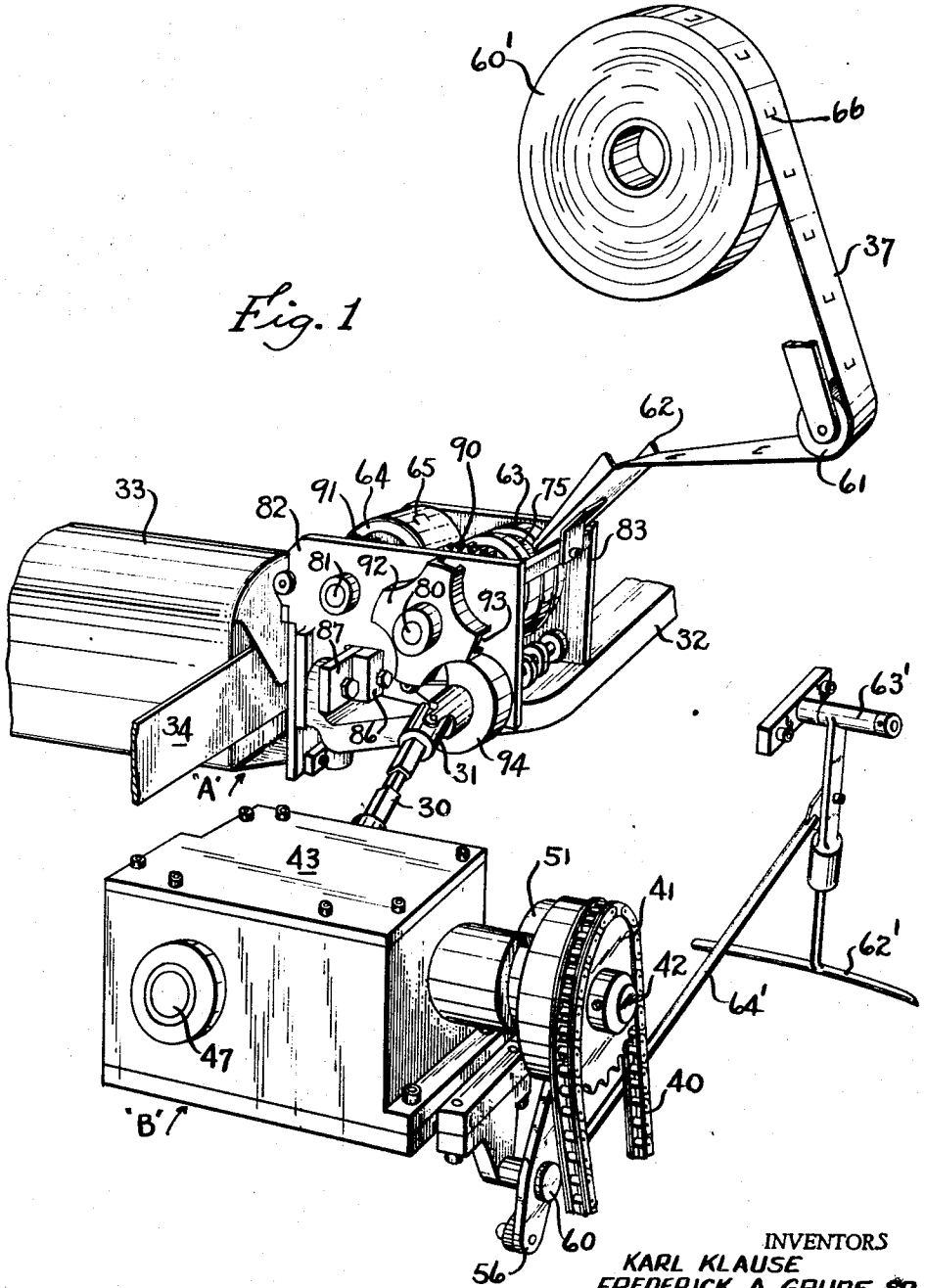
May 3, 1960 K. KLAUSE ET AL 2,934,870

APPARATUS FOR APPLYING TEAR CARD TO INNER FLAP OF WRAPPED PACKAGE

Filed Sept. 25, 1958 9 Sheets-Sheet 1

Fig. 1



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APPARATUS FOR APPLYING TEAR CARD TO INNER FLAP OF WRAPPED PACKAGE

Filed Sept. 25, 1958 9 Sheets-Sheet 2

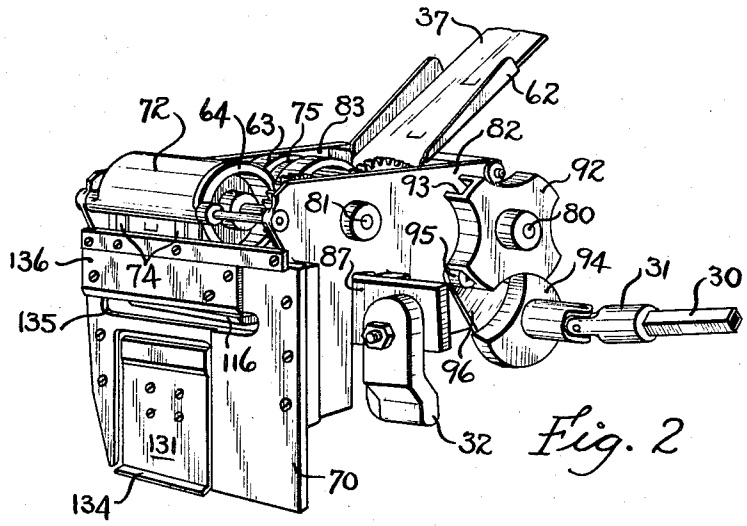


Fig. 2

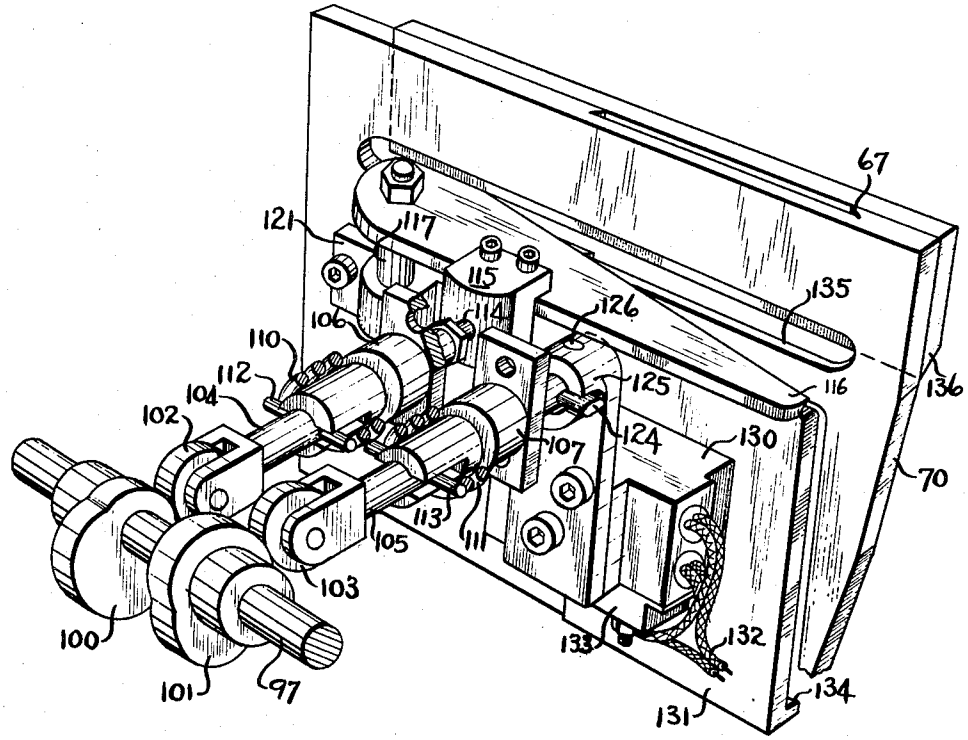


Fig. 3

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May 3, 1960 K. KLAUSE ET AL 2,934,870

APPARATUS FOR APPLYING TEAR CARD TO INNER FLAP OF WRAPPED PACKAGE

Filed Sept. 25, 1958 9 Sheets-Sheet 3

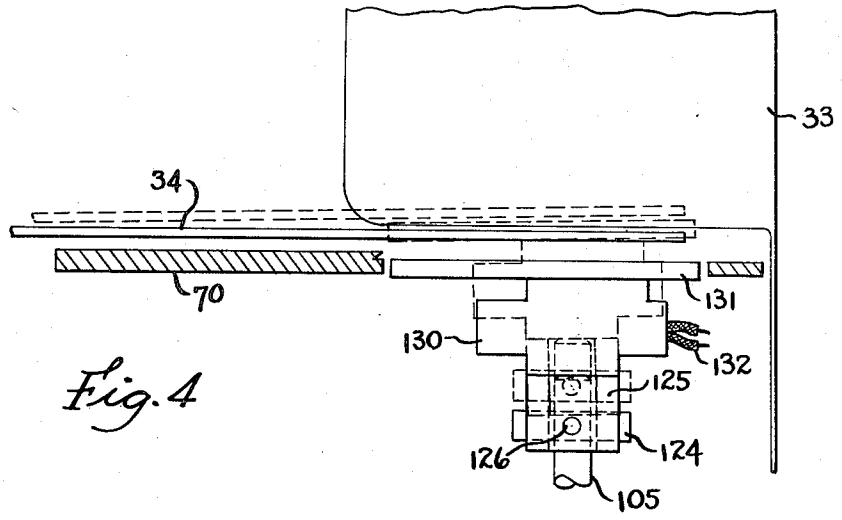


Fig. 4

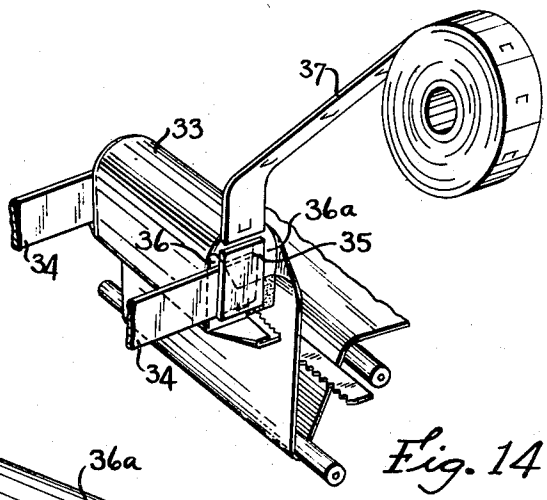
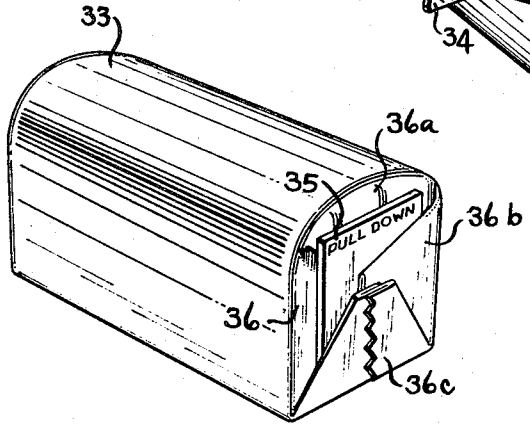


Fig. 14

Fig. 15



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APPARATUS FOR APPLYING TEAR CARD TO INNER FLAP OF WRAPPED PACKAGE

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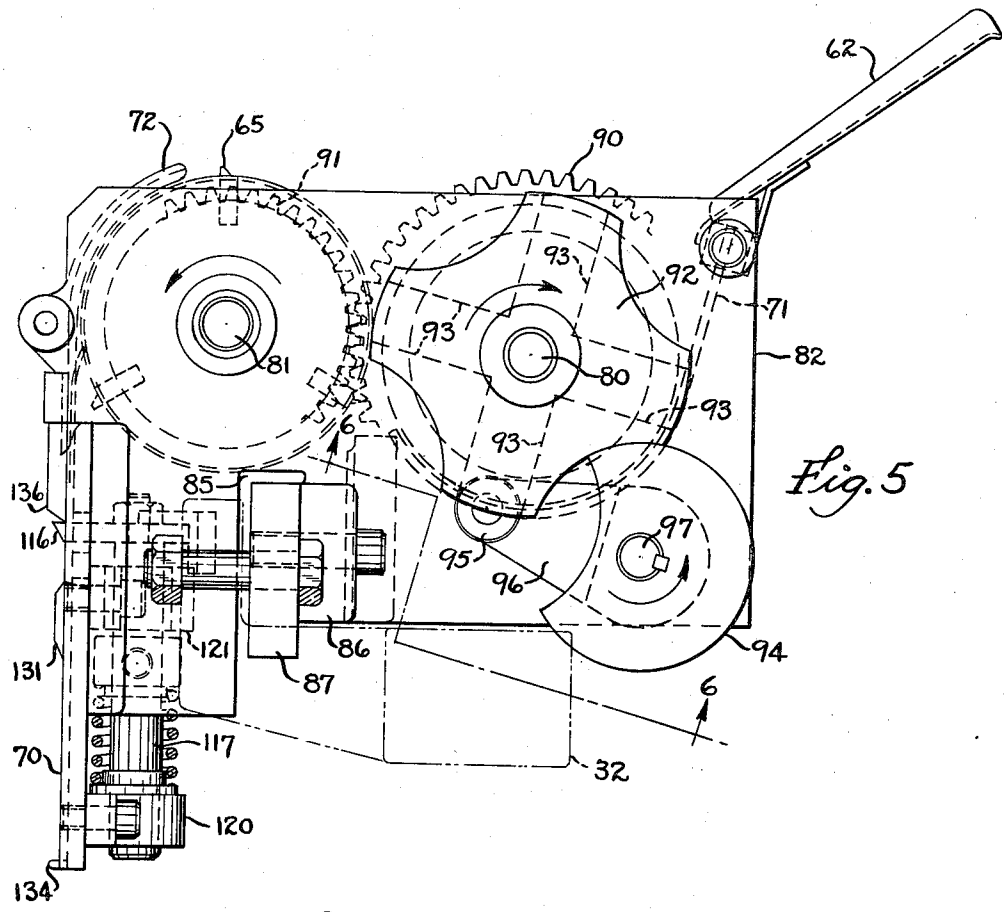


Fig. 5

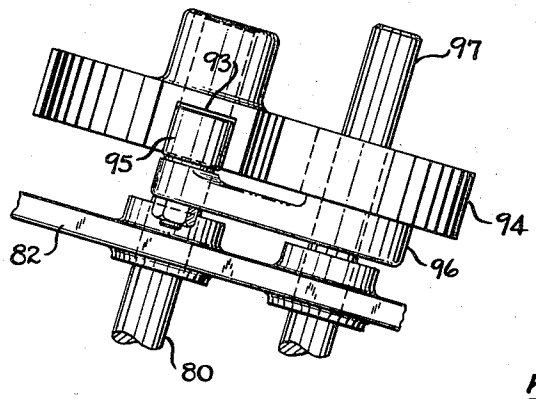


Fig. 6

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May 3, 1960 K. KLAUSE ET AL 2,934,870

APPARATUS FOR APPLYING TEAR CARD TO INNER FLAP OF WRAPPED PACKAGE

Filed Sept. 25, 1958 9 Sheets-Sheet 5

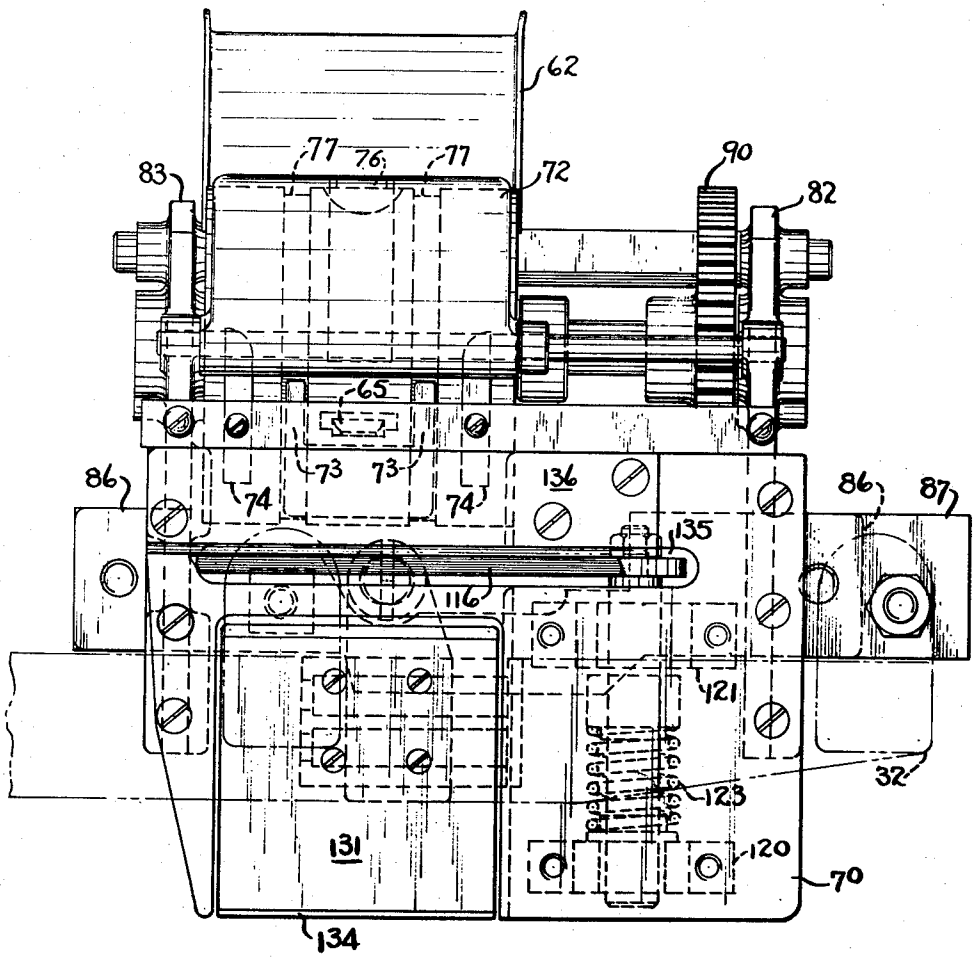


Fig. 1

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May 3, 1960 K. KLAUSE ET AL 2,934,870

APPARATUS FOR APPLYING TEAR CARD TO INNER FLAP OF WRAPPED PACKAGE

Filed Sept. 25, 1958 9 Sheets-Sheet 6

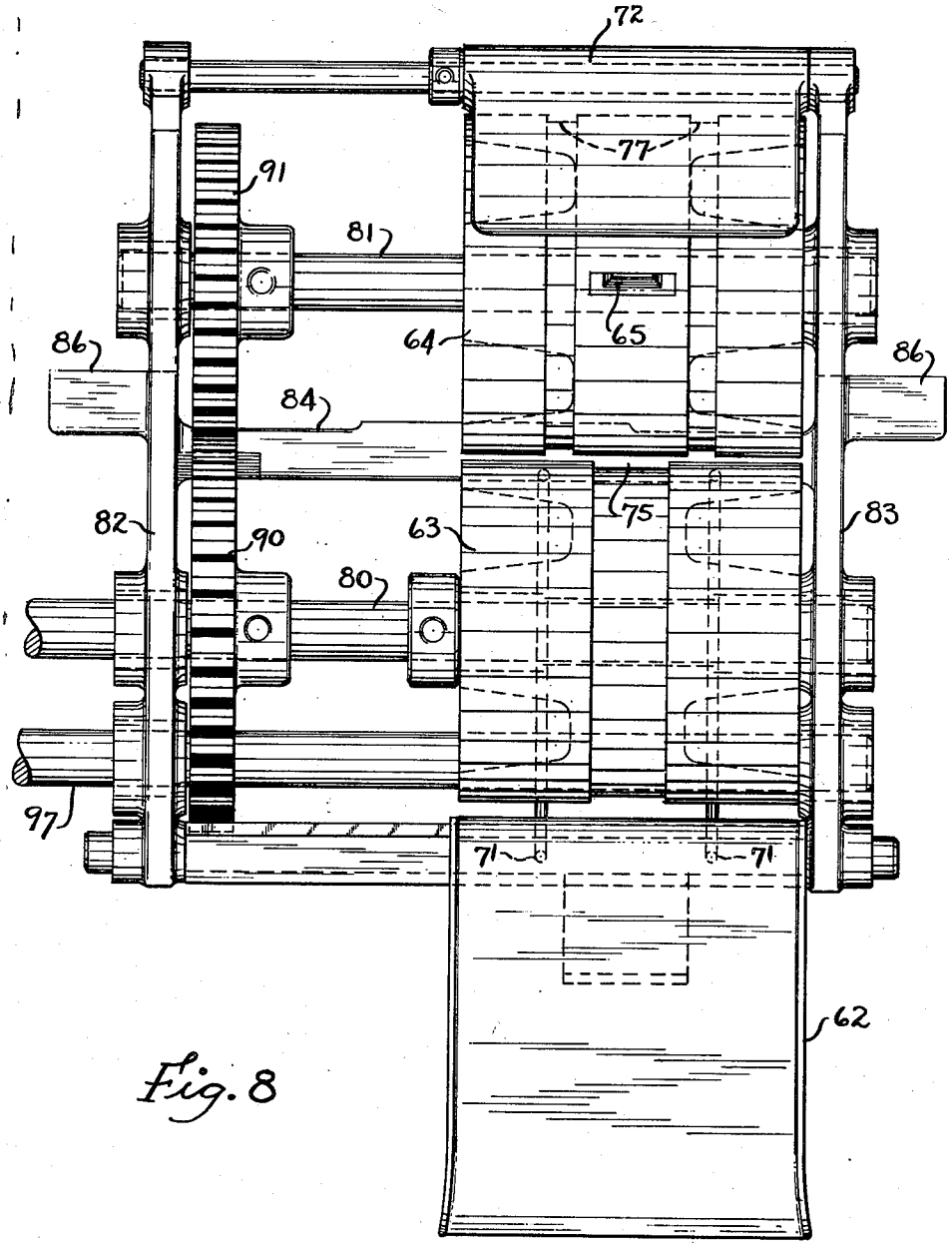


Fig. 8

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May 3, 1960 K. KLAUSE ET AL 2,934,870

APPARATUS FOR APPLYING TEAR CARD TO INNER FLAP OF WRAPPED PACKAGE

Filed Sept. 25, 1958 9 Sheets-Sheet 7

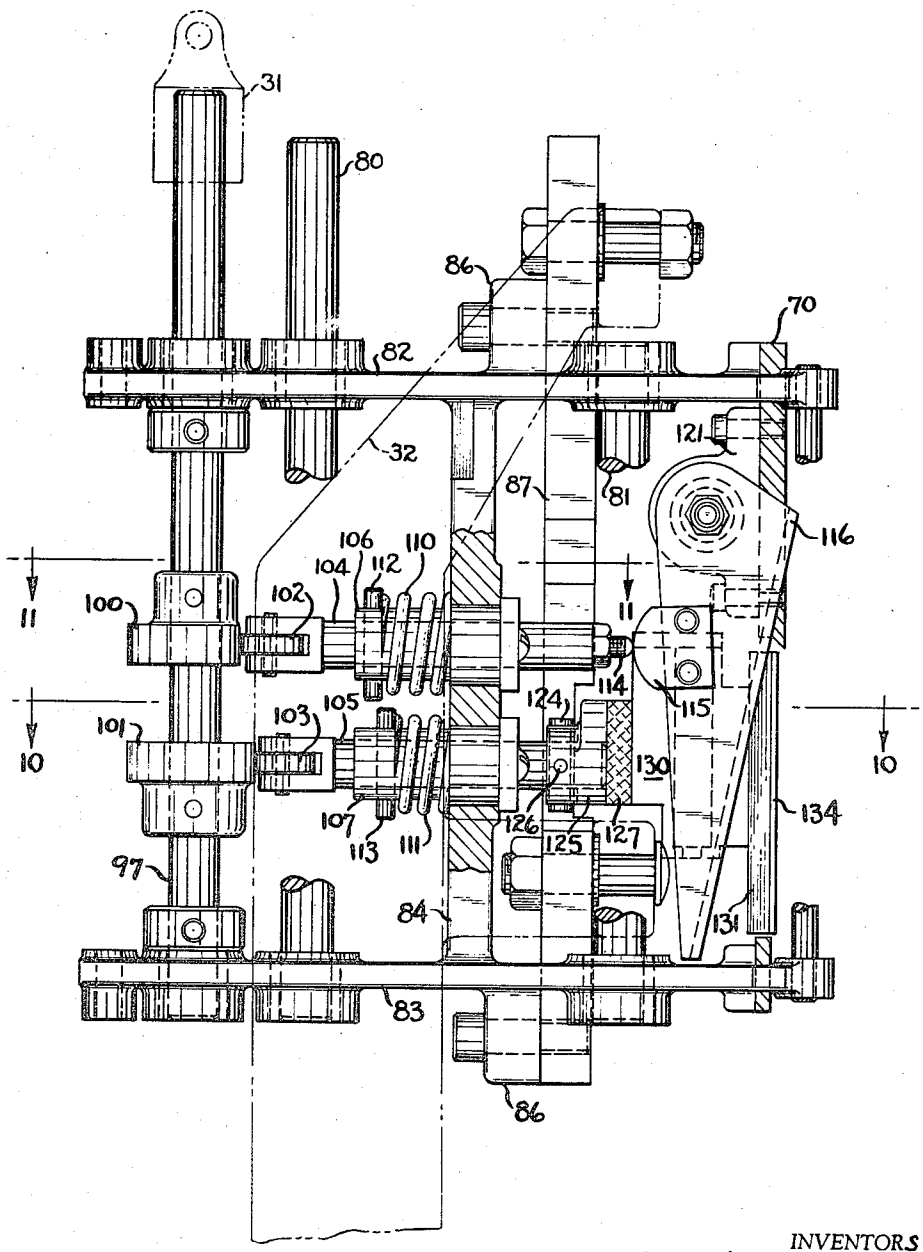


Fig. 9

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APPARATUS FOR APPLYING TEAR CARD TO INNER FLAP OF WRAPPED PACKAGE

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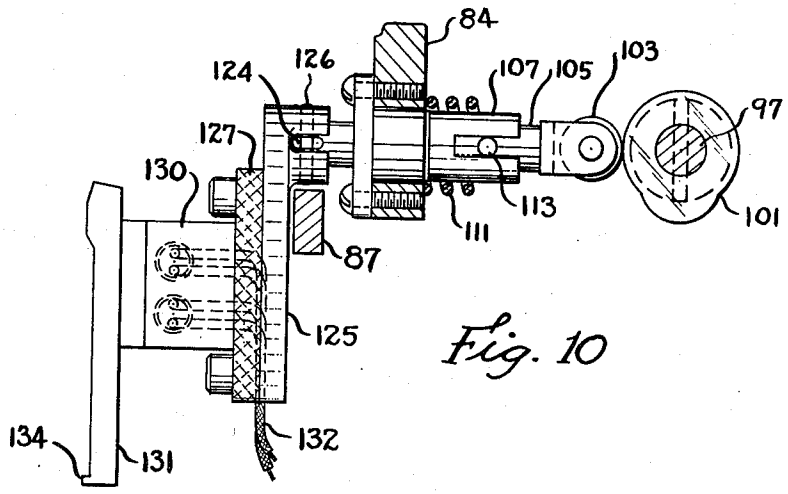


Fig. 10

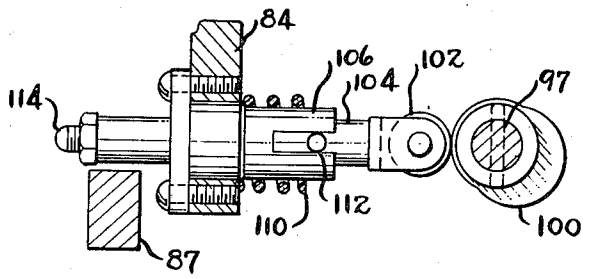


Fig. 11

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APPARATUS FOR APPLYING TEAR CARD TO INNER FLAP OF WRAPPED PACKAGE

Filed Sept. 25, 1958 9 Sheets-Sheet 9

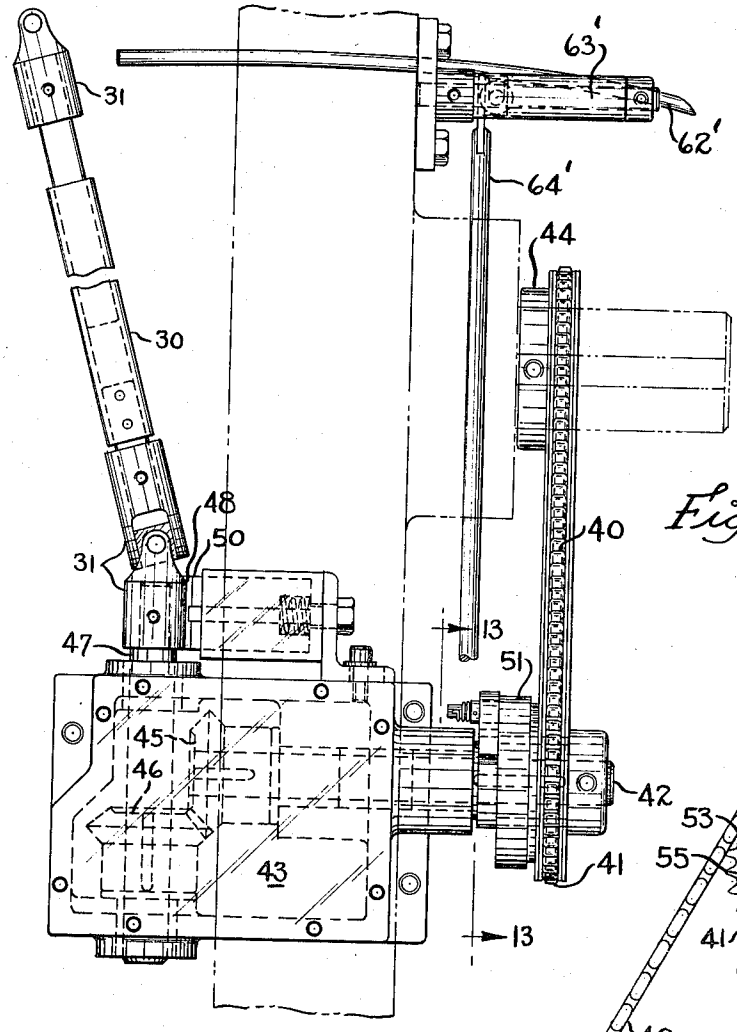


Fig. 12

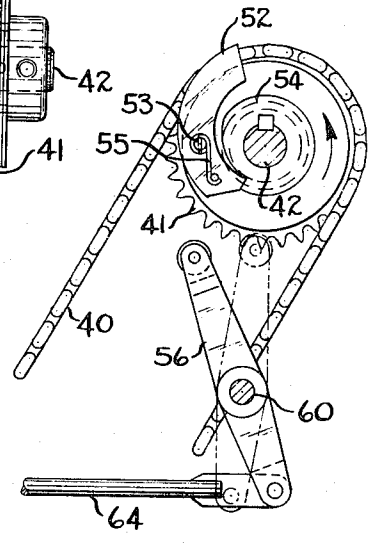


Fig. 13

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United States Patent Office 2,934,870 Patented May 3, 1960

2,934,870

APPARATUS FOR APPLYING TEAR CARD TO INNER FLAP OF WRAPPED PACKAGE

Karl Klause and Frederick A. Grupe, Sr., Appleton, Wis., assignors to American Can Company, New York, N.Y., a corporation of New Jersey

Application September 25, 1958, Serial No. 763,343

4 Claims. (Cl. 53—73)

This invention relates to apparatus particularly intended for association with a wrapping machine in which an article, such as a loaf of bread, is heat-sealed in a wrapper of waxed paper or the like. In its preferred aspect, this invention relates to apparatus for association with a bread wrapping machine for the purpose of applying a tear card to the outer surface of an inner folded end flap during the wrapping operation.

There has recently been developed an improved wrapped and folded package having an easy opening feature embodying a tear card positioned within the folds of the end flaps, and a method of making such a package, both of which are the subject of co-pending application Serial No. 759,758, filed on September 8, 1958, by Charles J. Lingelbach, Jr. It is the principal object of the present invention to provide apparatus, to be associated with a wrapping machine, which will position and apply a tear card to the outer surface of an inner folded end flap during the wrapping operation. Additional objects will be apparent from the following description.

One embodiment of our apparatus is illustrated in the drawings, wherein

Figure 1 shows in perspective view the back and side of the tear card applicator section and the power transmitting section of our apparatus, and also the relationship of the tear card applicator section with the article being wrapped in the wrapping machine;

Figure 2 is a perspective view showing the front and side of the tear card applicator section "A" of our apparatus;

Figure 3 is a perspective view, partly sectioned, showing the backside of the plunger face plate in the applicator section with its associated mechanism;

Figure 4 is a top plan view, partly sectioned, showing the plunger face plate in its normal position and in its extended position in contact with a tucker arm of the wrapping machine;

Figure 5 is a side elevation of the applicator section of our apparatus, as shown in Figure 2;

Figure 6 is a sectional view looking upwardly at the Geneva driving mechanism in the direction of the arrows along line 6—6 in Figure 5 of the drawing;

Figure 7 is a front elevation of the applicator section of our apparatus, as shown in Figure 2;

Figure 8 is a sectional top plan view of the applicator section of our apparatus;

Figure 9 is a partial sectional top plan view of the applicator section of our apparatus;

Figure 10 is a sectional side view of the plunger faceplate mechanism looking in the direction of the arrows along line 10—10 in Figure 9;

Figure 11 is a sectional side view of the tear card cutting knife actuating mechanism looking in the direction of the arrows along line 11—11 in Figure 9;

Figure 12 is a top plan view of the power transmitting section "B" of our apparatus shown in Figure 1;

Figure 13 is a sectional side view of the clutching

mechanism along the line 13—13 in Figure 12 showing the clutch arm in its engaged and disengaged positions;

Figure 14 is a perspective view of a loaf of bread in the process of being wrapped showing a tear card in the position it can be applied by our apparatus; and

Figure 15 is a perspective view of the completed bread package having a tear card inserted and adhered between the second and third folded end flaps and partly exposed to enable grasping as accomplished by the operation of our apparatus.

Referring to Figures 1, 2, 12 and 14 of the drawings, our apparatus comprises two sections, the tear card applicator section indicated generally by letter "A" and the power transmitting section indicated generally by letter "B." These sections are connected through a telescoping shaft 30 provided with one or more universal joints 31 thus allowing adjustability between the two sections and to correlate with changes in the size of the article being wrapped in the wrapping machine. The applicator section can be separately mounted on a conventional bread wrapping machine, as for example, by means of mounting bracket 32. As shown in Figure 1, a loaf of bread 33, partly wrapped and held on the end by a tucker arm 34 of the bread wrapping machine, is in position to have a tear card applied by our apparatus. The bread package at this stage can be seen more clearly in Figure 14 wherein a tear card 35 is in position to be adhered onto the second folded end flap 36*a* after the tear card is severed from the continuous web 37 which is threaded through the applicator section "A" of our apparatus. Normally, the bread and associated wrapper at this stage is in close aligned relationship with the applicator section "A" of the apparatus, the first end fold 36 having been previously formed, and the second folded end flap 36*a* being folded over tucker arm 34 by contact with the lower front edge 134 of the face plate 131 of the applicator in the upward movement of the bread by the wrapping machine. The subsequent folds 36*b* and 36*c* complete the end folds, as shown in Figure 15. It will also be seen that the tear card 35 is thus positioned in a pocket formed by the second, third and fourth end flaps, 36*a*, 36*b* and 36*c*, respectively.

Referring to Figures 1, 12 and 13, the operation of our apparatus is synchronized through the power transmitting section with the operation of the bread wrapping machine by means of chain 40 engaging gear 41 mounted on shaft 42 extending from gear box 43. Chain 40 also engages a gear 44 mounted on a shaft in the bread wrapping machine power unit. Gear box 43 contains a first bevelled gear 45, secured to shaft 42, which engages a second bevelled gear 46 secured to transverse shaft 47 extending through gear box 43. A universal joint 31, mounted on the extending end of shaft 47, is connected with telescoping shaft 30. Universal joint 31 is provided with a notch or groove 48, which is engaged by spring-actuated braking mechanism 50 when power is not being transmitted through gears 45 and 46. This device stops shaft 30 in a preselected position and prevents over-ride so that when power transmission is resumed it will always be from a common starting point. This phase of operation will be more clearly understood from the description to follow.

The transmission of power to gears 45 and 46 is controlled by clutch 51 operatively connected with gears 41, shaft 42 and gears 45 and 46. Clutch 51 is a conventional single revolution clutch (see Figure 13) consisting of crescent shaped key 52 pivotally mounted on the back of gear 41 by means of pin 53 and held in engagement with driving dog 54 by means of spring 55. Driving dog 54 is keyed to shaft 42 so that power is transmitted through shaft 42 as long as crescent shaped key 52 engages dog 54. This latter engagement is governed by the position

of clutch arm 56 mounted on shaft 60 which is in turn controlled by article sensing means consisting of rod 62' pivotally mounted on bracket 63' and connecting with clutch arm 56 by means of rod 64'. Thus, if no loaf of bread is in position to engage sensing rod 62', clutch arm 56 will be in the disengaged position and continued rotation of gear 41 will cause the outer periphery of crescent shaped key 52 to engage the end of clutch arm 56 and snap it out of driving engagement with dog 54. It should be noted that in the disengaged position driving dog 54 will be stopped in a position correlating with the braked position of universal joint 31. Thus, operation of our apparatus will always start and stop from a predetermined point.

Referring to Figures 1, 2, 3, and 5 through 11, particularly Figures 5 through 11, in the tear card applicator section of our apparatus, as distinguished from the power transmitting section just described, continuous web 37 of tear card material from supply roll 60' passes under roller 61 down guide chute 62 under a first-driven roller 63 and over a second-driven roller 64 having lugs 65 thereon to engage U-shaped slits 66 in tear card material 37 to carry the same forward, and finally through a guideway slot 67 (see Figure 3) in plunger face plate frame 70. In order to facilitate initial threading of the tear card material through the apparatus, two arcuate threading guide wires 71 (see Figures 5 and 8) are provided which guide the leading edge under roll 63 and up and around roll 64. An arcuate hold down guide 72 is provided to hold down the tear card material as it passes over roll 64. A set of guide fingers 73 is provided to facilitate withdrawal of lugs 65 from engagement with U-shaped slits 66 in the tear card material. Another set of guide fingers 74 is provided to hold down the lateral edges of the tear card material. Roll 63 and hold down guide 72 are provided with slots 75 and 76, respectively, to accommodate lugs 65 mounted on roll 64. Roll 64 is provided with a pair of slots 77 to accommodate guide fingers 73.

Rolls 63 and 64 are rigidly mounted on shafts 80 and 81, respectively, which are in turn mounted in and between two side framing plates 82 and 83. Side plates 82 and 83 are rigidly held and separated by cross bar 84, and are also provided with slots 85 (see Figure 5) having adjacent thereto mounting brackets 86 to which a second cross bar 87 is bolted. Mounting bracket 32 may be bolted to an extending end of cross bar 87, as shown in Figures 1 and 9 of the drawing. Cross bars 84 and 87 are suitably drilled and slotted to accommodate mechanism to be described more fully hereinafter.

Meshing gears 90 and 91 are rigidly mounted on shafts 80 and 81, respectively, in between side plates 82 and 83. These gears transmit power to advance the tear card material, which is guided by lug 65 through U-shaped slit 66, and under and over rolls 63 and 64. It should be noted that shaft 80 extends through and beyond side frame plate 82 and has rigidly mounted outside of said frame plate 82 a gear 92 having four U-shaped slots 93 spaced 90° apart. Gear 92 is part of the conventional Geneva driving mechanism which contains disc 94 having a portion of its peripheral surface cut away. The peripheral surface of disc 94 slides along the conforming concave portions of gear 92 when gear 92 is not being advanced. Gear 92 is advanced one-fourth of a revolution at a time by sliding engagement in one of slots 93 of gear 92 of a cylindrical lug 95 rotatably mounted on the end of cam 96 which is, with disc 94, keyed to a shaft 97. Shaft 97 is mounted in side framing plates 82 and 83 and extends through side plate 82 connecting with telescoping shaft 30 through universal joint 31. Thus, power from gear box 43 transmitted to the Geneva driving mechanism provides intermittent advancement of the tear card material during the period when gear 92 is engaged by lug 95.

Referring in particular to Figures 3, 9, 10 and 11, cams

100 and 101 are rigidly mounted on shaft 97 between side frame plates 82 and 83. Rollers 102 and 103, respectively, ride on cams 100 and 101. Shafts 104 and 105 are secured to rollers 102 and 103, respectively, and extend through bearings 106 and 107, respectively, which are mounted in cross bar 84, and through appropriate slots provided in cross bar 87. Shafts 104 and 105 are provided with conventional pressure springs 110 and 111 engaging bearings 106 and 107, respectively, and held in place by means of retaining pins 112 and 113, respectively. The end of shaft 104 opposite to the end having roller 102 thereon is provided with an adjustable set screw 114, the end of which engages curved bracket 115 which is rigidly secured to swinging knife 116. Knife 116 is mounted near the top of a vertically extending shaft 117 which is in turn secured to the back of face plate frame 70 by means of brackets 120 and 121. This construction can be seen in Figures 3, 5, 7 and 9 of the drawings. The return of knife blade 116 after cutting can be effected by means of torsion spring 123, which also functions as a pressure spring.

Shaft 105 with its associated mechanism, for convenience referred to as a plunger, is one of the vital elements in our apparatus. The end of shaft 105, extending through bearing 107, is provided with a laterally pivoting mechanism consisting of horizontally disposed, flat pin 124 secured in the end of shaft 105. The shaft is also provided with a mounting bracket 125 having horizontally disposed, flat pin 124 secured in the end of shaft 105. The shaft is also provided with a mounting bracket 125 having horizontally disposed slots adapted to receive the ends of flat pin 124, and vertically disposed, cylindrical pin 126 extending through bracket 125, pin 124 and shaft 105. The opposite side of mounting bracket 125 is provided with insulation 127 to reduce heat transfer from heating means 130 which provides heat to face plate 131 from its back side. Face plate 131 is secured to heating means 130 which is in turn secured to mounting bracket 125, thus providing a lateral pivoting movement for face plate 131. Electrical power for heating means 130 is supplied through wires 132. The temperature of face plate 131 may be controlled by means of thermostat 133.

Face plate 131 is provided along its lower front edge with a horizontally extending lip 134 which aligns with the leading edge of tear card material 37. The importance of this lip 134 will be explained more fully hereinafter. Face plate 131 in its reciprocating movement extends through the opening provided in face plate frame 70 which is itself secured to side framing plates 82 and 83 (see Figures 7 and 9). Face plate frame 70 has mounted on its front surface over guideway slot 67 and slotted opening 135 a stationary knife blade 136 which engages moving knife blades 116 passing through slotted opening 135 in the cutting of tear card material 37.

In the normal operation of our apparatus, a length of tear card material 37 is advanced into position for application, adhesive side out, by the engagement of lug 95 in one slot 93 of gear 92 in the Geneva mechanism for 90° of the revolution of disc 94. In the drawings, lug 95 is shown just leaving a slot 93 in gear 92 so that the end portion of the tear card material would normally be over face plate 131. The leading edge of the tear card material will either be resting on lip 134 of face plate 131 or slightly above it, depending upon the accuracy with which the U-shaped slits 66 have been put in tear card material 37. These U-shaped slits are put in the tear card material in registration with printing appearing thereon under the control of electric eyes which have an accuracy of plus or minus $\frac{1}{64}$ of an inch. Thus, it is possible for the length of the tear card to vary as much as $\frac{1}{32}$ of an inch. When the tear card material is is in place over face plate 131 the bread wrapping machine elevates a loaf of bread upwardly from directly under face plate 131 to form a flap over tucker arm 34 by con-

tact with the lower edge of face plate lip **134** and frame **70**. The function of lip **134** on face plate **131** is thus apparent. Except for the protection afforded by lip **134**, the end of the loaf of bread coming up in close aligning relationship with face plate **131** would catch the leading end of tear card material **37** and force it upwardly out of position so that the tear card would not be applied in the proper manner. In the period while the tear card material is waiting for a loaf of bread to be elevated into position, heat from face plate **131** is transferred to the overlying end portion of tear card material **37** to activate the adhesive thereon and prepare it for application to the bread wrapper flap. As pointed out previously, the operation of our apparatus is synchronized with that of the bread wrapping machine, and since the bread wrapping machine may turn out as few as 25 and as many as 60 or more loaves a minute, it is desirable that the temperature of face plate **131** be controlled so as to properly activate the heat-sensitive adhesive on the tear card material. That is, heated face plate **131** must activate the adhesive in the time period during which it is in contact with the end portion of the tear card material. Thus, face plate **131** will be at a higher temperature when the wrapping machine is operating at a rate of 60 loaves per minute than it would be when the wrapping machine is operating at the rate of about 25 loaves per minute.

When loaf of bread **33** is in position to receive a tear card, the rotation of shaft **97** (see Figures 3 and 9) first causes cam **100** to actuate cutting knife **116** to cut off the desired length of tear card material and then cam **101** actuates plunger shaft **105** to bring heated face plate **131** and the cutoff portion of tear card material having the adhesive thereon activated tightly against the flap portion of the bread wrapper facing the same. The function of the pivotal mounting of face plate **131** can be seen in Figure 4 where the depression of tucker arm **34** is shown together with the compression of the loaf of bread. That is, it is important in forming a good seal that the face plate be applied normally and firmly to the flap; otherwise, a poor seal would be achieved and the tear card would be easily moved or torn away on subsequent lateral movement of the bread in the folding and sealing of the third and fourth end flaps in completing the end closure.

It will be appreciated from the foregoing description that a high degree of mechanical cooperation between the various elements of our apparatus is required for effective utilization of the apparatus in associattion with a wrapping machine. That is, the sensing mechanism activates the power transmitting section when an article is being wrapped in the wrapping machine, and the power transmitting section provides the energy to the applicator section so that it may advance the tear card material into position, activate the adhesive thereon and cut and apply the tear card at the precise moment and during the brief period which the article is in position. The cutting and applying operations accomplish the desired end result and are governed in large measure by the design and arrangement of cams **100** and **101**. However, without the associated cooperating elements, the desired end result would not be achieved.

Referring to Figure 15, the desired end result is illustrated in the form of a completed bread package **33** having a tear card **35** positioned between the second and third folded end flaps, **36***a* and **36***b* respectvely, adhered to the former, and having an exposed grasping portion which when drawn downwardly will rupture the third flap near its inner folded edge and expose the contents. We have found that our apparatus, as described hereinabove, can be efficiently and effectively operated in associattion with a commercial bread wrapping machine, such as is manufactured and sold by American Machine & Foundry Corporation, to produce the package illustrated in Figure 15.

While this invention has been described and exemplified in terms of a preferred embodiment, those skilled in the art will readily appreciate that modifications can be made without departing from the spirit and scope of the invention as defined broadly in the appended claims.

We claim:

1. In apparatus for applying a tear card to an inner flap of a wrapped package during the wrapping thereof by a wrapping machine, the combination of a reciprocating plunger having pivotally mounted thereon a face plate, said face plate having a lip portion along its bottom face edge aligning with the leading end of a continuous length of tear card material; means for heating said face plate; means for actuating said plunger to force the tear card material into contact with a flap of wrapping material; a reciprocating knife for cutting a predetermined length of tear card material; means for actuating said reciprocating knife; means for holding and guiding a continuous length of tear card material into aligned relationship with said plunger face plate; means for periodically advancing the leading end of the tear card material adjacent to the lip of said plunger face plate; power transmitting means operatively connected with said plunger and knife actuating means and said advancing means; power disengaging means operatively connected to said power transmitting means; article sensing means operatively connected with said power disengaging means; and means for synchronizing said power transmitting means with the operation of the wrapping machine.

2. In apparatus for applying a tear card to an inner flap of a wrapped package during the wrapping thereof by a wrapping machine, the combination of a reciprocating plunger having a pivotally mounted face plate, said face plate having a lip portion along its bottom face edge aligning with the leading end of a continuous length of tear card material; thermostatically controlled means for heating the face of said plunger; means for actuating said plunger to force said tear card material into contact with a flap of wrapping material; plunger face plate framing means; a reciprocating knife for cutting a predetermined length of the tear card material; means for actuating said reciprocating knife; a stationary knife mounted on said framing means and positioned to engage said reciprocating knife in the cutting of the tear card material; means for holding a continuous length of tear card material and guiding the end thereof into aligned relationship with said plunger face plate; means for periodically advancing the leading end of the tear card material adjacent to the lip of said plunger face plate; power transmitting means operatively connected with said plunger and knife actuating means and said advancing means; power disengaging means operatively connected to said power transmitting means; article sensing means operatively connected with said power disengaging means; and means for synchronizing said power transmitting means with the operation of the wrapping machine.

3. In apparatus for applying a tear card to an inner flap of a wrapped package during the wrapping thereof by a wrapping machine, the combination of a cam-actuated plunger having a face plate pivotally mounted on its end, said face plate having a lip portion along its bottom face edge aligned with the leading edge of a continuous length of tear card material; means for heating said plunger face plate; plunger face plate framing means slotted to act as a guide for the tear card material; a cam-actuated knife for cutting a pretermined length of tear card material; a stationary knife mounted on said face plate framing means and positioned to engage said first-mentioned knife in the cutting operation; means for holding a continuous length of tear card material and guiding the leading end thereof into aligned relationship with said plunger face plate; cam actuating means for synchronously and consecutively advancing the leading end of the tear card material adjacent to the lip of said

plunger face plate, actuating said cutting knife, and actuating said plunger; a gear-box operatively connected with said cam actuating means; a clutch operatively connected with said gear-box; article sensing means operatively connected with said clutch; and means for synchronizing said gear-box with the operation of the wrapping machine.

4. In apparatus for applying a tear card to an inner flap of a wrapped package during the wrapping thereof,

the combination according to claim 3 wherein said cam actuating means includes a Geneva driving mechanism.

References Cited in the file of this patent

UNITED STATES PATENTS

2,844,929 Ringler ---------- July 29, 1958

FOREIGN PATENTS

248,422 Great Britain ---------- Mar. 1, 1956