Sept. 1, 1964 P. M. SLOANE 3,146,707

PRINTING DEVICE

Filed Aug. 28, 1962

FIG. 1.

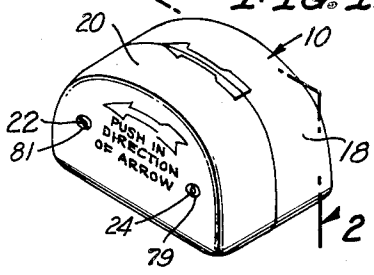


FIG. 3.

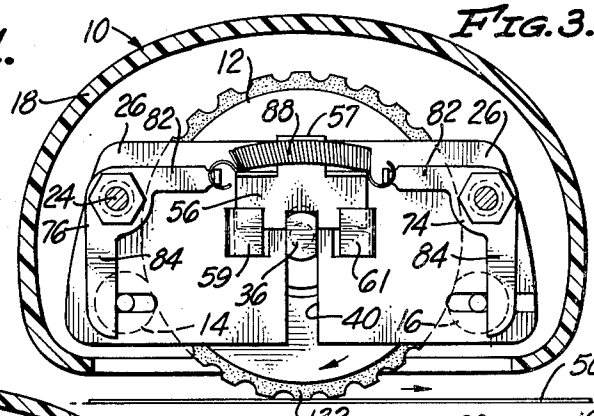


FIG. 2.

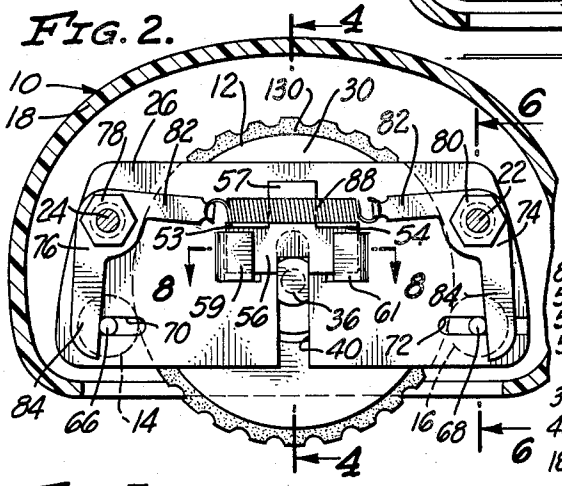


FIG. 4.

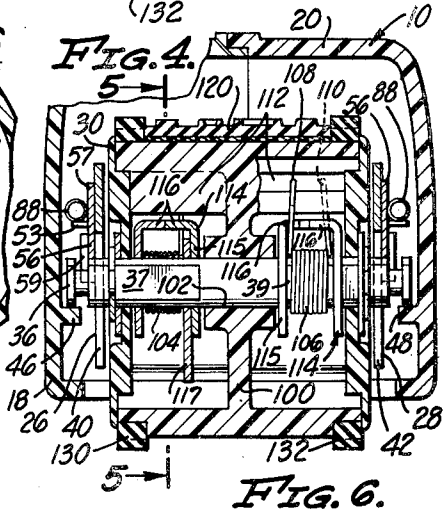


FIG. 5.

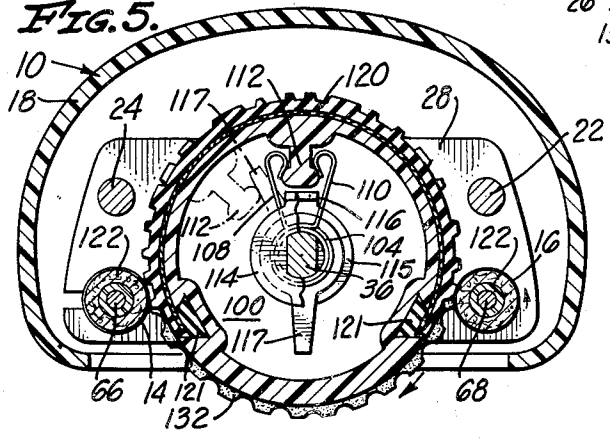


FIG. 6.

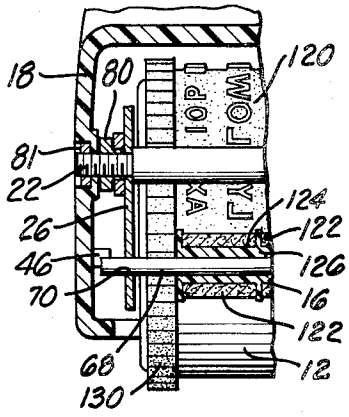


FIG. 7.

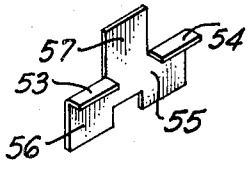
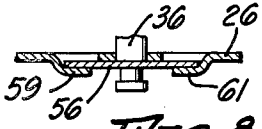


FIG. 8.



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3,146,707

PRINTING DEVICE

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4 Claims. (Cl. 101—329)

This invention relates to a printing device of the type employing a stereotype roller.

In roller stamps of this general type a mechanism is provided which permits the roller to move into contact with an inking pad with the application of sufficient pressure to move the roller over the material to be printed. Such devices commonly utilize two inking rollers which are rotatably supported on opposite sides of the printing roller and which are horizontally movable toward and away from the printing roller. The printing roller is commonly carried by a shaft which is vertically movable within the device and a mechanism is supplied for moving the two linking rollers into engagement with the printing roller during the operation of the device.

It is a primary object of this invention to provide a printing device having a simplified design.

Another object of the invention is to provide an improved mechanism for synchronizing the movement of the several rollers of the device.

A still further object of the invention is to provide an improved printing device which is readily assembled.

Another object of the invention is to provide a structure for holding the inking rollers with greater force to the printing roller.

A still further object of the invention is to provide an improved mechanism for returning the inking rollers and printing roller to their neutral, non-operative positions.

Other objects and advantages will appear in the following specification and in the accompanying drawing, in which:

FIG. 1 is an isometric view of a preferred embodiment of the printing device of the invention;

FIG. 2 is a sectional view taken on line 2—2 of FIG. 1, illustrating the device in its neutral, non-operative position;

FIG. 3 is another sectional view also taken along line 2—2 of FIG. 1 but showing the device in operation, being moved along a sheet of paper;

FIG. 4 is a fragmentary sectional view taken along line 4—4 of FIG. 2;

FIG. 5 is a longitudinal sectional view taken along line 5—5 of FIG. 4, illustrating still another portion of the device of the invention;

FIG. 6 is a fragmentary sectional view taken along line 6—6 of FIG. 2;

FIG. 7 is an isometric view of a pusher member of the device; and

FIG. 8 is a fragmentary sectional view taken along line 8—8 of FIG. 2.

A preferred embodiment of the device of the invention illustrated in the drawings includes a generally semicircular shell **10** which houses the mechanism of the device including a printing roller **12** and two laterally disposed inking rollers **14** and **16**. The shell **10** is made up of two half shells **18** and **20** which are held together by two bolts **22** and **24**. The shell **10** has been markedly strengthened by overlapping the adjoining, longitudinal edges of the two half shells **18** and **20** as best seen in FIG. 4. The structure includes two partial, inner walls **26** and **28** spaced from the inner longitudinal sides of the shell **10**. The bolts **22** and **24** traverse the spaced inner walls **26** and **28**, and the shell **10**.

The hollow printing roller **12** has a generally cylindrical shape and is closed at its opposite sides by circular plates **30** and **32**. The shell **10** and printing roller proper **12** are desirably made of a suitable plastic material. The printing roller **12** is rotatably supported on an axle **36**. The two ends of the axle **36** have lengths **37** and **39** of rectangular cross section (as best seen in FIGS. 3 and 4). The rectangular section lengths **37** and **39** of the axle **36** engage vertical slots **40** and **42** of the respective inner walls **26** and **28**. The slots **40** and **42** while holding the axle **36** against rotation, permit vertical movement of the axle **36** above inwardly protruding ledges **46** and **48** of the two shell halves **18** and **20**. As will be seen best in FIG. 4, the ledges **46** and **48** prevent the axle **36** from dropping downward out of the respective slots **40** and **42** in the inner walls **26** and **28** and through the open bottom of the shell **10**. The two slots **40** and **42** permit restricted upward movement of the printing roller during operation of the device. In FIG. 2, the printing roller **12** is shown in its inoperative, neutral position and in FIG. 3 pressure has been applied to the shell **10** to roll the device across a sheet of paper **50**. It will be noted that in the operative position of FIG. 3 there has been relative movement of the axle **36** toward the top of the slots **40** and **42**.

The two inking rollers **14** and **16** are respectively mounted on axles **66** and **68**, which axles are longitudinally disposed in horizontal slots **70** and **72** in the lower portions of the two inner walls **26** and **28**. The axles **66** and **68** move lengthwise of the respective slots **70** and **72**.

Two pairs of two-arm levers **74** and **76** are respectively held to the outside surfaces of the inner walls **26** and **28**, being pivotly supported thereto about the bolts **24** and **22** (see FIGS. 2 and 3). Nuts **78** and **80** are threaded on the outer ends of the two bolts **22** and **24** and serve to hold the respective levers **74** and **76** thereon. Nuts **79** and **81** secure the shell halves **18** and **20** to the outside ends of the bolts **22** and **24**. Each of the levers **74** and **76** includes a generally horizontally disposed arm **82** and a substantially vertically disposed arm **84**. The horizontal arms **82** of each pair of levers are connected together by a coil spring **88**. The coil spring **88** is spaced above horizontal axle **36** of the printing roller **12**, and in its normally relaxed position (FIG. 2) is substantially horizontal and rests on the outturned ledges **53** and **54** of a flat pusher member **56**. A single pusher member **56** is disposed astraddle each end of the axle **36** against the outer face of the respective inner wall **26** or **28**. The vertical arms **84** of the pivoted levers **74** and **76** at their lower ends engage the axles **66** and **68** respectively of the two inking rollers **14** and **16** (see FIGS. 2 and 6).

Each of the pusher members **56** includes a flat portion **55** which is slotted at its lower edge to provide legs to straddle the axle **36**. A tab **57** extending up from the flat portion **55** of the pusher member **56** provides a backing for the central portion of the spring **88** which rests on the aforementioned ledges **53** and **54** in the neutral position of FIG. 2. The two pusher members **56** are slidably held to the respective outer faces of the two inner walls **26** and **28** by ears **59** and **61** lifted out of the respective walls. With the coil spring **88** forced into the position illustrated in FIG. 3 there is a clockwise swinging of lever **74** and a counterclockwise swinging of lever **76** and a forcing of their vertical arms **84** inwardly, which in turn causes the two inking rollers **14** and **16** to bear against the surface of the printing roller **12**. With release of the force being applied to the shell **10** of the device, the pusher member **56** is returned to the position of FIG. 2 by the coil spring **88**. Simultaneously, the coil spring **88** returns the levers **74** and **76** to their neutral position of FIG. 2, thus permitting the inking rollers to move outwardly with the descent of the printing roller under the force of spring **88** to its neutral position. It has been found to be a distinct advantage to employ a

simple, integral piece such as the pusher member 56 in the mechanism of the device. Such integral piece greatly simplifies assembly and provides a rugged, serviceable structure. The use of the coil spring 38 and its manner of incorporation in the structure permit the use of a single spring for the synchronization of the movement of the three rollers. The particular mechanism of the device of the invention holds the inking rollers to the printing roller with greater force than has been possible heretofore, thus giving a stronger and more distinct imprint.

The printing roller 12, centrally of its length has a relatively thick diametrical wall 100. The wall 100 has a centrally located hole 102 through which the axle 36 extends. The axle 36 in the area of the central wall 100 is round and on either side of the wall is flattened to provide the rectangular cross sectioned lengths 37 and 39. The centrally disposed diametrical wall 100 divides the roller 12 into two compartments which respectively house coil tension springs 104 and 106. Each of the tension springs 104 and 106 at its opposite ends terminates in outwardly extending arms 108 and 110. These arms are disposed within the respective compartments on opposite sides of an inwardly extending rib 112 of the roller 12. With movement of the printing roller 12 either in a clockwise or counterclockwise direction, one of the arms 108 and 110 is engaged by and moved by the rib 112 of the roller and with further rolling of the printing roller 12, the coil tension spring 104 or 106 will be placed under tension or wound up, so to speak. The other one of the arms 108 and 110 of the tension springs 104 and 106, i.e. the arm not engaged by the rib 112 of the moving roller 12, is held stationary by one of the four arm holders 114 which are held to the immovable axle 36. With the lifting of the device from the paper 50, the wound up tension springs 104 and 106 will return the device to its neutral position.

Each of the arms 108 and 110 of the two coil tension springs 104 and 106 is engageable with a single one of the arm holders 114. Each arm holder 114 has a washer portion 115 about the axle 36 and a turned over tab arm 116. The tabs 116 are provided with slots in which the respective arms 108 and 110 of the coil tension springs 104 and 106 rest when the other arm is being turned by rib 112 of the printing roller 12. A free rotating detent member 117 cooperating with one of the fixed arm holders 114 protects the springs 104 and 106 against overwinding (as indicated in phantom lines in FIG. 5) and assures that the device will print only a single message with a single rolling of the device.

Referring to FIG. 5, it will be seen that with rotation of the printing roller 12 in a clockwise direction the rib 112 of the roller picks up the detent member 117 from the position shown in solid lines and moves the detent member 117 into engagement with the fixed tab arm 116 as shown in phantom lines. The roller 12 upon engagement of the detent member 117 with the tab arm 116 is prevented from making more than one revolution.

The provision of the arm holders 114 is an especially desirable feature of the printing device of the invention. The arm holders, besides improving the operation of the device, greatly facilitates the assembling of the device.

The printing roller 12 has approximately two-thirds of its perimeter recessed to provide an area for the mounting of a rubber stereotype 120. The stereotype 120 is bonded by a suitable adhesive to rubber pieces 121 contained in grooves at either end of the recessed area on the roller perimeter. The stereotype 120 carries raised figures and letters in several rows. The ink for the stereotype is provided by the two inking rollers 14 and 16. The respective inking rollers may comprise a single pad ink 122 or a plurality of such pads (if more than one color ink is desired). The particular embodiment illustrated has several such pads 122 in order that different rows of the stereotype letters may be inked with different colors. The individual pads 122 of the inking rollers 14 and 16 are held in recessed areas 124 of a spool-like member 126 which is fixed to the axle 66 or 68 of the respective rollers 14 and 16.

Elastic hoops 130 and 132 placed at the outside edges of the printing roller 12 provide the friction needed to rotate the roller on engagement with the paper 50.

Although an exemplary embodiment of the invention has been disclosed herein for purposes of illustration, it will be understood that various changes, modifications, and substitutions may be incorporated in such embodiment without departing from the spirit of the invention as defined by the claims which follow.

I claim:

1. In a printing device employing a printing roller rotatably and vertically movably supported in a housing, two linking rollers located on opposite sides of said printing roller and horizontally movably and rotatably supported in the housing, and two pivotally supported levers having two arms interconnecting said printing roller and the inking rollers, said levers being pivoted to permit inward movement of one of the arms of each of the respective pivoted levers to apply inwardly acting forces to the two inking rollers, the improvement comprising:

a coil spring connected at its opposite ends to the other arms of the two pivoted levers; and

means for transmitting force to the two levers with upward movement of the printing roller, thereby causing said other arms of the two pivoted levers to move inwardly, applying inwardly acting forces to the two inking rollers.

2. In a printing device having a printing roller and a horizontal axle to support said printing roller, said axle being vertically movably supported in the device, two inking rollers rotatably disposed on opposite sides of the printing roller and horizontally movable toward and away from the printing roller, and two pivotally supported levers having two arms interconnecting said printing roller and the inking rollers, said levers being pivoted to permit inward movement of one of the arms of each of the respective pivoted levers to move the inking rollers toward the printing roller, the improvement comprising:

a coil spring connected at its opposite ends to the other arms of the two pivoted levers, said coil spring being spaced above the horizontal axle of the printing roller; and

a pusher means interconnecting the axle of the printing roller and the underside of the coil spring.

3. A printing device in accordance with claim 2 wherein the pusher means comprises a flat member having legs astraddling the axle of the printing roller and a ledge abutting the underside of the coil spring.

4. In a printing device having a printing roller and a horizontal axle to support said printing roller, said axle being vertically movably, non-rotatably supported in the device, two inking rollers rotatably disposed on opposite sides of the printing roller and horizontally movable toward and away from the printing roller, and two pivotally supported levers each having two arms interconnecting said printing roller and the inking rollers, said levers being pivoted to permit inward movement of one of the arms of each of the respective pivoted levers to move the inking rollers toward the printing roller, the improvement comprising:

a oil spring connected at its opposite ends to the other arms of the two pivoted levers, said coil spring being spaced above the horizontal axle of the printing roller;

a pusher means interconnecting the axle of the printing roller and the underside of the coil spring, said pusher means comprising a flat member having legs straddling the axle of the printing roller and a ledge abutting the underside of the coil spring;

said printing roller being hollow with a tension spring

about the non-rotatable axle within said hollow roller, said tension spring terminating at its opposite two ends in radially extending arms which arms are disposed at the opposite sides of an inwardly extending rib of the hollow roller; and

two arm holders fixed to the non-rotatable axle and disposed to respectively receive one of the two spring arms to restrain said one arm against movement while

the other one of the spring arms is being moved by the rib of the roller.

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