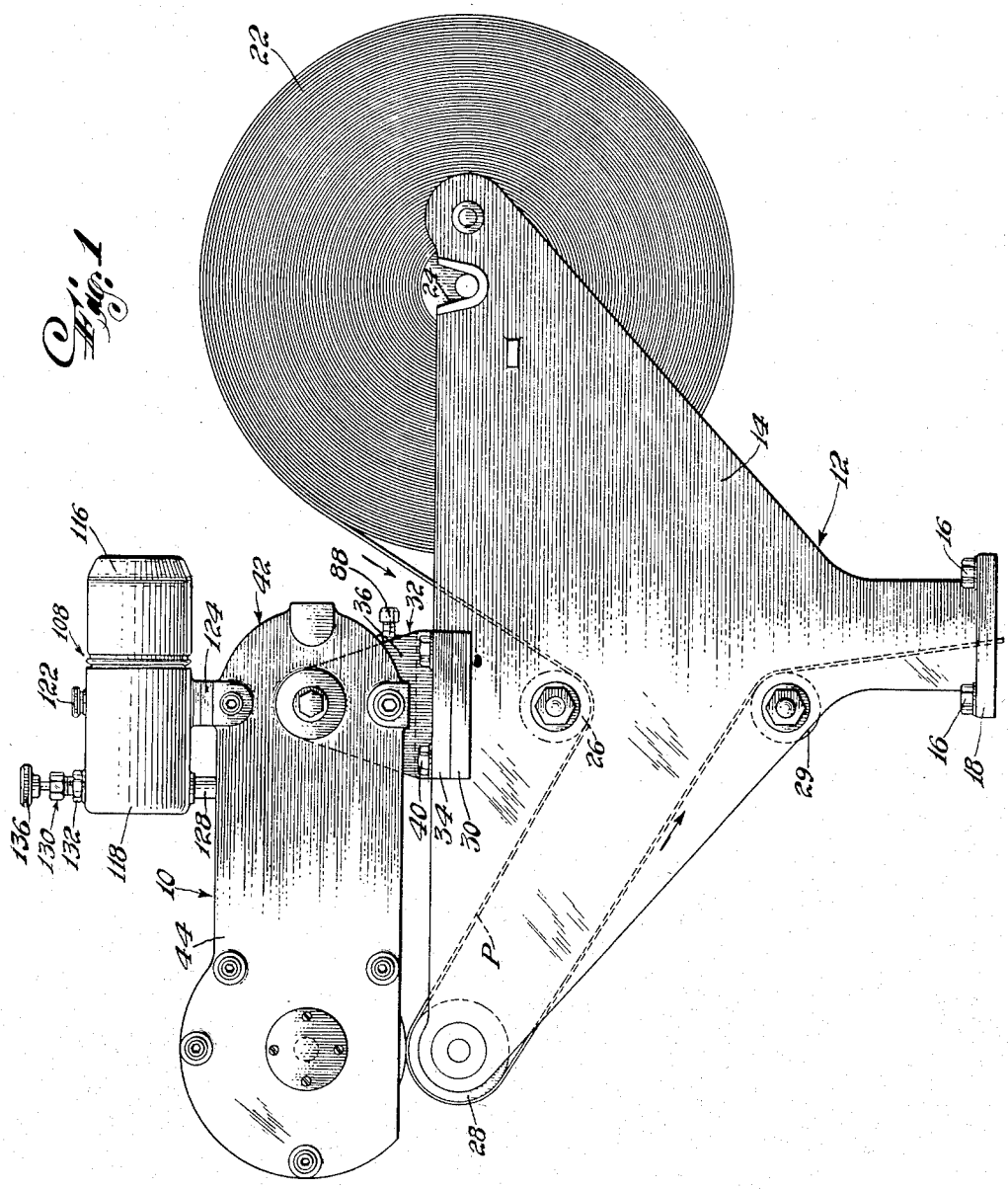
May 20, 1958 J. K. JACKSON 2,835,195

MARKING APPARATUS

Original Filed June 21, 1950 4 Sheets-Sheet 1

Fig. 1



INVENTOR.
JOHN K. JACKSON
BY
Joseph Montgomery
ATTORNEY

May 20, 1958 J. K. JACKSON 2,835,195

MARKING APPARATUS

Original Filed June 21, 1950 4 Sheets-Sheet 2

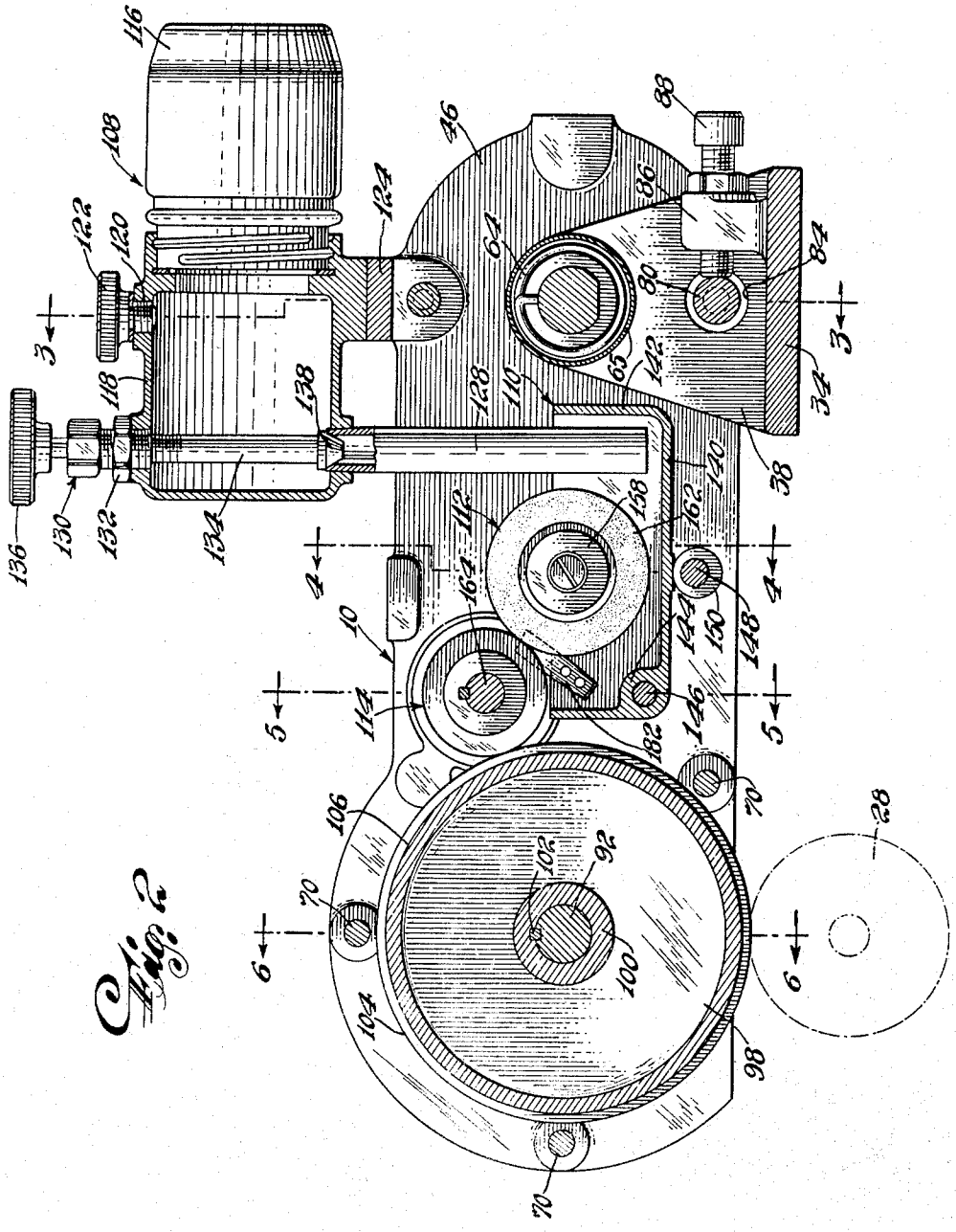


Fig. 2

INVENTOR.
JOHN K. JACKSON
BY
Jeff Montgomery
ATTORNEY

May 20, 1958 J. K. JACKSON 2,835,195

MARKING APPARATUS

Original Filed June 21, 1950 4 Sheets-Sheet 3

Fig. 4

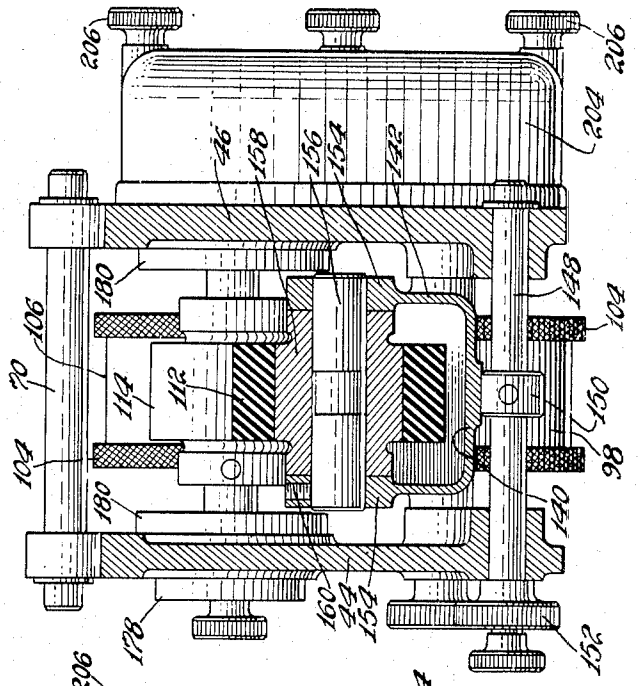
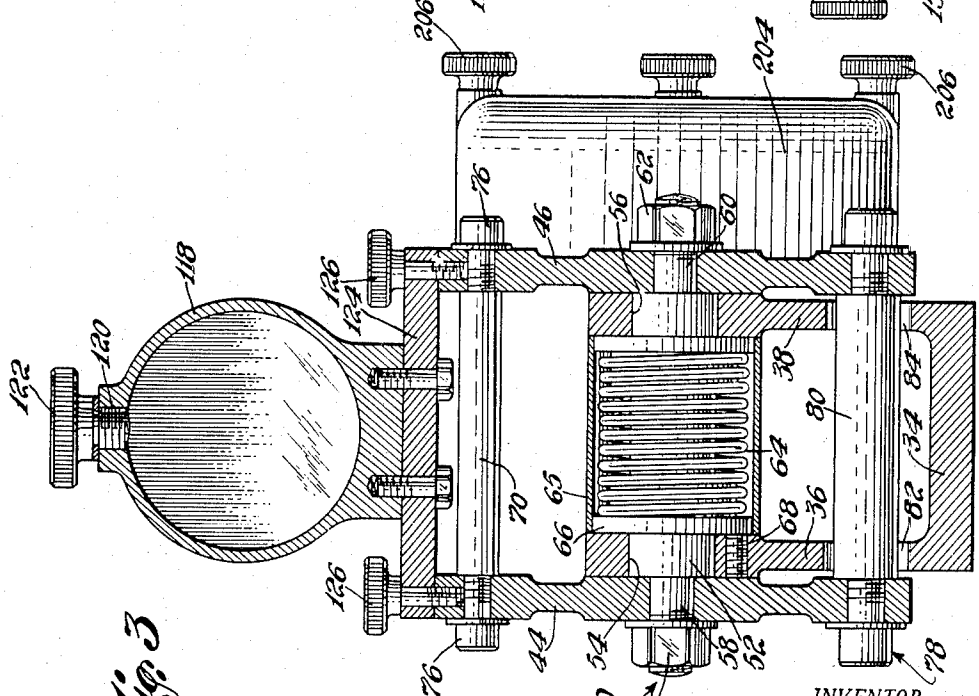


Fig. 3



INVENTOR.
JOHN K. JACKSON
BY
Jack Montgomery
ATTORNEY

May 20, 1958 J. K. JACKSON 2,835,195

MARKING APPARATUS

Original Filed June 21, 1950 4 Sheets-Sheet 4

Fig. 6

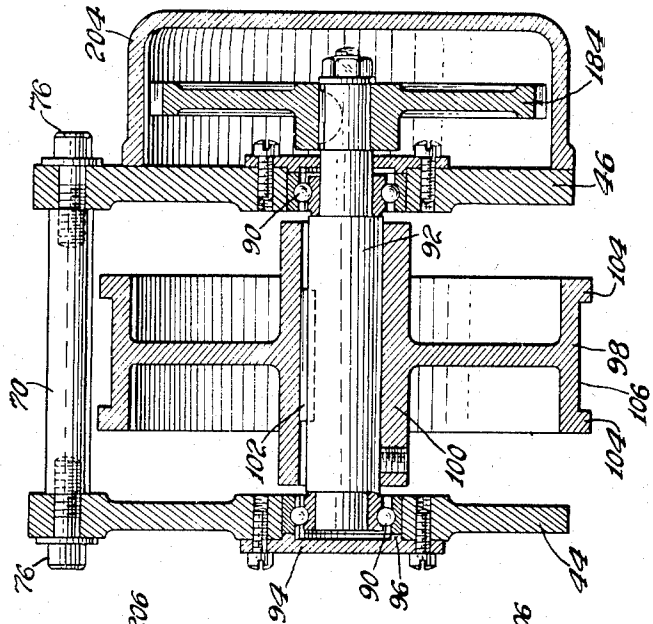
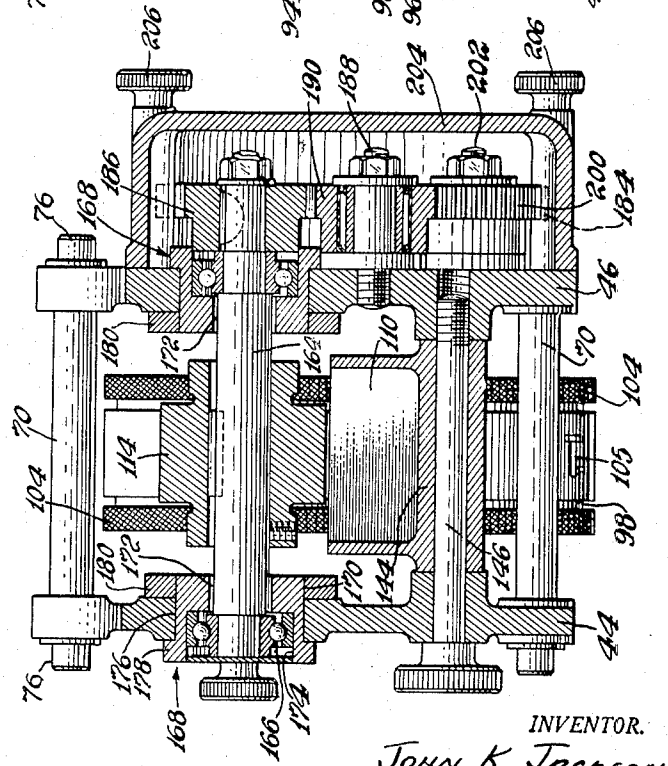


Fig. 5



INVENTOR.
JOHN K. JACKSON
BY
Joseph Montgomery
ATTORNEY

United States Patent Office 2,835,195 Patented May 20, 1958

2,835,195

MARKING APPARATUS

John K. Jackson, Westfield, N. J., assignor, by mesne assignments, to Adolph Gottscho, Inc., Hillside, N. J., a corporation of New York

Original application June 21, 1950, Serial No. 169,369, now Patent No. 2,641,999, dated June 16, 1955. Divided and this application May 5, 1953, Serial No. 358,320

5 Claims. (Cl. 101—219)

This invention relates to improvements in marking apparatus, and is particularly directed to apparatus for marking indicia in continuous or repeated patterns on a continuous roll, sheet, web or strip of material, or for applying indicia to other desired surfaces or objects.

This application is a division of my application No. 169,369, filed June 21, 1950, and is now Patent No. 2,641,999, issued June 16, 1953.

More specifically the invention is directed to marking apparatus for use with existing wrapping, cutting or similar machinery through which a continuous roll, sheet, web or strip of material, or other object to be marked is fed, which apparatus imprints a continuous or repeated pattern, trademark, code marking, date or the like on the material or object during the feeding of the latter through machinery of the character indicated.

One of the objects of the present invention resides in the provision of a marking or imprinting attachment for existing machinery through which a continuous web, sheet or strip of material, or object is fed, for printing continuous or repeated indicia or pattern thereon of uniform intensity and sharply defined clarity.

Another object is the provision of an attachment of the character indicated which operates on the principle of an aniline printing press for printing continuous or repeated indicia of uniform intensity and sharply defined clarity upon the continuous roll, sheet, web or strip of material, or object fed to or through existing machines performing operations thereon, and without interfering with such operations.

A further object is the provision of an attachment of the character indicated wherein the marking attachment includes means for controlling the printing pressure on the material or object being marked, and means for controlling the coating of printing ink upon the impression element or printing roller or cylinder.

A further object of the invention is the provision of a marking or printing attachment of the character indicated, wherein the contact of the impression or indicia bearing roller or cylinder with the sheet, strip or object to be marked is limited and the printing pressure may be effectively varied; and wherein structure is provided for varying and controlling the transfer of printing ink to the impression roller or cylinder to thereby provide a printing impression of uniform intensity and sharply defined clarity.

A further object of the invention is the provision of a printing or marking attachment of the character indicated embodying an improved system for transferring ink from the ink supply to the impression roller; which system includes an ink supply roller dipping into an ink fountain having a constantly maintained ink level therein, a transfer or metering roller interposed between the ink supply roller and the impression roller or cylinder, and mechanism for adjusting the surface contact of the ink supply roller with the transfer or metering roller, and the surface contact of the latter with the impression roller, to thereby achieve the even distribution of ink over the impression roller or cylinder.

A still further object of the present invention resides in the provision of a marking attachment of the character indicated for existing machinery through which a continuous web or sheet of material, or object is fed, which attachment is simple in construction, sturdy and easily cleaned and otherwise maintained, and which attachment is adapted to be installed on a variety of machines of the type referred to above to thereby eliminate the necessity for subjecting the material or object to a separate marking or printing operation.

Other and further objects of the present invention will be manifest from the following description and the accompanying drawings, wherein:

Fig. 1 is a side elevational view of the apparatus of the present invention, shown associated with a portion of a wrapping machine;

Fig. 2 is a longitudinal sectional view of the apparatus with parts shown in elevation;

Fig. 3 is a cross sectional view taken substantially on line 3—3 of Fig. 2;

Fig. 4 is a cross sectional view taken substantially on line 4—4 of Fig. 2;

Fig. 5 is a cross sectional view taken substantially on line 5—5 of Fig. 2; and

Fig. 6 is a cross sectional view taken substantially on line 6—6 of Fig. 2.

Referring to the drawings in detail, a marking or imprinting apparatus constructed according to one embodiment of this invention is illustrated and generally referred to by the reference numeral **10**. This marking apparatus is shown as mounted upon a portion of a wrapping machine **12**, for example, which machine forms no part of this invention, except insofar as it illustrates one of the many applications or uses of the apparatus of the present invention. It is to be understood that the marking apparatus **10** may be mounted upon any machine through which a continuous sheet, strip or web of material, or other objects or articles are fed, at a location where the material or object is exposed to permit the printing of indicia, pattern, trademark, code marking, or the like thereon.

The wrapping machine **12**, of which the paper or other web or strip material supplying portion is illustrated, includes a pair of substantially triangular, spaced apart, vertically disposed side plates **14**, having one apex thereof extending downwardly and supported on the remainder of the wrapping device (not shown) by bolts **16**, or similar fastening members, extending through flanges **18** formed on the lowermost apex of each side plate **14**. A feed roll **22**, providing a source of paper or other strip material P to be fed through the wrapping machine for marking, is rotatably journalled in upwardly opening notches **24** formed in the substantially horizontal upper edges of the side plates **14** adjacent one end thereof. The paper or other material to be marked, in the form of a continuous web or strip is drawn off the roll **22** in the direction of the arrow and is extended under the guide roller **26**, which is suitably journalled between the side plates **14**. From the guide roller **26**, the web P travels upwardly over and substantially around the backing roller **28** which is journalled between the side plates **14** and extends above the upper edges of the latter adjacent the ends thereof remote from the notches **24**. From the backing roller **28**, the paper P passes over a second guide roller **29**, also journalled between the side plates, and thence downwardly out of the machine, and into the portion (not shown) which performs the wrapping function. While the roller **28** has been identified as a backing roller, it is to be understood that it is an element of the wrapping machine, and that any

roller, similarly exposed, over which the strip of material passes in continuous fashion could be utilized, or adapted to be utilized as a backing surface for the marking apparatus. Where the existing machines do not include a roller such as 28, but do advance the material or articles to be marked over a relatively rigid table, or the like, then the latter may be utilized as the backing surface.

In the illustrated arrangement a plate 30, or similar supporting member for the marking apparatus 10, spans the top edges of the plates 14 between the opposite ends thereof. This marking or imprinting apparatus 10 includes a supporting base or stand 32, which in the illustrated embodiment of the invention is formed of a bottom plate 34 having the upstanding standards 36 and 38 extending from the opposite side edges thereof. The bottom plate 34 of the stand 32 is secured to the supporting member 30 of the wrapping machine by bolts 40 tapped into the member 30, or by similar securing means.

A frame, generally indicated at 42, is pivotally mounted upon the supporting base 32. The frame 42 includes a pair of substantially elongated, spaced apart, side plates 44 and 46. The standards 36 and 38 are disposed inwardly of the side plates 44 and 46, respectively. A pivot member 50, having a central portion 52 of relatively greater diameter extending rotatably through the horizontal bores 54 and 56 formed through the upper portions of the standards 44 and 46, is formed with reduced diameter threaded end portions 58 and 60 which extend through the plates 44 and 46 adjacent one end of the latter. Nuts 62 are threaded on the end portions 58 and 60 and secure the pivot member 50 relative to the frame 42. A coiled torsion spring 64 extends about the central portion 52 of the pivot member, and has one end fixed to the pivot member 50 (Fig. 3). The other end of the spring 64 is fixed to a spring seat 65 which is fixed relative to the standard 38 by the set screw 53. A tubular cover 65 extends around the spring 64 to shield the spring and pivot member from foreign matter. The torsion spring 64 is so disposed as to tend to lift the end of the frame 42 remote from the pivot member 50. By loosening the nuts 62 and adjusting the angular position of the pivot member 50 relative to the plates 44 and 46, the force exerted by the spring 64 may be varied, to thereby regulate the printing pressure, as will be hereinafter described in detail.

The side plates 44 and 46 are secured together to form the unitary frame 42 by a plurality of cross-members 70, each of which includes a pair of cap screws 76 extending through the side plates, and into cross-members, with the caps of the screws 76 engaging the side plates whereby to urge the side plates against the ends of the cross-members 70 in clamping relation. In addition to the cross-members 70, a cross-member 78 disposed below the pivot member 50 similarly connects the side plates 44 and 46 at that point. The member 78 is formed with an increased diameter central portion 80 which forms a part of the mechanism for adjusting the prining contact. The central portion 80 extends loosely through the openings 82 and 84 formed in standards 36 and 38, so that the frame 42 may rock slightly relative to the supporting base 32. A lug 86 is formed on the bottom plate 34 of the base 32, and threadedly receives an adjusting screw 88 which bears against the portion 80 of the cross-member 78. By moving the screw 88 into and out of the lug 86, the limitation on the downward movement of the end of the frame 42 remote from the pivot 50 may be adjusted.

The plates 44 and 46 are formed with horizontally aligned openings extending therethrough adjacent the ends remote from the pivot member 50. Anti-friction bearings 90, which are shown to be ball bearings but which may be roller bearings, are disposed in these openings and rotatably support the opposite ends of a shaft 92. Bearing covers 94 are secured to the side plates 44 and 46 and are formed with annular flanges 96 extending into the bearing receiving openings and abutting against the outer races of the bearings 90 for retaining the latter in place. A printing roller or cylinder 98 is formed with a hollow hub 100 disposed upon the shaft 92, and is fixed to the latter by a key 102. The peripheral surface of the printing cylinder 98 is provided with a pair of circumferentially extending, spaced apart, bearing ribs or flanges 104 disposed adjacent to the opposite side edges thereof. The bearing ribs or flanges 104 form an annular recess 106 therebetween for receiving an impression or marking element 105 which is preferably of the adhesive type, but may be of any other suitable known type. The impression element is provided with the desired indicia with which the web P is to be marked. The supporting base 32 is so disposed on the machine to which the marking apparatus 10 of the present invention is attached, that the printing roller 98 is positioned for surface contact with the impression roller 28. The ribs 104 of the printing roller, and the adjustable screw 88 acting against the crossmember 78 determine the extent of contact of the impression element 105 on the printing roller 98 with the continuous web or sheet of material P passing over the impression roller 28. Similarly, the torsion spring 64, which tends to lift the plate roller 98 away from the impression roller 28, determines the printing pressure.

The driving of the several movable parts of the marking device, to be described hereinafter, is derived from the rotatable printing or plate roller 98, which may be driven in several ways. This printing roller or cylinder may be rotated by frictional engagement of the ribs or flanges 104, having knurled surfaces, with the moving strip or web P, or by positive driving connection with the shaft of the impression roller 28, or with an auxiliary source of power, as by gears for example. When gears are employed to provide a positive drive one may be mounted on the shaft of the impression roller 28 and the other on the shaft of the printing roller 98. The teeth of the gears will slide slightly in mesh with each other during relative movement between the said rollers.

The marking device embodies an ink supplying assembly for evenly and continuously distributing a supply of printing ink onto the impression element or dies carried by the plate roller 98. The ink supplying assembly includes an ink reservoir 108 from which ink is fed to an open ink fountain 110, an inking roll 112 dipping into the open fountain 110 and having surface contact with a metering roll 114 which engages the plate roller 98 for distributing the ink on the latter. The ink reservoir 108 consists of a cylindrical transparent portion 116, open and threaded at one end, and a preferably metallic cylindrical portion 118 threadedly receiving the open end of the portion 108 to provide a closed container. The cylindrical portion 118 is provided with a filler opening 120 in the top thereof, which is sealed by the filler plug 122. The ink reservoir 108 is mounted on a transversely extending plate 124 extending across the top edges of the side plates 44 and 46 adjacent the ends thereof receiving the pivot member 50. The plate 124 is removably secured to the side plates 44 and 46 by the bolts 126 tapped into the side plates. An open ended transfer pipe 128 depends from the bottom of the portion 118 of the reservoir for conveying the ink to the ink fountain 110 disposed therebelow. A valve assembly 130 includes an internally threaded coupling 132 threaded into an opening formed in the portion 118 of the reservoir and axially aligned with the transfer pipe 128. A valve stem 134 is provided with a threaded portion received by the coupling 132, an operating knob 136 secured to the outer end of the stem, and a conical valve member or plug 138 for setting upon the upper end of the pipe 128. This valve assembly serves to control the flow of ink through the transfer pipe 138, and particularly is employed to

shut off the said flow during removal of the container **116**. The ink fountain **110** is formed of a substantially rectangular bottom **140**, and an upstanding peripheral wall **142**. The wall **142** and the bottom **140** meet in a thickened portion **144** at the forward end of the ink fountain, and a transverse shaft **146** extends rotatably through this thickened portion **144**. The opposite ends of the shaft **146** are journalled in the side plates **44** and **46** and thereby provide a pivotal mounting for the ink fountain. A shaft **148** is disposed below substantially the center of the bottom **140** of the ink fountain **110**, and an eccentric cam member **150** is fixed thereto. The opposite ends of the shaft **148** are journalled in the side plates **44** and **46**, and the cam **150** engages the bottom **140** providing for the adjustment of the ink fountain. A knob **152** is fixed to one end of the shaft **148** for rotating that shaft and the cam **150**.

Upstanding apertured lugs **154** are formed on the top edges of the side portions of the wall **142** of the ink fountain, and receive the opposite ends of the shaft **156** upon which a hub portion **158** of the inking roll is rotatably mounted. A set screw **160**, extending into one of the lugs **154**, engages the shaft **156** and secures the latter. The inking roll **112** includes a rim **162** on the hub **158**, formed of rubber or similar material, and dipping into the ink fountain **110**.

The metering roll **114** is rotatable about an axis parallel to the axes of rotation of both the plate roller **98** and the ink roller **112**, and spaced upwardly therefrom. As will be apparent from this relationship, as the cam **150** is rotated to pivot the ink fountain **110** about the shaft **146**, the contact of the ink roller **112** with the metering or transfer roller **114** will be varied. The metering roller **114** is formed with a ground chrome plated surface etched or engraved with fine lines or indentations for maximum wear and precision in transferring ink to the impression element or die. The roller **114** is keyed to a shaft **164** having the opposite ends supported in the inner races of anti-friction bearings **166**. The outer races of the bearings **166** are pressed or otherwise secured, in the bearing supports **168**. Each bearing support **168** is formed with a cylindrical outer surface **170**, a bore **172** through which the shaft **164** extends, and a counterbore **174** receiving the bearing **166**. The bore **172** and the counterbore **174** are concentric with each other, and not concentric with the outer cylindrical surface **170**. The outer surfaces **170** of the bearing supports **172** are rotatable in axially aligned circular openings **176** formed in the side plates **44** and **46**. A flange **178** formed on each bearing support abuts against the outer surfaces of the side plates and is provided with a knurled or roughened periphery to facilitate the gripping thereof for rotating the bearing support **172** in the opening **176**. Rings **180**, secured to the inner ends of the bearing supports, prevent movement of the latter axially relative to the respective side plates, and are also provided with roughened peripheries for turning the bearing supports. Since the bearing supports **172** are independently rotatable in each of the side plates **44** and **46**, the axis of rotation of the metering roll **114** may be adjusted relative to the axis of the printing roller **98** both angularly and with respect to the perpendicular distance therebetween. Therefore, the specific mounting of the metering roll provides a control of both the thickness of the ink coating deposited on the impression element or die, and of the equality of thickness of such coating across the width of the plates.

A scraping blade **182** mounted upon the upstanding wall **142** of the ink fountain engages the end edges of the metering roll **114** and the inking roll rim **162** to thereby remove excess ink from the rollers.

In order to provide a positive drive for the metering or transfer roll **114**, the shafts **92** and **164** of the printing roller **98** and the metering or transfer roll **114**, respectively, are extended through the side plate **44**. A spur

gear **184** is keyed or otherwise secured, to the extending portion of the shaft **92**, and a smaller spur gear **186** is similarly secured to the extending portion of the shaft **164**. A stub shaft **188** is tapped into the side plate **46**, and a pinion **190** is rotatably secured thereon. The shaft **188** is so disposed as to mesh the pinion **190** with the gear **186** on the transfer or metering roll shaft **164**. A second pinion gear **200** is rotatably mounted on another stub shaft **202** extending from the side plate **44**, and meshes with the gear **184** secured to the plate roller shaft and with the pinion **190**. The gears **164**, **200**, **190** and **186** transmit rotation from the plate roller shaft **92** to the shaft **164** of the transfer or metering roll, with the respective shafts being rotated in opposed directions. The gears **152**, **200**, **190** and **186** are so positioned as to rotate the transfer or metering roll **114** at a peripheral velocity equal to the perippheral velicoty of the impression roller or die carried by the printing roller **98**. In order to provide a positive drive for the inking roll **112**, the gear **186** on the shaft **164** of the metering roll will mesh with a gear (not shown) keyed to the shaft of the inking roll **112**. A cover **204** engages over the gears **152**, **200**, **190** and **186**, and is removably secured to the side plate **46** by the threaded bolts **206** which are tapped into that side plate. The bolts **206** are provided with knobs having roughened peripheries to facilitate the removal thereof.

In operating the marking device described above, a supply of quick drying aniline printing ink of any color is introduced into the reservoir **108** through the filler opening **120**. To prevent loss of ink during such filling of the reservoir, the valve **138** is seated upon the upper open end of the transfer tube **128**. The level of ink in the reservoir may be observed through the transparent portion **116**. The forming of the reservoir **108** in two separable portions **116** and **118** facilitate the cleaning thereof. After the filler cap or plug **122** has been replaced, the valve **138** is raised to thereby permit flow of ink into the ink fountain **110**. Since the reservoir is sealed relative to the atmosphere, the ink will rise in the fountain **110** only to a constant level determined by atmospheric pressure. This ink level will be higher than the lowermost portion of the ink roll **112**, so that the latter will pick up ink during its rotation.

The adjusting screw **88**, bearing against the cross-member **80**, is adjusted to provide the desired contact between the impression element or die on the printing roller **98** and the web or strip P passing over the impression roller **28**. The torsion spring **64** is also adjusted to provide the desired printing pressure. As the web or strip P is drawn over the impression roller **28**, the knurled bearers **104** which frictionally engage the web or strip will effect rotation of the roller **98**, and through the gears **164**, **200**, **190**, and **186** rotation of the transfer or metering roll **114** and the inking roll **112**. As previously mentioned, instead of relying on the frictional engagement of the web with the roller **98**, a positive drive may be employed for the latter roller from the shaft of the roller **28**, or some other source.

The contact of the transfer or metering roll **114** with the printing roller **98** is regulated by adjusting the eccentric bearing supports **168**, to provide a uniform ink coating of the desired thickness upon the impression element or die. The contact of the ink roll **112** with the metering roll **114** is regulated by adjustment of the fountain supporting cam **150** which rocks the ink fountain **110** and the ink roller shaft **156** about the pivot **146**.

The several adjustments provided in the described marking device for regulating printing contact, printing pressure, and the thickness and uniformity of the ink distribution on the impression element carried by the printing roller **98**, along with the constant ink level in the ink fountain **110**, achieve a printed impression of uniform clarity and sharpness.

It is to be understood, that while the device of the

present invention is adapted for use as an attachment for existing machines of the character indicated, and has been so illustrated and described, the device is equally adapted for operation as an independent unit, in which event the sheet, web or strip after receiving the impression may be rolled up or folded for storage or subsequent use. It is also to be understood that the device of the present invention is adapted for marking articles and objects other than sheets or webs of material, such articles being fed to the impression element successively in any suitable or well known manner.

While I have illustrated and described one embodiment of my invention, it is to be understood that various changes and modifications may be made therein without departing from the spirit and scope of my invention.

What I claim is:

1. A self-contained marking apparatus for applying repeated markings to a continuous web on any machine handling such a web and having a support over which the web is advanced; said marking apparatus comprising a stand adapted to be secured on the machine handling the web that is to be marked, a horizontal pivot pin rotatably mounted in said stand, a generally elongated frame mounted at one end on said pin to extend substantially horizontally from the latter to the location of the support over which the web is advanced, means releasably clamping said frame to said pin so that normally said frame and pin turn together relative to said stand and to permit rotational adjustment of said pin relative to said frame, a marking roller rotatably journalled in said frame adjacent the other end of the latter and having bearer rims to frictionally contact the advancing web and impart the movement of the latter to said marking roller, a helical torsion spring disposed around said pivot pin and having its opposite ends secured to said pin and stand, respectively, to yieldably urge said frame to pivot about the axis of said pin in the direction opposed to the effect of the force of gravity with a force that can be altered by rotational adjustment of said pin relative to said frame, an abutment fixed on said frame at a location that is spaced radially from the axis of said pivot pin, and an adjustable stop bolt threadably carried by said stand with the axis of said bolt extending normal to the radial plane from said abutment to said axis of the pin and with said bolt being engageable, at one end, with said abutment to adjustably limit the angular movement of said frame under the resultant of the forces due to gravity and said torsion spring.

2. A self-contained marking apparatus as in claim 1; wherein said frame includes two parallel, spaced apart side plates having cross-members extending therebetween, one of said cross-members defining said abutment, and said stand has openings therein through which said one cross-member loosely extends to be engaged by said stop bolt carried by the stand.

3. A self-contained marking apparatus as in claim 1; wherein said marking roller includes an axially central portion and reduced diameter portions interposed axially between the opposite ends of said central portion and said bearer rims so that, when a marking element for applying an inked mark is secured on said central portion, ink transferred to the marking element is isolated by said reduced diameter portions from said rims to avoid smearing of ink on the web by the bearer rims.

4. A self-contained marking apparatus as in claim 3; further comprising an ink supplying system including a metering roller, a metering roller shaft having rotatable shaft bearings receiving the opposite ends of the latter, rotatable bearing supports on said frame having eccentric portions receiving said shaft bearings so that rotation of said bearing supports will regulate the contact of said metering roller with a marking element on said marking roller, an ink applying roller rotatably mounted in said frame to effect rolling contact with said metering roller, the axes of rotation of marking roller, ink applying roller and metering roller being disposed so that the angle enclosed by lines extending radially from the axis of said metering roller to the axes of said marking and ink applying rollers, respectively, is at least as large as 90° in all rotated positions of said bearing supports and so that said metering and ink applying rollers lie between the tangent to the marking roller at the point of rolling contact of the latter with the web and the tangent to the marking roller at a diametrically opposed location.

5. A self-contained marking apparatus as in claim 4; wherein said metering and ink applying rollers have radially enlarged central portions in rolling contact with each other and axially limited between the confronting faces of said bearer rims on the marking roller, said metering and ink applying rollers being radially cut-back at opposite sides of said central portions thereof to prevent the deposit of ink from said ink applying roller on said bearer rims by said metering roller.

References Cited in the file of this patent

UNITED STATES PATENTS

596,653	Dick	Jan. 4, 1898
918,464	McCarty	Apr. 13, 1909
1,102,627	Alexander	July 7, 1914
1,226,243	O'Conner	May 15, 1917
1,536,184	Ahlburg	May 5, 1925
1,683,774	Haase	Sept. 11, 1928
1,992,613	Hartley	Feb. 26, 1935
2,186,555	Phillips	Jan. 9, 1940
2,369,814	Worthington	Feb. 20, 1945
2,424,606	Engler	July 29, 1947
2,641,999	Jackson	June 16, 1953
2,674,941	Hopwood et al.	Apr. 13, 1954