Feb. 19, 1957 W. BIXBY 2,781,986

TUFTING YARN SPOOL BEARING AND ASSEMBLY

Filed March 24, 1953

Fig. 1.

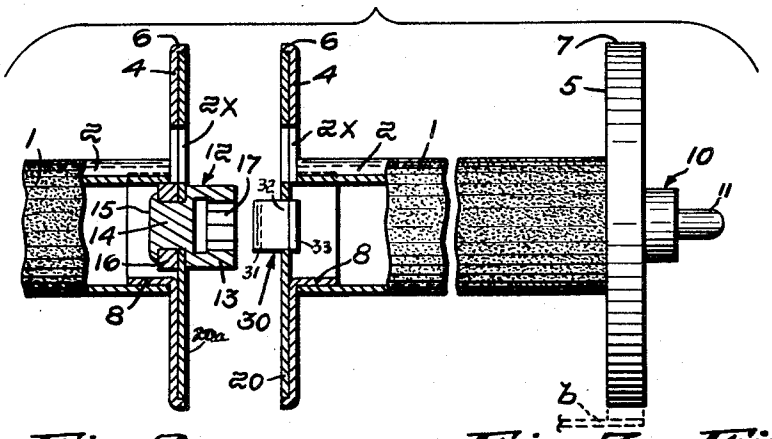


Fig. 2.

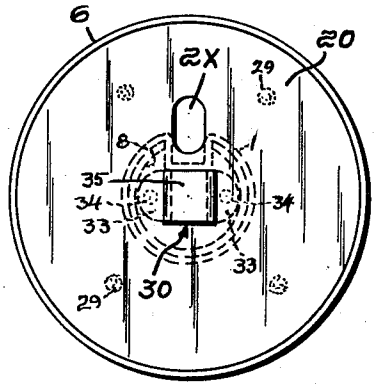


Fig. 3.

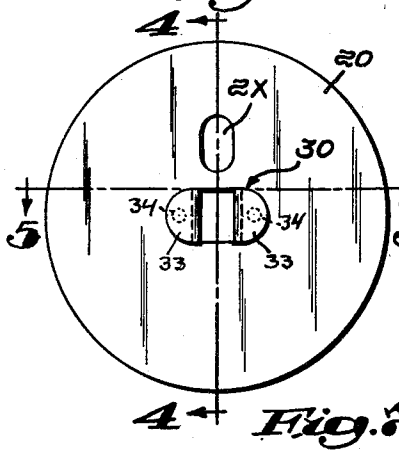


Fig. 4.

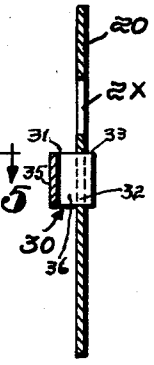


Fig. 5.

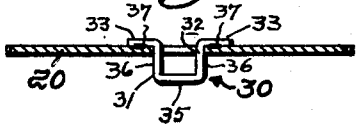


Fig. 6.

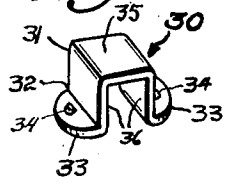
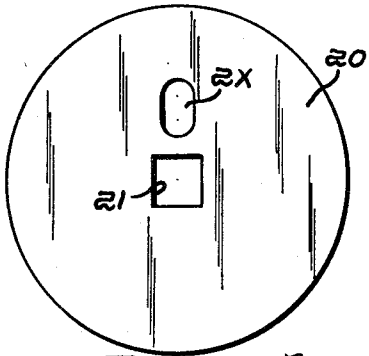


Fig. 7.



Inventor:
Walter Bixby,
by Emery, Booth, Townsend, Miller & Weidner
Attys

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TUFTING YARN SPOOL BEARING AND ASSEMBLY

Walter Bixby, Boston, Mass., assignor to Shawmut Engineering Company, Boston, Mass., a corporation of Massachusetts

Application March 24, 1953, Serial No. 344,341

2 Claims. (Cl. 242—123)

This invention relates to tufting yarn spools for use in weaving Axminster carpet and the like pile fabrics. Its object is further to improve the spool end or head structure and the bearing means thereat which enable a number of the spools to be installed in axial line on a tube-frame or spool carrier to operate thereon as a unit, so as to turn in unison at certain times and at other times to be unitarily held from turning, without relative rotation between the spools at any time while on the carrier.

This application is a continuation-in-part of my copending application Serial No. 191,062, filed October 19, 1950, now Patent 2,636,695.

In the drawings illustrating an improved embodiment of the invention:

Fig. 1 shows one end spool and the adjacent portion of an axially interlocking spool, with portions in longitudinal section;

Fig. 2 is an end view of the inner end of the right-hand spool of Fig. 1 looking from the left;

Fig. 3 is an elevation of the inner face of said mounting assembly;

Fig. 4 is a vertical sectional view of the bearing mounting plate and bearing element or gudgeon, before assembly with the spool head plate, on the line 4—4 of Fig. 3;

Fig. 5 is a section on the line 5—5 of Fig. 3;

Fig. 6 shows the gudgeon or bearing element separately in perspective; and

Fig. 7 shows a central portion of the mounting plate before assembly with the gudgeon.

Yarn spools as here concerned comprise each a cylindrical barrel 1 which holds the wound-on supplies of tufting yarns in readiness for draft when the carrier or frame which holds them is presented at the weaving point in the loom. These spool barrels 1 generally are hollow metal tubes usually with a re-entrant longitudinal channel 2 to take a clamp bar (not shown) for anchoring the inner ends of the yarn series to the spool, the spool heads being apertured as at 2x for reception of such yarn-locking rod.

The respective ends of each spool have yarn-retaining heads, each comprising a main circular plate 4 or 5 with outfacing peripheral flanges 6 or 7. Such flange of some of the spool heads, usually the outer head of an end spool as at the right in Fig. 1, may be of increased longitudinal extent as appropriate to present braking surface for coaction with the brake means of the spool-carrying frame as at *b*, Fig. 1. The spool head plates 4 and 5 are centrally apertured and formed with coaxial inturned collars 8 engaged with and rigidly connected to the spool barrel ends as by spot welding. As apparent in Figs. 1 and 2 these collars are recessed for conformance with the barrel channels 2.

The spool heads at both ends have bearing means for supporting the spools on the carrier frame with capacity for unison turning and unison braking. For the outer end of end spools of a series such bearing means is of

the type indicated generally at 10, Fig. 1, including a central projecting bearing pin or pintle 11 for rotative reception in the outer end bearing of the frame or carrier. Because much of the Axminster carpets and other pile fabrics are woven in widths greater than practical for a single yarn spool, the convenient maximum for which is about 54 in. or "six quarter" length, a plurality of the yarn spools is required, two, three, four or more being disposed in axial line on the supporting carriers or tube frames. To adapt such plurality of spools to function as a unit without relative turning between spools but with unit capacity for rotation at certain times to deliver yarn and at other times to be uniformly held against turning, the adjoining ends of adjacent spools are constructed for angular interconnective or clutching relation as well as for rotative bearing support.

The present invention concerns such inner or intermediate spool ends and the provision of interlocking means therefor, and more particularly an improved and simplified construction for the gudgeon or male bearing element of an interconnective male and female pair, as at the left end of the right-hand spool of Fig. 1, and as illustrated in more detail in Figs. 2 to 7, such gudgeon proper being herein designated generally at 30.

The spool head structure as a whole includes a flanged head plate 4, 6 as already mentioned. Integrated with such head plate is a sub-assembly or bearing unit comprising the gudgeon 30 and a mounting and locating plate 20 therefor in the form of a circular sheet metal disc dimensioned to fit snugly within the peripheral flange 6 of the particular spool head plate 4. This mounting plate 20 has a central aperture 21, see particularly Fig. 7, accurately sized and shaped to receive and fit snugly about the base of the projective bearing portion of the gudgeon 30, being in this instance quadrilateral and herein square. This circular mounting plate 20, having the gudgeon-seating square aperture 21 accurately centered in it is in turn accurately centered with respect to the spool head plate 4 and hence with respect to the spool as a whole by reason of the surrounding and locating peripheral head-plate flange 6 within which the mounting plate 20 snugly fits.

The gudgeon 30 is a unitary element in the general form of a strap or yoke, formed in one piece from metal stock as by stamping or dieing, or it may be die cast. It comprises a central projective bearer part 31 for reception in a bearing socket of an adjoining spool, an intermediate portion 32 of non-round and herein square section conformant to and fitting into and through the square aperture 21 of the mounting plate 20, and radially projecting header means in the form of wings 33, 33 for flatwise abutting and rigid welding to the adjacent inner face of the mounting plate 20. The flat abutment faces of this header element or means 33, 33 are provided with a plurality of locating and connective weld nubbins 34, 34. Two such nubs 34 are here shown, equally angularly spaced about and at a substantial radial distance from the bearing axis. These may be formed by striking out the metal or otherwise. If desired the inner face of the mounting plate 20 may be recessed at corresponding points for locating reception of the weld nubs 34. The header wings 33 as shown are of substantial circumferential as well as radial extent and if preferred may exceed in width, circumferentially, the dimension of the intermediate portion 32 of the gudgeon at which they are integrally joined.

The strap or yoke-like gudgeon 30 presents a square closed end face 35 at two opposite sides of which the side walls 36, 36 define two parallel faces of the bearing proper and of the intermediate or basal seating portion 32 of the gudgeon, said side faces also defining two sides of a square, in the plane of any transverse section

through the projective bearer and intermediate portions **31, 32**. These two side faces are substantially spaced, leaving an open hollow interior free of weight-increasing metal yet providing a bearing of adequate strength and rigidity. This non-round and herein square cross-sectional contour of the bearing and of the conformant plate aperture **21** affords a positive anchorage as between the gudgeon **30** and plate **20** with no chance for relative turning between them. Such non-rotative securement is further insured by the header wings **33** and the weld-assisting nubbins **34** at the spaced radial distances indicated.

In assembling the male form of bearing unit of the present invention, the bearer and intermediate portions **31, 32** of the gudgeon **30** are inserted through and installed in the square hole **21** of the mounting plate **20**. The radially extensive wings or header means **33** are pressed home against the portion of the mounting plate **20** marginal to the receiving aperture **21**. A spot welding tool having the electrodes shaped and arranged for plural spot welding at the regions of the nubbins **34** is applied to the assembly under pressure. Thus the gudgeon header means and the mounting plate are integrally connected by the resultant welds as indicated at **37, 37**, the gudgeon and plate becoming a unitary assembly for incorporation with the given flanged spool head plate **4**. Such bearing assembly unit **20—30** is centrally installed flatwise within the head plate flange **6** and is there secured to the head plate as by a number of spot welds as indicated at **29**, Fig. 2.

Spool heads equipped with gudgeons **30** in accordance with the present invention are adapted for interlocking cooperation with socket or female type bearings of other spools. One such is shown by way of example at the left in Fig. 1. There it comprises a socketed journal or hub element indicated generally at **12** including a socket portion **13** and a rivet-like shank **14** headed over as at **15** against a washer-like header piece **16** abutting the inner face of a mounting plate **20***a* similar to that which carries the gudgeon **30** and similarly assembled with the flanged spool head plate **4, 6**. Such socketed bearing element **12** is externally cylindrical for rotative bearing reception in one of the intermediate bearing brackets (not shown) of the yarn-carrier or tube frame. This socketed bearing element **12** is internally formed with a seat **17** to receive and lock with the square-sectioned gudgeon **30** of the present invention. To minimize the aligning rotation in installing the spools the socket seats **17** as in my said copending application may have the form of an eight-pointed serration or star as defined by superposed squares angularly offset 45°. This makes seating positions available for the square gudgeon at each 45° around the socket, so that relative turning to bring the socket and gudgeon into seating alignment need never be more than half that angle.

By this invention a spool head with male bearing element having strength, rigidity and insured securement against twisting relative to its mount is afforded. The laterally open strap-like gudgeon with squared U-form bearer and connective portions is readily fabricated at low cost and with important saving in metal stock. This laterally open U-shape for the gudgeon not only effects a corresponding overall weight reduction for the spool

head, a factor of significance where a plurality of the spools are to be mounted on the traveling tube-frames or yarn-spool carriers on the loom, but also facilitates handling and storage of the spools, the projective portion of the side-open U-gudgeon **30** affording in effect an eye by which the spool may be hung for suspended storage and otherwise manipulated.

My invention is not limited to the exemplary embodiment thereof illustrated and described herein, and I set forth its scope in my following claims:

1. A bearing assembly unit for centered flatwise connection at the outer face of a pile-fabric loom yarn spool head plate having a peripheral flange and central aperture, said unit adapting the spool for angularly fixed interconnection with an axial socket of an axially aligned spool of a plurality thereof, said unit comprising a mounting plate conformant to and adapted for centering within and by the flange of such spool head plate and having a central square aperture, and an axially extending male bearing element having an intermediate laterally open hollow portion formed by spaced parallel side walls defining two opposite sides of a cross-sectional square, said intermediate portion fitted through and projecting outwardly of the square aperture of the mounting plate, and said intermediate portion having integrally formed at the respective ends thereof at opposite faces of the mounting plate a transverse end wall presenting a square outer end face spanning said side walls and a plurality of radially projecting rigid header wings flatwise abutting and rigidly welded to the adjacent inner face of the mounting plate thereby fixedly presenting the said male element itself to constitute a hollow laterally open projective centered spool-supporting gudgeon when assembled to such spool head plate.

2. An interlock gudgeon element for a pile-fabric tufting yarn spool head for angularly fixed interconnection with an axially aligned spool of a plurality thereof, said element comprising an integral unitary one-piece metal member including a laterally open rectangular U-form portion presenting a square transverse end wall spanning two opposed parallel laterally spaced side walls defining a laterally open hollow body of uniform square cross-sectional contour at all transverse planes perpendicular to the longitudinal axis of the U-form portion, and an opposed pair of flat-faced rigid header wings extending inflexibly at right angles from the free ends of said side walls for flatwise abutment and welding attachment to a mounting plate through which said U-form portion is to be inserted and outwardly projected as a spool-supporting gudgeon for reception in a mating spool bearing socket, and a weld nubbin at the flatwise abuttive attachment face of each header wing, said laterally open U-form portion being supportively engageable in the manner of an eye for axial suspension of a spool to be equipped therewith.

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