Dec. 23, 1952 H. P. FARIS 2,622,825

ROTARY SPOOL UPON WHICH YARN IS ADAPTED TO BE WOUND

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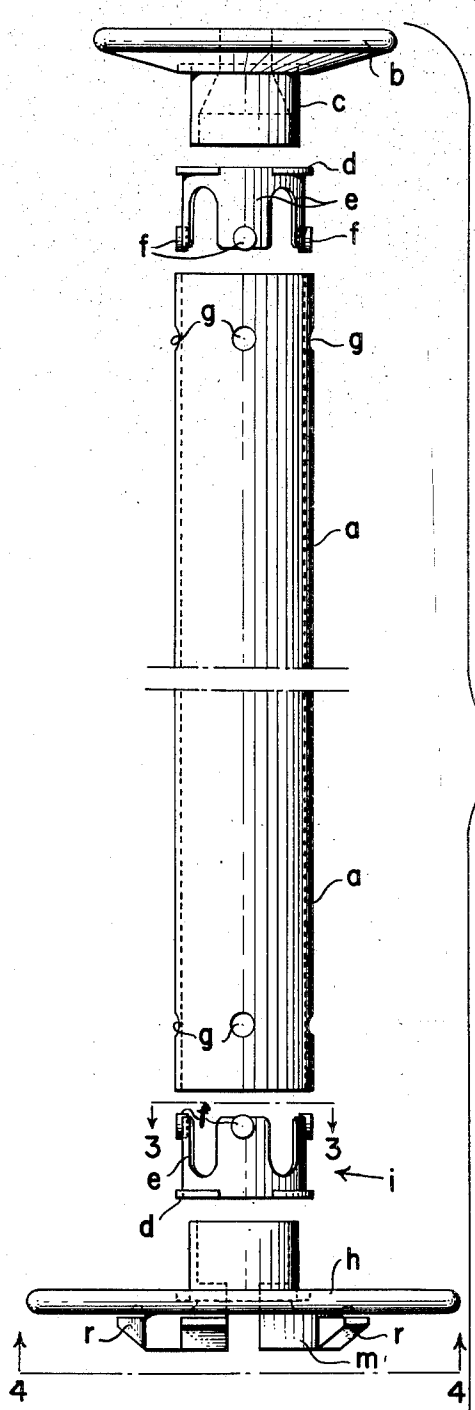


FIG. 1.

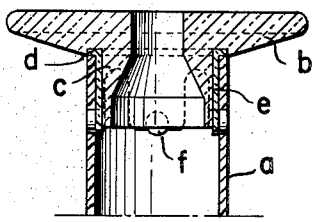


FIG. 2.

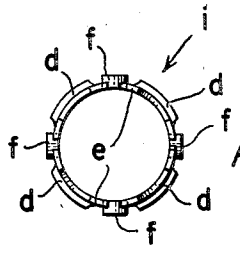


FIG. 3.

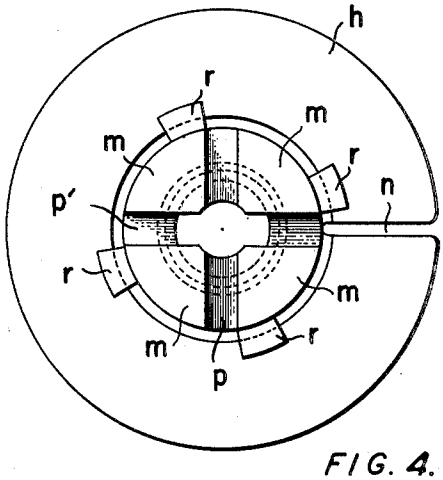


FIG. 4.

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ROTARY SPOOL UPON WHICH YARN IS ADAPTED TO BE WOUND

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3 Claims. (Cl. 242—124)

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My invention is an improvement in spools to which, while in rotation, twisted or other yarn is fed and upon which the yarn is wound spirally until the body of yarn reaches a predetermined diameter.

In operation such spools may occupy a vertical or a horizontal position and the two end heads may be of the same construction or of different constructions. For example, assuming that the spool in operation occupies a vertical position, the upper head may be a plain wooden disc, while the lower end head or base may be a disc of larger diameter and may be provided with a notch through which the end of the yarn, before winding, is passed, and with an annular groove around which the yarn end extends and with a metal clip that secures the extremity of the yarn end.

The spool bodies are usually made of carefully selected wood, in the form of a cylinder. The wall of the cylinder is necessarily quite thick, in order to receive the screws by means of which the end heads are secured to the spool body. By reason of the thickness of the wooden cylinder wall, the diameter of the spool must be relatively great and the length of yarn that may be wound upon the spool is limited.

In my improved spool the cylindrical spool body is made of metal, preferably of aluminum, or of any material which, when made with a thin wall, will be at least as resistant to warping as the thick-walled, standard wooden spool, as for example a synthetic resin or a plied fabric impregnated with a synthetic resin, and it can thus be made of a diameter much smaller than that of the standard wooden spool and therefore may have wound upon it a substantially greater length of yarn. Because the present wooden spool body must be of carefully selected wood and must be very accurately shaped, the cost of its production greatly exceeds that of a simple tube of aluminum or other inherently rigid material.

However, in the substitution of a thin-walled cylinder of small diameter for a thick-walled wooden cylinder of relatively large diameter, the problem arises of providing suitable end heads and means for securely fastening them to the spool body. Where, by way of example, the end heads are of plastic and the spool body of material having a different composition, it is impracticable to secure the heads to a thin-walled spool body solely by mechanical fastening means, and no adhesive is available which can be relied upon to effect a secure and permanent union between such unlike materials.

I have solved this problem by expedients which

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will be understood by reference, in connection with the description that follows, to the accompanying drawings, in which——

Fig. 1 is an elevational view showing the parts of the spool before the heads are secured to the spool body.

Fig. 2 is a sectional view showing one end head secured to the spool body.

Fig. 3 is a plan view of the connecting member between the spool body and end head on the line 3—3 of Fig. 1.

Fig. 4 is an inverted plan view of the spool base head as indicated by the arrows at the bottom of Fig. 1.

The spool body *a* may be assumed to be made of aluminum or of any other material having the qualities hereinbefore described. The upper head *b* is of plastic material and is provided with a downwardly extending annular flange *c* of the same material and integral therewith. A member formed of a plastic material having the same composition as the upper head *b* and adapted to connect the end head and the spool body, is composed of a ring *d*, having depending spaced-apart wings *e*.

The ring *d*, with its depending wings *e*, is adapted to slip telescopically into the end of the spool body *a*. On the lower ends of the wings *e* are formed projections *f*, which, when the ring is applied to the body, spring into the holes *g* formed in the spool body, thereby affording a permanent mechanical lock between the wings and the spool body. Adhesive may be applied to the outer faces of the ring *d* and wings *e* or to the contacting inner face of the spool body, but, as hereinbefore explained, this additional fastening means between metal and plastic is undependable and is unessential.

Head *b* is adapted to fit tightly within ring *d*. Since head *b* and ring *d* are formed of the same plastic material, they may be securely and permanently fastened together by a suitable adhesive between their contacting surfaces. Thus, for example, if the head and ring are both formed of ethyl cellulose, they may be bonded by, for example, acetone or vinyl benzene. It will be noted that when head *b* is thus positioned within ring *d* it acts to lock projections *f* in holes *g*.

The base *h* may be secured to the lower end of the spool body by means of a similar intermediate fastening member *i* between the spool body and base.

It will be understood that it is within the scope of my invention to apply the described improvement to either or both ends of a rigid, thin-walled

small diameter spool body, regardless of the construction of the heads per se or of the position occupied by the spool during the winding of the yarn thereon.

In the form of spool illustrated the plastic base head *h* may be of the same construction as the conventional wooden head; but a minor improvement embodied in the specific structure shown in the drawings involves a novel construction of this spool head. The head is provided, as in the conventional spool, with a notch *n* in its periphery. From the bottom of the base head extend four sector-shaped members *m* spaced apart to provide within them two intersecting diametric channels *p*, *p'*. Projecting outward from each member *m* is an ear *r*.

Before the beginning of the winding operation the yarn may first be pulled through the notch *n*, then drawn around the outside of one or more or all of the sectors *m*, passing under the corresponding ears *r*, and finally half way through one of the channels *p* or *p'* and the extremity inserted into the open center of the head, being then confined there when the spool is applied to the rotary spindle. Thus at different times the thread may extend diametrically through different confined diametric or radial paths in the head before anchoring its extremity. In order to facilitate fabrication of this base head, it may be provided with four holes aligning with the four ears *r*, but such holes are not an essential feature and are not therefore shown.

Another minor, but important, advantage of a spool embodying my invention is that it is of light weight as compared with the conventional wooden spool.

What is claimed is:

1. The combination with a tubular spool body having spaced holes provided therein, of a spool head comprising a disc of plastic and extending therefrom a central annular member of plastic, an intermediate connecting member of plastic enclosing and telescopically engaging said annular member and secured thereto by adhesive and also telescopically engaging and being enclosed by the end of the spool body, and mechanical securing means between said connecting member and the spool body, said connecting member comprising a ring and spaced-apart wings extending therefrom, said mechanical connecting means comprising projections secured to the end portions of the wings and engaging said spaced holes in the spool body.

2. The combination with a tubular body formed of a rigid metallic material and thus resistant to warping and having provided therein spaced apart holes along a common circumference, of a spool head comprising a disc of plastic and integral therewith and extending therefrom into the end of the spool body a central annular member also of plastic, an intermediate annular member of plastic enclosing and telescopically engaging said central annular member of plastic and secured thereto by adhesive and also extending within and telescopically engaging the end portion of the spool body and thus confined between the central annular member and the spool body, said intermediate annular member being cut away to form spaced apart wings, and projections on the wings engaging the holes in the spool body and thus effecting a mechanical connection between the intermediate annular member and the spool body.

3. The combination with a tubular body and having provided therein spaced apart holes along a common circumference, of a spool head comprising a disc and extending therefrom a central annular member, an intermediate annular member of plastic embracing and telescopically engaging said central annular member and secured thereto and also extending within and telescopically engaging the end portion of the spool body, said intermediate annular member being cut away to form spaced apart wings, and projections on the wings engaging the holes in the spool body.

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