April 16, 1963 F. C. WORTH 3,085,506

MARKING DEVICE

Filed March 23. 1960

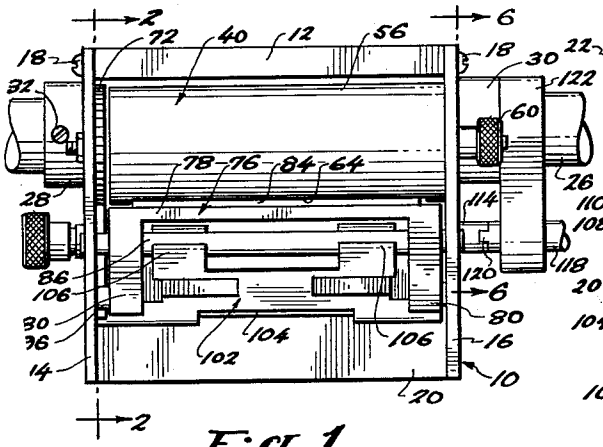


Fig. 1

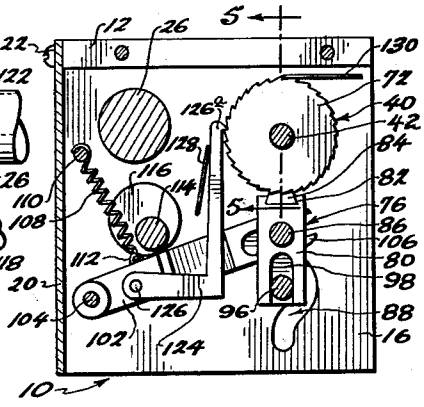


Fig. 2

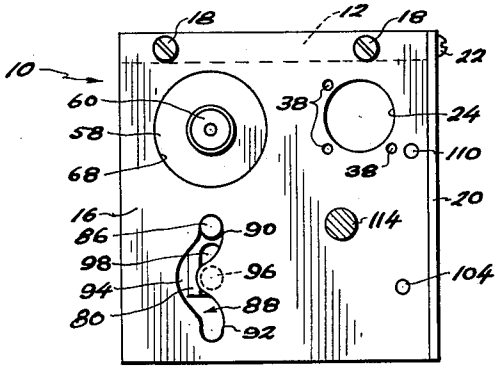


Fig. 4

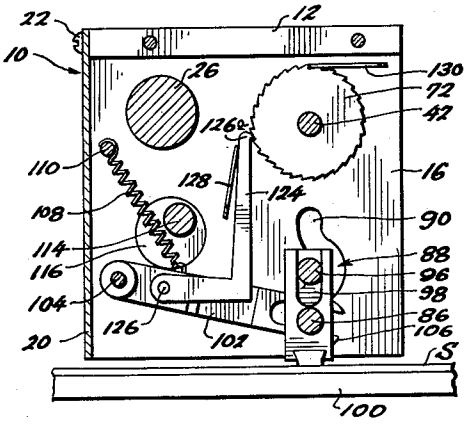


Fig. 3

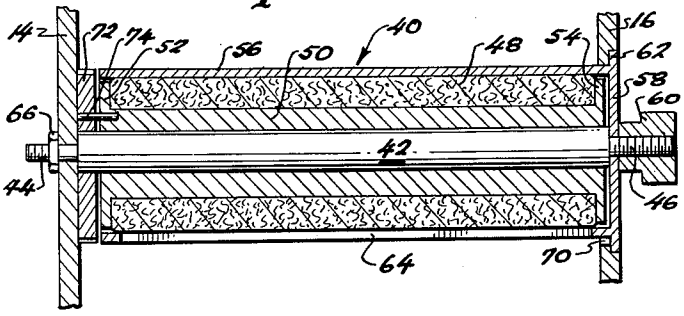


Fig. 5

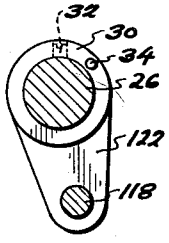


Fig. 6

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MARKING DEVICE

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This invention relates generally to marking or stamping devices, and more particularly is directed to a marking or stamping device for applying inked impressions or markings to articles or sheet material conveyed past the marking device and intermittently halted for marking by the latter.

Marking devices of the described character generally include a marking member carrying type or the like, an inking pad, and an actuating mechanism for moving the marking member between an inking position, where the type is pressed against the inking pad to receive ink from the latter, and a marking position, where the inked type is pressed against the article or sheet material at rest adjacent the marking device in order to apply an inked marking to the article or sheet material.

In marking devices having the above general arrangement, it is desirable that the type be displaced in a direct perpendicular to the surface of the article or sheet material to be marked during the final increment of the movement of the marking member toward its marking position in order to avoid blurring of the inked marking, and also that the type be displaced in a direction perpendicular to the surface of the inking pad during the final increment of the movement of the marking member toward its inking position in order to ensure the uniform application of ink to the raised surfaces of the type. Although some existing markings or stamping devices achieve the foregoing conditions for avoiding blurring of the inked markings and for obtaining uniform application of ink to the type, such existing devices contact the type with the same limited area of the inking pad during successive operating cycles so that such area of the pad has its ink supply rapidly depleted and undergoes excessive wear. Thus, with the existing stamping devices, it is necessary to frequently apply ink to the pad when only a relatively small area thereof has had the ink removed therefrom and also to renew the pad by reason of the uneven wear of its surface.

Accordingly, it is an object of the present invention to provide a marking or stamping device of the described character which provides the conditions essential for obtaining uniform application of ink to the type and for avoiding blurring of the inked marking, while utilizing the entire surface of the inking pad for applying ink to the type, thereby to avoid excessive localized wear of the inking pad and the repeated withdrawal of ink from a relatively small area of the pad.

Another object is to provide a marking or stamping device having the above characteristics and consisting of a relatively simple arrangement of structural elements capable of reliably consistent operation.

In accordance with an aspect of the invention, a marking or stamping device has an inking pad in the form of a rotatable cylinder to which step-by-step rotation is imparted in response to the repeated movement of the marking member from its inking position to its marking position so that a different portion of the surface of the inking pad is contacted by the type whenever the marking member is displaced to its inking position, thereby to equalize the wear on the surface of the inking pad and to ensure that the ink is removed uniformly from the entire surface of the pad.

In accordance with another aspect of the invention, the marking member is guided during its movements between the inking and marking positions so that the type faces in opposed directions in such positions, with the final increments of movement of the marking member toward its inking and marking positions being in the same directions in which the type faces at such positions, and the mechanisms for effecting the necessary movements of the marking member includes a rockable arm structure actuated by a rotated cam and pivotally connected to a pawl which engages a ratchet coupled to the cylindrical inking pad so that, during each angular displacement of the rockable arm structure corresponding to the movement of the marking member from its inking position to its marking position, the pawl causes an angular displacement of the cylindrical inking pad.

A further object of the invention is to provide an improved mounting for a marking or stamping device of the described character whereby the marking or stamping device is conveniently adjustable for marking articles or sheet material conveyed under the marking device, past one side of the marking device, or above the marking device.

The above, and other objects, features and advantages of the invention, will be apparent in the following detailed description of an illustrative embodiment thereof which is to be read in connection with the accompanying drawing forming a part hereof, and wherein:

FIG. 1 is a front elevational view of a marking or stamping device embodying the present invention;

FIG. 2 is a vertical sectional view taken along the line 2—2 of FIG. 1, and showing the device with its marking member in an inking position;

FIG. 3 is a view similar to that of FIG. 2, but showing the marking or stamping device with its marking member in a marking position;

FIG. 4 is a side elevational view of the marking or stamping device of FIG. 1;

FIG. 5 is an enlarged axial sectional view taken along the line 5—5 of FIG. 2, and showing an inking pad assembly included in the device embodying the invention; and

FIG. 6 is a fragmentary sectional view taken along the line 6—6 of FIG. 1.

Referring to the drawing in detail, it will be seen that a marking or stamping device embodying the present invention and there generally identified by the reference numeral **10** includes a housing having a top wall **12**, side walls **14** and **16** depending from the opposite side edges of top wall **12** and secured to the latter, as by screws **18**, and a back wall **20** depending from the back edge of top wall **12** and secured to the latter, as by screws **22**.

The opposite side walls **14** and **16** are formed with aligned circular openings **24** (FIG. 4) located in the upper rear portions of the side walls, with the housing being considered in the position illustrated in the drawing, and the openings **24** are intended to slidably receive a support rod **26** of circular cross section which is suitably mounted adjacent the path of the conveyed articles or sheet material to be marked. In order to position the housing of marking device **10** along the support rod **26**, collars **28** and **30** are secured on support rod **26**, as by set screws **32** (FIGS. 1 and 6), and are located against the outside surfaces of side walls **14** and **16**, respectively. Further, in order to angularly position the housing of marking device **10** about the axis of support rod **26**, the collar **30** secured to the support rod is provided with an axially projecting pin **34** (FIG. 6) adapted to be selectively engaged in one of several holes **38** formed in the adjacent side wall **16** close to the margin of the opening **24** in that side wall (FIG. 4).

The marking device **10** embodying the invention fur-

ther includes an inking pad assembly generally identified by the reference numeral 40 and illustrated in detail in FIG. 5. The inking pad assembly 40 includes an axle 42 having reduced diameter, threaded extensions 44 and 46 at its opposite ends. A cylindrical inking pad 48 is mounted on a bushing 50 having end flanges 52 and 54 and being freely rotatable on axle 42, and a cylindrical shield 56 surrounds the cylindrical inking pad 48 and has an end wall 58, at one end, formed with a central opening through which the threaded extension 46 of the axle projects to receive a knurled nut 60, by which the sleeve or shield 56 is secured on the axle 42. The periphery of end wall 58 projects radially beyond the outer surface of sleeve 56 to present an annular rim 62, and the sleeve 56 is formed with an axially extending slot 64 through which a portion of the surface of inking pad 48 is exposed for inking contact with type, as hereinafter described in detail.

The inking pad assembly 40 is mounted below the forward portion of top wall 12, with the threaded extension 44 of axle 42 projecting through a suitable opening in side wall 14 and receiving a nut 66 by which the axle is secured to side wall 14, and with the sleeve 56 extending through a circular opening 68 which is formed in side wall 16 (FIG. 4) and which is counterbored in order to provide a seat for the rim 62, as shown in FIG. 5. Further, the sleeve 56 of the inking pad assembly is secured against rotation with its slot 64 facing diametrically away from top wall 12, for example, by a key 70 (FIG. 5) extending from the rim 62 and being received in a suitable notch formed in the periphery of the opening 68. When it is desired to replace or re-ink the pad 48, the inking assembly 40 may be removed from the housing through the opening 68 upon removal of the nut 66.

As is apparent in FIG. 5, the bushing 50 carrying inking pad 48 has an axial length less than that of the axle 42 so as to leave a space between side wall 14 and the adjacent end flange 52 of the bushing, and a ratchet wheel 72 is rotatable on the axle 42 in that space and rotatably coupled to the bushing 50, for example, by an axial pin 74.

The marking device 10 embodying the invention further includes a marking member generally identified by the reference numeral 76 which has a cross piece 78 and end pieces 80 extending at right angles to the elongated cross piece. The surface of cross piece 78 facing in the direction away from the end pieces 80 is formed with a longitudinally extending, dove-tailed groove 82 which is adapted to receive rubber type 84 (FIG. 2), and the marking member 76 is mounted on an elongated pin 86 extending parallel to the cross piece 78 and having its opposite end portions projecting through suitable openings in the end pieces 80 and being slidably received in cam slots 88 which are formed in side walls 14 and 16 below the location of ink pad assembly 40. Referring to FIG. 4, it will be seen that each of the cam slots 88 includes upper and lower portions 90 and 92, respectively, which are generally in vertical alignment with the axis of the inking pad assembly 40, and an intermediate portion 94 which is bowed forwardly, that is, in the direction away from rear wall 20 of the housing. Further, each of the side walls 14 and 16 has a fixed, stub pin 96 projecting inwardly therefrom at a location just in back of the intermediate curved portion 94 of the related cam slot 88, and the fixed stub pins 96 are slidably received in elongated grooves 98 extending longitudinally along the outer surfaces of the end pieces 80 of cross member 76.

When the ends of the elongated pin 86 are disposed in the upper portions 90 of cam slots 88, the stub pins 96 engaging the grooves 98 position the marking member 76 so that the cross piece 78 thereof is uppermost and the type 84 mounted in the groove 82 project through the slot 64 of sleeve 56 for contact with the surface of inking pad 48, as shown in FIG. 2, thereby to apply ink to the raised surfaces of the type 84. On the other hand, when the pin 86 is moved downwardly with its opposite ends guided by the cam slots 88, the pin 86 passes in front of the axis of the stub pins 96 so that, when the ends of the pin 86 are disposed in the lower portions 92 of the cam slots, as shown in FIG. 3, the marking member 76 is disposed with its cross piece 78 lowermost, and the type 84 face downwardly for marking contact with the surface of an article or sheet material, indicated by the letter S on FIG. 3 in order to apply an inked marking to the article or sheet material while the latter is supported by a support surface 100.

The elongated pin 86 is displaced along the cam slots 88 by a rockable arm structure 102 which is pivoted, at one end, on a pin 104 having its opposite ends supported in suitable openings formed in the lower rear portions of side walls 14 and 16, so that the arm structure 102 can swing about an axis parallel to that of the pin 86. The free end portion of the rockable arm structure 102 terminates in two slotted or bifurcated extensions 106 which are laterally spaced part, and which slidably embrace the elongated pin 86 between the end pieces 80 of marking member 76 (FIG. 1). Tension springs 108 (FIG. 2) are connected, at one end, to a pin 110 which is supported, at its opposite ends, in the upper rear portions of side walls 14 and 16, while the opposite ends of the springs 108 are secured to anchor rings 112 secured in arm structure 102 ahead of the pivot pin 104. Thus, springs 108 yieldably urge arm structure 102 to rock upwardly, thereby tending to move the elongated pin 86 to the upper portions of cam slots 88 for disposing the marking member 76 in its inking position, as illustrated in FIG. 2.

In order to effect the intermittent movement of the marking member 76 to its marking position, as illustrated in FIG. 3, a drive shaft 114 is rotatably journalled in the side walls 14 and 16 and extends above the rockable arm structure 102 and a radial cam 116 (FIGS. 2 and 3) is secured on shaft 114 for rotation with the latter in order to depress the rockable arm structure in opposition to the action of springs 108 when shaft 114 is turned from the position where a portion of the cam 116 of relatively small radial extent engages the arm structure 102 to a position where the latter is engaged by a portion of the cam of maximum radial extent.

The supporting surface 100 may be intermittently advanced past marking device 10, and thereby form the conveyor for the article or sheet material S to be marked, or, where the sheet material is in the form of a continuous web, the supporting surface 100 may be stationary, while the continuous web is intermittently pulled, or otherwise advanced over the stationary supporting surface. In either case, the rotation of the drive shaft 114 is synchronized with the movement of the intermittently conveyed articles or sheet material so that, starting with the cam 116 in the position illustrated in FIG. 2, a single complete revolution is imparted to shaft 114 whenever an article or the sheet material comes to rest adjacent the marking device. During such complete revolution of shaft 114, the marking member 76 is moved from its inking position (FIG. 2) to its marking position (FIG. 3), and then back to its inking position. Thus, during the advancement of the conveyed articles or sheet material, the marking member remains in its inking position, in which the type 84 is remote from the path of the conveyed articles or sheet material to avoid any interference with the movement thereof. Further, it will be apparent that, by reason of the fact that the upper and lower portions 90 and 92 of the cam slots 88 and the stub pins 96 all lie in a common plane passing through the axis of inking pad assembly 40, it will be apparent that the final increments of movement of the type 84 toward both the surface of the inking pad 48 and the surface of the article or sheet material to be marked occur in directions perpendicular to such surfaces, thereby

to ensure the conditions necessary for uniform application of ink to the raised surfaces of the type and for avoiding blurring of the inked markings applied to the articles or sheet material.

As shown in FIG. 1, the shaft 114 of the marking device may be driven by a shaft 118 with an axially separable coupling 120 therebetween so that the axial withdrawal of the shaft 118 from the shaft 114 renders the marking device inoperative, even though the shaft 118 continues to be actuated in synchronism with the movements of the associated conveyor. If desired, the end of shaft 118 adjacent marking device 10 may be rotatably and axially slidably supported in a bracket 122 (FIGS. 1 and 6) which is also suspended from the rod 26 and suitably secured to the adjacent collar 30.

In accordance with the present invention, the cylindrical inking pad 48 is rotated, in a step-by-step manner, in response to the repeated movement of marking member 76 from its inking position (FIG. 2) to its marking position (FIG. 3). In order to effect such step-by-step rotation of inking pad 48, a pawl 124 is pivotally mounted, at one end, on a pin 126 carried by the rockable arm structure 102, while the other end of the pawl 124 is formed with a nose 126*a* engageable with the peripheral teeth of the ratchet wheel 72 which is rotatably coupled with the bushing 50 of the inking pad. A leaf spring 128 is secured, at one end, to the adjacent side wall 14 of the housing, while the free end of leaf spring 128 bears slidably against pawl 124 for yieldably urging the nose 126*a* of the pawl against the periphery of ratchet wheel 72. It will be apparent that, whenever rockable arm structure 102 is displaced downwardly from the position of FIG. 2 to the position of FIG. 3, the nose 126*a* of pawl 124 cooperates with the teeth of ratchet wheel 72 to cause angular displacement of the latter through a fraction of a revolution, and such angular displacement is transmitted to the inking pad 48 in order to expose a new portion of the surface thereof at the slot 64 for contact by the type 84 when marking member 76 is returned to its inking position. In order to prevent reverse rotation of ratchet wheel 72 and inking pad 48 during the return of the marking member to its inking position, a leaf spring 130 is also mounted, at one end, against the inside surface of side wall 14 and has its free end in resilient engagement with the peripheral teeth of ratchet wheel 72 to act as a hold pawl permitting rotation of ratchet wheel 72 only in the counter-clockwise direction, as viewed in FIG. 2.

Although the marking device 10 is illustrated with its housing secured to the support rod 26 so that the type 84 projects downwardly from the housing in the marking position of marking member 76, thereby to apply inked markings to the articles or sheet material conveyed under the marking device, it is apparent that, by engaging the pin 34 of collar 30 in another selected one of the openings 38 of side wall 16, the housing may be disposed so that the type 84 will project either from the side of the housing or from the top of the housing when the marking member 76 is in its marking position, thereby to permit marking of articles or sheet material conveyed along a path extending past the side of the housing or above the housing, respectively.

From the above description of an illustrative embodiment of the invention, it will be apparent that the entire surface of the cylindrical inking pad 48 is utilized in applying ink to the type 84 during repeated operating cycles of the marking member 76, thereby to ensure uniform wear on the surface of the inking pad and uniform withdrawal of ink from the pad. Further, these advantages with respect to the utilization of the inking pad are obtained in an arrangement imparting substantially linear movements to the marking member 76 as it approaches both its inking position and its marking position, thereby to obtain the most advantageous conditions for uniform inking of the type and for the avoidance of blurring of the inked markings.

Although a particular embodiment of the invention has been described in detail herein with reference to the accompanying drawing, it is to be understood that the invention is not limited to that precise embodiment, and that various changes and modifications may be effected therein without departing from the scope or spirit of the invention, except as defined in the appended claims.

What is claimed is:

1. A marking device comprising a housing including side walls, one of said side walls having a relatively large circular opening therein and the other of said side walls having a relatively small opening in axial alignment with said large opening; an inking assembly including a cylindrical shield dimensioned to extend axially through said large opening and having an axial slot, an end wall at one end of said shield projecting radially beyond the latter to define a rim for abutment against said one side wall around said large opening, said end wall having a central opening, an axle having reduced diameter, threaded end portions dimensioned to extend through said central opening of the end wall and said small opening of the other side wall, respectively, nuts on said end portions of the axle to secure the latter to said shield and to secure the inking assembly to said housing, respectively, and a cylindrical inking pad rotatable on said axle within said shield and having a portion of its surface exposed through said slot of the shield; a tumbler type marking member carrying type and being movably mounted between said side walls of the housing for combined pivotal and bodily movement between an inking position, where said type projects through said slot into contact with said exposed portion of the surface of the pad, and a marking position, where said type is remote from said pad and disposed for marking contact with a surface to be marked; means for displacing said marking member between said inking and marking positions; and means operative in response to displacement of said marking member toward said marking position to effect turning of said inking pad so that a different portion of the surface of said pad is exposed for contact by said type whenever said marking member returns to said inking position.

2. A marking device as in claim 1; wherein said means for displacing the marking member includes an arm structure rockable about an axis parallel to the axis of said cylindrical inking pad, spring means urging said arm structure to rock in one direction for moving said marking member to said inking position, and cam means acting on said arm structure to intermittently rock the latter in the other direction for moving said marking member to said marking position.

3. A marking device as in claim 2; wherein said means operative to effect turning of the inking pad includes a ratchet wheel rotatable on said axle at one end of said inking pad and being rotatably coupled to the latter, and a pawl pivotally mounted on said arm structure and engaging said ratchet wheel to turn the latter during rocking of the arm structure in said opposite direction by said cam means.

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