A. A. ADAMSON AND W. F. GRUPE.

METHOD OF MAKING BOXES.

APPLICATION FILED DEC. 1, 1916.

1,381,097.

Patented June 14, 1921.

2 SHEETS—SHEET 1.

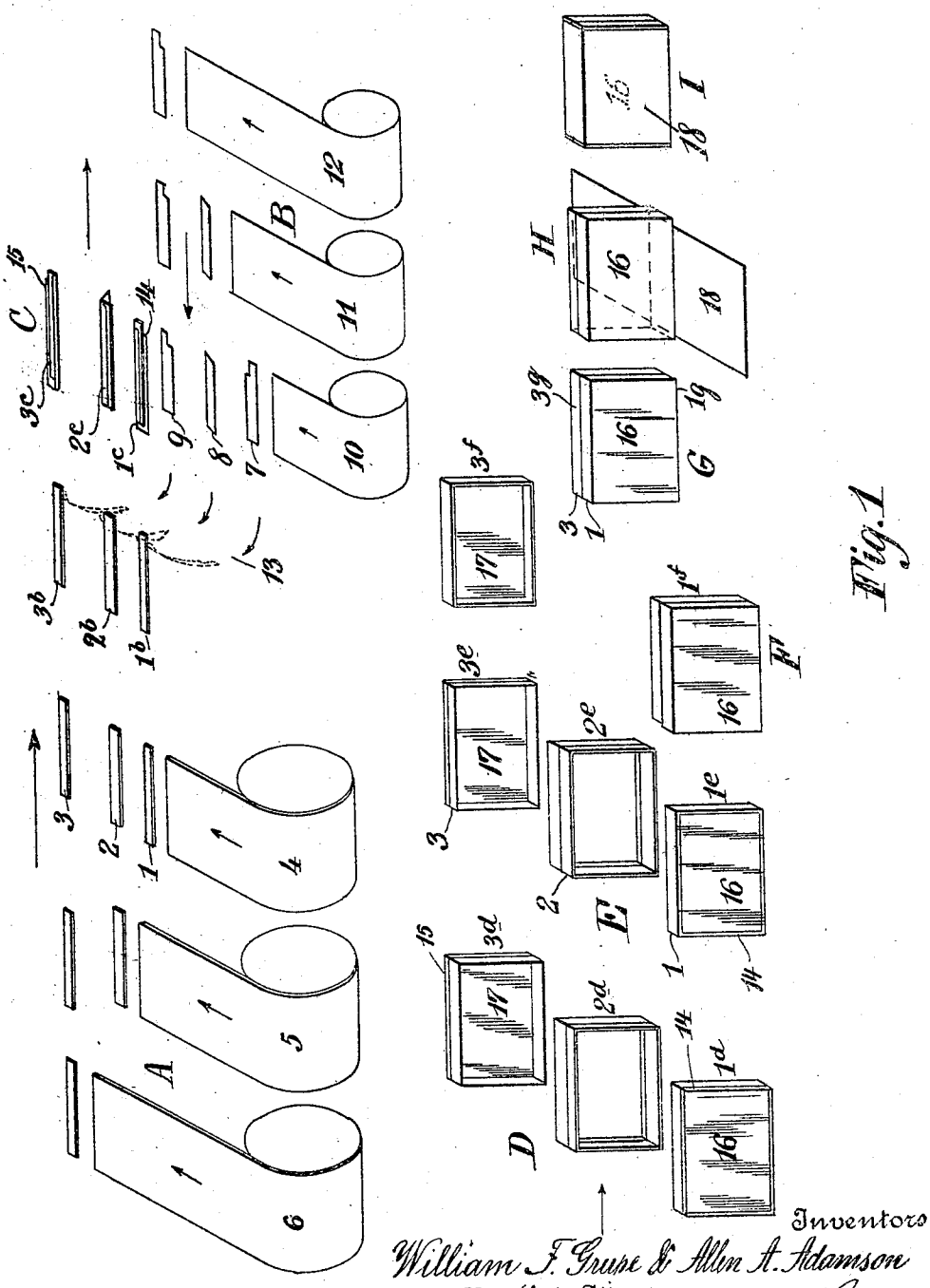


Fig. 1

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2 SHEETS—SHEET 2.

Fig. 2

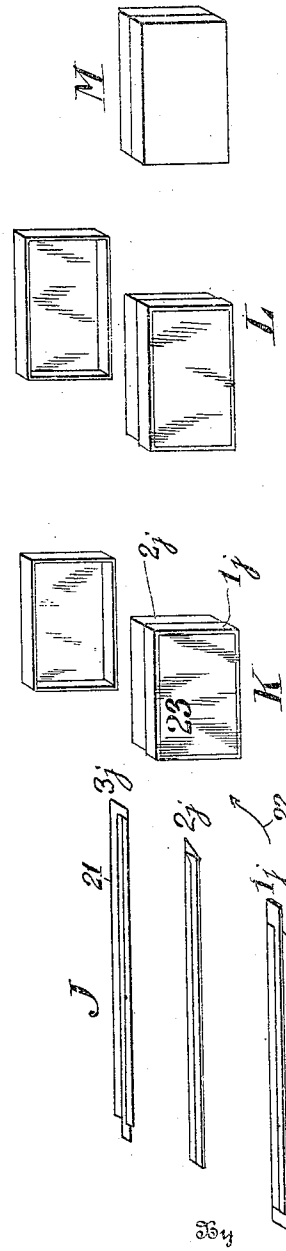
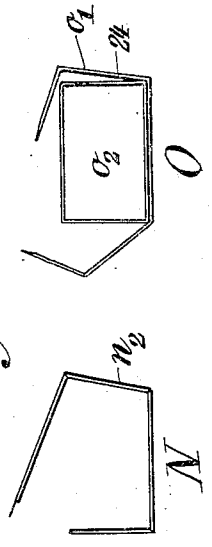


Fig. 3



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METHOD OF MAKING BOXES.

1,381,097. Specification of Letters Patent. Patented June 14, 1921.

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To all whom it may concern:

Be it known that we, ALLAN A. ADAMSON and WILLIAM F. GRUPE, citizens of the United States of America, residing at Brooklyn, county of Kings, State of New York, and at Hudson Boulevard, North Bergen, county of Hudson, State of New Jersey, respectively, have invented certain new and useful Improvements in Methods of Making Boxes, of which the following is a specification.

The invention relates to the method of making boxes.

It has been heretofore proposed to manufacture boxes, such as cigarette boxes, by producing the cover by means of a cover making machine, and by producing the trays and tray rims in respectively separate machines—also separate from the cover making machine—or by making such trays and tray rims in a single machine, separate, however, from the cover making machine. In the practice of such prior methods, the formed covers and the formed trays are respectively collected in piles, either in special reservoirs, or otherwise, and accumulated over a period of time extending from days or weeks depending upon the practice of the individual box makers. In pursuance of such practice, the paper and board stock of the covers and trays are subjected to varying atmospheric conditions, especially temperature and humidity. Incidental to such practice, the storing of the covers and trays give rise to undue pressure on the relatively delicate parts due to piling on one another, and thereby dis-shaping or distorting the contour and shape of the same. Such prior practice has led to the further complication in the use of the adhesive being applied to the paper and board under varying atmospheric temperature and humidity, thereby causing variable absorption of the liquid ingredients of the adhesive in the paper and board and variable "drying" of the solid or paste ingredient of the adhesive.

In the practice as heretofore carried out, such deformation of the individual parts of the box and variable conditions of paper board and ingredients of the adhesive has resulted in complicating the necessary subsequent step of assembling the covers on the trays, respectively, requiring special apparatus or parts for effecting such assembly, as well as increase of labor, and also resulting in a high percentage of rejected covers, and trays. On the whole, accordingly, the practice as heretofore carried out, is at best haphazard in producing commercially perfect boxes.

On the other hand, as more particularly pointed out, applicants have discovered that the production of commercially perfect boxes is effected with certainty by forming the cover, and parts thereof, and the tray, including the tray rim and other parts thereof, and the application of the adhesive required, substantially simultaneously, *i. e.*, under practically the same temperature and humidity conditions. Applicants' process further includes the delivery of the formed covers and formed trays substantially immediately thereafter to the succeeding stage of the process, and thus continuing the process from one step substantially immediately to the succeeding step, in other words, progressing preferably substantially without delay, from one step to the next under the same temperature and humidity conditions.

More particularly, the invention is directed to certain improvements in the method of making boxes formed of a tray having a neck portion. The invention may be illustrated by reference to the making of cigarette boxes comprising a tray formed of a bottom board, a tray rim secured to said bottom board, a neck portion secured to said rim and a cover comprising a top board and cover rim secured to said top board. Usually the cover is "hinged" to the tray, as by a label affixed to the back face of the box and the exposed tray and cover rims and neck portions are covered by paper finished as may be desired. In the making of such cigarette box, the cover and tray rims and the neck are preferably formed from webs or reels of suitable board, or cut from sheet board which are finished to proper length and width and which may be scored or indented or plain to facilitate the formation of the corners. Such board lengths are then simultaneously fed along defined paths and brought respectively into proper contact with the finish papers for the same, suitable adhesive or the like being applied as required. At the end of this stage, a certain portion of each finish paper on the cover rim and tray rim extends beyond the side of the same to which it has been applied, the extended portion of the finish paper being uti-

lized to hold in position the respective top and bottom boards.

The three respective board lengths are then moved to the next stage at which the board lengths are respectively formed into hollow rectangles or other configuration, as by wrapping or folding, or otherwise, and top and bottom boards are fed into proper position respectively relative to the cover rim and the tray rim.

At a next stage, the finish papers may be respectively folded, including the smoothing out of the fold corners, thereby securing the attachment of the top board to the cover rim and the bottom board to the tray rim, and at the same time strengthening the cover and the tray rims.

At a next stage, the neck is inserted within the tray, at which stage adhesive or the like is applied, either before or simultaneously while the neck is being wrapped.

At a next stage, the cover and the assembled tray and neck are pressed, to attain accurate fixation of the sides, faces and corners thereof. If desired, the step of pressing may be effected at the previous stage of forming the cover rim, neck and tray rim into hollow configuration or at the previous stage of insertion of the neck into the tray.

At the next stage, the cover is placed onto the neck of the tray, thereby closing the box, whereafter a suitable label may be applied to one or more faces of the box, including the back face of the box to thereby "hinge" the cover onto the tray. Usually, the label is cut of sufficient length to extend over the outer faces of the top and bottom boards to thereby finish the same.

The above stated steps may be modified by forming the tray rim into its hollow configuration and the neck subsequently formed directly over the formed tray. Also, the tray rim and neck may be simultaneously formed in proper direct contact with one another to form a unitary hollow configuration, and the bottom board applied to complete the tray.

Other features and objects of the invention will be more fully understood from the following description and the accompanying drawings, forming part of this application, in which drawings,—

Figure 1 indicates diagrammatically one series of stages embodying the invention;

Fig. 2 indicates diagrammatically a modification of certain particular stages of Fig. 1, and

Fig. 3 indicates diagrammatically a further modification.

In the following particular description of the diagrams of the drawings, it will be understood that the particular directions of movement indicated by the diagrams are not material features of the invention, except as especially noted hereinafter and as may be specifically defined by the appended claims.

Referring to Fig. 1, there are represented a series of operations comprising stages at which one or more steps are performed.

At the stage indicated A, the board lengths 1, 2, 3 are respectively the tray rim, neck and cover rim, which may be obtained from the respective three webs of board 4, 5, 6 and properly transferred to the relative positions at 1, 2, 3. If desired, these lengths may be derived from a reel or cut from sheet board and scored or indented either prior to or subsequent of the cutting.

At stage B, the papers for finishing the tray rim, neck and cover rim are respectively indicated at 7, 8, 9, which papers may similarly be cut from the indicated three rolls of paper 10, 11, 12 and transferred, as indicated by the curved arrowed path 13, to be brought into proper lapping engagement with the aforesaid three board lengths, respectively, at 1^b, 2^b, 3^b.

At stage C, the tray rim paper 7 has been folded about the exposed edge of the tray rim 1 as indicted at 1^c, similarly for the neck as indicated at 2^c and the cover rim as indicated at 3^c. The rim papers are respectively of sufficient dimensions to provide the projecting portion 14 of the tray rim paper extending beyond the tray rim and the projecting portion 15 of the cover rim paper extending beyond the cover rim.

The stage D, as also subsequent stages thereto, is drawn on a somewhat enlarged scale, in order to picture the indicated steps more clearly. At 1^d is represented the step of forming the tray rim board 1 having its paper affixed thereto but still with the projecting portion 14 extending therebeyond, the step of forming being usually done by wrapping or folding onto a form. The bottom board 16 is fed and positioned in proper relation to the tray rim. The neck, having its fully applied paper is similarly formed at 2^d by wrapping or folding. The cover rim having its paper affixed thereto but still with the projecting portion 15 extending therebeyond is similarly formed at 3^d, while the top board 17 will have been fed and properly positioned relative thereto.

At stage E, the projecting portion 14 has been folded onto the outer face of bottom board 16, as indicated at 1^e, and the projecting portion 15 folded onto the outer face of the top board 17, as indicated at 3^e. The neck has been advanced to its position 2^e.

At stage F, the neck 2 has been inserted within the tray 1 to form the assembled tray indicated at 1^f and the cover at 3^f has been forwarded from its prior position 3^e.

At the stage F, or between the same and the subsequently indicated stage, the assembled tray and the cover are pressed by suitable means to straighten the sides of the

same, aline the corners and otherwise force the parts into accurate positions.

At stage G, the cover 3^g has been positioned onto the tray 1^g.

This step is readily effected by bringing a side of the cover and the corresponding side of the neck into register and then relatively moving the cover and tray to bring the remaining sides into register.

At stage H the label 18 is being applied to the bottom faces of the tray and cover, the said label being preferably sufficiently long to extend over the greater part of the top and bottom of the box to finish the same and to bind the cover rim paper and tray rim paper and their folded corners. The label usually extends up to the open joint of the box, but it may be applied to extend over both box joints and later cut out at the open box joint.

The result, indicated at stage I, is a box which is provided with an inserted neck and a cover hinged by the label onto the tray. The finish of the various parts of the box, as described, and other parts of the box will be selected as desired.

In Fig. 2, the stage J corresponds to the stage C of Fig. 1, and represents at 1^j the tray rim having the paper folded thereon with the edge 20 projecting therebeyond; at 2^j the neck; and 3^j the cover rim having its paper folded thereon with the edge 21 projecting therebeyond. Passing from stage J, the article 1^j has been transferred as indicated by the arrow 22 into suitable relation to the article 2^j and the two jointly wrapped or folded at stage K onto a suitable form, accompanied by the proper application of adhesive and the feeding of the bottom board 23, to form the tray as an entirety at a single stage. At stage K, the fold corners of the tray rim paper may be smoothed out simultaneously with the wrapping or folding of the tray rim. Also, if desired, at stage K the cover may be wrapped or folded, as indicated at stage D of Fig. 1.

At stage L, the assembled tray and cover are pressed, similarly as in the method hereinabove described.

At stage M, the cover has been closed onto the completed tray.

The method may be further modified as indicated in Fig. 3, by first forming the neck n^2, either by wrapping the same about a form or by folding over a stationary form, as shown at stage N, and the tray rim board O^1, then formed directly onto the formed neck O^2, as shown at stage O. At stage O, the projecting portion 24 of the tray rim paper may be folded onto the bottom board to position the same, simultaneously with the step of wrapping or folding the tray rim board. The affixing of the label onto the closed box may be also effected by applying first an end of the label onto the top, then applying the intermediate and opposite end of the label successively onto the rear side and bottom of the box. Or, the obverse operation may be carried out by first applying an end of the label onto the bottom.

It will be understood that the labels applied to the interior and exterior faces of the top and bottom may be varied as desired, or the said faces may be printed directly.

It will be understood that many changes and modifications may be made in the respective stages of our method and in the intermediate steps of said stages without departing from the scope of our invention, as defined by the appended claims.

We claim.

1. The process of making a paper box formed of a tray having a neck formed separately from and inserted within the body of the tray and cover telescoping on said neck, comprising separately forming substantially simultaneously the parts of said cover and the parts of said tray, including the application of adhesives as desired, definitely progressing said cover and said tray simultaneously and effecting substantially without delay the closure of the box by positioning said cover on said tray.

2. The process of making a paper box formed of a tray having a neck formed separately from and inserted within the body of the tray and cover telescoping on said neck, comprising producing the strips for the rim of the cover and the rim and neck of the tray, then forming the cover rim and applying the top and separately forming the tray rim and neck and applying the bottom, then definitely progressing the formed cover and the formed tray toward one another and then substantially without delay closing the box by effecting the positioning of said cover on said tray.

3. The process of making a paper box formed of a tray having a neck formed separately from and inserted within the body of the tray and a cover telescoping on said neck, comprising producing the strips of the rim of the cover and the neck and rim of the tray, then forming the cover rim and applying the top separately forming the tray rim and neck and applying the bottom under substantially the same temperature and humidity conditions, then progressing the thus formed cover and the thus formed tray toward one another and then closing the box by effecting the positioning of the cover about the neck of the tray under substantially the aforesaid temperature and humidity conditions.

4. The process of making a paper box formed of a tray having a neck formed separately from and inserted within the body of the tray and a cover telescoping on the neck, comprising producing the strips for the

cover rim, the neck and tray rim, and forming the cover rim and applying the top and separately forming the neck and the tray rim and applying the bottom substantially under the same conditions, thereafter progressing the formed cover and the formed tray toward one another and then closing the box by effecting the positioning of the cover on the neck of the tray under substantially the aforesaid conditions.

5. The process of making a paper box formed of a tray having a neck formed separately from and inserted within the body of the tray and a cover telescoping on the neck, comprising producing the strips for the cover rim, the neck and tray rim, and forming the cover rim and applying the top and forming the neck and the tray rim and applying the bottom substantially under the same temperature and humidity conditions, thereafter progressing the formed cover and formed tray toward one another and then closing the box by effecting the positioning of the cover on the neck of the tray under substantially the aforesaid temperature and humidity conditions.

6. The process of making a paper box having a neck of material separate from and inserted within the body of the tray of the box comprising producing the strips for the cover rim, the neck and tray rim, then forming the cover rim and applying the top and separately forming the neck and forming the tray rim and applying the bottom substantially simultaneously, then inserting the neck within the formed tray while progressing the formed cover; then progressing the tray with the neck inserted therein and the cover toward one another and then substantially immediately thereafter closing the box by effecting the positioning of the cover on the neck.

7. The process of making boxes comprising providing coincidently strips of board for the cover rim, neck and tray rim; forming coincidently the cover rim, neck and tray rim; applying the top and the bottom coincidently to the formed cover rim and formed tray rim respectively; then applying the cover onto the tray and then hinging the cover to the tray.

8. The process of making boxes comprising providing coincidently strips of board for the cover rim, neck and tray rim, forming coincidently the cover rim, neck and the tray rim; pressing the formed cover rim, formed neck and the formed tray rim; then applying the cover to the tray and then hinging the cover onto the tray.

9. The process of making boxes comprising providing coincidently strips of board for the cover rim, neck and tray rim, forming coincidently the cover rim, neck and the tray rim and applying the top and the bottom to the formed cover rim and formed tray rim respectively; pressing the formed cover to the formed tray, then closing the box and then hinging the cover onto the tray.

10. The process of making a box comprising forming the cover rim, neck and the tray rim coincidently while applying the top and the bottom, pressing the formed cover and the formed tray, then closing the box and then applying the label to hinge the cover onto the tray.

11. The method of making boxes comprising forming the cover rim, the neck and the tray rim, while coincidently applying the top and the bottom, pressing the formed cover rim and cover, the formed neck and the formed tray rim and bottom, then closing the box and then applying a label to hinge the cover onto the tray.

12. The process of making boxes comprising providing coincidently strips of board for the cover rim, the neck and the tray rim; forming coincidently the cover rim, the neck and the tray rim while at the same time applying the top and the bottom to the formed cover rim and the formed tray rim respectively, pressing the formed cover rim and top, the formed neck and the formed tray rim and bottom, then closing the box and then hinging the cover onto the tray.

13. The process of making a paper box comprising a tray having a neck of material separate from and inserted within the body of the tray and a cover positioned on the neck, comprising providing three strips of paper board respectively for the tray rim, the neck of the tray and the cover rim; applying finish paper to the said three strips of paper board substantially simultaneously; folding the neck and the tray rim and positioning the neck within the tray, and applying the bottom while simultaneously therewith folding the cover rim and applying the top; thereafter without substantial delay progressing the tray with the neck inserted therein and the cover toward one another and thereafter substantially without delay closing the box by effecting the positioning of the cover on the neck.

In testimony whereof we have signed this specification.

ALLAN A. ADAMSON.
WILLIAM F. GRUPE.