Nov. 3, 1959 M. HIRSCHEY 2,910,937

ROTARY MARKING APPARATUS

Filed Oct. 3, 1956 4 Sheets-Sheet 1

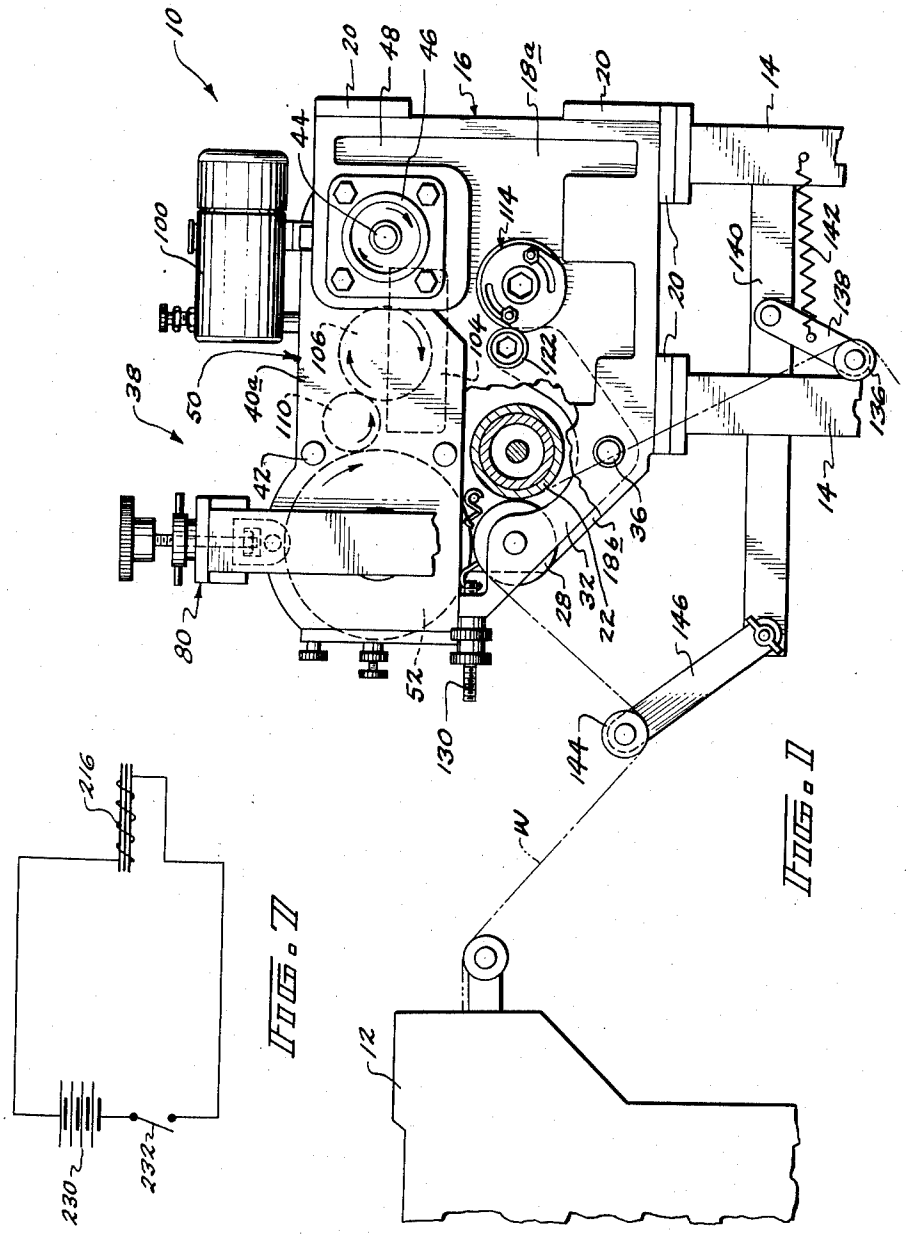


FIG. II

FIG. I

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ROTARY MARKING APPARATUS

Filed Oct. 3, 1956 4 Sheets-Sheet 2

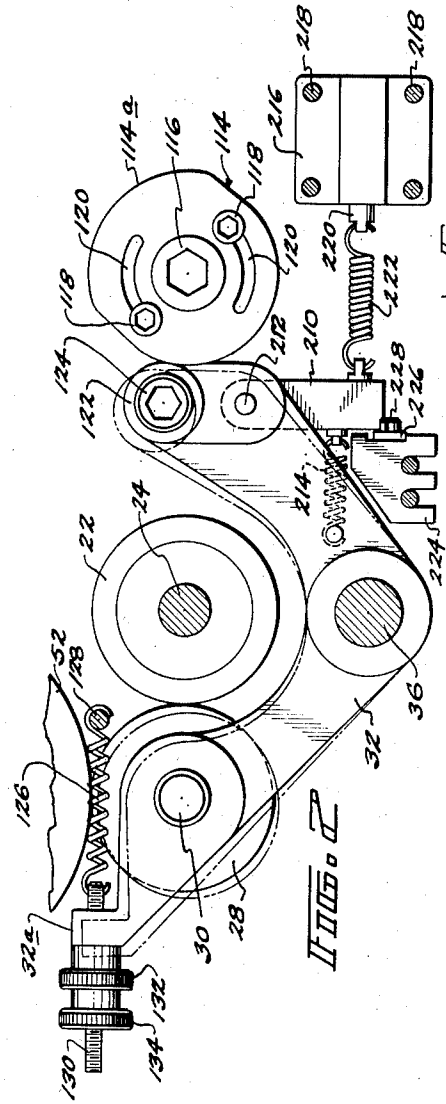


FIG. 2

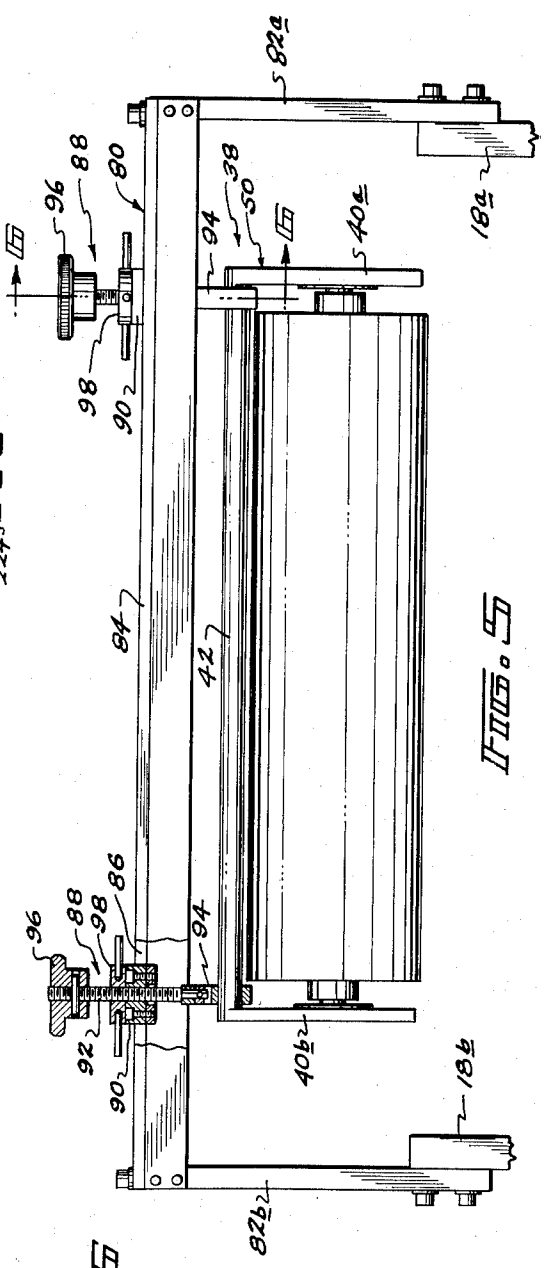


FIG. 5

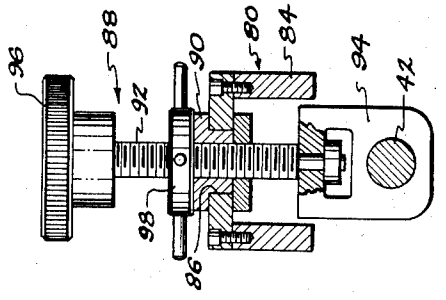


FIG. 6

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ROTARY MARKING APPARATUS

Filed Oct. 3, 1956

4 Sheets-Sheet 3

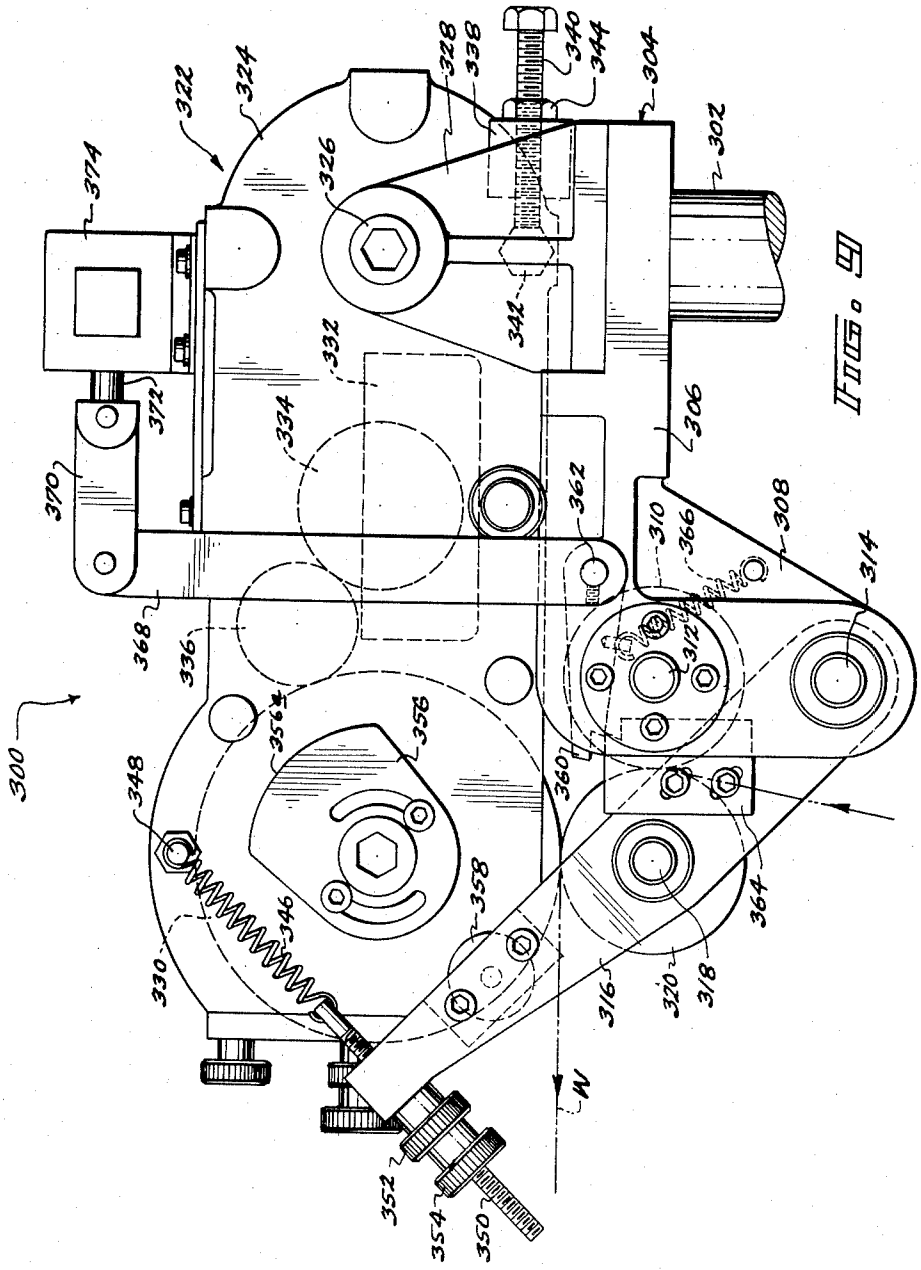


FIG. 9

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ROTARY MARKING APPARATUS

Filed Oct. 3, 1956

4 Sheets-Sheet 4

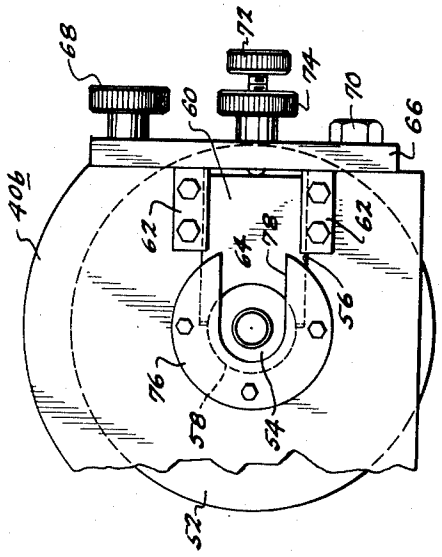


FIG. 3B

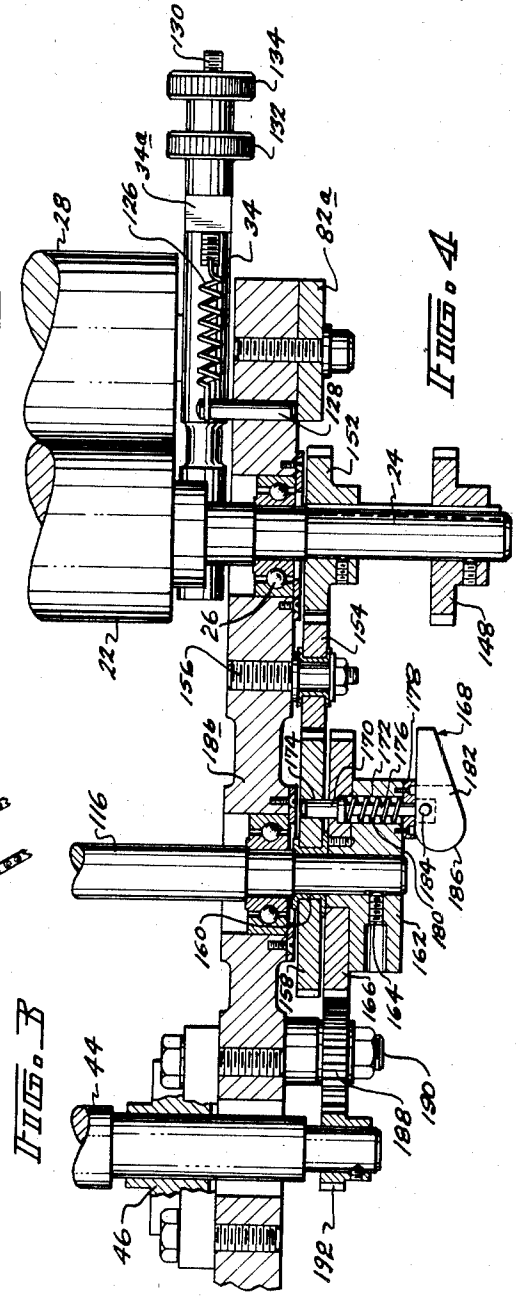


FIG. 4

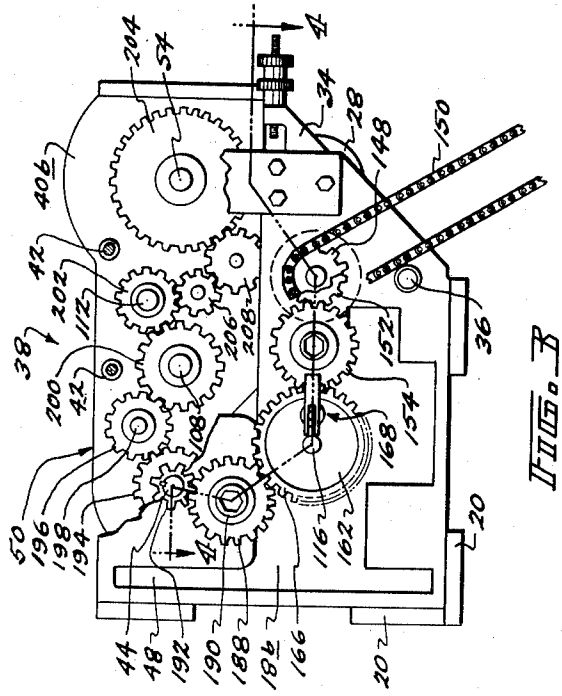


FIG. 3

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United States Patent Office 2,910,937
Patented Nov. 3, 1959

2,910,937

ROTARY MARKING APPARATUS

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Application October 3, 1956, Serial No. 613,719

16 Claims. (Cl. 101—228)

This invention relates generally to marking apparatus, and more particularly is directed to apparatus for marking a continuous web of sheet material as the latter is fed to an associated machine which cuts the marked web into predetermined lengths prior to utilizing the latter for the performance of an additional function, for example, as in a wrapper, bundler and the like.

In such wrappers, bundlers and the like, the web feeding and cutoff of the machines may be a variety of different lengths, and even in a given machine, such lengths may be varied from time to time. Further, some wrapping and building machines have a continuous feed of the web into the machine, while others employ an intermittent feed of the web, which may gradually increase and then decrease in speed from and to, respectively, a condition of rest either with uniform or non-uniform acceleration and deceleration, or which may alternate between periods of feed at constant speed and interposed rest or dwell periods.

When a marking apparatus has heretofore been associated with a machine having a continuous feed of the web and a variable web cutoff, it has been necessary to provide a different diameter die or marking wheel for each of the different lengths of cutoff. Providing die wheels of different diameters is obviously expensive and further requires that adjustments or allowances be made in the marking apparatus to compensate for the different radial dimensions of the several die wheels as the cutoff is altered. Furthermore, the changeover of the associated machine from one cutoff to another then requires the changing of several parts and the making of adjustments, all of which is inconvenient and time consuming.

If the feed of the web to the associated machine is intermittent, the above mentioned problems arising out of a variable cutoff with a continuous feed still exist and, in addition thereto, it becomes necessary to interrupt marking of the web whenever the feed of the latter is interrupted and also to synchronize the feeding of the web through the marking apparatus with the feeding of the web through the associated machine during the entire operating cycle of the latter. However, stopping of the marking apparatus is not desirable since, when operation is resumed, imperfect marking, or even a complete failure to apply a portion of the mark, may result depending upon the duration of the interruption.

Further, when the associated wrapper, bundler or the like has a manually controllable, infinitely variable cutoff, the operator may set the feed either above or below that actually required for the set cutoff without normally affecting the operation thereof. However, if a fixed circumference marking or printing apparatus is attached to a wrapper, bundler or the like, the occurrence of such a variance between the cutoff and feed can cause imperfect marking. Although marking apparatus has heretofore existed for effecting perfect marking under the above circumstances, such existing apparatus cannot apply a marking to the full length of the cutoff.

Accordingly, it is an object of the present invention to

provide printing or marking apparatus for attachment to wrapping, bundling or the like machine of the described character, and which, under all circumstances, satisfy the above mentioned requirements therefor and are capable of marking almost the full width of the web and substantially the entire length of each cutoff thereof while accurately registering the marking with the cutoff.

In accordance with an aspect of the invention, a marking unit having a marking or die wheel is mounted on the associated wrapper, bundler or the like machine between the parent or supply roll of the web to be marked and the web feeding portion of the associated machine. Mounted below the marking unit is a rubber covered feed roll which is driven from the associated machine, and this feed roll is also operatively connected to the drive of the marking unit so that the marking or die wheel of the latter completes one revolution during each operating cycle or cutoff of the associated machine. Also mounted below the marking unit is an idler roll which is arranged so that the web to be marked first passes between the idler and feed rolls and then between the idler roll and the marking wheel. The mounting for the idler roll is movable between an operative position, wherein the web is pressed between the idler roll and the feed roll and marking wheel, in which case the idler roll cooperates with the driven feed roll to advance the web and also cooperates with the marking wheel, as a compression or back-up roll for the latter, to cause application of the marking to the advancing web, and an inoperative position, wherein the idler roll is spaced from both the feed roll and the marking wheel, so that feeding of the web and the application of markings thereto are simultaneously interrupted. The movement of the idler roll between the above mentioned operative and inoperative positions is controlled by a cam which is driven from the associated machine so as to make one complete revolution during each operating cycle or cutoff of the machine.

In one embodiment of this invention, the cam controlling movement of the idler roll is mounted on a shaft which is journalled in a frame that also supports the movable mounting for the idler roll so that the reaction to the action of the cam is contained within such frame and cannot affect the mounting of the marking unit, and, in another embodiment of the invention, the cam for controlling the movement of the idler roll is mounted on the shaft supporting the marking wheel for rotation with the latter.

In either of the above embodiments of the invention, the marking wheel has a circumference greater than the largest cutoff for which the associated machine can be set and the cam is shaped to move the idler roll to its inoperative position during rotation of the marking wheel through an angular extent corresponding to the circumferential arc by which the circumference exceeds the set cutoff, whereby the web is advanced and marked a distance substantially equal to the length of the set cutoff during each operating cycle of the associated machine. Thus, the length of the set cutoff of the associated machine may be varied without changing the circumference or diameter of the marking wheel and it is only necessary to replace the cam so that the configuration of the latter corresponds with the set cutoff.

Since many wrapping, bundling or the like machines with which marking apparatus embodying the present invention may be associated are designed to interrupt the feeding of the web therethrough when there is a gap or interruption in the feed of articles to be wrapped or bundled to the machine, it is another aspect of this invention to provide the marking apparatus with latching means for preventing the movement of the idler roll to its operative position in response to the occurrence of such a gap or interruption in the article feed.

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

Fig. 1 is a side elevational view, partly broken away and in section, of marking apparatus embodying the present invention and shown diagrammatically associated with an existing machine for utilizing the continuous web marked thereby;

Fig. 2 is an enlarged side elevational view of an assembly included in the marking apparatus of Fig. 1;

Fig. 3 is a side elevational view of the marking apparatus of Fig. 1, but viewed from the opposite side and partly broken away to expose otherwise hidden elements of the apparatus;

Fig. 4 is an enlarged, fragmentary sectional view taken along the line 4—4 of Fig. 3;

Fig. 5 is a front elevational view, partly broken away and in section, of a hold-down assembly included in the marking apparatus of Fig. 1;

Fig. 6 is an enlarged, detail sectional view taken along the line 6—6 of Fig. 5;

Fig. 7 is a wiring diagram of an electric circuit included in the marking apparatus of Fig. 1;

Fig. 8 is an enlarged, fragmentary side elevational view of a bearing arrangement included in the marking apparatus of Fig. 1; and

Fig. 9 is a side elevational view of marking apparatus constructed in accordance with another embodiment of the present invention.

Referring to the drawings in detail, and initially to Fig. 1 thereof, a marking apparatus embodying the present invention and generally identified by the reference numeral **10** is there shown associated with a wrapping, bundling or the like machine **12** for applying markings to a continuous web W as the latter is fed, either intermittently or continuously, from a parent roll (not shown), or other source of the web of sheet material, into the feed section of the machine **12**. The wrapping, bundling or the like machine **12**, with which the marking apparatus **10** is associated, is of the kind that cuts the web W of sheet material into lengths thereof, with the lengths of the cutoffs being variable either on the same machine, or from machine to machine with which the marking apparatus is to be associated. As previously mentioned, the feed of the web W into the machine **12** may be either continuous or intermittent, and, if intermittent, such movement may be either harmonic or crank, that is, gradually increase and then decrease in speed from and to, respectively, a condition of rest either with uniform or non-uniform acceleration and deceleration, or the intermittent feed movement may consist of alternating periods of rest and of substantially constant speed movement. The marking apparatus **10** is intended to apply repeated markings to the web W under all the varying conditions of cutoff and feed movement possible with the wrapping, bundling or the like machines with which the marking apparatus may be associated.

The illustrated marking apparatus **10** includes standards **14** suitably positioned in relation to the feed section of the associated machine **12** and, at their upper ends, carrying a main frame **16** which includes side frame members **18***a* and **18***b* and lateral members **20** secured to the side frame members at the back and bottom edges of the latter and holding the members **18***a* and **18***b* in vertical, spaced apart relation with the distance between the side frame members being greater than the maximum width of a web of sheet material that can be handled by the associated machine **12**.

A feed roll **22** is mounted on a lateral shaft **24** which, at its opposite ends, is journalled in bearings **26** (Fig. 4) carried by the side frame members **18***a* and **18***b*. Extending parallel to the feed roll **22**, and disposed in front of the latter, is an idler roll **28** which is mounted on a lateral shaft **30** having its opposite ends journalled in a bell-crank member **32** (Figs. 1 and 2), disposed adjacent the inside face of side frame member **18***a*, and a lever member **34** (Figs. 3 and 4), disposed adjacent the inside face of side frame member **18***b*, respectively. The bell-crank member **32** is secured, intermediate its opposite ends, and the lever member **34** is secured, adjacent one end, to a pivot shaft **36** having its opposite ends journalled in the side frame members **18***a* and **18***b* below the feed roll shaft **24** (Figs. 1 and 2). The journalled ends of shaft **30** are equally spaced from the pivoting axis of bell-crank member **32** and lever member **34** defined by pivot shaft **36**, and the plane extending through the parallel axes of shafts **30** and **36** is inclined upwardly and forwardly from the axis of shaft **36** so that, in response to clockwise rocking of the members **32** and **34**, as viewed in Figs. 1 and 2, the idler roll **28** moves rearwardly and upwardly to an operative position (shown in full lines on Fig. 2) against the feed roll **22** and, in response to counterclockwise rocking of members **32** and **34**, the idler roll moves forwardly and downwardly away from the feed roll to an inoperative position (shown in broken lines on Fig. 2) where a substantial clearance exists between the surfaces of rolls **22** and **28**.

The illustrated marking apparatus **10** also includes a marking unit which is generally identified by reference numeral **38**. Marking unit **38** has side frame plates **40***a* and **40***b* (Figs. 1, 2 and 5) which are held in parallel, spaced apart relation by cross-members **42**. Adjacent their back ends, the side frame plates **40***a* and **40***b* carry suitable bearings (not shown) in which a combined drive and support shaft **44** is rotatably received, and the opposite ends of the shaft **44** are journalled in bearings **46** (Figs. 1 and 4) carried by upstanding projections **48** of the side frame members **18***a* and **18***b*, so that the frame **50** of marking unit **38**, formed by the plates **40***a* and **40***b* and cross-members **42**, extends generally forwardly over the main frame **16**.

The marking unit **38** further has a marking or die wheel or roll **52** which is mounted on a shaft **54** journalled between the forward end portions of plates **40***a* and **40***b* so that the axis of marking roll **52** is disposed above, and generally in the same vertical plane as, the axis of the idler roll **28**, so that, as the latter moves upwardly and rearwardly toward the feed roll **22**, the idler roll also moves toward the marking roll **52** and, as the idler roll **28** moves forwardly and downwardly away from the feed roll, the idler roll also moves away from the marking roll **52**, as shown in broken lines on Fig. 2.

In order to facilitate removal and replacement of the marking roll **52**, for example, when the marking or legend applied thereby is to be changed or when a thorough cleaning of the marking surface is required, each of the side frame plates **40***a* and **40***b* is preferably provided with a split bearing (Fig. 8) for rotatably receiving the adjacent end portion of the marking roll shaft **54**. This split bearing includes a forwardly opening slot **56** in the related side frame plate having a semi-circular inner end surface **58**, and a movable bearing section **60** slidable in the slot **56** between guides **62** and having a semi-circular inner end edge **64** normally cooperating with the end surface **58** of slot **56** to define a circular bearing for the shaft **54**. The movable bearing section **60** is held in its normal position within slot **56** by a cap **66** which is removably secured to the front edge surface of the related frame plate **40***a* or **40***b*, for example, by bolts **68** and **70**, and which carries an adjusting screw **72** extending threadably through cap **66** to bear rearwardly against the front end edge of movable bearing section **60**. It is apparent that, with the cap **66** applied to the related frame plate **40***a* or **40***b*, screw **72** can be employed to tighten the engagement of the split bearing about shaft **54**, and a lock nut **74** is provided on screw **72** to prevent inadvertent loosening of the latter. When the marking roll **52** is to be removed from the frame **50** of marking unit **38**, the caps **66** are

removed and the movable section 60 of each bearing is withdrawn from slot 56 to permit forward withdrawal of shaft 54, and its marking roll 52, from the marking unit. In order to laterally position the shaft 54 within frame 50, each side frame plate 40*a* and 40*b* has an annular retaining member 76 secured on the outside face thereof to axially engage a radial shoulder at the related end of shaft 54, and the retaining member 76 is formed with a radial, forwardly opening slot 78 through which the related end of shaft 54 can move during insertion and removal of the marking roll.

Since the frame 50 of marking unit 38 is pivotally supported on shaft 44 and extends forwardly from the latter, the weight of the marking unit tends to pivot the latter in the counter-clockwise direction, as viewed on Fig. 1, and the marking roll 52 would follow the movements of the idler roll 28 in the absence of an additional support for the forward end portion of the marking unit frame. In the illustrated marking apparatus 10, a hold-down assembly 80 is provided for adjustably positioning the frame 50 of the marking unit relative to the main frame 16.

As seen in Figs. 5 and 6, the hold-down assembly 80 includes standards 82*a* and 82*b* extending upwardly from the front end portions of side frame members 18*a* and 18*b*, respectively, and secured, at their upper ends, to the opposite ends of an inverted U-shaped, built-up beam 84 having a longitudinal slot 86 in the top thereof. The forward portion of the marking unit frame 50 is suspended from beam 84 by two hangers 88. Each hanger 88 includes a slide 90 fitting non-turnably in the slot 86 and slidable along the latter, with portions of the slide 90 extending laterally beyond the edges of the slot above and below the top of beam 84 to prevent removal of slide 90 from the beam. Further, slide 90 has a vertical, tapped hole extending therethrough and threadably receiving a bolt 92 which, at its lower end, is loosely coupled to a bracket 94 secured on a cross-member 42 of the marking unit frame. The connection between bolt 92 and bracket 94 permits turning of bolt independent of the bracket while the latter is movable with the bolt in the axial direction of the latter. The bolt 92 is provided with a knob 96 on its upper end for manual rotation thereof, and a lock nut 98 is screwed on bolt 92 above slide 90 to normally hold the bolt against inadvertent rotation relative to the slide. Thus, the bolts 92 of hangers 88 can be manually rotated to raise or lower the forward portion of marking unit frame 50, and hence the marking roll 52, relative to the main frame 16, and to hold the marking unit frame in an adjusted position relative to the main frame.

Further, it is apparent that the marking unit 38 may have a marking roll 52 with a width or axial dimension only slightly smaller than the axial dimensions of the feed roll 22 and idler roll 28 so as to be capable of applying markings to the complete width of the widest web that can be handled by the rolls 22 and 28, or, in case markings are to be applied to only a relatively small portion of the width of the web W, a relatively narrow marking unit 38 may be employed and suitably positioned, in the lateral direction, along the shaft 44 and the beam 84.

The marking unit 38 is adapted to apply inked impressions or markings to the web W as the latter is contacted by the marking roll 52 with the idler roll 28 in its raised or operative position (shown in full lines on Fig. 2) and ink is applied to the surface of a marking element or die on the periphery of roll 52 by an inking system that includes an ink tank 100 supported on top of the marking unit frame 50 (Fig. 1) and feeding ink through a depending pipe 102 into an upwardly open reservoir 104 supported between side frame plates 40*a* and 40*b*. An ink applying roll 106 mounted on a rotatable shaft 108 (Fig. 3) dips into the reservoir 104 and is in rolling contact with a metering roll 110 which is mounted on a rotatable shaft 112 (Fig. 3) and, in turn, in rolling contact with a marking element or die on the periphery of marking roll 52, the reservoir 104, ink applying roll 106, metering roll 110 and marking roll 52 all appearing in broken lines on Fig. 1.

As hereinafter described in detail, the rolls 52, 106 and 110 of marking unit 38 are driven from the associated machine 12 so that the marking roll 52 makes one complete revolution during each operating cycle or cutoff of the associated machine. The marking roll 52 has a circumference at least as large as the largest cutoff for which the associated machine 12 may be set so that, when the actual, set cutoff is smaller than the circumference of the marking roll, only a portion of the marking roll circumference is employed for marking the web. As seen in Fig. 1, the web W passes upwardly between the feed roll 22 and idler roll 28 from a parent roll (not shown) and then forwardly between the idler roll 28 and marking roll 52 before entering the feed section of the associated machine 12.

When the idler roll 28 is in its operative position, as shown in full lines on Fig. 2, the web W is gripped between the idler roll and the driven feed roll 22 to be advanced by the cooperation of rolls 22 and 28, and, at the same time, the idler roll 28 lifts the advancing web against the bottom of marking roll 52 so that the latter applies a marking thereto. On the other hand, when the idler roll 28 is moved to its inoperative position, as shown in broken lines on Fig. 2, so that clearances are established between roll 28 and rolls 22 and 52, there is no pressure from the roll 28 to apply the web against either the feed roll 22 or the marking roll 52 and the feeding and marking of the web are, therefore, interrupted.

In order to control the movement of the idler roll 28 between its operative and inoperative positions, a radial cam 114 (Figs. 1 and 2) is secured on a cam shaft 116 that is rotatably journalled, adjacent its opposite ends, in the side frame members 18*a* and 18*b* of main frame 16. Preferably, the cam 114 is carried by a circular pad (not shown) on an end portion of shaft 116 extending through frame member 18*a* and is angularly adjustable relative to that circular pad, for example, by loosening bolts 118 which extend through arcuate slots 120 in cam 114 and are screwed into suitably tapped holes of the circular pad to normally hold the cam fixed relative to the cam shaft. Since the cam 114 is disposed outside of the adjacent frame member 18*a*, the cam 114 can be easily angularly adjusted relative to the cam shaft 116, or removed from the latter, as when the cutoff of the associated machine 12 is changed and it is necessary to provide a cam with a configuration corresponding to the new cutoff.

The periphery of cam 114 is engageable by a cam follower roller 122 which is rotatably mounted on a stub shaft 124 extending from the end of bell-crank member 32 remote from the journal for idler roll shaft 30. The stub shaft 124 extends loosely through a suitable slot (not shown) in the side frame member 18*a* so that, while the bell-crank member 32 and cam 114 are at opposite sides of frame member 18*a*, the roller 122 carried by the bell-crank member can engage the cam.

The assembly, consisting of pivot shaft 36, bell-crank member 32, lever member 34, idler roll 28 and its shaft 30, is yieldably rocked in the clockwise direction, as viewed in Figs. 1 and 2, to move the idler roll to its operative position and to engage cam follower roller 122 with the periphery of cam 114. In the illustrated embodiment, such yieldable rocking is effected by helical tension springs 126 (Figs. 2 and 4) connected between anchor pins 128 extending inwardly from the frame members 18*a* and 18*b* and adjusting screws 130 which pass through extensions 32*a* and 34*a* of the bell-crank member and lever member, respectively, and which are held against being pulled through the related extensions 32*a* and 34*a* by adjusting nuts 132 and locking nuts 134 threaded on the screws 130. It is apparent that, by adjusting the nuts 132 and 134 along the related screws

130, it is possible to vary the spring force urging the idler roll 28 to its operative position.

The cam shaft 116 is also driven from the associated machine 12, as will hereinafter be described in detail, so that the cam 114, as well as the marking roll 52, makes a single complete revolution during each operating cycle or cutoff of the associated machine, and the cam 114 is formed with a radially enlarged peripheral portion 114*a* (Fig. 2) having an angular extent substantially equal to the angular extent of the portion of the circumference of the marking roll 52 by which the circumference of the latter exceeds the length of the cutoff for which the associated machine has been set. The cam 114 is radially dimensioned so that, when roller 122 engages the enlarged peripheral portion 114*a*, bell-crank member 32, and hence, also pivot shaft 36 and lever member 34, are rocked in opposition to the springs 126 to move the idler roll to its inoperative position, and, when roller 122 engages the remainder, or relative small radial portion of the cam, the bell-crank 32, and hence also the shaft 36 and lever member 34, can be rocked by springs 126 to dispose the idler roll in its operative position. Further, the feed roll 22 which, as previously mentioned, is driven from the associated machine 12, has a surface speed equal to that of the driven marking roll 52.

Thus, by reason of the above described action of cam 114, during each operating cycle or cutoff of the associated machine 12, the idler roll 28 will remain in its operative position only long enough to cause feeding and marking of a length of the web W substantially equal to the length of the cutoff and, during the remainder of the operating cycle, in the event that the circumference of marking roll 52 exceeds the length of the cutoff, the idler roll will be moved to its inoperative position to permit continued rotation of the marking roll, and of the rolls 106 and 110 of its inking system, without corresponding additional feeding and marking of the web. Since the length of the web W that is fed and marked during each operating cycle is independent of the circumference of the marking roll, the latter can be given a fixed diameter and a change in the cutoff is compensated for merely by replacement of the cam 114 and does not require a marking roll of correspondingly different diameter which would entail redesign or extensive adjustment of the marking unit frame 50 relative to the main frame 16 to retain the working relationship between the marking roll and its compression or back-up roll represented by the idler roll 28 in the apparatus 10. Further, since the rolls 106 and 110 of the inking system of marking unit 38 are continuously rotated, even during that portion of each operating cycle when marking and feeding are interrupted, ink is continuously applied to the marking element or die on roll 52 and there is no chance that imperfect marking will result on renewal of the marking operation by reason of an interruption in the supplying of ink to the roll 52.

As shown in Fig. 1, a doctor roll 136 is preferably engaged with the web W at a location between the parent roll or supply of the web and the idler roll 28, and the roll 136 is carried by arms 138 pivoted on a support 140 and acted upon by tension springs 142 that urge the arms 138 in the direction (counter-clockwise as viewed in Fig. 1) moving the doctor roll 136 against the web W.

When the marking apparatus 10 is associated with a wrapping, bundling or the like machine having a continuous feed of the web W therethrough, registration of the marking applied by roll 52 to the web with the cutoff of the web in the associated machine can be easily obtained merely by rotationally adjusting the marking roll 52 with respect to its driven shaft. However, when the associated machine 12 has an intermittent feed of the web W, a registration roll 144 is provided in engagement with the web at a location between the idler roll 28 of the marking apparatus and the feed section of the associated machine. The registration roll 144 is rotatably mounted on an angularly adjustable arm 146 carried by the support 140. When the feed in the machine 12 is intermittent, registration of the applied marking with the cutoff requires that the length of the web W between the point of contact of marking roll 52 therewith and the location of the cutoff knife (not shown) of the machine 12 must be a whole multiple of the cutoff length, and this condition can be obtained for any set cutoff by angularly adjusting the arm 146 thereby to increase or decrease, as desired, the length of the web between the point of contact of roll 52 therewith and the location of the cutoff knife.

In order to obtain the desired drive of the feed roll 22 and of the rolls 52, 106 and 110 of marking unit 38 from the associated machine 12, a sprocket 148 (Figs. 3 and 4) is fixed on an end portion of feed roll shaft 24 projecting through side frame member 18*b* and is engaged by a drive chain 150 (Fig. 3) which also runs around a sprocket (not shown) on a drive shaft (not shown) of the associated machine. A spur gear 152 is also fixed on the projecting end portion of shaft 24 and meshes with an idler gear 154 which is rotatable on a stub shaft 156 extending from side frame member 18*b*. The idler gear 154 meshes, in turn, with a gear 158 which is rotatably mounted on a bearing 160 carried by an end portion of cam shaft 116 projecting through side frame member 18*b* so that the gear 158 can rotate relative to the shaft 116. Also mounted on the projecting end portion of cam shaft 116 is a disc 162 which is secured to the cam shaft, for example, by a set screw 164. The disc 162 carries a spur gear 166 which is fixed to the disc and, through the latter, to the cam shaft 116.

A releasable coupling 168 (Fig. 4) is provided between the gears 158 and 166 and includes a pin 170 slidable axially in a bore 172 formed in the disc 162 and gear 166 and adapted to project from the latter into a bore 174 in the gear 158. A stem 176 extends axially through the bore 172 from the pin 170 and projects through a cover plate 178 secured to the outer face of disc 162, with a helical compression spring 180 being provided on the stem 176 between the pin 170 and cover plate 178 to urge the pin 170 axially in the direction into bore 174 of gear 158. In order to provide for axial withdrawal of pin 170 from bore 174, a lever 182 is pivoted on the outer end of stem 176, as at 184, and the lever 182 has a cam surface 186 thereon of increasing radial distance from the pivoting axis 184. When the lever 182 is in its normal position, as shown in Fig. 4, the spring 180 can urge pin 170 into bore 174 of gear 158 so that the gears 158 and 166 are then coupled together. However, when lever 182 is rocked about the pivot 184, the cam surface 186 rides against cover plate 162 and draws pin 170 axially out of bore 174, thereby to uncouple gear 166 from driven gear 158 and to interrupt the drive of cam shaft 116 as well as to interrupt the drive of marking unit 38, which will now be described in detail.

Gear 166 meshes with an idler gear 188 on a stub shaft 190 extending from side frame member 18*b*, and the gear 188 meshes, in turn, with a spur gear 192 fixed on a projecting end portion of the combined supporting and driving shaft 44 of the marking unit. Also fixed on shaft 44 adjacent side frame plate 40*b* of the marking unit is a spur gear 194 (Fig. 3) which meshes with an idler gear 196 rotatable on a stub shaft 198 extending from plate 40*b*. The idler gear 196 meshes, in turn, with a spur gear 200 fixed on an end portion of the ink supplying roll shaft 108. The gear 200 meshes with a spur gear 202 fixed on a projecting end portion of the metering roll shaft 112. The pitch diameters of the gears 200 and 202 are preferably equal to the diameters of the ink supplying and metering rolls 106 and 110, respectively, so that the latter are driven at the same surface speeds. The marking roll 52 is also preferably driven at the same surface speed as the rolls 106 and 110, but a gear on the marking roll shaft 54 meshing directly with the gear 202 and having a pitch diameter equal to the diameter of roll 52

would have teeth projecting radially beyond the periphery of roll 52 and interfering with marking of a web having a width greater than that of the marking roll. Thus, in the marking unit 38, a gear 204 having a pitch diameter substantially smaller than the diameter of the marking roll 52 is secured on a projecting end portion of shaft 54 and successive, meshing idler gears 206 and 208 are mounted on related stub shafts extending from frame plate 40*b* and serve to transmit the rotation of gear 202 to gear 204, the gears 204, 206 and 208 being dimensioned so that marking roll 52 rotates at the same surface speed as metering roll 110, as desired.

As previously mentioned, the several above described gears are dimensioned so that the cam 114 on shaft 116, and the marking roll 52 on shaft 54 each rotates through one complete revolution during each operating cycle or cutoff of the associated machine 12.

It will be apparent that the releasable coupling 168 makes it possible to disconnect both the cam shaft 116 and the drive of the marking unit 38 from the drive of the feed roll 22 so that, if desired, the web W can be fed to the associated machine 12 while the marking apparatus 10 remains inoperative. Further, since the pin 170 of the releasable coupling can engage in the bore 174 in only one relative position of the gears 158 and 166 and the cam shaft 116 and marking roll shaft 54 rotate in a one-to-one ratio, the marking roll 52 is automatically restored to a condition of registration with the cutoff of the associated machine 12 when the coupling 168 is again engaged to drive shaft 116 and gear 166 from driven gear 158.

Since many wrapping, bundling or the like machines, with which the marking apparatus 10 is intended to be associated, are arranged to interrupt the feeding of the web therein when there is an interruption or gap in the feed thereto of articles to be wrapped or bundled, the marking apparatus 10 preferably also includes an arrangement for then preventing the feeding and marking operation of the marking apparatus. Referring in detail to Fig. 2, it will be there seen that a latch member 210 is pivoted, as at 212, on the arm of bell-crank member 32 carrying the cam follower roller 122. The latch member 210 depends or extends downwardly from its pivot 212 and is yieldably urged to rock toward the left, as viewed in Fig. 2, by a tension spring 214 which is connected between the latch member and the bell-crank member 32. A solenoid 216 is mounted against the inside face of the side frame member 18*a*, for example, by bolts 218, and has its armature 220 connected to the latch member 210 by a tension spring 222. Thus, when the solenoid 216 is energized to retract its armature 220, the tension in spring 222 is increased sufficiently to overcome the force of oppositely acting spring 214 and thereby to move latch member 210 toward the right to an inoperative position, as shown in Fig. 2. However, when the solenoid 216 is de-energized, spring 214 becomes predominant and moves the latch member toward the left from the position of Fig. 2 to an operative position (not shown).

Also mounted against the inside face of side frame member 18*a* is a bracket 224 which has a laterally extending stop plate or keeper 226 secured thereon, as by bolts 228. Preferably, the bolts 228 extend through vertically elongated holes (not shown) in the keeper 226 so that the latter may be vertically adjusted. The bracket 224 is disposed so that the keep 226 is disposed in the path of downward travel of a corner of the latch member 210 with the bell-crank member 32 when the latch member is in its operative position, by reason of de-energization of the solenoid 216, and is effective to prevent rocking of the bell-crank member 32 in the direction for moving the idler roll 28 to its operative position even when the radially enlarged portion 114*a* of cam 114 moves out of contact with the roller 122. However, when solenoid 216 is energized and latch member 210 is moved to its inoperative position shown in Fig. 2, the lower corner of the latch member clears keeper 226 and the latter no longer interferes with rocking of bell-crank member 32.

As seen in Fig. 7, a circuit for energizing the coil of solenoid 216 may include a source 230 of electric current and a normally open switch 232 connected in series between the source 230 and the solenoid, the switch 232 being article actuated and arranged adjacent the feed of articles to the machine 12 so that switch 232 is closed by the articles and the solenoid 216 remains energized so long as a normal feed of articles to machine 12 is maintained, and so that the switch 232 is opened to de-energize solenoid 216, and thereby prevent operation of the marking apparatus 10, when a gap or interruption occurs in the feed of articles to the associated wrapping, bundling or the like machine.

Although the latch member 210 of the illustrated marking apparatus 10 is electro-magnetically controlled by the solenoid 216, it is to be understood that the necessary movement of the latch member between its described operative and inoperative positions may be obtained with a suitable mechanical linkage (not shown) actuated from the associated machine 12 to render the apparatus 10 inoperative in response to an interruption in the feeding of the web W into the machine 12.

As an example of the operation of the marking apparatus 10, let it be assumed that the marking roll 52 has a circumference of eighteen inches while the associated machine 12 is set to intermittently feed and cutoff fourteen inch lengths of the web W. With these relative conditions, a cam 114 would be employed having a radially enlarged portion 114*a* extending over that part of its circumference corresponding to approximately three and one-half inches of the circumference of the marking roll. Prior to operation, the registration roll 144 is adjusted so that the length of web W between the point of marking contact of roll 52 with the web on roll 28 and the location of the cutoff knife of machine 12 is a whole multiple of fourteen inches, and the cam 114 is rotationally adjusted relative to its shaft 116 so that the roller 122 will move off the radially enlarged portion 114*a* of the cam to commence the feeding and marking operation of the marking apparatus 10 prior to the commencement of the feed of the web through the feed section of the machine 12. Thus, when the idler roll 28 is moved to its operative position to cooperate with the feed roll 22 and the marking roll 52, the marking apparatus will feed and mark a fourteen and one-half inch length of the web W. Initially, the feed of the web by the marking apparatus will create slack in the web between the marking apparatus and the entrance to the associated machine 12. Then the delayed feeding of the web into the machine 12 for a distance of fourteen inches will occur. When the radially enlarged portion 114*a* of the cam again engages the roller 122 to return the idler roll 28 to its inoperative position spaced from the feed roll 22 and the marking roll 52, the excess one-half inch length of feed of the web W is pulled back over the roll 28 by the spring loaded roll 136 so that exact registration of the next imprint applied by roll 52 with the cutoff is thereby established. The feed of the web W by the rolls 22 and 28 of the marking apparatus a distance greater than the length of the cutoff by the machine 12 ensures that proper marking pressure will be attained between rolls 52 and 28 for a length of the web W at least as long as the cutoff by the machine 12 so that the entire length of the cutoff can be marked without the danger that a delay in the occurrence of an adequate marking pressure or a premature reduction of that pressure will cause imperfect marking at the beginning and end of the cutoff length. Further, the excess feed of the marking apparatus compensates for the use of an idler roll 28 having a soft surface to provide optimum marking conditions when it acts as a compression or

back-up roll for the marking roll 52. With such a soft surfaced idler roll 28 which is indented by contact with the roll 52, so that the contact therebetween is over a substantial area rather than along an axial line, the actual length of web W advanced between the rolls 28 and 52 will be longer than the circumferential distance on the surface of the marking roll engaged with the web during each operating cycle by a distance equal to the width of the area of contact between the rolls 52 and 28.

Although the above described marking apparatus 10 has its idler roll 28 urged to its operative position by springs 126 and the cam 114 acts to move the idler roll to its inoperative position, it is apparent that the parts may be re-arranged so that the cam acts directly to move the idler roll to its operative position and either springs, or even the mere weight of the idler roll, are relied upon to move the latter to its inoperative position. Further, a single revolution, or other, clutching arrangement may be interposed in the drive of the control cam if required by the operating conditions of the associated machine 12.

Although the cam 114 of the marking apparatus 10 is mounted on a shaft 116 journalled in the main frame 16 so that the reaction to the force of the cam against the roller 122 on bell-crank lever 32 is contained within the main frame and, thereby, isolated from the pivoted frame 50 of the marking unit 38, the present invention is not limited to such an arrangement. For example, in Fig. 9 of the drawings, a marking apparatus constructed in accordance with another embodiment of the invention is illustrated and generally identified by the reference numeral 300. The apparatus 300, although differing in appearance from the previously described apparatus 10, is functionally similar to the latter and operates to repeatedly mark and feed a web W as the latter is taken from a parent roll or other source (not shown) into the feed section of an associated wrapping, bundling or the like machine (not shown).

The marking apparatus 300 includes standards 302 suitably positioned in relation to the parent roll and feed section of the associated machine and supporting a main frame 304 at their upper ends. The frame 304 includes side frame members 306 that extend forwardly from the standards 302 and have depending extensions 308 at their forward ends. A feed roll 310, corresponding to the feed roll 22 of apparatus 10, is mounted on a shaft 312 that has its opposite end portions journalled in suitable bearings carried by the forward end portions of the side frame members 306. A pivot shaft 314 is journalled, at its opposite ends, in the depending extensions 308 of the side frame members with the axes of shafts 312 and 314 lying in substantially the same vertical plane. Two radial arms 316 are secured, at one end, to shaft 314 at locations adjacent the inside surfaces of the side frame members and a shaft 318 extends parallel to the shafts 312 and 314 and has its ends mounted in the arms 316 intermediate the ends of the latter. A rotatable idler roll 320, corresponding to the idler roll 28 of apparatus 10, is mounted on shaft 318 and movable toward and away from the illustrated operative position in contact with the feed roll 310 in response to rocking of the arms 316.

A marking unit 322, which is generally similar to the previously described unit 38, has a frame 324 which is pivotally mounted, at its back end, on a shaft 326 having its opposite ends carried by brackets 328 extending upwardly from the side frame members 306. A marking roll 330 is rotatably mounted in the forward portion of the marking unit frame above the idler roll 320, and ink is applied to the surface of a marking element or die on the periphery of roll 330 by an inking system that includes a reservoir 332 having an ink supplying roll 334 dipping therein and a metering roll 336 in rolling contact with roll 334 to receive ink from the latter and to transfer such ink to the marking element on roll 330.

The frame 324 of marking unit 322 is angularly positioned on support shaft 326 so that, when idler roll 320 is in its operative position against feed roll 310, the roll 320 will also act as a compression or back-up roll for the marking roll 330. In order to angularly position the frame 324 about shaft 326, at least one of the brackets 328 has a lug 338 formed on its inner face and provided with a tapped bore extending through the lug to receive a bolt 340 which, at its front end, engages the head of a bolt 342 projecting from the adjacent side of the marking unit frame, thereby to adjustably limit swinging of the latter in the direction lowering the marking roll 330 toward the idler roll 320. A lock nut 344 is preferably provided on the bolt 340 to prevent inadvertent movement of the latter.

In order to urge the pivoted arms 316 in the direction moving idler roll 320 to its operative position, tension springs 346 are connected between anchors 348 on the marking unit frame 324 and adjusting bolts 350 which extend through suitable openings in the free ends of arms 316 and carry knurled adjusting and locking nuts 352 and 354. Thus, by adjusting the nuts 352 and 354 along the related bolts 350, the force of springs 346 urging the roll 320 to its operative position, and hence the contact pressure of roll 320, in its operative position, which feed roll 310 and marking roll 330 may be varied.

In the marking apparatus 300, the idler roll 320 is moved away from the feed roll 310 and the marking roll 330 by a cam 356 which is angularly adjustably fixed on an extension of the shaft of marking roll 330 and which has a radially enlarged portion 356*a* engageable with a cam follower roller 358 on one of the arms 316. The cam 356 is dimensioned so that, when its enlarged portion 356*a* engages the roller 358, the related arm 316, the shaft 314 and the other arm 316 are jointly rocked in the counter-clockwise direction, as viewed in Fig. 9, to space the roll 320 from the rolls 310 and 330. As in the case of the cam 114 of apparatus 10, the enlarged portion 356*a* of cam 356 corresponds substantially to the portion of the circumference of marking roll 330 by which the length of that circumference exceeds the cutoff length set on the associated machine.

Further, as in the first described embodiment of the invention, the feed roll 310 and the rolls 330, 334 and 336 of the marking unit are all driven from the associated machine by a suitable gear transmission (not shown) therebetween so that the marking roll 330, and hence the cam 356 thereon, complete a single revolution during each operating cycle or cutoff of the associated machine.

As seen in Fig. 9, the web W passes upwardly between the idler roll 320 and the feed roll 310 and then forwardly between the idler roll and the marking roll 330. Thus, when the idler roll 320 is in its operative position, as shown, the Web W is simultaneously fed and marked between the roll 320 and the rolls 310 and 330, respectively, and the cam 356 is formed so that, although the marking roll 330 may have a circumference substantially greater than the cutoff of the associated machine, only a length of web substantially equal to the cutoff will be fed and marked during each cycle.

As in the first described embodiment, the marking apparatus 300 has an arrangement for preventing the marking and feeding operation thereof in response to the occurrence of a gap or interruption in the feed of articles to the associated wrapping, bundling or the like machine. Such arrangement includes a latch member 360 extending radially from an axle 362 that is pivoted in a side frame member 306 so that the latch member may be rocked between a raised, or inoperative position illustrated in Fig. 9 and a lowered operative position in which the latch member engages a keeper plate 364 adjustably secured on the adjacent arm 316 and prevents rocking of the arms 316 in the direction for moving

idler roll 320 to its operative position. A spring 366 is connected between the latch member 360 and the adjacent side frame member extension 308 to yieldably urge the latch member to its operative position.

An actuating arm 368 extends upwardly from the axle 362 and can be rocked in the clockwise direction to move latch member 360 to the raised, inoperative position of the latter. The arm 368 can be connected to a mechanical linkage controlled from the associated machine or, as shown, the upper end of arm 368 can be pivotally connected to a link 370 which is, in turn, pivotally connected to the armature 372 of a solenoid 374 mounted on the frame 324 of the marking unit and corresponding to the solenoid 216 of the apparatus 10. As in the case of the solenoid 216, solenoid 374 is energized so long as an adequate feed of articles to the associated machine is maintained, thereby to hold latch member 360 in its inoperative position and permit repeated movement of roll 320 to and from its operative position. However, when a gap or interruption occurs in the article feed, solenoid 374 is de-energized and spring 366 moves latch member 360 to its operative position thereby blocking movement of idler roll 320 to the operative position of the latter and preventing further marking and feeding of the web W until the supply of articles to the machine has been restored and the machine again requires a supply of marked web.

Although particular embodiments of the invention have been described in detail herein and shown in the accompanying drawings, by way of example, it is to be understood that the invention is not limited to those embodiments 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. Apparatus for applying repeated markings to a web of sheet material comprising a freely rotatable idler roll over which the web passes, a driven feed roll disposed adjacent and parallel to said idler roll with the web passing therebetween, a driven marking roll also arranged adjacent and parallel to said idler roll with the web passing therebetween, means supporting said idler roll for bodily movement relative to said feed and marking rolls between an operative position, in which the idler roll is simultaneously pressed against said feed and marking rolls to cooperate with the feed roll in feeding the web therebetween and to serve as a back-up roll for said marking roll, and an inoperative position, in which the idler roll is spaced substantially from said feed and marking rolls to interrupt the feeding and marking of the web by said feed and marking rolls, respectively, and control means effective to maintain said idler roll in said operative position during at least a portion of a complete revolution of said marking roll and to displace said idler roll to said inoperative position during the remainder of said complete revolution so that the length of the web that is fed and marked during each revolution of the marking roll is determined by said control means and is independent of the circumference of said marking roll.

2. Apparatus for applying repeated markings to a web of sheet material fed to an associated machine which, during each operating cycle thereof, cuts a predetermined length from the web for use in wrapping, bundling and the like; said apparatus comprising a freely rotatable idler roll over which the web passes prior to entry into the associated machine, a driven feed roll disposed adjacent and parallel to said idler roll with the web passing therebetween, a marking roll also disposed adjacent and parallel to said idler roll with the web passing therebetween, means rotating said marking roll so that the latter makes one complete revolution during each operating cycle of the associated machine, means supporting said idler roll for bodily movement relative to said feed and marking rolls between an operative position, in which the idler roll is simultaneously pressed against said feed and marking rolls to cooperate with the driven feed roll in feeding the web therebetween and to serve as a back-up roll for said marking roll as the latter marks the fed web, and an inoperative position, in which said idler roll is spaced substantially from said feed and marking rolls to interrupt the feeding and marking of the web, and control means effective to maintain said idler roll in said operative position during each operating cycle of the associated machine for a period sufficient to provide feeding and marking of a length of the web substantially equal to the predetermined length cut from the web by the associated machine and to displace said idler roll to said inoperative position during the remainder of the operating cycle of the associated machine.

3. Apparatus for applying repeated markings to a web of sheet material fed to an associated machine which, during each operating cycle thereof, cuts a predetermined length from the web for use in wrapping, bundling and the like; said apparatus comprising a freely rotatable idler roll over which the web passes prior to entry into the associated machine, a driven feed roll disposed adjacent and parallel to said idler roll with the web passing therebetween, a marking roll also disposed adjacent and parallel to said idler roll with the web passing therebetween, means rotating said marking roll so that the latter makes one complete revolution during each operating cycle of the associated machine, means supporting said idler roll for bodily movement relative to said feed and marking rolls between an operative position, in which the idler roll is simultaneously pressed against said feed and marking rolls to cooperate with the driven feed roll in feeding the web therebetween and to serve as a back-up roll for said marking roll as the latter marks the fed web, and an inoperative position, in which said idler roll is spaced substantially from said feed and marking rolls to interupt the feeding and marking of the web, said marking roll having a circumference at least as large as the predetermined length cut from the web by the associated machine during each operating cycle of the latter, and control means effective to maintain said idler roll in said operative position during at least an angular portion of a complete revolution of said marking roll enclosing a circumferential dimension on the latter substantially equal to the predetermined length cut from the web and to displace said idler roll to said inoperative position during the remainder of said complete revolution of the marking roll so that the length of web that is marked and fed by the apparatus is substantially equal to the predetermined length cut from the web by the associated machine and is independent of the circumference of said marking roll.

4. Apparatus for applying repeated markings to a web of sheet material comprising a freely rotatable idler roll over which the web passes, a driven feed roll disposed adjacent and parallel to said idler roll with the web passing therebetween, a driven marking roll also arranged adjacent and parallel to said idler roll with the web passing therebetween, means supporting said idler roll for bodily movement relative to said feed and marking rolls between an operative position, in which the idler roll is simultaneously pressed against said feed and marking rolls to cooperate with the feed roll in feeding the web therebetween and to serve as a back-up roll for said marking roll, and an inoperative position, in which the idler roll is spaced substantially from said feed and marking rolls to interrupt the feeding and marking of the web by said feed and marking rolls, respectively, and means for controlling the positioning of said idler roll including a control cam rotated at the same rotational speed as said marking roll and effective to dispose said idler roll in said operative position during at least a portion of a complete revolution of said marking roll and to dispose said idler roll in said inoperative position during the remainder of said complete revolution

so that the length of the web that is fed and marked during each revolution of the marking roll is determined by the configuration of said control cam and is independent of the circumference of said marking roll.

5. Apparatus for applying repeated markings to a web of sheet material comprising a freely rotatable idler roll over which the web passes, a driven feed roll disposed adjacent and parallel to said idler roll with the web passing therebetween, a driven marking roll also arranged adjacent and parallel to said idler roll with the web passing therebetween, means supporting said idler roll for bodily movement relative to said feed and marking rolls between an operative position, in which the idler roll is simultaneously pressed against said feed and marking rolls to cooperate with the feed roll in feeding the web therebetween and to serve as a back-up roll for said marking roll, and an inoperative position, in which the idler roll is spaced substantially from said feed and marking rolls to interrupt the feeding and marking of the web by said feed and marking rolls, respectively, and means for controlling the positioning of said idler roll including a control cam rotated at the same rotational speed as said marking roll and having a first cam surface portion extending over a predetermined extent of the circumference of said control cam and a second cam surface portion extending over the remainder of said circumference of the control cam, said first and second cam surface portions being effective to dispose said idler roll in said operative and inoperative positions, respectively, so that the length of the web that is fed and marked during each revolution of the marking roll is determined by the relative circumferential extents of said first and second cam surface portions and is independent of the circumferential dimension of said marking roll.

6. Apparatus for applying repeated markings to a web of sheet material fed to an associated machine which, during each operating cycle thereof, cuts a predetermined length from the web for use in wrapping, bundling and the like; said apparatus comprising a freely rotatable idler roll over which the web passes prior to entry into the associated machine, a driven feed roll disposed adjacent and parallel to said idler roll with the web passing therebetween, a marking roll also disposed adjacent and parallel to said idler roll with the web passing therebetween, means rotating said marking roll so that the latter makes one complete revolution during each operating cycle of the associated machine, means supporting said idler roll for bodily movement relative to said feed and marking rolls between an operative position, in which the idler roll is simultaneously pressed against said feed and marking rolls to cooperate with the driven feed roll in feeding the web therebetween and to serve as a back-up roll for said marking roll as the latter marks the fed web, and an inoperative position, in which said idler roll is spaced substantially from said feed and marking rolls to interrupt the feeding and marking of the web, said marking roll having a circumference at least as large as the pretermined length cut from the web by the associated machine during each operating cycle of the latter, and means for controlling the positioning of said idler roll including a replaceable control cam rotated at the same rotational speed as said marking roll and having a first cam surface portion enclosed by an angle equal to the angle on said marking roll enclosing a portion of the circumference of the latter substantially equal to the predetermined length cut from the web by the associated machine and a second cam surface portion extending over the remainder of said control cam, said first and second cam surface portions being effective to dispose said idler roll in said operative and inoperative positions, respectively, so that the length of the web that is fed and marked during each revolution of the marking roll is substantially equal to the length cut from the web during each operating cycle of the associated machine and is determined by the relative circumferential extents of said first and second cam surface portions independent of the circumferential dimension of said marking roll.

7. Apparatus for applying repeated markings to a continuous web of sheet material as the latter is fed into an associated machine which, during each operating cycle thereof, cuts a predetermined length from the marked web for use in the wrapping, bundling and the like of articles fed to the associated machine; said apparatus comprising a freely rotatable idler roll over which the web passes on the way to the associated machine, a driven feed roll disposed adjacent and parallel to said idler roll with the web passing therebetween, a driven marking roll also disposed adjacent and parallel to said idler roll with the web passing therebetween, means supporting said idler roll for bodily movement of the latter relative to said feed and marking rolls between an operative position, in which the idler roll is simultaneously pressed against said feed and marking rolls to cooperate with the driven feed roll in feeding the web therebetween and to serve as a back-up roll for said marking roll as the latter marks the fed web, and an inoperative position, in which said idler roll is spaced substantially from said feed and marking rolls to interrupt the feeding and marking of the web, control means normally effective to dispose said idler roll in said operative position during at least an angular portion of a complete revolution of said marking roll and to dispose said idler roll in said inoperative position during the remainder of said complete revolution, and means for preventing movement of said idler roll from said inoperative position to said operative position when the feeding of articles to the associated machine is interrupted.

8. Apparatus for applying repeated markings to a continuous web of sheet material as the latter is fed into an associated machine which, during each operating cycle thereof, cuts a predetermined length from the marked web for use in the wrapping, bundling and the like of articles fed to the associated machine; said apparatus comprising a freely rotatable idler roll over which the web passes on the way to the associated machine, a driven feed roll disposed adjacent and parallel to said idler roll with the web therebetween, a marking roll also disposed adjacent and parallel to said idler roll with the web therebetween, means for rotating said marking roll through a complete revolution during each operating cycle of the associated machine, said marking roll having a circumferential dimension at least as large as the predetermined length cut from the web by the associated machine, means supporting said idler roll for bodily movement of the latter relative to said feed and marking rolls between an operative position, in which the idler roll is simultaneously pressed against said feed and marking rolls to cooperate with the latter in respectively feeding and marking the web, and an inoperative position, in which said idler roll is substantially spaced from said feed and marking rolls to interrupt the feeding and marking of the web, means yieldably urging said idler roll to said operative position, control means normally effective to permit movement of said idler roll to said operative position during rotational displacement of said marking roll through an angle enclosing at least a portion of the circumference thereof substantially equal in length to the length cut from the web by the associated machine and to dispose said idler roll in said inoperative position during the remainder of a complete revolution of said marking roll so that said control means determines the length of the web that is fed and marked independent of the circumference of the marking roll, and means for preventing movement of said idler roll from said inoperative position to said operative position when an interruption occurs in the feeding of articles to the associated machine.

9. Apparatus for applying repeated markings to a continuous web of sheet material as the latter is fed into an associated machine which, during each operating cycle thereof, cuts a predetermined length from the marked web for use in the wrapping, bundling and the like of articles fed to the associated machine; said apparatus comprising a freely rotatable idler roll over which the web passes on the way to the associated machine, a driven feed roll disposed adjacent and parallel to said idler roll with the web therebetween, a marking roll also disposed adjacent and parallel to said idler roll with the web therebetween, means for rotating said marking roll through a complete revolution during each operating cycle of the associated machine, said marking roll having a circumferential dimension at least as large as the predetermined length cut from the web by the associated machine, means supporting said idler roll for bodily movement of the latter relative to said feed and marking rolls between an operative position, in which the idler roll is simultaneously pressed against said feed and marking rolls to cooperate with the latter in respectively feeding and marking the web, and an inoperative position, in which said idler roll is substantially spaced from said feed and marking rolls to interrupt the feeding and marking of the web, means yieldably urging said idler roll to said operative position, control means normally effective to permit movement of said idler roll to said operative position during rotational displacement of said marking roll through an angle enclosing at least a portion of the circumference thereof substantially equal in length to the length cut from the web by the associated machine and to dispose said idler roll in said inoperative position during the remainder of a complete revolution of said marking roll so that said control means determines the length of the web that is fed and marked independent of the circumference of the marking roll, and a registration roll engageable with the web at a location along the latter intermediate the point of marking contact therewith by said marking roll and the point where the associated machine cuts the web, said registration roll being adjustably movable to vary the length of the web between said points so that the last mentioned length may be made a whole multiple of the length cut from the web by the associated machine during each operating cycle, whereby the repeated markings applied to the web by said marking roll can be registered with the successive lengths cut from the web.

10. Apparatus for applying repeated markings to a web of sheet material comprising a frame, a driven feed roll rotatably mounted in said frame, a freely rotatable idler roll disposed at one side of and parallel to said feed roll with the web to be marked passing upwardly between said feed and idler rolls and then over the idler roll in the direction away from said feed roll, a marking unit mounted on said frame and having a rotated marking roll parallel to said idler roll and disposed in an adjustably fixed position adjacent and above said idler roll with the web passing therebetween, support means rockably connected to said frame and supporting said idler roll for bodily movement relative to said marking and feed rolls between an operative position, in which said idler roll presses against said feed and marking rolls simultaneously to cooperate therewith in feeding and marking the web, and an inoperative position, in which said idler roll is substantially spaced from both of said feed and marking rolls to interrupt the feeding and marking of the web, spring means yieldably urging said support means to rock in the direction moving said idler roll to said operative position, and cam means rotated at the same rotational speed as said marking roll and cooperating with said support means to permit rocking of the latter in the direction disposing the idler roll in said operative position during at least a portion of the rotation of the marking roll through a complete revolution and acting to rock said support means in opposition

to said spring means to dispose said idler roll in said inoperative position during the remainder of said complete revolution of said marking roll so that the length of web that is fed and marked during each revolution of the marking roll is determined by said cam means independent of the circumferential dimension of the marking roll.

11. Apparatus as in claim 10; wherein said cam means is rotatably mounted on said frame so that the reaction to the action of said cam means against said support means is contained within said frame and thereby isolated from said marking unit and the marking roll of the latter.

12. Apparatus as in claim 10; wherein said marking unit includes a rotated shaft carrying said marking roll, and said cam means is mounted on said shaft to rotate with the marking roll.

13. Apparatus for applying repeated markings to a web of sheet material comprising a frame, a continuously driven feed roll rotatably mounted on said frame, a freely rotatable idler roll disposed at one side of, and parallel to said feed roll with the web passing upwardly between said feed and idler rolls and then over the idler roll in the direction away from said feed roll, a marking unit mounted on said frame and having a rotatable marking roll parallel to said idler roll and disposed in an adjustably fixed position above and adjacent said idler roll with the web passing therebetween, support means movably connected to said frame and supporting said idler roll for bodily movement relative to said idler and feed rolls between an operative position, in which said idler roll presses the web against said feed and marking rolls simultaneously to cause feeding and marking of the web, and an inoperative position, in which said idler roll is substantially spaced from said feed and marking rolls to interrupt the feeding and marking of the web, means yieldably urging said support means in the direction disposing said idler roll in said operative position, a rotatable cam having a radially enlarged peripheral portion, follower means on said support means engageable by said cam to move said idler roll to said inoperative position during engagement of said follower means by said radially enlarged peripheral portion of the cam and to permit movement of said idler roll to said operative position during engagement of the follower means by the remainder of the periphery of the cam, gear train means for driving said cam and said marking roll at the same rotational speed from said driven feed roll so that the length of web that is fed and marked during each complete revolution of the marking roll is determined by the angular extent of said radially enlarged peripheral portion of the cam independent of the circumferential dimension of said marking roll, and a releasable drive coupling interposed in said gear train means between said driven feed roll and said cam so that the drive for said cam and marking roll can be interrupted while the feed roll continues to rotate.

14. Apparatus as in claim 13; wherein said cam is mounted on a cam shaft and said gear train means includes a first gear on said cam shaft rotatable relative to the latter, gear means driving said first gear from said feed roll, a second gear on said cam shaft and rotationally fixed with respect to the latter, gear means driving said marking roll from said second gear on the cam shaft, said first and second gears each having a bore therein spaced equally from the axis of said cam shaft to register with each other when said cam is in a single rotational position with respect to said marking roll; and wherein said releasable drive coupling includes a coupling pin movable axially in said bore of said second gear and engageable in said bore of said first gear when said bores are in axial registration, means yieldably urging said pin into said bore of the first gear, and means for withdrawing said pin from said bore of the first gear so that the latter and said gear means between the feed roll and said first

gear can rotate independent of rotation of said cam shaft and said marking roll.

15. Apparatus for applying repeated markings to a web of sheet material comprising a frame, a driven feed roll rotatably mounted in said frame, a freely rotatable idler roll disposed at one side of, and parallel to said feed roll with the web to be marked passing upwardly between said feed and idler rolls and then over the idler roll in the direction away from said feed roll, a marking unit pivotally mounted on said frame and having a rotated marking roll with the axis of the latter spaced from the pivoting axis of the marking unit, said axis of the marking roll being parallel to the axis of said idler roll disposed above said idler roll so that the web passes between said marking and idler rolls, means angularly positioning said mounting unit relative to said frame for adjustably determining the position of said marking roll, support means rockably connected to said frame and supporting said idler roll for bodily movement relative to said marking and feed rolls between an operative position, in which said idler roll presses against said feed and marking rolls simultaneously to cooperate therewith in feeding and marking the web, and an inoperative position, in which said idler roll is substantially spaced from both of said feed and marking rolls to interrupt the feeding and marking of the web, spring means yieldably urging said support means to rock in the direction moving said idler roll to said operative position, and cam means rotated at the same rotational speed as said marking roll and co-

operating with said support means to permit rocking of the latter in the direction disposing the idler roll in said operative position during at least a portion of the rotation of the marking roll through a complete revolution and acting to rock said support means in opposition to said spring means to dispose said idler roll in said inoperative position during the remainder of said complete revolution of said marking roll so that the length of web that is fed and marked during each revolution of the marking roll is determined by said cam means independent of the circumferential dimension of the marking roll.

16. Apparatus as in claim 15; further comprising latch means movable to an engaged position in which it prevents rocking of said support means in the direction for disposing the idler roll in said operative position of the latter, and electro-magnetically operated means normally holding said latch means out of said engaged position to permit rocking of said support means between the operative and inoperative positions of said idler roll.

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