete turns around the barrel between the outer and the inner surfaces thereof.

The resulting construction is not only very light but has great strength and durability for the purpose intended, and at the same time makes possible the substitution of different forms of heads at will on the same barrel.

The journal end of the locking journal member, in each case, will be adapted to fit the particular spool bearings carried by the tube frame brackets. Where the spool bracket on the tube frame is a small bearing, the journal end must of course be correspondingly small, as in Figures 1 and 9. On the other hand, where the journal bearings in the spool brackets are of large diameter the bearing portion of the journal will be made correspondingly large, as in Figure 7. The construction of the bearing member of the journal will also be adapted to the kind of bearing bracket used, whether it is an open

bearing seat or a closed bearing seat. It will therefore be understood that any form of bearing journal may be applied to the different spool constructions, according to the kind of spool bearing bracket used in conjunction therewith. Therefore, if the central threaded anchor studs be made of a standard pitch and diameter, all that would be necessary to transform any given spool to fit different sizes and styles of bearing brackets will be the removal of the journal nut member of one style and the substitution of the other, and for this purpose it would not be even necessary to remove the head. The result is a universal attaching member to which any form of journal member could be applied.

What we claim is:

1. A yarn spool embracing in its construction a hollow barrel formed of veneer coiled upon itself in spiral layers connected together and provided with metallic reinforcement, and circular heads having attaching members projecting from the interior portion of the head and adapted to be inserted in the ends of the barrel and detachably fastened thereto, substantially as described.

2. A yarn spool embracing in its construction a tubular barrel comprised of laminated spirals of wood veneer cemented together, an interior reinforcement of metal tubing upon which said veneer is tightly shrunk, radially projecting disks provided with interiorly disposed attaching members securely fastened to the barrel.

3. A yarn spool barrel embracing in its construction a tube of closely coiled layers of wood veneer cemented together, with strips of thin metal inserted between successive layers of the veneer and wound therein thereby preventing splitting of the barrel longitudinally, substantially as described.

4. A yarn spool embracing in its construction a tubular barrel of laminated wood plies, an interior reinforcement of metal tubing upon which the wooden tube is tightly shrunk, and end heads secured to the metal tubing, substantially as described.

5. A yarn spool embracing in its construction a tubular wooden barrel, interiorly disposed tight fitting metallic tubing, end heads detachably secured in said barrel by means of integral hollow bosses inserted in the ends of said metallic tubing, and threaded concentric journal members for preventing accidental displacement of said bosses, substantially as described.

6. A yarn spool embracing in its construction a tubular barrel comprising outer wooden tubing and inner metallic tubing, detachable metallic end heads formed with concentric hollow bosses adapted to fit inside the open end of the barrel, locking studs forming fixing anchoring means inside said

metal tubing, and journal members having detachable threaded engagement with said studs and acting to prevent accidental displacement of the heads from the barrel, substantially as described.

7. A yarn spool embracing in its construction a hollow barrel comprising an outer shell of wood and a tubular metallic lining, a threaded head-retaining member anchored inside the end of the barrel by countersunk portions of the metallic lining to prevent displacement with relation to the barrel, a metallic head formed with an annular flange adapted to be inserted in the end of the tube, and means for detachably locking the head in place by threaded engagement with said head-retaining member, substantially as described.

8. A yarn spool embracing in its construction a hollow barrel comprising an exterior wooden shell and an interior tightly fitting metallic lining tube, a centrally perforated head provided with an annular inwardly turned flange around said perforation removably inserted in the barrel, and fastening means comprising a locking member having threaded engagement with an attaching member anchored inside the barrel and arranged to press against said annular flange of the head to keep the head detachably in place, substantially as described.

9. A yarn spool embracing a tubular barrel, a concentric head-attaching stud anchored inside said barrel, a metallic end head formed with an annular flange adapted to fit inside the barrel, and a journal member having threaded engagement with said stud and arranged to prevent the withdrawal of the head from the barrel, substantially as described.

10. A yarn spool embracing a tubular barrel comprising outer and inner tubular members, the latter being formed with a threaded end portion, an end head formed with an interiorly located laterally projecting threaded annular flange adapted to be screwed into the threaded end of the inner member of the barrel to retain the head in operative position, and a journal member secured concentrically of the head, substantially as described.

11. A yarn spool embracing in its construction a tubular barrel whose ends are formed to be interlockingly engaged by attaching portions of the end heads, oppositely disposed end heads provided with annular lateral flanges, said flanges being formed to interlockingly engage the end portions of the tubular barrel to secure the barrel and the heads together while permitting the removal of the latter at will, substantially as described.

12. A yarn spool embracing a tubular barrel, end heads detachably secured thereto, removable journal members embracing in-

ternally threaded nuts having threaded engagement with anchoring studs arranged coaxially of the barrel and forming means for retaining the heads against displacement in relation to the barrel, substantially as described.

13. A yarn spool embracing a tubular barrel comprising an outer shell of wood and an inner shell of sheet metal, an end head having screw threaded connection with the inner shell by means of a laterally projecting annular attaching flange, and journal members detachably secured concentrically of the barrel to support the spool rotatably in suitable bearings, substantially as described.

14. A yarn spool embracing a tubular shell of laminated wood, end heads removably secured thereto by detachable connection with a sheet metal lining secured inside said shell, and a removable journal member located concentrically of the barrel and an adjustable and removable retaining nut preventing loosening of the head from the barrel, substantially as described.

15. A yarn spool embracing a tubular barrel comprising an outer non-metallic shell and an inner sheet metal lining, a metallic head formed with a concentric annular trough adapted to receive and embrace the outer and the inner edge of said barrel, and means for detachably securing the head so as to maintain the end of the barrel in said trough and prevent loosening of the head from the barrel, and a projecting journal member located concentrically of the barrel, substantially as described.

16. A yarn spool embracing in combination a tubular barrel of laminated ply wood, and end heads provided with lateral flanges adapted to be interlocked with reinforcing members secured in the ends of the barrel whereby the heads are detachably retained in normal operative relation to the barrel, substantially as described.

In witness whereof, we have subscribed the above specification.

EDGAR F. HATHAWAY.
WALTER BIXBY.