Nov. 30, 1965 L. C. PRICE, JR 3,220,341

PRINTING APPARATUS

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FIG. 1.

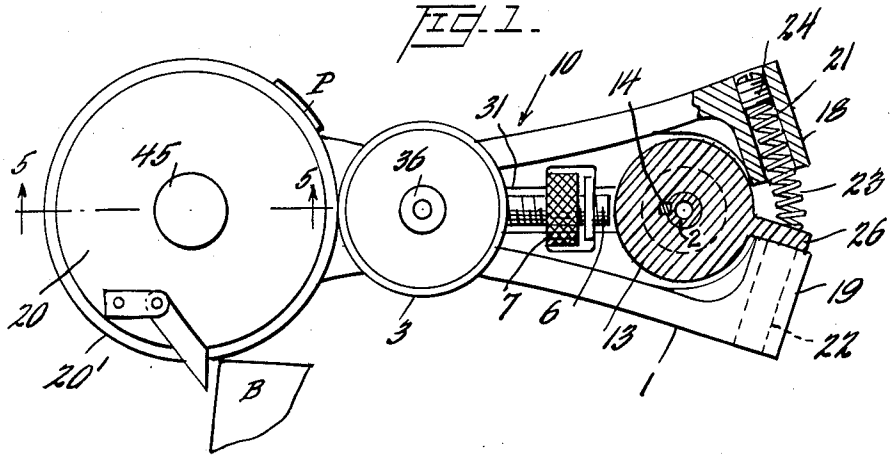
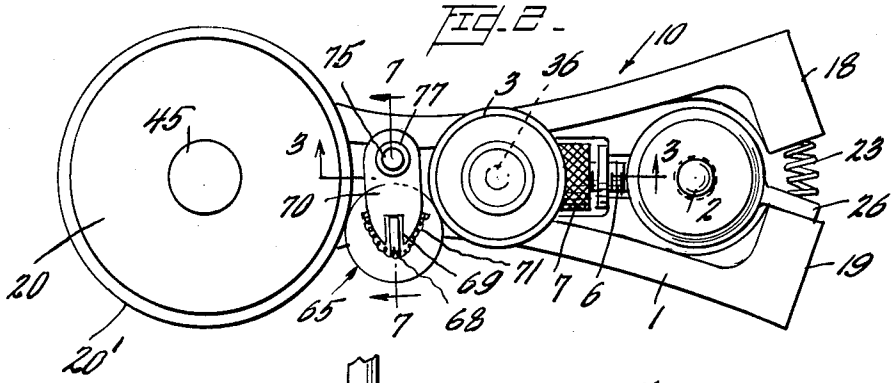


FIG. 2.



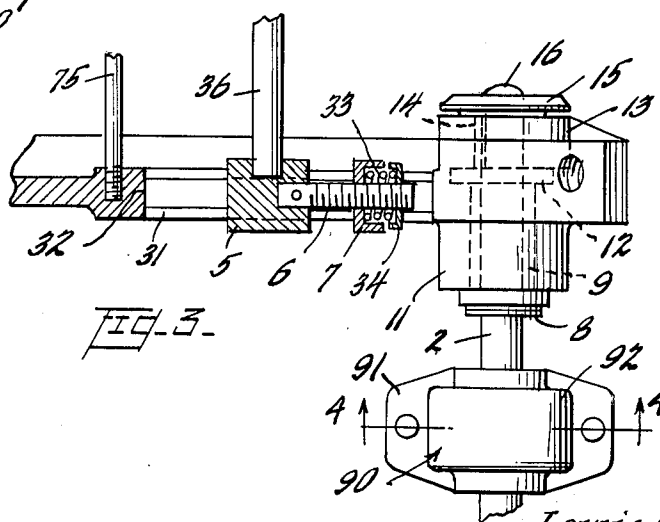


FIG. 3.

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FIG. 4.

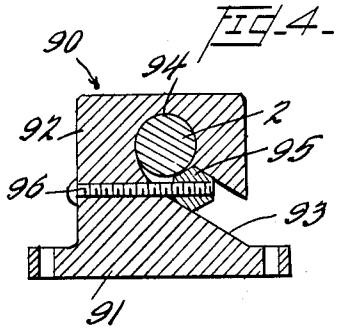


FIG. 5.

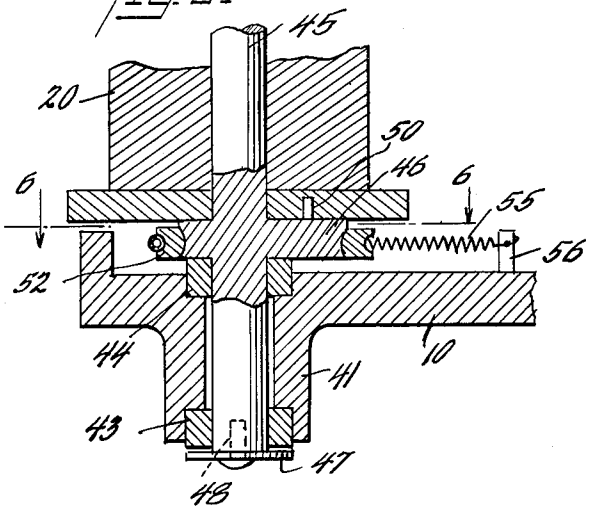


FIG. 7.

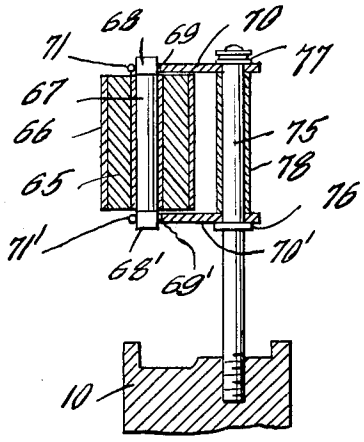


FIG. 6.

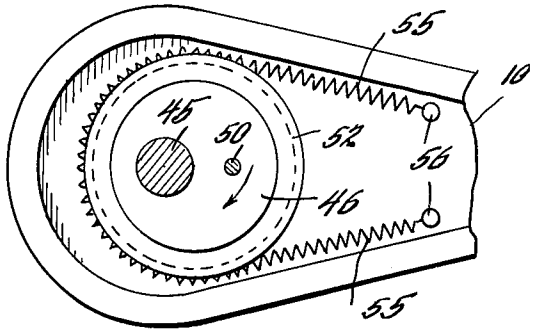
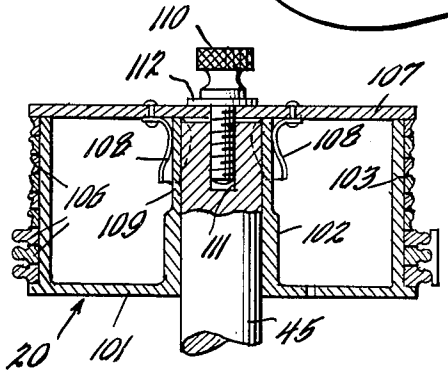


FIG. 8.



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3,220,341

PRINTING APPARATUS

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Filed Nov. 22, 1963, Ser. No. 325,713
4 Claims. (Cl. 101—35)

This invention relates to marking apparatus. In particular the invention is concerned with a novel printing roll and support assembly wherein the assembly may be practically universally used, regardless of the conditions existing at the place of such use.

Prior marking roll assemblies have been subject to serious limitations because each has been designed for special application to any given individual problem. For example, the mountings used in previous structures required separate parts for either right- or left-hand operation. Further, adjustment of the inking roll relative to the printing roll involved cumbersome adjustments, best carried out by an experienced printer. Conversion of the printing system from one type of inking roll to another usually requires replacement of the entire assembly. Further difficulties are experienced due to unreliable mounting brackets for such assemblies. These and other troublesome matters are overcome by the present invention which includes various novel features adapted to make the device herein disclosed adaptable to any given situation with an absolute minimum of manipulation, rearrangement of parts, or difficult adjustments.

Accordingly, an object of the invention is to produce a novel code marking assembly.

A further object of the invention is to provide a universal marking device.

Another object of the invention is to produce a marking assembly adaptable very simply to right- or left-hand operation.

An additional object of the invention is to provide a bracket assembly which assures positive and secure locking of the assembly to any given frame or framework.

Still a further object of the invention is to provide a novel and useful reset mechanism for returning the printing roll to its initial "zero" position.

Another object of the invention is to produce an inking roll system which through the use of interchangeable parts will adapt the system for use in almost every given condition at the printing roll.

Further, an additional object of the invention is to provide a unique mounting system for ink rolls whereby the pressure of the ink roll against the printing roll may be conveniently and quickly adjusted.

Still a further object of the invention is to produce a new printing cylinder arrangement.

These and other objects of the invention not specifically referred to but, none-the-less inherent therein may be accomplished by providing a pivotally mounted arm, biasing said arm relative to a stationary supporting shaft at one end by means of a compression spring whereby the arm may be biased either in a clockwise or counterclockwise direction; the arm having mounted thereon a slide block actuated by means of a "floating" screw such that an inking roll mounted on the slide block may be moved toward and away from a printing roll carried by the opposite terminal end of the arm; means are also provided whereby the printing cylinder or roll may be returned to a preselected zero position by a cam and spring arrangement while at the same time rearrangement of the inking roll printing roll system can be accomplished by providing a "floating" transfer roll between the inking roll and printing roll.

Additionally a novel printing roll is provided wherein

a series of rubber rings in contiguous relation are retained emplaced on the base cylinder by means of a cap or cover held in place by spring fingers.

The invention herein will be clearly understood by consideration of the following detailed description thereof, reference being made to the appended drawings, wherein,

FIG. 1 is a top plan view of the invention partly in section showing in detail the biasing means,

FIG. 2 is a view similar to FIG. 1 but showing a variation in the inking system,

FIG. 3 is a partial side sectional view taken along the line 3—3 of FIG. 2,

FIG. 4 is a sectional view of the mounting bracket shown in FIG. 3, taken along the line 4—4 thereof,

FIG. 5 is a side sectional view taken along the line 5—5 of FIG. 1,

FIG. 6 is a top plan view with certain parts removed of the reset mechanism taken along the line 6—6 of FIG. 5,

FIG. 7 is an elevational sectional view taken along the line 7—7 of FIG. 2, and

FIG. 8 is a side sectional view of a printing roll constructed according to the invention.

Turning initially to FIGS. 1 and 2, it will be seen that there is provided an arm **10** having one end **1** pivotally connected, as will be described to a supporting standard **2**. The opposite or free terminal end of arm **1** carries a printing roll **20** journaled for rotation thereon.

Midway between the terminal ends of arm **1**, there is provided an inking roll **3**. The roll **3** is mounted on a slide block **5** (FIG. 3) which is movable along the arm by means of a screw **6** which may be turned by means of a knurled operator **7**.

The fixed end **1** of arm **10** is mounted on standard **2** so as to pivot relative thereto. Thus standard **2** is provided with a lock ring **8**. A suitable "Oilite" or other bushing member is placed on standard **2** and bears against the ring **8**. The arm **10** is apertured and includes a trunnion **11** which in turn surrounds bushing **9**. A further bearing member **12** in the form of a flat washer is placed on the standard **2** and it in turn is topped by a stop member **13** which is keyed at **14** to the standard **2** being held in place by a bolt and washer **15**, **16** respectively.

The pivoted end of arm **10** is bifurcated so that extending outwardly and rearwardly of the arm **10** are a pair of ear members **18** and **19** which are apertured horizontally at **21**, **22** to receive a spring member **23** which is held in place at one end by a screw **24** threadedly engaged within the aperture **21** or **22** selectively. The opposite end of spring **23** bears against a tongue **26** which extends rearwardly from the stop member **13** and downwardly between the bifurcated ends **18**, **19** of the arm **10**. Since stop member **13** is keyed to standard **2** and the latter, in turn, is non-rotatably fixed to frame F, as will be described, it may be seen, that as shown in FIG. 1 the spring **23** continuously bases the arm **10** in a counterclockwise direction such that pressure against printing roll **20** tending to move the arm **10** clockwise will be resiliently resisted by spring **23**. Thus, firm, but yielding contact, is established between the printing cylinder **20** and, for example, an article B to be printed upon as it is conveyed to the left (as seen in FIG. 1).

When it is desired to change the assembly from right- to left-hand operation, the right-hand operation being illustrated in FIG. 1, then it is quite a simple matter merely to remove the screw **24**, spring **23** from the ear **18** and insert same into aperture **22** in ear **19** whereupon the arm **10** will be biased in the opposite or clockwise direction. This arrangement completely eliminates the use of torsion springs as have been used in the past and also eliminates the necessity for stacking right- and left-hand parts

as also was and is customary in the case of torsion spring mountings.

Turning now to FIG. 3, along with FIG. 2, it will be seen that arm **10** at approximately its midpoint, is slit longitudinally intermediate its ends. The configuration of this opening **31** is generally cruciform so as to accommodate in freely rotatable relation screw member **6** and the operator **7** therefor. One end of screw member **6** is surrounded by a spring member **33** having one end confined within the interior of operator **7** and its opposite end bearing against a cup shaped washer **34** which is seated against the end wall of the cruciform aperture **31**. The opposite end of the screw **6** is fixed as by insertion into a suitable aperture in and to a movable block **5** as by a set screw or pin member, the block having slotted sides so as to be engaged by and slidable along the side walls of slot **31**. Block member **5** in turn carries a spindle **36** adapted to receive inking roll **3** as will be described hereinafter. Thus as the operator **7** is turned the threaded engagement beween itself and screw **6** will cause the screw and slide block to move longitudinally of arm **10** in whichever direction it is desired to move same. Because the jack screw **6** is floatingly mounted in arm **10** it will accommodate quite readily any misalignment which might exist between block **6** and the sides of slot **31** and thus the operation of the assembly is quite smooth and free from objectional bending of the block **5** or screw **6** noticeable in most such assemblies. Thus, also, the inking roll carried by spindle **36** can readily be moved toward and away from the printing cylinder **20** to assure correct pressure between the surface of the printing cylinder plates and the surface of the inking roll **3**.

Turning now to FIGS. 5 and 6, the mounting and reset means for the printing cylinder **20** will now be described in detail. As shown in FIG. 5, the free end of arm **10** is provided with a trunnion **41** which is vertically apertured and in turn carries bearings **43, 44** therein. Journaled for rotation in these bearings is a shaft **45** provided intermediate its ends with a cam member **46** formed integrally therewith. The underside of the cam member **46** rests on bearing **44** while the lower end of shaft **45** is provided with a screw and washer assembly **47, 48** to retain the shaft in place on arm **10**.

The cam member **46** which is eccentric with respect to shaft **45** obviously rotates therewith and is provided on its upper surface with a small pin or projection **50**, which pin engages a recess provided in the printing roll or cylinder **20** so that as the surface of the cylinder is rotated by contact with an object to be printed the cylinder **20**, shaft **45** and cam **46** will be rotated.

For the purpose of biasing the shaft **45** back to a zero position, the outer periphery of cam **46** is surrounded by a biasing ring **52** which ring is formed of an oil impregnated metal and which ring also is freely rotatable about cam **46**. Looped around the exterior of ring **52**, which is suitably grooved, is a spring member **55** having its ends attached to pins **56, 56'** in turn rigidily fixed to arm **10**.

It is believed apparent that as printing cylinder **20** is rotated by contact of the contact rings **20'** with an article (FIG. 8) and shaft **45** and cam **46** are also rotated, the high point on the cam will move toward the end of arm **20** with the consequence that spring **55** is placed under increasing tension tending to cause the cam to rotate back to the position shown in FIG. 6. Thus, if cylinder **20** is rotated less than 180° before an article clears the printing station, it will be rotated back to the position at which rotation began. However, if it is rotated more than 180° then the cam **46** will continue its rotation through a full 360° and again cylinder **20** will be returned to its start position as the spring **55** biases the eccentric cam **46** back to the position shown in FIG. 6. It is now believed apparent that a simple but highly effective reset mechanism is provided for cylinder **20**.

Returning briefly to FIG. 1, it will be noted that cylinder **20** may be provided with a trip member **60** comprising an arm **61** spring biased by spring **62** in one direction. This trip assembly will be used where, for example, it is essential that an imprinted character register with precise accuracy on each article. The trip assembly **60** assures that, with the printing matter P positioned at any given point on the circumference of the printing cylinder **20**, it will contact each item B at precisely the same point as the item contacts trip **60** and begins rotation of the roll **20**.

Turing again to FIGS. 1 and 2, it has been stated that these two figures show variations in the inking system which may be accommodated by the described assembly. Thus in FIG. 1 the inking roll **3** is directly in contact with the printing surface P while in FIG. 2, the ink is transferred from inking roll **3** to the printing roll **20** via an intermediate roll **65** which is mounted as shown in FIG. 7 for universal floating movement between the ink roll **3** and cylinder roll **20** to assure positive contact between its peripheral surface and the surfaces of these respective rolls. Thus, as shown in FIG. 7, intermediate roll, having a suitable ink receptive cover **66** is journaled for rotation on a shaft **67**. Shaft **67** in turn is provided with squared or rectangular ends **68, 68'** which ends rest in slots **69, 69'** (see FIG. 2) provided at the terminal ends of bracket members **7, 70'**. In order to retain the ends of the shaft **67** seated in the enlarged slots **69, 69'** spring members **71, 71'** are looped around the ends of bracket members **70, 70'** and are fixed thereto by their ends at points removed inwardly toward the center of these brackets. Brackets **70, 70'** are in turn carried rotatably on a spindle member **75**, by suitable lock rings **76, 77** and spacer **78** interposed between them. Thus it will be seen that transfer roll **70** will be continually spring biased toward contact with the surfaces of rolls **3** and **20** and can move in almost any direction to accommodate for variations in roll surface or perhaps some vertical misalignment between spindle **36** and spindle **75**.

As has been previously stated the entire assembly may be mounted on a frame such that printing of the desired matter on articles being conveyed or moved by the marker is obtained. For the purpose of mounting the standard **2** on such a frame, for example, there is provided a unique bracket **90**, illustrated in FIGS. 3 and 4. This bracket includes a base portion **91** and an upstanding apertured clamping portion **92**. The base **91** is fixed to frame F by suitable bolts S. The clamping portion of the bracket is provided with an inclined slit **93** which leads from one side face thereof to a central opening **94** adapted to receive the member to be fastened therein, in this case standard **2**. Slidably carried in the slot is a hexagonal shaped key **95** which has two of its sides engaging the walls of the slot and a further side in engagement with standard **2**. The key **95** is locked in clamping engagement with standard **2** by means of a lock screw **96** which pierces the clamping portion of bracket **90** and intersects with slot **93** and is threadedly engaged with key **95**. Thus as draw screw **96** is tightened the key **95** is drawn up the inclined slot into firm engagement with standard **2** holding same securely against any axial or rotational movement. Also associated with the assembly described is a novel printing cylinder **20** shown in detail in FIG. 8. Essentially this element consists of a hollow cylinder **101** having a central base **102** which is apertured to receive shaft member **45**. The outer cylindrical wall **103** of the cylinder is surrounded by a series of concentric loosely fitting concentric annular rings **106**, which rings are generally T-shaped in configuration and are type holding members constructed to function as suggested in patent 2,222,333. In order to retain these rings in place, the top of cylinder **102** is closed by a cover member **107** positioned and held in place by a plurality of spring fingers **108** which engage a reduced portion **109** of central boss **102**. Thus the

entire cylinder assembly can be removed as a unit from shaft **45**.

For the purpose of retaining the entire assembly on shaft **45**, a hand screw **110** is provided, the threaded portion thereof engaging threaded base **111** in shaft **45**, and the head thereof being provided with an annular shoulder **112** bearing against cover **107**.

Having described my invention in detail it will be apparent that various modifications will occur to those skilled in the art, such changes being within the spirit and scope of the invention which is limited only as defined in the claims following.

What is claimed is:

1. A printing assembly for printing on moving objects comprising a movable arm having a free end and a pivotally mounted end; means for mounting said arm adjacent articles to be imprinted with its free end positioned so as to move toward and away from said articles; a printing member mounted on the free end thereof for contact and imprinting of said articles; the pivotally mounted end of said arm including a bifurcated portion and having journal means disposed medially of the bifurcated portion to pivotally support the arm; said mounting means including further a stationary part mounted thereon having outstanding lug disposed medially of said bifurcated portion with said lug extending between the bifurcations defining the end portion of said arm; compression spring means biased between and acting on one of said bifurcations so as to bias the other of said bifurcations against the opposite side of said lug and consequently position said free end of said arm in a direction toward the articles to be imprinted.

2. A printing assembly as defined in claim **1** wherein said compression spring is adjustably biased between said lug and said one bifurcation of end portion of said arm.

3. A printing assembly as defined in claim **1** wherein the bifurcations defining the bifurcated end portion of said arm are identical and said spring is positionable selectively between either one of said bifurcations and said lug for either right or left hand operation of said assembly.

4. A printing means for articles moving in a predetermined path comprising a pivoted arm having a free end and a journaled end; printing means adopted to contact the moving articles mounted on the free end of said arm, said journaled end thereof including a pair of spaced terminal ends defining bifurcations and a mounting means disposed medially between said bifurcations; a standard receiving said mounting means, said mounting means being rotatably fixed to the standard; stop means fixed to said standard above said mounting means, said stop means including a lug member extending between said bifurcations; a compression spring mounted between and acting on said lug and one of said bifurcations and means for adjusting said spring carried by said one bifurcation whereby said arm is biased toward the articles and the other of said bifurcations engages said lug to limit said biased movement.

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