June 13, 1939. F. X. MALOCSAY 2,161,877

MECHANISM FOR APERTURING CARTONS

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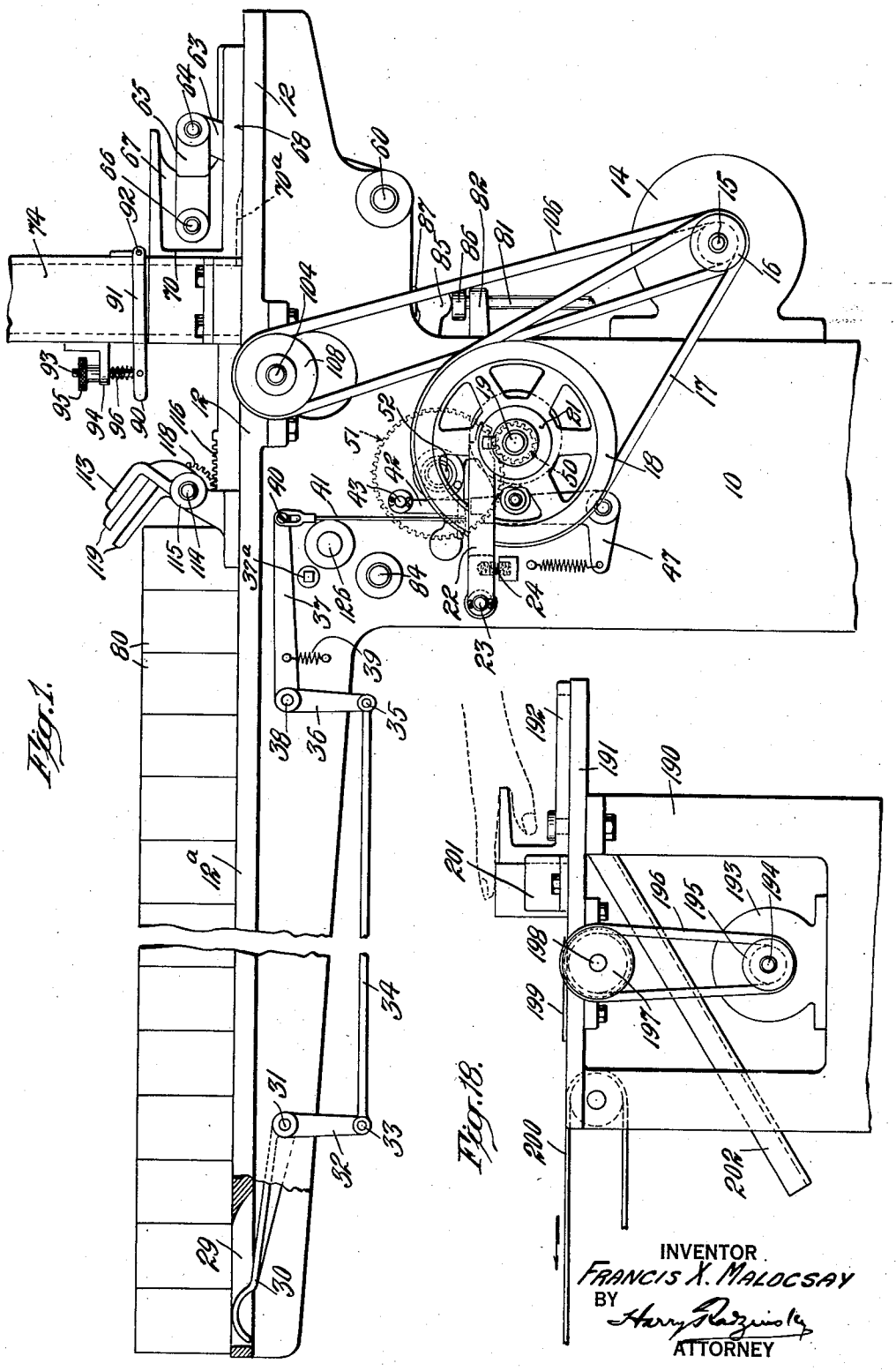


Fig. 1.

Fig. 1a.

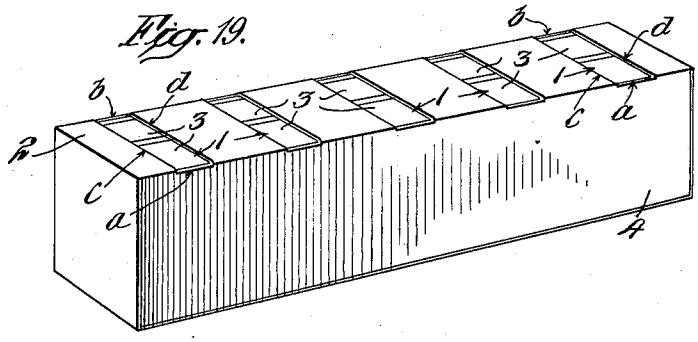
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MECHANISM FOR APERTURING CARTON S

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Fig. 19.



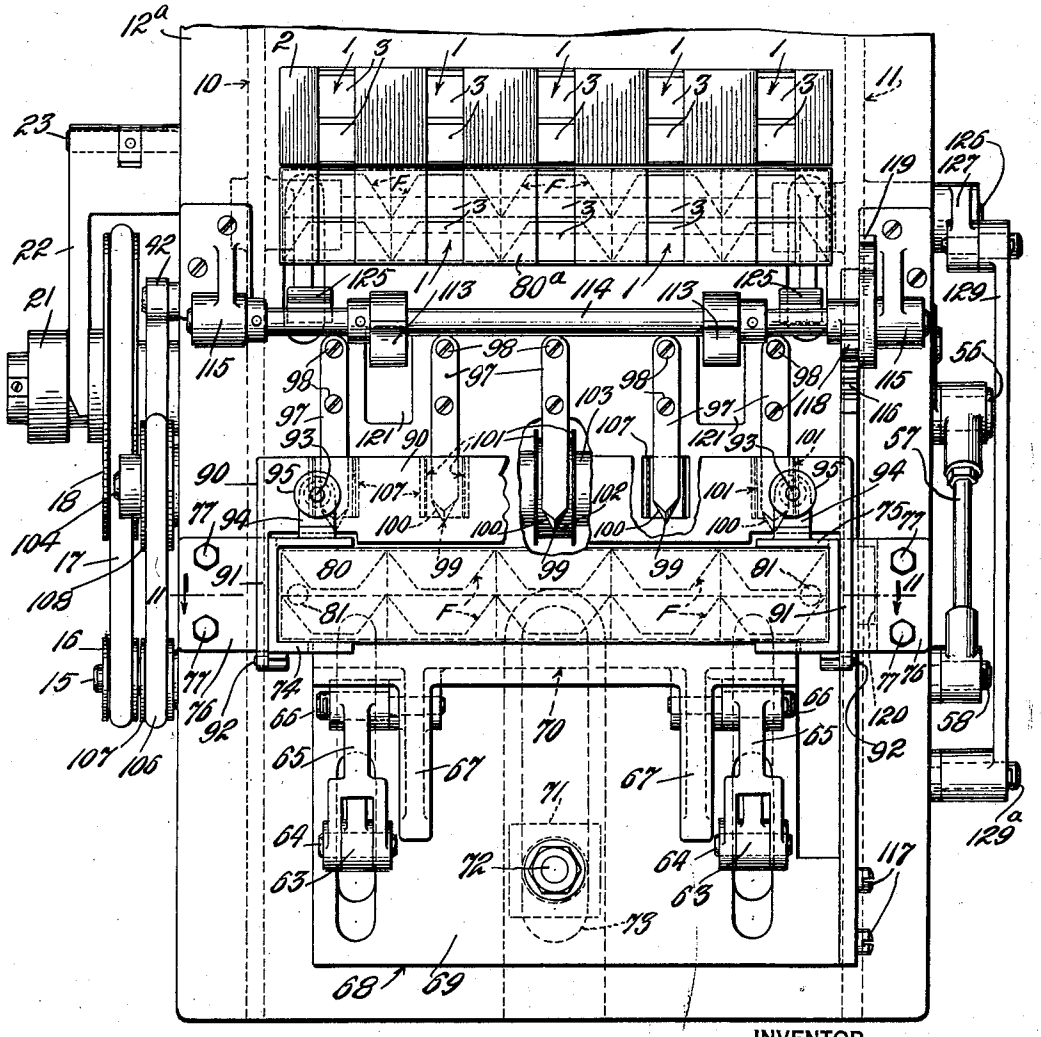


Fig. 2.

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MECHANISM FOR APERTURING CARTONS

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Fig. 3.

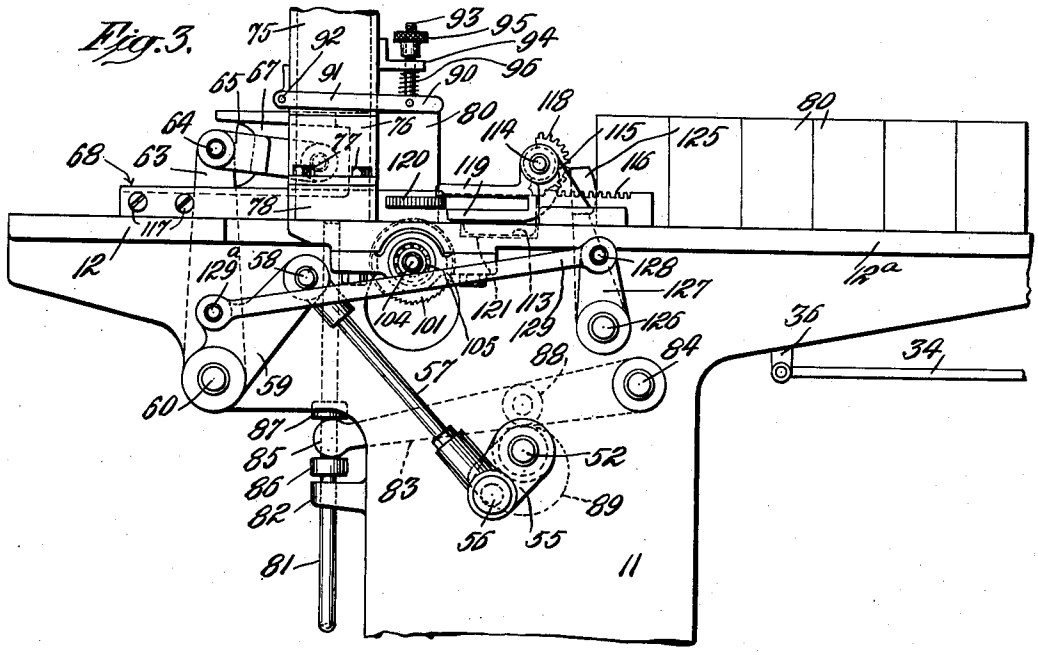
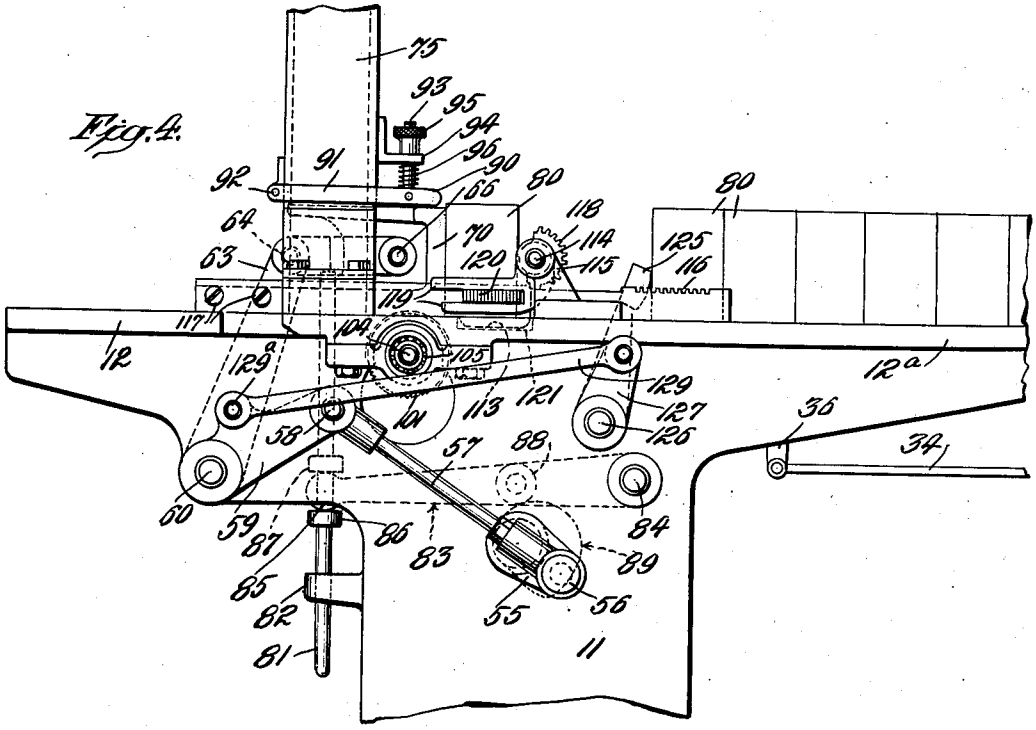


Fig. 4.



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MECHANISM FOR APERTURING CARTONS

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Fig. 5.

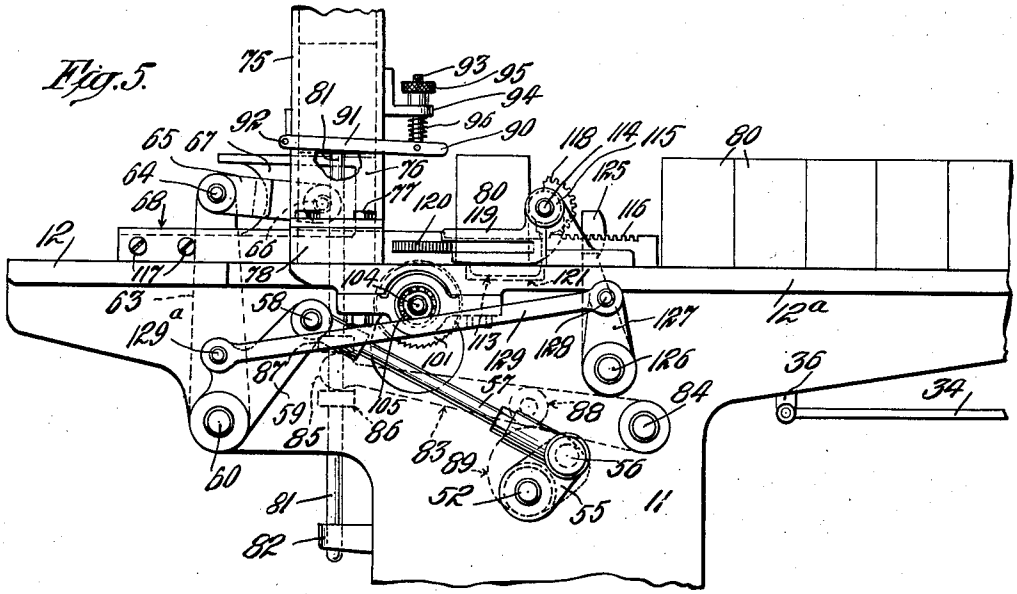
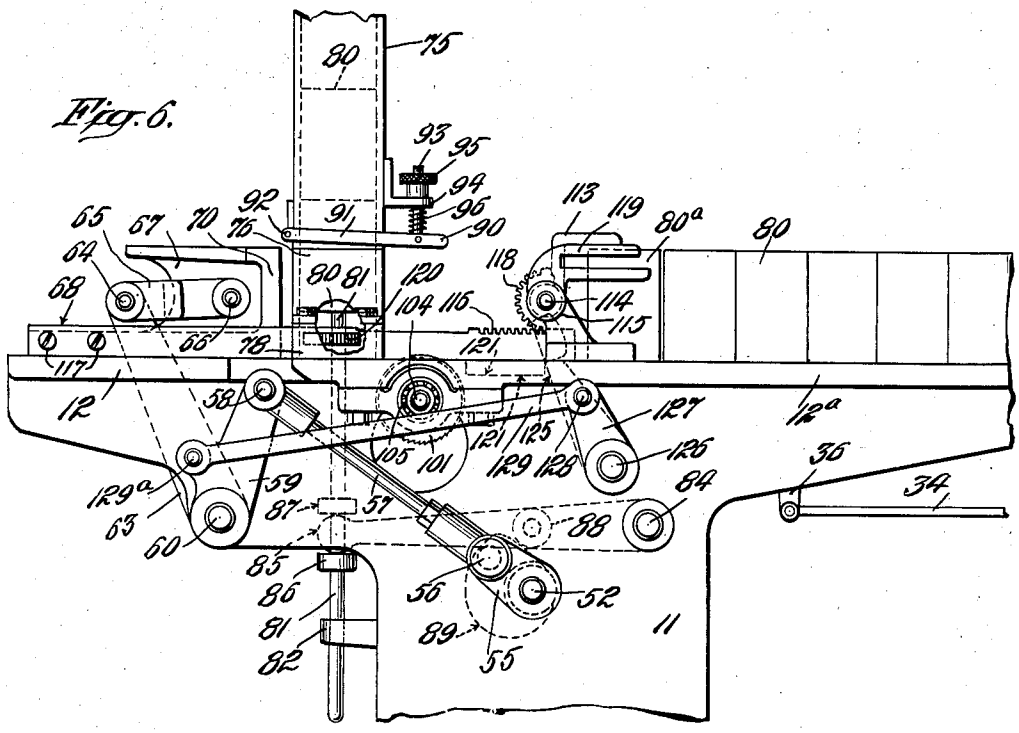


Fig. 6.



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Fig. 7.

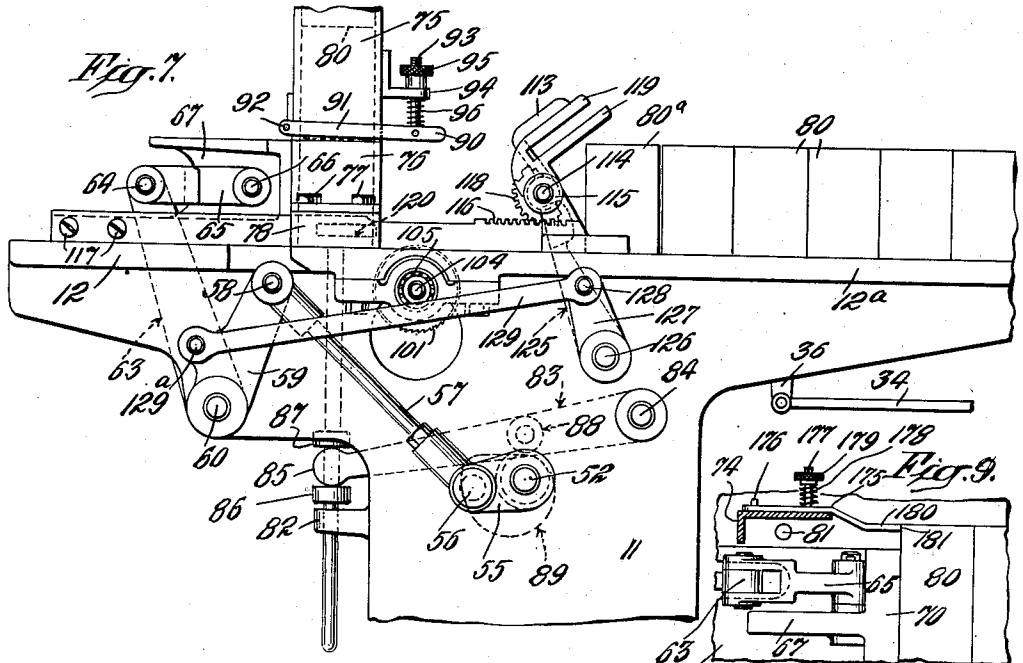
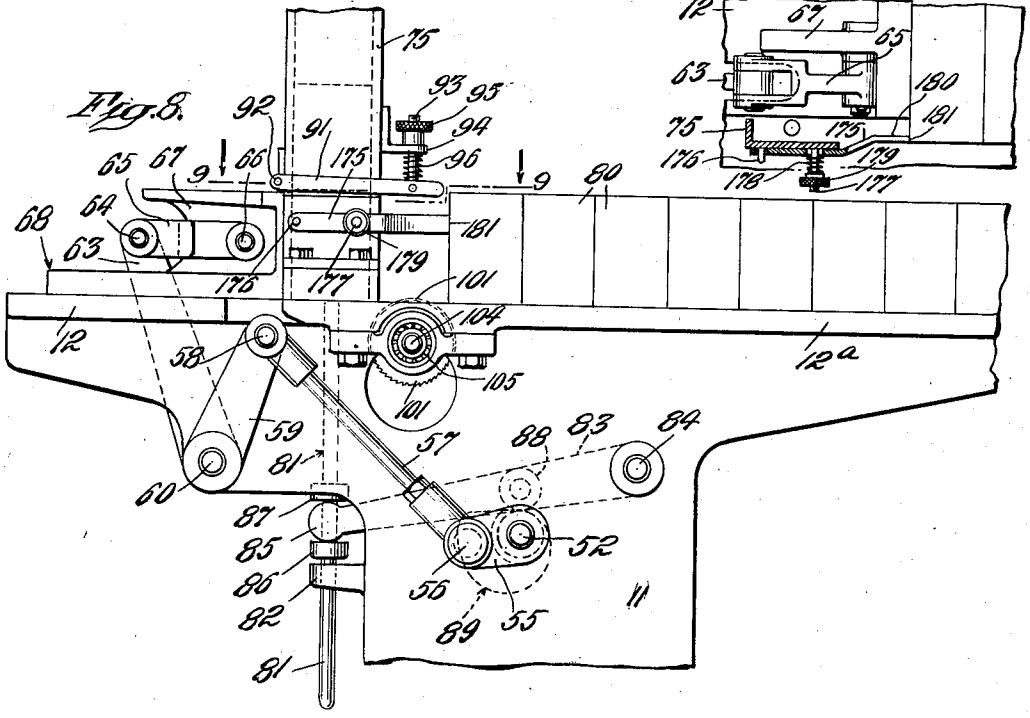


Fig. 9.

Fig. 8.



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MECHANISM FOR APERTURING CARTONS

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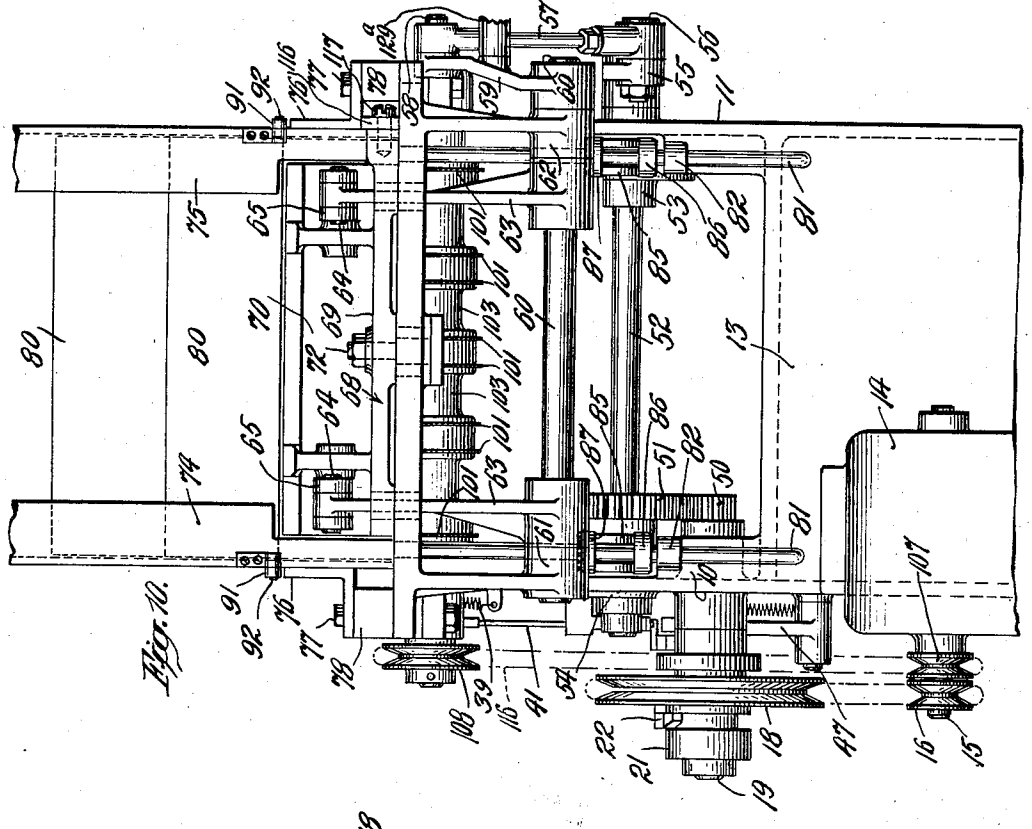


Fig. 10.

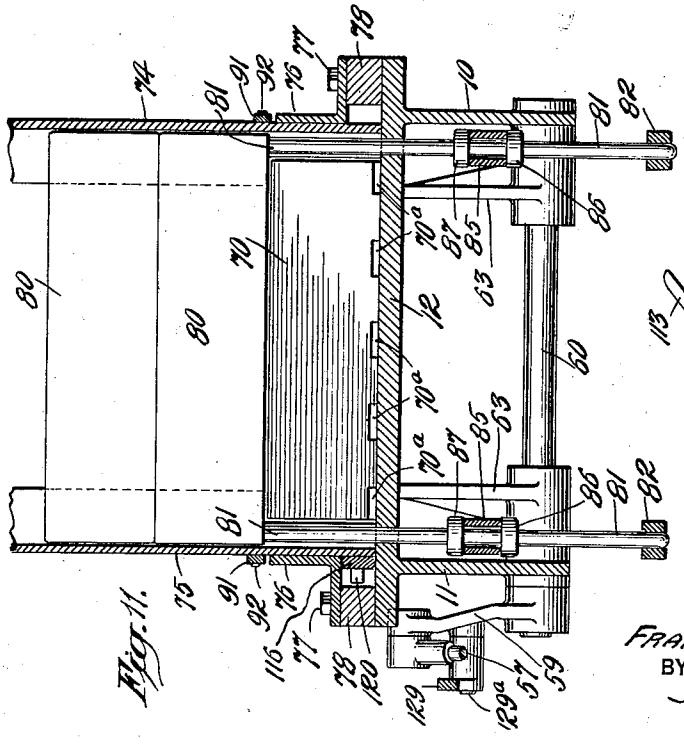


Fig. 11.

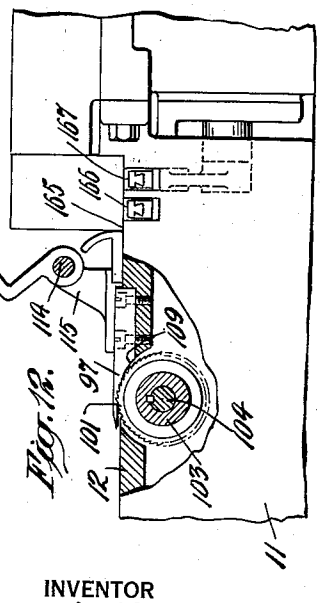


Fig. 12.

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MECHANISM FOR APERTURING CARTONS

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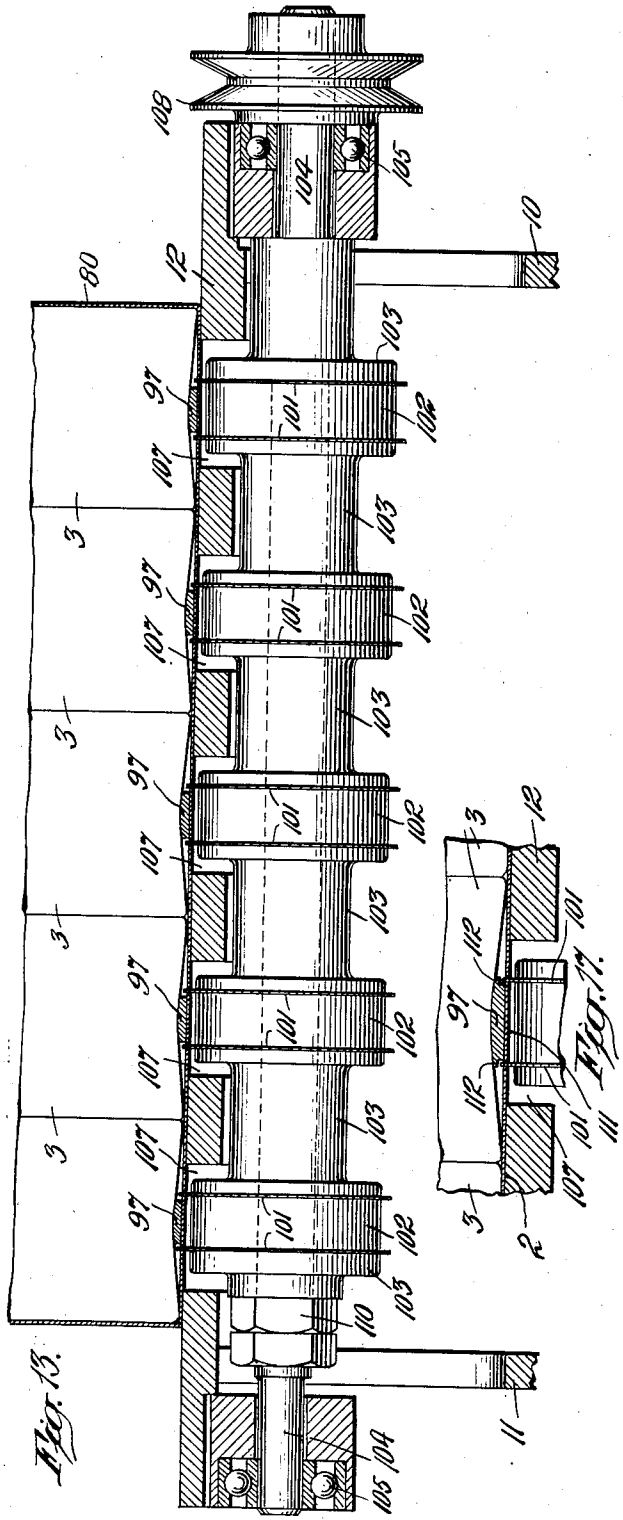


Fig. 13.

Fig. 17.

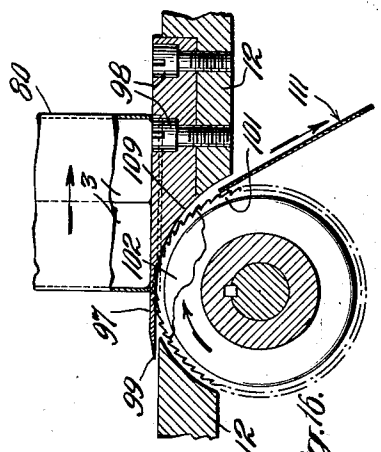


Fig. 16.

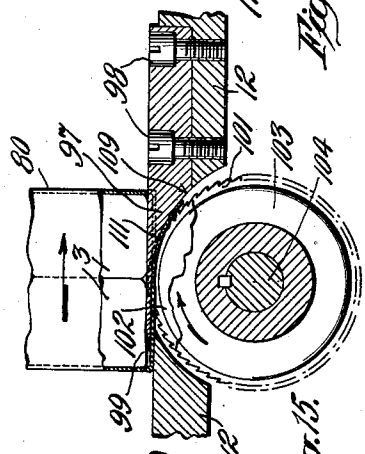


Fig. 15.

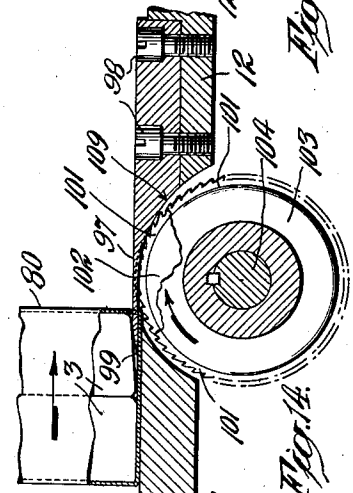


Fig. 14.

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Patented June 13, 1939 2,161,877

UNITED STATES PATENT OFFICE

2,161,877

MECHANISM FOR APERTURING CARTONS

Francis X. Malocsay, Upper Saddle River, N. J.

Application November 10, 1938, Serial No. 239,824

26 Claims. (Cl. 164—34)

This invention relates to a mechanism for producing one or more apertures in card-board boxes, cartons or the like, and has for one of its objects the provision of means by which a box or carton may be speedily and accurately formed with one or more apertures in one of its walls without requiring the removal of the contents from the box or carton, and if the carton is sealed, without requiring the breaking of the seal or opening of the carton.

At the present time, various State laws require the application of a tax stamp to a package of cigarettes when the same is sold within that particular State. Since these stamps are applied by jobbers, dealers or others located in the particular states where the stamp affixment requirement exists, considerable labor cost is involved as the cigarette manufacturers supply the cigarette packages in sealed cartons containing ten or more packages. These cartons have to be opened, the packages removed from the carton, the stamps applied to the packages, and the stamped packages then repacked in the cartons, and the cartons re-sealed.

In my Patent No. 2,139,701, dated September 13, 1938, I show a carton for containing a number of cigarette packages, the carton there shown being provided with a series of apertures in one of its walls through which portions of the ends of the cigarette packages are exposed so that the tax stamps may be applied to the ends of the packages without requiring the removal of the packages from the carton. In the structure of that patent the openings or apertures shown are formed or produced in the carton either during the manufacture of the carton or thereafter, but in each case, before the contents are placed in the carton. In other words, the placement of the apertures in the carton occurs before the carton is filled with the cigarette packages.

The present invention contemplates the provision of means by which one or more apertures may be speedily and simultaneously produced in one of the walls of a filled and sealed carton without disturbing or damaging the contents of the carton or requiring the opening of the carton. That is to say, with the present invention, the cartons as manufactured and filled, are of conventional imperforate construction; they are filled and sealed in the usual way by the cigarette manufacturer and shipped by him to jobbers, dealers or others in the States where the stamp requirement exists, and the jobbers, dealers or others, through the use of the improved apparatus herein described, can speedily perforate the cartons and apply the stamps to the cigarette packages therein through the openings so formed, without unsealing the cartons or opening them, or removing the contents thereof. After the cartons are perforated, the application of the stamps to the cigarette packages is speedily performed at a minimum labor cost.

The primary object of the invention therefore consists in the provision of an apparatus of the character mentioned; which apparatus may be provided, if desired, with means for automatically feeding the cartons to cutting elements and then moving the perforated cartons away from the cutting means; which may also be provided if desired, with means for reversing the positions of the perforated cartons to place the perforated walls thereof uppermost to thereby conveniently position the cartons for either the manual or mechanical affixment of the stamps; which may be provided if desired with manual carton-feeding means, and which, if desired, may be applied to a decalcomania-applying machine such as is disclosed in my Patent No. 2,117,618, dated May 17, 1938.

In the accompanying drawings, wherein several embodiments of the invention are disclosed, Fig. 1 is a side elevation of a machine constructed in accordance with the invention; Fig. 2 is a plan view of the same, with certain of the parts broken away to disclose construction; Fig. 3 is a side elevation of the machine, looking at the side opposite to that shown in Fig. 1; Fig. 4 is a view of the machine similar to that of Fig. 3, showing the parts in the position where the aperturing of a carton has been performed and the carton is ready to be overturned to a position where the cut-out wall portion is disposed uppermost; Fig. 5 shows the machine in the position where overturning of the carton is ready to begin; Fig. 6 shows the machine in the position where the apertured carton has been turned over and placed in position in the delivery row; Fig. 7 shows the machine in the position where the parts are returning to the initial starting point; Fig. 8 is a side view of the machine, modified by the elimination of the carton-overturning mechanism so that the apertured cartons are placed in the delivery row in the same position as they occupy when moved over the cutting mechanism; Fig. 9 is a sectional view on the line 9—9 of Fig. 8, looking in the direction of the arrows; Fig. 10 is a front elevation of the machine; Fig. 11 is a sectional view on the line 11—11 of Fig. 2, looking in the direction of the arrows; Fig. 12 is a view of a part of the machine, with parts in sec-

tion, indicating how the same may be attached or connected to a decalcomania-applying machine such as shown in my Patent No. 2,117,618; Fig. 13 is a sectional view through the cutting table, showing the rotary cutters and the piercing blades; Figs. 14, 15 and 16 are sectional views through the cutting mechanism showing the successive steps in forming an aperture by severing a section from a wall of the carton; Fig. 17 is a sectional view showing a modification of the piercing blades; Fig. 18 is a side elevation of a modified structure, wherein the cartons are manually fed to the cutting mechanism; and Fig. 19 is a perspective view of a carton in which the apertures have been formed.

In Fig. 19 is shown a carton as it appears after having passed through the machine. The five apertures, indicated at 1, are preferably formed in the rear wall 2 of the carton which, as originally supplied by the cigarette manufacturer, is imperforate. The packed and sealed cartons, as supplied by the cigarette manufacturer to the dealers, usually contain ten packages 3 of the cigarettes packed in the carton in superposed rows, the folding cover for the carton being indicated at 4, and being usually sealed by an adhesive. The filled carton thus supplied by the cigarette manufacturer is imperforate, closed and sealed and the present invention produces the five apertures 1 shown in Fig. 19 without requiring the removal of the cigarette packages from the carton, without requiring breaking of the carton seal and without damaging the cigarettes or the wrappers in which they are contained.

Each aperture 1 in the carton extends from one end of the wall 2 of the carton to the other end of the wall and each aperture exposes portions of the ends of two packages so that the five apertures shown expose parts of the ten packages and the tax stamps may be applied to these exposed portions of the packages through the apertures 1 either by hand or by machine. If a carton of different construction contains more or less packages, the number of apertures formed in the carton may be increased or decreased accordingly without requiring extensive changes in the machine.

With reference to the machine, 10 and 11 indicate the side members of the machine frame, the same being connected by front plate 13 and by a top or table portion 12 on which the cartons are supported and moved to the cutting mechanism as hereinafter explained. Mounted on the front plate 13 of the frame is an electric motor 14 having a shaft 15 upon which a pulley 16 is mounted. A belt 17 extending over the pulley 16, extends around a pulley 18 which normally rotates freely on a bushing on clutch shaft 19 unless coupled thereto by a clutch mechanism, which will be briefly described. A clutch operating in somewhat similar manner was employed in the machine of, and is more completely described in, my prior Patent No. 2,117,618.

The operation of the clutch is governed by the passage of cartons which have been apertured by the cutting mechanism and which, after having passed the cutting mechanism, are moved in a delivery row along the face of the table extension 12*a*. At a desired location, and preferably near the end of the table or wherever else desired, the table extension 12*a* is provided with an opening 29 through which the rounded end of a feeler lever 30 extends upwardly, said lever being secured on shaft 31 mounted to rock in the frame. Said shaft carries an arm 32 pivotally connected at 33 to the end of a link 34. The other end of link 34 is pivotally attached at 35 to the arm 36 of a bell-crank lever, pivoted at 38 on the frame and having its other arm 37 engaged by a spring 39 which extends to the frame and which tends, through its downward pull on arm 37, limited by the stop 37*a*, to elevate the feeler lever 30 for a distance up through the opening 29 unless prevented from doing so by a carton resting upon table extension 12*a* above the opening 29. The end of arm 37 carries a stud 40 which is located in a slot in the upper end of a rod 41. The lower end of the rod 41 passes through an opening in a pivoted guide member 42 which is pivoted at 43 to the side member 10 of the frame.

The clutch structure consists of means by which the pulley 18 will be coupled with and drive the shaft 19 as long as the rod 41 is in a lowered position, this occurring while the feeler lever 30 is elevated through opening 29. In other words, as long as there are no cartons located over opening 29 to depress lever 30, the carton feeding and upturning mechanism will continue in operation. The clutch structure includes, among other elements, the clutch drum 21, stripping arm 22 pivoted at 23, and upwardly spring-pressed at 24; the latch member 42, lever 47 and other operative elements, the structure and operation of said clutch being fully described in my previous Patent No. 2,117,618, and in other prior patents. It is sufficient to state that the structure is such that unless the feeler lever 30 is elevated, the constantly-rotating pulley 18 will remain uncoupled from shaft 19 so that the carton feeding, carton-upturning, and carton delivery mechanism will remain inoperative.

Secured on the inner end of the clutch shaft 19 is a pinion 50 (Fig. 10) which meshes with and drives a gear 51 secured on the shaft 52 mounted to rotate in the bearings 53 and 54 on the side frame members 10 and 11. Secured on one end of said shaft 52, on the outside of frame side 11, is a crank arm 55, pivotally attached at 56 to one end of a link 57 which has its opposite end attached at 58 to the end of an arm 59 secured on a shaft 60 mounted to oscillate in the bearings 61 and 62 in the side frame members. Fixed on the shaft 60, and projecting upwardly therefrom, are two arms 63, each of which has its upper end pivotally attached at 64 to a link 65 (Fig. 2) having its opposite end pivotally attached to a stud 66 extending from the vertically-disposed web portions 67 of a carton feed-member 68.

The carton feed-member 68 consists of a horizontally disposed plate portion 69 supported on the table 12 and reciprocated thereon by means of the mechanism above described, and it also includes a vertically disposed web or plate 70 from which the web portions 67 extend. Plate 70 constitutes a platen which contacts with each carton and slides it along the table 12 to the cutting mechanism. A guide block 71 mounted on bolt 72 is guided in slot 73 in the table to direct the carton feed member in its reciprocating movement, and hold it against the top of the table.

The cartons to be apertured are arranged in a stack above the table 12 and by movement of the carton feed member 68 are successively fed from the bottom of the stack to the cutting mechanism. The stack holder includes the two, properly-spaced, channel shaped guide members 74 and 75, cut away at their lower ends to permit lateral movement of the lowermost carton by the feed member 68. Each of the guide members has a laterally extending flange or foot 76 secured

by the screws 77, through spacer blocks 78, to the table 12.

The cartons 80 in the stack are during certain periods of time, supported by rods 81. These rods have their upper ends engaging under and supporting the stack while the carton feed-member is on its travel to a retracted position in preparation for its next forward or carton-feeding movement. The carton feed-member 68 during its retracting movement is shown in Fig. 5 and the manner in which the stack of cartons is supported at this time by the rods 81 is clearly shown in Fig. 11. Each rod 81 is guided for vertical movement through a guide lug 82 on the frame and the two rods are simultaneously elevated and lowered at the proper time by means of levers 83 pivoted at 84 on the frame, each of these levers having a yoke 85 at its free end located between the collars 86 and 87 on the rod. Each rod 81 is elevated and lowered by one of the levers 83 and each lever 83 carries a cam roller 88 which rides on a cam 89 secured on the shaft 52.

As the lowermost carton in the stack is moved to the cutters by the carton feed-member, or to the right as viewed in Figs. 3 and 4, it is moved under and held down by a resiliently mounted pressure plate indicated at 90 in Fig. 2. At each of its ends the plate is attached to an arm 91, pivoted at 92 to one of the stack guide members 74, 75. Extending upwardly from the top of the pressure plate are pins 93 which pass through guide members 94 projecting from the stack guides 74 and 75, said pins being threaded for the reception of the adjusting nuts 95. A coil spring 96 surrounds each pin 93 and is interposed between the under side of the guide 94 and the top of the plate 90. By adjustment of the nuts 95 it will be apparent that the tension of the spring may be varied and the plate raised or lowered so that it applies the correct pressure on top of a carton moved beneath it by the carton feed member 68.

Cutting mechanism

Secured on top of the table 12 are five properly spaced piercing blades 97 shown most clearly in Figs. 2 and 13 to 16 inclusive. Each blade is mounted in a complementary recess formed in the table 12 and firmly secured in position by means of the screws 98. At its free end each blade is formed with a point 99 and its upper face adjacent the point is inclined or beveled at 100 as clearly seen in Figs. 1 and 14. The pointed end portions of the blades are elevated above the face of the table 12 for a distance equal to the thickness of the card-board of which the body of the carton is made. As will be noted in Fig. 2, the blades are preferably but not necessarily of several different lengths so that when a carton is moved against their pointed ends, the pointed ends of all the blades do not strike the carton simultaneously.

Situated below the piercing blades are spaced rotary cutters 101 which operate in the openings 107 in the table 12, these cutters being held in properly spaced relationship by means of the spacing elements 102 and 103 and the nuts 110. The cutters and spacing elements are all keyed on a shaft 104 rotating at each of its ends in a ball bearing 105 secured to the frame. Shaft 104 is driven at relatively high speed from the motor 14 by means of the belt 106 extending around the pulley 107 (Fig. 10) secured on the motor shaft 15, and over the pulley 108 secured on the cutter shaft 104.

As will be seen in Fig. 13, each of the piercing blades is located between two of the cutters 101 so that the two shorter ends *a* and *b* (Fig. 19) of each opening 1 in the carton is formed by the entry and exit of one of the blades through the carton, while the longer sides *c* and *d* of each opening are produced by the action of two of the rotating cutters.

The combined piercing and cutting operation, by which the apertures or openings 1 are produced in the wall of the carton, is shown in detail in Figs. 14 to 16 inclusive. As a carton at the bottom of the stack is engaged by the feed member 68 and moved along the top of the table 12 to the right, as viewed in Fig. 3, with the wall of the carton to be apertured resting upon the surface of the table, the carton is pushed into contact with the pointed ends of the piercing blades 97 which enter within the carton at one end of the wall 2 of the same, or as indicated at *a* in Fig. 19. To permit the feed member 68 to pass over the piercing blades 97, the bottom of the feed member is grooved as indicated at 70*a* in Fig. 11. The beveled end 100 of each blade enables the blade to enter into the carton between the packages therein and the inside face of the wall 2, as shown in Figs. 13 and 14 without tearing or damaging the wrappers on the packages. As these wrappers on the packages are usually made of a slippery, transparent material such as "Cellophane", the blades slide easily past the packages. It will also be noted that when the packages are fed to the blades, the flaps on the wrappers of the packages, indicated at F in Fig. 2 are so disposed that the blades move from the fold of the flap toward the free end thereof so that the blades cannot possibly enter between the flaps and the remainder of the wrapper and damage either the flaps or wrapper. The blades, entering into the carton, elevate the packages slightly in a direction away from the wall to be apertured. As the carton continues its movement in the direction of the arrow (Figs. 14 to 16) it reaches a point where the two rotary cutters located at the sides of the blade, contact with the outer face of the wall 2 of the carton and form two parallel cuts or slits *c* and *d* therein (Fig. 19) extending from the ends of the slit formed at *a* by the entry of the piercing blade into the carton. The blades 97 holding the packages raised from the wall of the carton thus keep the packages raised away from the cutters. The under side of each piercing blade is curved or concaved as indicated at 109 to follow the peripheral curve of the cutters, and this curved under-portion of the blade directs the cut-out portion 111 of the carton downwardly and away from the carton, as the carton continues its movement as indicated in Fig. 15. As further movement of the carton is continued past the cutting mechanism, the ends of the piercing blades finally emerge out of the carton, at the point *b*, (Fig. 19) thus producing the last slit required and which connects those formed at *c* and *d* by the rotary cutters and frees the cut-out section 111 from the body of the carton, so that the same falls down as indicated in Fig. 16, into a suitably positioned receptacle. It will be thus apparent that by the operation of the piercing blades, the two cuts or slits *a* and *b* are formed at the front and rear ends of the wall to be apertured, and that the ends of these two slits are connected by the longer parallel slits formed at *c* and *d* by the spaced rotary cutters so that a rectangular section is cut out and completely removed by each piercing blade and a co-

operating pair of cutters, leaving a window opening 1 in the wall of the carton, as clearly seen in Fig. 19, through which a portion of the end of two packages is exposed.

While five piercing blades and a pair of companion cutters for each blade are shown, to suit the requirements of present-day cigarette cartons and contents, it will be apparent that this arrangement may be varied as may be required to suit any reasonable changes in cigarette packing in the future. To facilitate the smooth entry of each blade into the carton, the top of each blade may be rounded slightly as seen in Figs. 13 and 17, and also, if desired, the longitudinal side edges of each blade may be undercut as indicated at 112 in Fig. 17, with the toothed edges of the rotary cutters disposed in the undercut recesses so formed, to thus cover these toothed edges and prevent the same from contact with the hands of an operator should they be inadvertently placed near the cutters.

Carton-upturning mechanism

After an apertured carton has passed the cutting mechanism, it is overturned onto the table extension 12*a* so that the apertured wall 2 of the carton is placed uppermost, enabling the stamps to be easily applied to the packages without requiring manual upturning of the carton. A pair of tumbling arms 113 secured on an oscillating shaft 114 engages the carton, by impingement against its apertured wall, and tumble it over so that the apertured wall is uppermost, or to the position shown in Fig. 2. Each end of the shaft 114 is rotatably mounted in a bearing 115 rising from the table 12. Shaft 114 is rocked by means of a rack 116 secured to and extending from one side of the carton feed plate 68 by screws 117 and reciprocated with the feed plate. A segmental pinion 118, secured on the shaft 114, is periodically engaged by the rack at the proper time to oscillate the shaft 114 in synchronism with the feed mechanism. A yoke 119 forming an extended portion of the hub of pinion 118 holds the tumbling arms in a lowered position during the time that the carton feed plate 68 is continuing its movement of the carton past the cutting mechanism. During this period, the yoke 119 is engaged by a lug 120 constituting a lateral extension of the rack 116. The lug 120, in engagement with the yoke 119, is clearly shown in Fig. 4.

The manner in which the carton-upturning mechanism operates will be clearly understood by reference to Figs. 3 to 7 inclusive. In Fig. 3 the carton 80 is shown passing over the cutting mechanism, the same being, at this time, pushed to the right by the feed member 68. The tumbling arms 113 are in lowered position, the same resting in recesses 121 formed in the top of the table 12, and the lug 120 is about to enter into the yoke 119 to hold the shaft 114 against oscillatory movement and hold the pinion against movement during the time that the toothed portion of the rack is moved away from below the pinion. In Fig. 4 the carton has passed the cutting mechanism and has been moved to a position over the tumbling arms 113, or in other words, has reached the limit of its movement to the right under the impulse of the carton feed member 68. Carton feed member 68 now begins to retract or move to the left, as shown in Fig. 5, leaving the apertured carton 80 resting on the table 12 directly over the tumbling arms 113. As the feed member 68 retracts, lug 120 is moved out of the yoke 119 and the rack 116 is brought into mesh with the pinion 118. With the continuance of movement of the feed member 68 to the left, rack 116 rotates the pinion 118 clockwisely, as viewed in Fig. 5, causing the tumbling arms 113 to swing upwardly and tumble, or overturn the carton then resting above them, to a position with its apertured wall uppermost. A carton so placed by operation of the tumbling arms is shown at 80*a* in Fig. 2.

Carton delivery mechanism

When the apertured cartons are upturned in the manner just described, they are delivered onto the table extension 12*a* and moved along the same in a delivery row as seen at the right of Figs. 3 to 7 and at the left in Fig. 1. Means is provided for moving each carton, as it is upturned, out of the way of the next carton to be upturned. Said means includes a pair of delivery arms 125 secured on an oscillating shaft 126 rotatively mounted in bearings in the side frame members 10 and 11. Secured on one end of said shaft is an arm 127 which has its end pivotally connected at 128 to one end of a link 129 having its opposite end attached at 129*a* to a pin projecting from the arm 59. When shaft 60 is oscillated to move the carton feed member 68 to the right (Fig. 6) to cause it to force the lowermost carton in the stack to the cutting mechanism, arm 59 being also swung to the right, will swing arm 127 through link connection 129 therewith, in the same direction, and the delivery arms 125 will contact with the last carton that has been upturned and push it and the preceding cartons on the delivery row along the top of the table extension 12*a* to make room for the next carton to be deposited in the row in upturned position by the tumbler arms 113.

Briefly, the operation of the machine is as follows:

To begin operation of the machine, the stack is first filled with cartons, with the wall of each carton to be apertured facing downwardly.

Assuming that current to the motor 14 has been turned on, the motor will begin driving the pulley 18 and also begin rotation of the cutter shaft 104. If table extension 12*a* is cleared of cartons and none is located above feeler lever 30, so that said lever is elevated up through opening 29, shaft 19 will be at once coupled by the clutch to pulley 18 and begin its rotation. Carton-feeding member 68 now begins movement toward the left, as viewed in Fig. 1, moving the lowermost carton in the stack before it toward the piercing blades 97. As the carton is so moved, it passes under the spring-pressure plate 90 which holds it down during the cutting operation. The pointed ends of the piercing blades enter the carton and the cutters 101 co-operating therewith, begin the severance of five sections of the carton as shown in Fig. 14. Continuance of movement of the carton past the piercing blades causes the five sections 111 of the carton to start downward movement away from the carton, as shown in Fig. 15. Finally, the pointed end of each piercing blade emerges out of the carton as shown in Fig. 16 and the severed section of the carton descends as there shown. Under the push of the carton feed member 68, the now apertured carton continues its movement past the piercing blades until it reaches a position of rest directly above the tumbling arms 113, which are at this time in lowered position, as shown in Fig. 4. At this time also, the lug 120 is located in

the yoke 119 thus holding shaft 114 against shifting rotative movement. The carton feed-member 68 has now reached the limit of its feeding movement and begins its return movement. While this is occurring, the cartons in the stack are held in elevated position by the rods 81 so that the feed member may pass under them on its return movement. As the carton feeding member moves on its return movement, the rack 116 rotates pinion 118 causing shaft 114 to be rotated to swing the tumbling arms upwardly and cause them to upturn the apertured carton so that its apertured wall is disposed uppermost. When the feed member reaches its retracted position, rods 81 are lowered to allow the then lowermost carton in the stack to descend and come to rest on top of the table 12 in front of the retracted feed member. Carton feed member now begins its next feeding movement and as this takes place, pusher arms 125 are moved to cause them to shift the upturned, apertured carton and those preceding it in the delivery row, away for a distance of approximately the width of a carton so that the next apertured carton may be tumbled into the space so provided. The apertured cartons disposed on the table extension 12*a* may have the stamps applied to their contents directly upon the table, if desired, or they may be removed elsewhere to have the stamps applied. In order to maintain the machine in constant operation, it is necessary that the cartons be removed from over the opening 29 to permit raising movement of feeler lever 30. Thus, if the machine should be unattended it will automatically halt the feeding and cutting of cartons as soon as one is located over the opening 29. Also, if girls applying the stamps to the cartons issued from the machine work more slowly than the output of the machine, the machine will automatically halt whenever the table is full of cartons.

While the apertured cartons may have the stamps manually applied to their contents while the cartons are on the table extension 12*a* or elsewhere, the present machine may also be employed in conjunction with, or used as an attachment for, the decalcomania-applying machine shown in my Patent No. 2,117,618. The manner in which this can be done is disclosed in Fig. 12. There, the tumbler arms 113 are arranged to upturn the apertured cartons directly on top of a support 165 under which carrier bars 166 and 167 of the decalcomania-applying machine are moved with an upward, forward, then downward and backward, movement to move the carton progressively along from one position of stamp-application to the next, as fully explained in said patent. These carrier bars form a part of said decalcomania-applying machine, and by the combination of the present invention with said machine the cartons can be apertured, fed directly to the decalcomania-applying machine, and the stamps applied by said machine.

A modification of the invention is disclosed in Figs. 8 and 9 wherein the carton-upturning means is omitted and the apertured cartons are delivered upon the table extension 12*a* with their apertured walls facing downwardly. In this structure, means is provided for preventing rearward movement or creeping of the apertured cartons, such means consisting of bars 175, one of said bars being located at the outer side of each of the stack guides 74 and 75. Each bar is loosely mounted upon two pins 176 and 177 and is resiliently held against the side of the stack guide on which it is mounted by means of a coil spring 178 surrounding the pin 177 and capable of having its tension adjusted by means of the adjusting nut 179 threaded on the pin 177. The free end portions 180 of the bars 175 are bent inwardly, or in a direction toward one another so that they are spaced apart for a distance slightly less than the length of a carton. As a carton is moved between the two bars 175 during the cutting operation, the bars will spread apart against the tension of springs 178 to permit the carton to pass between them. As soon as the carton is moved beyond the cutters to the position shown in Fig. 8, the bars 175 will move toward one another under pressure of the springs 178 to a position behind the carton as indicated at 181 in Fig. 9, thus holding the carton in place in the delivery row and preventing it from moving backwardly toward the cutters.

While I have thus far described an apparatus in which the cartons to be apertured are fed to the cutting means mechanically and are thereafter delivered by mechanical means, it will be obvious that such mechanical feeding and delivery means may be eliminated, in the case where a simple carton-aperturing device is desired, and the cartons fed to the cutting means by hand. Such a structure is disclosed in Fig. 18. There is shown a frame 190 having a table portion 191 on which is slidably mounted a carton feed member 192 which may correspond generally in shape to feed member 68 except that it is manually reciprocated on the table. A motor 193 is provided with a shaft 194 on which a pulley 195 is attached. A V-belt 196 extends over pulley 195 and connects to pulley 197 secured on cutter shaft 198 which may be similar in all respects to the cutter shaft 104 and provided with the rotary cutters in the same manner. Table 191 is provided with piercing blades 199 similar to those shown at 97. A conveyor belt is shown at 200 for carrying away the apertured cartons. With this structure, a carton is manually placed with one of its ends against an upstanding guide plate 201, and in front of the feed member 192. The hand of the operator, shown in dotted lines in the drawings, rests on top of the carton and on the raised top of the feed member and moves the feed member and carton together toward and over the piercing blades 199 and the co-operating rotary cutters. As the carton is passed over the cutters and blades the apertures are cut out as explained with respect to the structure shown in Figs. 14 to 16 inclusive. The sections of waste material cut out of the carton by the formation of the apertures therein, fall down into chute 202 and into a suitably placed receptacle. The stroke of the sliding carton feed-member 192 is sufficient to move the carton beyond the blades 199 and onto the conveyor 200 by which it is carried away while the carton feed member is manually returned to its initial position in readiness to move the next carton to the cutters.

While I have described several embodiments of the invention it will be obvious that various modifications may be made without departing from the spirit of the invention. By means of the several structures herein described, sealed and filled cartons can be apertured to permit the affixment of stamps to the contents without disturbing the contents. Since the packages are not removed from the cartons for the affixment of the stamps, undue handling of the packages and the possibility of damage to the cigarettes resulting therefrom is avoided. The consumer of

the cigarettes is thus assured that the merchandise secured by him is in the same condition as when it was originally packed. On the other hand, the apertures in the packages permit ready examination of the contents for the purpose of ascertaining that the stamps have been attached as required by law.

What I claim is:

1. A machine of the character described, comprising, a support for a filled carton containing a plurality of packages, means for piercing the carton and entering into the interior of the carton, and cutting means co-operating with the piercing means for cutting out a section of a wall of the carton and detaching said section to form an aperture in the wall without damage to the contents of the carton and without requiring the removal of the contents from the carton.

2. A machine for forming an aperture in a filled carton of packages comprising, a piercing member for entering into the carton between one wall thereof and the packages contained in the carton, and cutting means operative from the outside of the wall adjacent the piercing member and co-operating therewith in cutting out and removing a section of the carton wall to form a window aperture therein.

3. In a machine for forming an aperture in a wall of a filled carton, a piercing member, means for thrusting the same within the carton at one end of the wall and out of the carton at the other end of the wall, and cutting members operative against the outside of the wall along the edges of the piercing member for co-operation with said piercing member in cutting out and detaching a section of the wall from said wall.

4. In a machine for forming an aperture in a wall of a filled carton, a piercing member, means for causing said member to be thrust through one end of the wall of the carton to enter into the carton and out of the carton through the opposite end of the wall to thereby form slits in the carton at its opposite ends, and cutting members operative along the sides of the piercing members for cutting slits across the wall to connect those formed at the opposite ends of the wall by the piercing member.

5. In a machine for forming an aperture in a wall of a filled carton, a piercing member, means for causing said member to be thrust through one end of the wall of a carton between said wall and the carton contents and to thereby move the contents away from said wall, said means also causing the end of the piercing member to extend out of the opposite end of the wall to thereby form slits in the carton wall at the opposite ends of said wall, rotary cutters operative along the sides of the piercing member for cutting slits across the wall to connect those formed at the ends of the wall by the piercing member, and means for rotating said cutters.

6. A machine of the character described comprising, a support for a filled carton, a plurality of spaced piercing members disposed on said support to pierce a carton at spaced points at one end of one of the walls of the carton and enter into the carton and then project out of the other end of the wall of the same when the carton is moved on its support in a direction toward the piercing members, a plurality of cutters adapted to cut spaced slits in the pierced wall of the carton to connect the slits produced therein by the piercing members and thereby sever sections from said wall of the carton to leave openings in said wall, and means for operating the cutters.

7. In a machine of the character described, a support against which the wall of a carton to be apertured is placed, a plurality of fixed piercing blades attached to said support, means for moving the carton over said blades to cause the blades to enter into said carton at one end of the wall to be apertured and pass out of the opposite end of the wall to thereby form a slit in the carton at each end of the wall, a pair of cutting members between which one of the piercing blades is located, means for causing said cutting blades to form a pair of parallel slits to connect the two slits formed by the piercing blades, and means on said blades for ejecting the portion of the wall of the carton that is located between the four slits so formed.

8. In a machine of the character described, cutting means for producing an aperture in a wall of a closed and filled carton comprising, fixed and movable cutting elements co-operating in cutting out and ejecting a cut-out section from the carton wall, and means for moving the carton to be cut over said cutting elements whereby the fixed element will enter the carton between its contents and the wall to be apertured.

9. In a machine of the character described, cutting means for producing an aperture in a wall of a closed and filled carton comprising, fixed and movable cutting elements co-operating in cutting out and ejecting a cut-out section from the carton wall, means for moving the carton to be apertured over said cutting elements whereby the fixed elements will enter the carton between its contents and the wall to be apertured, the movable cutters being operative along the sides of the fixed cutting elements.

10. A machine of the character described comprising, a support, fixed and movable cutting members disposed respectively above and below said support, means movable over said support for moving a filled and closed carton over said cutting elements whereby said cutting elements cut out sections of the wall of said carton that is facing the support, without requiring removal of the contents of the carton or the opening of the carton.

11. A machine of the character described, comprising, a support, fixed and movable cutting members, means movable over said support for moving a filled and closed carton over said cutting elements whereby said cutting elements cut out sections of the wall of said carton to form spaced window openings therein to expose parts of the contents without requiring removal of the contents of the carton or the opening of the carton, and means for moving the carton after the same has been apertured to bring its apertured wall uppermost on the support.

12. In a machine of the character described, a flat support, a fixed piercing blade secured thereon and having a pointed tapered end, a pair of movable cutters disposed so that one of said cutters is at each side of said blade, and means for moving said cutters, whereby a closed and filled carton passing over the blade and cutters will have a section cut out of the wall of the same that is directed toward said blade and cutters by the blade and cutters, and means on the fixed blade for ejecting the cut-out section of the carton in a direction away from the carton.

13. A machine of the character described comprising, means for supporting a stack of closed and filled cartons, a support on which the lowermost carton in the stack rests, a feed member and means for reciprocating the same below the

stack to cause the same to engage the lowermost carton therein and move it away from the stack, a plurality of spaced cutting elements over which the carton is moved by said feed member to cause apertures to be formed in said cartons without requiring opening of the cartons or the removal of the contents thereof, and means for moving the apertured cartons away from the cutting elements after the cartons have been apertured thereby.

14. A machine of the character described comprising, means for supporting a stack of closed and filled cartons, a support upon which the lowermost carton in the stack rests, a feed member movable on the support, means for moving said feed member below the stack to cause the same to engage the lowermost carton in the stack and move it away from the stack, a plurality of spaced, fixed piercing blades mounted on the support and having tapered and pointed ends directed toward the carton that is moved toward them by the feed member, each of said blades having a rotary cutting knife operative along each of its edges whereby said blades and knives co-operatively cut apertures in the cartons without requiring the opening of the cartons or the removal of the contents thereof, means for rotating the cutting knives, and means for moving the apertured cartons away from the blades and knives after the cartons have been apertured thereby.

15. A machine of the character described comprising, means for supporting a stack of closed and filled cartons, a support upon which the lowermost carton in the stack rests, a feed member movable on the support, means for moving said feed member below the stack to cause the same to engage the lowermost carton in the stack and move it away from the stack, a plurality of spaced, fixed piercing blades mounted on the support and having tapered and pointed ends directed toward the carton that is moved toward them by the feed member, each of said blades having a rotary cutting knife operative along each of its edges whereby said blades and knives cooperatively cut apertures in the cartons without requiring the opening of the cartons or the removal of the contents thereof, means for rotating the cutting knives, means for moving the apertured cartons away from the blades and knives after the cartons have been apertured thereby, and means for tumbling the carton to bring its apertured wall to an upwardly disposed position on the support.

16. A cutting device for cutting out an aperture in the wall of a closed and filled carton comprising fixed and movable cutters over which the carton is moved to cause said cutters to enter the carton and sever a section from the carton from one end of the wall to the other end and detach said severed section, without requiring removal of the contents of the carton, and means for moving the carton during the cutting operation.

17. A device for cutting a plurality of spaced window apertures in the wall of a closed carton containing a plurality of cigarette packages completely filling the interior of the carton comprising a blade entering the wall at one end thereof and emerging at the other end, and cutters operative along the opposite edges of said blade and working on the outer face of the wall for co-operating with the blade in cutting out and detaching a section of the wall with the packaged contents of the carton remaining within the carton during the cutting operation.

18. In a machine of the character described, a support, a flat blade secured on the upper surface of the support, said blade having a tapered, pointed end whereby a carton moved over the support and over the blade will be pierced by the blade at the opposite ends of the wall of the carton that rests against the support, and means for cutting spaced slits through said wall of the carton from one end of said wall to its other end, while the blade is passing through the carton.

19. In a machine of the character described, a support, a flat blade secured on the upper surface of the support, said blade having a tapered, pointed end raised above the surface of the support, whereby a carton moved over the support and over the blade will be pierced by the blade at the opposite ends of the wall of the carton that rests against the support, means for cutting spaced slits through said wall of the carton while the blade is passing through the carton from one end of the wall to the opposite end, and means at the underside of the blade for causing the section of the carton defined by the slits to be ejected from between the blade and cutting means.

20. In a machine of the character described, a pair of spaced rotary cutters, a support over said cutters on which a carton is moved with its wall to be apertured directed toward the cutters whereby said cutters form a pair of spaced parallel slits in said wall extending from one end of the wall to the other and an element fixed on the support between the cutters for forming a pair of slits at the opposite ends of those formed by the cutters and at right angles thereto.

21. In a machine of the character described, means for holding a stack of filled cartons to be apertured, a sliding feed member mounted for movement below the stack to successively feed the lowermost carton in the stack away from the stack, a plurality of fixed blades and companion cutting elements to which the cartons are successively fed by the feed member, means for operating said cutting elements to cause the same in co-operation with the blades to sever and detach sections from a wall of each carton as each carton is moved over said blades and cutting elements, means for moving the feed member to and from the cutting means, and means operative from below the stack for supporting the cartons in the stack while the feed member is moving beneath the stack.

22. In a machine of the character described, a supporting surface upon which a filled cardboard carton to be apertured is moved, a fixed blade mounted on said surface and spaced above the same for a distance equal to the thickness of the wall of the carton to be apertured, whereby a carton moved over said surface and against the blade will cause said blade to enter into the carton between the wall of the carton that is in contact with the surface and the carton contents, and cutting means co-operating with said blade for cutting out a section of said carton wall and detaching said section.

23. The method of cutting out an aperture in the wall of a filled and closed carton comprising, causing a piercing element to enter into the carton at one end of the wall to be apertured and to pass between the inner face of said wall and the carton contents and then pass out of the carton at the opposite end of the wall, and slitting the carton through said wall from the outside of the wall by slitting elements operative along the sides of the piercing element to con-

nect the two slits formed by the piercing element.

24. The method of cutting out an aperture in the wall of a filled and closed carton containing cigarette packages comprising moving the carton past a stationary piercing element to cause said element to form a slit and enter into the carton through said slit at one end of the wall to be apertured and pass between the cigarette packages and the inner face of the wall and then form a slit and pass out therethrough at the opposite end of the wall, and slitting the carton through said wall by slitting elements operating from the outside of the wall and forming a pair of slits which connect those formed by the piercing element, and ejecting the section of the wall defined by the four slits in a direction away from the carton.

25. The method of forming an aperture in a closed and filled carton comprising, inserting a relatively flat member within the carton between the wall thereof to be apertured and the contents and forming a slit in the carton by the insertion of said member thereinto, causing the flat member to emerge from the carton and forming a slit by the emergence of said member, and cutting spaced slits in the wall of the carton along the sides of said member to connect the two slits formed by the entry and emergence of said member.

26. A machine of the character described comprising, a carton support for the reception of a filled and closed carton, a cutting device for forming a plurality of apertures in one wall of the body of the carton located on the support while the carton remains filled and closed, to thereby expose portions of the carton contents through the apertures so formed, and carton-feeding means for feeding the carton to the cutting device and moving the carton relatively to the cutting device during the formation of the apertures.

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