Oct. 17, 1950 O. J. GARLOUGH ET AL 2,526,469

PIERCING AND PRINTING METHOD

Filed Aug. 13, 1946 5 Sheets-Sheet 1

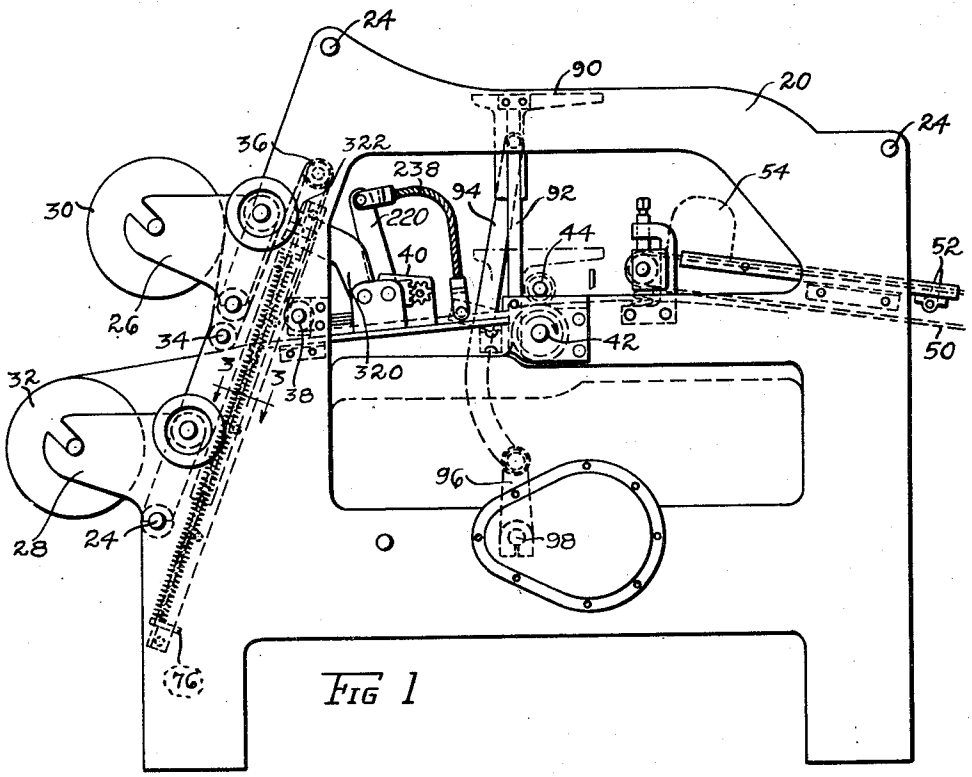


FIG 1

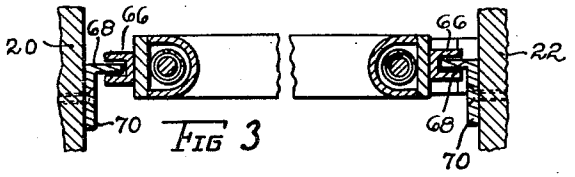


FIG 3

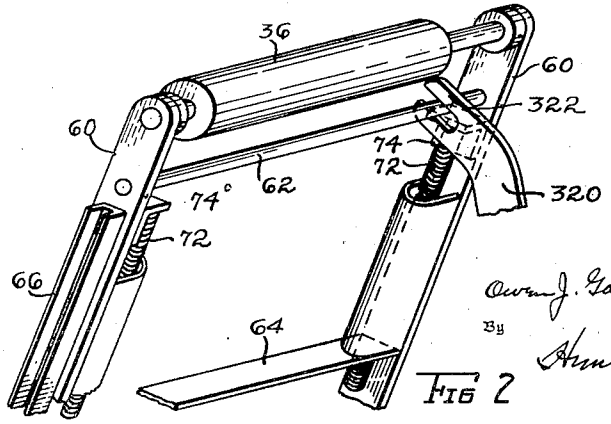


FIG 2

Inventors

Owen J. Garlough & Harry M. Stewart

By Henry G. Dyburg

Attorney

Oct. 17, 1950 O. J. GARLOUGH ET AL 2,526,469

PIERCING AND PRINTING METHOD

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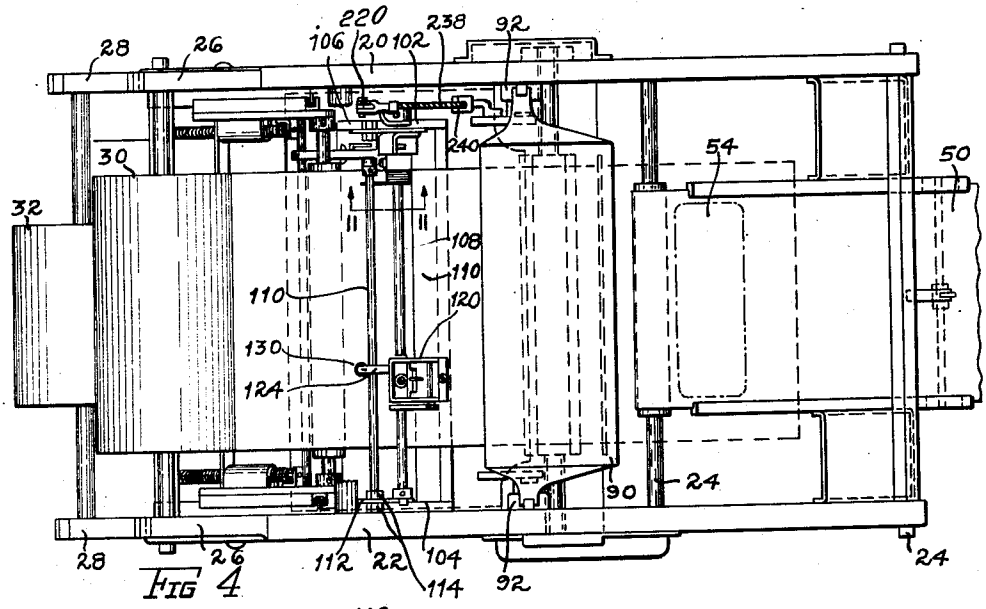


FIG 4

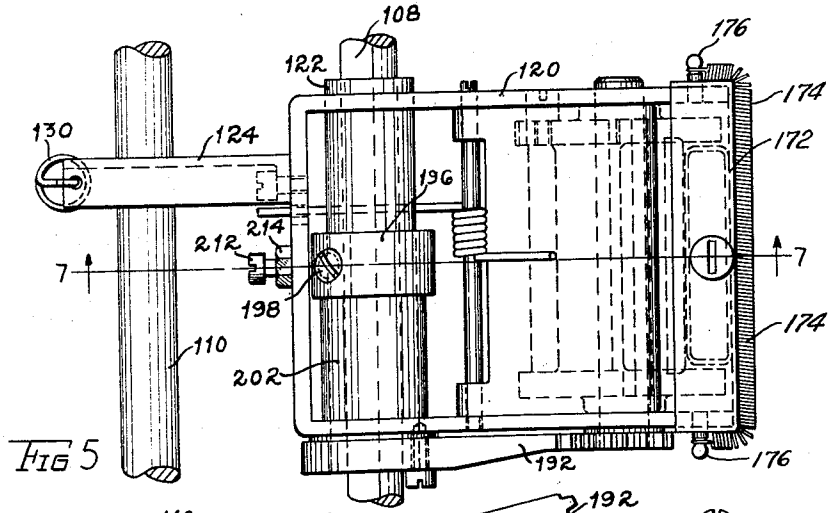


FIG 5

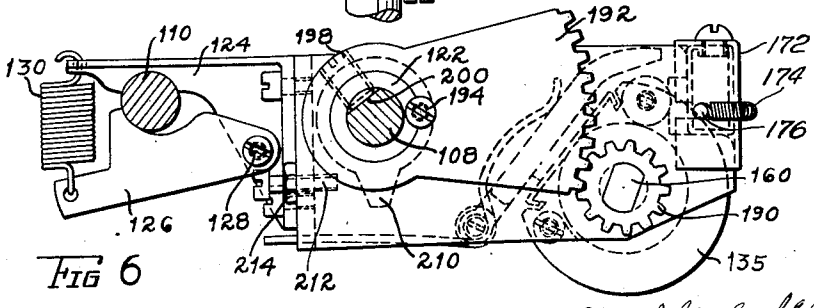


FIG 6

Inventors

Owen J. Garlough & Harry M. Stewart

By Henry G. Lowig

Attorney

Oct. 17, 1950 O. J. GARLOUGH ET AL 2,526,469

PIERCING AND PRINTING METHOD

Filed Aug. 13, 1946 5 Sheets-Sheet 3

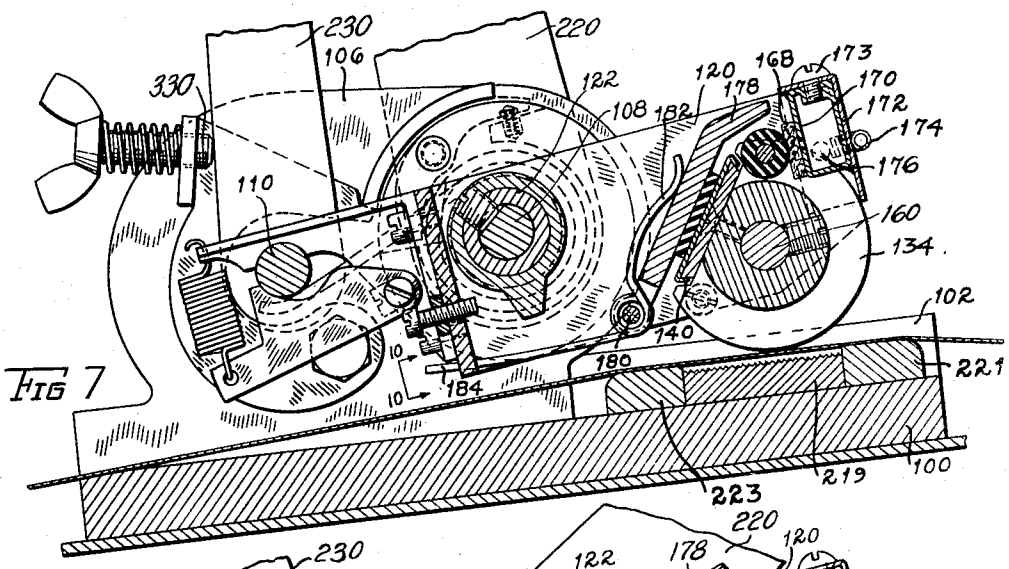


FIG 7

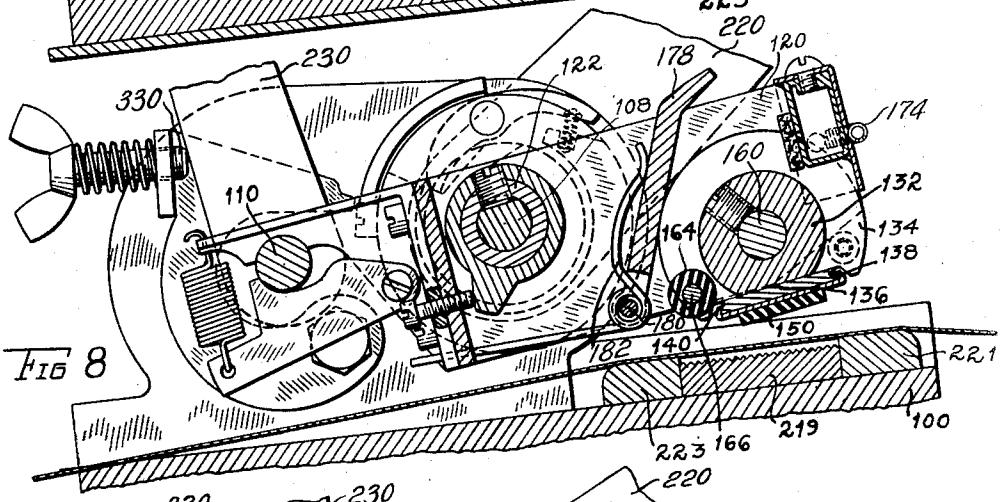


FIG 8

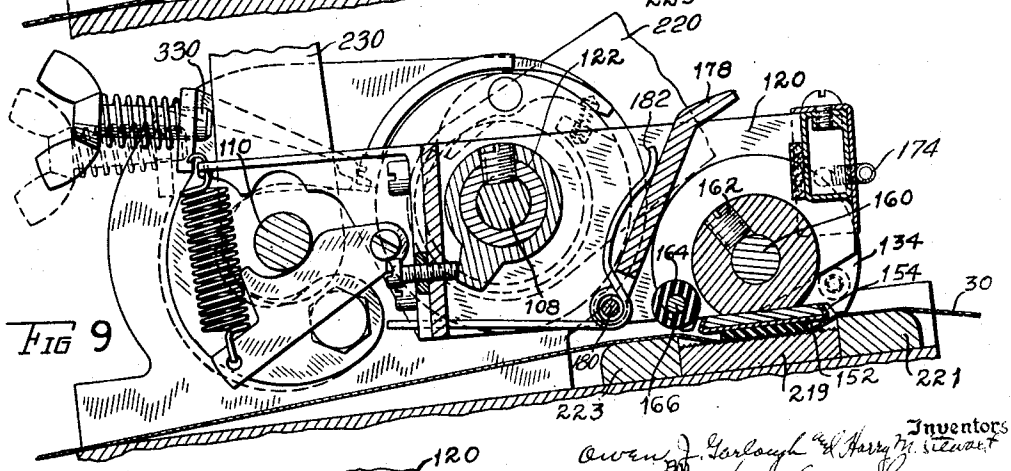


FIG 9

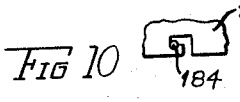


FIG 10

Inventors
Owen J. Garlough
Harry M. Stewart
By
Harvey G. Dyking
Attorney

Oct. 17, 1950 O. J. GARLOUGH ET AL 2,526,469

PIERCING AND PRINTING METHOD

Filed Aug. 13, 1946 5 Sheets-Sheet 4

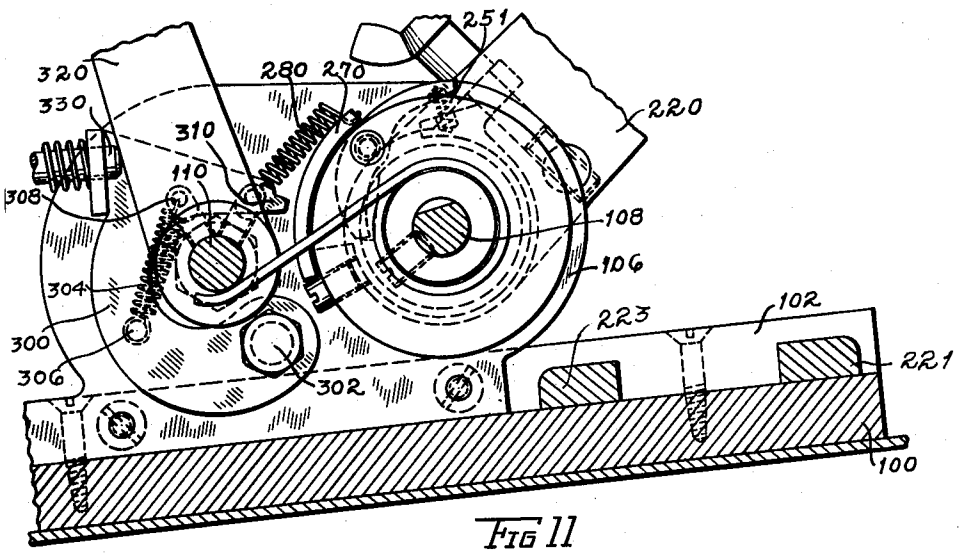


FIG 11

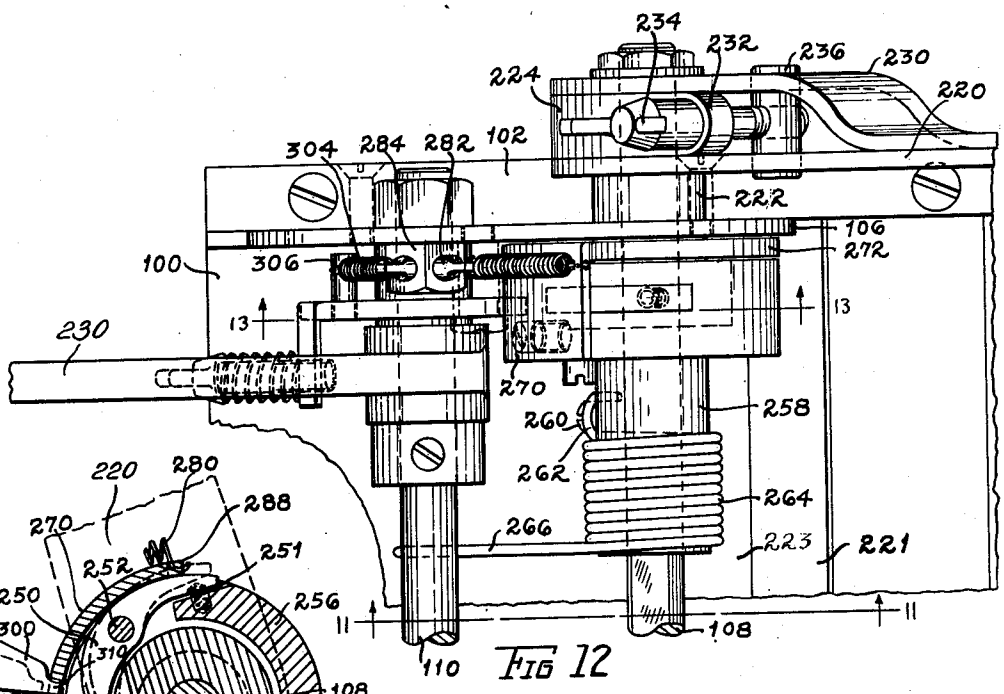


FIG 12

FIG 13

Inventors

Owen J. Garlough and Harry M. Stewart

By

Henry G. Dyer

Attorney

Oct. 17, 1950 O. J. GARLOUGH ET AL 2,526,469

PIERCING AND PRINTING METHOD

Filed Aug. 13, 1946 5 Sheets-Sheet 5

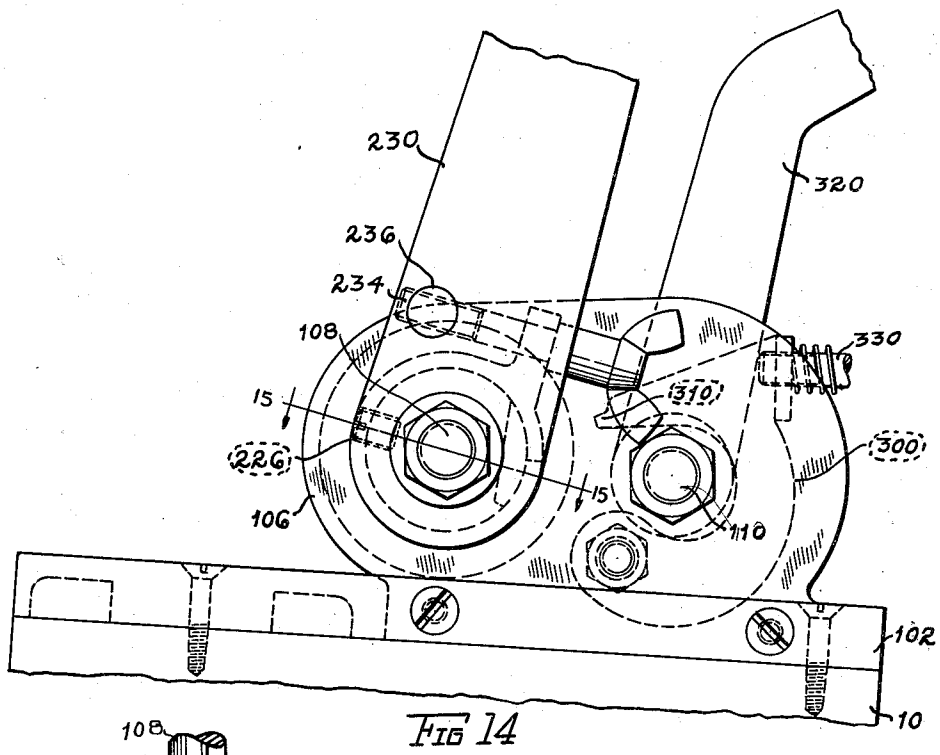


FIG 14

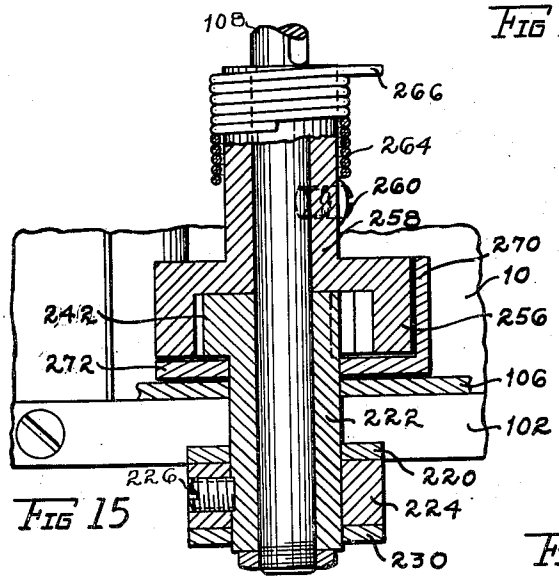


FIG 15

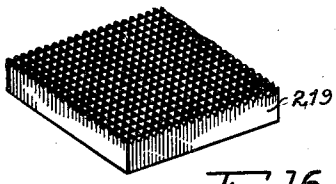


FIG 16

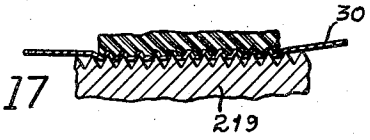


FIG 17

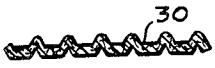


FIG 18

Inventors

Owen J. Garlough & Harry M. Stewart

By Henry L. Dybvig

Attorney

Patented Oct. 17, 1950 2,526,469

UNITED STATES PATENT OFFICE

2,526,469

PIERCING AND PRINTING METHOD

Owen J. Garlough and Harry M. Stewart,
Springfield, Ohio

Application August 13, 1946, Serial No. 690,265

2 Claims. (Cl. 101—32)

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This invention relates to a printing device and more particularly to a printing device for printing on sheet material that may be provided with an ink-repellant surface, such as waxed paper used in wrapping food, as for example, bread, wafers, et cetera, although not necessarily limited to this usage.

In wrapping bread and other similar commodities, waxed paper may be used as the outer wrapper. This protects the bread from the elements and it also prevents evaporation or drying out of the loaf. This wrapping material forms valuable advertising space. That being the case, it is common practice to print advertising material on the paper used in wrapping bread before the paper is waxed. After the paper has been waxed, printing ink refuses to adhere to the waxed surface. The wrapping paper is preferably printed in large quantities and stored in readiness for use. If the price is printed on the wrapping material before the waxing operation, it may result in large quantities of wrapping material being of no use in the event of a price change. Some manufacturers have gone to the expense of wrapping a separate ribbon of paper around the loaf, either outside or inside of the waxed paper, which ribbon contains the price. Then, in the event of a price change, only the printing material on the ribbon needs to be changed. However, this is an expensive procedure, requires complicated mechanism and therefore is objectionable.

An object of the device disclosed herein is to overcome all of these difficulties by printing or stamping the price on a roughened surface of the waxed paper, this roughened surface being provided with a surface where ink will adhere. Furthermore, the price is stamped on the wrapping paper between the roll and the wrapping mechanism. Merely by changing plates or stamps, it is possible to change the stamped price, so that if a bakery supplies a ten cent loaf, a twelve cent loaf and a fourteen cent loaf, all of these loaves may be wrapped on the same machine and the proper price printed on the wrapper by merely changing the type or plate used.

Another object of this invention is to provide a printing device for printing upon sheet materials provided with an ink-repellant surface or finish, wherein the finish or surface is roughened or mutilated as far as the ink-repellant properties are concerned, so as to provide a surface adaptable for printing.

Another object of this invention is to provide an attachment for a wrapping machine wherein the attachment includes a printing device for printing on the wrapping material as it is fed into the machine, the printing device being halted if for any reason the wrapping machine fails to operate during a wrapping cycle.

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Another object of this invention is to provide a platen for use in a printing device, wherein the platen has an irregular surface, the surface irregularities of the platen and of the imprinting mechanism are complementary, to thereby roughen the record material to facilitate the printing thereon.

Other objects and advantages reside in the construction of parts, the combination thereof and the mode of operation, as will become more apparent from the following description.

Referring to the drawings, Figure 1 is a side elevational view of a bread wrapping machine showing the attachment mounted thereon.

Figure 2 is an enlarged fragmentary perspective view of a reciprocatory carriage functioning in response to the tension of the wrapping paper.

Figure 3 is an enlarged fragmentary cross sectional view taken substantially on the line 3—3 of Figure 1.

Figure 4 is a top plan view of a bread wrapping machine showing the attachment mounted thereon.

Figure 5 is an enlarged fragmentary top plan view of a portion of the wrapping machine.

Figure 6 is a transverse cross sectional view showing the gear sector used in actuating the imprinting mechanism.

Figure 7 is a cross sectional view taken substantially on the line 7—7 of Figure 5.

Figure 8 is another cross sectional view similar to Figure 7, showing the imprinting mechanism in a transition position.

Figure 9 is another cross sectional view showing the imprinting mechanism in the printing position.

Figure 10 is a fragmentary view looking in the direction of the arrows 10—10 in Figure 7.

Figure 11 is an enlarged cross sectional view taken substantially on the line 11—11 of Figure 4.

Figure 12 is a top elevational view showing the mechanism shown in Figure 11.

Figure 13 is a cross sectional view taken substantially on the line 13—13 of Figure 12.

Figure 14 is an end elevational view of the mechanism shown in Figure 12, as viewed from the top of this figure.

Figure 15 is a cross sectional view taken substantially on the line 15—15 of Figure 14.

Figure 16 is a perspective, fragmentary view of the platen.

Figure 17 is an enlarged cross sectional view of the platen and the imprinting mechanism as it appears during the printing operation.

Figure 18 is an enlarged cross sectional view of

the wrapping material as it appears after it has been printed.

In view of the fact that the imprinting mechanism is shown as an attachment for a bread wrapping machine, only so much of the bread wrapping machine will be described that has a bearing upon the operation and function of the printing mechanism. The bread wrapping machine per se does not form a part of this invention and will not be described in detail.

In the drawings, the reference characters 20 and 22 indicate the main frame members of the bread wrapping machine. These frame members are held in fixed spaced relation by suitable tie rods 24. The frame members are provided with extensions 26 and 28 for supporting rolls of wrapping paper 30 and 32. One of these rolls supports the inner wrapper and the other roll supports the outer wrapper. In the arrangement shown herein, the roll 30 supplies the outer wrapper. No further description is deemed necessary of the roll 32.

The wrapping paper advances from the roll 30 under an idler roller 34, upwardly over a second idler roller 36, downwardly under a roller 38 and then under the price printing mechanism 40 to a pair of feed rollers 42 and 44. The feed rollers operate intermittently to advance the paper through the wrapping mechanism. Either one or both of the feed rollers 42 and 44 is preferably provided with a resilient covering, such as sponge rubber, so as to effectively grip the paper.

To the right of Figure 4 is shown a conveyor 50 which supplies loaves of bread to the bread wrapping mechanism. A loaf of bread 54 has been shown approaching the end of the conveyor. When the loaf of bread 54 comes to the end of the conveyor 50, it is wrapped in paper by suitable mechanism. It is not deemed necessary to describe the wrapping mechanism, as this mechanism per se does not form a part of the invention.

The bread wrapping mechanism operates cyclically. When a loaf of bread is advanced by the conveyor 50 towards the bread wrapping mechanism, the loaf engages the trigger 52 which causes the feed rollers 42 and 44, through a suitable driving mechanism which has not been shown, to rotate for a predetermined period of time, so as to feed a needed quantity of paper through the bread wrapping mechanism sufficient to wrap a loaf. The loaves are usually fed to the bread wrapping mechanism at predetermined intervals. If, for some reason, a loaf is omitted, no paper is advanced through the bread wrapping machine for the blank space that would normally be filled by the loaf, to thereby save upon paper and prevent clogging of the mechanism.

Whenever the feed rollers 42 and 44 are set in motion, the feed rollers rapidly feed the paper to the bread wrapping mechanism. If the paper were to be withdrawn directly from the rolls and the rolls 30 and 32 were comparatively full of paper, it can readily be seen that a sudden jerk of the paper might tear the paper, rather than to rotate the rolls of paper. In order to overcome this difficulty, the roller 36, as may best be seen by referring to Figure 2, is mounted in a frame including the frame members 60 held in fixed spaced relation by a tie rod 62 and a brace 64. Each of the members 60 is provided with laterally disposed channel guide members 66, as best seen in Figure 3. Each of these guide members 66 engage a flange 68 of angle bars or irons 70 fixedly secured to the frame members 20 and 22. The roller 36, together with the frame including frame members 60, is normally biased into the "up" position shown in Figure 2, by a pair of compression springs 72 positioned between the angle brackets 74, secured to the frame members 60, and suitable stops 76, as shown in Figure 1, which stops 76 are attached to the main frame members 20 and 22. When the feed rollers 42 and 44 are rapidly rotated to advance the piece of paper through the bread wrapping machine, the compression springs 72 are compressed, so as to permit the roller 36 to be lowered, thereby causing the shock of a sudden jerk caused by rotating the feed rollers 42 and 44, to be absorbed by the roller 36 yielding against the force of the springs 72. The rolls of paper 30 and 32 begin to unwind paper at a comparatively slow speed, so that when a sufficient quantity of paper has been withdrawn and the rolls 40 and 42 come to a stop and the roller 36 is in the lowermost position, the rolls 30 and 32 will continue to rotate. The slack is taken up by the roll 36 advancing to the uppermost position. By this time the rolls 30 and 32 may come to a rest, so that the mechanism is ready to repeat another cycle of paper feeding when a succeeding loaf engages the trigger 52.

When loaves are fed regularly to the bread wrapping mechanism without interruption, the roller 36 and the parts associated therewith continue to reciprocate up and down, so as to maintain a substantially uniform motion of the rolls 30 and 32. This slack absorbing mechanism is standard equipment upon the bread wrapping machine and has been described only for the reason that the operation of this slack absorbing mechanism is utilized in connection with the price printing mechanism, as will appear more fully later.

In addition to the above described mechanism, the paper wrapping machine includes an elevator mechanism including a transverse elevator member 90 mounted upon a pair of guides 92 that cause the elevator member 90 to travel through a vertical path. The elevator 90 is actuated by a pair of arms 94 pivotally attached to the elevator 90 and to a crank arm 96 mounted upon a rocker shaft 98, causing the crank arm 96 to oscillate through a semi-spherical path. This rocker shaft 98 is driven continuously, so that the elevator 90 is raised and lowered as a part of the bread wrapping mechanism, whether a loaf of bread is supplied to the bread wrapping mechanism or not.

Price printing mechanism

The price printing mechanism includes a base 100 provided with a pair of transverse bars 102 and 104. This base is secured to the paper wrapping machine in any suitable manner. The bar 102 has fixedly attached thereto, a plate member 106, having journalled therein the drive shaft 108 and secured thereto a supporting rod 110. The transverse bar 104 supports a plate 112, having journalled therein the opposite end of the shaft 108, and supports the end of the rod 110 held in position by a pair of nuts 114.

The price printing mechanism per se, as may be best seen in Figures 4 to 9 inclusive, includes a U-shaped frame member 120 mounted for oscillation on a tubular sleeve 122 keyed to the drive shaft 108. The U-shaped member 120 supports a bracket 124, shown in Figures 5 and 6, provided with an arcuate recess normally engaging the rod 110. Member 126 is pivotally at-

tached at 128 to the bracket 124 in such a manner that the ends of bracket 124 and member 126 remote from the frame member 120 are urged toward each other by a tension spring 130. This tends to maintain the U-shaped member in a predetermined angular position with respect to the plane common to the longitudinal axis of the shaft 108 and the rod 110. The frame member 120 may rock on the shaft 108, as will appear more fully from the description that follows.

The frame member 120 supports a cylindrical member 132 having a pair of flanges 134 and 135, one in either end thereof. The cylindrical member 132 is provided with a flattened surface 136 supporting a plate 138, provided with bevelled edges 140. This plate 138 has mounted thereon a printing plate 150 made of rubber, or any other suitable resilient material. This rubber plate 150 has the desired characters, letters or numerals, as the case may be, formed therein, and is preferably vulcanized or otherwise secured to a metal plate 152 provided with reentrant flange portions 154 adapted to engage the bevelled edges 140 of the plate 138.

The flange 134 is provided with suitable notches to permit removal of the plate 150 by merely sliding the plate 150 endwise, so as to expel it from the supporting plate 138. This may be done at the time that the plate 150 is in the position shown in Figure 8.

The cylindrical member 132 is secured to a shaft 160 by a suitable set screw 162. The shaft 160 is oscillated from the position shown in Figure 7 to the position shown in Figure 9 by a suitable drive mechanism which will be described later. An inking roller 164 is mounted upon the shaft 166 secured to the flanges 134 and 135, so as to oscillate with the cylindrical member 132. This inkling roller 164, when the cylinder is in the position shown in Figure 7, engages an inking pad 168 secured to a supporting member 170 secured to an angle bracket 172 by suitable screws 173. The angle bracket 172 is positioned in engagement with the ends of the legs of the U-shaped frame member 120 and held in position by a helical spring 174, having the ends secured to pintles 176 fixedly secured to the legs of the U-shaped member 120. This provides a yieldable support for the inking pad 168. While in this position a plate 178, pivotally mounted upon a rod 180, having the end fixedly secured in the legs of the U-shaped frame member 120, and biased in a clockwise direction by a spring 182, contacts the face of the printing plate 150, so as to ink the plate. The spring 182 is wrapped or wound around the rod 180 and has the free end 184 hooked into a suitable notch in member 120, as best seen in Figure 10. Ink is supplied to the plate 178 by the inking roller 164, forming a rolling contact with the plate 178 whenever the cylindrical member 132 is oscillated.

The driving mechanism for the cylindrical member 132 includes a pinion 190 fixedly secured in any suitable manner upon the end of the shaft 160. The pinion 190 is driven by a gear sector 192 non-rotatably mounted upon the tubular sleeve 122 held in position by a suitable screw 194. A collar 196 surrounds the sleeve 122 and is mounted for non-rotation upon the shaft 108 by a set screw 198 that threadedly engages a suitable aperture in the collar 196 and passes through a suitable aperture in the tubular sleeve 122 and engages a flattened surface 200 on the shaft 108. This flattened surface extends throughout the entire length of

the shaft 108. By loosening the screw 198, the printing mechanism may be adjusted along the shaft 108 and the supporting rod 110 to any desired position. When it has been properly located, it may be secured in position by tightening the screw 198 and thereby accurately position the printing device. A tubular spacing member 202 is mounted between the collar 196 and the leg of the U-shaped member 120 mounted adjacent the gear sector 192, so as to hold the U-shaped frame member 120 in a fixed spaced relation with respect to the collar 196. The collar 196 is provided with a downwardly directed dog 210 adapted to engage an adjustably mounted set screw or stop 212 threadedly engaging the base of the U-shaped member 120 and locked in adjusted position by a lock nut 214. As the drive shaft 108 is oscillated by a suitable oscillating mechanism or drive mechanism which will be described later, the gear sector 192 will rotate the pinion 190, so as to actuate the cylinder from the position shown in Figure 7 to the position shown in Figure 8, when the stop or dog 210 engages the stop 212, so as to cause the frame member 120 to rotate, stretching the tension spring 130, so as to cause the plate 150 to be pressed against the wrapping paper from the roll 30 that is forced against a serrated platen 219 adjustably mounted between a pair of guide rails 221 and 223 mounted upon the base 100 and adjusted into proper position. The teeth in the platen 219 will pierce through the paper 30 and force the serrated or pierced portion of the paper 30 into the face of the rubber plate 150, providing broken surfaces in the wax, which broken surfaces permit the ink to saturate into the pierced paper to make the printing visible. As soon as the shaft 108 is permitted to rotate into home position shown in Figure 7, the tension spring 130 will raise the frame 120 into the position shown in Figure 7. The inking roller will engage the inking plate 178 and finally engage the inking pad 170 in readiness for another printing operation. At this time the printing plate 150 is in engagement with the inking surface on plate 178 in readiness for the succeeding printing operation. The driving mechanism for the shaft 108 will now be described.

As may best be seen by referring to Figures 4 and 11 to 15 inclusive, the driving mechanism for oscillating the shaft 108 includes an arm 220 secured to a tubular sleeve 222, which tubular sleeve has mounted thereon a collar-like portion 224 held in position by a suitable set screw 226. The arm 220 is provided with a brace 230 that also is seated on the tubular sleeve 222, but on the opposite side of the collar-like portion 224. The collar-like portion 224 is provided with a lug 232 having an aperture receiving an adjusting screw 234 threadedly engaging a pintle 236 fixedly attached in the arm 220 and the brace 230. This is to adjust the angular position of the arm 220 with respect to the sleeve 222. The arm 220, as may best be seen by referring to Figure 4, is driven by a cable 238 attached to a bracket 240 secured to the elevator 90. As already described, the elevator 90 has a vertical reciprocatory movement and operates cyclically whenever the bread wrapping machine is in motion. This elevator 90 continues its reciprocatory movement irrespective of whether there is a loaf of bread in the machine or not.

In order to halt the operation of the printing

mechanism when there is no loaf of bread in the bread wrapping compartment of the machine, it is necessary to provide a mechanism for interrupting the operation of the printing mechanism during the cycle when the bread wrapping mechanism is idle. This has been accomplished by a releasable pawl mechanism for interconnecting the tubular sleeve **222** to the shaft **108**, which mechanism will now be described.

As may best be seen by referring to Figure 13, the tubular sleeve **222** is provided with a flange **242** provided with a notch **244**. A pawl **250**, biased in a counterclockwise direction by a compression spring **251**, as seen in Figure 13, is pivotally mounted upon a pin **252** extending into the side wall forming a notch **254** in a hollow cylindrical member **256**, integral with a tubular sleeve **258**, secured to the shaft **108** by a set screw **260** normally engaged by a loop **262** of a torsion spring **264** having an end **266** positioned in contact with the rod **110**. The spring **264** tends to rotate the shaft **108** in a counter-clockwise direction, as viewed in Figure 13. A cam sector **270** integral with a disc-like portion **272** is journalled on the tubular sleeve **222** and biased in a counterclockwise direction by a spring **280**, as viewed in Figure 13. This spring **280** has one end attached to a screw eye **282**, threadedly engaging a nut **284**, used in clamping the rod **110** to the plate member or bracket **106**. When the spring **280** is free to actuate the cam sector **270**, the cam sector **270** is rotated in a counterclockwise direction, as viewed in Figure 13, until it engages the set screw or stop **286** in member **256**, shown in dotted position in Figure 13. When in this dotted position, the upper edge **288** of the cam sector **270** moves into a position, permitting the pawl **250** to rotate in a counterclockwise direction upon the pivot **252**, so as to permit the end **290** of the pawl **250** to drop into the dotted position shown in Figure 13 in the path of the shoulder **292** of the notch **244**. As the arm **220** is rotated, the shoulder **292** engages the pawl end **290**, so as to rotate the cylindrical member **256** and with it the shaft **108**, causing the gear sector **192** to rotate the pinion **190** to oscillate the printing cylinder to cause the printing plate to move into operative position, at which time the dog **210** engages the stop **212**, causing the frame of the printing mechanism to oscillate to thereby cause the printing plate to move towards the arm **220**, as best seen in Figure 17, to complete the printing operation.

A trigger **300** is pivotally mounted upon the pivot **302** fixedly attached upon the plate member **106**. This trigger is biased in a clockwise direction, as viewed in Figure 11, by a tension spring **304** having one end mounted upon a pintle **306** fastened to the trigger **300** and the opposite end engaging a screw eye **308** threadedly engaging an aperture in the nut **284**. The tension spring **304** urges the end **310** of the trigger into the path of the cam sector **270**. Whenever the cam sector **270** is rotated in a clockwise direction, as viewed in Figure 11 into the "up" position, it overlies the free end of the pawl **250**. The trigger **300** is rotated in a counterclockwise direction, as viewed in Figure 11, by an arm **320** pivotally mounted upon the rod **110** and terminating in a bifurcated end **322**, straddling the tie rod **62** mounted between the frame members **60**. Whenever paper is advanced by the feed rollers **42** and **44**, the rod **62** is lowered, causing the arm **320** to be rotated in a counterclockwise direction, as viewed in Figure 11, so as to engage a resiliently

mounted stop **330** secured to the trigger **300**, so as to release the trigger from the cam sector **270**, permitting the tension spring **280** to snap the cam sector **270** into the position shown in Figure 11 to clear the end of the pawl **250**, to permit the clutch mechanism to actuate the printing mechanism into printing position, so as to print the price upon the paper.

In the event a loaf of bread does not engage the trigger **52**, so as to set the feed rollers **42** and **44** in motion, the trigger **300** is not released so as to cause the cam sector **270** to remain in the "up" position shown in Figure 13, thereby holding the shoulder engaging end **290** of the pawl **250** out of the path of the shoulder **292**, so that when the arm **220** is oscillated, it does not rock the shaft **108** and therefore the printing mechanism remains inoperative until the succeeding loaf engages the trigger **52** to set the feed rollers **42** and **44** in motion, so as to feed paper to the bread wrapping machine and thereby lowering the rod **62** so as to release the trigger **300** to permit the pawl **250** to engage the shoulder **292**, causing the shaft **108** to be rocked, setting the printing mechanism in operation, to again print or stamp the price upon the sheet of paper, in readiness for a succeeding operation.

Although the preferred embodiment of the device has been described, it will be understood that within the purview of this invention various changes may be made in the form, details, proportion and arrangement of parts, the combination thereof and mode of operation, which generally stated consist in a device capable of carrying out the objects set forth, as disclosed and defined in the appended claims.

Having thus described our invention, we claim:

1. The method of printing upon paper coated with an ink-repellant coating material, said method including the steps of fracturing the ink-repellant coating underneath the areas to be printed, and applying ink to the fractured surfaces so that the ink adheres to the paper throughout the areas where the ink-repellant coating has been fractured.

2. The method of printing upon paper having a waxed coating, said method including the steps of piercing the waxed paper from one side so as to break the wax coating on the opposite side to expose portions of the paper through the wax coating, and printing upon the area of the paper having the waxed coating broken and portions of the paper exposed.

OWEN J. GARLOUGH.
HARRY M. STEWART.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
110,031	Goodman	Dec. 13, 1870
261,025	Murdock	July 11, 1882
986,548	Cowles	Mar. 14, 1911
1,135,053	Sampson	Apr. 13, 1915
1,232,634	Whitaker	July 10, 1917
1,262,205	Joline	Apr. 9, 1918
1,307,532	Angell	June 24, 1919
1,466,000	Sevigne	Aug. 28, 1923
1,549,784	Middleton	Aug. 18, 1925
1,556,552	Welter	Oct. 6, 1925
2,082,945	Ferenci	June 8, 1937
2,356,644	Arelt	Aug. 22, 1944