Oct. 7, 1952 J. B. HAWLEY 2,613,049

SPOOL WITH REMOVABLE HEAD

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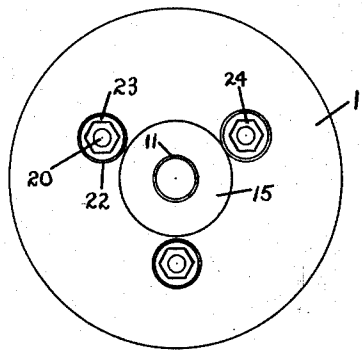


Fig. 2

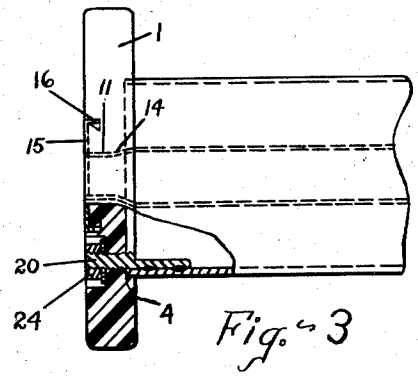


Fig. 3

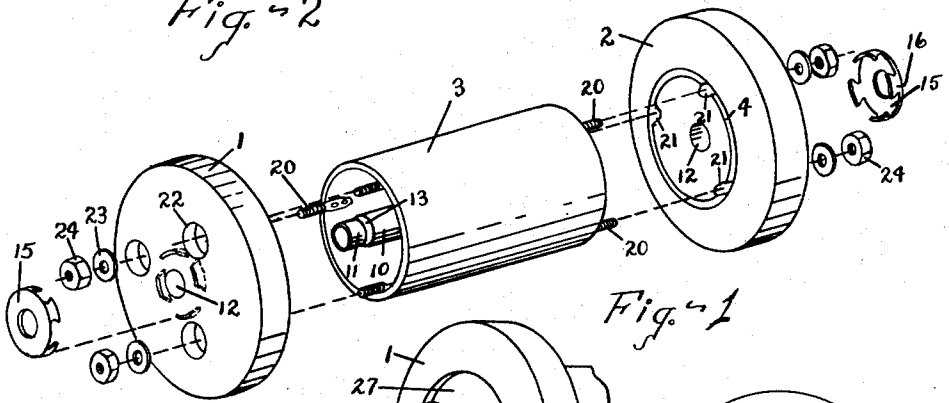


Fig. 1

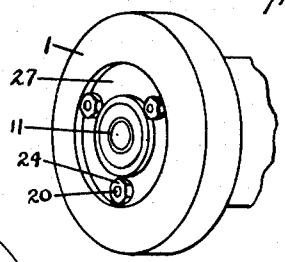


Fig. 4

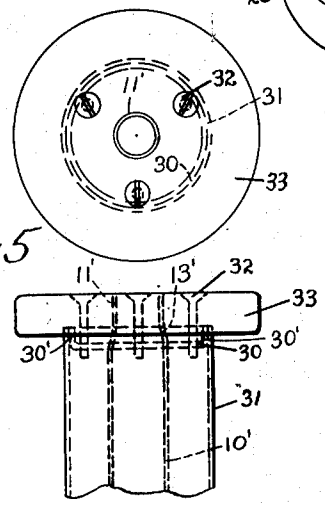


Fig. 5

Fig. 6

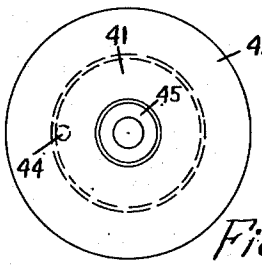


Fig. 7

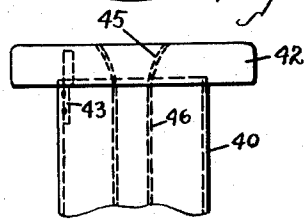


Fig. 8

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SPOOL WITH REMOVABLE HEAD

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2 Claims. (Cl. 242—124)

1

This invention relates to an improved spool for the textile industry, and particularly a spool of the larger type which is used for re-spooling cotton cables, etc.

Cotton cables are made from twisted cotton cord. It is customary to re-spool them between their manufacture and use. They are re-spooled on to spools about six or eight inches long and several inches in diameter. The cables are wound tightly on to the spools. The barrel of a spool must be made sufficiently strong to withstand the very considerable pressure exerted by the tightly wound cable. Also the heads of a spool must be held to the barrel so that the lateral pressure of the wound cables against the heads does not cause them to separate from the barrel. Pressure developed varies with the material wound on to a spool. The new constructions of this invention make all sizes of spools sufficiently strong to permit successful winding of all materials including those of highest shrinkage factor.

In all spools except metal ones there is a tendency for the heads to chip and break because of the rough treatment they undergo. This rough treatment tends to raise burrs on metal-headed spools and they may catch and fray or sever the material being wound. The heads of this invention are preferably molded of plastic and therefore are exceedingly resistant to chipping, breaking, and raising of burrs.

The various novel features of the invention will be more evident from the detailed description which follows:

In the drawings,

Fig. 1 is an exploded view of a preferred spool of the invention;

Fig. 2 is an end view of the spool;

Fig. 3 is a side view of the spool partly broken away;

Fig. 4 is an end view of a slightly different construction;

Fig. 5 is an end view of a modified form of the invention;

Fig. 6 is a side view of the same;

Fig. 7 is an end view of a further modification; and

Fig. 8 is an end view of the same.

The spool comprises two heads 1 and 2, and a barrel 3. In the larger spools the barrel 3 is cut from metal tubing. In smaller spools such as may be used for winding thread or cord for any purpose the barrel may be of resin-treated paper which is cured to give it high strength. Generally, however, sections of metal tubing will be preferred for both larger and smaller spools.

2

The heads 1 and 2 are preferably molded from reinforced hard rubber, although other plastics may be used. The reinforcing filler which is preferred in the hard-rubber construction is known in the trade as "friction." It is ground-up fabric consisting of thread or cords of cotton, rayon, nylon, etc., perhaps ½ inch in length. This "friction" may be made from used automobile tire carcasses. Hard rubber with such filler is not only resilient and resistant to chipping, but the filler gives it strength so that it is highly resistant to breakage.

An annular groove is counter-sunk into the heads 1 and 2 at 4 on the inner surface to receive the ends of the barrel 3. Instead of countersinking an annular groove in the inner surface of each head, the countersunk area may be a counterbore which may be circular and of the same or nearly the same diameter as the barrel. In any event the ends of the barrel are inset into the heads so that no thread or cable or whatever is wound upon the spool can work its way over an end of the barrel to become caught between it and the head. This is an improvement over those spools in which the ends of the barrel are flush with the inner surface of the head.

The tube 10 which passes through the axis of the spool accommodates the spindle or other element on which the spool is mounted in use and is known as the spindle guide. In the construction shown in Figs. 1–3 the diameter of this guide is decreased at each end at 11 and these portions of smaller diameter fit into the openings 12 in the head of the spool. The shoulder 13 of the guide cooperates with the complementary shoulder 14 in the head to assist in spacing the heads, and to provide greater rigidity to the heads by means of this shoulder support which keeps the heads perpendicular to this barrel. The larger inside diameter of the spindle guide between the shoulders aforementioned provides greater clearance between the wall of the spindle guide and the spindle on which the spool will be placed in use. Such enlargement of the spindle guide prevents stray scraps of thread, cord, etc. from binding the spindle if they chance to enter the spindle guide when the spool is on the spindle, and in cotton mills prevent lint from packing and binding the spindle.

Each head may be provided with a friction plate 15 which is fastened into the head of the spool in any suitable manner. This friction plate prevents wear. In the arrangement shown the wings 16 are flared at each end and the plastic of the

heads is molded over and around them to anchor them in the plastic.

There are two or more threaded studs **20** welded into each end of the barrel and there are corresponding openings **21** in each head through which these studs protrude. Each head is countersunk at **22** to receive the washers **23** and nuts **24**. These nuts are tightened onto the studs. By molding counterbores into the molded heads to receive the nuts frictional losses are eliminated as well as the danger of injuring a person who might contact one of the nuts in attempting to remove a spool from a spindle while the spool is spinning.

Alternatively, the washers may be replaced by a thin annular metal ring **27** which is suitably incorporated in each head, as shown in Fig. 4.

Such spools are economically made. They are exceedingly strong and because they withstand the roughest treatment they are more economical to use from the maintenance standpoint.

In the modification shown in Figs. 5–6 a cup **30** is welded as at **30'** to the inside of the barrel **31** and the bolts or self-tapping screws **32** are screwed into them. The heads of the bolts or screws come flush with the head **33** of the spool. Thus, instead of bringing the head of the spool against the ends of the barrel by tightening the nuts **24** as in the structure shown in Figs. 1–3, the bolts are threaded down into the cup in the modification shown in Figs. 5 and 6. In the latter figures, the spindle guide **10'**, reduced end portions **11'** thereof, and shoulders **13'** cooperate with the barrel **31** and heads **33** in substantially the same manner as their unprimed counterparts in Figs. 1 to 3 cooperate with barrel **3** and heads **1** and **2**.

In the modification shown in Figs. 7 and 8, the pin **43**, one end of which is projection-welded to the barrel **40**, projects into a small well **44** in the head. This pin is not threaded. It simply prevents the head **42** from turning with respect to the barrel **40**. There need be but one such pin at each end of the barrel. The heads are prevented from separating from the barrel by flaring the ends **45** of the spindle guide **46**. With both ends of the guide **46** flared, as shown in Figs. 7 and 8, it is impossible for the heads to separate from the barrel.

In all the modifications the ends of the hollow cylindrical barrel are inset in the heads. The barrel is not fabricated other than to cut it from a longer section. Thus it is of uniform cross-section throughout. Although it is preferably cylindrical, it will be appreciated that it may be many-sided, as, for example, a hexahedron or octahedron. Means is provided for preventing relative rotation of the heads with respect to the barrel and means is also provided for preventing the heads from separating from the barrel. The former means may be provided by simply cutting the ends of the barrel along irregular lines, as by cutting them with saw-tooth edges, or the like. The latter means may include the flared ends of the spindle guide which passes through the axis of the spool, although generally, separate means such as shown in the constructions illustrated in Figs. 1 through 6 will be employed. Thus, although a preferred design of spool is shown in Figs. 1–3, modifications may be made. The invention is defined in the appended claims.

What I claim is:

1. A spool having a cylindrical barrel which is a section of tubing and having heads at each end against which rest the ends of the barrel, a tubular spindle guide located axially of the spool and having end areas reduced in diameter which extend through said heads to provide bearings for said spindle, shoulders formed on said guide at the inner ends of each reduced area, each of said heads engaging at least a portion of one of said shoulders, a centrally apertured cup welded in each end of said barrel and having an outer peripheral flange that extends toward the adjacent end of the barrel with the outer edge of each flange being substantially flush with the adjacent edge of the barrel, said spindle guide passing through said central apertures in said cups without being joined thereto, said heads and said cups being provided with aligned openings, and threaded bolts extending through the latter openings into threaded engagement with the adjacent cup, to hold the heads of the spool to the barrel and prevent rotation of the barrel relative to either head.

2. A spool having at its axis a tubular metal spindle guide of smaller interior and exterior diameter in its end areas and of larger interior and exterior diameter intermediate its end areas whereby a shoulder is provided on its outer surface at the junction with each end area, a cylindrical metal barrel surrounding said guide, a centrally apertured cup in each end of said barrel provided with an integral, outer peripheral flange that is welded to said barrel, said flanges extending toward the adjacent ends of the barrel with the outer edge of each flange being substantially flush with the adjacent edge of the barrel, said spindle guide passing through said central apertures in said cups without being secured thereto, a pair of spaced, centrally apertured spool heads against which rest the respective ends of said barrel, said end areas of said guide extending through the apertures in said heads and providing bearings for said spindle, with each of said heads engaging at least a portion of one of said shoulders, said heads and said cups being provided with aligned openings, and self-tapping screws extending through the latter openings into threaded engagement with the adjacent cup to hold the heads of the spool to the barrel and prevent rotation of the barrel relative to either head.

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