H. B. SMITH.

METHOD OF MAKING BOXES.

APPLICATION FILED DEC. 20, 1920.

1,386,374. Patented Aug. 2, 1921.

Fig. 1.

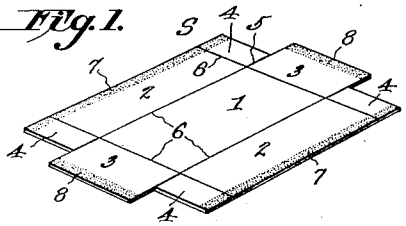


Fig. 3.

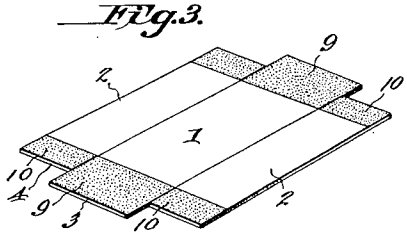


Fig. 2.

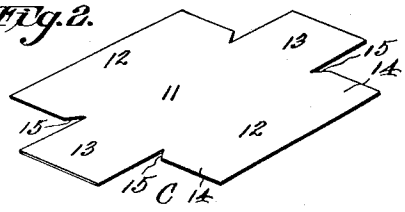


Fig. 4.

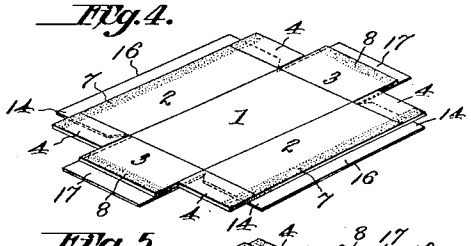


Fig. 7.

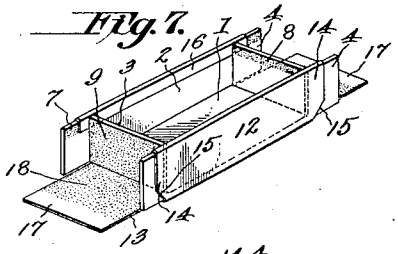


Fig. 5.

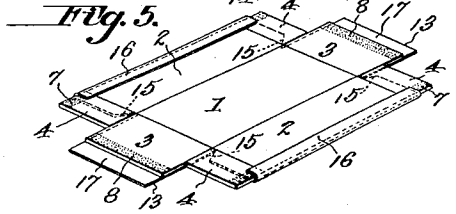


Fig. 8.

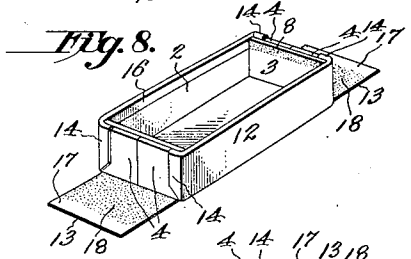


Fig. 6.

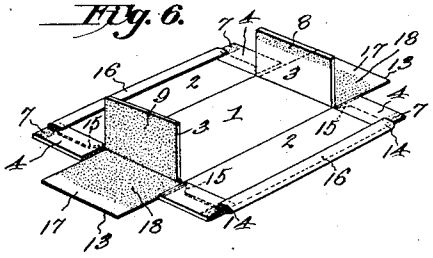


Fig. 9.

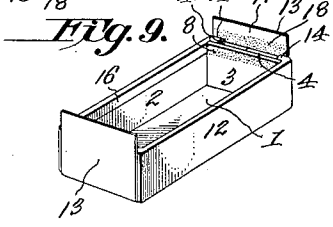
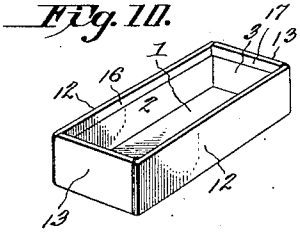


Fig. 10.



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UNITED STATES PATENT OFFICE.

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METHOD OF MAKING BOXES.

1,386,374. Specification of Letters Patent. Patented Aug. 2, 1921.

Application filed December 20, 1920. Serial No. 431,911.

To all whom it may concern:

Be it known that I, HARRY BRIDGMAN SMITH, a citizen of the United States, and resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Methods of Making Boxes, of which the following is a specification.

My invention relates to a method of making a distinctly new type of box which may be called for descriptive purposes, a semi-loose wrapped box. My companion application, executed on even date herewith, shows and describes a box of this style.

The general object of the present invention is to provide a suitably economical and rapid method for producing such boxes. The present invention is, in certain respects, an improvement upon methods of my invention described in my previous applications, Serial No. 254,630, filed September 18, 1918, and Serial No. 370,180, filed March 31, 1920.

According to the general method disclosed in said applications, a suitable sheet or blank of box shell material is brought into contact with a blank or sheet of covering material with adhesive supplied between them, usually by applying the adhesive to one of the confronting surfaces, either of the shell or cover, as may be preferred for various reasons. These initially assembled blanks, or the initially assembled sheets after being severed to bring them into assembly-blank form, usually comprise a body portion, side and end wings, and corner laps, and these parts are then bent or folded up into box form and secured together to form a complete box part.

According to previous methods, the engaging surfaces of the shell and cover are either adhesively connected throughout their entire areas to produce a tight-wrapped box, or only narrow marginal portions of the covered blank are adhesively connected to similar portions of the shell, to produce a loose wrapped box. In the present invention, certain considerable areas of the shell and cover are adhesively connected, such for instance as the entire end wing and corner lap surfaces, and other extensive, and usually larger areas of the two members such as the entire contacting body and side wing areas, are entirely unconnected by adhesive. Therefore, while my present invention enables boxes to be produced which have certain characteristics of a tight-wrapped box, considerably less adhesive is required than in the case of a tight-wrapped box, resulting in important saving in cost of production, and at the same time the boxes have certain of the desirable characteristics of loose wrapped boxes. The advantages and characteristics of boxes produced according to the present method are more particularly described in said companion application.

I will now describe with reference to the accompanying drawing one exemplifying performance of the method, and after considering this, persons skilled in the art will understand that many variations may be made in the method as a whole, and also in different subordinate steps or groups of operations; also that certain of the separate steps or groups of operations may be advantageously employed apart from others; and I contemplate the employment of any of the methods or method steps which are properly within the scope of the appended claims.

In the drawing, the views are all in perspective, and

Figure 1, shows the upper surface of a sheet of shell material, in this case cut into blank form, and supplied with marginal stripes of adhesive;

Fig. 2, shows a sheet of covering material, also cut into blank form;

Fig. 3, shows the under side of the shell blank with certain parts of its surface coated with adhesive;

Fig. 4, shows the shell blank applied to the cover blank;

Fig. 5, shows marginal wing portions of the cover folded over upon the side wing margins of the shell;

Figs. 6, to 9, inclusive, show successive stages of the formation of the shell and cover assembly into box form, and

Fig. 10, shows a completed box part.

A blank S of box shell material, usually cardboard of suitable thickness, is provided, comprising a body portion 1, side wings 2,

end wings 3 and corner laps 4, extending in this instance from the ends of the side wings. The blank is severed along the lines 5 to separate the inner ends of the corner laps from adjacent edges of the end wings, and the blank is creased or scored along the lines 6 to facilitate subsequent folding.

Stripes 7 of adhesive are applied along the outer margins of the side wings and outer ends of the corner laps and other stripes 8 of adhesive are applied along outer margins of the end wings, all of these stripes being on the upper surface of the shell blank as shown in Fig. 1. Adhesive is also applied to the under surface of the blank as shown in Fig. 3, this application of adhesive being most desirably, in the present embodiment of the invention, such that the entire bottom surfaces of the end wings are covered with adhesive 9, and the entire under surfaces of the corner laps are coated with adhesive 10.

A covering sheet, in the present case in the form of a cover blank C, is provided, usually of paper of suitable quality for boxes of the kind intended, this cover paper being usually thinner than the shell material. The cover blank usually has a shape corresponding more or less closely to that of the shell blank and, therefore, comprises in the present instance a body portion 11, side wings 12, end wings 13 and corner laps 14. The side wings, however, are preferably wider than the shell side wings 2 and the end wings 12 are preferably longer than the shell end wings 3, and the corner laps may conveniently be shorter in the direction of the length of the side wings, than the shell corner laps 4, and conveniently, also, the inner ends of the corner laps are cut away diagonally as at 15.

A shell blank prepared as described is placed with its under face downward upon a cover blank, producing the initial box-blank assembly shown in Fig. 4, in which side wing margins 16 and end wing margins 17 of the cover extend beyond the respective edges of the shell side and end wings, and the shell corner laps extend beyond the outer edges of the cover corner laps. The blanks are pressed together so that the adhesive surfaces 9 and 10 of the shell engage properly with underlying surfaces of the cover, and the latter surfaces are coated with adhesive by contact with the coated surfaces of the shell, this application of adhesive as to certain portions of the cover being conveniently termed an "offset" adhesive application. This method of applying adhesive by offset is more particularly explained in my previout application Serial No. 370,180, filed March 31, 1920, above referred to.

The projecting margins 16 of the cover are then folded over and pressed upon the adhesive stripes 7 of the shell wing margins, completing the box blank assembly, as shown in Fig. 5.

The adhesive applied to the blanks is of such character, and the previously and subsequently described operations take place in such an interval of time that the adhesive remains soft or moist until the performance of the method can be completed.

The shell end wings 3 are now peeled or stripped away from the cover end wings to such a position as that shown in Fig. 6, leaving surfaces 18 of the cover end wings 12 coated with adhesive by offset from the coated surfaces 9 of the shell wings 3. The side wing portions of the blank are then or substantially concurrently, folded up, as shown in Fig. 7, and the corner laps of the blank are turned in against the coated surfaces 9 of the shell end wings, as shown in Fig. 8. The cover end wings 12 are then folded up and pressed against the ends of the box structure, adhesive engagement thus being secured between adhesive surfaces 18 of the cover end wings and the outer surfaces of the assembly corner laps (and when the inward ends of the corner laps do not closely adjoin, parts of the adhesive surfaces of the cover end wings will be engaged with central portions of the shell end wings 3), and at the same time adhesive engagement is effected between the assembly-corner-laps and the adhesive surfaces of the shell end wings. The box is then in the condition shown in Fig. 9. The upstanding margins of the cover end wings are then turned inward and then down, and secured to adhesive stripes 8 of the shell end wings, producing a completed box, as shown in Fig. 10, characterized by the absence of any "raw" or exposed edges of shell material, and especially for the purposes of the present invention characterized by smooth and tightly glued outer end surfaces 13, corresponding in appearance to similar portions of a tight-wrapped box, and more or less loosely fitting outer side cover portions 12 and body cover portion, these side and body portions of the cover being entirely unconnected by adhesive to the underlying shell material and presenting the appearance of similar portions of a loose-wrapped box.

My previous application, Serial No. 254,630, above mentioned, describes methods by which a blank-assembly similar to that of Fig. 4 may be produced either by a "continuous" (web) method or by a "separate" (blank) assembly method. My previous application, Serial No. 370,180, also mentioned above, describes methods of applying adhesive by offset, similar in many respects to the method as here employed. Also in a companion application executed on even date herewith, which is in certain respects a continuation of said application, Serial No.

254,630, and in certain respects a division of application, Serial No. 370,180, I have also shown methods of offset adhesive application and box part manipulation in general available for purposes of the present invention, in connection with both the "separate" and "continuous" methods of assembly. After considering the exemplification of the present method above described, and especially after also considering the other applications referred to, persons skilled in the art will understand that many variations may be made within the principles of the present invention, too numerous to mention; and I contemplate the employment of any method or separate steps or combinations of steps which are properly within the scope of the appended claims.

Among many variations which may be made in the present method the following are included: The main adhesive applications, that is on end wing and corner lap surfaces, may be made to surfaces of the cover blank instead of the shell blank; the sheets of shell and cover material may be fed from continuous rolls and brought together, with adhesive applied to a surface of either web, and individual blank assemblies may then be cut from the continuous web assembly by suitable operations; suitable mechanical devices may be employed in the operations of separating the shell and cover end wings as well as in other steps of the method; and especially in the separate assembly method, application of adhesive to certain parts of the engaging surfaces of the shell or cover end wings, as the case may be, may be prevented by the insertion of separating or spacing devices when the blanks are initially brought together.

All of these and other possible variations are within the scope of certain of the claims.

The description of certain parts of the blanks or of the blank assembly as "end" and "side" wings, is intended for descriptive convenience, rather than as a limitation, since evidently if the length of the side wings is reduced, and the length of the end wings is increased, these parts may be indistinguishable, except arbitrarily; or the present end wings will appear to be side wings, and vice versa; also the corner laps may appear to be attached to the end wings rather than the side wings.

What I claim is:

1. A method of making boxes of paper or like materials, comprising preparing a blank-assembly consisting of a shell sheet and a cover sheet having end portions of considerable area in adhesive engagement and large intermediate areas unconnected by adhesive, and shaping the assembly into box-form.

2. A method of making boxes of paper or like materials, comprising preparing a blank assembly consisting of a shell sheet and a cover sheet having end portions of considerable area in adhesive engagement and large intermediate areas unconnected by adhesive, and shaping the assembly into box-form with portions of the assembly inserted between certain of the adhesively coated surfaces of the sheets.

3. A method of making boxes of paper or like materials, comprising preparing a blank assembly consisting of a shell sheet and a cover sheet having end portions of considerable area in adhesive engagement and large intermediate areas unconnected by adhesive, separating certain of the adhesively engaged portions of the sheets, and shaping the assembly into box-form, with certain portions of the blank assembly inserted between the previously-separated sheet-portions.

4. A method of making boxes of paper or like materials, comprising preparing a blank assembly consisting of a shell-sheet and a cover-sheet having substantially corresponding body portions, side and end wings and corner laps and having adjacent faces of the respective end-wings and corner laps in adhesive engagement, and having other adjacent surfaces unconnected by adhesive, and shaping the assembly into approximate box-form, with the assembly-corner-laps inserted between adhesive surfaces of the shell and cover end wings.

5. A method of making boxes of paper or like materials, comprising preparing a blank assembly consisting of a shell-sheet and a cover-sheet having substantially corresponding body portions, side and end wings and corner laps and having adjacent faces of the respective end-wings and corner laps in adhesive engagement, and having other adjacent surfaces unconnected by adhesive, separating the shell and cover end wings, shaping the assembly into approximate box-form with the corner laps between the separated end-wings, bringing the end wings back toward each other and into engagement with the corner laps, and completing the box-formation of the assembly.

6. A method of making boxes of paper or like materials, comprising preparing a blank assembly consisting of a shell-sheet and a cover sheet having substantially corresponding body portions, side and end wings and corner laps and having adjacent faces of the respective end wings and corner laps substantially completely coated with adhesives, and having other adjacent surfaces unconnected by adhesives, and shaping the assembly into approximately-complete box form with the assembly-corner-laps inserted between adhesive surfaces of the shell and cover end wings.

7. A method of making boxes of paper and similar materials, comprising bringing a sheet of box shell material and a sheet of cover material into flatwise contact, the

sheets having substantially corresponding body portions, side wings, end wings, and corner laps, with adhesive substantially covering the contacting areas of the end wings and corner laps, the contacting body and side wing areas of the sheets being substantially free from adhesive, folding extending marginal portions of the cover side wings over and adhesively securing them to upper surface margins of the shell sheet, separating the shell and cover end wings and thus presenting the previously-contacting surfaces of the wings covered with adhesive, shaping the assembled sheets into approximate box form and inserting the corner laps between the separated end wings, and bringing the end wings back toward each other with the corner laps adhesively secured between them.

8. A method of making boxes of paper and similar materials, comprising bringing a sheet of box shell material and a sheet of cover material into flatwise contact, the sheets having substantially corresponding body portions, side wings, end wings and corner laps, with adhesive substantially covering the contacting areas of the end wings and corner laps, the contacting body and side wing areas of the sheets being substantially free from adhesive, folding over extending marginal portions of the cover side wings and adhesively securing them to upper surface margins of the shell sheet, separating the shell and cover end wings and thus presenting the previously-contacting surfaces of the wings covered with adhesive, shaping the assembled sheets into approximate box form and inserting the corner laps between the separated end wings, and bringing the end wings back toward each other with the corner laps adhesively secured between them, and turning in and adhesively securing marginal portions of the cover end wings to inner surfaces of the shell end wings.

9. A method of making boxes comprising adhesively coating end wing and corner lap surfaces of one side of a shell blank, leaving side wing and body surfaces of the same side of the blank substantially uncoated, applying stripes of adhesive along margins of the other side of the shell blank, applying the shell blank to an approximately-similarly formed cover blank with the main coated side of the shell blank in facial contact with the cover blank, thus securing adhesive contact between portions of the blanks and applying adhesive by offset to the cover end wings and leaving body and side wing portions of the respective blanks unconnected by adhesive, separating the end wings of the cover and shell, bending the assembled blanks into approximate box form and inserting corner lap portions between the separated shell and cover end wings, and bringing the separated end wings back approximately together with adhesive surfaces of the shell and cover end wings respectively in contact with opposite sides of the assembly corner laps.

10. A method of making boxes comprising adhesively coating end wing and corner lap surfaces of one side of a shell blank, leaving side wing and body surfaces of the same side of the blank substantially uncoated, applying stripes of adhesive along margins of the other side of the shell blank, applying the shell blank to an approximately-similarly formed cover blank with the main coated side of the shell blank in facial contact with the cover blank, thus establishing adhesive contact between end portions of the blanks, and applying adhesive by offset to the cover end wings, while body and side wing portions of the respective blanks are unconnected by adhesive, separating the end wings of the cover and shell, bending the assembled blanks into approximate box form and inserting corner lap portions between the separated shell and cover end wings, bringing the separated end wings back approximately together with adhesive surfaces of the shell and cover end wings respectively in contact with opposite sides of the assembly corner laps, and turning in projecting margins of the cover end wings and securing them on adhesively coated margins of the shell end wings.

11. In a method of making boxes composed of approximately similar shell and cover blanks, each having a body portion, side and end wings and corner laps, the steps of applying an adhesive coating to the under sides of the shell end wings and corner laps, applying marginal stripes of adhesive to the upper surfaces of the shell, applying the lower surfaces of the shell to a surface of the cover so that the end wing and corner lap portions of the respective blanks are in adhesive engagement and body side wing portions are substantially unconnected, and shaping the assembled blanks into box form.

12. In a method of making boxes composed of approximately similar shell and cover blanks, each having a body portion, side and end wings and corner laps, the steps of applying an adhesive coating to the under sides of the shell end wings and corner laps, applying marginal stripes of adhesive to the upper surface of the shell, applying the under surface of the shell to a surface of the cover so that the end wing and corner lap portions of the respective blanks are in adhesive engagement and body and side wing portions are substantially unconnected, folding over projecting margins of the cover side wings upon adhesively coated margins of the shell side wings, and shaping the assembled blanks into approximate box

form with the assembled corner laps inserted between surfaces of adjacent shell and cover end wings.

13. In a method of making boxes composed of approximately similar shell and cover blanks, each having a body portion, side and end wings and corner laps, the steps of applying an adhesive coating to the under sides of the shell end wings and corner laps, applying marginal stripes of adhesive to the upper surface of the shell, applying the under surface of the shell to a surface of the cover so that the end wing and corner lap portions of the respective blanks are in adhesive engagement and body and side wing portions are substantially unconnected, folding over projecting margins of the cover side wings upon adhesively coated margins of the shell side wings, shaping the assembled blanks into approximate box form with the assembled corner laps inserted between surfaces of adjacent shell and cover end wings, and turning in projecting margins of the cover end wings and securing them to the adhesively striped margins of the shell end wings.

Signed at New York city, in the county of New York and State of New York, this 17th day of December, A. D. 1920.

HARRY BRIDGMAN SMITH.