

Sept. 23, 1952

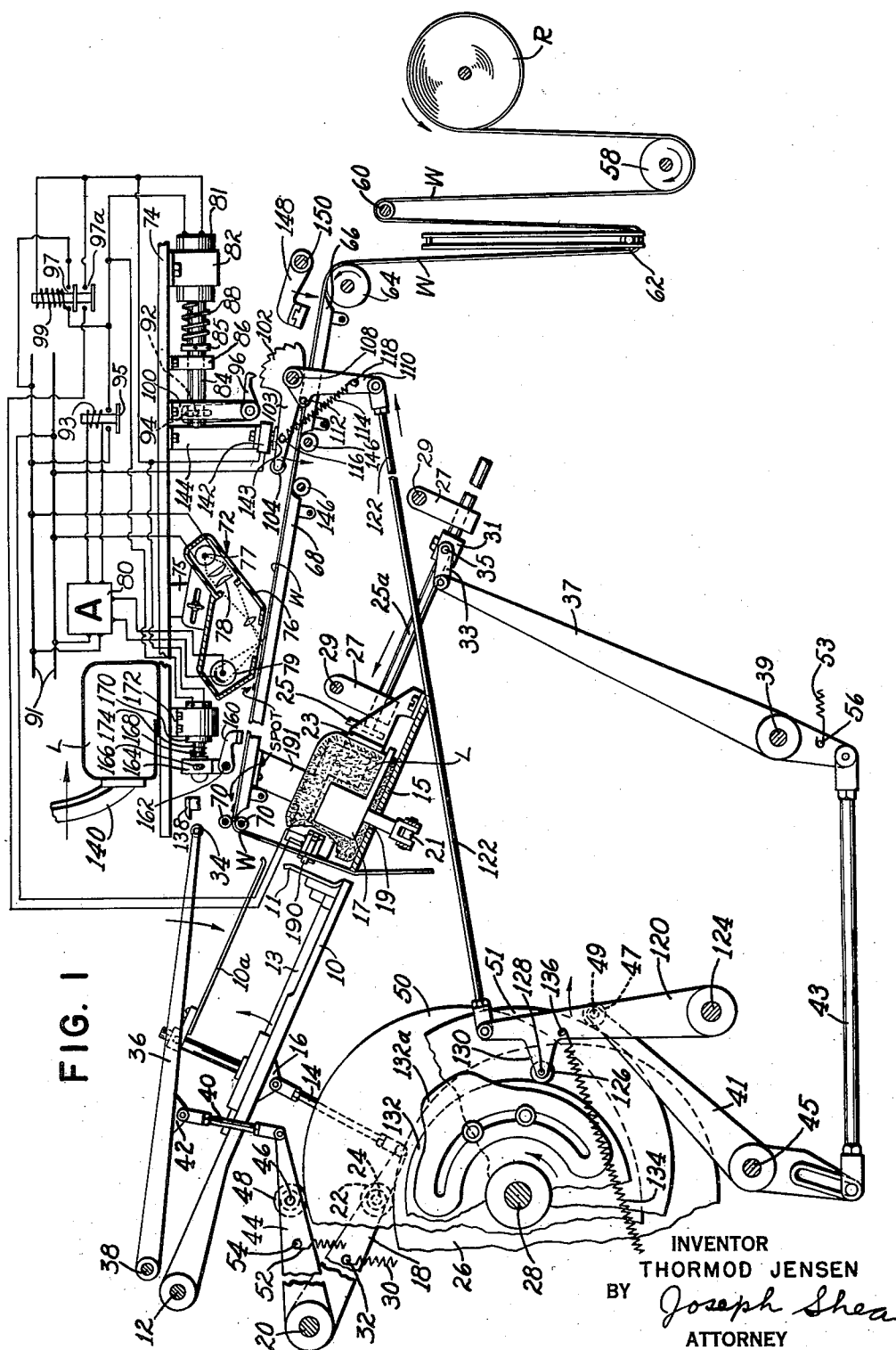
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2,611,224

REGISTRATION DEVICE FOR WRAPPING MACHINES

Filed July 1, 1947

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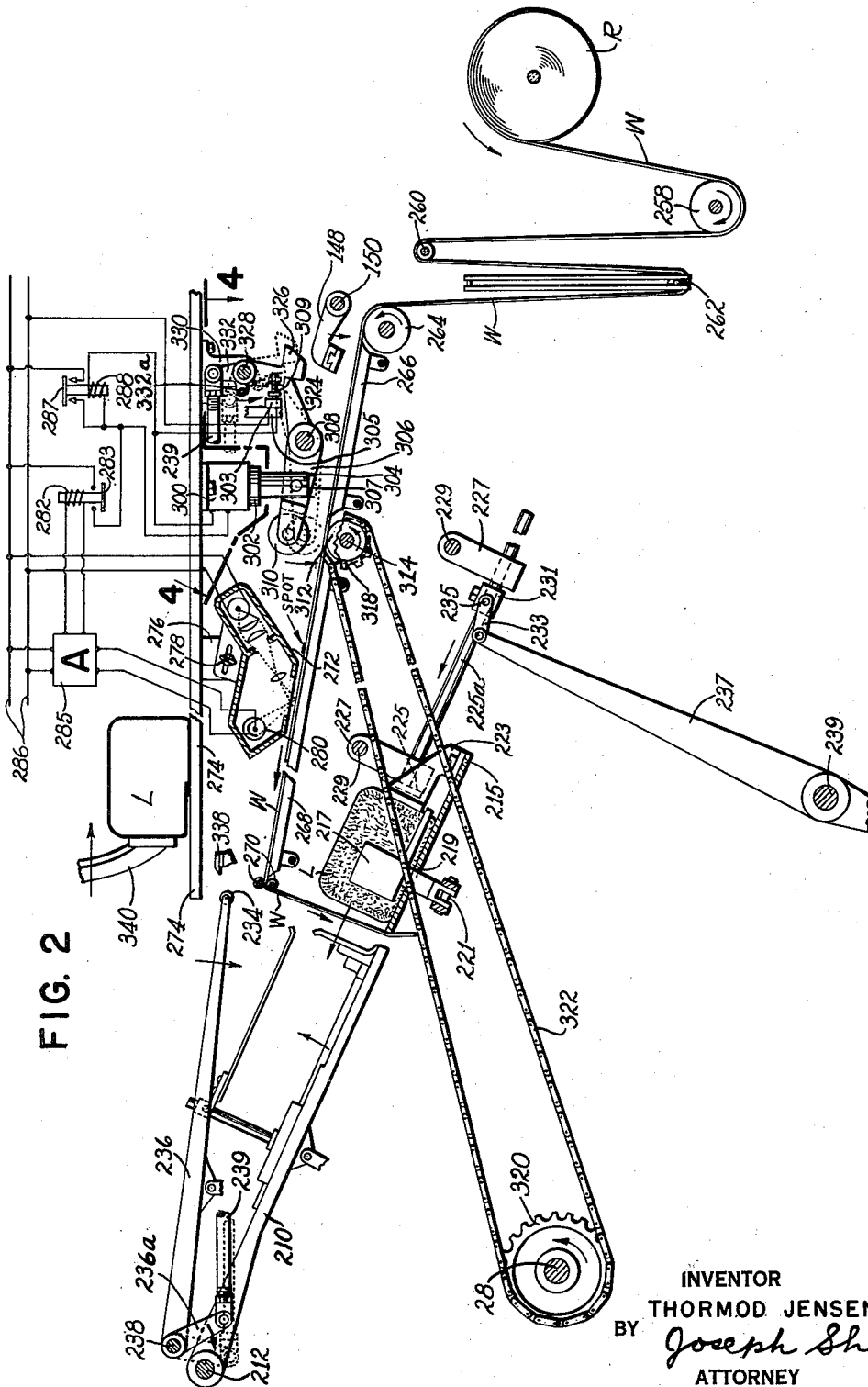
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REGISTRATION DEVICE FOR WRAPPING MACHINES

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FIG. 2



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FIG. 3

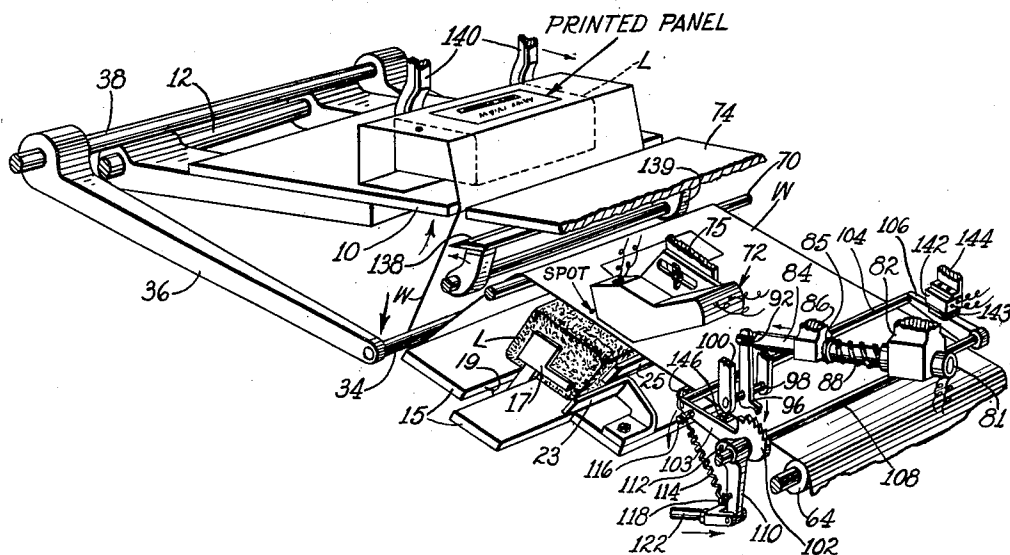
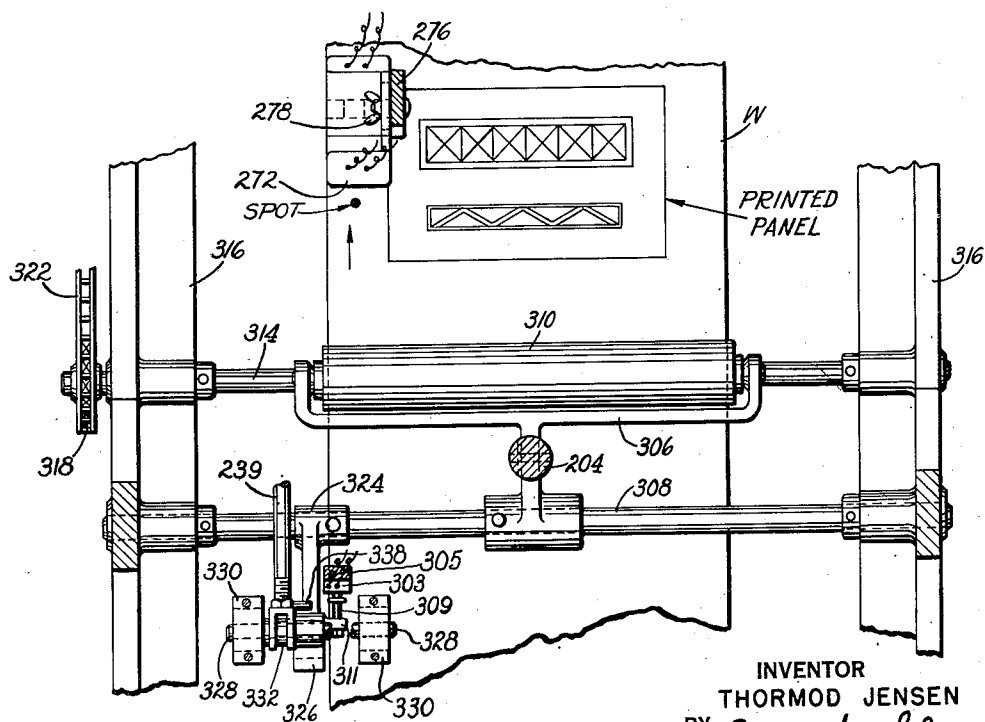


FIG. 4



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UNITED STATES PATENT OFFICE

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REGISTRATION DEVICE FOR WRAPPING MACHINES

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13 Claims. (Cl. 53—25)

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This invention relates to wrapping machines, more particularly to wrapping machines equipped with web registering devices for maintaining the printed panel or other printed matter on the wrapping material in a predetermined position on one of the faces of the article about which the wrapping material is folded.

Heretofore in wrapping machines of the type wherein an article was enfolded in the leading end of a web of wrapping material prior to severance of the required length of wrapper from the web it was not possible, particularly when wrapping articles of non-uniform girth such as bread loaves, to apply the wrapper to the article in such a manner that the printed matter would appear in the desired position on the top or other face of the article. Therefore one of the main objects of this invention is to equip this type of wrapping machine with web registering devices which will obtain the desired position of the printed matter on one of the faces of the wrapped article.

For this purpose the web of wrapping material may be provided with a series of equally spaced indicia such as printed spots having a predetermined relationship to the printed labels or other printed matter on the web. Any suitable type of web registering device may be employed to locate each of said spots successively in a predetermined position following the severance from the web of the portion of the leading end of the web enfolding an article. Thus although variations in the girth of the article will cause the line of cut along which the wrapper is separated from the web to be nearer or further from the next printed spot on the web, variations in the position of the printed matter with respect to the article to be enfolded in the wrapping material will be avoided. A further object of the invention, accordingly, is to provide web registering devices which will locate the printed matter in a predetermined position prior to the enfoldment of articles varying in girth in the leading end of the web of wrapping material.

If desired, the position of the cut edge of the web may be further corrected in accordance with variations in the height of the article to be wrapped. A suitable device for this purpose may include a feeler engaging the top of the article and instrumentalities connected to said feeler and operated by displacement of the feeler resulting from variations in the height of the article engaging the feeler, to retract the web relative to the article about which it is to be wrapped. Thus the desired position of the printed matter

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on the article will be assured for articles of varying height.

With these and other objects not specifically mentioned in view the invention consists in certain constructions and combinations hereinafter fully described and set forth in the appended claims.

In the accompanying drawings which form a part of this specification:

Fig. 1 is a side elevation of the web feeding mechanism of a wrapping machine illustrating a preferred embodiment of my invention;

Fig. 2 is a side elevation of the same general type of web feeding mechanism illustrating a suitable form of the invention;

Fig. 3 is a perspective view of the web registering device shown in Fig. 1;

Fig. 4 is a plan view taken on line 4—4 of the form of the web registering device shown in Fig. 2;

Fig. 5 is a detail view of the web registering device shown in Fig. 1 associated with mechanism for varying the position of the web of wrapping material in accordance with variations in the height of the article to be wrapped; and

Fig. 6 is an end elevation of the same taken on the line 6—6 of Fig. 5.

In the particular embodiment of the invention illustrated in Figs. 1 and 3, which will now be described, the web of wrapping material is overfed and then retracted to the desired position. A lifter table 10 which may be of the general type disclosed in my prior Patent 2,385,706 is provided with a back tension plate 11 and a top tension plate 10a supported thereon in the manner described in said patent. Table 10 is pivotally mounted on a shaft 12 suitably supported in side frames (not shown), and back tension plate 11 may be secured to a member 13 slidably mounted on table 10 in the manner described in said Patent 2,385,706. An adjustable connecting rod 14 is pivoted to a lug 16 on the under side of lifter table 10 and pivotally connected to the free end of a cam lever 18 loosely mounted on a shaft 20 suitably supported in the side frames (not shown). A cam follower 22 is rotatably mounted on a stud 24 projecting from the side of cam lever 18. Cam follower 22 engages a cam 26 which is mounted on a main cam shaft 28 suitably journaled in the side frames (not shown) and driven from a suitable source of power (not shown). A tension spring 30 attached at one end to a pin 32 projecting from cam lever 18 and at the other end to one of the side frames (not shown) maintains cam

follower 22 against cam 26. Cam 26 thus imparts an oscillating motion to cam lever 13 which in turn transmits this motion to lifter table 10 through connecting rod 14 in timed relation to the other parts of the machine.

The lifter table 10 is normally maintained in an inclined position aligned with an inclined infeed runway 15 (Fig. 1) over which the loaves L are advanced into position to be delivered to table 10 by pusher plates 17 projecting through a slot 19 in runway 15. The pusher plates 17 are attached to an intermittently moving conveyor chain 21 of well known construction, wherefore further description thereof is deemed unnecessary. One side of each loaf L slides along a guide plate 23 adjustably mounted on runway 15. Guide plate 23 has a suitable cut-out (not shown) to allow passage of a reciprocating pusher plate 25 which pushes loaf L from runway 15 in the direction of the arrow, Fig. 1, and on to lifter table 10. Pusher plate 25 is affixed to the end of a rod 25a slidably supported in brackets 27 which are affixed to cross bars 29 suitably attached to the side frames (not shown). A sleeve 31 is adjustably secured on rod 25a. A link 33 attached to a stud 35 protruding from sleeve 31 is connected to a lever 37 to operate the pusher plate in a manner which will be presently described. Lever 37 is fulcrumed on a shaft 39 and receives its motion from cam lever 41 through connecting rod 43. Cam lever 41 is pivoted on a shaft 45 and has a cam follower 47 mounted on a stud 49 projecting from the end of said cam lever. Cam follower 47 engages a cam track formed on the periphery of a cam 51 which is also mounted on main cam shaft 28. A tension spring 53 is employed to maintain the cam follower 47 against cam 51, and is anchored at one end to a pin 56 on lever 37 and at its other end to one of the side frames (not shown).

A lap roller 34 is supported in the ends of arms 36 attached to shaft 38 suitably supported in side frames (not shown). Arms 36 are actuated by a connecting rod 40 pivotally connected to lug 42 on the under side of one of the arms 36 and pivotally connected to a cam lever 44. Shaft 20 is also the fulcrum for cam lever 44 which has projecting from its side a stud 46 on which is mounted a cam follower 48. Cam 50 mounted on main cam shaft 28 is engaged by cam follower 48 which is held against cam 50 by a tension spring 52 attached at one end to a pin 54 protruding from cam lever 44 and at its other end to the side frame (not shown).

The web of wrapping material W is supplied to the machine from a roll R (Fig. 1) suitably mounted between the side frames (not shown). The web W passes under a continuously rotating feed roller 58, over a guide roller 60 and under a floating roller 62 to another roller 64. Further description of the rolls 58, 60 and 62 is deemed unnecessary since their construction is fully described in Gwinn Patent 1,626,409. The web W then passes along the top of plates 66 and 68 to a pair of guide rollers 70 so that its leading end hangs freely behind loaf L and between runway 15 and lifter table 10. The web of wrapping material W has suitable indicia, such as the spots indicated in Fig. 1, printed thereon at predetermined intervals to actuate a photo-electric cell unit 72 in a manner hereinafter described. A delivery table 74 suitably held between side frames (not shown) has affixed to its under side a bracket 75 on which is adjustably secured the photo-electric cell unit 72.

Photo-electric cell unit 72 is of conventional construction and is located directly over the path of the printed spots on web W. Unit 72 is provided with a housing 76 having an opening in its bottom through which a beam of light is projected from an incandescent lamp 77 through a set of lenses 78 on to the web W. The light reflected from web W impinges on a photoelectric cell 79 of conventional construction. The printed spots are spaced at equal distances along the web corresponding to the girth of an average loaf plus the desired overlap of the edges of the wrapper.

Photoelectric cell 79 is connected by suitable electrical wiring to an amplifier 80 of conventional construction which is connected in a manner hereinafter described, to a solenoid 81 supported by a bracket 82 secured to the under side of table 74. An extension 84 of the solenoid armature is slidably supported in a bracket 86 also fastened on the under side of table 74. A compression spring 88 encircles extension 84 with one end thereof seated against solenoid 81 and its other end pushing against a collar 85 affixed to extension 84 and thereby tending to hold said extension 84 in a predetermined position. The extension 84 at its free end is provided with a forked portion 90 which carries a pin 92 engaging with a vertical slot 94 formed in the upper end of pawl 96. A shaft 98 held by brackets 100 fastened to the under side of table 74 passes through a hole in the pawl 96 whereby the latter is supported directly above a ratchet 102 with which it engages when the solenoid 81 is energized.

The amplifier 80 and the incandescent lamp 77 are connected to the supply lines 91 which are connected to a suitable source of electricity. The amplifier 80 is also connected to the winding 93 of a relay 95 of conventional construction which is adapted when energized to close a hold-in relay 99 of conventional construction and establish a circuit through the solenoid 81 and a limit switch 142 in a manner which will be hereinafter described. The winding of the relay 99 is connected in this circuit to be energized and thereby close the contacts 97 and 97a thereof to establish a separate circuit through the solenoid 81 and limit switch 190 in a manner also to be described hereinafter. The limit switch 190 is mounted on a back stop plate 191 secured to plate 68 and is normally closed to complete a circuit through solenoid 81 when the contacts 97 and 97a are closed. When a loaf L is advanced toward the lifter table 10 by pusher plate 25 it engages and opens the limit switch 190 whereby the solenoid 81 will be deenergized if the limit switch 142 is also open.

Ratchet 102 is provided with a rearwardly projecting arm 103 on which is pivoted one end of a roller 104 extending horizontally across and beyond the full width of the web W. The other end of roller 104 is pivoted in an arm 106 (Fig. 3). Arm 106 and ratchet 102 are secured on a common shaft 108. There is loosely mounted on shaft 108 an arm 110 having a lug in which a pin 112 is fastened. Arm 110 is positioned directly beside ratchet 102 so that pin 112 extends underneath the arm 103 of said ratchet. One end of a spring 114 is attached to a pin 116 projecting from the arm 103 of ratchet 102, and its other end is anchored to a pin 118 in arm 110. Spring 114 serves a twofold purpose. Spring 114 holds the arm 103 against projecting pin 112, and when

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pawl 96 is in engagement with ratchet 102 to hold arm 103 stationary, spring 114 stretches and arm 110 is thereby allowed to oscillate. The oscillating motion of arm 110 is produced by a cam lever 120 through a connecting rod 122. A shaft 124 is the fulcrum for the cam lever 120 which is provided with a cam follower 126 engaging a cam 132. Cam follower 126 is pivoted on a stud 128 projecting from a lug 130 of cam lever 120 and is held against cam 132 by a tension spring 134 which is anchored at one end to a pin 136 projecting from the side of cam lever 120 and is fastened at its other end to the side frame (not shown). Cam 132 is mounted on main cam shaft 28 and is provided with a circular periphery. A cam segment 132a is adjustably secured to cam 132 and has a portion adapted to engage cam roller 126 to operate arm 110. The adjustment of segment 132a serves a purpose which will be hereinafter described.

A pair of rollers 146 are suitably mounted on the side frames (not shown) in the space between the adjoining ends of plates 66 and 68. These rollers 146 are spaced a sufficient distance apart to allow the roller 104 to move downwardly therebetween while retracting the web W as will be hereinafter described.

In the operation of the embodiment of my invention shown in Figs. 1 and 3, the loaf L is pushed in the direction of the arrow shown in Fig. 1 by the reciprocating pusher plate 25. This motion is derived from cam 51 in the manner previously described. As the loaf is pushed on to lifter table 10, it presses the web W against the back tension plate 11 while the latter is displaced rearwardly and the top tension plate 19a wipes the wrapping material over the top of the loaf. The loaf is thus partially enwrapped in the portion of web W draped in its path. Cam 26 then actuates cam lever 18 and through connecting rod 14 raises lifter table 10 to the level of table 74 as shown in Fig. 3. While back tension plate 11 is clearly illustrated in Fig. 1, it is omitted in Fig. 3 for the sake of clarity. At the same time and by reason of the upward motion of said lifter table the web is pulled over plates 66 and 68. Lap roller 34 through the action of cam 50 upon cam lever 44 and connecting rod 40 previously described moves downward to the position shown in Fig. 3. During this motion of lap roller 34 more of the web W is drawn off the feed roll R and through the machine and thereby overfed by an amount greater than the distance between adjoining printed spots on web W until the printed spot on the portion of web W immediately behind the portion thereof wrapped about loaf L reaches a position beyond the photoelectric cell 72, as shown in Fig. 1. At this point a clamping arm 148 affixed to a shaft 150 mounted in the side frames (not shown) is operated by a suitable cam (not shown). Clamping arm 148 is operated to move in the direction of the arrow (Fig. 1) and clamp the web of wrapping material W against plate 66 and thus prevent drawing of any further length of said web from roll R. Clamping arm 148 also serves the purpose of holding the web of material W taut while a knife 138, which is supported on pivoted arms 139, is actuated in timed relationship through a suitable cam (not shown) to cut the web W. The wrapping material W is pinched against the edge of the lifter table 10 by suitable mechanism such as shown in my Patent 2,385,706 while the lap roller 34 moves downwardly and the knife 138 severs the required length of wrapping material from web W. Knife

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138 is operated by mechanism such as shown in my Patent 2,385,706.

A set of fingers 140 on conveyor chains of conventional construction (not shown) similar to those shown in the Schmitt Patent 1,851,295 then push the enveloped loaf L in the direction of the arrow through suitable side folder plates (not shown) and on to the stationary table 74. The web W then falls to its original draped position shown in Fig. 1 and lifter table 10 and lap roller 34 return to their original positions illustrated in Fig. 1.

One terminal of limit switch 142 of conventional construction is connected to one of the supply lines 91. The other terminal of switch 142 is connected to the solenoid 81 and the winding 99 of hold-in relay 97 which are connected in parallel. Switch 142 has a spring contact 143 and is supported on bracket 144 attached to the under side of table 74. Spring contact 143 is normally held open by the pressure of arm 106 against the spring contact 143 when said arm is in its uppermost position. This spring contact 143 is closed when ratchet arm 103 with arm 106 through shaft 198 is moved in a downward direction indicated by the arrow in Figs. 1 and 3. Therefore, if relay 95 is energized, the hold-in relay 97 will be closed and solenoid 81 will be energized. When the beam of light from lamp 77 strikes a printed spot on web W while the same is being retracted over the plate 68, the intensity of the light reflected on to photoelectric cell 79 is thus diminished and the passage of electric current from cell 79 to the amplifier is materially decreased or interrupted. This decrease in current flowing from cell 79 permits sufficient current to flow through amplifier 80 into winding 93 to close relay 95 and thereby energize solenoid 81 and cause pawl 96 to engage ratchet 102 and stop the retraction of web W.

The downward motion of arm 103 is produced when the engagement of cam follower 126 with cam segment 132a thereby actuates cam lever 120 and through connecting rod 122 oscillates arm 110. The tension of spring 114 pulls ratchet arm 103 downwardly with lever 110 wherefore the roller 104 on the end of said ratchet arm 102 will engage with web W and draw it into the space between rollers 146. Inasmuch as the web W is held immovable at one section by clamp 148 its leading end is retracted until the printed spot thereon impinges the beam of light projected through the opening in the bottom of its photoelectric cell unit 72. When this spot reaches the beam of light the solenoid 81 is thereby energized and its armature extension 84 is displaced sufficiently to cause pawl 96 to engage ratchet 102 and thus stop the motion of ratchet arm 103 and roller 104 and halt the retraction of web W.

The arm 103 is then moved upwardly by the pin 112 on the oscillating arm 110 whereby the limit switch 142 is closed. The limit switch 190 remains open, however, and the solenoid 81 remains energized until the limit switch 190 is opened. If a loaf L is then moved towards the lifter table 10 by the pusher plate 25, the limit switch 190 will be opened and the solenoid 81 will be deenergized. Therefore the pawl 96 will be disengaged from ratchet 102 to permit the arm 103 to move downwardly with roll 104 and retract web W following the severance of the portion thereof folded about the girth of loaf L. If there is no loaf in position to be advanced by pusher plate 25 against limit switch 190, the circuit through the latter from solenoid 81 will

remain closed. Thus pawl 96 will remain engaged with ratchet 102 and the arm 103 will not be able to move downwardly with roll 104 when arm 110 is operated by the connecting rod 122. Accordingly the web W will not be displaced if no loaf is delivered to the lifter table 10. If the web W were retracted by roll 104 when no loaf is delivered to lifter table 10, web W would no longer be in the position required to position the printed matter on the top of the loaf.

A clamp 160 pivoted on a stationary shaft 162 has an upright extension 164 provided with an elongated slot engaging a pin 166 on the armature 168 of a solenoid 170. Solenoid 170 is supported in a bracket 172 secured to table 74. A compression spring 174 is seated against the solenoid 170 and engages a shoulder on armature 168 to normally maintain arm 160 out of contact with the web W. The solenoid 170 is connected to the power lines 91 through the relay 99 and switch 142. Therefore solenoid 170 will be energized when the relay 99 is closed during the retraction of web W upon the interception of the beam of light by the printed spot on the web. Upon energization of solenoid 170 the clamp 160 presses web W against plate 68. If the web W were not pressed by clamp 160 the loop formed in web W during the descent of roller 104 might straighten out when roller 104 is raised by arm 103 and affect the position of the leading end of web W. The leading end of the web W will therefore be properly positioned relative to the loaf L about whose girth it is folded during delivery of loaf L to lifter table 10, to cause the printed portion of web W to be disposed on the top of loaf L. Clamp 148 then releases web W, arm 103 is returned to its normal uppermost position whereby arm 106 will be pressed against spring 143 and thereby break the circuit through microswitch 142 and deenergize solenoid 81. The pawl 96 will thus be moved out of engagement with ratchet 102 and the machine is ready to repeat its cycle.

The web W will be advanced by equal increments in successive cycles corresponding to the distance between the printed spots thereon, but the length of the wrapper severed therefrom will vary in accordance with the girth of the loaf to which the wrapper is applied. If a loaf having a girth greater than an average size loaf is enfolded in the leading end of the web W, a greater length of wrapping material will be required to enfold the article in accordance with the increased girth of the loaf. Therefore the distance from the leading end of the wrapper to the line across which it is cut by knife 138 will be greater than in the case of an average size loaf, and the distance from the line of cut to the next printed spot will be shorter. However due to the retraction of web W by roll 104 until the printed spot is registered with the beam of light projected through the bottom of the photoelectric cell unit 72, the end of the web behind this line of cut will be positioned slightly higher relative to the path of the next loaf L delivered to the lifter table. Accordingly the underlap of the wrapper on the next loaf will be sufficiently smaller to maintain each printed panel or other printed matter, which is located in a predetermined relationship to a printed spot as illustrated in Fig. 4, in a predetermined position on the top or other face of the loaf about which it is folded, as shown in Fig. 3.

If the next loaf has a girth smaller than an average size loaf, less wrapping material will be

required to enfold the article and the distance from the leading end of the portion of the web W folded about this loaf to the line of cut will be shorter. Accordingly the distance from the line of cut to the next printed spot on web W, when the same is registered with the beam of light projected through the bottom of the photoelectric cell unit 72 during the retraction of the web, will be greater. Therefore the leading end of the web will be slightly lower relative to the path of the next loaf delivered to the lifter table and the underlap of the wrapper on this next loaf will be sufficiently greater to maintain the printed panel in the desired position on the top or other face of the loaf.

By adjusting the cam segment 132a the time at which the web W is retracted may be varied as required by differences in the widths of loaves delivered to table 10 by pusher 25. If loaves of wider width are to be handled, then the time of retraction of the web W is advanced by adjustment of cam segment 132a to prevent the loaf engaging the hanging end of the web before the retraction thereof is completed.

Figs. 2 and 4 illustrate another embodiment of the invention wherein the principle of underfeeding of the web of wrapping material W is employed to obtain the desired result. The machine is of the same general design and construction as that described above, including a lifter table 210 pivoted on a shaft 212 and an infeed runway 215 having pusher plates 217 projecting through a slot 219 in runway 215 and propelled by an intermittently moving conveyor chain 221. A guide plate 223 has a slot (not shown) through which a pusher plate 225 is reciprocated to push a loaf L in the direction of the arrow, Fig. 2. Said pusher plate 225 is, as previously described, attached to the end of a rod 225a which is actuated by lever arm 236a pivoting on shaft 239 and through connecting link 233 attached to stud 235 in the side of sleeve 231 which is adjustably mounted on rod 225a. Brackets 227 held by cross bars 229 slidably support rod 225a. A cam as previously disclosed actuates lever arm 237. There is also provided a lap roller 234 which is supported between arms 236 affixed to shaft 238 and oscillated from a suitable cam as disclosed above.

In addition to these various operating mechanisms which correspond to and are similar to mechanisms described in connection with Figs. 1 and 3, a lever arm 237 is fastened to shaft 238 so that the oscillating motion of lap roller 234 and arms 236 imparts a similar motion to lever 237 for the purpose of actuating a tripping device hereinafter described.

The web of wrapping material W is supplied to the machine from roll R. Said web material has spots printed upon its surface at predetermined intervals and in predetermined relationship with the printed matter thereon. The web W passes through the machine under a constantly rotating roller 258, over a guide roller 260 and under a floating roller 262 which constitute parts of the device described in Gwinn Patent 1,626,409. From there the web W passes over another roller 264 and across the top of plates 266 and 268, and thence between a pair of guide rollers 270 and hangs freely across the path of the loaf L and between lifter table 210 and infeed runway 215.

This embodiment of the invention is also provided with a photoelectric cell unit 272 adjustably mounted by a thumb screw 278 on a bracket

276 affixed to the bottom of table 274. Photoelectric cell unit 272 is similar in construction to the photoelectric cell unit 72 and is similarly mounted directly above the path of travel of the printed spots on web W. Therefore the spots on web W serve to interrupt or diminish the reflection of the light focused thereon from the light source of the cell unit 272 on to the photoelectric cell 280 thereof sufficiently to operate a solenoid 302 in a manner which will now be described. The photoelectric cell 280 is connected to an amplifier 285 of conventional construction which is connected to the winding 282 of a relay 283 which is adapted when energized to close the hold-in relay 287. The amplifier 285 is connected to the power lines 286, and the circuits which are closed by relays 283 and 287 are connected in parallel to one of the power lines 286 and to one of the terminals of the solenoid 302. The other terminal thereof is connected in parallel to the winding 288 of relay 287 and a terminal of a make-and-break switch 303. Switch 303 is supported on a bracket 305 secured to table 274 and may be similar in construction to switch 142. The other terminal of switch 303 is connected to one of the power lines 286. The relay 283 will be closed when a printed spot on web W intercepts the beam of light projected from photoelectric cell unit 272, and thus the relay 287 will be closed and the solenoid 302 will be energized if switch 303 is closed. A stud 309 secured in a lug 311 of a locking arm 326 hereinafter described, normally engages switch 303 and breaks the circuit through switch 303 to maintain solenoid 302 deenergized.

Solenoid 302 is supported in a bracket 300 attached to the bottom of table 274. Solenoid 302 has extending downwardly therefrom an armature 304 whose free end is slotted so that it straddles lever 306 to which it is connected by a pin 307. Lever 306 is fixed to a shaft 308 suitably mounted in the side frames 316. The free end of said lever arm 306 is bifurcated as shown in Fig. 4 and a roller 310 is rotatably mounted therein. Between plates 266 and 268, directly below roller 310, is a second roller 312 fastened to a shaft 314 which is suitably supported in side frames 316. Said second roller 312 is so placed that its periphery is tangent to the section of web W which extends between rollers 310 and 312. A sprocket 318 secured to shaft 314 is continuously driven from another sprocket 320 by a sprocket chain 322. Sprocket 320 is attached to a shaft 28 corresponding to the main cam shaft shown in Figs. 1 and 3. The friction of the continuously driven roller 312 against the under side of web W is insufficient to cause said web to feed through the machine. The weight of roller 310 against the top of web W, when permitted to drop into the dotted position shown in Fig. 2, increases the friction of roller 312 sufficiently to cause web W to be fed forwardly over table 368.

A locking arm 324 is also fastened to shaft 308, and the free end of said locking arm engages a shoulder on another weighted locking arm 326 loosely mounted on a shaft 328 which is supported by brackets 330 fastened to the bottom of table 274. These locking arms 326 and 324 are normally in the locked position shown in full lines in Fig. 2 and thereby hold roller 310 out of contact with web W. Thus they allow the continuously rotating roller 312 to revolve without feeding the web W. There is also loosely mounted upon shaft 328 a bell crank

lever 332. One end of said bell crank lever 332 is connected by a rod 239 to the lever 237 previously described from which it is actuated. Projecting from the other end of the lever 332 is a pin 338 which, when moved downwardly in the direction of the arrow (Fig. 2) contacts the side of locking arm 326. This motion of pin 338 causes locking arm 326 to become disengaged from locking arm 324 whereby lever 306 drops and roller 310 presses the web W against the continuously driven roller 312, as indicated by the dotted positions thereof in Fig. 2. Arm 306 and roller 310 remain in this position so that the web W will be fed by roller 312 until the solenoid armature 304 raises roller 310 off web W when solenoid 302 is energized.

Inasmuch as locking arm 324 and lever 306 are fastened to the same shaft 308, the raising of lever 306 will simultaneously lower locking arm 324 so that it will lock arm 326 in the position shown in full lines in Fig. 2 when lap roller 234 returns to the position shown in Fig. 2. It will be noted that pin 332a on bell crank lever 332 travels freely through a predetermined arc before tripping locking arm 326. This arrangement is provided for the purpose of allowing lap roller 234 to travel through the greater part of its downward motion before tripping locking arm 326. The tripping action takes place during the last few inches of downward travel of lap roller 234 and thus prevents feeding of web W by rollers 310 and 312 while it is being drawn through the machine by lap roller 234.

The operation of this modified embodiment of the invention is as follows:

The reciprocating pusher plate 225 on rod 225a is moved forwardly in the direction of the arrow (Fig. 2) by the action of lever 237 through link 233. Loaf L is thereby pushed on to lifter table 210 and partially enwrapped in the section of web W draped in its path. As previously described the lifter table rises together with partially enwrapped loaf L to the level of table 274. This motion of the lifter table draws an additional length of web W through the machine from roll R. Lap roller 234 then moves downwardly and draws an additional length of the web W through the machine until the printed spot reaches a predetermined "underfed" position just in front of the photoelectric cell unit 272, as illustrated in Fig. 2. Clamping arm 148 fastened on shaft 150 then moves downwardly against web W to hold it while knife 338, which is similar to the knife 138 shown in Figs. 1 and 3 and similarly actuated, cuts the required length of wrapper from the web.

The loop formed in the web W intermediate the loaf L and rollers 270 during the downward movement of lap roller 234 is severed by knife 338 whereby the free end of web W is draped across the path of another loaf L brought into position on infeed runway 215. During the downward motion of lap roller 234, shaft 238 swings the lever 237 in the direction of the arrow to the dotted position shown in Fig. 2. Connecting rod 239 is thereby moved to turn lever 332 about shaft 328 counter-clockwise in the direction of the arrow, and pin 338 on lever 332, after traveling through a predetermined arc, trips weighted locking arm 326. This operation frees locking arm 326 and allows arm 306 to drop roller 310 against web W and press against the continuously revolving roller 312. The weight of roller 310 thereby causes sufficient friction to feed web W through the machine in the direction of the arrow, Fig. 2, until the spot thereon reaches the beam of light

projected through the bottom of photoelectric cell unit 272.

When the arm 326 is tripped as previously described, the stud 309 is disengaged from the switch 303 and the circuit through the solenoid 302 will be completed when the spot on web W reaches said beam of light. The spot thus decreases the amount of light reflected on the photoelectric cell 280 and permits closing of relay 283 by current flowing from the amplifier 285 through the winding 282. Thus the relay 287 will be closed and the solenoid 302 will be energized to draw armature 304 upwardly and raise lever 306 with roller 310. This relieves the friction of web W against roller 312 and stops the feeding of said web through the machine. The wrapping material is now in its predetermined position for correctly wrapping the next loaf L.

In the meantime a pair of intermittently moving fingers 340, similar to the fingers 140 previously described have already pushed the wrapped loaf from lifter table 210 on to table 274. The lifter table is then returned to its initial position, Fig. 2. Lap roller 234 having also been returned to its initial position, the machine is ready to repeat its cycle.

The distance between the printed spots on the web W corresponds to the girth of an average bread loaf or other article to be wrapped plus the required overlap of the longitudinal edges of the wrapper. If a loaf having a girth greater than an average size loaf is enfolded in the leading end of the web W a greater length of wrapping material will be required to enfold the girth of the loaf. Therefore the distance from the leading end of the wrapper to the line across which it is cut by knife 338 will be greater than in the case of an average size loaf. Moreover the leading end of the web W behind this line of cut will be positioned, when the next spot is registered with the beam of light projected through the bottom of the photoelectric cell unit 273, slightly higher relative to the path of the next loaf L delivered to the lifter table. Accordingly the underlap of the leading end of the web W on the next loaf will be sufficiently smaller to maintain the printed panel or other printed matter in a predetermined position on the top or other face of the loaf about which it is folded.

If the next loaf has a girth smaller than an average size loaf, less wrapping material will be required during the enfoldment of the loaf therein and the distance from the leading end thereof to the line of cut will be shorter. Accordingly the distance from the line of cut to the next printed spot on web W, when the same is registered with the beam of light projected through the bottom of the photoelectric cell unit 273, will be greater. Therefore the leading end of the web W will be slightly lower relative to the path of the next loaf delivered to the lifter table and the underlap of said leading end on the bottom of this next loaf will be sufficiently greater to maintain the printed panel in the desired position on the top or other face of the loaf.

In the embodiment of the invention shown in Figs. 5 and 6 the web registering device of Figs. 1 and 3 is illustrated in combination with mechanism for adjusting the position of the leading end of the web of wrapping material to compensate for variations in the height of the bread loaf or other article to be wrapped. Therefore no detailed description of the construction of the web registering device is needed. It will be sufficient to explain the coaction of the web adjust-

ing mechanism with the parts of the web registering device shown in Figs. 5 and 6.

After a wrapper has been severed from the web W of wrapping material following the enfoldment of an article in its leading end it is retracted across the table 68 until the printed spot is registered with the beam of light projected through the bottom of the photoelectric cell unit 72. The retraction of the web W is performed in the manner previously described in connection with Figs. 1 and 3 by a roller 104 supported by an arm 103 of ratchet 102 and an arm (not shown) similar to arm 106 shown in Fig. 3. The ratchet 102 (Fig. 5) is loosely mounted on shaft 108 and arm 103 is connected by a tension spring 114 to an arm 110 loosely mounted on shaft 108, the tension of the spring normally maintaining the arm 103 against a pin 112 on arm 110. The arm 110 is oscillated by mechanism shown in Figs. 1 and 3 to move the roller 104 downwardly with the underlying section of web W between rollers 146 located between the adjoining ends of tables 66 and 68, until the pawl 96 supported on frames 100 is operated by the solenoid armature extension 84 to engage the ratchet 102. The manner in which the solenoid is energized, when the printed spot reaches the photoelectric cell unit 72, to operate the armature extension 84 has been fully described in connection with Figs. 1 and 3.

Following is a description of the mechanism for varying the position of the leading end of the web in accordance with differences in the height of the loaf L. A U-shaped bracket 59 supports a pair of guide rollers 70 between which the leading end of the web W is threaded. The lower roller 70 is mounted on bracket 59, and on lugs 61 of bracket 59 are pivoted arms 63 which support the upper roller 70.

The bracket 59 is pivoted on studs 65 secured in a bracket 67 fastened to the bottom of table 68. Bracket 59 is provided with lugs 69 carrying stop screws 71 arranged to engage stops 73 on table 68 and thereby limit the downward movement of bracket 59. On a stud 83 secured in the bottom of bracket 59 is pivoted a feeler 87, the stud 83 being provided with a cross pin 101 on which the lugs 89 of feeler 87 are pivotally mounted.

The loaf L is advanced in the direction indicated by the arrow in Fig. 6 by the flights 17 into position to be delivered to the lifter table (not shown) by the pusher 25. During this movement of loaf L its top face will engage the feeler 87 and thereby swing the bracket 59 upwardly to a position determined by the height of loaf L. Therefore the leading end of web W will be raised relative to loaf L to cause the printed matter on the web W to appear in the desired position on the top face of loaf L despite variations in the height of the same. The leading end of web W is maintained in this position by rollers 70 until the loaf L is delivered to the lifter table by pusher 25 which is supported in a bracket 27 mounted on a rod 29.

The leading end of the web W will thereby be folded about the girth of the loaf L and the leading edge of the web will be wiped under the bottom of the loaf to provide the required amount of underlap for positioning the printed matter in the required position on the top face of the loaf. The enfoldment of the loaf in the leading end of the web W is completed by a lap roller (not shown), which has been fully described in Figs. 1 and 3, and the portion of the web W en-

folding loaf L is then severed. The machine is then ready for the next cycle of operations.

While I have described different embodiments of my invention, it will be understood that various modifications thereof may be made and that no limitations upon the invention are intended that are not imposed by the scope of the appended claims.

What is claimed is:

1. In a machine for wrapping articles of varying girth in the leading end of a continuous web of wrapping material provided with a series of equally spaced printed panels, the combination with means for folding the leading end of said continuous web about the girth of an article to be wrapped whereby the length of the material wrapped about the article varies in accordance with variations in the girth of the article, of a web registering mechanism for automatically varying the position of the leading end of the web with respect to said folding means prior to the wrapping of the article in the leading end of the web to cause the leading printed panel to be located in a predetermined position on the article about which the web is wrapped.

2. In a wrapping machine, the combination with means for wrapping the leading end of a continuous web of wrapping material about articles of varying girths, of a knife adapted to sever from the remainder of said web the portion thereof folded about the girth of the article by said wrapping means to provide a wrapper for said article, said wrapping means operating to overlap the trailing edge of said wrapper upon the leading edge of said wrapper at the bottom of the article; of web registering mechanism for automatically varying after severance of said wrapper, the position of the leading end of said web relative to the next article about which it is folded by said wrapping means to locate a predetermined portion of the leading end of said web in a predetermined position and thereby displace the severed edge of said web relative to said next article and thereby vary the underlap of the leading edge of the wrapper on said next article in accordance with variations from a predetermined size in the girth of the article previously enfolded in its wrapper.

3. In a wrapping machine, the combination with means for wrapping the leading end of a continuous web of wrapping material about particles of varying girths; of web registering mechanism for automatically varying the position of the leading end of said web relative to the article about which it is to be folded by said wrapping means to locate a predetermined portion of the leading end of said web in a predetermined position, said web registering mechanism including a device for retracting the leading end of said web relative to said wrapping means prior to wrapping of the article therein and said device including a feeler adapted to be displaced by articles of varying height and instrumentalities actuated by the displacement of said feeler to retract the leading end of said web in accordance with the height variations in the articles of varying girth to be wrapped.

4. In a wrapping machine, the combination with members for guiding a continuous web of wrapping material from a roll into position to permit an article to be enfolded in its leading end, said web having equally spaced indicia printed thereon at intervals corresponding to the length of wrapping material required to enfold

an article, and printed panels or other printed matter in predetermined relationship to said indicia; of folding means for enfolded an article in the leading end of a continuous web of wrapping material guided by said members whereby different lengths of wrapping material will be drawn off said roll in accordance with variations in the girth of the article enfolded in the leading end of said web; and web registering mechanism responsive to said indicia for automatically locating the leading indicia on the leading end of said web in a predetermined position relative to said folding means prior to the enfoldment of the article in the leading end of said web.

5. In a wrapping machine, the combination with members for guiding a continuous web of wrapping material from a roll into position to permit an article to be enfolded in its leading end, said web having equally spaced indicia printed thereon at intervals corresponding to the length of wrapping material required to enfold an article, and printed panels or other printed matter in predetermined relationship to said indicia; of folding means for enfolded an article in the leading end of a continuous web of wrapping material guided by said members whereby different lengths of wrapping material will be required in accordance with variations in the girth of the article enfolded in the leading end of said web; said folding means operating to draw from the roll a length of wrapping material which is greater than the distance between adjoining indicia on said web; a web severing device for severing the portion of said web folded about an article by said means from the remainder of the web; and web registering mechanism responsive to said indicia for automatically locating the leading end of said web with the leading indicia thereon in a predetermined position relative to said folding means prior to the enfoldment of the next article in the leading end of said web, said web registering mechanism including a source of light for projecting a beam of light upon the web, a photoelectric cell arranged in the path of light reflected from said web and responsive to variations in the reflection of the light created when the light beam impinges upon one of the indicia, and a device controlled by said photoelectric cell for retracting said web until the beam of light impinges on one of the indicia whereby the retraction of the web will be stopped and the leading indicia on the leading end thereof will be located in a predetermined position.

6. In a wrapping machine, the combination with members for guiding a continuous web of wrapping material from a roll into position to permit an article to be enfolded in its leading end, said web having equally spaced indicia printed thereon at intervals corresponding to the length of wrapping material required to enfold an article, and printed panels or other printed matter in predetermined relationship to said indicia; of folding means for enfolded an article in the leading end of a continuous web of wrapping material guided by said members whereby different lengths of wrapping material will be required in accordance with variations in the girth of the article enfolded in the leading end of said web; a web severing device for severing the portion of said web folded about an article by said means from the remainder of the web; and web registering mechanism responsive to said indicia for automatically locating the leading end of said web with the leading indicia thereon in a predetermined position relative to said folding

means prior to the enfoldment of the next article in the leading end of said web, and said mechanism including a source of light for projecting a beam of light upon said web, a photoelectric cell arranged in the path of the light reflected from said web and responsive to variations in the intensity of the reflected light created when one of said indicia encounters the light beam, and a device controlled by said photoelectric cell for feeding the web toward said folding means after severance of the web until the beam of light impinges on one of the indicia whereby the forward movement of the web will be stopped and the leading end thereof will be located with the leading indicia thereon in a predetermined position relative to the folding means.

7. In a wrapping machine having a source of supply of continuous web wrapping material provided with a series of equally spaced printed panels, the combination with means for circumferentially wrapping the leading end of said continuous web about an article whereby the length of the material wrapped about the article varies in accordance with variations in the girth of the article, of a web registering mechanism for automatically varying the position of the leading end of the web with respect to said wrapping means prior to the wrapping of the next article in the leading end of the web to register the printed panel in predetermined position on the article about which the web is to be wrapped, said web registering mechanism including a device for determining the height of articles delivered to said folding means and retracting said web in accordance with variations in the height of the article to position the leading end of the web in the proper position to register the printed label or printed matter in a predetermined position upon the article about which the leading end of said web is folded by said folding means.

8. Web registering mechanism for a continuous web of wrapping material having a regularly recurring pattern comprising a member for locating the leading end of said web into a predetermined position for enfoldment of an article therein, means operative to locate said pattern relative to said member, said member being movable to vary the position of the leading end of said web relative to said article, a movable feeler adapted to engage the top of articles advanced into position to be enfolded in the leading end of said web and adapted to be displaced vertically by variations in the height of said articles, said feeler being connected to said member to displace said member in accordance with variations in the height of said articles whereby the position of the leading end of said web will be automatically adjusted relative to said article prior to the enfoldment of the article therein.

9. In a wrapping machine adapted to wrap articles varying substantially in girth and having a source of supply of continuous web wrapping material provided with a series of equally spaced printed panels and equally spaced printed indicia in predetermined relationship to said printed panels, the combination with a movable lifter table, of means for forwarding said articles one at a time on to said lifter table, mechanism for lifting said table after an article has been delivered thereto by said means, a back tension plate slidably mounted on said table and adapted to be displaced rearwardly by an article delivered to said table by said means, paper guiding means for supporting the free end of said web of material between said article and

said tension plate to cause the wrapping material to be pressed against said back tension plate by the article and wrapped around the girth of said article as it is forwarded on to said table against said tension plate and said table is lifted, and thereby pull off a length of wrapping material from said source which is measured by the girth of the article, a knife for severing the portion of the web of wrapping material wrapped about the girth of said article, and a web registering mechanism responsive to said printed indicia for locating the leading printed indicia on the web in a predetermined position and thereby varying the position of the leading edge of the web with respect to the article advanced on to the lifter table by said forwarding means.

10. In a wrapping machine adapted to wrap articles varying substantially in girth and having a source of supply of continuous web wrapping material provided with a series of equally spaced printed panels and equally spaced printed indicia in predetermined relationship to said printed panels, the combination with a movable lifter table, of means for forwarding articles one at a time on to said lifter table, mechanism for lifting said table after an article has been delivered thereto by said means, paper guiding means for positioning the free end of said web of material in front of said article to cause the wrapping material to be wrapped around the girth of said article as it is forwarded on to said table, said paper guiding means including a member for drawing the material downwardly over the rear face of the article as it is elevated by said table whereby there is drawn off from said source of wrapping material a length of wrapping material greater than is required to enfold the girth of the article, a knife for severing the portion of the web of wrapping material folded about the girth of said article, and a web registering device responsive to said printed indicia for retracting said web to locate the leading printed indicia thereon in a predetermined position and thereby automatically vary the position of the cut edge of said web with respect to the next article delivered to said table by said forwarding means.

11. In a wrapping machine adapted to wrap articles varying substantially in girth and having a source of supply of continuous web wrapping material provided with a series of equally spaced printed panels and equally spaced printed indicia in predetermined relationship to said printed panels, the combination with a movable lifter table, of means for forwarding articles one at a time on to said lifter table, mechanism for lifting said table after an article has been delivered thereto by said means, paper guiding means for positioning the free end of said web of material in front of said article to cause the wrapping material to be wrapped around said article as it is forwarded on to said table, said paper guiding means including a member for drawing the material downwardly over the rear face of the article as it is elevated by said table, a knife for severing the portion of said web folded about the girth of said article, and a web registering device responsive to said indicia for feeding said web forwardly to locate the leading printed indicia thereon in a predetermined position and thereby automatically vary the position of the cut edge of said web with respect to the next article delivered to said table by said forwarding means.

12. In a wrapping machine adapted to wrap articles varying substantially in girth and hav-

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ing a source of supply of continuous web wrapping material provided with a series of equally spaced printed panels and equally spaced printed indicia in predetermined relationship to said printed panels, the combination with a movable 5 lifter table, of means for forwarding articles one at a time on to said lifter table, mechanism for lifting said table after an article has been delivered thereto by said means, paper guiding means for positioning the free end of said web 10 of material in front of said article to cause the wrapping material to be wrapped around said article as it is forwarded on to said table, said paper guiding means including a member for drawing the material downwardly over the rear 15 face of the article as it is elevated by said table, a knife for severing the portion of said web folded about the girth of said article, and a web registering device responsive to said indicia for feeding said web forwardly to locate the leading 20 printed indicia thereon in a predetermined position and thereby automatically vary the position of the cut edge of said web with respect to the next article delivered to said table by said forwarding means, said web registering device including a roll overlying said web, a pivoted support whereon said roll is mounted, a latch for retaining said support in an elevated position with said roll, and means for disengaging said

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latch from said support when the web-drawing member of said paper guiding means approaches the lower limit of its downward movement.

13. In a wrapping machine with a support for guiding the leading end of a continuous web of wrapping material in front of articles of varying girths to be wrapped therein, of web registering mechanism automatically varying the position of the leading end of said web relative to said web guide support to locate a predetermined portion of said web in a predetermined position, and means operative to vary the position of said web guide support relative to the height of the article prior to its enfoldment in said web.

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