Nov. 27, 1962 H. J. BIEDINGER ET AL 3,065,838

RIBBON SPOOL

Filed April 2, 1959 2 Sheets-Sheet 1

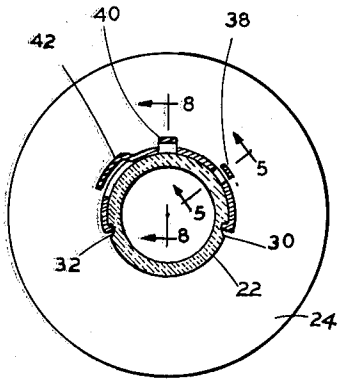


FIG. 2

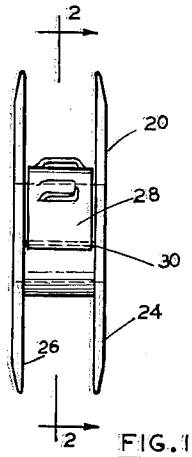


FIG. 1

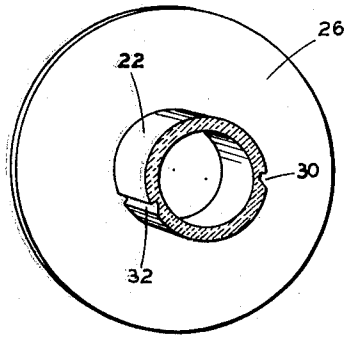


FIG. 3

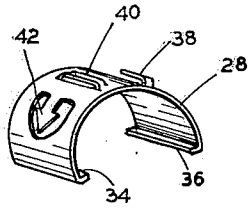


FIG. 4

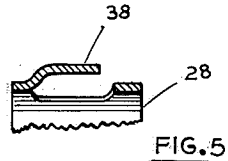


FIG. 5

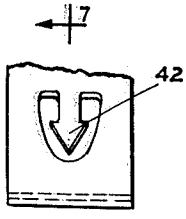


FIG. 6

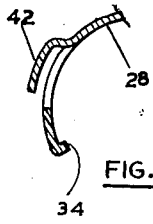


FIG. 7

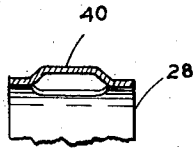


FIG. 8

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RIBBON SPOOL

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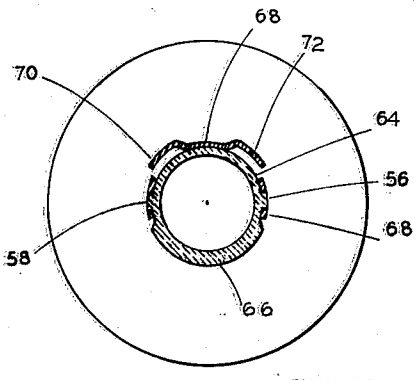


FIG. 10

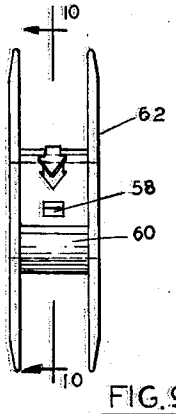


FIG. 9

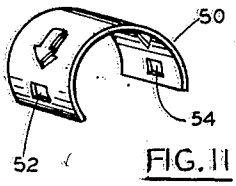


FIG. 11

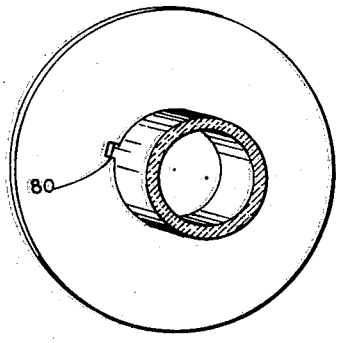


FIG. 13

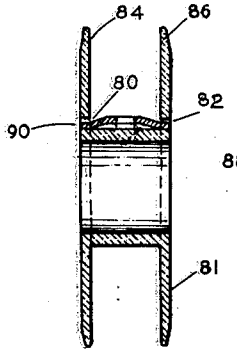


FIG. 12

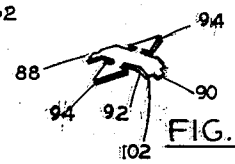


FIG. 14

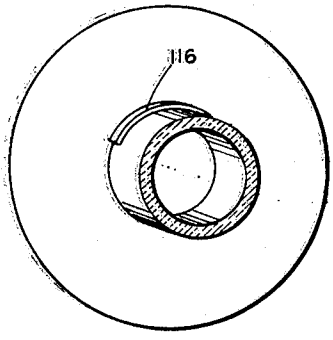


FIG 16

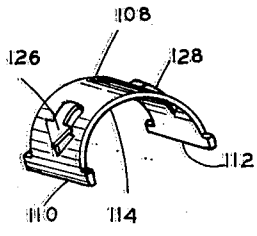


FIG 17

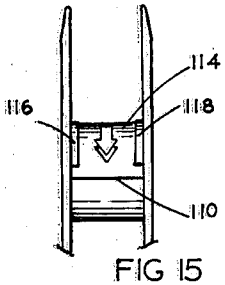


FIG 15

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3,065,838

RIBBON SPOOL

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Filed Apr. 2, 1959, Ser. No. 803,617
1 Claim. (Cl. 197—175)

This invention relates to typewriter ribbon spools and the like, and more particularly to a molded spool formed of plastic, and the provision of ribbon end attachment means in the form of adapters.

Ribbon spools of the type referred to have been made from sheet metal stampings, usually comprising separate formed flanges, coupled together through a drum stamping. Such spools are costly, require a finish to prevent corrosion, and are subject to various limitations resulting from the sheet metal constituents.

The present invention is directed to the provision of molded plastic spools, wherein the flanges and drum are a unitary structure. Such spools require in association with the drum, a means for readily attaching a ribbon end. Such means in the spools formed of sheet metal are readily formed integral with the metal, and generally comprise sharp barbs, loops, or transverse tongues, depending upon whether the ribbon is adapted to be attached to the drum by directly piercing the fabric thereof, or through means of a hook on the ribbon end, or in some cases a ribbon end loop. Such barbs, loops or tongues are not readily molded, and if molded would be of insufficient structural strength due to the nature of the plastic or other material employed. The invention is thus directed to providing in a molded spool a secure means of adequate strength, in the form of an adapter, which adapter will form a part of the spool and provide secure means for ribbon attachment.

The above and other novel features of the invention will appear more fully hereinafter from the following detailed description when taken in conjunction with the accompanying drawings. It is expressly understood that the drawings are employed for purposes of illustration only and are not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claim.

In the drawings, wherein like reference characters indicate like parts:

FIGURE 1 is an elevational view of a spool having an adapter applied thereto;

FIGURE 2 is a sectional view taken on the line 2—2 of FIGURE 1;

FIGURE 3 is a perspective view, partly in section of the spool of FIGURE 1;

FIGURE 4 is a perspective view of the adapter to be applied to the spool of FIGURE 3 in the manner shown in FIGURES 1 and 2;

FIGURE 5 is a fragmentary enlarged sectional view taken on the line 5—5 of FIGURE 2;

FIGURE 6 is a fragmentary enlarged elevational view of the barb of FIGURE 4;

FIGURE 7 is a sectional view taken on the line 7—7 of FIGURE 6;

FIGURE 8 is a fragmentary enlarged sectional view taken on the line 8—8 of FIGURE 2;

FIGURE 9 is an elevational view of a modified spool and adapter;

FIGURE 10 is a sectional view taken on the line 10—10 of FIGURE 9;

FIGURE 11 is a perspective view of the adapter of FIGURES 9 and 10;

FIGURE 12 is an elevational view of a further modified spool and adapter, with parts of the spool broken away;

FIGURE 13 is a perspective fragmentary view of the spool of FIGURE 12;

FIGURE 14 is a perspective view of the adapter of FIGURE 12;

FIGURE 15 is an elevational view of a further modified form of spool and adapter;

FIGURE 16 is a perspective fragmentary view of the spool of FIGURE 15; and

FIGURE 17 is a perspective view of the adapter of FIGURE 15.

Referring to FIGURES 1–8 inclusive there is shown a reel and adapter for typewriter ribbons and the like. The reel 20 may be of molded plastic or other suitable composition, and comprises a hollow hub 22, of generally cylindrical form, and integral side flanges 24 and 26. In order to provide certain means for securing the end of the inked ribbon to the spool, an adapter 28 is provided. Such adapter may be formed of spring steel or other elastic material, and be substantially semi-cylindrical in form, the actual arcuate length of the adapter being somewhat greater than 180°.

The spool hub is provided with elemental grooves 30 and 32 disposed angularly by a distance somewhat greater than 180°, and such grooves are adapted to receive inwardly formed key flanges, 34 and 36 at either end of the adapter. The adapter preferably will be formed with an internal radius slightly less than that of the drum exterior diameter, and the key flanges 34 and 36 will be so disposed, as to be snapped or sprung into the grooves 30 and 32, by forcing the adapter upon the spool drum, to the position, as shown in FIGURE 2 where it will snugly embrace the hub 22.

The adapter is provided with various means for anchoring a ribbon end, such as a transverse tongue 38, to receive a loop end of a ribbon, or a raised strap 40, to receive an end hook of a ribbon, or a barb 42, adapted to pierce the fabric of the ribbon end. Since the adapter may be sprung in place upon the reel hub, facing in either direction, one barb as shown will suffice. The tongue 38, bridge or strap 40, and barb 42 may be struck from the metal of the adapter, and will be so formed as to leave a substantial portion of the metal along the marginal arcuate edges of the adapter intact to assure adequate resilient strength in the adapter.

In FIGURES 9, 10 and 11, a somewhat different form of adapter 50 is shown wherein the semi-circular spring material is provided with notched openings 52 and 54 adjacent its opposite ends, the circumferential spacing between the notches being about 180° or more. Such notched openings are adapted to be snapped over and embrace bosses 56 and 58 molded in the hub face 60 of the reel 62. If desired, the reel hub or drum face 60, may have a reduced diameter area 64 to receive the adapter, the reduction in diameter being sufficient to cooperate with the adapter so that the balance of the hub as at 66 will be flush with or have a uniform radius with the exterior of the adapter as shown at 68.

The adapter 50 may have one or more barbs 70 and 72 struck upwardly in its face, to attach to a ribbon end as by piercing the fabric. If desired, a single barb, or a strap or hook, as shown in FIGURES 5 and 8 may be provided, depending on the type or types of ribbons to be accommodated, or the adapter may be made to universally accommodate the various types of ribbons, in the manner of the adapter of FIGURE 4.

In FIGURES 12, 13 and 14, the reel 81 is provided with opposed notches or recesses 80 and 82 in the inside faces of the flanges 84 and 86 in order to receive the opposed lugs 88 and 90 of the adapter 92. Such adapter may be provided with barbs 92 and 94, oppositely facing, one or the other being adapted to pierce the fabric of the

ribbon end, according to the direction of winding rotation of the reel when put to use.

The insert form of adapter **92**, may be stamped with the lug ends **96** and **98** bent about 30° to 45° from the plane of the central portion **100**, to permit the assembly of the adapter upon the spool, it being understood that the spacing between the lug ends, when so bent, will approximate the inside spacing between the spool flanges, or only such greater spacing, as will still permit the insert to be placed in initial position, with one lug or the other lug partially projected into one or the other of the notches or recesses **80** or **82**. Thereafter, the insert, while the lug ends are aligned with the opposite recesses **80** and **82**, may be flattened and deformed to expand the spacing between the lugs, so as to project the lugs securely into the apertures and lock the adapter in place, with the opposite shoulders such as **102** preferably abutting against the inside walls of the spool flanges.

In the form shown in FIGURES 15, 16 and 17, the adapter **108** is made with T head ends **110**, **112**, joined by a somewhat narrower arcuate body portion **114**. The T head ends are adapted to interlock with opposite arcuate shoulders **116** and **118** formed in the corners between the drum **120** and side flanges **122** and **124** of the reel, the arcuate shoulders being of an arcuate length to conform to the arcuate distance along the body portion **114** of the adapter between the T head ends referred to. In practice the arcuate length of the shoulders will preferably exceed 180°. Any suitable ribbon fastening means such as the barbs **126** and **128** may be employed.

In practice it will be appreciated that if the spools are symmetrical about a center plane transverse to the spool axis, a barb facing in one direction only need be employed, since the spool may be inverted to provide for a change in direction of reeling. On the other hand the adapter with a single barb, may be sprung in place with the barb facing in the desired direction. It will also appear that once the ribbon is wound upon the adapter, the tension of the ribbon will assist in holding the adapter in position, although it is contemplated in the forms shown in FIGURES 1–8, 9–11 and 15–17 that the resilience of the adapter material, and its arcuate length exceeding 180° will adequately provide secure attachment.

In any of the forms shown in FIGURES 1, 13 and 16, the spool drum may be reduced in diameter over an area corresponding with the shape of the adapter, so that the exterior surface of the adapter will be approximately cylindrically flush with the remainder of the drum surface. The semi-cylindrical adapter in each case will preferably be made of resilient material and of a curvature slightly less than the curvature of the drum, whereby the adapter can easily be snapped in place, and once so positioned will remain locked in place, unless removed by spreading, as by some mechanical spreading instrument.

From the foregoing it will be seen that a plastic spool, economical of manufacture, is provided with suitable ribbon engaging means through the expedient of the adapter, which is a relatively low cost stamping. It will be appreciated that a plastic tongue, or barb formed integral with the plastic spool, is both expensive to form, and in general lacks the strength necessary to assure against fracture.

While several embodiments of the invention have been illustrated and described, it is to be understood that the invention is not limited thereto. As various changes in the construction and arrangement may be made without departing from the spirit of the invention, as will be apparent to those skilled in the art, reference will be had to the appended claim for a definition of the limits of the invention.

What is claimed is:

An inked ribbon spool comprising a hub and integral side flanges, said hub having a substantially cylindrical exterior surface, an adapter formed of resilient sheet metal overlying a circumferential portion of said hub of a circumferential length greater than 180°, said adapter having a reduced axial width intermediate its circumferential end to provide keying means and interengaging complemental keying means on said spool hub comprising arcuate shoulders extending around the hub and disposed conjointly on either end thereof and on the internal faces of said flanges and integral attachment means for securing a ribbon end struck from said adapter, said adapter having an internal radius and curvature, when removed from the hub slightly less than the radius of the hub.

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