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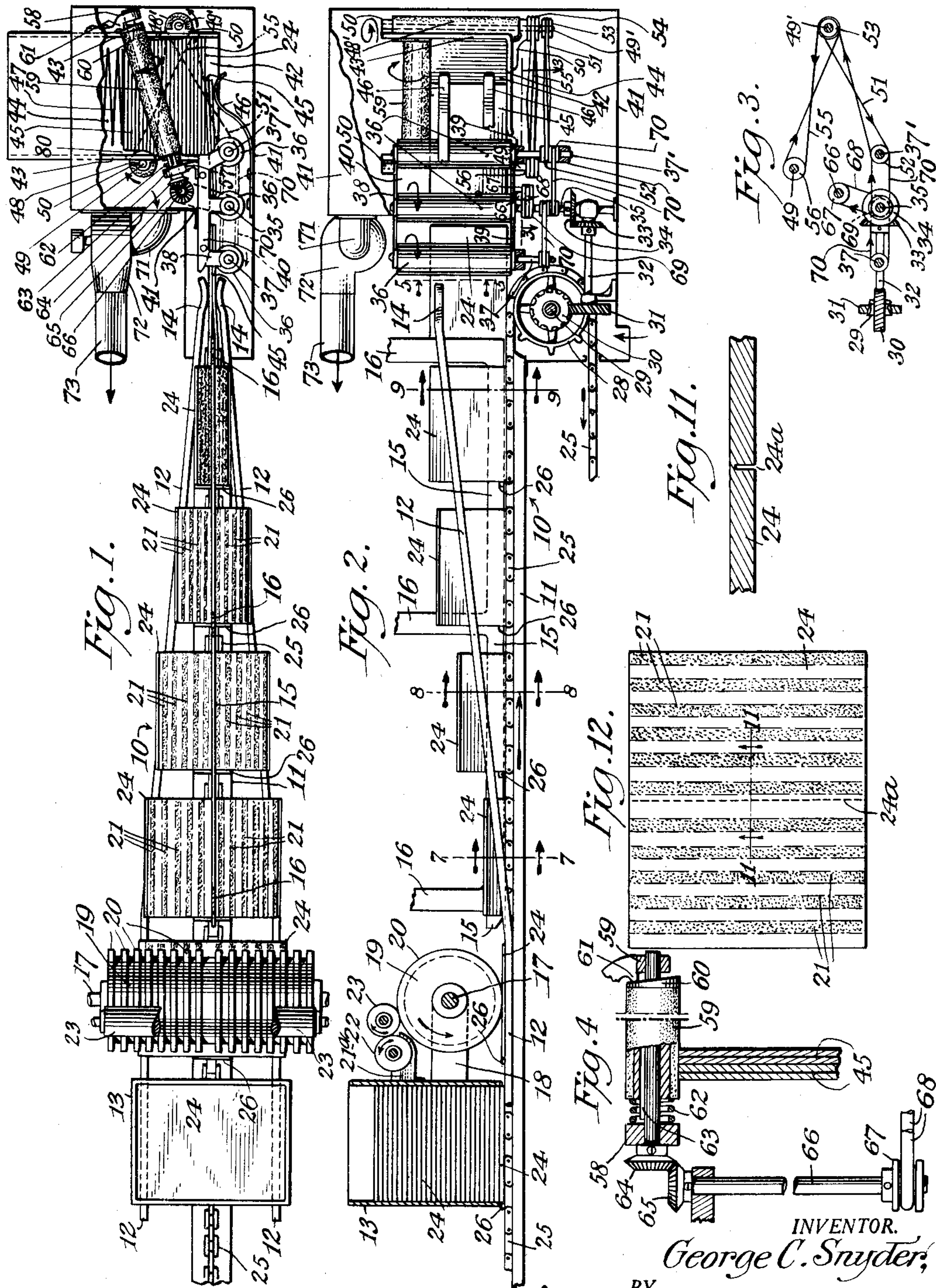
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METHOD AND APPARATUS FOR MAKING LAMINATED PAPER BOARD COVERS

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2 Sheets-Sheet 1



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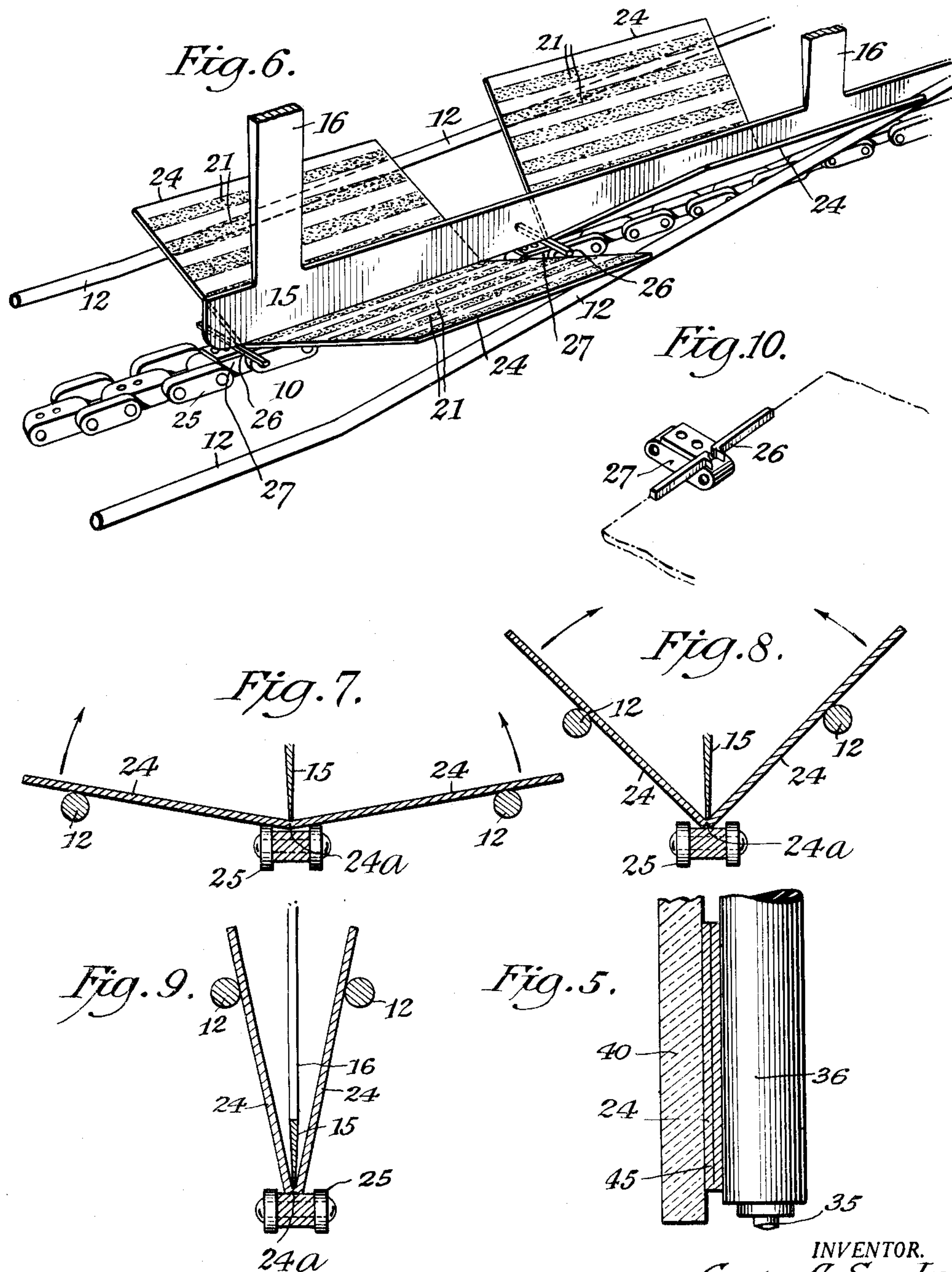
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UNITED STATES PATENT OFFICE

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METHOD AND APPARATUS FOR MAKING LAMINATED PAPER BOARD COVERS

Application filed June 1, 1931. Serial No. 541,353.

The present invention relates to a method and apparatus for producing carton or cigar box covers or lids of the dual laminated type, whereby such covers or lids may be made of
5 suitable pre-covered cardboard blanks with the grain of the cardboard pieces disposed in line and glued together in an improved manner to produce a lid structure quite as strong and as attractive in appearance as
10 the more expensive wooden lid structures.

Practice has proved that to nicely balance each lamina against its companion, so that in addition to caring for universal shrinkage, the warpage of the mounted board
15 should be balanced against one another; accordingly, the accomplishing of this result is an object of my invention.

Another object of the invention is to provide means for feeding pre-scored cardboard
20 blanks, under means for applying glue thereon in spaced lines or strips, thence forwardly under breaker means and over folding means to a means for sealing the lamina of the cover together with the glue lines in
25 staggered or overlapping relation to provide a balanced laminated box cover.

Another object of my present invention is found in means for final dimensioning the finished lids before attachment to the cigar
30 boxes, such as shown and described in my copending application, Serial No. 523,722, filed March 19, 1931—Carton structure.

In carrying out my invention, I preferably apply spaced lines of adhesive, such as
35 glue, to the inner face of successively conveyed cardboard blanks, after pre-cut-scoring the blanks laterally on the outer face and at the center thereof. The lines of adhesive being located in relative opposite staggered relation to the score line so that when
40 the blanks are folded on the said central score line, the adhesive lines will overlap, and when a sealing pressure is applied, the result will be a hard, rigid, laminated, bal-

anced board which will remain plane and flat under all climatic conditions.

Further objects incident in the particular construction of the parts of the structure will be hereinafter apparent in the specifica-
45 tion and the accompanying drawings, in which there is illustrated a preferred embodiment, and in said drawings—

Fig. 1 is a top or plan view of the mechanism above referred to for forming carton
50 lids or covers, and representing my invention, parts being broken away to better disclose some of the features.

Fig. 2 is a side elevation, partly in section, of the mechanism shown in Fig. 1, and
55 with parts omitted.

Fig. 3 is a diagrammatic horizontal section looking downward and about on the line
3—3 of Fig. 2.

Fig. 4 is a fragmental view of a portion of
60 a reciprocatory abrasive roller and its driving connection.

Fig. 5 is an enlarged fragmental sectional elevation showing a smooth sealing panel,
65 a sealing roller and a box lid compressed therebetween.

Fig. 6 is an enlarged perspective view of part of the lid feeding mechanism showing
70 two lids carried on a feed chain and a breaker or guiding frame.

Fig. 7 is an enlarged cross sectional elevation taken about on the line 7—7 of Fig. 2.

Fig. 8 is an enlarged cross sectional elevation taken about on the line 8—8 of Fig. 2.
80

Fig. 9 is an enlarged cross sectional elevation, taken about on the line 9—9 of Fig. 2, showing the folding operation of the lamina as nearly complete.

Fig. 10 is a perspective view of the pick-
85 up or follower carried by the feed chain and adapted to abut the rear side of said lids to feed them along with the chain to the sealing rollers.

Fig. 11 is an enlarged cross section taken
90

through the central portion of the box lid blank on the line 11—11 of Fig. 12.

Fig. 12 is a reduced plan view of the box lid blank, showing the central cut-score line and the relative positions of the lines of adhesive as applied to a box lid blank, so that the said lines will overlap when the lamina of the lid are folded and sealed.

Referring to the drawings, in describing the parts in detail, 10 designates the conveyor generally, and 11 the base thereof, from the far sides of which extends forwardly converging and upwardly inclined folding bars 12, extending from under a magazine 13, forwardly to be formed in opposed horizontal curved portions or guides 14.

Arranged centrally of the conveyor-base 11, is a breaker-frame 15 vertically disposed and supported by upwardly directed arms 16.

Arranged to rotate on a fixed shaft 17, supported in suitable arms or brackets 18, (one only being shown) is a glue applying roller 19, which has raised faces 20, to which glue is transferred from a glue pot 21a, by suitable rollers 22 and 23.

The glue applying roller has no drive, other than its contact with the passing cardboard blanks 24, having each a cut-score 24a in one side, the opposite side takes the wet glue from the raised faces 20, thus sharply defined glue strips or rows 21, are applied to the inner faces of the passing blanks and positioned on said blanks in such manner that the glued areas will overlap, forming a solid uniform film of glue when the lamina are sealed to form a perfectly sealed and balanced laminated structure. Said rows have therebetween spaces or plain surface strips, as shown.

A conveyor chain 25 carries pick-up shoulders 26, on an occasional link 27 to feed the box cover blank forwardly; said chain is preferably supported by a sprocket 28, on a cross shaft 29, and power may be applied to this shaft 29 or to a shaft (not shown) supporting the opposite end of the chain. Affixed to the sprocket shaft 29 is a spiral gear 30, constantly in mesh with another spiral gear 31, affixed to a horizontal shaft 32, on which is fixed a bevel gear 33, in turn meshed with a companion gear 34 fixed on a vertical shaft 35 carrying a preferably rubber sealing roller 36.

At opposite sides of the roller drive shaft 35 are other vertical shafts 37 and 37' carrying sealing rollers 36 which are all similarly mounted in top and bottom three-bearing brackets 38 and 39 secured to the top and bottom of a smooth sealing slab 40, secured to a fixed housing 41, in any desired manner.

The mechanism for reducing the built-up laminated box covers thus produced, to final accurate dimensions, as to width and length, is preferably done by rotary, and rotary and

reciprocatory abrasives, will now be described.

I may in practice, employ several abrasive rollers operating at other than right angles and having reciprocatory longitudinal movements acting on the sides and top of the box covers, for finishing purposes, as they are moved backwardly in feeding movement from the line of feed, but here I have shown but one angularly arranged rotary reciprocatory top roller and two rotary fixed side rollers, either vertical or slightly inclined, which, it is thought, will be sufficient to illustrate my invention, as intended, for as above stated, I may employ any number of rotary abrasive members at the sides and for the top of the feedway for accurately finishing the cigar box covers.

At the end of and partially enclosing the delivery end of the conveyor 10, is a fixed housing 41 in which is a feedway 42, having side walls 43, and a bottom 44, which serves to receive the laminated box covers 45, by the feeding urge of curved springs 46, engaging the laminated box covers as they are progressively presented from the sealing rollers 36; the springs 46, have power enough to overcome a backing spring 47, bearing against the box covers at the rear to offer slight retarding pressure for maintaining the box covers in orderly alinement in their backward feed movement through the feedway.

Extending from the outside through appropriate slots or openings in the side walls 43 of the feedway are abrasive rollers 48 and 48' mounted on vertical or slightly inclined shafts 49 and 49' carried in suitable upper and lower bearings 50, and driven, preferably by a belt 51, from a pulley 52, on the shaft 37' of the forwardmost sealing roller 36, said belt 51 traversing a pulley 53, locked to the abrasive roller shaft 49'. Also fixed to this shaft 49' is a pulley 54, which is connected by a cross belt 55 with another pulley 56.

Journalled on a shaft running in suitable bearings 57, and 58, for rotary and reciprocatory contact with the upper edge of the cigar box covers in the feedway 42 in an abrasive roller 59, having at one end a cam disk 60, Fig. 4, on which a finger or lug 61 of the bearing 58 constantly contacts to impart a longitudinal reciprocating movement to the roller 59. The action of the cam 60 and lug 61 is to move the roller over against the action of a compression spring 62, which immediately returns the roller when released by the cam thrust, over and over again. The abrasive roller 59 is fixed to turn with its shaft by means of a spline 63, and said splined roller shaft is supplied with a bevel gear 64 (see Fig. 4) operating in mesh with a companion gear 65, on a vertical shaft 66, having a pulley 67, at its lower end over which a belt 68 travels to a pulley 69 on the

sealing roll shaft 35, see Figs. 2 and 3, of the drawings. Other belts and pulleys, generally indicated at 70 may be employed to drive the sealing rollers 36 from the central roller shaft 35.

The mechanism for accurately dimensioning the finished box covers is preferably enclosed in the housing 41 as above stated to confine dust and dirt therein, from which it may be drawn through a conduit 71 to a fan or blower 72 and thence through a second conduit 73 to a suitable place of deposit or to the outside air.

In the operation of the dimensioning abrasive rollers on the ends of the box covers, there are spaces 80, left back of these cutting rolls 48 and 48' in the feedway, since the front abrasive roller 48' will first tend to force the box covers against the opposite side of the feedway, after which the second abrasive roller 48 in its rotary operation on the box cover edges will tend to force them back to the opposite side, and these alternate movements may continue if several or many abrasive rollers are employed.

By reference to Fig. 11, of the drawings, which is an enlarged fragment of the cardboard employed, it will be noted the cut-scores are deep and leave only a thin hinging portion so that the blank 24, will bend accurately on said score and further, the walls of the deep cut-score, will aline (when the sides of the blank are fully folded, each through 90° from the cut-score) and form a square plane edge at this side of the box cover.

What I claim is:

1. An apparatus for producing laminated box covers including in combination a magazine for storing pre-cut scored blanks, a conveyor for feeding said blanks, means for applying rows of adhesive to the opposite median sides of said blanks in staggered relation laterally from the median line thereof, means for breaking said blanks on said score lines, means for gradually folding said blanks in the feeding and breaking movement of said blanks on said cut score line, means for sealing the folded lamina of the box cover and means for abrasively dimensioning said covers thus formed to produce finished laminated, braced and balanced box covers.

2. The method of making laminated box covers, consisting in providing foldable blanks of cardboard in stacks, each blank having a cut-score in the underside thereof and midway of its width; causing said blanks to progressively feed; applying parallel lines of glue to said blanks when feeding, in relative staggered relation at opposite sides to its cut-score line; bending and folding said blanks progressively in the feed thereof; sealing the side portions of said blanks when folded to form a laminated box cover; then dimensioning said laminated box cover.

3. The method of making laminated box covers, consisting in providing foldable blanks of cardboard in stacks, each blank having a cut-score in the underside thereof and midway of its width; causing said blanks to progressively feed; applying parallel lines of glue to said blanks when feeding, in relative staggered relation at opposite sides to its cut-score line; bending and folding said blanks progressively in the feed thereof; sealing the side portions of said blanks when folded to form a laminated box cover; then dimensioning said laminated box covers by edge abrasion.

4. An apparatus for producing laminated cigar box covers, from centrally cut-scored blanks of cardboard, including in combination a conveyor, means for applying spaced stripes of glue to the progressively moving blanks on said conveyor, means for breaking and folding said blanks centrally in the direction of feed, a fixed plane member and coacting rotary members for imparting sealing and feeding pressure to the sides of said box covers, a laterally disposed feedway and means for transferring and feeding the box covers thereinto, means for dimensioning said box covers by edge contact, and a housing enclosing the feedway and dimensioning means.

5. An apparatus for producing laminated cigar box covers from centrally cut-scored blanks of cardboard, including in combination a conveyor, means for applying spaced stripes of glue to the progressively moving blanks on said conveyor, means for breaking and folding said blanks centrally in the direction of feed, means for sealing the folded lamina of the box cover one to the other to produce registering edges, a laterally disposed feedway and means for transferring and feeding the box covers thereinto, means for dimensioning said box covers by edge contact, and a housing enclosing the feedway and dimensioning means.

6. In an apparatus for producing laminated box covers from cardboard blanks pre-scored at their feeding centers; a conveyor; means for applying strips of glue to said blanks in spaced relatively staggered relation to the central score line in the feeding operation, and means for folding and sealing the blanks to provide laminated box covers with registered edges.

7. In an apparatus for producing laminated box covers from cardboard blanks pre-scored at their feeding centers; a conveyor; means for applying strips of glue to said blanks in spaced relatively staggered relation to the central score line in the feeding operation, and means for folding and sealing the blanks to provide laminated box covers with registered edges, said blanks having a uniform distribution of glue and being balanced against warpage.

8. In a box board apparatus, a conveyor, folding bars having spaced ends for receiving a board in flat condition on said conveyor, a breaker having an edge positioned adjacent said conveyor for engaging said board along its central line, and adjoining ends of said bars disposed above said conveyor, whereby during movement of the latter the intermediate portions of said bars may urge said board inwardly on opposite sides of said line for conveying said board in folded condition between said second ends.

9. In an apparatus for making box boards, a conveyor chain, converging bars having spaced ends disposed on opposite sides of said chain for receiving a board in flat condition, retaining means carried by said chain for the board, said bars having their opposite ends adjacently disposed above said chain, and a vertically disposed board breaker positioned above said chain and having adjacent the latter an edge for engaging the central line of said board, whereby on movement of said chain the intermediate portions of said bars may urge said board inwardly on opposite sides of said line for conveying said board in folded condition between said second ends.

10. An apparatus for making laminated box boards comprising in combination a conveyor, an elongate board breaker disposed above said conveyor and having adjacent the latter an edge for engaging the central line of a board, converging bars having ends disposed on opposite sides of said conveyor for receiving the board in flat condition, means disposed adjacent said ends for applying adhesive to said board, sealing means, and adjoining ends of said bars disposed above said conveyor at said means for guiding thereto said board, the intermediate portions of said bars being effective to fold said board during its travel.

11. In an apparatus for producing laminated box boards, including delivery means, means for finishing the edges of said boards, said second means including abrasive rollers, and means for urging said boards from said first means to said second means.

12. In an apparatus for producing laminated box boards, comprising rotary delivery means, means for finishing the edges of said boards, said latter means including abrasive rollers for engaging the edges of said boards, and flexible means connecting said delivery means and said rollers whereby to revolve the latter.

13. In an apparatus for producing laminated box covers comprising rotary delivery means, means for finishing the edges of said boards, a spring for urging said boards to said second means, said latter means including abrasive rollers for engaging the edges of said boards, and flexible means connecting said

delivery means and said rollers whereby to revolve the latter.

14. In an apparatus for producing laminated box covers comprising in combination rotary sealing and delivery means, a housing, means disposed within said housing for finishing the edges of said boards, said latter means including abrasive rollers for engaging said edges and flexible means connecting said first means and said rollers whereby to revolve the latter.

15. In combination with an apparatus for producing laminated box covers comprising rotary delivery means, a housing, finishing means including in said housing abrasive rollers, said rollers adapted to precision the edges of said boards, a spring for urging said boards from said first means to rollers, and flexible means connecting said first means and said rollers whereby to revolve the latter.

16. The method of making a laminated box board, consisting in applying spaced strips of adhesive material to one surface of a sheet of cardboard, and bending said sheet inwardly along its central line to engage the strips of one half of said sheet against the interposed spaces of the other half.

17. The method of making a laminated box cover, consisting in applying to one surface of a sheet of cardboard strips of adhesive material in spaced relation and on one side of the central line of said sheet, simultaneously applying to said surface spaced strips of adhesive material on the other side of said line, and bending said sheet inwardly on said line to engage the first mentioned strips, against the spaces between said second strips.

18. The method of making a laminated box element from a slab of cardboard, consisting in cut-scoring said slab centrally along one of its surfaces, applying spaced strips of adhesive material on the opposite surface of said slab so that the inner strip on one side of the line of said cut may be adjacent the latter, there being a space adjacent said line on its opposite side, and bending said slab inwardly on said line to engage said strips against said spaces.

19. The method of making a laminated box element from a slab of cardboard, consisting in cut-scoring the slab centrally along one of its surfaces, applying uniformly spaced strips of adhesive material on the opposite surface of said slab so that the inner strip on one side of the line of said cut may be adjacent the latter, there being a space adjacent said line on its opposite side, folding said slab inwardly on said line to engage said strips against the interposed spaces, and applying pressure to the opposite surface portions of the folded slab.

20. The method of making a laminated box cover from a rectangular slab of cardboard, consisting in scoring the slab centrally on one of its surfaces between opposed edges or

plying spaced strips of adhesive material on
the opposite surface of said slab so that the
inner strip on one side of the line of the score
may be adjacent the latter, there being a space
5 adjacent said line on its opposite side, break-
ing said slab on said line, folding the halves
of said slab inwardly to engage said strips
against the interposed spaces, and applying
sealing pressure to said halves in the folded
10 position.

Signed at New York, in the county of New
York and State of New York this 26th day
of May, A. D. 1931.

GEORGE C. SNYDER.

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