June 23, 1964 F. C. WORTH 3,138,098

MARKING APPARATUS

Original Filed May 23, 1958 3 Sheets-Sheet 1

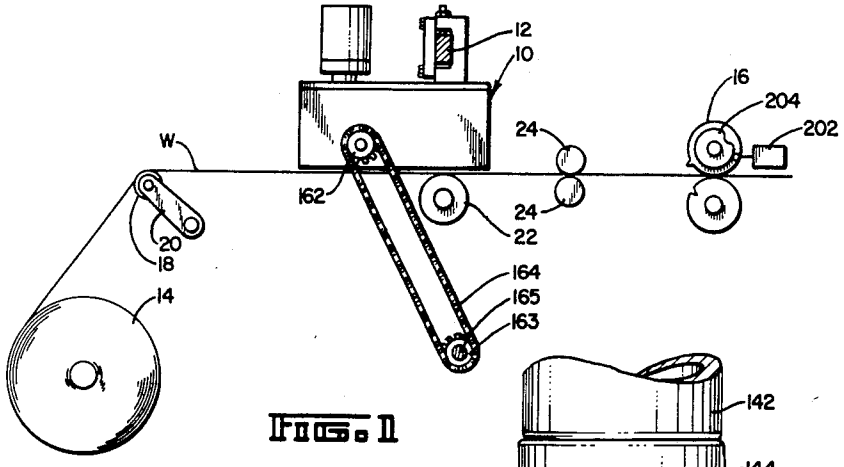


FIG. 1

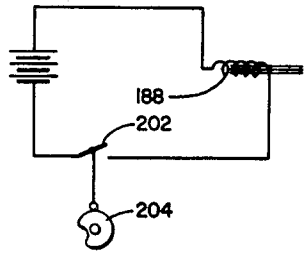


FIG. 6

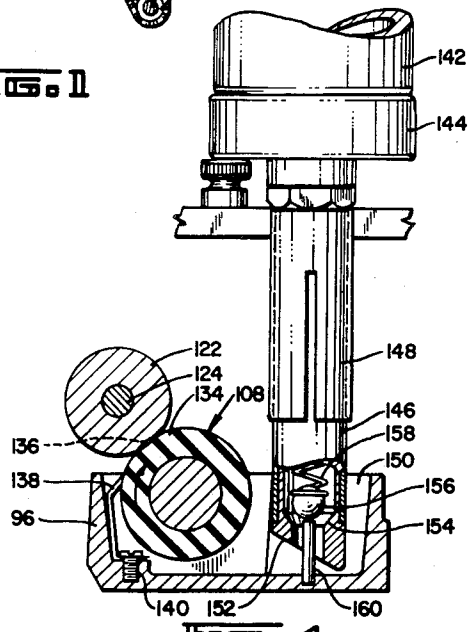


FIG. 4

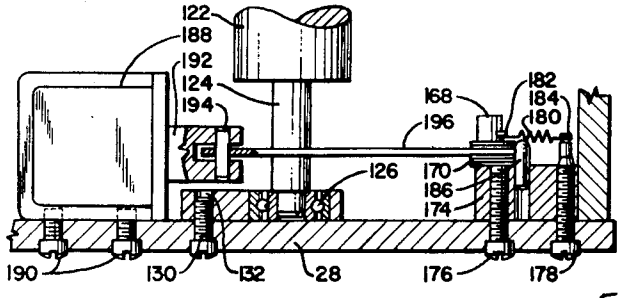


FIG. 5

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MARKING APPARATUS

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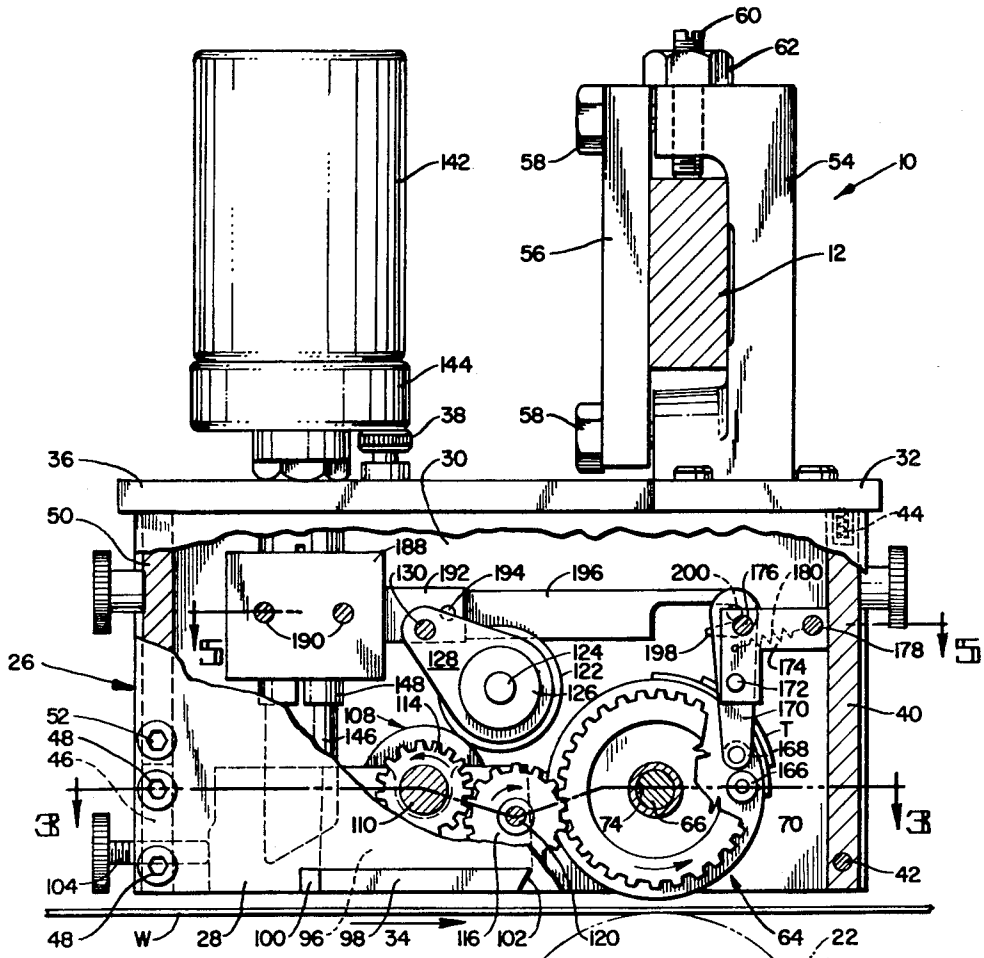


FIG. 2

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MARKING APPARATUS

Original Filed May 23, 1958 3 Sheets-Sheet 3

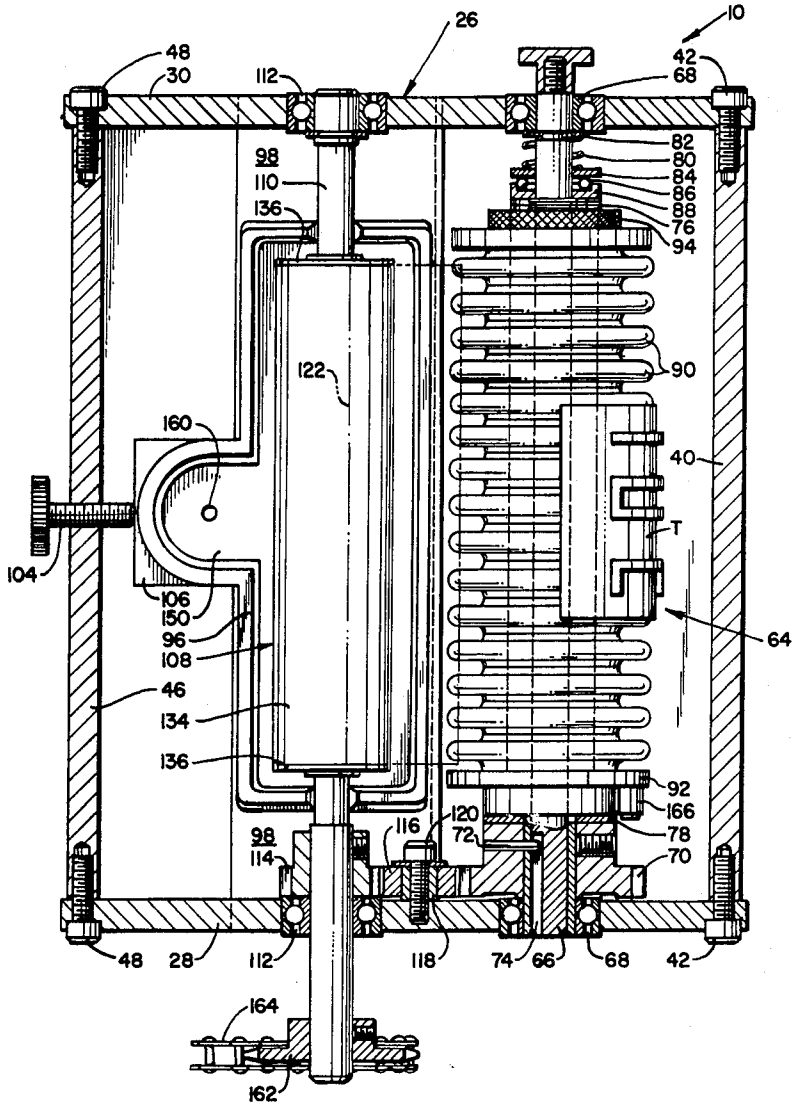


FIG. 3

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United States Patent Office 3,138,098 Patented June 23, 1964

3,138,098

MARKING APPARATUS

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Original application May 23, 1958, Ser. No. 737,393, now Patent No. 2,996,005, dated Aug. 15, 1961. Divided and this application June 12, 1961, Ser. No. 116,585

2 Claims. (Cl. 101—227)

This invention relates generally to marking apparatus, and more particularly is directed to a marking apparatus effective to intermittently apply markings to a continuous web or sheet, for example, to apply markings to successive sections or lengths of a continuous web of wrapping material which are to be cut from the latter in a conventional wrapping machine. This application is a division of my co-pending application, Serial No. 737,393, filed May 23, 1958, now U.S. Patent No. 2,996,005.

It is an object of the invention to provide marking apparatus of the described character which is effective to apply inked impressions to the continuous web of sheet material fed to an existing wrapping machine or the like, and wherein the marking apparatus can be installed without requiring modification or alteration of the existing wrapping machine, while the marking apparatus is made to operate in synchronism with the operation of the wrapping machine in cutting off successive sections or lengths of the continuous web of wrapping material.

Another object is to provide marking apparatus of the described character that is easily adjustable across the continuous web of wrapping material fed to the associated wrapping machine in order to permit the inked impressions to be applied at any desired lateral position on successive sections of the web.

In accordance with an aspect of the invention, a marking apparatus includes an inking roll rotatably dipping into an ink fountain or reservoir and in rolling contact with a metering roll which is, in turn, disposed for rolling contact with the raised marking surfaces of type elements or logotype mounted on a portion of the periphery of the die wheel. The inking roll and the shaft of the die wheel are positively driven, while the metering roll is freely rotatable and is frictionally driven by reason of its rolling contact with the continuously rotated inking roll. Although the shaft of the die roll is continuously rotated, a slip clutch is provided as the coupling between the die wheel and its shaft so that the die wheel can be intermittently held against rotation in a position where its type elements, logotype or other marking members are out of contact with both the metering roll and the continuous web passing over the related impression roll. In order to hold the die roll against rotation, the latter is provided with a projecting stop pin, and an abutment is mounted for movement into and out of the circular path of movement of the stop pin, such abutment being actuated by a solenoid which is, in turn, controlled by a switch actuated by a cam on the usual rotary cut-off of the associated wrapping machine.

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 drawings forming a part hereof, and wherein:

FIG. 1 is a diagrammatic side elevational view of a marking apparatus embodying this invention and of those elements of an associated wrapping machine or the like which are essential for an understanding of the operation of the marking apparatus;

FIG. 2 is an enlarged side elevational view of the marking apparatus of FIG. 1, with a portion of a side wall of

the housing thereof being removed to show the internal structure;

FIG. 3 is a sectional view taken along the line 3—3 of FIG. 2;

FIG. 4 is a detail elevational view which is partly broken away and in section and shows the arrangement for feeding ink in the apparatus of FIGS. 1, 2 and 3;

FIG. 5 is a detail sectional view taken along the line 5—5 of FIG. 2; and

FIG. 6 is a wiring diagram of an electrical control circuit for the marking apparatus embodying this invention.

Referring to the drawing in detail, and initially to FIG. 1 thereof, it will be seen that a marking apparatus embodying the present invention and generally identified by the reference numeral **10** is mounted, in a manner hereinafter described in detail, on a cross bar **12** extending laterally above the path of movement of a continuous web W of wrapping material being fed through the infeed tunnel of a conventional wrapping machine from a supply roll **14** to the usual rotary cut-off **16** of the conventional wrapping machine. Between the supply roll **14** and the rotary cut-off **16**, the web W passes over a dancer or tensioning roll **18** which is rotatably mounted, at its opposite ends, in pivoted arms **20**, and the latter are resiliently urged in the direction for causing the roll **18** to tension the web W. After passing over the dancer or tensioning roll **18**, the web W further passes over an impression roll **22**, and then between feed rollers **24** disposed ahead of the location of the rotary cut-off **16**. The impression roll **22** and feed rollers **24** are suitably driven in synchronism with the rotation of rotary cut-off **16** so that the web W is fed, as required, to the rotary cut-off and is there intermittently cut into suitable sections or lengths which are to be employed for wrapping selected articles, such as, loaves of bread or the like.

Referring now to FIGS. 2 and 3, it will be seen that the marking apparatus **10** embodying this invention includes a housing which is generally identified by the reference numeral **26** and has opposite side walls **28** and **30**, a cross member **32** joined to the upper edges of the side walls **28** and **30** at the forward portion of the housing, considered in the direction of movement of the web W indicated by the arrow **34** on FIG. 2, and a cover **36** extending across the remainder of the top of the housing between the upper edge portions of the side walls and removably secured to the latter, as by screws **38** having knurled heads. A front end wall **40** is pivotally mounted adjacent its lower edge on bolts **42** passing through the lower front corners of the side walls **28** and **30** and is releasably held in closed position by a spring urged detent **44** (FIG. 2). The housing **26** is completed by a rear wall that includes a fixed lower portion **46** secured, as by bolts **48**, to the side walls **28** and **30**, and an upper portion **50** which is pivotally mounted adjacent its lower edge on bolts **52** passing through the side walls of the housing and which is releasably held in closed position by a resiliently urged detent (not shown) similar to the detent **44** associated with the pivotally mounted front end wall **40**.

As can be seen in FIG. 2, the housing **26** is mounted from the cross bar **12** by means of a generally C-shaped bracket **54** extending upwardly from the cross member **32** to embrace the cross bar **12** at the top and one side of the latter, and a clamping plate **56** which is releasably secured across the open side of the C-shaped bracket **54** by bolts **58** in order to clamp the cross bar **12** between the bracket **54** and the clamping plate **56**. Further, in order to adjustably determine the position of housing **26** relative to cross bar **12**, the upper leg of the C-shaped bracket **54** has two locating screws **60** extending threadably therethrough at laterally spaced apart locations to

engage the upper surface of cross bar **12**, and lock nuts **62** are provided on the set screws **60** in order to prevent inadvertent rotation of the latter. It will be apparent that, by simultaneously rotating the set screws **60**, the vertical position of housing **26** relative to cross bar **12**, and hence also relative to the impression roll **22** which rotates about a fixed axis, can be adjusted, while the angular position of the housing relative to the cross bar and relative to the axis of the impression roll can be varied by suitable relative rotations of the two set screws **60**.

The marking apparatus **10** has a die wheel assembly generally identified by the reference numeral **64** (FIGS. 2 and 3) and including a laterally extending shaft **66** that is rotatably journalled adjacent its opposite ends in bearings **68** carried by the side walls **28** and **30** in the forward end portions of the latter. A spur gear **70** is mounted on the end portion of shaft **66** adjacent side wall **28**, and shaft **66** is made to rotate with gear **70**, for example, by a pin **72** carried by the hub of gear **70** and engaging in a slot **74** extending axially in the surface of shaft **66**.

The die wheel assembly **64** further includes a hollow body **76** telescoping axially over the shaft **66** and rotatable with respect to the latter. The hub of gear **72** is provided with an annular disc **78** (FIG. 3) of friction material which is glued or otherwise secured to the inner end face of the hub and frictionally engages the adjacent end surface of the die wheel body **76** so that, when the latter is urged axially toward the gear **70**, the die wheel body **76** tends to rotate with gear **70** and shaft **66**. In order to urge the body **76** axially toward the gear **70**, the die wheel assembly **64** further includes a helical compression spring **80** extending around shaft **66** and interposed axially between an abutment disc **82** engaging against the bearing **68** carried by side wall **30** and a disc **84** which rides against ball bearings **86** in an annular race **88** abutting axially against the end of body **76** remote from gear **70**.

The body **76** of die wheel assembly **64** carries members for securing marking elements which extend over only a portion of the circumference of the die wheel assembly. For example, as shown in FIG. 3, the outer cylindrical surface of body **76** may support locking rings **90** which are shaped in the manner disclosed in U.S. Letters Patent No. 2,643,609 issued June 30, 1953, to Ira S. Gottscho, in order to define annular, radially opening spaces therebetween for gripping suitable locking elements formed on the back surface of rubber type elements or logotypes T having raised characters corresponding to the inked impression to be applied to the web W. As in the above identified patent, the body **76** has a radial flange **92** adjacent one end thereof, and a locking nut **94** is screwed on the opposite end of the body **76** which is suitably threaded for that purpose so that the rings **90** can be axially compacted between flange **92** and locking nut **94** to securely hold the locking elements on the back of the logotype T. It is to be understood that the housing **26** of marking apparatus **10** is located with respect to the impression roll **22** so that, as the die wheel assembly **64** is rotated, the raised marking surfaces of the characters on the type elements or logotype T secured on the periphery of the die wheel assembly by the locking rings **90** will come into rolling and marking contact with the web W passing over the impression roll.

In order to apply ink to the raised marking surfaces of the type elements or logotype T secured on the periphery of the die wheel assembly **64**, the marking apparatus **10** may further include an upwardly opening ink fountain or reservoir **96** disposed in back of the die wheel assembly and having lateral, flat extensions **98** which are received in downwardly opening, elongated cutouts **100** formed in the bottom edges of side walls **28** and **30**. The forward edges of the lateral extensions **98** and of the related cutouts **100** may be beveled, or inclined with respect to the vertical, as at **102** (FIG. 2) and a securing screw **104** extends forwardly through a suitably tapped

hole at the center of the lower fixed portion **46** of the rear end wall of housing **26** to abut against a block **106** projecting rearwardly from the fountain **96**.

An inking roll **108** is fixed on a shaft **110** extending parallel to shaft **66** of the die wheel assembly at a location above the lateral medial line of the ink fountain **96**. Shaft **110** is rotatably journalled, adjacent its opposite ends, in bearings **112** carried by side walls **28** and **30** of housing **26**. A gear **114** is secured on shaft **110** adjacent the inner surface of side wall **28** and meshes with an idler gear **116** which, in turn, meshes with the gear **70** on shaft **66** of the die wheel assembly. The idler gear **116** is rotatably mounted on a bushing **118** carried by a stud bolt **120** which is received in a suitably tapped bore in side wall **28**. Thus, gear **70**, and hence shaft **66** of the die wheel assembly, are rotated in response to rotation of the shaft **110** of the inking roll.

The arrangement for supplying ink to the raised marking surfaces of the type elements or logotoype T secured on the surface of the die wheel assembly further may include a metering roll **122** on a shaft **124** which extends parallel to the axes of shafts **66** and **110** and which has its opposite ends rotatably journalled in bearings **126** carried by arms **128** (FIGS. 2 and 5) disposed against the inside surfaces of side walls **28** and **30**. Each of the arms **128** is pivotable about a screw **130** which passes through a smooth bore in the adjacent side wall **28** or **30** and is received in a tapped hole **132** formed in the arm **128** at a location spaced radially from the axis of shaft **124**.

The inking roll **108** may include a rubber body **134** (FIGS. 3 and 4) interposed axially between metal discs or flanges **136**, and the metering roll **122** may have an axial length substantially equal to the axial distance between the discs **136**. As seen in FIG. 4, a doctor or scraper blade **138** is secured, as by screws **140** within the fountain **96** and engages the surface of the rubber body **134** of inking roll **108** at the front side of the latter where the surface of the inking roll is moving upwardly out of the body of ink within fountain **96**, thereby to scrape the excess of ink from the inking roll prior to the transfer of ink from the latter to the metering roll **122**.

It will be apparent that, in the described inking arrangement, the metering roll **122** mounted on the freely rotatable shaft **124** is frictionally driven by its rolling contact with the rotated inking roll **108**. Further, it will be apparent that ink picked up by the inking roll **108** from a body of ink within fountain **96** and transferred to the metering roll **122** is then transferred from the latter to the raised marking surfaces of the type elements or logotype T on the periphery of die wheel assembly **64** as the latter is rotated to move such marking surfaces past the metering roll in rolling contact with the surface of the latter.

In order to maintain a substantially constant supply or body of ink within the reservoir or fountain **96**, the marking apparatus **10** may further include an inverted tank or container **142** having a removable closure **144** at its lower end from which a hollow stem or tube **146** depends (FIGS. 2 and 4). A longitudinally split tube **148** may be fixedly secured, at its upper end, in a suitable opening in the cover **36** of the housing **26** and be dimensioned so that the stem **146**, when extended downwardly through the longitudinally split tube **148**, will be frictionally retained in the latter with the lower end of the hollow stem **146** entering into a rearward extension **150** (FIG. 3) of the fountain **96**. Thus, ink can pour from the container **142** through the hollow stem **146** into fountain **96** for replenishing the supply of ink in the latter as the ink is taken up by the inking roll **108**.

The lower end edge **152** of hollow stem **146** may be cut at an acute angle with respect to the axis of the hollow stem so that the end edge **152** will be inclined from the horizontal when the container **142** is disposed in its

normal operating position in which the hollow stem depends vertically into the ink fountain.

Further, the interior of hollow stem **146** may be formed with an upwardly facing valve seat **154** (FIG. 4) against which a ball or check valve **156** is urged by a spring **158**, and a valve opening pin **160** may project upwardly from the rearward extension **150** of the reservoir or fountain **96** in axial alignment with the longitudinally split tube **148** carried by the cover **36** to unseat valve **156** when the container **142** is installed in its operative position with the stem **146** extending downwardly into the rearward extension **150** of fountain **96**.

In accordance with this invention, the inking roll **108** is positively driven from the associated wrapping machine or the like in synchronism with the rotation of the rotary cut-off **16** of the latter and, for this purpose, an end of the shaft **110** is extended outwardly through side wall **28** and has a sprocket **162** fixed thereon (FIGS. 1 and 3) to be driven by a chain **164** which passes over a sprocket **163** on a rotated drive shaft **165** (FIG. 1) of the associated wrapping machine. Thus, inking roll **108** is continuously rotated in synchronism with the rotation of the rotary cut-off **16**, and the metering roll **122** is similarly continuously rotated by reason of its frictional contact with the inking roll. It will also be apparent that, by reason of the gear train formed by the gears **114**, **116** and **70**, the shaft **66** of die wheel assembly **64** is also continuously rotated. The clutch disc **78** carried by gear **70** and frictionally engaging the adjacent end of the die wheel body **76** tends to rotate the latter along with the shaft **66**. However, in the marking apparatus **10** embodying this invention, the flange **92** of the wheel body **76** is provided with an axially projecting stop pin **166** (FIGS. 2 and 3) which is directed toward the adjacent side wall **28** and which is spaced radially from the axis of rotation of the die wheel assembly. Further, an abutment in the form of a pin **168** (FIGS. 2 and 5) is mounted for movement into and out of the circular path of movement of the stop pin **166** with the die wheel body **76** so that, when the pin **168** is moved into the path of movement of stop pin **166**, as in FIG. 2, pin **166** moves into engagement with pin **168** to prevent further rotation of the die wheel body **76** and of the type elements or logotype T mounted on the periphery thereof while the friction disc **78** slips relative to the adjacent end surface of the die wheel body. On the other hand, when the pin **168** is moved out of the path of movement of pin **166**, the die wheel body **76** is then free to be rotated with shaft **66** by the action of the clutch disc **78**.

The stop pin **166** is preferably located with respect to the circumference of the die wheel body **76** so that, when pin **166** engages pin **168**, the raised marking surfaces of the type elements or logotype T carried at the periphery of the die wheel assembly face away from both the metering roll **122** and the web W passing over the impression roll **22**, as shown in FIG. 2, thereby to permit continued rotation of the metering roll and continued feeding of the web W without interference from the halted die wheel assembly. It will be apparent that, following each movement of the abutment pin **168** to its inoperative or released position out of the path of movement of the stop pin **166**, the die wheel body **76** will be free to complete one full revolution.

In the illustrated embodiment of the invention, the abutment pin **168** extends from the lower end of a lever **170** which is pivotally mounted, intermediate its ends, on a pivot pin **172** carried by a block **174** which is secured, as by screws **176** and **178**, to the side wall **28**. A tension spring **180** is connected, at its opposite ends, to an anchor **182** provided on lever **170** above the pivot pin **172** and to an extension **184** of the screw **178** in order to urge the lever **170** in the clockwise direction, as viewed in FIG. 2, to a position where the upper end of lever **170** rests against a pin **186** (FIG. 5) projecting from block **174** and where pin **168** is interposed in the path of movement of the stop pin **166**. Further, a solenoid **188** is mounted on the side wall **28**, as by screws **190** and has a movable armature **192** which is pivotally connected, as by a pin **194**, to one end of a link **196**. The opposite end of link **196** is in the form of a hook **198** (FIG. 2) which extends around a pin **200** extending between the legs of an upper bifurcated end of the lever **170**.

The solenoid **188** is arranged so that, upon the energization thereof, the armature **192** is retracted, thereby to pull the link **196** for rocking lever **170** in the counterclockwise direction, as viewed in FIG. 2, so that the abutment pin **168** is then removed from the circular path of movement of the stop pin **166** and the die wheel body **76** is free to complete a full revolution.

In order to coordinate the operation of marking apparatus **10** with the operation of the rotary cut-off **16** of the associated wrapping machine, the electrical circuit for energizing the solenoid **188**, as shown in FIG. 6, has a normally open switch **202** interposed therein, and such switch is actuated by a cam **204** (FIG. 1) secured on the shaft of the rotary cut-off **16** so that, during each revolution of the latter, and consequently during each cut-off of a section or length of the web W, the solenoid **188** will be energized to release the abutment pin **168** from the stop pin **166** and thereby permit a full revolution of the die wheel assembly **64** for applying a suitable inked impression to the web W. At the end of such full revolution of the die wheel assembly **64**, the type elements or logotype T, which occupy only a segment of the periphery of the die wheel assembly, will be returned to their normal rest position out of contact with both the web W and the metering roll **122**. It is apparent that, by controlling the operation of the marking apparatus **10** from shaft of the rotary cut-off **16**, the location of each inked impression along the web W will be positively registered with respect to the lengths or sections cut from the web W by the rotary cut-off.

Although an illustrative embodiment of the invention has been described in detail herein with reference to the accompanying drawings, 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. The combination of a wrapping machine including a rotary cut-off means operative to cut successive sections from a continuous web during movement of the web through said rotary cut-off means, which sections are utilized by said machine during repeated operating cycles for the wrapping of articles; and an apparatus for applying markings to the successive sections of the continuous web comprising a rotatable die wheel having marking means projecting radially therefrom over a portion of the periphery of the die wheel to effect rolling and marking contact with the web during rotation of the die wheel, means driven by said machine for rotating said die wheel and including a slippable clutch, a projecting stop member movable in synchronism with said die wheel to move along a circular path during rotation of the latter, an abutment member, means mounting said abutment member for movement between an operative position, where said abutment member extends into said circular path to block rotation of said die wheel with said marking means facing away from said web and while said clutch slips, and an inoperative position where said abutment member is withdrawn from said circular path to free said die wheel for rotation, resilient means urging said abutment member to said operative position, electromagnetically actuated means energizable to move said abutment member to said operative position, circuit means for energizing said electromagnetically actuated means including a normally open switch, and cam means rotated in synchronism with said rotary cut-off means and operative to momentarily close said switch for only

momentarily moving said abutment to its inoperative position during the cutting off of each section from the web, said abutment member being mounted at one end of a lever which is pivotally supported intermediate its ends, and said electromagnetically actuated means including a solenoid having a normally extended armature which is retracted upon energization of the solenoid, a link pivotally connected, at one end, to said armature and having a hook-shaped configuration at the other end opening generally in the longitudinal direction of the retracting movement of the armature, and a pin projecting from the other end of said lever and received in said hook-shaped end of the link to cause rocking of the lever in the direction moving said abutment member to its inoperative position upon energization of said solenoid.

2. The combination as in claim 1; wherein said stop member and abutment member have cylindrical surfaces with parallel axes so that said abutment member can cam over said stop member during the initial rotation of said die wheel following the momentary energization of said solenoid.

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