May 27, 1941. G. G. TUCKER, JR 2,243,300

SPOOL AND BOBBIN

Filed Dec. 2, 1939

Fig-1

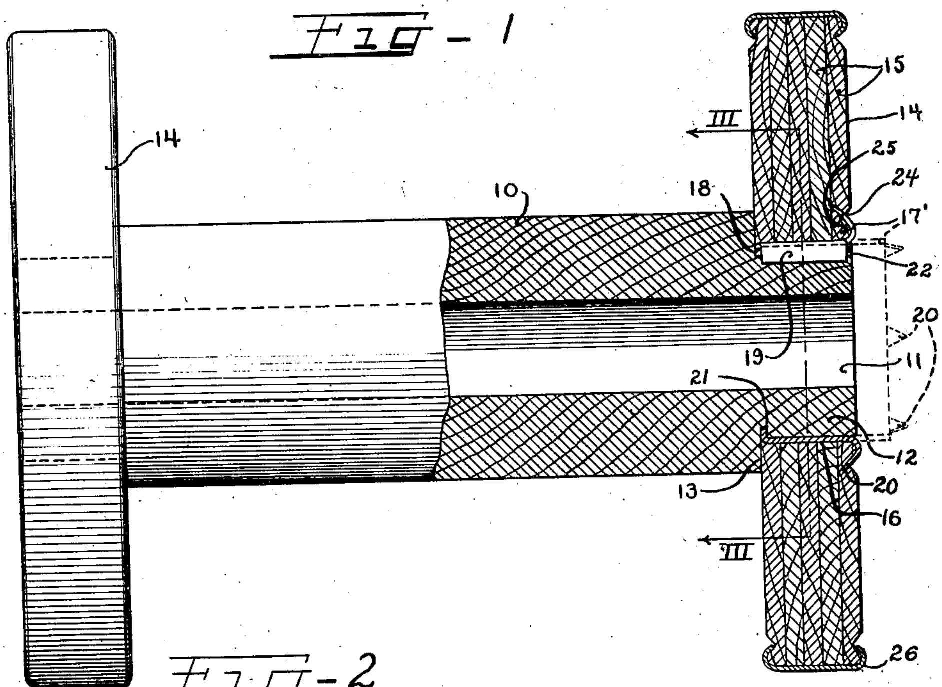


Fig-2

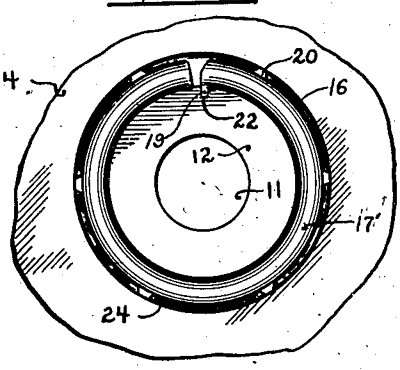


Fig-3

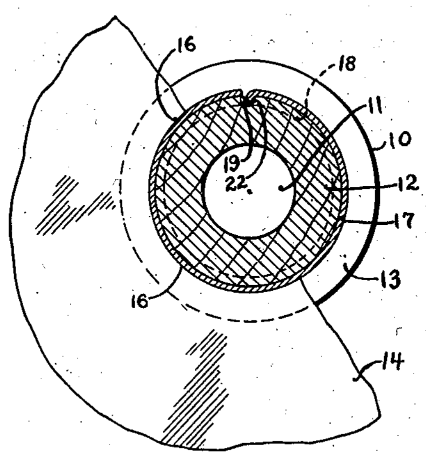


Fig-4

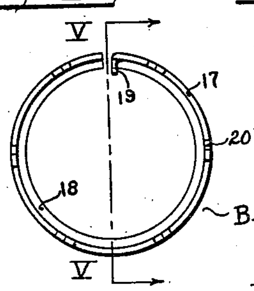
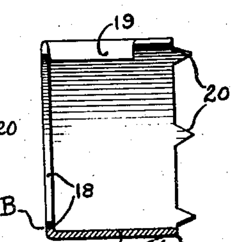


Fig-5



Inventor
George G. Tucker Jr.
by Charles W. Hills Attys

Patented May 27, 1941

2,243,300

UNITED STATES PATENT OFFICE

2,243,300

SPOOL AND BOBBIN

George G. Tucker, Jr., Berwyn, Ill., assignor to Hubbard Spool Company, Chicago, Ill., a corporation of Illinois

Application December 2, 1939, Serial No. 307,224

3 Claims. (Cl. 242—118)

My invention relates to spools or bobbins adapted particularly for holding yarn, silk, and analogous material for various textile mill operations.

The important object of the invention is to provide simplified and more efficient means for securing the spool heads to the ends of the barrel and to produce a comparatively light spool of sufficient strength against breakage under the various conditions to which it will be subjected during operation or during shipment.

More in detail, the important object is to provide improved sheet metal bushings and manner of association thereof with a non-metallic barrel and heads for intimately securing the heads to the barrel ends with minimum cost of material and labor.

A spool embodying the various features of my invention is disclosed on the accompanying drawing, in which drawing:

Figure 1 is a side elevation, partly in diametral section, of a spool;

Figure 2 is an end view of the spool;

Figure 3 is a section on plane III—III of Figure 1;

Figure 4 is an end view of the bushing employed; and

Figure 5 is a section on plane V—V of the bushing.

The spool comprises the cylindrical barrel 10 having the axially extending bore 11 therethrough for arbors or other supporting means for the spool when in service. The ends of the barrel are of reduced diameter to leave cylindrical necks 12 and annular radial shoulders 13. The barrel may be of wood or other non-metallic material.

The heads 14 shown are of non-metallic material and may be built up of laminations 15 to produce strength and resistance against warpage, the material used being preferably non-metallic. The heads have the central orifices or bores 16 for receiving the barrel necks 12. For intimately securing the heads to the barrel, bushing structures B are provided preferably constructed integrally of sheet metal.

Referring to Figures 4 and 5, the bushing used is in the form of a split ring comprising the cylindrical body 17 and the radially inwardly extending flange 18 at the inner end of the body. At one end of the body 17 a portion 19 is deflected radially inwardly to provide a key, and extending from the outer edge of the body are teeth 20. The bushings being of sheet metal in the form of split rings, they may be readily expanded sufficiently for reception by the flange 18 of the barrel neck 12, the necks adjacent the shoulders 13 being provided with annular recesses 21 for receiving the flanges 18 when the bushings are contracted, and the necks having also the longitudinally extending keyways 22 for receiving the keys 19 of the respective bushings. When the bushings are contracted around the necks, their flanges 18 will lock them against axial displacement on the barrel, and the engagement of the keys 19 in the keyways 22 will lock the bushings against rotational displacement.

As shown on Figures 4 and 5, and by dotted lines on Figure 1, the bushing bodies 17 are normally cylindrical throughout their longitudinal lengths in order that, after application thereof to the barrel necks, they may receive the orifices 16 of the heads 14, so that the heads may be slid into position against the shoulders 13. The orifices 16 are of such diameter that when the heads are applied to the bushings, the bushings will be intimately contracted around and against the necks 12, and the flanges 18 and the keys 19 will be intimately seated in the recesses 21 and keyways 22 respectively.

After the heads have been applied to the bushings, the outer portions 17' of the bushings will be deflected radially inwardly against the outer faces of the heads, by suitable tools. To facilitate this operation, the heads on their outer sides are cut to provide annular recesses 24 and annular beads 25, the end portions 17' being deflected around the beads, and during such deflection the teeth 20 at the ends of the bushings are forced into the heads. The heads are thus forced axially along the bushings into snug and intimate seating engagement with the shoulders 13, and the deflected end portions of the bushings and the teeth 20 rigidly secure the heads to the bushings against rotational displacement thereon, and as the bushings are securely anchored to the barrel against axial and rotational displacement, the heads will be securely held to the barrel against axial or rotational displacement relative thereto. Assembly of the spool is a comparatively simple matter, the bushings being first applied to the barrel necks, then the heads are forced by suitable means along the bushings against the barrel shoulders 13, during which operation the bushings are closed and securely clamped to the barrel necks, and then by suitable tools the end portions of the bushings are deflected into engagement with the outer sides of the heads for forcing the heads against the shoulders 13.

To strengthen the heads and to protect the pe-

ripheries thereof against blows or the accumulation of dirt and moisture, sheet metal tires **26** may be provided therefor, the side portions of the tires being deflected around the peripheral corners. The tires will thus serve to hold the laminations of the heads together and cover their ends so that moisture or dirt cannot enter.

I have shown a practical and efficient embodiment of the features of my invention, but I do not desire to be limited to the exact construction and arrangement shown and described, as changes and modifications may be made without departing from the scope of the invention.

I claim as my invention:

1. A spool or bobbin comprising a cylindrical barrel having reduced ends to form necks and to leave shoulders, annular recesses in said necks adjacent said shoulders, sheet metal bushings receiving said necks and having flanges at their inner ends engaging in said annular recesses whereby to be locked against axial displacement, said bushings having radial extensions forming keys and said necks having keyways receiving said keys whereby the bushings will be held against rotational displacement, and heads receiving said bushings and seating against said shoulders, the outer portions of said bushings being deflected against the outer sides of said heads whereby said heads will be clamped to said shoulders.

2. A spool or bobbin comprising a cylindrical barrel having reduced ends to form necks and to leave shoulders, annular recesses in said necks adjacent said shoulders, sheet metal bushings receiving said necks and having flanges at their inner ends engaging in said annular recesses whereby to be locked against axial displacement, said bushings having radial extensions forming keys and said necks having keyways receiving said keys whereby the bushings will be held against rotational displacement, and heads receiving said bushings and seating against said shoulders, the outer portions of said bushings being deflected against the outer sides of said heads whereby said heads will be clamped to said shoulders, said bushings having projections extending into the material of said heads whereby to lock said heads against rotational displacement.

3. A spool or bobbin comprising a cylindrical barrel having a reduced end to form a neck and to leave a shoulder, a circumferentially extending recess in said neck adjacent to said shoulder, a sheet metal integral bushing in the form of a split ring receiving said neck and having a flange at its inner end engaging in said circumferentially extending recess whereby to be locked against axial displacement on said neck, the end of said bushing adjacent the split being deflected to form a longitudinally extending key and said neck having a keyway receiving said key whereby said bushing will be held against rotational displacement, and a head receiving said bushing and seating against said shoulder, the outer portion of said bushing being deflected against the outer side of said head whereby said head will be clamped to said shoulder.

GEORGE G. TUCKER, JR.