

[54] **CARTON SLICER**

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Related U.S. Application Data

[63] Continuation of Ser. No. 793,346, Jan. 23, 1969, abandoned.

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[51] Int. Cl. **B31b 1/00**

[58] Field of Search **93/34, 36 A, 93 M, 93/93.2; 53/53, 54, 65; 83/361, 371**

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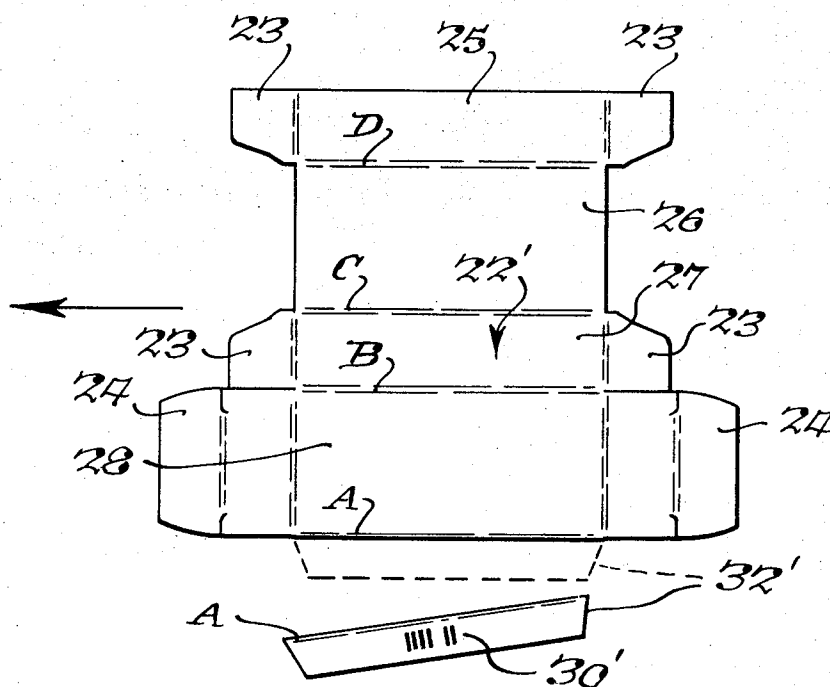
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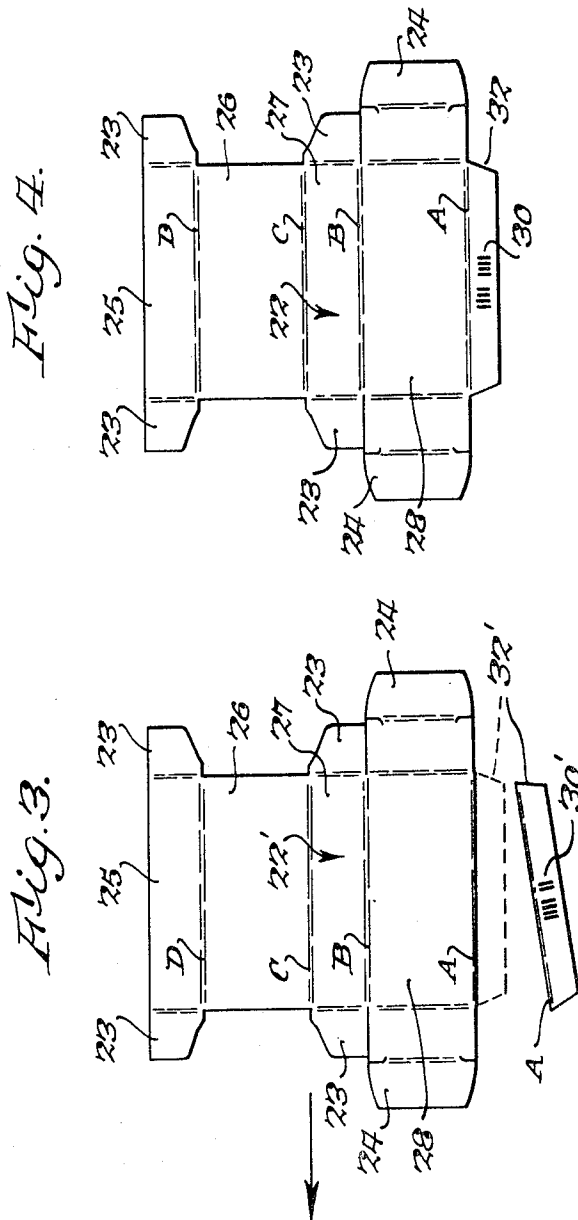
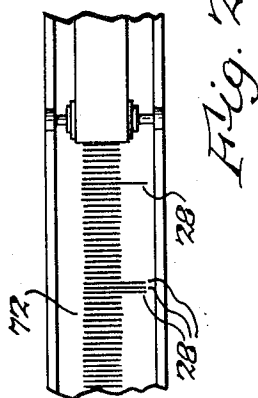
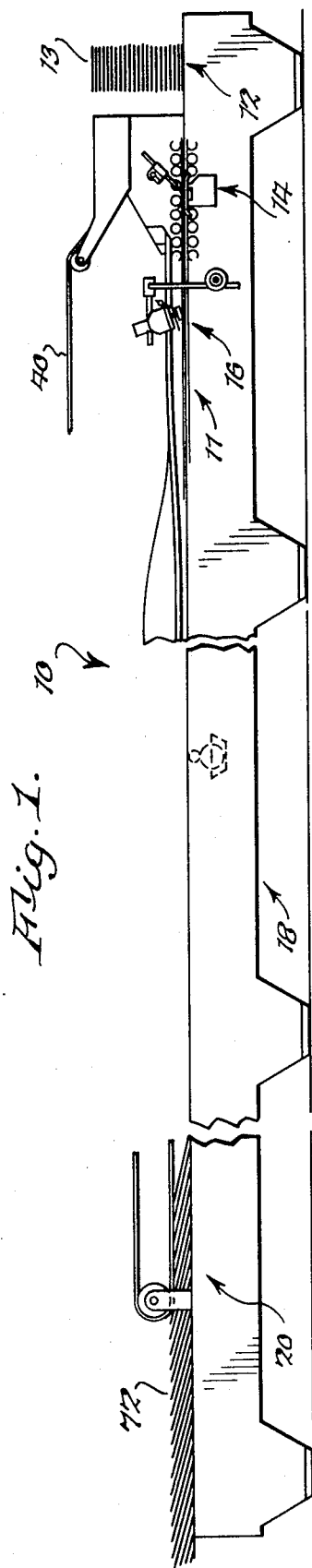
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[57] **ABSTRACT**

Apparatus for selectively destroying improperly coded cartons in a series of cartons moving through a folding and gluing machine, comprising a code reader mounted on the machine to sense coded indicia on cartons and a cutter activated by the code reader when it senses an improper code, and synchronized to intercept and sever an element of the improperly coded carton, thus rendering the carton unusable while permitting the remainder of the severed carton to proceed without disturbing the properly coded cartons as they pass together through the machine, the miscoded carton being severed in a manner to insure that a portion of the severed carton will extend from the stack of completed cartons as the stack leaves the machine to provide for flagging of improperly coded cartons.

7 Claims, 16 Drawing Figures





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Fig. 5.

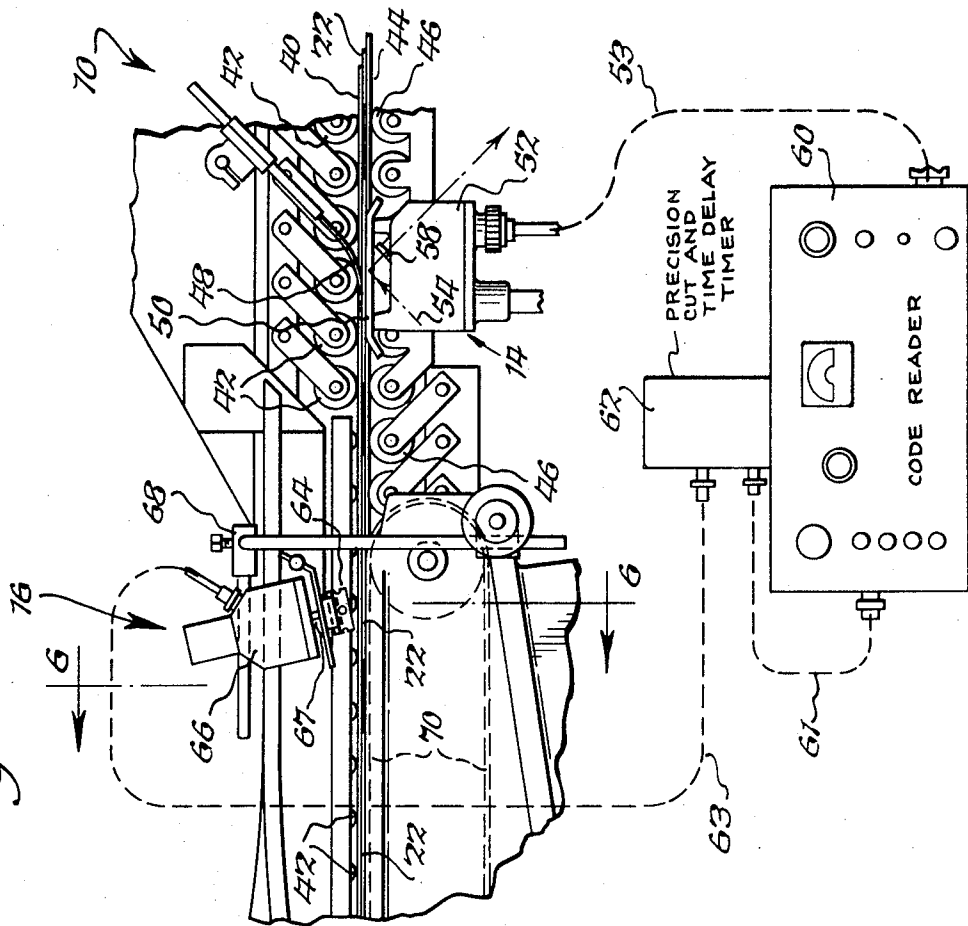
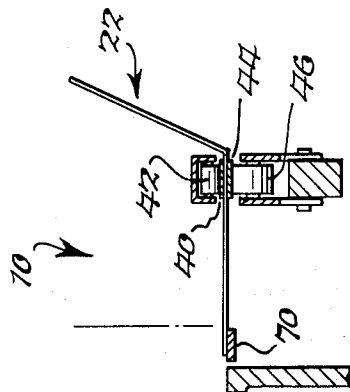
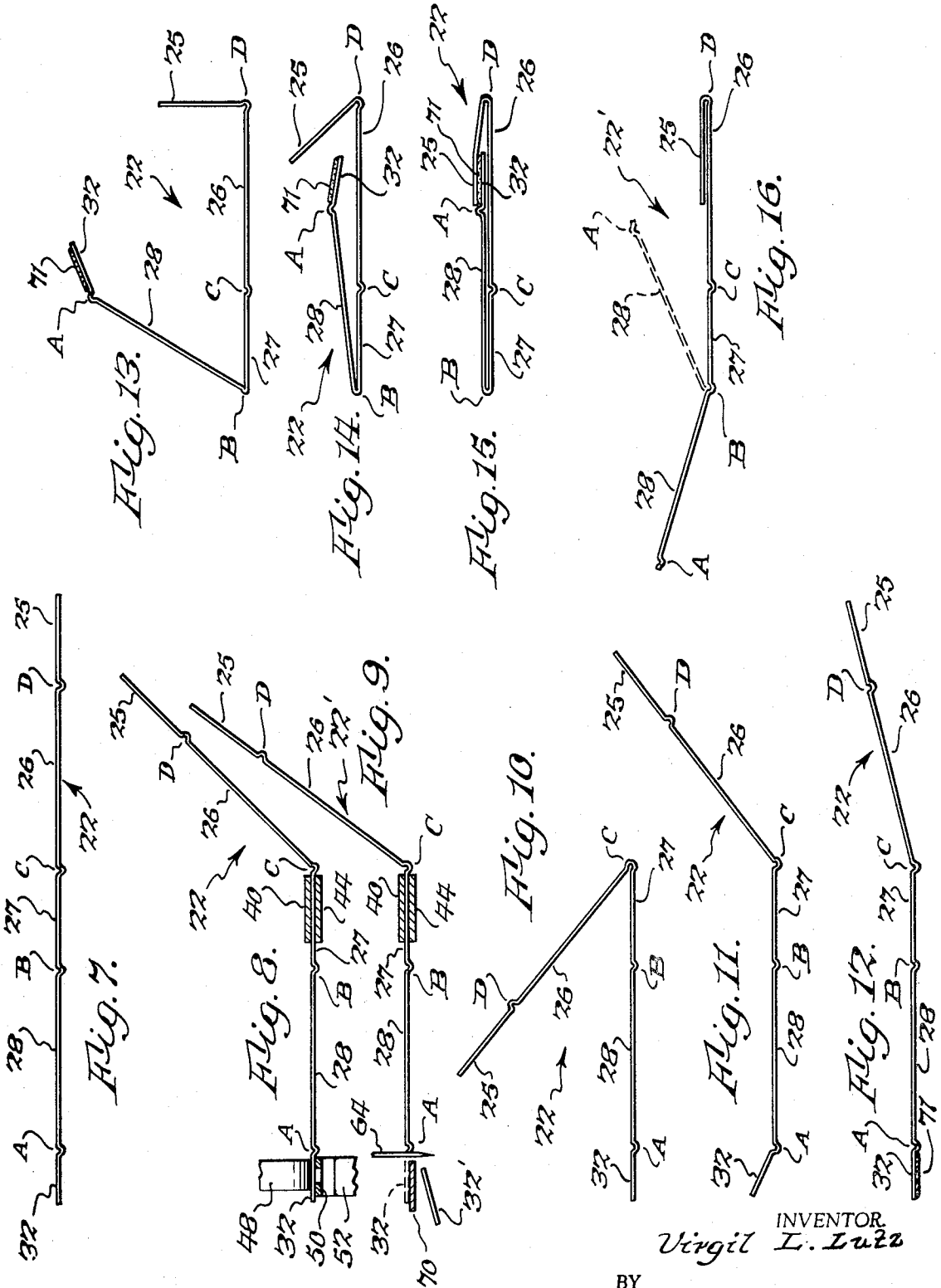


Fig. 6.



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CARTON SLICER

This application is a continuation of Ser. No. 793,346, filed Jan. 23, 1969, now abandoned.

The presence of a mislabeled carton in a group of properly labeled cartons is a serious cause for concern among drug houses in particular and more generally among any manufacturer or packager whose reputation depends upon proper labeling of his products. An obvious example would be drugs which are often similarly packaged but which have drastically different effects. Mislabeling can possibly cause death or serious injury if not detected in time. Carton blanks are manufactured in tremendous quantities with many cartons of the same type and size being manufactured in one plant simultaneously. Often the only difference between the cartons is the printed matter. To facilitate differentiation, a code is included with the printed matter and is usually printed on the carton glue flap. These codes may be, for example, a series of printed bars. Heretofore, these code bars were optically scanned as the cartons traveled at rates sometimes exceeding 55,000 per hour on a conveyor in the glue machine. When a miscoded carton was scanned a visual or audio signal was generated alerting the machine attendant of the presence of a miscoded carton. The machine was then shut down and the attendant had to find the carton. The number of miscoded cartons which passed between the signal and the shut down was not readily determinable and if more than one passed the scanning station it could be missed by an attendant, who having found one miscoded carton neglected to determine if there were others. Also, since removal of a miscoded carton depended upon the whim of the attendant there always existed the possibility that a signal would not be properly responded to. Still further, the necessity to shut down a high speed conveyor has rather obvious economic disadvantages. The instant invention is a response to the pressing need for a foolproof and efficient means of eliminating miscoded cartons. It was found that a practical system would have to eliminate the miscoded carton without disturbing the progress of the blanks on the conveyor. Since there exists a certain degree of overlap between successive cartons on the conveyor, a system which merely rejects a miscoded carton would tend to disturb the orientation of the other carton blanks on the conveyor. It was found, however, that as the cartons approach the space between the gluer feed station and glue application on the gluing machine their glue flaps project over the edge of the conveyor and are separated from the glued flaps of preceeding and succeeding carton blanks. For this reason, it has been the practice to scan the blanks before they reach the gluing station. This area of the machine also provided a place for the unique segregation of miscoded carton blanks contemplated by this invention. In response to the signal generated by the miscoded carton, a knife whose action is timed to coincide with the speed of the conveyor, is lowered into the plane of the glue flap and cuts off the flap of the offending carton. This has a three fold effect. First, and most important, the carton can no longer be glued and therefore will never become a usable carton. Second, the remainder of the blank passes the gluing station but no glue is deposited thereon since the projecting glue flap has been eliminated, however, since the remainder of the blank stays on the conveyor, none of the other blanks are disturbed. And third, during assembly, the mislabeled car-

tons will remain open permitting a bar mounted on the machine to cause the offending carton to extend beyond the stack of assembled cartons, thus making it dimensionally distinguishable. Since the miscoded carton is now highly visible it can be quickly eliminated automatically or by the machine attendant. If for any reason it is still missed at this point, it still does not constitute a threat because the end user cannot mistakenly pack his product in the offending carton because it is incapable of holding a product.

Having thus generally described the instant invention, it is the object of the instant invention to provide a method and apparatus for practicing that method which will substantially eliminate the danger of the inclusion of a mislabeled carton in a shipment of properly labeled cartons. It is a further object of the instant invention to provide an apparatus which will render a mislabeled carton unusable as a container. It is another object of the instant invention to provide apparatus which will operate in response to a scanner signal and which is synchronized with the speed of the conveyor to remove the projecting glue flap of a miscoded blank carton travelling with properly coded carton blanks on a conveyor to prevent its final assembly and to render the miscoded carton blank dimensionally distinguishable from the assembled carton blanks.

Other objects will be readily determinable from the foregoing description and the subsequent detailed description and claims, taken in connection with the accompanying drawings in which:

FIG. 1 is a diagrammatic representation of an 180° Prebreaking Gluer Machine as used with this invention.

FIG. 2 is a fragmentary plane view of the apparatus of FIG. 1 showing the delivery end of the apparatus.

FIG. 3 shows a carton blank with the glue flap severed.

FIG. 4 shows a carton blank of the type to be operated upon by this invention having proper coding.

FIG. 5 is an enlarged fragmentary side elevation of the apparatus of FIG. 1 showing the apparatus of the instant invention in place thereon.

FIG. 6 is a horizontal cross section showing the conveyor belts of the apparatus of FIG. 1.

FIGS. 7, 8, 10 through 15 show an end view of a carton blank of the various stages of assembly in the apparatus of FIG. 1.

FIGS. 9 and 16 show the action of the apparatus of FIG. 1 on the blank of FIG. 7 and the operation and effect of the instant invention where an improper code is printed on the carton blank.

Referring to the drawings, FIG. 1 illustrates a conventional high speed carton assembly machine of a type well known by those familiar with the carton assembly art. As used with this invention, it is generally indicated at 10 comprising a conveyor 11, a feed station 12, a stack 13 of blanks, a code reading station 14, a destruct station 16, an operations section 18, a delivery station 20, a pair of cooperative conveyor belts 40 and 44.

FIGS. 3 and 4 illustrate carton blanks of the type operated upon by the instant invention. Particularly, FIG. 4 illustrates a carton blank 22 having the proper coded indicia 30 thereon for the series of blanks being processed while FIG. 3 illustrates a carton blank 22' having improperly coded indicia 30' thereon. Both blanks 22 and 22' have identical physical configurations, however, carton blank 22' has printed matter applied to it which is different from that applied to the remainder of

the series. This is indicated by the different coded indicia 30'. The blanks further comprise end flaps 23 and 24, wall panels 25, 26, 27 and 28. Blank 22 is further provided with a glue flap 32 along side wall 28. In this case, the coded indicia 30 appears on the glue flap. Blank 22' is provided with glue flap 32' having the improperly coded indicia 30' thereon. FIG. 3 also shows flap 32' as it would appear when severed from blank 22'.

FIG. 5 illustrates the code reading station 14 and destruct station 16 in greater detail. The conveyor 11 is provided with upper belt 40, upper backup rollers 42, lower belt 44, and lower backup rollers 46. The belts are synchronized to run at the same speed and carry the carton blanks with them. Carton blanks 22 are carried in a spaced identically oriented relationship through the coded reading station 14 by belts 40 and 44 which engage wall panels 27 adjacent scored fold line C. The glue flaps of blanks 22 which extend laterally beyond belts 40 and 44 (FIG. 6) pass through the code reading station 14, supported vertically by platform 50 being held down thereagainst by holddown spring 48. As the glue flaps pass between platform 50 and holddown spring 48, the coded indicia on the glue flap is read through an aperture in platform 50 (not shown) by scanning sensor 52. The sensor comprises a light source (not shown), whose light is directed along a light path 54 through an aperture towards the carton blank and a light receiving Cd cell 58 which reads light reflected from the carton blank. Variations in the reflected light caused by the coded indicia cause a signal corresponding to the coded indicia to be generated by the Cd cell. The signal is transmitted via connecting cable 53 to code reader 60 which is programmed to recognize and distinguish proper and improper coded indicia. As long as the signals transmitted to the code indicator constitute a properly coded sequence, the code reader remains dormant. Upon sensing an improper series of signals, the code reader generates an error signal which passes via cable 61 to a time delay relay 62. The time delay relay 62 stores the error signal and is set to delay further transmission of the error signal to the destruct station 16 until the improperly coded blank has reached the destruct station. The delay is, therefore, synchronized with the speed of the conveyor. After an appropriate delay, the signal is transmitted via line 63 to the destruct station. The destruct station comprises a pivotally mounted knife 64 and a solenoid 66 which is on support bracket 68 above it. The solenoid is connected to the time delay relay by line 63. When an error signal is received by the solenoid, its plunger 67 depresses knife 64 placing the knife blade in the line of travel of the carton blanks. Knife 64 is positioned to sever the glue flap of the improperly coded carton blank. The glue flap is supported adjacent the knife for increased cutting efficiency by glue flap supporting belt 70.

FIGS. 7 through 16 progressively illustrate the operations carried out upon the carton blanks.

FIG. 7 illustrates a front edge view of the carton blank as received by the conveyor.

FIG. 8 illustrates the carton blank as it passes the code reading station. At this point a crease is being applied to fold line C and glue flap 32 is passing over the sensor.

FIG. 9 illustrates the operation of knife 64 which severs the glue flap on improperly coded cartons adjacent fold line A.

In FIG. 10 the creasing of fold line C has been completed.

In FIG. 11 side panels 25 and 26 are shown springing back toward their original position about fold line C and a crease is being applied to fold line A.

FIG. 12 illustrates the application of a film of glue 71 to glue flap 32.

FIGS. 13 through 15 progressively show the completion of the folding and gluing operations carried out on the carton.

FIG. 16 illustrates the effect of severance of the glue flap 32 in that unlike the illustration of FIG. 15 where side wall 25 is engaged and held by the glue film 71 on glue flap 32, side wall 28 will spring back toward its original position due to the severance of a glue flap 32 shown in FIG. 9.

As the carton blanks reach the end of the conveyor, they will come together in a stack 72 as shown in FIG. 1. Those carton blanks which have had their end flaps severed, however, will have side wall 28 projecting out from the stack as shown in FIG. 2 to provide a flagging effect thus making the unassembled offending cartons highly visible in the stack of assembled cartons.

What is claimed is:

1. Apparatus for use with high speed conveyor means for transporting a series of folding carton blanks from a stack of such blanks to a station for further processing, each of the blanks having a predetermined portion essential to the erection of the blank into a useable carton and having coding indicia formed on said portion, said apparatus comprising means for generating a signal in response to the coding indicia on said portion as it passes a predetermined point adjacent the conveyor means, means operative in response to the signal generated for selectively destroying the predetermined portion of any carton passing said point from which carton a predetermined signal has not been generated without altering the position of any carton blank on the conveyor means.

2. Apparatus for use with high speed conveyor means for transporting a series of folding carton blanks from a stack of such blanks to a station for further processing, each of the blanks having a predetermined portion essential to the erection of the blank into a useable carton and having coding indicia formed on said portion, said apparatus comprising means for sensing the coding indicia on each carton, means operatively connected to said sensing means and programmed to distinguish a preselected coding indicia on said cartons sensed by said sensing means and to change state in response to the absence of said preselected coding indicia on at least one of said cartons and means operatively connected to said programmed means for selectively destroying said predetermined portion in response to said change of state without altering the position of any carton blank on the conveyor means.

3. The apparatus of claim 2 further comprising means for controlling the operation of said selective destroying means in response to said change of state to insure the destruction of only those cartons which pass said sensing means and cause a change of state in said programming means.

4. The apparatus of claim 3 wherein said selective destroying means comprises a cutting means for removing

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the portion of the carton on which the indicia is formed.

5. The apparatus of claim 4 wherein said cutting means is mounted adjacent to said conveyor means, spaced along the direction of movement of said carton blanks on said conveyor from said sensing means and said predetermined portion of said carton blanks comprises a glue flap hingedly connected to said blank.

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6. Apparatus according to claim 5 wherein said controlling means comprises means for delaying the operation of said cutting means.

7. The apparatus of claim 6 wherein said controlling means comprises a time delay means synchronized with the speed of said conveyor.

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