March 23, 1943. P. WILLNER 2,314,749

SPOOL, BOBBIN OR THE LIKE

Filed Sept. 29, 1941

Fig. 1.

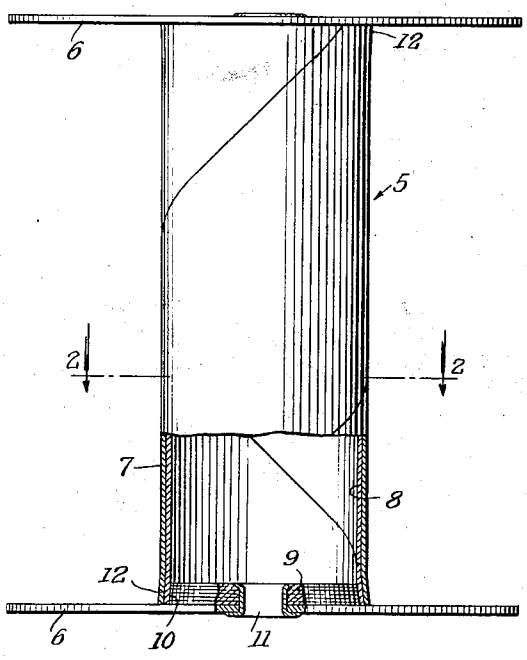


Fig. 3.

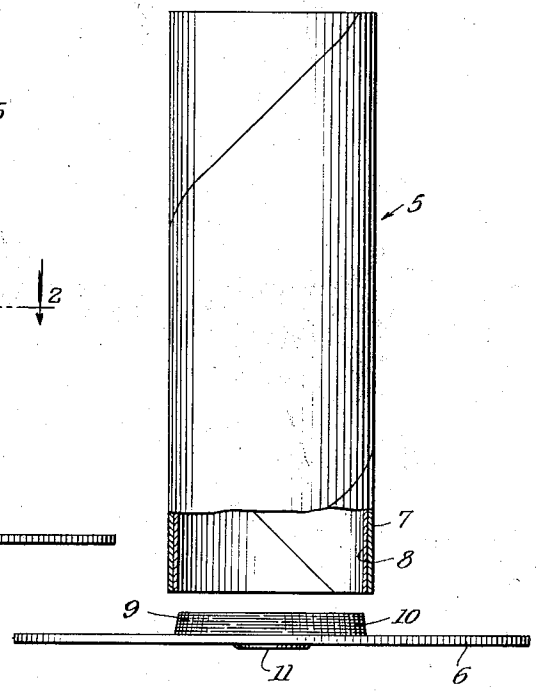
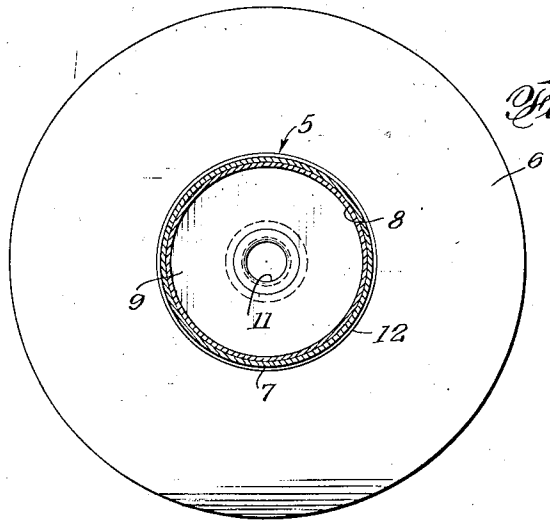


Fig. 2.



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Patented Mar. 23, 1943 2,314,749

UNITED STATES PATENT OFFICE

2,314,749

SPOOL, BOBBIN, OR THE LIKE

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Application September 29, 1941, Serial No. 412,873

4 Claims. (Cl. 242—119)

This invention relates to spools, bobbins and the like.

Much time and effort has been expended in seeking to provide spools which are strongly made and yet inexpensive to produce because they are discarded after having served their function. In the various and numerous attempts that have been made to provide a strong inexpensive spool, the problem was attacked from the viewpoint that it was necessary to provide means for effecting a strong union between the core and the flanges of the spool. Thus glue, staples and other such means were resorted to. Various undercut grooves, special connecting plugs and other relatively expensive concepts and devices were also attempted in seeking low cost, strong structures.

By means of the present invention, a strong and extremely inexpensive spool is provided by taking advantage of the expansible properties of the compressed fibres of the paper from which the spool is made and thus obviating the need for the means and devices heretofore employed.

Broadly stated, the primary object of the invention is to provide a spool of sufficient strength for the purpose intended and of extremely low cost.

Another object is to provide a paper spool which is low in cost and strong for its purpose.

Other objects, features and advantages of the invention will be realized from the detailed disclosure comprising the following specification and the accompanying drawing forming the bases thereof.

In the drawing which is illustrative of an at present conceived form of the invention:

Fig. 1 is an elevational view, partly in cross-section of a spool incorporating features of the invention.

Fig. 2 is a cross-sectional view as taken on the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 1 showing the manner of assembling the core and one of the flanges of the spool.

In that form of the invention which is shown in the drawing, the spool comprises a core 5 and flanges 6. As contemplated, the core is a tubular paper member or body, being preferably formed with an outer helically wound portion 7 and an inner helical wound portion 8, said helically wound portions being axially positioned relative to each other in such manner that they break respective joints. The portions 7 and 8 are glued to each other and otherwise formed in a well-known manner. A tube or core made in this manner is quite strong and especially so in resisting expanding forces applied from within the tube. Such a tube may be bought in the open market at extremely low cost.

The flanges 6 are preferably made of paper of a thickness approximating $\frac{1}{32}''$. For this purpose any of the coated cardboards available in the open market, may be used.

To connect the core or hollow body 5 and the flanges 6, plugs 9 are used. These plugs are of a thickness approximating $\frac{3}{16}''$ and are made up of fiber disks preferably formed of inexpensive laminated and fibrous paper material such as pasteboard, the striations or laminations being such as to provide a fibrous surface 10 for reasons later aparent. In the present instance, it is preferred to form the plug 9 as the frustum of a cone with the smaller diameter of the said disks approximating the inside diameter of the core.

Each flange 6 and its plug 9 are connected as by a tubular rivet 11 by means of which the spool may be mounted upon a spindle. This method of connection is preferred because relative rotation between the core and the flange is afforded for reasons which will be explained.

The disks making up plug 9 are held together only at the center portion thereof by said rivet 11 or similar attaching means, so as to allow the edges of the fiber disks at surface 10 of plug 9 to flex and to freely move for a purpose, as hereinafter set forth.

When making up the spools, the cores 5 are provided in desired lengths and the flanges 6 riveted, as described, to their plugs. As shown in Fig. 3, the tubular core is merely pressed over the plug or the plug inserted into the outer end of the core until contact is made between the core end and the flange. This process is repeated for the other end of the core and the spool is complete.

As the plug 9 slides into the outer end of tubular core 5, the striated or laminated structure of the plug is compressed preferably at its circumference inwardly (against the direction of its sliding movement) by the resistance to expansion of the tubular core 5. Since the strata or disks of the plug may freely move at the circumference thereof and intersupport each other, they resist displacement in the direction of the axis of the plug and the fibrous laminae thereof are compressed. The expansive force of the laminae, however, is directed outwardly against the inner wall of the tubular core and serves to effectively press said laminae thereagainst, the pressure being such as to somewhat expand the end of the core as shown at 12.

If a proper purchase were provided, the plug could be pulled away from its position in the core. However, the nature of the cardboard comprising the flanges 6, while sufficiently rigid and strong for the purpose, is such that they would bend and tear before a sufficient pull upon them could be exerted to dislodge the plugs 9. The plugs might be dislodged by a rotational force, but since such a force could only be transmitted by the flanges, said flanges, as explained, are free to rotate with respect to the plugs.

Despite the extreme simplicity of the invention, an improved, low cost spool has been provided which represents an advance in a crowded art. While the invention is capable of only few variations, it should be understood that this disclosure is by way of example only and that the following claims are intended to include such possible variations.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent, is:

1. A spool comprising a hollow cylindrical body having opposed ends, disc-shaped flanges for said body ends, and means securing said flanges to said body, each of said means comprising a substantially circular head connected to each of said flanges, each head comprising a plurality of stacked fibrous laminae at least the marginal edges of which being free to flex, at least some of the laminae of each head having a diameter slightly greater than the internal diameter of said cylindrical body, whereby a tight fit is established between said body ends and said laminated heads upon engagement of said opposed body ends with said laminated heads, thus bringing about resistance to separation of said heads and said flanges from said cylindrical body ends by the free flexing action of said marginal edges of said laminae within said body ends.

2. A spool comprising a cylindrical tubular core having opposed ends, disc-shaped flanges for said core ends, and means rotatably securing said flanges to said core, each of said means comprising a substantially circular plug eyeleted to each of said flanges, each plug comprising a plurality of superpositioned fibrous laminae at least the marginal edges of which being free to flex, at least some of the laminae of said plug having a diameter slightly greater than the internal diameter of said core, whereby a tight fit is established between each core end and the respective laminated plug when said opposed core ends engage with said laminated plugs, thus bringing about resistance to separation of said plugs together with said flanges from said core ends due to free flexing of said marginal edges of said laminae within said tubular core ends.

3. A spool made from cardboard and the like comprising a hollow cylinder having opposed ends, disc-shaped flanges for said cylinder ends, and means for securing said flanges to said cylinder ends, respectively, each of said means comprising a substantially circular head projecting from each of said flanges, each head comprising a plurality of stacked fibrous laminae substantially centrally connected together and arranged so that the marginal edges thereof are left free to flex, at least some of the laminae of said head having a diameter slightly greater than the internal diameter of said hollow cylinder, whereby a tight fit is established between said cylinder ends and said laminated heads upon engagement of said laminated heads with said opposed cylinder ends, thereby producing enhanced resistance to separation of said heads together with said flanges from said cylinder ends by the frictional action due to the free flexing of said marginal edges of said laminae within said cylinder ends, respectively.

4. A spool comprising a hollow cylinder forming the core and having opposed ends, disc-shaped flanges for said cylinder ends, and means rotatably securing said flanges with respect to said cylinder ends, each of said means comprising a substantially circular head riveted to each of said flanges, each head comprising a plurality of superpositioned cardboard layers at least the marginal edges of which being left free to flex, some of the layers of said head having a diameter slightly greater than the internal diameter of said cylinder ends, whereby a flexible tight fit is established between said cylinder ends and said heads upon engagement of said opposed cylinder ends with said heads and resistance to separation of said heads and said flanges from said cylinder ends is enhanced by the frictional action produced by the free flexing of said marginal edges of said layers in said cylinder ends, respectively.

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