April 5, 1932. H. D. CLINTON 1,852,953

WARPING SPOOL

Filed May 16, 1928

Fig. 1.

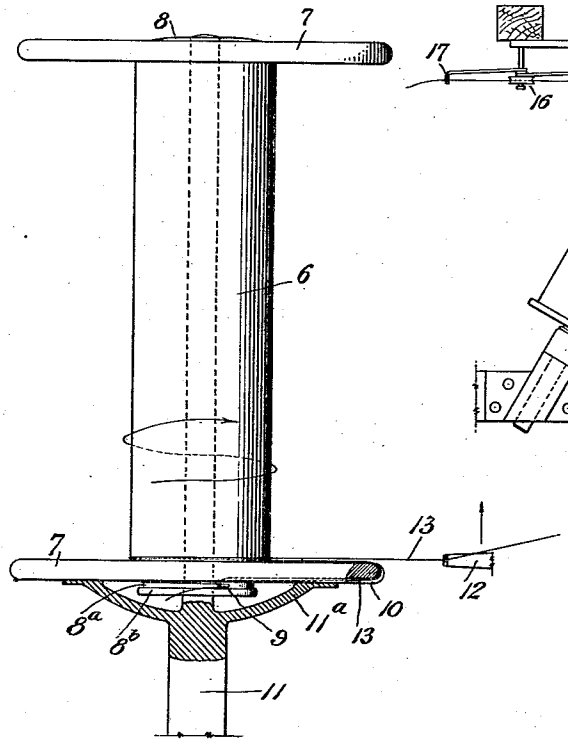


Fig. 3.

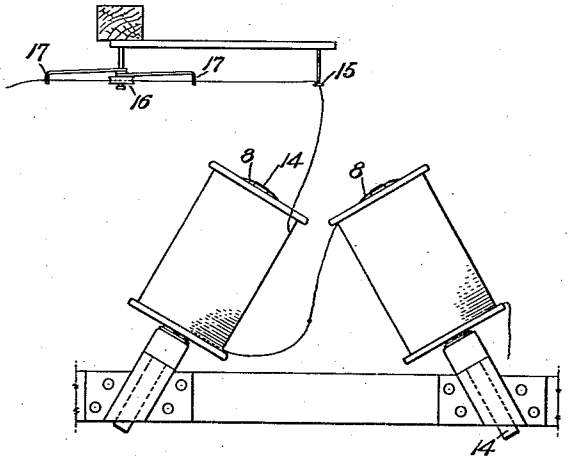
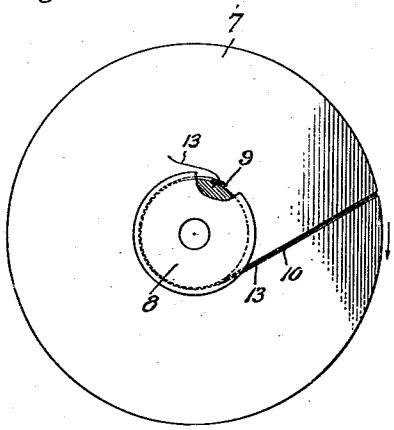


Fig. 4.

Fig. 2.



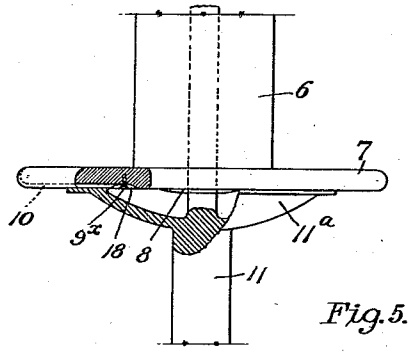


Fig. 5.

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Patented Apr. 5, 1932 1,852,953

UNITED STATES PATENT OFFICE

HARRY D. CLINTON, OF JOHNSON CITY, NEW YORK

WARPING SPOOL

Application filed May 16, 1928. Serial No. 278,222.

This invention relates to textile spools and bobbins and more particularly to those known as "warping-spools" for feeding yarn onto beam-cylinders or ball-warps preparatory to weaving fabrics. It aims to provide spools of a construction adapted to special loading and arrangement in high-speed warping operations.

The invention will be best understood upon further description with reference to the accompanying drawings wherein embodiments thereof are illustrated in loading and in feeding positions.

In said drawings:

Fig. 1 is an elevational view of one form of spool embodying the invention represented on a winding spindle for yarn loading thereon, one of the spool heads and said spindle being shown partly in section;

Fig. 2 is an end elevation of the spool, showing the manner of securing and shielding the innermost end of yarn wound thereon;

Fig. 3 is a view representing a pair of the spools as arranged on a creel-rack for uninterrupted feed of yarn in a high-speed warping operation;

Fig. 4 is a perspective view of a detail of the spool construction; and

Fig. 5 is a fragmentary elevational representation of a modified form of spool on a winding spindle.

In the illustrative embodiments, spools of conventional "warper" type are shown respectively comprising a hollow barrel 6 with heads 7 secured on the barrel ends. This barrel is usually formed of wood while the heads are formed preferably from hard vulcanized-fibre or other composition resisting breakage under rough usage conditions. The heads are rigidly fastened to the barrel by wooden bushings or plugs 8 which are formed with tapering head-portions driven compressively into notched central apertures provided in the heads, and with reduced glue-coated shank-portions fitting into receptive counter-recesses formed in the barrel ends as illustrated and described for example in my U. S. Patent No. 1,515,148 dated November 11, 1924.

In this instance, the bushing or plug 8 at one end of the spool is left projecting somewhat beyond the outer face of the head instead of being trimmed off substantially flush with the head in conformity with the usual practice. (Note the difference at opposite ends of the spool in Fig. 1).

The projecting part of said plug at one end is shown lathed to "bottle-neck" form with reduced portion 8^a narrowly spacing an extremital flange or rim 8^b thereof from the spool head. In effect, the plug so formed provides a peripherally grooved axial extension of the spool barrel.

To the reduced portion or neck of the projecting plug, a "slip-catch" for yarn or thread represented by the clip 9 is secured. As said catch or clip accordingly lies between the spool head and the extremital flange or rim 8^b of the plug, it is protected against loosening knocks and unintentional snagging of yarn or thread.

In the outer face of the head at said end of the spool, a narrow groove 10 is shown extending tangentially of the projecting plug from a point substantially diametrically opposite the aforesaid clip thereon to and over the peripheral edge of the head, said groove being of a depth sufficient merely to protectively receive a strand of yarn in extension across the head to said plug.

Spools of the described construction may be loaded and used for general purposes in the usual way while they are also adapted to special loading and arrangement for uninterrupted or "magazine-feed" of yarn in high-speed warping operations wherein the yarn is drawn from the spools in the direction of their axes without rotating the same, rather than at right angles to the spool axes requiring rotation thereof under the pull of the yarn.

The manner of loading for this special purpose is illustrated in Fig. 1, wherein a spool of described form is shown applied to a winding spindle 11 so that its end with projecting plug opposes the latter's cup-shaped disc 11^a on which the spool head rests for rotation with the spindle. A "traveler-guide" represented by the eyeleted member 12 is shown in the lower position of its movement up and down or back and forth in parallel

relation to said spindle for evenly guiding a thread or strand of yarn onto the spool barrel during rotation with the spindle. From a supply bobbin (not shown), a strand of yarn 13 is represented passing through said traveler-guide to and partly around the spool barrel, thence across the inner side of the spool head to the groove 10 beginning at its peripheral edge, then over the edge and backwardly across the outer side of the head within said groove to and partly around the projected plug, where it is finally loop-engaged under the catch or clip 9 on the latter (see Fig. 2).

As thus extended over and secured to the outer side of the spool head, the yarn strand is held against slippage and is shielded within the spool while the latter is engaged on the spindle for drawing the yarn thereon through the traveler-guide. When the spool has been filled with the yarn windings, the trailing end of the innermost winding thereon will nevertheless extend outwardly beyond the loaded barrel and upon disengagement from the slip-catch will be free for connection with yarn on another spool.

In Fig. 3, a pair of the spools loaded as described are shown as arranged on a creel-rack for continuous or "magazine" feed of the yarn in high-speed warping operations in which the yarn is drawn from the ends of the spools according to the novel method illustrated and described in my Patent No. 1,639,927 dated August 23, 1927, for Method and means for high speed warping. In said figure the spools are engaged over axis-pins 14 inclined to a common "take-off" eyelet 15 equi-spaced from the spool ends through which the feeding yarn strand is shown passing to and through a tensioning-device 16 between guide-eyelets 17 and from there to a warper-machine (not shown). In this arrangement, the trailing end of the yarn on the feeding spool is shown connected to the leading end of the yarn on the other or next supply spool, while the trailing end of the yarn on the latter is shown hanging for like connection with the leading end of yarn on a successive spool. As soon as the yarn on the feeding spool is exhausted, the feed uninterruptedly transfers to the other, and the emptied spool is then replaced by another loaded spool which is similarly connected to the "continuing feed" spool. A plurality of the spools may be arranged and successively connected in this manner, so that a continuous and uninterrupted supply of yarn will be assured during the entire warping operation.

The described "magazine-feed" arrangement of spools is possible only when the innermost or trailing ends of the yarn thereon extend outwardly for free connection with the leading end of yarn on other spools, but it is not customary to load spools in this manner. Moreover, the ordinary warping spools are not adapted for loading in this way, and if attempt to do so were made, the loose end of the yarn would simply slip off the barrel with rotating pull, or fly wild and become entangled with the yarn feeding onto the spool. Breakage of the yarn would then result either during the spool loading operation or in the warping-operation.

This invention provides a spool wherein the trailing end of the yarn may be fastened to the outside of the spool and within the spool body, so that it will remain taut and shielded from the winder mechanism during the loading operation, but may be quickly unfastened after the spool is loaded. Such spools are of special advantage over the ordinary warping spools and the invention therefore supplies a distinct need in the art.

Referring now to Fig. 5, a modification is shown wherein the projection of fastening plug at an end of the spool is eliminated and the slip-catch or clip for yarn is fixed in the spool head rather than on the plug. In the illustrative modification, the slip-catch is represented by a taper-headed pin or screw 9x secured to the head within a shallow recess 18 provided in the latter and from which the groove 10 is extended radially across the outer face and around the edge of the head. In this instance the trailing end of the yarn strand extending across the outer face of the head within the groove is simply looped under said pin and thereby held against slippage from the pull of the rotating spool during the loading operation. Said modification provides a spool adapted to the same purpose but allowing for a shorter length of yarn than in the form first described.

Obviously, spools adapted for loading with the trailing end of the yarn thereon extending out from the barrel may be made in various forms without departing from the spirit and scope of the invention, the essential purpose being to provide for shielding and fastening the yarn on the outer side of the spool by means which will not cause injury to the hand nor entangle and break the yarn when the spool is used for other purposes than herein described. Therefore, while certain restrictions are necessarily imposed, it is not intended that the invention shall be limited by the appended claims to the specific construction shown and described.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a spool embodying a barrel with heads secured on the ends thereof, a bottleneck extension from the barrel having means for fastening thereto the end of the innermost yarn winding on the barrel at the outer side of one of the heads and means maintaining the yarn within the body of said head where extended across the face thereof to said point of fastening.

2. In a spool comprising a barrel having heads on its ends and plugs securing the heads thereto, a circumferentially grooved extension of the plug at one end of the barrel having means thereon for catch-fastening the end of the innermost yarn winding on the barrel, and a groove in the outer side and edge of the head at said end of the barrel within which the yarn is received in extension thereacross to the point of fastening.

3. A spool comprising a barrel, heads on the ends of the barrel and plugs securing said heads thereto, the plug at one end of the spool being formed with a bottle-neck extension projecting only slightly beyond the outer side of the head at that end, means on said extension for fastening thereto the end of the innermost yarn winding on the barrel and a groove in the outer face and peripheral edge of said head within which the yarn may lie in shielded extension thereacross to the point of fastening.

4. In a spool embodying a barrel with heads on the ends thereof, means for fastening the end of the innermost winding of yarn on the barrel at the outer side of one of the heads and a groove in said one of the heads to receive such end within the body thereof where extended across its face to the point of fastening.

5. In a spool embodying a barrel with disc-like heads on the ends thereof, means for extending the trailing end of the innermost winding of yarn on the barrel outwardly across one of the heads to the outer side thereof without lying upon its face in the line of draw thereacross and means on the outer side of the head for fastening said end accessible to handling along with the free end of the outermost winding after the spool has been fully loaded with the yarn windings.

6. In a spool embodying a barrel having flat disc-like heads on its ends, means for extending the innermost end of yarn windings on the barrel transversely of one of the heads to the outer side thereof without lying upon the face of the latter in the line of extension thereacross and a slip-catch on the outer side of the head for fastening said end thereto accessible to quick release.

In testimony whereof I affix my signature.

HARRY D. CLINTON.