

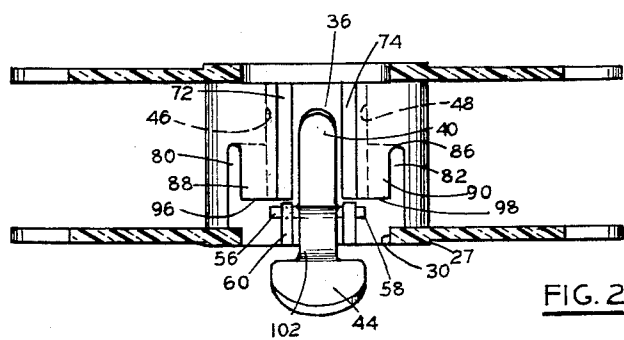
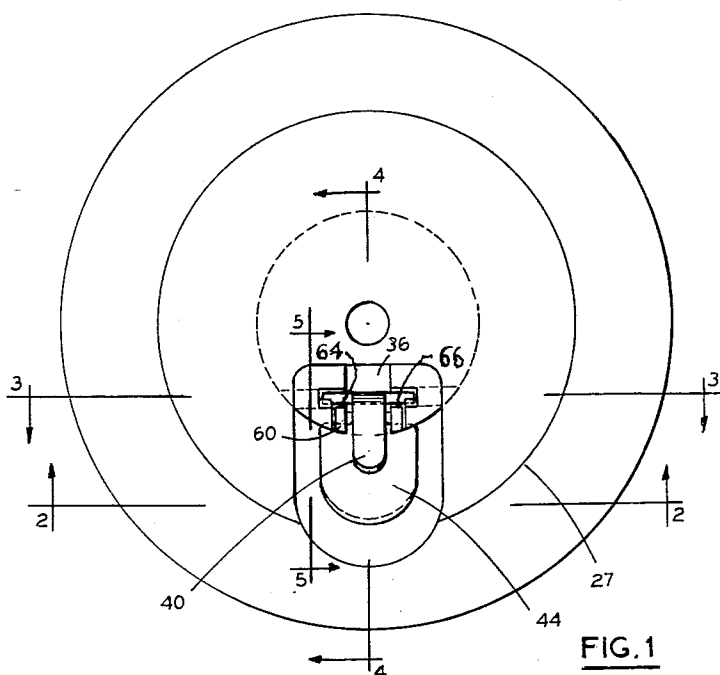
**Nov. 22, 1960**

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TYPEWRITER RIBBON SPOOL

**2,961,083**

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

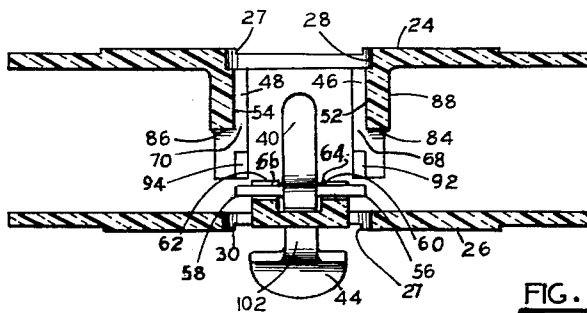


FIG. 3

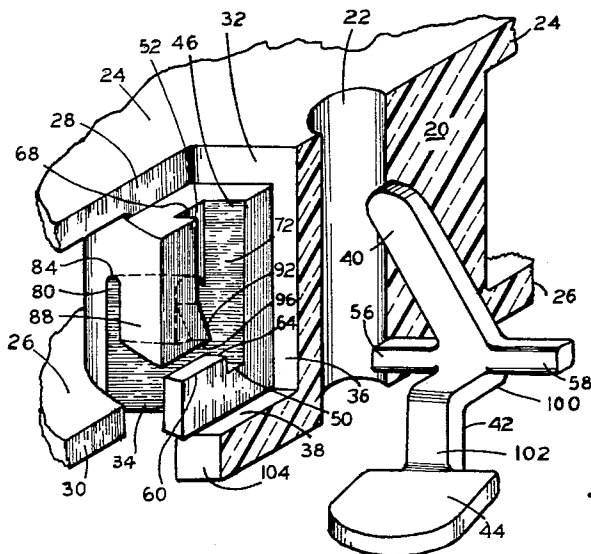


FIG. 4

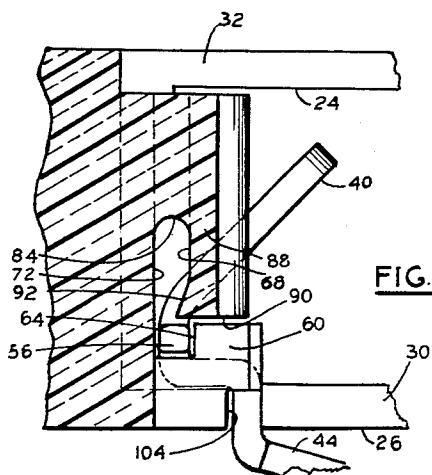


FIG. 5

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## TYPEWRITER RIBBON SPOOL

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9 Claims. (Cl. 197—175)

This invention relates to typewriter inked ribbon spools and more particularly to plastic die cast integral spools with ribbon convolution actuated triggering mechanism.

It has been the practice to fabricate ribbon spools from sheet metal stampings or the like, a spool requiring separate flange elements and a drum element assembled as a unit. Triggering mechanism, actuated by the presence or absence of covering convolutions of inked ribbon have been provided for actuating typewriter reversing gear, so that when the end of a ribbon is reached, the drive to the spool is reversed. Such triggers have taken the form of a bell crank pivoted in or adjacent to the plane of one of the flanges and on a line adjacent to a tangent of the drum element. The use of metal stampings has made it possible to provide suitable pivots for such triggers without adding materially to the cost of stampings.

The present invention is directed to providing a one piece die cast plastic spool with such a trigger, and is directed to the construction of the spool such that it can be die cast in a single operation, and at the same time provide for reception of a pivotal trigger element which may be assembled in the finished one piece die cast spool, with comparative simplicity.

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 claims.

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

Figure 1 is a top plan view of the spool;

Figure 2 is a sectional view with parts in side elevation taken substantially on the line 2—2 of Figure 1;

Figure 3 is a sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a fragmentary sectional view taken substantially on the line 4—4 of Figure 1, with the parts shown in perspective, and the trigger shown in exploded relation; and

Figure 5 is a fragmentary sectional view taken on the line 5—5 of Figure 1.

In the drawings, there is shown an integral typewriter ribbon spool which may be die cast of plastic or the like and which comprises a drum portion 20, having a central aperture 22, and spaced integral end flanges 24 and 26. The end flanges are stepped in thickness as at 27 and provided with radial recesses or windows 28 and 30, which extend inwardly of the drum as at 32 and 34, at the opposite ends thereof. The drum is provided with a radial recess generally indicated at 36, which consists of a slot extending from recess 32 at one side of the spool to the approximate inside plane of the spool flange on the other side, as is indicated at 38, the width of which is sufficient to easily accommodate the arm 40,

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and the knee bracket 42 leading to the control pad 44 of a pivoted bell crank control element or trigger, as for example shown in Figure 4.

On opposite sides of the recess 36, are parallel slots 46 and 48 which extend toward the other flange 26, but which terminate a short distance above the plane of the surface 38, as at 50. The opposite walls 52 and 54 of such slots are spaced apart sufficiently to clear the length of the opposed ends 56 and 58 of the pintle of the control element or trigger, and the width of the slots 46 and 48 in a radial direction is sufficiently greater than the cross sectional diameter of such pintles, whereby the opposed pintle ends may freely pivot, when disposed within the opposed slots. Steps 60 and 62, on opposite sides of the recess 36, have faces 64 and 66 which lie in the plane of the outer faces 68 and 70 of the slots 46 and 48.

The width of the outer faces 68 and 70 of the slots 46 and 48 is less than the width of the faces 72 and 74 of the slots by the width of the steps 60 and 62. Upwardly extending slots 80 and 82 have walls that form a continuation of the walls 68 and 72 and 70 and 74 of the slots 46 and 48, and the slots 80 and 82 terminate as at 84 and 86, and form depending yielding resilient tongues 88 and 90. The inside faces 68 and 70 at their lower ends are provided with inclined locking wedges 92 and 94 which project inwardly radially approximately half way across the radial width of the respective slots 46 and 48. The under surfaces 96 and 98 of the tongues 88 and 90 thus extend part way across the slots 46 and 48, in practice, approximately half way.

By employing a trigger having pintle ends 56 and 58 of a cross sectional diameter greater than half the width of the slots 46 and 48, such pintles when slid down the slots 46 and 48, to a position below the locking wedges 92 and 94, cause the tongues 88 and 90 to spring radially outward, to permit the pintle ends to seat upon the surfaces 50 and 51 in a position confined by the steps 60 and 62. The tongues 88 and 90 spring back, and thereafter confine the pintle ends below the surfaces 96 and 98 of the tongues.

The knee bracket portion 42 of the control element or trigger, when its pintle ends 56 and 58 are locked below the lock wedges 92 and 94, has a horizontal portion 100 that rests upon the surface 38, which acts as a stop, and a vertical portion 102 that depends downwardly over the end 104 of the surface 38, such arm portion 102 depending below the flange 26 of the spool and supporting a control pad or arm 44 which extends radially outward, and somewhat inclined downwardly, when the knee portion rests upon the surface 38. The control element has an arm 40 which extends from the pintles in a direction diagonally upward and outward to a point radially beyond the cylindrical surface of the drum 20. When a ribbon is wound upon the drum, the upper end of the arm 40 is caused to recede, and swing inwardly by the ribbon convolutions so as to lie within the cylindrical surface defined by the drum, and when in such position, the trigger control pad 44 is tilted upwardly toward and partially into the recess 30 of the lower spool flange 26.

When such pad is thus held in the upward position by one or more convolutions of ribbon around the arm 40, the pad clears the reversing mechanism adjacent the spool, as is understood in the art. When the end of the ribbon is reached and the last convolution of ribbon uncovers the arm 40, the pad is allowed to drop to a position such that it extends radially and divergently downward away from the spool flange, where it becomes active as a trigger to engage the reversing mechanism of the typewriter.

It will be seen that the molded spool, and the pro-

vision for receiving the trigger, is such as to permit molding of the spool in a single operation, the upper and lower dies merely requiring projecting cores, the upper die having a downwardly projecting core that forms the recess 36, grooves 46 and 48, and lock wedge surfaces 92, 94 and stepped members 60 and 62, while the lower die has an upwardly projecting core having tongues for forming the slots 80 and 82. When the spool is completed, the insertion of the trigger element is but a matter of pressing the pintle ends down the grooves 46 and 48, and forcing them beyond the wedge locks 92 and 94 by temporarily springing the arms 88 and 90 outwardly, to provide permanent location of the pintles in the stepped members 60 and 62. The walls 64 and 66 of the stepped members, in combination with the walls 72 and 74, provide bearings for the pintle adequate for resisting lateral torque on the control arm 44.

While a single embodiment of the invention has 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 claims for a definition of the limits of the invention.

What is claimed is:

1. In a typewriter ribbon spool, a drum, opposed trigger pintle receiving slots extending parallel to the drum axis formed in said drum, each of said slots having a portion of one of its side walls formed as a resilient finger, means disposed on the free end of said fingers for partially restricting the width of said slots, and pintle receiving bearing seats disposed across said slots adjacent to and beyond the restricting ends of said fingers.

2. In a typewriter ribbon spool, a drum, opposed trigger pintle receiving slots extending parallel to the drum axis formed in said drum, each of said slots having a portion of one of its side walls formed as a resilient finger, means disposed on the free end of said fingers for partially restricting the width of said slots, pintle receiving bearing seats disposed across said slots adjacent to and beyond the restricting ends of said fingers, and a trigger having a pintle of greater cross sectional width than the restricted width of said slot disposed on said seats, and having an arm adapted to project radially beyond the circumference of the drum, and a control pad adapted to extend axially beyond the end of the drum.

3. In a typewriter ribbon spool, a drum, opposed trigger pintle receiving slots extending parallel to the drum axis formed in said drum, each of said slots having a portion of one of its side walls formed as a resilient finger, wedge means disposed on the free end of said fingers increasing in height toward the free ends of the fingers for partially restricting the width of said slots, and pintle receiving bearing seats disposed across said slots adjacent to and beyond the restricting ends of said fingers.

4. In a typewriter ribbon spool, a drum, opposed trigger pintle receiving slots extending parallel to the drum axis formed in said drum, each of said slots having a portion of one of its side walls formed as a resilient finger, wedge means disposed on the free end of said fingers increasing in height toward the free ends of the fingers for partially restricting the width of said slots, pintle receiving bearing seats disposed across said slots adjacent to and beyond the restricting ends of said fingers, and a trigger having a pintle of greater cross sectional width than the restricted width of said slot disposed on said seats, and having an arm adapted to project radially be-

yond the circumference of the drum, and a control pad adapted to extend axially beyond the end of the drum.

5. In a typewriter ribbon spool, a drum, opposed pintle receiving slots extending parallel to the drum axis formed in said drum, and extending from one end thereof, pintle rests adjacent the other end of the drum and extending across said slots, wedge means formed on a side wall of each of said slots adapted to partially restrict each slot adjacent to said pintle rests, and means for rendering said side wall adjacent said wedge means resilient, whereby said wedge means may be yieldingly moved from restricting said slot.

6. A typewriter ribbon spool comprising a drum having a slot therein extending along one side of the drum and parallel to the drum axis, opposed parallel grooves on opposite sides of said slot, adapted to receive the opposite ends of a trigger pintle disposed on an axis having chordal relation to the drum, rests for said pintle near one end of said grooves, and means formed on a side wall of each of said grooves for partially blocking the groove adjacent said rests, said drum having slots extending in the plane of said grooves to form resilient fingers of the blocking side walls of said grooves.

7. A typewriter ribbon spool comprising a drum and integral side flanges, said side flanges each having a radially extending aperture partially overlying said drum, a slot in one side of said drum extending to one of said apertures and having opposed pintle receiving grooves, resilient locking tongues formed from one wall of each of said grooves having an end portion extending part way across said grooves, bearing rests extending across the end of said grooves beyond the end portions, and a control trigger having opposed pintle ends disposed between said bearing rests and said end portions, and of a cross-sectional width greater than the width of the grooves at adjacent said end portions.

8. A typewriter ribbon spool comprising a drum and integral side flanges, said side flanges each having a radially extending aperture partially overlying said drum, a slot in one side of said drum extending to one of said apertures and having opposed pintle receiving grooves, resilient locking tongues formed from one wall of each of said grooves having an end portion extending part way across said grooves, bearing rests extending across the end of said grooves beyond the end portions, and a control trigger having opposed pintle ends disposed between said bearing rests and said end portions, and of a cross-sectional width greater than the width of the grooves at adjacent said end portions, said trigger having a ribbon convolution actuated arm extending from said pintle radially outward through said slot, and an actuating arm extending from said pintle radially outward into the other flange aperture.

9. A typewriter ribbon spool comprising a drum and spaced flanges, said drum having a slot in one side extending from one end to the inside plane of the flange at the other end, said last named flange having an aperture radially beyond the slot, a trigger pivoted in said slot on a chordal axis wholly within the circumference of said drum, said trigger having a knee arm projecting radially out of said slot and axially through said flange aperture, and a ribbon convolution actuated arm extending outward from said slot into the space between said flanges and beyond the drum periphery.

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