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H. A. HEINRICH ET AL
RIBBON SPOOL CONSTRUCTION

2,880,841

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2 Sheets-Sheet 1

Fig. 1

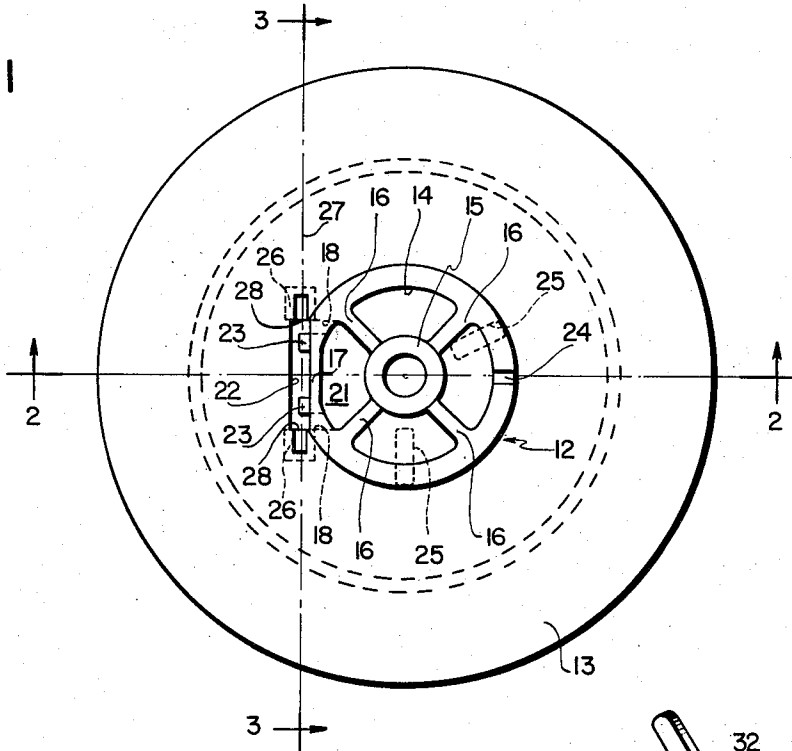


Fig. 4

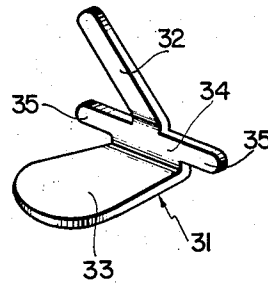
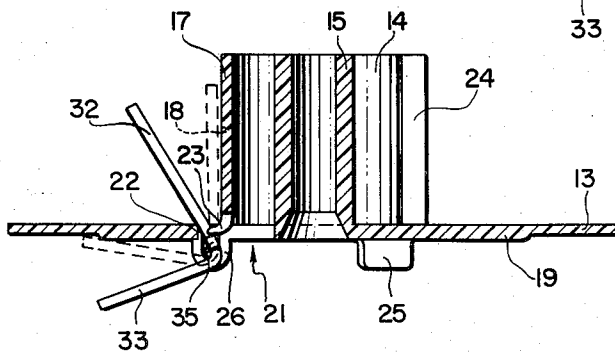


Fig. 5



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Fig. 3

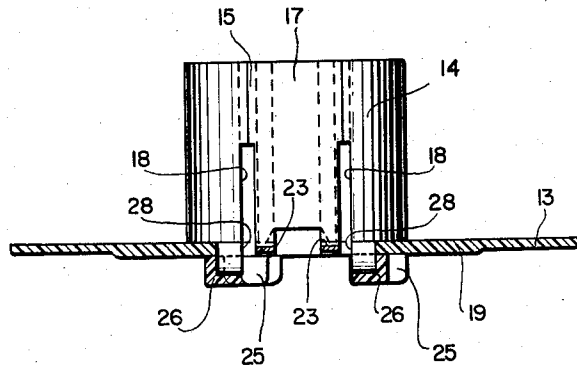
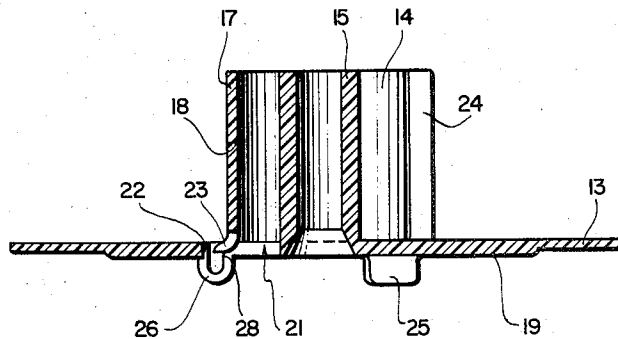


Fig. 2



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RIBBON SPOOL CONSTRUCTION

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6 Claims. (Cl. 197-175)

This invention relates to spools upon which are wound the ribbons utilized to transfer ink to paper in response to the actuation of type bars on typewriters or like printing machines; more particularly it relates to ribbon spools of the type which have support means for automatic ribbon reversing mechanism trip levers; and specifically it relates to an integral ribbon spool construction of the above mentioned type which facilitates the assembly thereof of an automatic ribbon reversing mechanism trip lever in one operation.

As is well known a ribbon spool of the above mentioned type generally comprises a cylindrical core upon which a ribbon is wound and upper and lower circular flanges coaxially joined to the core for supporting and maintaining the edges of the ribbon perpendicular to the axis of the core as it winds and unwinds. The lower flange is usually formed with a pair of downwardly depending lugs which are adapted to engage a toothed collar on a ribbon spool drive shaft whereby the spool may be rotated. The lower flange is also provided with means for supporting a ribbon reversing mechanism trip lever. Both metal and plastic ribbon spools are presently in use. The lower flange of the metal spools are usually die stamped whereby downwardly depending drive lugs and a pair of spaced perforated downwardly depending ears for rotatably supporting the trip lever are formed adjacent an open area of the flange. In assembly a mechanic is required to bend one or both of said ears outwardly to enable insertion of the trip lever pivots, to mount a trip lever biasing spring on the trip lever, and to thereafter bend the ears back to a position perpendicular to the plane of the flange whereby the trip lever is securely mounted to the flange. The lower flanges of the plastic spools presently in use are formed in a mold; the formed flange including the drive lugs. In accordance with present practice a metal bracket having a pair of spaced perforated ears, whereby the trip lever is assembled to the spool, must be screwed or riveted to the underside of the flange by a mechanic, who must thereafter perform the same operations to assemble the trip lever thereto as those required in assembling a trip lever to a metal spool. As is apparent from the foregoing, assembling a ribbon spool can be a tedious and time consuming task.

In accordance with the present invention an integral ribbon spool construction is provided including a trip lever mounting formed integral with the lower flange and core thereof, whereby a trip lever may be snapped into place and securely held in operative position. Further in accordance with the present invention, the trip lever is so weighted that a biasing spring is unnecessary to insure its movement to an operative position.

An object of the invention therefore is the provision of a novel ribbon spool construction.

Another object of the invention is the provision of an integral ribbon spool which is easily and inexpensively manufactured.

Another object of the invention is to provide an integral ribbon spool construction which facilitates the mounting of a ribbon reversing trip lever by unskilled persons without special tools.

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A further object of the invention is to provide a ribbon spool having an integrally formed ribbon reverse trip lever support which permits the trip lever to be easily and securely snapped into engagement with the spool.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings in which like reference numerals designate like parts throughout the figures thereof and wherein:

Fig. 1 is a top plan view of the novel ribbon spool;

Fig. 2 is a cross sectional view taken along lines 2-2 of Fig. 1;

Fig. 3 is a cross sectional view taken along lines 3-3 of Fig. 1;

Fig. 4 is a perspective view of a ribbon reverse trip lever; and

Fig. 5 is a view similar to Fig. 2 showing the trip lever mounted on the novel ribbon spool.

Referring now to the drawings there is shown in Fig. 1, which illustrates a preferred embodiment, a ribbon spool comprising a substantially cylindrical core generally designated by reference numeral 12 coaxially joined to a circular flange 13. In accordance with the invention the spool is formed from any suitable plastic, e.g. polystyrene; although it is to be understood that the invention may also be practiced with spools formed of any suitable metal. The core of the ribbon spool is defined by an outer wall 14 joined to an inner cylindrical hub 15 by a plurality of webs 16 radially extending equivalent distances from the hub. The outer wall 14 of the core is cylindrical and concentric with the hub 15 except for a straight flat section 17 between two of the webs. The straight section 17 of the core wall is relatively thinner than the rest of the wall 14, and as seen in Fig. 3, the intersections of the straight and cylindrical portions of the outer wall are defined by slots 18 extending predetermined distances upward from the lower surface 19 of the flange. The circular flange which is integrally joined to the core is formed with a cut away area 21 (Figs. 1 and 2) defined by the area between the two webs having between them the straight section 17 of the core wall and a line 22 outwardly parallel from the plane of the straight section. The lower corners of the straight wall section are formed with two projections 23 which extend down into the cut away area and then toward the periphery of and parallel to the plane of the bottom surface of the flange 19 for reasons which will hereinafter appear. Diametrically opposite the straight wall section, the core wall is formed with a slot 24, whereby the terminal end of a ribbon may be secured to the core.

As is apparent from the above, the straight section 17 of the core wall is free to deflect toward the axis of the core upon application of force to the lower end of the straight section.

The underside of the flange is formed with at least two spaced downwardly depending rectangular drive lugs 25 and with two upwardly open semi-cylindrical pivot housings 26 depending from the bottom surface 19 of the flange. The axes 27 of the pivot housings are disposed on a line parallel with and between the plane of the straight section 17 and the edge 22 of the cutout area parallel to the plane of the straight section of the core wall. The facing ends of the semi-cylindrical pivot housings 26 which are co-planar with the sides 28 of the cut way area are open as seen in Figs. 1 and 3, while the outwardly facing ends are closed. As seen in Figs. 1 and 2 the projections 23 on the straight section of the core wall extend over and beyond the axes 27 of the semi-cylindrical pivot housings 26.

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Referring now to Fig. 4, there is shown a perspective view of the ribbon reverse trip lever 31. The trip lever comprises an upper and lower arm 32 and 33 respectively joined by a body portion 34. The lower arm 33 is spade shaped and perpendicular to the body portion 34 and the upper arm 32 is bent at a predetermined acute angle toward the lower arm. The body portion is made at least as wide as the width of the straight section of the core wall and is formed with pivots 35 extending from the top edge of the opposite sides thereof.

To assemble the spool the spade shaped arm 33 is forced down between the edge 22 of the cutout area in the flange and the projections 23 on the straight section 17. As seen in Figs. 2 and 5 the edges 22 and projections 23 are bevelled whereby upon insertion of the trip lever 31 the straight section 17 is deflected toward the axis of the core by a camming action. After the lower arm 33 is pushed through, it is grasped on the underside, rotated toward the underside of the flange and pulled until the body portion 34 clears the projections 23 on the straight section of the core wall, whereupon the pivots 35 drop into the pivot housings 26 and the straight section 17 snaps back to normal. As is apparent in Fig. 5, the trip lever pivots are locked in the semi-cylindrical pivot housings 26 by the projections 23 after the straight section resumes its undeflected position. The trip lever 31 after being locked in is free to pivot to approximately 30° below the underside of the flange.

As is understood in the art the spool assembly is placed on a typewriter or like printing machine with the drive shaft within the cylindrical hub 15 of the core and with the lugs 25 depending from the flange in engagement with a toothed collar on the drive shaft whereby the spool assembly is rotated. A ribbon wound on the spool will retain the trip lever 31 in the dotted position as shown in Fig. 5 until the ribbon unwinds and frees the upper arm 32 of the trip lever whereupon the weight of the lower spade shaped arm 33 will cause the trip lever to drop to the position shown in full whereby it may actuate a member of a conventional ribbon reverse mechanism in its path. Actuation of the ribbon reverse mechanism will reverse the rotation of the now unwound spool causing the ribbon to rewind. As the ribbon rewinds on the core it will cause the upper arm of the trip lever to rotate back to its normal position adjacent the flat face of the straight wall action.

It should be understood, of course, that the foregoing disclosure relates to only a preferred embodiment of the invention and that it is intended to cover all changes and modifications of the example of the invention herein chosen for the purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

The invention claimed is:

1. As an article of manufacture, a ribbon spool having a substantially cylindrical hollow core and a coaxially joined circular flange, said flange having an area cut therefrom having at least two parallel edges, a pair of aligned semi-cylindrical pivot housings oppositely formed in said parallel edges, said core being formed such that a wall section parallel to the axes of said pivot housings and over said area is resiliently deflectable toward the axis of said core, and projections on the lower corners of said wall section extending over and beyond the axes of said pivot housings, adapted in combination with said pivot housings to rotatably support a ribbon reversing mechanism trip lever.

2. As an article of manufacture, a ribbon spool of the type adapted to rotatably mount a ribbon reversing mechanism trip lever, said spool comprising a core comprising a substantially cylindrical outer wall and a circular flange coaxially joined to said core, said outer wall being characterized by at least one flat surface parallel to the axis of the core, slots in the outer wall on either

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side of said flat surface and extending predetermined distances from the plane of the flange, said flange being characterized by an open area extending beneath said flat surface, said flange being further characterized by a pair of semi-cylindrical pivot housings open to the upper surface of said flange and having a common axis parallel to the plane of said flat surface, said pivot housings being formed in opposite edges of said open area and outward of the plane of said flat surface, and projections on the lowermost corners of said flat surface extending over and beyond the axes of said pivot housings, adapted in combination with said pivot housings to rotatably support a ribbon reversing mechanism trip lever.

3. As an article of manufacture, a ribbon spool of the type adapted to rotatably mount a ribbon reversing mechanism trip lever, said spool comprising a core comprising a substantially cylindrical outer wall joined to a hub by spokes radiating from said hub and a circular flange coaxially joined to said core, two spaced slots in the outer wall of said core extending predetermined distances upward from said flange and defining between them a deflectable member, said flange being characterized by an open area extending beneath said member whereby it may be deflected, said flange being further characterized by aligned upwardly open semi-cylindrical depressions having a common axis formed in opposite edges of said open area outward of said member, and projections parallel to the plane of said flange and extending toward the periphery of said flange formed on the lower corners of said member, said projections on said member extending over and beyond the axes of said depressions.

4. As an article of manufacture, a ribbon spool having a substantially cylindrical substantially hollow core and a coaxially joined flange, said flange being characterized by an open area and a pair of aligned upwardly open semi-cylindrical depressions in opposite sides of said area, said core being characterized by at least one flat wall section partially separated from the remainder of the core wall by a pair of spaced slots perpendicular to the plane of the flange, the plane of said flat wall section being parallel to the axis of said depressions and disposed over said area, and means projecting outwardly from the lower corners of said flat wall section extending over and beyond the axes of said semi-cylindrical depressions.

5. A ribbon spool assembly comprising a ribbon spool having a substantially hollow core and a coaxial flange, a ribbon reversing mechanism trip lever, and cooperating means integrally formed with said core and flange respectively, said trip lever comprising a pair of pivots, said cooperating means on said core comprising a resilient member, and said cooperating means on said flange comprising a pair of trip lever pivot housings parallel with the plane of and below said resilient member, said resilient member being adapted to deflect to allow insertion of said trip lever pivots into said housings and thereafter to resume its undeflected position after the insertion of said trip lever pivots thereby to maintain said trip lever securely mounted for rotation.

6. A ribbon spool assembly comprising a ribbon spool having a substantially hollow core with a coaxial flange, a ribbon reversing mechanism trip lever having a pair of pivots, pivot housings integrally formed on said flange, and resilient means integrally formed with said core for enabling the trip lever pivots to be inserted in and maintained in said pivot housings.

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