April 30, 1935. A. LAVEAU 1,999,765

SPOOL

Filed April 14, 1934

Fig. 1

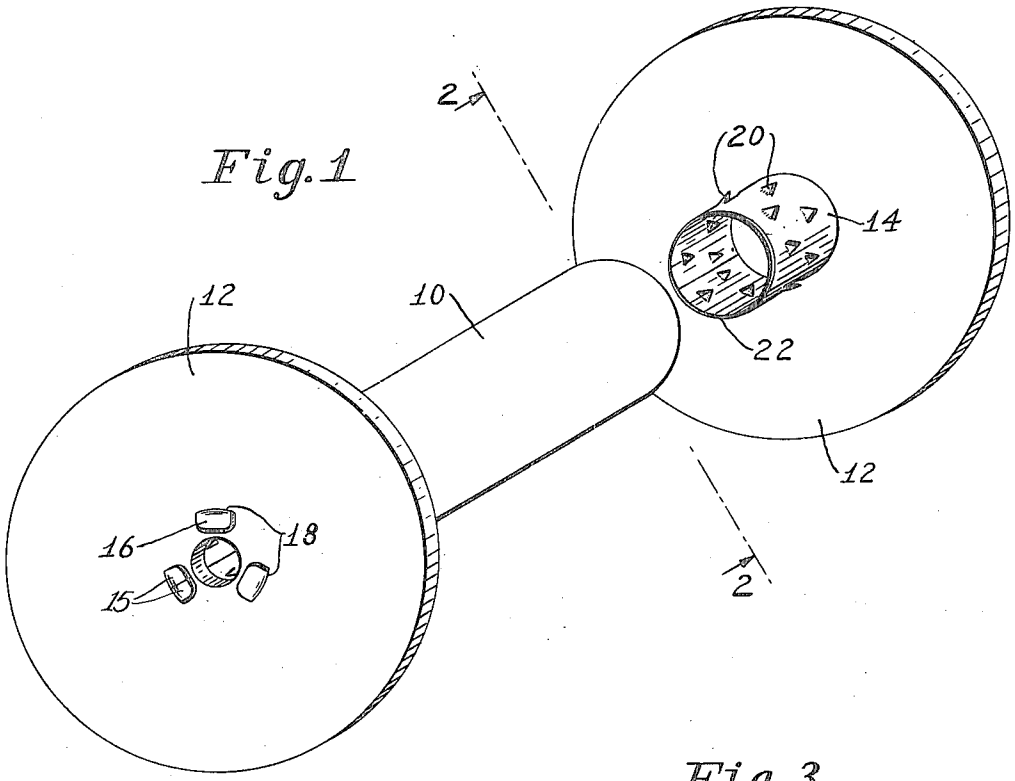



Fig. 3

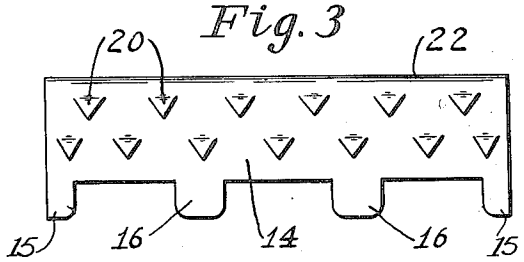
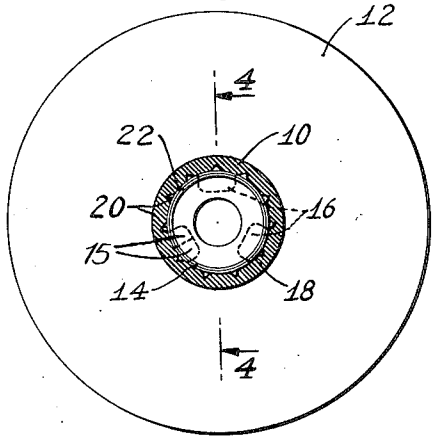



Fig. 2



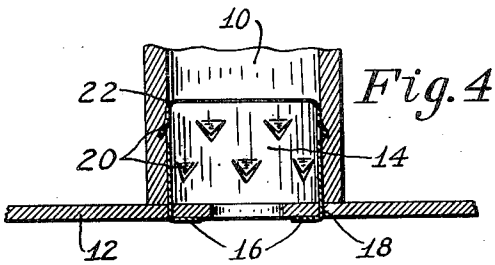




Fig. 4

Witness
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1,999,765

# UNITED STATES PATENT OFFICE

1,999,765

## SPOOL

Angeline Laveau, Malden, Mass.

Application April 14, 1934, Serial No. 720,637

2 Claims. (Cl. 242—124)

The present invention relates to improvements in spools, and is more particularly concerned with the provision of means for securing together a core or tube and the end flanges of spools manufactured preferably from cardboard or similar fibrous materials.

The object of the present invention is to provide in spools of this general description, novel and improved means for securing the end flanges to the core or tube which will permit the assembly of these parts into a rigid and serviceable unit in the simplest possible manner.

It is a further object of the present invention to provide a securing element which is of a simple, inexpensive construction, and at the same time acts when assembled in a spool of this general description to provide a structure of exceptional strength and durability.

With these and other objects in view, as may hereinafter appear, one feature of the invention consists in the provision of a tubular metal bushing which is rigidly secured to the end flange of the spool and is provided with pointed metal offsets which are distributed over the external surface of the bushing and are adapted, when the spool is assembled, for biting engagement with the inner surface of the tube or core.

The several features of the present invention consist also in the devices, combinations and arrangement of parts hereinafter described and claimed, which together with the advantages to be obtained thereby, will be readily understood by one skilled in the art from the following description when taken in connection with the accompanying drawing, in which Fig. 1 is a perspective view of a spool with one flange unit including the flange and bushing supported from the core; Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1; Fig. 3 is a developed view on an enlarged scale of the stamped metal blank forming the bushing; and Fig. 4 is a detail sectional view on the line 4—4 of Fig. 2.

Spools of the type herein disclosed are intended primarily for mill use, and serve as temporary holders for narrow fabrics, wire, belting, etc., in the mill, or for shipment, as the case may be. Inasmuch as these spools are ordinarily thrown away after use, it is essential that they be constructed of the cheapest and most easily manufactured material adaptable for the purpose. In commercial practice these spools are usually constructed of paper cardboard, pasted chipboard, or binders' board or the like, and comprise a tubular rolled paper core to which are affixed two flat flanges which may be preferably of the above mentioned materials. In the manufacture of these spools, a principal item of cost has consisted in the provision of a satisfactory means for securing the two end flanges to the paper cylinder which forms the core of the spool. In commercial practice, this is most frequently accomplished by means of a plug or bushing which is secured by staples or by similar means to the flange and fits into the end of the tube or core, being then cemented into place therein.

Other methods of securing these parts have been tried, but for the most part have been found impractical, principally due to the additional expense involved.

Inasmuch as these spools are relatively bulky in their assembled state, and therefore provide generally unsatisfactory packages for shipment, it is an object to construct these spools in such a manner that they may be shipped in a knock-down state, and may be readily assembled at the place where they are to be used, into rigid dependable units with a minimum expenditure of time and trouble.

In carrying out the several features of the invention, the present applicant has devised a novel and improved fastening device for securing the flanges to the end of the tubular core or tube, which permits the assembly of the spool at any time into a rigidly complete whole merely through the operation of pushing or driving the bushings secured to the end flanges into place within the ends of the core or tube. This device comprises broadly a tubular bushing which in its simplest form may consist of a single piece of stamped metal cylindrical in shape which is provided at one end with tabs for clinching the bushing rigidly to the flange, and has distributed over its outer surface a number of pointed offsets which are preferably shaped to provide a minimum resistance to the movement of the bushing into place in the tube, and a maximum grip on the inner surface of the tube to prevent the removal of the unit therefrom. With the construction shown there is no possibility of the spool flying apart through failure of a cementing material, or of any complicated locking device which might ordinarily be employed.

Referring more specifically to the drawing which illustrates a spool embodying the several features of the present invention, a core or tube is indicated at 10, and the usual flanges of the spool at 12. These parts are preferably constructed of some light and inexpensive fibrous

material such as paper or cardboard, whether of an ordinary variety or chemically hardened for added strength. The spool illustrated in the drawing comprises cardboard flanges 12 and a rolled paper core 10. There is secured to each end flange a metal bushing generally indicated at 14 which preferably is formed from a flat piece of stock punched out into the desired shape as best shown in Fig. 3, and then turned to secure the desired cylindrical shape. This stamping has formed thereon tabs 15 and 16 which are adapted when the stamping is rolled over and put in place to extend through corresponding apertures 18 in the face of the disk 12, being then clinched and bent over to lock the bushing in place on the end flange. Where it is demanded by the trade, it will readily be understood that a washer or disk may be placed over the outside of the flange and may be similarly slotted to receive the tabs 18.

In order to lock the bushing in place within the tubular core when assembled therewith, there are distributed over the blank 14, offsets 20 which slope outwardly toward the flanged end of the bushing, and are V-shaped to provide sharp, pointed tips for biting engagement with the inner surface of the core or tube. These tips are raised uniformly above the surface of the plug or bushing, so that an imaginary cylinder passing through the tips of these points would be appreciably larger than the inside diameter of the core or tube. The shape of these offsets 20 is such as to permit the cylindrical bushing to be pushed into the end of the core with a minimum of friction between the points and the wall surface of the core. This movement of the points inwardly is facilitated by the resilient character of the paper core, the inner surface of which will readily yield to permit the passage of the points without in any way disturbing the shape of the outer surface. Any tendency of the bushing to move in an opposite direction, however, will be arrested by the points which become embedded deeply into the inner surface of the core, so that any movement of the bushing in an opposite direction will tend merely to force the points deeper into biting engagement with the core. It has been found that where a rolled paper core having a relatively thick wall is employed, the outside diameter of the bushing may with advantage be made at least equal to and even slightly greater than the inside diameter of the core, so that an extremely snug fit is obtained between these elements, without at the same time in any way affecting the shape of the outside surface of the core. A molded or rounded edge 22 is formed along one side of the stamping 14, so that a smooth upper edge is provided which will readily slide over the inner surface of the core to facilitate in the assembly of the parts.

With the construction and arrangement of parts above described and illustrated, it will readily be seen that a simple yet sturdy bushing or plug for the spool is obtained which requires only the very simple operation of driving the bushing plug into the end of the core for assembly of the parts, and when once in place provides a rigid, sturdy unit of great strength.

It will be understood that the invention is not limited to the specific embodiment shown, and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What is claimed is:

1. A spool having in combination with a core of fibrous or similar material, a flange unit comprising a flange and a tubular metal bushing rigidly secured thereto having the walls thereof substantially parallel to the core and of an external diameter substantially equal to the internal diameter of the core, and having distributed over the outer surface thereof pointed projections extending outwardly and toward the flange adapted for biting engagement with the inner wall of the core to secure a rigid assembly of the flange and the core, said core and unit being adapted for shipment in an unassembled condition and to be assembled into a rigid and permanent spool by forcing the unit into locking position in the core.

2. A spool having in combination with a core of fibrous or similar material, an end flange unit comprising a flange, a tubular metal bushing rigidly secured thereto having an external diameter substantially equal to the internal diameter of the core and having pointed metal offsets punched in said bushing, said offsets being distributed over the surface of the bushing and pointed outwardly and toward the flange to cause a biting engagement of said points with the inner wall of said core, said core and unit being adapted for shipment in an unassembled condition and to be assembled into a rigid and permanent spool by forcing the unit into locking position with the core without affecting the external diameter of said core.

ANGELINE LAVEAU.