

H. B. SMITH.
METHOD OF AND MECHANISM FOR MAKING COVERED BOX SHELLS.
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1,402,259.

Patented Jan. 3, 1922.

2 SHEETS—SHEET 1.

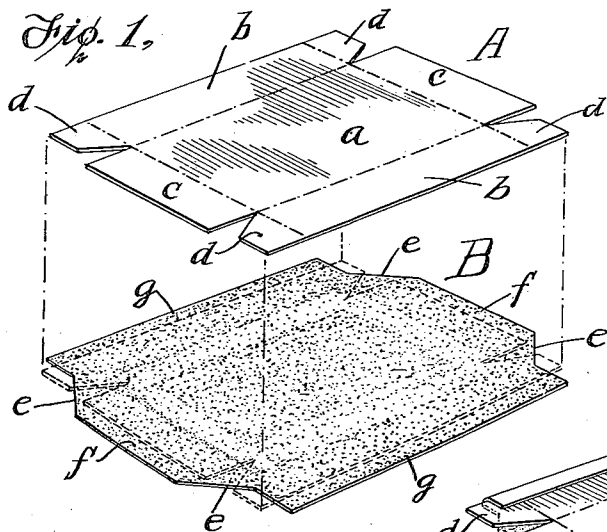


Fig. 2,

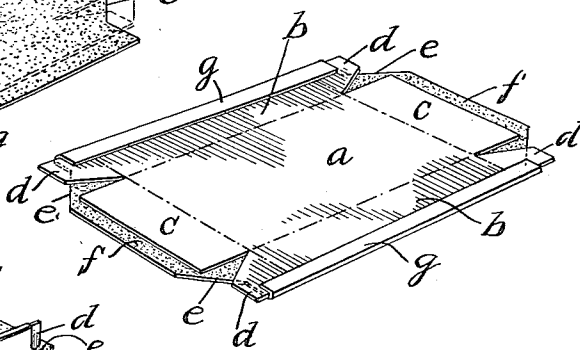


Fig. 3,

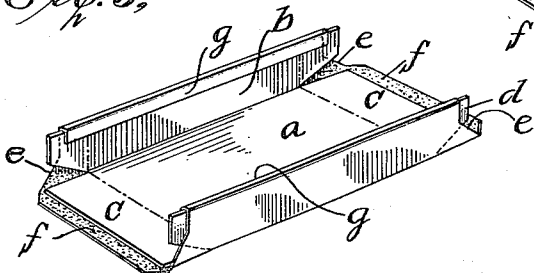


Fig. 4,

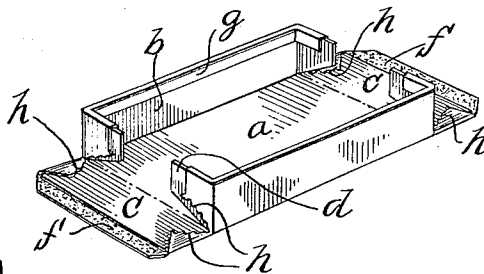


Fig. 5,

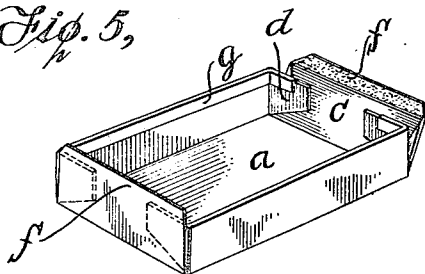
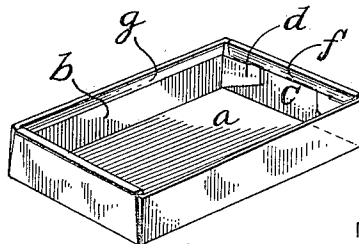


Fig. 6,



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METHOD OF AND MECHANISM FOR MAKING COVERED BOX SHELLS.

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To all whom it may concern:

Be it known that I, HARRY BRIDGMAN SMITH, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Methods of and Mechanism for Making Covered Box Shells, of which the following is a specification.

My present invention relates to the art of making covered paper boxes of that type wherein the box shell has an externally applied cover blank of plain, printed or decorated material, usually paper, but sometimes composed of fabric.

Boxes of this type have heretofore been manufactured by first cutting out the shell blanks and the cover blanks in separate machines, then the shell blanks are folded to box form and "set up" by corner-staying operations, and then, as a separate operation, and by a different machine the cover blanks are applied to the "set up" box shells, marginal portions of the cover blanks being inturned over the edges of, and adhesively affixed to, the inner faces of the side and end walls of the shells. The operations of inturning and affixing the marginal portions of the cover blanks have always, as far as I am aware, been the final steps in the covering operation.

The object of the present invention is to greatly simplify the prevailing manufacturing method; reduce the number of operations; increase the rate of production, and therefore materially reduce the cost of the finished product due to these factors.

According to my improved method I assemble the box-shell blank or web and the cover-blank or strip in superposed relation while these elements are substantially "flat," and I also inturn and affix marginal portions of the cover blank or strip to wall portions of the shell blank or web while these elements are substantially "flat," so that the operation of covering the shell blank, including a part of the marginal "turn-in" is actually completed before said blank is folded to final box form. The manner of applying the cover blank or strip is such as to obviate entirely the necessity for corner-staying the box shell, the cover blank itself being in most instances, sufficient to maintain the box-shell in its final "set up" condition, although in some instances and with some

forms of boxes, the box shell blank may be additionally held in box form by "spots" or "zones" of adhesive properly applied.

While my improved method may be carried out by operating with two separately cut blanks, I prefer to operate with webs, strips or sheets of material by advancing these in proper superposed relation and effecting the assembling, cutting, inturning, and folding in regular sequence and by a continuous operation, so that where mechanism is employed to carry out the method, webs, strips, or sheets may be fed into the machine at one or more points, and the completely formed and covered boxes will be delivered from the machine at another point.

My present invention then relates to an improved method of and mechanism for making covered box shells and in order to enable others skilled in the art to understand and practice the same, I will proceed to describe the method and one form of mechanism for carrying the method into effect, it being understood however that the present showing is merely by way of illustration and is not to be taken as restrictive, except by a fair interpretation of the claims, it being perfectly obvious that modifications will suggest themselves without departing from the spirit of the invention.

In the annexed drawings—

Figure 1 is a perspective view of one form of box shell blank and its cover-blank about to be assembled in superposed relation.

Figure 2 is a perspective view of the assembly prior to folding in box form, marginal portions of the cover blank being shown infolded and affixed to wall portions of the shell-blank.

Figures 3, 4 and 5, show successive steps in the folding operation of the assembly.

Figure 6 is a perspective view of a box made in accordance with the invention.

Figure 7 is a side elevation partly in section, of one form of mechanism for carrying the invention into effect according to the continuous method.

Figure 8 is a detail of a web of the box shell material and a superposed liner web as they are fed to the machine.

Figure 9 is a detail perspective view of a form of cutting and scoring die for the shell blank web.

Figure 10 is a perspective view showing

the two superposed webs as they appear when passing through the machine.

Figure 11, is a perspective view of a punched-out part of the shell blank web.

5 Figure 12, is a perspective view of one form of presser roll employed in the machine.

Figure 13, is a perspective view of a portion of the assembled webs looking at the reverse side from that shown in Fig. 10, and illustrating marginal portions of the cover web intumed over and affixed to side wall members of the shell blank web, and showing also the spots or zones of adhesive employed in holding the shell blank in "set up" condition.

Figure 14, is a perspective view showing another punched out portion of the assembled webs formed when the finished "assembly" so called, is severed from the web.

Figure 15, is a perspective view of one form of folding mechanism for folding portions of the "assembly" in the formation of the finished product.

Figure 16, is a perspective view showing a form of end-flap turn-in mechanism.

Figure 17, is a sectional view of a form of mechanism for infolding the remaining marginal portions of the cover blank after the box shell has been otherwise completely covered.

Figure 18, is a perspective view of one form of covered box made in accordance with the invention.

In Figs. 1 to 5 inclusive I have illustrated the various steps performed in making and covering one type of box according to my improved method, it being understood of course that the form of the blanks is merely illustrative and that these will vary somewhat depending upon the particular style of box it is desired to produce. In the type illustrated, A designates the box-shell blank, usually of card-board, and B, the covering blank, usually of plain or ornamental finishing paper which may be printed with labels if desired.

The shell-blank, in the instance illustrated, is cut and scored, as shown to provide a body portion *a*, having integral side wings *b*, and end wings *c*, the side wings *b* having integral end-laps *d*, at the opposite ends thereof. The said side and end wings, and end laps, when folded up at right angles to the body portion *a* of the blank, form a box shell having reinforced ends. Shell blanks of this type are now in common use, and the practice has been to apply the cover blank thereto after the shell blank has been completely "set up" into box form or during the folding operation. According to my improved method, as will presently appear, I propose to apply the cover blank to the shell blank while the latter is substantially

flat producing a covered assembly which is afterwards folded and set-up.

The cover blank B, in the instance shown is in the form of a sheet of approximately rectangular form, having portions *e* of obtuse angle formation cut away at the corners leaving marginal extensions *f*, at opposite ends of the blank.

The cover blank is of greater dimensions than the shell blank as shown except that the cut away corner portions *e* may, if desired, leave portions of the end-laps *d*, exposed so that such portions may be adhesively attached to the end wings *c*, in cases where the shell blanks are to be secured in "set up" condition, by means other than, or in addition to the cover blank, all as will hereinafter appear.

In making boxes according to my improved method and with the blanks described, I provide a flat assembly by arranging the blanks, or blank strips or webs, while substantially flat, in superposed relation, one or the other, (preferably the cover blank,) having had a surface coating, or zones of adhesive applied thereto, so that the shell blank will be completely covered on one face. I then, while the blanks are still substantially flat, intume the exposed marginal portions *g*, of the cover blank over the opposite edges of and adhesively affix them to the opposite or uncovered face of the shell blank as illustrated in Fig. 2, completing the assembly, these intuming operations being preferably carried on simultaneously and preferably, but not necessarily, during advancing movement of the blanks, all as will presently appear. The assembly having been formed I then turn up, or down as the case may be, the two covered side wings *b*, as shown in Fig. 3, to form the side walls of the box shell, these walls being then completely covered including the "turn in" as clearly appears from the drawing. The end laps *d*, at the opposite ends of the side wings *b*, are then folded inward toward each other as shown in Fig. 4, these operations being preferably performed simultaneously. During these infolding operations the upstanding web portions of the cover blank adjacent the corners of the shell are slit, cut or torn as indicated at *h*, Fig. 4, said web portions being adhesively affixed to the inner faces of the end wings *c* of the shell blank so that they cover the raw edges at opposite ends of the end wings and leave portions that will lie between adjacent plies of the multiple end wall construction of the finished box. Of course the cover blank could be previously slit or cut at the points *h* where they are similarly cut or torn during the end-lap folding operation as just described, but this would then require an accurate centering and registration of the shell blank and cover blank dur-

ing the assembling operation which is more or less slow and tedious. Where the blank is unslitted as shown, this registration is not required and I consider this as an important feature of the invention resulting in a great saving both in cost of production and output, since there is practically no waste such as results from improper registration of adhesively assembled blanks.

After the end laps *d* have been folded as described, then the covered end wings *c*, are folded up as shown in Fig. 5, and the marginal portions *f*, of the cover blank at the opposite ends of the box are intumed over the upper edges of and adhesively affixed to the inner walls thereof, to complete the covering and setting-up operations, these marginal portions serving in and of themselves to maintain the box in its set-up condition as illustrated in Fig. 6.

While the covering, folding and setting-up operations may be carried out by hand in the manner described, I contemplate performing these operations continuously and in steps or stages by employing webs, strips or sheets, which are assembled and from which the companion blanks are cut and folded into finished box-shell form. This for many reasons is the preferred method, and a form of mechanism for carrying the same into effect is illustrated in Figs. 7 to 17 inclusive.

Referring more particularly to Fig. 7, the reference numeral 1, designates a roll of box blank stock in the form of a box-board web, and 2 designates a roll of lining paper in the form of a paper strip which may or may not be employed as desired. It is employed only when the boxes are to be finished on the interior as well as the exterior. In most cases interior finish is not required. When employed the strip 2, is run over adhesive applying rolls 3, fed with adhesive from a tank 4, by distributing rolls 5. The two webs are fed forward between presser rolls 6, which adhesively attach the webs. The lining strip 2 is preferably a little narrower than the box-blank web 1, as shown in Fig. 8.

The lined or unlined web 1, as the case may be, is then fed forward between a pair of companion die-members, here shown in the form of rolls 7 and 8, but which may be of any preferred construction. The roll 7 carries transverse and circumferential scoring blades 9 and a cutting die 10, Fig. 9, shaped to cut regularly spaced openings in the web 1, these openings, in the instance shown, being in the form of double pointed arrows, as shown in Fig. 10, one of the punched-out pieces as 12, being illustrated in Fig. 11. The blades 9 form longitudinal and transverse score lines in those portions of the web between each punched-out opening to provide a succession of embryo box shell blanks A connected by the web portions

h, parts of which are subsequently cut away, as will presently appear. Each embryo blank when completely formed will have a body portion *a*, side wings *b*, end wings *c*, and end laps *d*, as heretofore described and as illustrated in Fig. 1, of the drawings.

The punched-out web is then fed further forward, and as it is advanced there is superposed thereon the cover strip B which ultimately constitutes the exterior cover or finishing blank for the box-shell being formed. This cover strip, in the instance shown, is taken from a roll 13, the strip passing over suitable glue-applying rollers 14, the glue being supplied to the rollers 14 from a tank 15 by means of distributor rolls 16. The adhesively coated cover strip is pressed into uniting relation with the web 1 by means of a pair of combined feed and presser rolls 17 and 18, the roll 18 being preferably provided with transverse and circumferential grooves or depressions 19, as more clearly shown in Fig. 12, so that the adhesively coated cover-strip B will not be closely united with the web 1 along the lines where the side and end walls of the finished blank are folded up to box-shell form. This is done for the purpose of enabling the composite blank or assembly to be readily folded along the scored lines without unduly straining or tearing the cover blank or strip, which straining or tearing would likely occur, especially where certain kinds of covering material are employed, if the two strips were intimately united along the folding lines of the blank. I consider this one of the distinctively novel features of my improved method and while it may not be necessary with some forms of covering material to leave certain zones ununited as described, yet with other kinds of material this is very important.

After leaving the combined presser and feeding rolls 17 and 18, where the two blanks are united forming an "assembly", the composite web is then fed further forward between a pair of oppositely-disposed folding horns 20 which operate to turn over and infold the marginal portions *g* of the web and adhesively affix them to the opposite or uncovered face of the blank, as shown in Fig. 13, this infolding and affixing of the said marginal portions being carried on while the blanks or web and strip from which they are formed are maintained in a substantially flat condition.

If the boxes ultimately be formed from the assembly are to be adhesively held in a set-up condition by means other than the infolded portions of the cover blank itself as hereinafter described, such adhesive which may be in the form of spots or zones, *i*, Fig. 13, may be appropriately applied to the end wings, *c* of the blanks, as they are fed forward, by means of a suitable spotter

shown in the present instance as in the form of a roll 21, having glue applying pads which receive adhesive from a tank or receptacle 22 through the medium of distributor rolls 23, all as clearly shown in Fig. 7.

A plate 24 operating in opposition to a presser roll 25 serves to maintain the composite web or strip, in a substantially flat condition during the operation of adhesively affixing the marginal portions *g* of the cover strip to the web 1, and a roll 26 operates in opposition to the glue spotter 21 to support the composite web during the glue-spotting operation.

The composite web or assembly now passes between a second pair of die members shown in the form of co-operating rolls 27 and 28, the roll 27 carrying a suitably constructed die or dies which cut small sections *j*, Fig. 14, from the web portions at opposite edges of the composite strip and likewise sever the strip transversely and centrally and longitudinally of the double pointed arrow-shaped openings to provide covered box-shell assembly sections as more clearly shown in Fig. 10, wherein it will be seen that the transverse cutting of the assembly leaves free marginal portions *f* of the cover material projecting beyond the edges of the end wings *c* of the box shell blank to be folded over the marginal edges of the end wings of said blank when the assembly is folded into box form. The co-operating die rolls 27 and 28, operate upon the web to deliver the assembly sections successively between a pair of feed rolls 29 and a pair of co-operating wing-folding rolls 30 and 31, the roll 30 being flanged at 32 as more clearly shown in Fig. 15, so that as the assembly sections are fed between the rolls, the two oppositely disposed and covered side wings *b* of the cover blank will be folded at right angles to the body portion *a*.

The feed rolls for the severed assembly sections are driven at a speed slightly in excess of the speed of travel of the composite web in order that the severed assembly sections may be moved forward quickly when severed by the companion rolls 27 and 28.

The thus partially folded assembly is then fed further forward between a pair of opposite vertically arranged rolls 33, one of which is shown to the left of Fig. 7, the advance edge of the assembly sections finally abutting against a transverse stop 34 to position the sections so that the body portion *a* thereof will overlie the face of a reciprocating plunger 35. As soon as a partially folded section has been delivered onto the plunger, as described, two pairs of oppositely disposed wing-folders 36, Fig. 16, are caused to move inward toward each

other, and thus fold the end laps *d* of the assembly inwardly to the position as indicated in Fig. 4. The wing folders 36 are preferably provided with lateral flanges 36' adapted to engage and tear or cut portions of the cover blank at *h* during the wing folding operation as heretofore described and simultaneously infold parts of the severed portions over the opposite raw edges of the end wings *c* of the cover blank and adhesively affix them thereto, as illustrated in Fig. 4.

The plunger 35 then carries the partially folded blank through a suitable mechanism for completing the folding and setting up of the boxes. This mechanism may be of any approved construction. In the instance shown, it comprises a pair of rolls 37, preferably rubber-covered, which rolls operate to turn down the end wings *c* of the assembly, as the latter is forced therebetween, so that said wings will overlie the previously infolded end laps *d*, as more clearly shown in Fig. 5, portions of the cover strip being thus confined between the said end laps and end wings, and all raw edges neatly covered.

The plunger 35, which may be operated by an appropriate mechanism (not shown) carries the partially folded assembly through the rolls 37 and then comes to rest momentarily to enable presser blocks 38 which may be operated in any suitable means, such as toggle joints 39, to move in and firmly press the walls of the box shell against the plunger to maintain said walls true, and while thus held under pressure edge turn-in fingers 40, Figs. 7 and 17, move inward carrying with them the marginal portion *f* of the cover blank, folding these portions over the marginal edges of the end walls of the box. The plunger 35 is preferably made up of two parts, one of which is in the form of a plate 41 carried by suitable means such as rods 42, so as to be operated independently of the plunger, as well as with it. When the plunger has carried the partially formed box-shell to the position where the edge turn-in fingers 40 operate, the plate part 41 of the plunger is separated from the main part 35, so that the marginal portions *f* of the cover blank may be inturned between the adjacent faces of the plate 41 and the plunger. The plate 41 is then caused to advance into the formed box-shell carrying with it the inturned marginal portions *f* of the cover blank and causing said portions to become adhesively attached to the inner faces of the end walls *c* of the box-shell, thus completing the covering and setting-up operation, the finished box being maintained in its set-up condition by the adhesively attached marginal portions *f*, as heretofore described. Just prior to the inturning operation as described, the toggle links 39 are

operated by any suitable means to cause the presser blocks 38 to move slightly away from the walls of the box-shell and immediately after the inturning operation performed by the plate 41, the presser blocks 38 are again caused to exert pressure against the end walls of the box including the inturned marginal portions in order that these portions may be securely affixed so that the box will be firmly held in its set-up condition.

The box having now been completely covered, the presser blocks 38 are again moved away and the plunger is caused to advance further so as to carry the box into a well 43, preferably provided with brush walls 44, these walls yieldingly engaging the exterior of the boxes delivered into the well and retaining them a sufficient length of time to enable the glue to set. The plunger now withdraws from the box and is moved to its initial position where the described cycle of operations is repeated.

I have not shown the various mechanical parts necessary to give the described movement to the several cover-applying devices, as my present invention is not concerned especially with these, and furthermore because any well-known mechanical element may be employed for the purpose, my present invention being more particularly directed to the method described of simultaneously making and covering finished box-shells and any form of mechanism may be employed for the purpose, although I prefer a form of mechanism somewhat as shown wherein the parts operate and are so constructed and arranged that webs or sheets may be fed into the machine continuously at one or more points, and completely covered and set-up boxes delivered at another point.

I do not wish to be understood as limiting myself to a construction or mode of operation where in all the successively operating parts or steps work in the precise manner stated, as obviously certain parts of the machine as well as certain steps of the method may be associated with different mechanisms or steps than those shown and described, or may be constructed and operated as independent steps or mechanisms without departing from the broad spirit of the invention, and I have thus directed some of the appended claims to what I believe to be novel steps in a method and novel devices or mechanisms for making and covering box shells.

In the illustrated embodiment of the invention I have shown and described what is commonly termed in the art as a "tight-wrapped" box, that is to say, a box wherein the cover-blank is adhesively attached to all portions of its exterior walls. It is obvious however, that the same method may be employed in making what are known in the art

as "loose-wrapped" boxes, that is to say, boxes wherein the cover blank is loosely applied to the exterior walls thereof and affixed only at the marginal edges of the cover-blank where such edges are inturned over and into the box-shell. Where "loose-wrapped" boxes are made the attaching adhesive is applied in stripes or zones, as is customary.

The expression "substantially flat" as herein employed, is intended primarily to cover constructions wherein the side wings as *b* of the shell blank, or those portions of the web which ultimately constitute such side wings, lie in substantially the plane of the body portion as *a*, of the blank or its web, it being understood that in the practice of the method it is not necessary that the end wings as *c*, of the blank shall lie in the plane of the body portion during the marginal inturning operation as the marginal edges of such end wings are not covered by the marginal portions of the cover blank until the box shell assembly has been finally folded into box form.

Where mechanism is employed to operate upon initially cut individual box shell blanks and cover blanks as shown in Figs. 1 to 5 inclusive, as distinguished from forming the boxes from continuous webs, I may provide any suitable mechanism for advancing and assembling the individual blanks, including means for applying a surface coating of glue to the cover blank and I prefer to advance the blanks with one of the side wings *b* of the shell blank foremost, causing it to meet the cover blank at a point removed from the forward edge thereof a sufficient distance to permit the marginal portion *g* of the cover blank to be inturned over and affixed to the shell blank. The other marginal portion *g* of the cover blank may if desired be turned over and affixed to the shell blank during a subsequent stage and thereafter the thus partially covered shell blank may be folded and set up in box form by any suitable form of mechanism.

It is to be understood that during the assembling and marginal infolding and affixing operations, the end wings *c* of the shell blank need not necessarily remain in the plane of the other portions of the blank, but may be upstanding or infolded over the body portion of the blank as desired. Operations or blank manipulations of this character fall within the spirit of the invention.

What I claim is:

1. The method of making covered paper boxes, which consists in producing a substantially "flat" assembly consisting of a box-shell blank having a body portion and side and end wings and a superposed cover blank of greater dimensions than the shell blank having marginal portions thereof infolded over and adhesively attached to the

opposite edges of said shell blank, then folding said side and end wings of the assembly at substantially right angles to the body portion of the shell blank to provide a box shell, and finally inturning the remaining marginal portions of the cover-blank over the edges of their associated box-walls and adhesively attaching the same to the inner faces of such walls, whereby to maintain the covered box-shell in a permanently set-up condition.

2. The method of making covered paper boxes which consists in producing a substantially flat assembly consisting of a box-shell blank having a body portion and side and end wings, the latter provided with end-laps, and a cover blank of greater dimensions than the shell blank having opposite marginal portions infolded over and adhesively attached to opposite wings and end-laps of the shell blank, then folding the assembly into box form with portions of the cover blank infolded between the said end-laps, and end wings of the shell blank, and finally inturning the remaining marginal portions of the cover blank over the edges of and adhesively attaching them to the inner faces of their associated wings whereby to maintain the covered box into a permanently set-up condition.

3. The method of making covered paper boxes which consists in simultaneously advancing and assembling in superposed relation a shell blank web and a covering strip to cover one face of the web, punching regularly spaced openings in the shell blank web prior to the assembly to provide a succession of embryo box blanks, each having a body portion and side and end wings, inturning marginal portions of the covering strip over and adhesively affixing them to the opposite face of the prepared shell blank web to provide an assembly, severing the assembly transversely on a line intersecting the said spaced openings to provide box forming sections and then folding the severed sections into box shell form.

4. The method herein described of making covered paper boxes which consists in simultaneously advancing in superposed relation a shell blank web having regularly spaced openings and a covering strip arranged to cover one face of said web and overlies said openings, inturning marginal portions of the cover strip over and adhesively affixing such portions to the uncovered face of the shell blank web to provide an assembly consisting of a succession of embryo covered box shell blanks, severing box shell forming sections from the assembly, and then folding the severed sections into box shell form in successive stage operations.

5. The method of making covered boxes which consists in advancing a shell blank web, punching said web at intervals to pro-

vide embryo shell blanks, advancing a covering strip, arranging the said web and strip in superposed relation to cover one face of the web, inturning marginal portions of the strip over the opposite edges of and adhesively affixing them to the opposite face of the web, severing the covered web transversely to provide box shell assembly sections, and then folding said sections into box form.

6. In a method of making covered paper boxes, the steps which consist in assembling while in a substantially flat condition, a shell blank having a body portion with side and end wings and corner laps and a cover blank of greater length and width than the shell blank, inturning marginal portions of the cover blank over the edges of two of said wings and their corner laps and adhesively affixing the same to the uncovered face of the shell blank while the latter is in a substantially flat condition, to provide an assembly, then folding the assembly into box form, and finally inturning and affixing other marginal portions of the cover blank over the edges of the end wings and corner laps of the formed box at the ends thereof.

7. The method of making covered paper boxes which consists in advancing a shell blank web, punching spaced openings in the web during its advance to provide embryo box shell blanks, advancing a cover strip in superposed relation to the punched web to cover one face thereof, inturning opposite longitudinal edges of the cover strip over opposite longitudinal edges of and adhesively affixing the same to the uncovered face of the web, severing the covered web transversely to provide a succession of box forming assemblies, and then folding the assemblies into box form.

8. In a method of making covered paper boxes, the steps which consist in advancing a shell blank web, punching spaced openings in the web to provide a succession of embryo box shell blanks, advancing a cover strip in superposed relation to the punched web to cover one face thereof, and then inturning opposite longitudinal edges of the cover strip over opposite longitudinal edges of and adhesively affixing the same to the uncovered face of the web to provide an assembly.

9. As an improvement in the art of manufacturing covered paper boxes, the steps which consist in advancing a web having regularly spaced openings providing a succession of embryo box shell blanks connected in web form, each blank having a body portion and integral side and end wings, advancing a cover strip in superposed relation therewith to cover one face of the web including said openings, inturning marginal portions of the cover strip over marginal edges of and adhesively affixing them to the uncovered face of the web, and finally sev-

ering the covered web transversely to provide a succession of covered box shell assemblies.

10. In a method of making covered paper boxes wherein an assembly of a shell blank and an adhesively coated cover blank is provided and wherein the shell blank has a body portion and side and end wings joined thereto along folding lines, the step which consists in adhesively attaching the cover blank to one face of the shell blank, leaving unattached those portions of the cover blank which overlie and are adjacent to the folding lines of the shell blank.

11. The method of making covered paper boxes which consists in arranging in superposed relation a box shell blank and an adhesively coated cover blank, wherein the shell blank is provided with folding lines, adhesively uniting the two blanks by imparting an initial pressure to portions thereof adjacent the folding lines, thereafter folding the blank along such folding lines to form a box shell, and then pressing and attaching the unattached portions of the cover strip to the shell.

12. The method herein described of making covered paper boxes which consists in advancing in superposed relation a shell blank web and a covering strip to cover one face of said web, adhesively attaching the said web and strip by pressure, leaving unattached, portions that are subsequently to be folded, inturning marginal portions of the cover strip over the edges of and adhesively affixing them to the uncovered face of the shell blank web to provide an assembly, severing box-forming sections from the assembly, and then folding the severed sections into box-shell form and attaching to the shell blank walls the unattached portions of the cover strip.

13. In a machine for making covered paper boxes, means for advancing a shell blank web and a cover strip in superposed relation, with marginal portions of the cover strip extending beyond the opposite longitudinal edges of the shell blank web, means for punching openings in the shell blank web at regularly spaced intervals to provide a connected succession of embryo box shell sections, means for inturning marginal portions of the covering strip over and adhesively affixing them to the uncovered face of the shell blank web to provide an assembly, and means for severing the web and cover strip transversely through each opening to provide covered box forming sections each having a body portion with integral side and end wings and with marginal portions of the cover projecting beyond the end wings of the shell blank.

14. In a machine for making covered paper boxes, means for advancing a shell blank web and a cover strip in superposed

relation, with marginal portions of the cover strip extending beyond the opposite longitudinal edges of the shell blank web, means for punching openings in the shell blank web at regularly spaced intervals to provide a connected succession of embryo box shell sections, means for inturning marginal portions of the covering strip over and adhesively affixing them to the uncovered face of the shell blank web to provide an assembly means for severing the web and cover strip transversely through each opening to provide covered box forming sections, each having a body portion with integral side and end wings and with marginal portions of the cover projecting beyond the said end wings of the shell blank, and mechanism for folding the said sections into box shell form.

15. In a machine for making covered paper boxes, means for advancing a shell blank web, means for punching openings in said web at regularly spaced intervals to provide embryo box shell blanks, means for advancing a cover strip, means for applying adhesive to one face of said strip, means for bringing the two strips into superposed relation, means for inturning the marginal edges of the cover strip over the edges of and adhesively affixing them to the uncovered face of the shell blank web, and means for severing the web and cover strip transversely from said openings to provide covered box shell forming sections, each including a shell blank having a body portion with integral side and end wings and with marginal portions of the cover projecting beyond the said end wings of the shell blank.

16. In a machine for making covered paper boxes, means for forming a substantially flat box forming assembly consisting of a box shell blank having a body portion and integral side and end wings and a cover blank of greater dimensions than the shell blank, with marginal portions of the cover blank infolded over opposite marginal edges of and adhesively attached to the uncovered face of the shell blank, and means for subsequently folding the said assembly into box form, said latter means including devices for inturning the remaining marginal portions of the cover blank over and affixing them to the inner walls of the formed box.

17. In a machine for making covered paper boxes, means for advancing an assembled box shell blank and cover blank, means for inturning marginal edges of the cover blank over and adhesively attaching them to opposite edge portions of the shell blank, means for folding the assembly into box form, and means for inturning and adhesively attaching marginal portions of the cover blank at the ends of the formed box to the inner faces of the end walls.

18. In a machine for making covered

paper boxes, means for adhesively assembling in superposed relation a shell blank having a body portion and side and end wings and a cover blank of greater dimensions than the shell blank, means for inturning the side marginal portions of the cover blank over and adhesively attaching them to marginal portions of the shell blank, and means for folding the assembly into "set up" box form, said means including devices for inturning the marginal portions of the cover blank over the edges of the end wings of the shell blank.

19. In a method of forming covered box shells from an assembly including a box shell blank and a cover blank, wherein said blanks have integral side wings and end laps, the step which consists in inturning the end laps and simultaneously severing portions of the cover blank overlying the end-laps and adjacent the corners of the box.

20. In a method of forming covered box shells from an assembly including a box shell blank and a cover blank wherein said blanks have integral side and end wings and end laps, the step which consists in inturning the end laps and simultaneously severing portions of the cover blank adjacent the corners of the box and affixing portions adjacent the severed line to the inner face of the end wings of the shell blank.

21. In a machine for forming covered box shells from an assembly including a box shell blank and a cover blank wherein said blanks have integral side wings and end laps, a wing-folder adapted to infold the said end laps and portions of the cover blank, said wing-folder being provided with means for severing a portion of the cover blank adjacent the end lap during the infolding operation.

22. In a machine for making covered paper boxes, means for advancing a shell blank web, means for punching openings in said web at regularly spaced intervals to provide embryo box shell blanks, means for advancing a cover strip, means for bringing the two strips into superposed relation to cover one face of the web and overlie said openings, means for inturning marginal edges of the cover strip over the edges of and adhesively affixing them to the uncovered face of the shell blank web, and means for severing the web and cover strip transversely through said openings to provide covered box shell forming sections, each having a body portion and side and end wings with free portions of the cover projecting beyond the edges of the end wings of the shell blank.

23. In a machine for making covered paper boxes, means for advancing a shell blank web, means for creasing the web longitudinally and transversely to provide bending or folding lines, means for punching openings in said web at regularly spaced intervals to provide a connected succession of embryo box shell blanks, means for advancing a cover strip, means for bringing the two strips into superposed relation and adhesively attaching them to provide an assembly, means for severing the assembly transversely and cutting sections from opposite edges thereof on lines intersecting the said regularly spaced openings to provide individual covered box shell forming sections, each having a body portion and side and end wings with portions of the cover extending beyond the edges of the shell blank end wings, and means for folding the said sections into box form.

24. In a machine for making covered paper boxes, means for advancing a shell blank web, means for creasing the web longitudinally and transversely to provide bending or folding lines, means for forming regularly spaced openings in the web to provide a connected succession of embryo box shell blanks, means for advancing a cover strip and adhesively attaching the same to the said prepared web in overlying relation to the said openings, means for inturning marginal edges of the cover strip over the edges of and adhesively affixing them to the uncovered face of the shell blank web to provide an assembly, and means for severing the web transversely and cutting sections from opposite edges thereof on lines intersecting the said openings to provide individual covered box shell forming sections, each having a body portion and side and end wings with portions of the cover extending beyond the free marginal edges of the shell blank end wings.

25. In a method of forming covered box shells from an assembly including a box shell blank consisting of a body portion having side wings with corner laps and end wings, and a cover blank of greater dimensions than the shell blank, the step which consists in inturning the corner laps on the formation of the end walls of the box and simultaneously inturning and affixing portions of the cover blank to opposed faces of the inturned corner laps and their companion shell blank end wings.

In testimony whereof I have hereunto set my hand.

HARRY BRIDGMAN SMITH.