Nov. 13, 1934. E. F. HATHAWAY ET AL 1,980,586

SECTIONAL SPOOL FOR TUBE FRAMES AND THE LIKE

Filed May 14, 1931 2 Sheets-Sheet 1

Fig. 1.

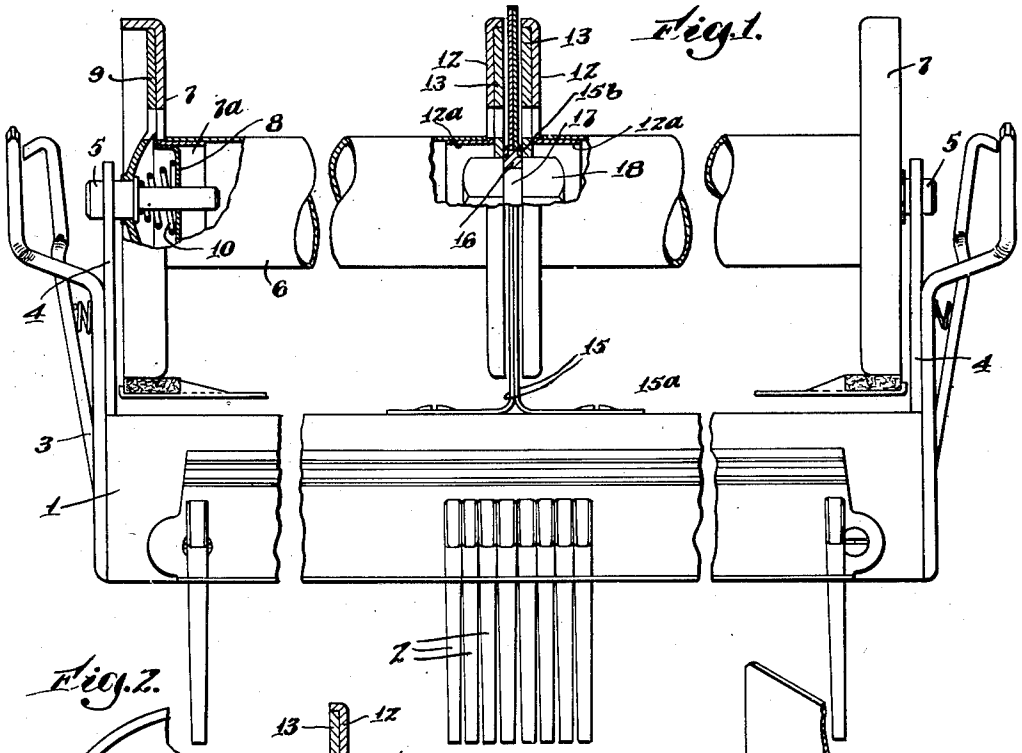


Fig. 2.

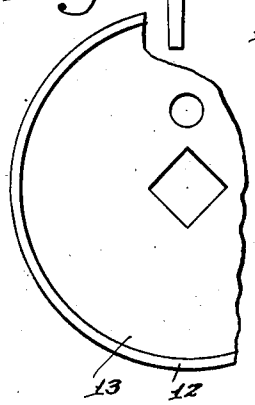


Fig. 3.

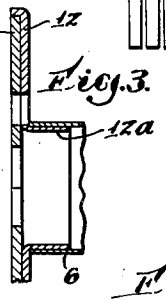
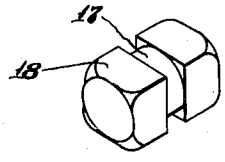


Fig. 4.



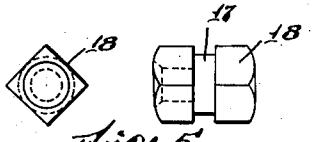


Fig. 5.

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SECTIONAL SPOOL FOR TUBE FRAMES AND THE LIKE

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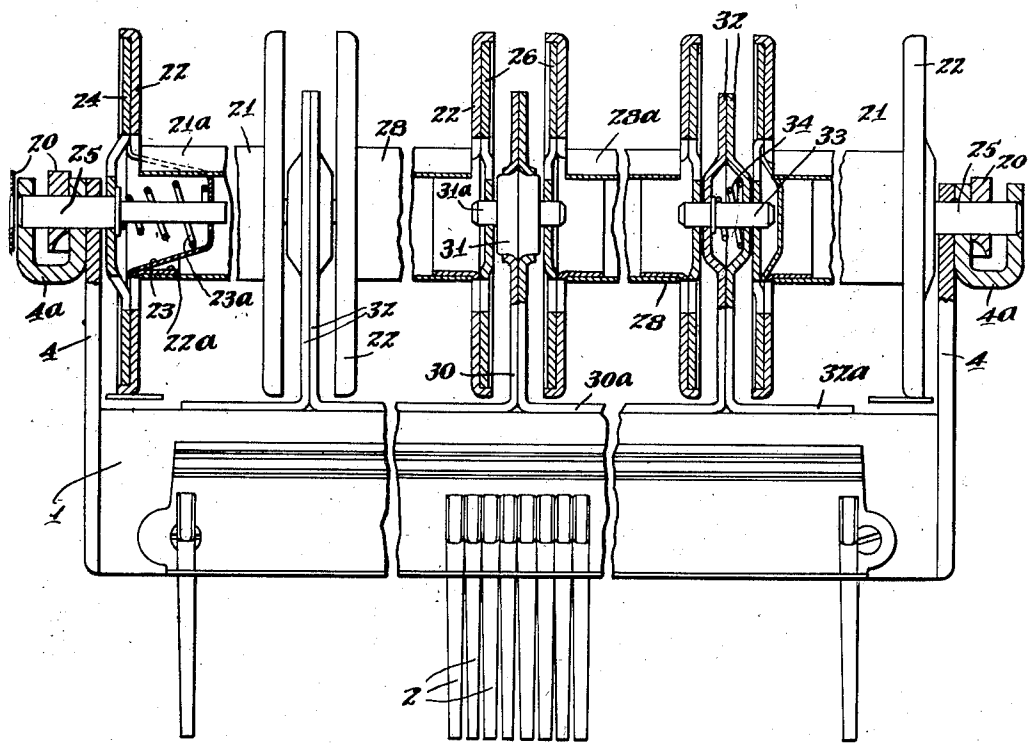


Fig. 6.

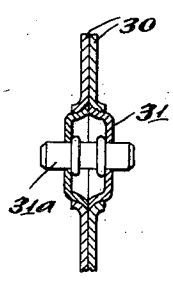


Fig. 7.

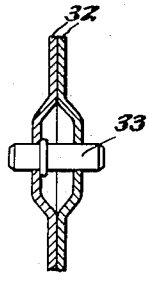


Fig. 8.

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SECTIONAL SPOOL FOR TUBE FRAMES AND THE LIKE

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Application May 14, 1931, Serial No. 537,305

7 Claims. (Cl. 139—10)

This invention relates to yarn spools and more particularly to yarn spools which are made in separate end to end sections for carrying supplies of yarn for tube frames used in the operation of Axminster looms.

Heretofore it has been the practice, when using spools made in longitudinal sections, to provide in addition to the usual end bearing brackets intermediate bearing brackets provided with bearings for supporting in abutting relation two journals projecting from adjacent ends of spool sections into the bearing opening in the bracket. This has necessitated the use of a relatively wide intermediate bearing bracket in order to afford sufficient width of bearing surface, not only to properly support the journal but to avoid the possibility of the journal having some end play of working out of the bearing. The present invention relates particularly to the construction for supporting adjacent ends of a multiple section yarn spool and comprises, generally speaking, a plural section spool, the adjacent ends of whose sections are revolubly supported by a gudgeon whose middle portion is mounted in an intermediate supporting bracket interposed between the two adjacent spool ends and whose opposite ends project freely through apertures in the spool ends into the interior of each spool section, thereby permitting the use of a very narrow bearing bracket between the spool sections while affording a construction that completely eliminates the danger of either spool section from accidentally becoming dismounted from its bearing support.

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

In the accompanying drawings I have illustrated two different forms of construction embodying the principles of this invention, in which

Fig. 1 is a front elevation of a complete tube frame, portions of the spool being shown in central section to illustrate the features of construction.

Fig. 2 and Fig. 3 are detail views showing, respectively, an end elevation and a vertical cross section of an inner end head of one of the spool sections.

Fig. 4 is a disassembled view of the parts comprising the intermediate bearing bracket and the spool supporting gudgeon rotatably mounted therein.

Fig. 5 is a detail view showing the spool section supporting gudgeon as viewed from the end and the side, respectively.

Fig. 6 is a view similar to Fig. 1 showing a modified construction of the middle bracket and supporting gudgeon.

Fig. 7 is a detail view showing a portion of the middle bracket with one of the non-slidable bearing gudgeons for supporting the spool sections.

Fig. 8 is a similar view of the axially movable gudgeon, shown in Fig. 6, as the common support for the inner end of an end spool and its next adjacent spool section.

The tube frame with which my improved construction is associated is illustrated in Fig. 1 and is of well known construction embracing a longitudinal carrier bar 1, to one face of which is secured a row of parallel side by side tuft tubes, or guides, 2, the carrier bar having suspension means embracing a well known type of suspension bracket 3 secured at each end to the carrier bar and, in addition, an end bearing bracket 4 projecting upwardly inside the suspension bracket and formed with a bearing for receiving a rotary end supporting pintle or journal 5.

Spool barrel 6 in this case is of tubular construction and the end head 7 is provided with an interior annular attaching flange 7^a adapted to fit telescopically inside the end of the barrel and be secured thereto by soldering, welding or otherwise. A thrust disc or plate 8 is fastened inside this flange 7^a and is centrally perforated to form an inner bearing for the spool pintle 5, the outer end of which pintle is mounted in a bearing aperture formed in a reenforcing disc 9 that is secured to the outside face of the disc 7. A thrust spring 10 is interposed between a shoulder on the pintle and the thrust disc 8 to normally press the pintle outward, while allowing it to be pressed inward to permit its disengagement from the bearing aperture in the end bracket 4.

The inner ends of the spool sections are provided with end heads 12 having interior annular attaching flanges 12^a fitted into, and secured to, the adjacent ends of the respective spool sections. A reenforcing disc 13 is secured against the face of each end head 12 and extends transversely across the open inner end of the spool section. The central area of this disc or plate 13 is punched out to form a polygonal aperture adapted to receive a corresponding polygonal end of a supporting gudgeon that is rotatably mounted in the intermediate supporting bracket which

comprises two upstanding plates or strips of sheet metal 15, having at their lower ends angularly disposed attaching feet 15[a] by which they are firmly secured to the carrier bar. This intermediate bracket is provided with a central aperture that is coaxial with the axis of the spool sections when the spool is assembled for use in the tube frame. The edge of each of these apertures is struck out to form an annular retaining lip or flange 15[b] projecting somewhat from the outside face or foot step side of each bearing plate. Before the plates are assembled together a two-part bearing bushing 16, having a peripheral flange giving it a T-shape cross section, is inserted between the plates and the plates are then brought together face to face to embrace the peripheral flange and hold the bushing in position. Before the bushing 16 is assembled in the uprights 15 of the bracket, as described, they are assembled about the grooved cylindrical middle portion 17 of a polygonal gudgeon 18, so that when the intermediate bearing bracket is assembled, as shown in Fig. 1, the supporting gudgeon for carrying the adjacent ends of two adjacent spool sections is rotatably mounted in the intermediate bracket, while held against any axial movement or endwise play. The polygonal ends of the gudgeon fit into, and correspond with, the shape of the central openings formed in the transverse end plates 13 of each spool, so that both spool sections are rotatably supported in this intermediate bracket by means of a gudgeon common to both, which also serves to rotatably interlock both spool sections together, so that they must revolve in unison with each other. The opposite spool engaging ends of the gudgeon may have sufficient length to prevent any possibility of the spool slipping off from its bearing support by reason of any endwise play to which the spool may be subjected when in service.

This principle of utilizing a supporting gudgeon mounted in an intermediate bearing bracket to support the adjacent ends of two adjacent spools is embodied in a somewhat different form illustrated in Fig. 6.

In this case, for sake of further illustration, I have shown a construction of tube frame similar to that shown in Fig. 1, so far as concerns the carrier bar, the tuft tubes, and the spool bearing end brackets 4, but in this type of tube frame the suspension hangers for releasably attaching it to the carrier chains are omitted, since the yarn tufts are not delivered by transfer of the tube frame itself from the carrier chains into the loom to insert the tuft ends between the warp threads of the fabric being woven, but the tube frame remains in the carrier chains 20 and the yarn tufts are withdrawn from the delivery ends of the tuft tubes 2 by well known nipper frames which grip the individual tufts, draw them out from the ends of the tuft tubes a sufficient distance to enable the withdrawn tufts to be severed beyond the ends of the tuft tubes, and the nipper frame then moves away in position to insert the severed tuft yarn into the fabric being woven. In the form shown, the end bearing brackets 4 of this tube frame are provided with U-shaped clips adapted to interweave with the two parallel links of the carrier chain 20, both the chain links and the supporting member 4[a] being perforated to receive the outer end of the spool supporting pintle 25 which is mounted in a centrally perforated interior supporting member 23 and forming a thrust plate for the spring 23[a] and the centrally perforated portion of the reenforcing plate 24, similar in principle to the construction shown in Fig. 1 but differing in details of form. This tube frame also shows a four-section spool in which all the tubular barrel sections are formed with a longitudinal depression or channel in line with perforations through the end heads to receive the anchored clamp which holds the inner ends of the tuft yarn elements in their proper predetermined order of color arrangement to form the desired pattern when weaving. The two outer, or end, sections of the spool are alike and comprise the tubular barrels 21 provided with the longitudinal channel 21[a] for receiving the yarn holding clamp while the end heads 22 are secured to opposite ends of the tubular barrels by means of attaching flanges 22[a], as previously described, except that these flanges at the point subtending the channel member 21[a] are cut out to allow the attaching flanges to telescope inside each end of the barrel. The central intermediate bearing bracket in this case comprises a pair of face to face plates 30 provided with angle feet 30[a] for securing them to the carrier bar. Both plates are perforated concentrically with the axis of the sectional spool and, as shown in Fig. 6, the edges of these perforations or apertures are turned outwardly to receive and retain a central bearing gudgeon comprising the hub portion 31 with oppositely projecting pins or bearing members 31[a], which when the device is assembled project through central bearing apertures in the reenforcing discs 26. The barrels 28 of the inner spool sections have the same contour including the channel or trough-like member 28[a] as do the end sections for a like purpose.

The intermediate bearing stands or brackets, that are interposed between the inner end of each outer spool section and the adjacent end of the inner spool section, comprises a pair of face to face upright plates 32 provided with the attaching feet 32[a] and having their areas subtending the spool barrel sections spread apart and centrally perforated to form a double support for the yielding pintle 33 and to receive an interposed spiral compression spring 34. Therefore, in each case the intermediate bearing bracket is provided with a gudgeon for rotatably supporting the two adjacent ends of the spool sections, the supporting gudgeons being mounted in the spool supporting intermediate brackets and having loose engagement with bearing openings in the ends of the spool section structure.

To remove the spool sections, the end section is first removed by forcing inward the end pintle 25 by the thrust of a nail or wire until its outer end lies inside the plane of the bearing member 4. This permits the spool to be tipped up at its outer end so that it can be withdrawn from the tube frame. The next adjacent spool is then easily removed by drawing outward the pintle 33 to disengage it from its bearing engagement with the next intermediate spool, which can then be tipped up and lifted out of the tube frame. It should be understood, of course, that in the drawings the actual length of the barrels of the different sections is very much shortened by cutting out in order to permit large scale illustration of details. The relative axial length of each spool section to the diameter of the spool would be in the ratio of approximately

25 or 30 to 1. The construction of spool in both cases is very simple and economical, since the parts, except the bearing pintles, can be made of pressed metal and the bearing pintles can be produced very cheaply on screw machines.

What we claim is:

1. A sectional yarn spool embracing in its construction two coaxially aligned spool sections having sheet metal end heads provided with centrally disposed gudgeon-receiving perforations in mutual alignment, and a supporting gudgeon, revolubly mounted in a bearing coaxial with said perforations and located between the adjacent end heads and dimensioned to fit into and project through and beyond said central perforations a sufficient distance to permit axial play of both end heads in relation to the gudgeon while the spool is being revolved.

2. A sectional yarn spool embracing in its construction two coaxially aligned spool sections whose end heads are provided with central gudgeon-receiving perforations combined with a coaxially disposed revolubly mounted supporting gudgeon whose opposite ends fit loosely into and project through said perforations into the interior of each spool section and permitting endwise withdrawal of each section from said gudgeon.

3. A sectional yarn spool embracing in its construction, two tubular coaxially aligned spool sections, having sheet metal discs forming adjacent end heads which are provided with central gudgeon receiving perforations combined with a coaxially disposed supporting gudgeon, whose opposite ends project loosely and removably through said openings into the interior of each spool and whose middle portion is revolubly supported between the two spool sections, the ends of said gudgeon which project through said openings being of non-circular cross section in correspondence with the openings through which they project and which form spool-supporting engagement with the revoluble gudgeon.

4. A sectional yarn spool embracing in its construction, two coaxially aligned spool sections, whose adjacent end heads are provided with gudgeon receiving openings combined with a coaxially disposed supporting gudgeon unattached to either spool section projecting through the openings in the adjacent end heads of said spool section and being formed to rotatively couple said sections together to cause them to rotate in unison, the middle portion of said gudgeon being supported in the space between the two adjacent spool sections.

5. A sectional yarn spool embracing in its construction, two coaxially aligned spool sections, a supporting and coupling gudgeon unattached to the spool sections whose opposite ends project through and revolubly support the adjacent ends of said spool sections and form rotative coupling connection between said spool sections, the middle portion of said gudgeon being rotatably supported in a bearing between said spool sections, and its opposite end portions formed to impart equal rotation to both spools.

6. A sectional yarn spool embracing in its construction, two coaxially aligned spool sections, a supporting gudgeon member whose opposite ends project loosely through the ends of said spool sections to form supporting bearing members on which said spool sections are revolubly mounted, and means located between said spool sections for supporting said gudgeon in coaxial relation to said spool sections.

7. A sectional yarn spool embracing in its construction, two coaxially aligned spool sections provided at their centers with axially aligned bearing openings in association with an intermediate supporting bracket, and a bearing pintle mounted in said bracket coaxially with said spool sections with its opposite ends projecting through the respective bearing openings in the spool sections, said pintle being movable axially to facilitate withdrawal of a spool section.

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