March 5, 1963 P. V. FORD ET AL 3,079,846

METHOD AND APPARATUS FOR SCORING AND SLOTTING CARTON BLANKS

Filed June 30, 1961 6 Sheets-Sheet 1

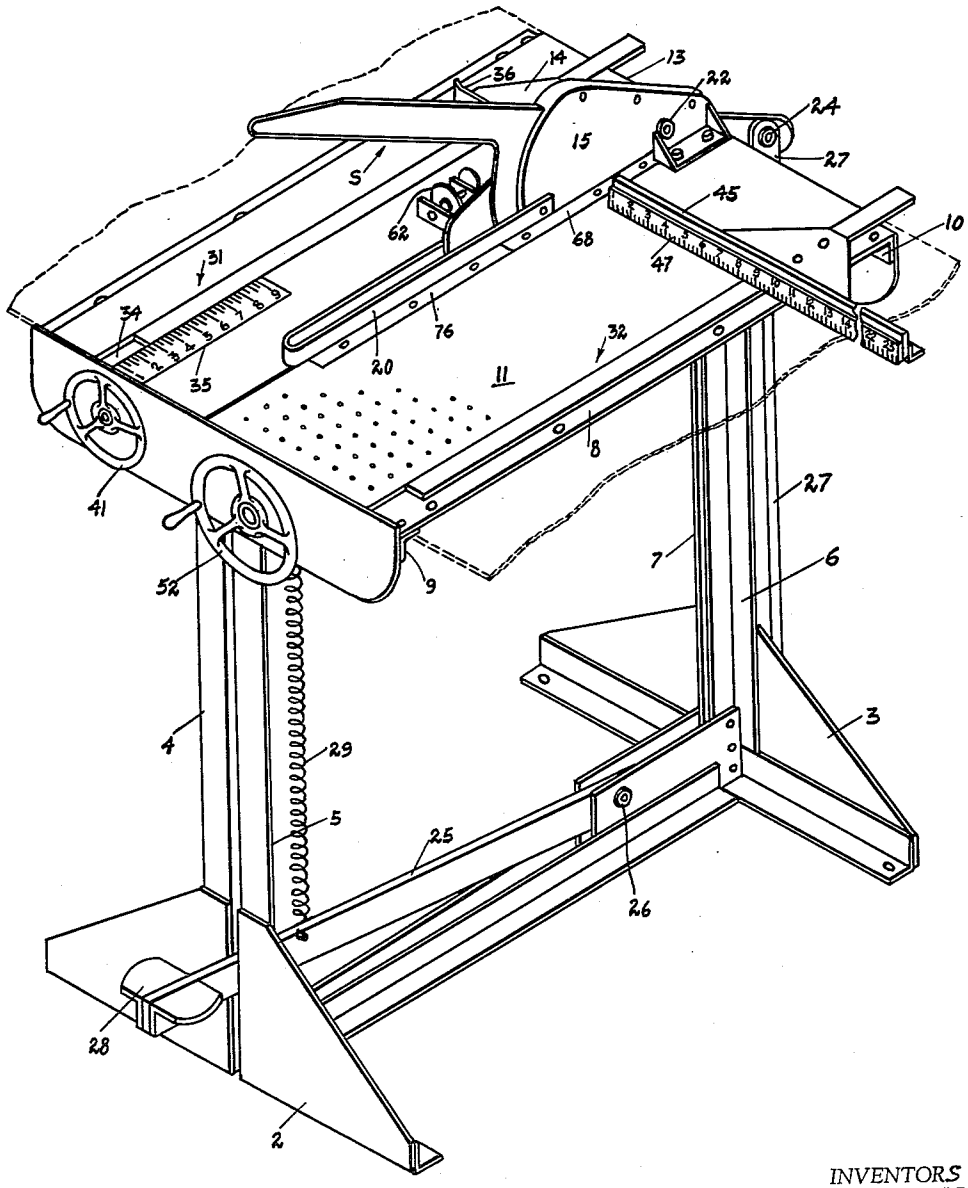

Fig. 1.

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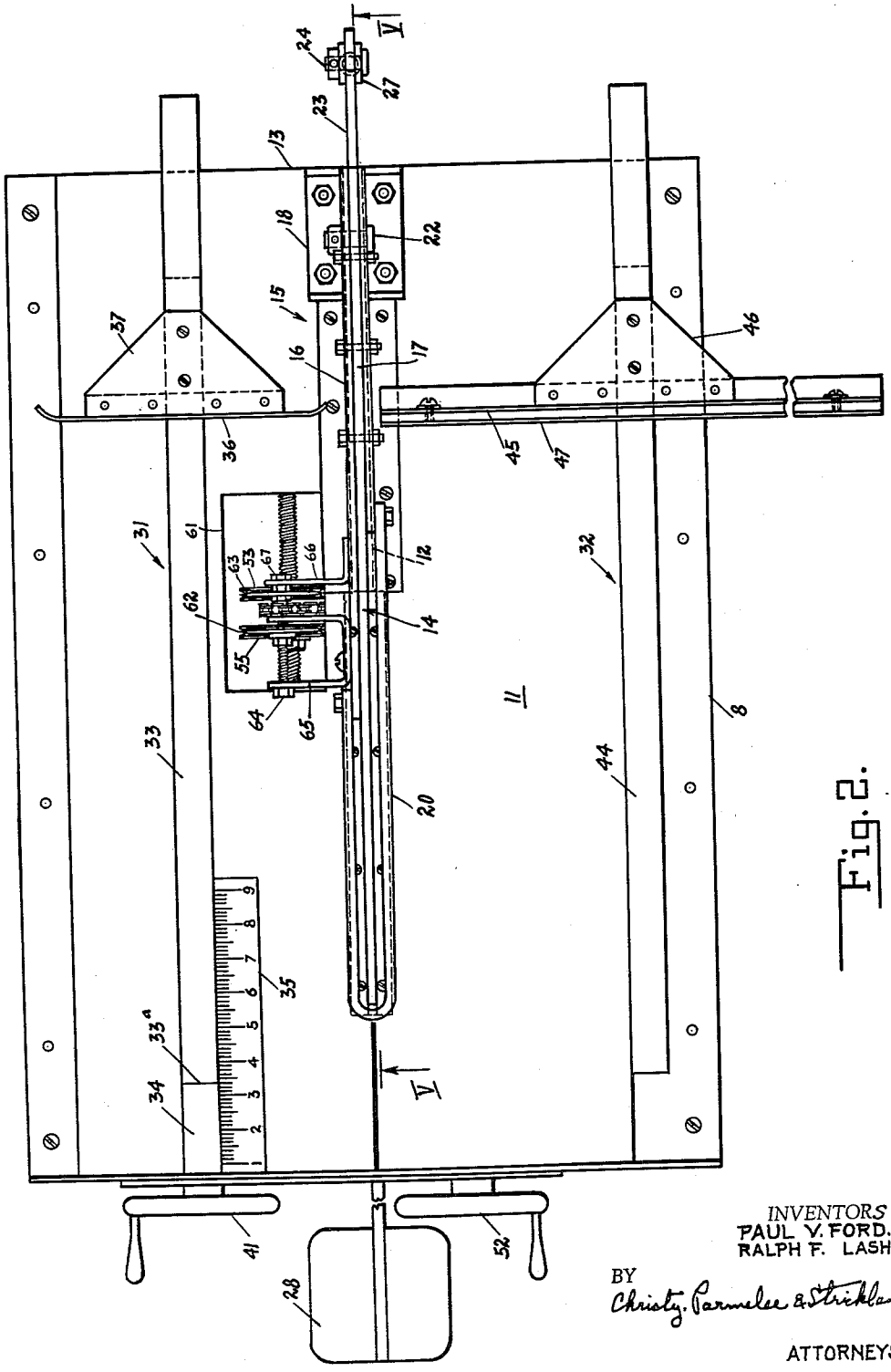

Fig. 2.

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Filed June 30, 1961 6 Sheets-Sheet 3

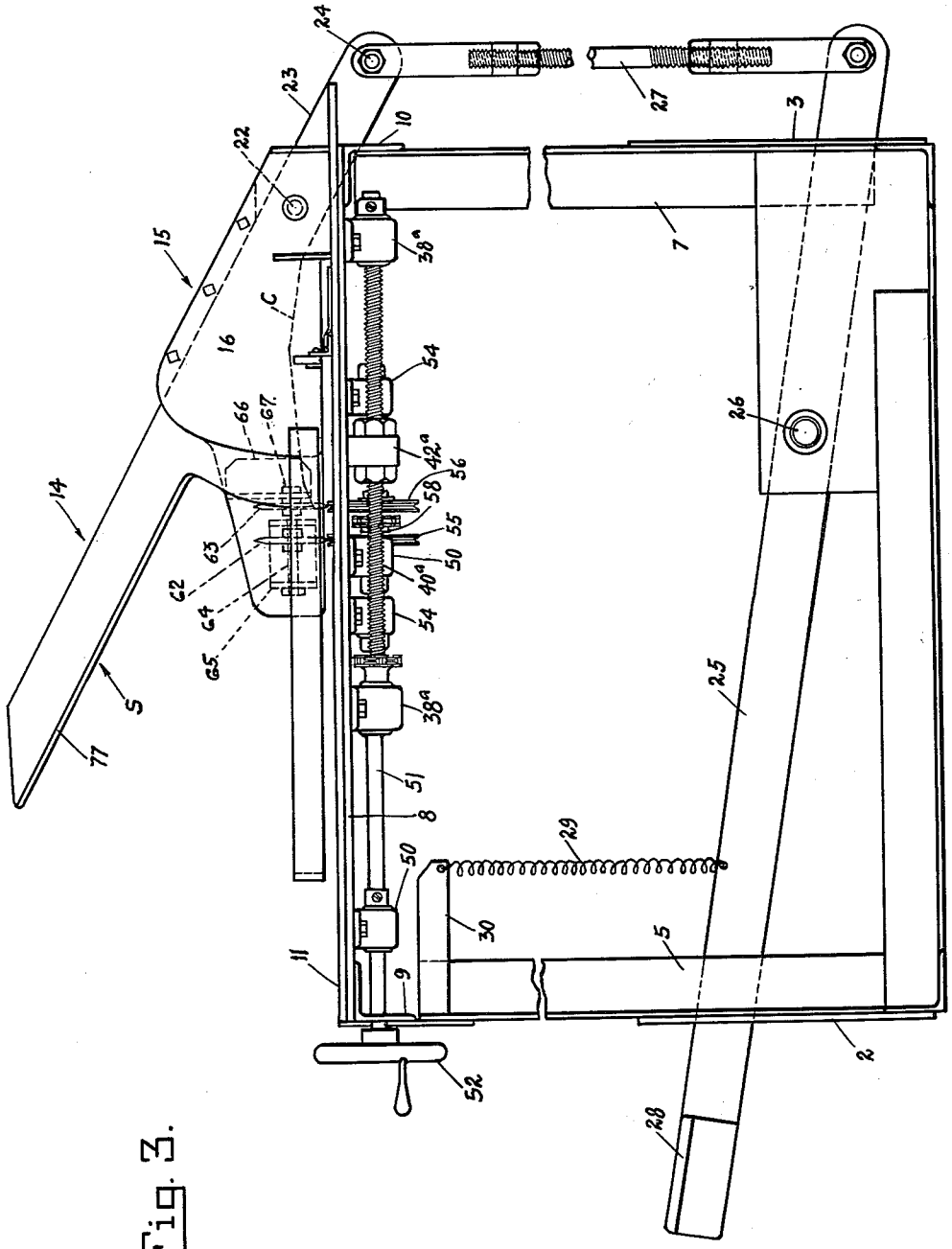

Fig. 3.

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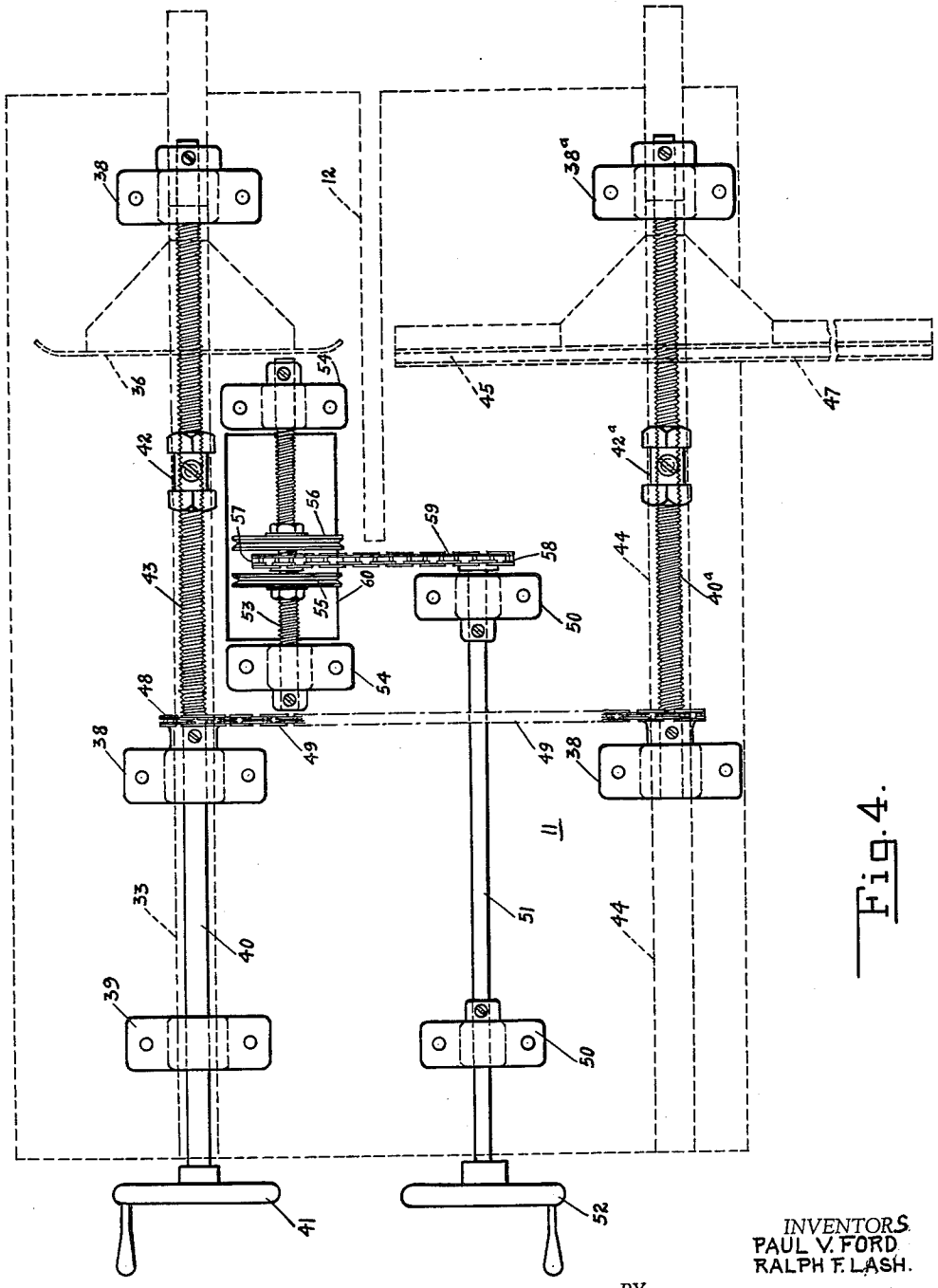

Fig. 4.

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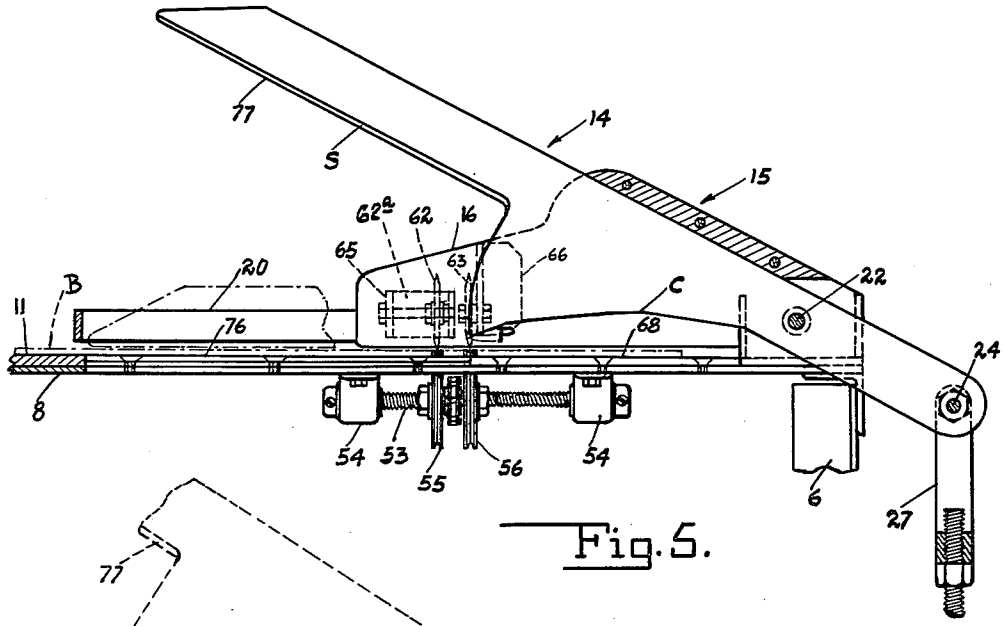

Fig. 5.

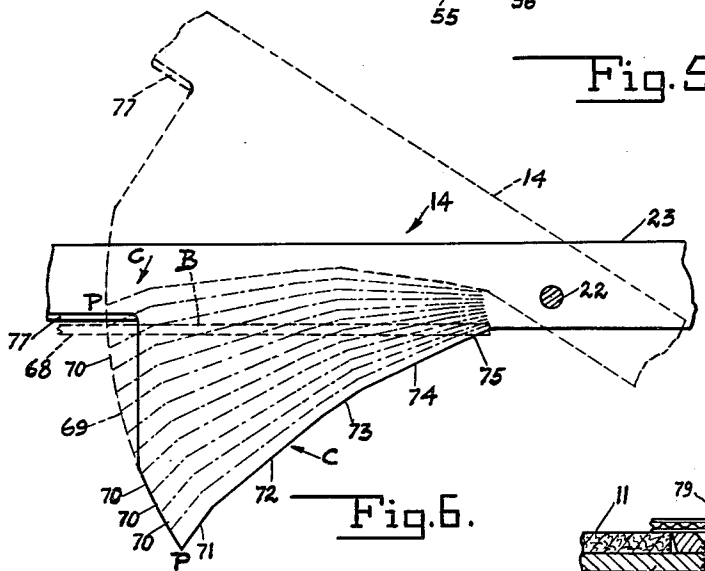

Fig. 6.

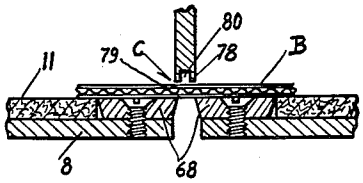

Fig. 5A.

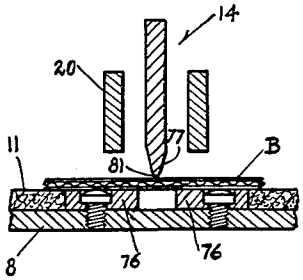

Fig. 5B.

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METHOD AND APPARATUS FOR SCORING AND SLOTTING CARTON BLANKS

Filed June 30, 1961 6 Sheets-Sheet 6

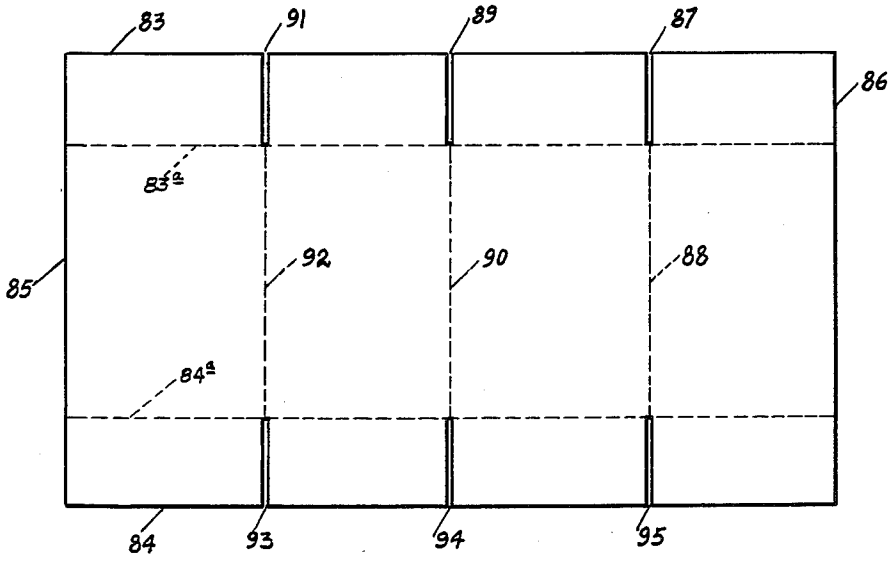

Fig. 7.

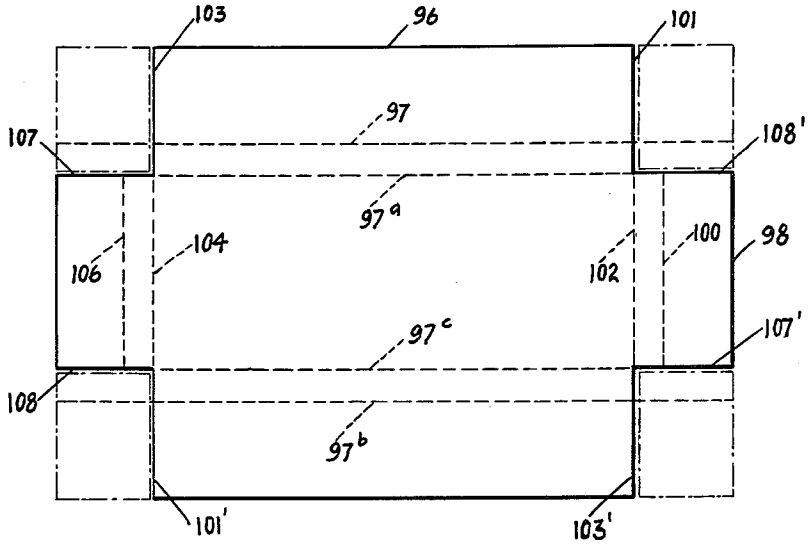

Fig. 8.

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United States Patent Office

3,079,846

Patented Mar. 5, 1963

3,079,846

METHOD AND APPARATUS FOR SCORING AND SLOTTING CARTON BLANKS

Paul V. Ford, Glenshaw, and Ralph F. Lash, Ambridge, Pa.; said Lash assignor to Box-O-Matic Machine Inc., a corporation of Pennsylvania

Filed June 30, 1961, Ser. No. 121,209
13 Claims. (Cl. 93—58.3)

The present invention relates generally to method and apparatus for scoring and slotting blanks for forming cartons and other packaging materials. More specifically, the present invention relates to a method of and readily adjustable apparatus for manually slotting and scoring blanks and related packaging materials employed in forming containers known generally in the art as fiberboard boxes.

Fiberboard is a generic term applied to the material from which the containers commonly called paper boxes are formed. These containers or paper boxes have gradually assumed a dominating position, supplanting wooden boxes for packaging a great variety of materials.

The construction of the container and the disposition of the materials enclosed thereby is both an art and a science, giving rise to a new profession known as Package and Pack Engineering. To obtain the maximum advantages from the use of fiberboard containers, they should be designed and constructed to suit the specific load to be placed therein and the materials forming such specific load must be packed therein to occupy a minimum of space and movement relative to the walls of the container. After the shape of the "pack" or load is determined, the container is constructed to the minimum size to receive same and, where necessary, interior packing pieces are designed and constructed to obtain the minimum relative movement between pack and container during handling and shipping to the ultimate consumer. These containers are also employed to store the pack in warehouses for varying periods under varying atmospheric conditions.

It, therefore, becomes obvious that the packaging problems encountered in the packaging and shipping departments of various types of industry are many and varied. Where the size of the pack is fairly uniform or falls into an established group of sizes, the slotted and scored blanks to form the containers may be purchased in large volume and produced on automatic machinery to obtain a surprisingly low cost per blank.

When, however, the number of any specific size of container blanks is small, ranging from one to one thousand, the cost per container blank increases many times. Under present day prices and using conventional machinery, a slotted and scored container blank obtainable for nine cents in minimum lots of 1,000 will cost 23 to 30 cents per blank in lots of 100. This results from the labor costs in "setting-up" or adjusting existing equipment to handle the slotting and scoring of any given size of blank. Slotting and scoring equipment to produce large volumes of any given size and shape of blank must be heavily constructed, require a minimum tolerance of $\pm 1/8$" for every dimension, and in many cases require larger tolerances. This variation in inside dimension of containers cannot always be tolerated when shipping fragile articles and additional packaging pieces or fillers may be required, with the need thereof varying from container-to-container and pack-to-pack. Such conditions naturally reduce output per employee and increase the cost of packaging.

One object of the invention is to provide a method for progressively slotting and scoring container blanks to varying sizes in any desired dimensional increments.

Another object of the present invention is to provide apparatus for scoring and cutting small numbers of container blanks of any one size at a cost approximately that obtainable with only large lots of 1,000 or more of the same size.

Another object of the present invention is to provide apparatus for the above purposes which is manually controlled and may be quickly and accurately adjusted to produce slotted and scored blanks of practically every size and shape and producible on the large automatic machines.

Another object of the invention is to provide such apparatus which may be accurately and quickly adjusted to produce slotted and scored blanks which differ in size from one another in very small increments.

Another object of the invention is to provide apparatus of the character described which may economically successively slot and score the blank by movement of a single cutter blade.

Another object of the inventiton is to provide apparatus of the character described which is capable of ready adjustment to economically cut and score blanks of varying thickness and shapes, as well as liners and other interior packing pieces in small lots.

These and other objects will be made apparent from the following description and the drawing forming a part thereof wherein:

FIG. 1 shows a perspective view of the apparatus of the invention and detachable auxiliary tables which may be added thereto to facilitate handling of over-size blanks by a single operator;

FIG. 2 shows a plan view of the apparatus indicating the relative positions of the slotting and scoring blade, adjustment and gauging parts and a manual drive for moving the blank being worked on relative to said blade;

FIG. 3 shows a side elevation of the apparatus of FIG. 2;

FIG. 4 is a plan view, similar to FIG. 2, with the blank supporting base plate removed to show construction of the portions of the apparatus employed in adjusting and driving the blank past the cutter blade;

FIG. 5 shows a cross-section taken on lines V—V of FIG. 2 showing the cutting and scoring blade in full lines when in normal raised position and by dotted lines in slotting and scoring position;

FIGS. 5A and 5B show sections through the blade of FIG. 5 at the slotting and creasing dies;

FIG. 6 shows an enlarged view illustrating development of the shape of the cutting edge of the blade providing a shearing cut for slotting the blank;

FIG. 7 shows one form of blank as made on the machine to provide a commercial regular slotted container; and

FIG. 8 shows a special form of blank produced on the machine to provide a container referred to as a one-piece folder.

The basic apparatus disclosed in the drawings comprises a suitable supporting stand provided with front and rear base members 2 and 3 having spaced uprights 4, 5 and 6, 7 extending upwardly therefrom. Disposed above said uprights is a bed plate 8 which is connected with the uprights by transverse front and rear angular members 9 and 10. Overlying bed plate 8 is face plate 11 providing a flat smooth working face upon which is supported the container blank being slotted and scored by the apparatus.

As best illustrated in FIGS. 2 and 3 of the drawing, the face plate 11 and base plate 8, intermediate their side edges are provided with a slotted opening 12 extending inwardly from the back edge thereof, to receive the cutting and scoring blade 14. Overlying plate 11 and extending inwardly from the back edge 13 thereof is a housing member indicated generally at 15 provided with depending side walls 16 and a top wall 17. Said side

walls 16 being disposed at opposite sides of face plate opening 12 and having adjacent the rear edge of the face plate, side flanges 18 secured to the face plate 11 and the underlying base plate 8. Said side walls 16 inwardly of flanges 18 being spaced above the face plate opening as at 19. Extending inwardly of the face plate 11 from the housing 15 is a U-shaped guard member 20 disposed in vertically spaced relation to the face plate and aligned with the opening 12. Disposed within housing member 15 is the combined slotting and scoring blade indicated generally at 14 and pivotally mounted intermediate its ends at 21 upon a pivot 22 disposed in said housing side walls 16. Said blade 14 having a portion 23 extending rearwardly of pivot 22 and provided with opening 24. A treadle member 25 is pivotally mounted intermediate its ends on said stand at 26. Said treadle having a pivotal connection with opening 24 of the cutter blade, through an adjustable rod 27. The opposite end of treadle 25 extends through said upright members 4 and 5 and has a treadle plate 28 thereon. A suitably mounted tension spring 29 has one end connected to treadle 25 and the opposite end connected with the stand above the treadle plate, as at 30.

Referring now to FIGS. 2 and 4 of the drawings, a pair of blank gauging members indicated generally at 31 and 32 are mounted upon the face plate 11. Gauge 31 comprises a rectangular member 33 slidably mounted in a recess 34 in face plate 11 so as to be flush with the top face thereof. Adjacent member 33 and recessed in the face plate 11 is a scale bar 35. The member 33 is movable rearwardly of the edge 13 of face plate 11 and has mounted intermediate its ends an abutment face 36 extending above the face plate and a rearwardly extending portion 37 secured to member 33. Beneath member 33 and aligned longitudinally thereof are a pair of bearings 38 secured to the bottom face of base plate 8. A similarly mounted bearing 39 is disposed adjacent the front of the base plate and a shaft 40 is mounted in said bearings 38, 39 and extends through the front table member 9 to receive a hand wheel 41. The base plate 8 beneath member 33 is slotted between the bearings 38 and a member 42 mounted on shaft 40 has a portion extending upwardly through said slot into fixed engagement with member 33. The shaft 40, intermediate the bearings 38, is provided with a continuous thread 43 engaging with an internal thread within member 42, whereby alternate rotation of shaft 40 in opposite directions moves member 42 in opposite directions along said shaft 40.

Gauge member 32 comprises a rectangular member 44, similar to member 34, recessed into the face plate 11, for sliding movement relative thereto, and has an elongated abutment face 45 disposed transversely thereof and secured to member 44 by the rearward extension 46. Abutment face 45 is continuously transversely aligned with abutment face 36 and has a forwardly extending portion 47 secured thereto in vertically spaced relation to the face plate 11. The vertical face of member 47 has scale markings thereon, for a purpose hereinafter set forth. Disposed beneath base plate 8 in alignment with member 44 is a second shaft 40*a* suspended in bearings 38*a* and having a member 42*a* mounted thereon and connected with gauge member 42 for movement therealong as for member 33. Shafts 40 and 40*a* have mounted thereon suitable sprocket members 48 over which is trained a sprocket chain 49 whereby rotation of hand wheel 41 simultaneously drives both shafts in the same direction of rotation.

Intermediate shafts 40, 40*a* and suspended within bearings 50 secured to the under face of base plate 8 is a shaft 51 having a hand wheel 52 at one end thereof. Intermediate shafts 40 and 51 is disposed a shaft 53 rotatably mounted in spaced bearings 54. Secured to shaft 53, intermediate the bearings 54 are spaced scoring wheels 55 and 56, and intermediate the latter is a sprocket 57 secured in fixed relation to the shaft. A similar sprocket 58 is mounted on shaft 51 in alignment with sprocket 57 and a suitable chain 59 is trained thereover to drive shaft 53 from shaft 51. Base plate 8 and face plate 11 have slots 60, 61 therein through which a portion of the periphery of wheels 55 and 56 protrude above the plane of the top face of plate 11. Aligned with wheels 55, 56 are wheels 62, 63. Wheel 62 is adjustably mounted upon a threaded shaft 64 pivotally mounted in bracket 65 secured to extension 16*a* of housing 15. Wheel 62 is pivotally mounted on extension 16*a* of housing 15 by means of bracket 66 having a pivot 67 receiving wheel 63. The periphery of wheels 55 and 56, as shown in FIG. 2, have a rectangular groove therein. The periphery of wheels 62, 63 are of V-shape and aligned with and engaging within the indentation of the matching wheels 55, 56 for a purpose hereinafter set forth. It will be noted that scoring wheel 63 is aligned with point P of cutting blade C, hereinafter discussed.

Referring now to FIGS. 2, 5 and 6 of the drawing disclosing the construction and operation of the combined slotting and scoring blade 14. The blade 14, as previously described, is actuated by rod 27, through the treadle plate 28. In normal, inoperative position the blade is elevated above the face plate 11 and the carton blank thereon. The blade, when actuated by rod 27, moves about pivot 22. The cutting surface C first engages the blank at point P and progressively severs the blank from point P in a direction towards the pivot 22. After the blade surface C completes the cutting of the slot in the blank, the blade scoring portion S is disposed substantially parallel to and immediately adjacent the unslotted surface of the blank so that continued movement of the blade 14 about its pivot 22 presses the entire length of blade surface S across the face of the blank beneath it.

As best illustrated in FIG. 6, the cutting surface C moves in an arc about pivot 22 and towards the pivot as it penetrates the blank B and passes between the spaced surfaces of the cutting or slotting dies 68. Therefore, the surface C must be a developed surface whereby each increment of the length of C engaging and passing through the blank should be at an angle thereto to insure a cutting and not a crushing force being continuously applied to the blank. One method of developing surface C is illustrated in FIG. 6. Here the arc of movement 69 of point P, in engaging the blank and until the inner edge of C passes through the blank, is divided into substantially equal increments 70. The length of cutting edge C is then divided into angularly disposed segments 71 through 75, whereby each segment in passing through the blank B (indicated by dotted lines) imparts a slicing action and not a crushing action thereto in cutting through the thickness of the blank.

As shown in FIG. 5, cutting dies 68 are secured to base plate 8 with their upper surface flush with the plane of face plate 11, in the path of movement of the cutting edge C of blade 14, and creasing dies 76 are similarly disposed beneath the area of engagement of the creasing edge 77 of the blade 14. FIG. 5A discloses the contour of the cutting edge C of blade 14, wherein the sides 78 of the blade form a square corner with the bottom edge 79 and edge 79 has an inverted modified V-shaped notch 80 therein. FIG. 5B discloses the contour of the creasing edge 77, wherein the bottom of edge 77 is decreased in width and rounded at 81. In each view 5A and 5B, the cutting dies 68 are shown associated with cutting edge C and the creasing dies 76 are shown associated with the creasing edge 77. It will be understood that side walls 78 of cutting edge C move through dies 68 with a slight clearance. The creasing edge 77 does not move downwardly past the dies 76, since the blank at this point, is to be scored and not severed. The depth of crease, or movement of surface 81 of creasing edge 77 into the blank, can be adjustably set by the adjustment provided in rod 27 connected to the member 14.

The apparatus of the invention, as previously stated,

can be used to slot and crease a blank for folding into practically any and every form of container presently used, in addition to forming the filling pieces and other shapes to be inserted inside the container. For purposes of illustrating operation and use of the apparatus, we have shown two forms of blanks. Fig. 7 showing a blank foldable into a commercial rectangular slotted container, and FIG. 8 showing blank for a commercial container known as a one-piece folder.

Referring now to FIGS. 2 and 7 of the drawings and assuming the length of the slots extending inwardly from the edge 83 of the blank is two inches, the hand wheel 41 is rotated to bring the inner end 33*a* of member 33 in alignment with numeral 2 on the scale 35 adjacent the hand wheel 41. Since the longitudinal plane of the face of abutment 36 is in alignment with the initial engagement of point P, of knife 14 with the blank, when the end 33*a* of member 33 is aligned with zero on the scale, the face of abutment 36 will be two inches in advance of point P and also wheel 63 when the end of member 33 is aligned with numeral 2 on the scale. The blank is now advanced with the edge 83 abutting 36 and moved towards the blade to bring the leading edge 86 of the blank beneath wheel 63. Rotation of hand wheel 52 to the left will cause similar rotation of scoring wheels 56 and 63 to draw the edge 86 towards and through housing slot 19 and beneath raised knife 14 and across the face of abutment 45. The rotation of hand wheel 52 is continued until blank edge 86 is aligned with numeral 3 of scale 45, the desired location of slot 87 relative to blank edge 86. The foot treadle 28 is now depressed causing the knife to lower and slot 87 is formed. At the conclusion of the formation of slot 87, further rotation of knife 14 brings the scoring portion 77 thereof into engagement with the blank, inwardly of slot 87 and depress the blank into the space between scoring dies 76 to form score line 88. If the length of the knife scoring portion 77 is equal to or greater than the length of blank edge 86, the score line may extend fully across the blank. In any event the length of scoring portion is equal to or greater than one-half the blank being worked upon. Hand wheel 52 is again rotated a sufficient distance, measured on scale 45, and the operator again presses down on treadle plate 28 to form slot 89 and score line 90. Thereafter the treadle plate 28 is released and spring 30 lifts the knife 14 free of the blank and the blank is again advanced the desired distance and the operation repeated to form slot 91 and score line 92. The blank is then rotated 180° to bring blank edge 84 into engagement with abutment 34 and scoring wheels 56, 63 and the sequence of operations is repeated to form slots 93, 94 and 95 and complete the scores 88, 90 and 92. As previously described, the scoring wheels 56 and 63 in advancing the blank also forms the longitudinal scores 83*a* and 84*a* at the base of the slots extending inwardly from each blank edge 83, 84. The blank is now removed from the face plate 11 and assembled in the usual manner.

Referring now to FIGS. 2 and 8 of the drawing, the blank FIGURE 8 is of the type forming a one-piece folder container. Here it will be noted that all four corners of the blank are removed by intersecting slots 103 and 107, 101 and 103', 103 and 101' and 103' and 107'. At the time of forming the slots to remove the blank corners, the score lines 97*a*, 97*c*, 102 and 104 may be formed as previously described. The additional score lines 97, 97*b*, 100 and 106 may be formed by re-adjusting the abutments 36 and 45 to the desired spacing and merely running the blank through the scoring wheels 56 and 63 without operation of the knife 14.

Many special forms of containers and other pieces used with containers require additional score lines parallel with and inwardly of the inner edges of the slots made by said knife. Such score lines can be effected by blade 63. However, where quantities are large, the bracket 65 with its adjusting shaft 64 and wheel 62 may be set up to form these scores simultaneously with scores made by wheel 63.

Utilizing the gauges, scoring wheels and blade 15 in the manner hereinbefore described, it will be apparent that blanks providing any form of container or internal packing pieces may be prepared. When different thicknesses of paper board or other material are employed in the blanks, the rod 27 may be adjusted to provide the necessary depth of score in accordance with change in material.

Although the slotting cuts of the two specific forms of blanks illustrated were disposed at right angles to the margins of rectangular blanks, it will be obvious to those skilled in the art that slots at other angles than right angles may be readily formed by changing the position of the blank so that the margin is at the desired angle to the direction of movement of the cutting edge of the blade.

It will be obvious from the foregoing that any desired length and width of blank received by face plate 11 can be slotted and scored to provide most any desired shape of carton. As shown at FIG. 2 of the drawing, any desired length of extension plates may be disposed on opposite sides of the basic mechanism to provide for handling extra length of blanks. Likewise the length from front to back of the base plate 8 and face plate 11, as well as the length of the cutting and scoring blade may be increased, as desired, to handle greater width of the carton blanks.

The extreme ease and limited time necessary to adjust the mechanism to accommodate relatively large or small increases in the size of blanks worked on, the length and spacing of the slots or score lines makes the machine extremely flexible. Another outstanding advantage resulting from the use of the machine, is that the containers may be made to the exact size required. By this means many expensive interior packing pieces may be either eliminated entirely or greatly reduced in number. Additionally such interior packing pieces such as, plain pad, various rat trap pads, clearance pads, folded pads, collars, etc., may be readily formed in this machine, where desired.

Although but two forms of scored and slotted box blanks have been described, we have also made many other types of blanks for containers, including such well known containers as full over lap (FOL), regular slotted carton (RSC), five panel folders (FPF), double slide and triple slide boxes, full telescopic containers (FTC), etc.

Apart from the specific form of apparatus herein disclosed we have developed and disclosed a method of providing slotted and scored container blanks which is entirely different from that heretofore used in the industry. The step of employing a pivotally mounted slotting knife which pierces the blank inwardly from a marginal edge thereof and slicing through the thickness of the blank in a direction outwardly towards said marginal edge provides clean sheared edges defining the slot so formed. The length of the slot to be so formed may be accurately and quickly established by one simple adjustment of the abutments disposed on opposite sides of the knife and movable relative to the point of engagement between the piercing edge of the blade and the blank. Said abutments also serve the dual purposes of determining the length of the slot and the spacing between the slots, longitudinally of the blank, by reason of the markings on the abutments measuring the degree of advancement of the leading edge of the blank past the knife. By reason of the slots being sequentially formed concurrent with advancement of the blank past the knife, any desired increments of spacing between slots is obtainable and accurately determined.

The employment of a scoring surface integral with and as an extension of the knife inwardly of the inner edge of the previously formed slots permits two separate operations to be sequentially performed by a single movement of the knife over a range of blank widths from less than the length of the knife scoring surface, up to somewhat

greater than twice the length of the scoring surface. Should the score formed on the blank extend entirely across the remaining width of the blank and into the area to be removed after the blank is rotated 180° for slotting inwardly from the margin thereof, no harm results to the blank. The width of slot to be formed is never less than the width of the scoring line.

Although the blank may be advanced by hand past the blade, in forming slots, the use of top and bottom scoring wheels to both advance the blank past the knife and simultaneously form the score line in the direction of movement of the blank materially reduces the time required to prepare the blank for folding into the desired carton. Furthermore, setting the abutment gauges to any desired position permits forming these latter score lines independently of movement of the knife, when slotting is not required. The use of multiple pairs of such scoring wheels permits formation of more than one score line at a time, without operation of the knife. In this manner many desired forms of interior packing pieces may be formed.

The pivotal mounting of the knife in the manner described and the adjustable length of the operating rod thereof provide full control of the depth of the score applied by the scoring extension of the knife regardless of change in thickness of the blank.

Having described the principles of operation of the machine, along with certain specific details of construction therein, it will be understood that many variations in such construction details will suggest themselves to those skilled in the art, and within the scope of the invention as defined by the appended claims.

We claim:

1. Apparatus for slotting and scoring a blank of fiberboard for folding into a shipping container, comprising a work surface over which said blank is movable, slotting means pivotally mounted adjacent the rear and above said work surface for movement into engagement with the body of the blank inwardly of the adjacent margin and severing a slot therein in a direction towards and through the adjacent margin of the blank, abutment means adjustably mounted in said work surface and engaged by the said adjacent margin of the blank in moving beneath said slotting means, scoring means mounted on said slotting means for engagement with the body of the blank inwardly of the slot upon completion of the severing of said slot, operating means for said slotting means normally maintaining the latter above the work surface and selectively actuating the slotting and scoring means into engagement with the blank, and means for moving said blank relative to said abutment and slotting means when the latter is in elevated position.

2. Apparatus as defined in claim 1 wherein the said slotting means comprises an elongated member pivotally mounted intermediate its ends above said work surface, one end of said member extending rearwardly beyond said pivotal mounting and towards the rear edge of the work surface, the other end of said member extending forwardly from said pivotal mounting and comprising a blank severing edge having an outer portion depending below the plane of the pivotal axis of the member and upward and inwardly extending portion connecting said depending portion with said member adjacent said pivotal axis thereof, said edge portions at their points of intersection forming a blank piercing point.

3. Apparatus as defined in claim 2 wherein said scoring means comprises a linear extension of said slotting means member and forwardly of said member pivotal mounting, said extension being disposed substantially parallel to the upper plane of the blank being worked on when initially engaged therewith.

4. Apparatus as defined in claim 3, wherein the said means for moving said blank relative to said abutment and slotting means, includes means engaging the blank upon the upper and lower surfaces thereof for scoring the blank in a direction reverse to the direction of movement thereof.

5. Apparatus for processing card and fiberboard blanks for folding into a shipping container, comprising a work surface over which the blank is moved during processing, blank slotting means pivotally mounted above the work surface adjacent the rear edge thereof for reciprocal movement towards and away from the said surface, blank gauging abutments adjustably mounted within the work surface and extending thereabove at opposite sides of the vertical plane of movement of the slotting means, means for intermittently moving said blank longitudinally of said abutments and transversely of the path of movement of said slotting means, means associated with said slotting means and forming an extension thereof for scoring said blanks inwardly of the path of movement of said slotting means and transversely of the path of movement of the blank relative to said gauging abutments, and means for selectively actuating said cutting means about its pivotal mounting.

6. Apparatus as defined in claim 5, wherein said means for moving the blank longitudinally of the said abutments includes scoring means imparting a score line upon the blank concurrent with the movement of the blanks.

7. Apparatus as defined in claim 6, wherein said adjustably gauging abutments include measuring scales for determining the length and spacing of said slots formed in the blank by the cutting means.

8. Apparatus for processing blanks of fiberboard for folding into containers, comprising a work surface over which the blank is moved during processing, blank gauging abutments mounted within the work surface for adjustment transversely of said surface and disposed in a direction longitudinally thereof, blank scoring means mounted adjacent the rear longitudinal edge of the work surface for reciprocal movement towards and away from said surface in a vertical plane of movement transversely of the said surface, means for selectively actuating said scoring means and means for manually controlling movement of the blank transversely of the plane of movement of the scoring means.

9. Apparatus as defined in claim 8, wherein said scoring means has associated therewith a slotting means disposed in end to end relation whereby a single reciprocal movement of the scoring means effects a slotted opening through one longitudinal edge of the blank as an extension of the scoring of the blank.

10. Apparatus as defined in claim 9, wherein said means for manually controlling movement of the blank transversely of the plane of movement of the scoring means, includes means actuated by said control means to effect a scoring of the blank in a direction longitudinally thereof.

11. The method of slotting and scoring a blank for folding into a fiberboard shipping container, comprising the steps of, providing a blank sheet of fiberboard of the desired sizes, supporting same on a flat cutting and scoring surface, providing a pivotally suspended slotting and scoring bar for sequentially cutting slots in one margin of the blank in a direction from the body of the blank outwardly towards and through said margin then scoring the blank from the inner end of the slot towards the center of the blank, moving the blank transversely of the cutting bar and against an adjustable abutment gauging the length of the slot cut in the adjacent blank margin and the spacing between said slots in the adjacent blank margin, scoring the blank in the direction of its moving length during movement past the slotting and scoring bar, then rotating the blank 180° and repeating the slotting of the marginal edge of the blank in alignment with the previous slots while longitudinally scoring the blank during movement past the cutting bar.

12. Apparatus for slotting and scoring a blank of fiberboard for folding into a shipping container, comprising a member having a supporting surface over which the

blank is moved, a slotting and scoring bar mounted upon said member for reciprocal movement towards and away from said supporting surface, an abutment disposed transversely to the path of movement of said slotting and scoring bar and adjustably mounted on said supporting surface for movement in a direction longitudinal of the length of said slotting and scoring bar, and blank scoring means mounted on said supporting surface in spaced relation to said abutment engaging a blank disposed upon said surface in engagement with said abutment blank and moving said blank past said slotting and scoring bar.

13. A method of scoring and slotting a blank for folding into a fiberboard container, comprising the steps of:

(*a*) providing a piece of fiberboard of the size required;

(*b*) supporting same on a work surface for selective movement relative thereto;

(*c*) engaging a marginal edge of the blank with a linearly extending abutment;

(*d*) passing the length of the blank in a sequence of measured steps along said abutment beneath a reciprocating member moving in a vertical plane transversely of the vertical plane of the abutment and into and out of engagement with said blank;

(*e*) progressively piercing the blank inwardly of said marginal edge, severing a slot through the blank in a direction towards and through said marginal edge and scoring the blank inwardly thereof from the slot so formed during each engagement of the reciprocating member with the blank;

(*f*) rotating the blank 180° upon the work surface;

(*g*) then again passing the blank in similar measured steps along said abutment and beneath said reciprocating member with the former leading edge of the blank now forming the trailing edge to slot both opposite marginal edges and connect the opposing slots by score lines.

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