

F. J. MOTZ.
PROCESS FOR MAKING PAPER BOXES.
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1,136,479.

Patented Apr. 20, 1915.

Fig. 1.

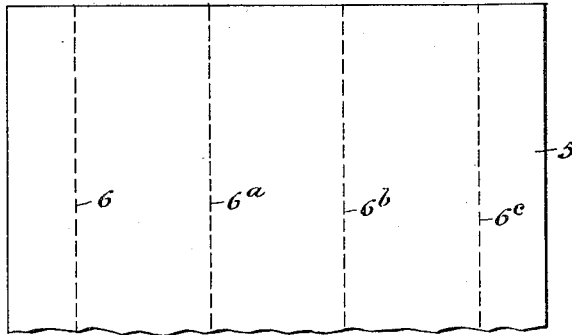


Fig. 2.

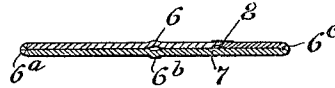


Fig. 3.

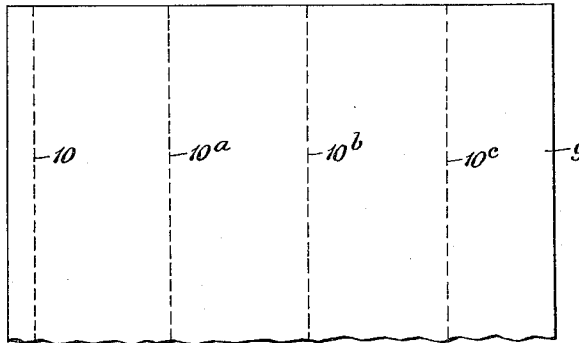


Fig. 4.

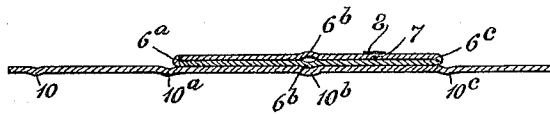


Fig. 5.

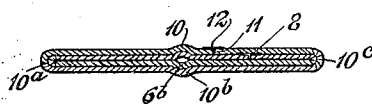
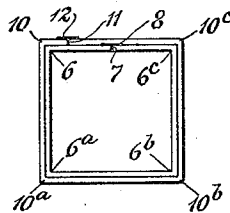


Fig. 6.



WITNESSES

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PROCESS FOR MAKING PAPER BOXES.

1,136,479.

Specification of Letters Patent.

Patented Apr. 20, 1915.

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To all whom it may concern:

Be it known that I, FREDERICK J. MOTZ, a citizen of the United States of America, and a resident of Cincinnati, county of Hamilton, State of Ohio, have invented certain new and useful Improvements in Processes for Making Paper Boxes, of which the following is a specification.

My invention relates to the manufacture of paper boxes and more particularly the kind known as knock-down boxes which are manufactured in a flat or folded condition, and has for its object to provide an efficient process for making such boxes of two or more plies of material in a simple, inexpensive and continuous manner with a minimum of waste.

My invention will be fully described hereinafter and the features of novelty will be pointed out in the appended claims.

Reference is to be had to the accompanying drawings which show diagrammatically the various steps of my improved process and in which—

Figure 1 is a face view of the first ply of material with scoring lines indicated thereon; Fig. 2 is a cross-sectional view of the first ply in folded condition; Fig. 3 is a view similar to Fig. 1 of the second ply of material; Fig. 4 is a cross-sectional view showing the folded first ply in position on the second ply; Fig. 5 is a cross-sectional view showing second ply folded about the first ply, and Fig. 6 is an elevation of Fig. 5.

In carrying out my improved process I take a number of rolls of material corresponding to the number of plies to be included in the finished product and of a proper width to form the desired cross-sectional area of box and mount them in such a manner that the material may be withdrawn from each roll as required. The material which is to form the inner or first ply is first fed along from the rolls in a continuous sheet as indicated at 5 in Fig. 1 and is scored by a suitable mechanism at the points where said material is to be bent to form the edges of the box, the scoring lines being designated as 6, 6^a, 6^b and 6^c in Fig. 1. After being scored as just described, the said sheet of material is folded or bent upon itself along the scoring lines 6^a and 6^c until it assumes the form shown in Fig. 2 the opposite side edges of the strip being brought into engagement to form a butt joint 7. A tape or strip of material 8 is now pasted or

otherwise secured so as to cover the joint 7 and extend to either side thereof and thus fasten said side edges in proper co-relation to each other, it being understood that the strip or tape 8 is preferably very thin and light. An adhesive of any suitable kind is now applied in any convenient manner to the outer surfaces of the folded first ply shown in Fig. 2 and the sheet 9 illustrated in Figs. 3 and 4 and intended for the second ply of the product is fed along and scored as at 10, 10^a, 10^b and 10^c in the same manner as was this first ply. If the finished product is to consist of more than two plies the both surfaces of this sheet 9 are now coated with an adhesive otherwise only the inner surface thereof is so coated or, if desired, the adhesive on the outer surfaces of the first ply may be relied on. This second ply of material is now brought into contact with the folded first ply so that at this stage of the process the relative position of the second ply to the first is as illustrated in Fig. 4, the scoring lines 10^a and 10^c registering with the opposite folded edges of said first ply 5. The second ply 9 is now bent along the said scoring lines 10^a and 10^c and folded about the folded first ply as shown in Fig. 5, the opposite side edges of said second ply 9 being also brought together to form a butt joint 11 similar to the joint 7. The scoring lines 10, 10^a, 10^b and 10^c on the ply 9 are preferably so located and the said second ply 9 preferably so positioned relatively to the folded first ply 5 that the joints 7 and 11 in the double ply product will be located at different points or in other words in break joint arrangement. In other words the second ply is fed along somewhat to one side or out of registry with the first ply and the said second ply is scored along lines in substantial registry with the scorings of the first ply. This second joint 11 is now also taped with a strip of material 12 of the same kind and in the same manner as was the joint 7. It will be seen that in this condition of the two plies 5 and 9 the scoring lines 6, 6^a, 6^b and 6^c register with the lines 10, 10^a, 10^b and 10^c so that the finished box may readily be unfolded or opened to its operative condition along these lines in the usual manner this same relative arrangement being followed if more than two plies are combined together. As many more additional plies of material as may be desired may be added in the same manner to the structure so far se-

cured until the desired thickness of product has been attained, it being understood that the butt joints of all the plies are preferably in break joint arrangement relatively to each other. After the desired number of plies have been combined as described the continuous folded body passes between suitable pressing rolls to press the various plies firmly together. After passing from the pressing rolls the continuous body is fed along and cut by suitable cutting mechanism of any well-known description into lengths corresponding to the length of box desired. From this point the operations are varied according to the particular style of box being manufactured and may be any of the well-known steps adapted to produce the particular box desired.

It will be seen that the material necessary to carry out my improved process may be secured in single sheets of any length mounted on rolls or in any other convenient manner to be easily handled and may be placed in position to be suitably fed along and then combined to form continuous bodies of the required thickness, which bodies after being built up as described may be cut into any desired length, the material being continuously fed from the rolls and the various steps of the process being continuously carried on, new rolls of material being substituted as fast as the old ones are used up. This is in contradistinction to the usual process in which the sheets are first cut into certain standard or fixed proportions and then combined to form the required number of plies, a step usually performed at the paper mill, and after having been thus combined in this manner are sold to the box manufacturers to be formed into single boxes. It will readily be seen that with this last described method a great deal of waste of material may result while with the process forming the subject matter of the present case this waste is practically eliminated or at any rate is reduced to a minimum. In addition to this all the steps of the present process are performed by the box manufacturer and can be instantly varied to suit the requirements of any particular case. In the present process it is for instance easy to vary the length of the boxes, thus making it a simple matter to produce boxes of different lengths during a given operation by simply cutting the continuous body at points spaced apart the necessary distance to secure the desired result. It is also a simple matter to increase or diminish the number of plies during an operation by simply feeding additional sheets of material or discontinuing the feeding of one or more sheets as the case may be.

A box body constructed according to the present process when reinforced with tape is stronger at the joints or seams than at

any other part of the box and requires less stock on account of the butt joints and the avoidance of the usual lap. By forming the joints in break joint relation to each other the strength of the body is further increased. The absence of the usual lap also permits a lid to be fitted snugly over the body and prevents said boxes from becoming easily damaged or torn open as is the case when the body is formed with a lap joint. The finished boxes are preferably shipped in a flat or folded condition and are unfolded or set up in the usual manner.

It is, of course, to be understood that any sort of closure may be applied to the body, that is, either a separate closure, flaps formed integral with the body, or any other form of cover which may be found convenient, may be used. While I have shown only the two ply box and have specifically described only the process of making this two ply box, any number of plies of material may be combined by simply carrying out my process and I wish it distinctly understood that I do not limit myself to two ply boxes or to a process for making two ply boxes.

Various changes may be made within the scope of the claims without departing from the spirit of my invention.

I claim:

1. The process of making paper boxes which consists in feeding a continuous web of material and scoring the same lengthwise along lines intended to form the edges of the boxes, folding said web flatly upon itself along some of said scoring lines as it advances, with the opposite edges of said web engaging each other to form a butt joint, feeding a second web of material along out of registry with said first web, scoring said second web along lines in substantial registry with the scorings of said first web, bringing said second web into surface engagement with said flat folded first web, folding said second web along some of its scoring lines into engagement with said folded first web and bringing the edges of said second web into abutting engagement at a distance from the butt joint of the first web, uniting said two webs together to form a flat unitary body and then cutting said flat unitary body into the desired lengths.

2. The process of making paper boxes which consists in feeding a continuous web of material and scoring the same lengthwise along lines intended to form the edges of the boxes, folding said web flatly upon itself along some of said scoring lines as it advances with the opposite edges of said web engaging each other to form a butt joint, applying an adhesive to the outer surfaces of said folded flat web, feeding a second web of material along out of registry with said first web, scoring said second web along lines

in substantial registry with the scorings of
said first web, bringing said second web into
engagement with the one gummed surface
of said flat folded first web, folding said
5 second web along some of its scoring lines
and about said flat folded first web into en-
gagement with the other gummed surface
of said flat folded first web and bringing
the opposite edges of said second web into
10 abutting engagement at a distance from the
butt joint of the first web to combine both

webs into a flat unitary body and cutting
said flat unitary body into the desired
lengths.

In testimony whereof I have hereunto set 15
my hand in the presence of two subscribing
witnesses.

FREDERICK J. MOTZ.

Witnesses:

HERBERT JACKSON,
M. M. BRESNAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."