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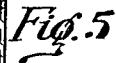
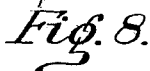
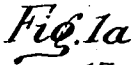


Fig. 6.

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LAP-BOARD.

960,112.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOSEPH P. ROEHM, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Lap-Boards, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to lap-boards, and has for its object the production of a board of this type from paper, which shall be light, stiff, durable, non-warping in character, and cheap to manufacture.

As usually made, the lap-board is of wood, in dimensions about 7 by 25 inches, and among other things it is used for wrapping cloth, dress goods, linings, etc. in the mill for shipment. It has been proposed to make similar boards of paper, but so far as I know without success, owing to too great flexibility, weak edges, liability to warp, and quick deterioration from various causes. My present improvement is designed with a view to removing the difficulties heretofore experienced in the use of paper for this purpose.

Briefly stated, it consists in forming a board with a cellular or ribbed formation running diagonally across the board, and in the best form with a double thickness of the cellular formation folded so that the diagonals cross each other and smooth unbreakable edges are presented on both sides. The ends may be protected in the same way by forming flaps, so that the exposed or cut portion of the structural material is all intumed. As an alternative, I may protect the ends in various ways as by folded pieces of metal, or by metal or wood stiffening rods inclosed within the paper ends.

My invention is illustrated in the accompanying drawing in which—

Figure 1 is a face view of a complete board embodying my invention, and Fig. 1^a is an end view thereof. Fig. 2 shows the same with metal end protectors. Fig. 3 is a view similar to Fig. 1 with one flap open and with portions broken away to show the structure of the paper. Fig. 4 is a section on the line *x-x* of Fig. 3. Fig. 5 is a face view of one end of a board with a stiffening rod. Fig. 6 is an edge view of the same. Fig. 7 is a similar view of an end formed with a flap, the corrugations running

straight instead of diagonally. Fig. 8 is an edge view of the same.

Referring to the drawings, and especially Figs. 1 and 1^a, B represents the board as a whole, *b* being the back in one piece, *b'* *b*² the flaps folded over at *b*³ and *b*⁴ to meet along the line *b*⁵ intermediate of the edges of the board. The material employed is paper familiarly called corrugated or cellular and widely employed for packing material and the like. It consists essentially of two or more strata or laminae with a corrugated intermediate layer glued to the layers on both sides of it, and inclosing continuous air spaces between its successive ribs or corrugations. Such paper, or as it is sometimes called, paper board, is quite stiff, and will resist considerable pressure. Its strength is of course imparted to it by the arrangement of its congruent layers, the walls of the respective corrugations serving as transverse braces and stiffeners, while the surface layers resist strains in their own planes. The benefit of this bracing in several directions is lost, however where the corrugations are parallel to the axis of a rotating or compound flexing strain. In other words, where the corrugations run length-wise or cross-wise, the board will warp.

In the present case, as shown in Figs. 3 and 4, I cut the board on the bias so that the corrugations are oblique, and then fold it on the lines *b*³ and *b*⁴, causing the flaps *b'* and *b*² to meet along one side intermediate of the edges, and preferably on a median line as shown. These flaps are glued down to the body or back *b*, and the whole board may be put in a press to dry, after which it is almost impossible to twist it, and difficult to break it, as the corrugations act like cross veneers, making the product very tough.

It will be observed in Fig. 1 that both the edges *b*³ and *b*⁴ are protected by being doubled over, and that raw or cut edges are exposed on the ends only. As the outside layers of this paper board are usually tough the liability to damage on the sides or edges is thus reduced to a minimum, and the ends as a rule are not subject to hard usage. However, they may be protected in any one of several ways, one of which is shown in Fig. 2, another in Figs. 5 and 6, and still another in Figs. 7 and 8.

In Fig. 2 a metal plate *p* is folded over the end and riveted through the board at

p' . This not only serves to protect the end against breakage, but also holds down the corners of the flaps b' and b^2 insuring against their starting and so loosening up the seam b . In Figs. 5 and 6, a rod h is laid within a turned over flap b^6 , and in Figs. 7 and 8 the flap b^6 is shown without the rod but provided with the metal plate p which, however, may be omitted, as the folded end affords considerable protection by itself. It will be observed that in Fig. 5 the flap b^6 is made pointed, and that the flaps b' and b^2 are cut to join when closed, so that the edge all around is continuously protected.

I am aware that some changes and alterations may be made in nonessential details, such as the shape of the article produced, and the protection of its ends, and I contemplate all such changes as fall fairly within the scope of the appended claims. Thus for example, as shown in Fig. 7, the edge protection by folding the flaps b' and b^2 over each other is attained successfully even where the corrugations run straight across or lengthwise of the board and the flaps instead of diagonally. The flap b^6 may be omitted and the flaps b' and b^2 extend clear to the end of the board along the line b^5 , and their exposed edges may be protected across the end by gluing or pasting a strip of cloth or other fabric thereover, as well as across the edges of both flaps and extending longitudinally to cover the line b^5 .

Having thus described my invention what I claim and desire to secure by Letters Patent is—

1. A lap-board formed of paper laminæ with interior corrugations, said corrugations extending diagonally to the length of the board, and the material being folded so that the corrugations will cross each other on opposite sides, substantially as described.

2. A lap-board formed of corrugated paper cut so that the corrugations will extend diagonally to the length of the board, and

folded to form flaps meeting intermediate of the edges thereof, substantially as described.

3. A lap-board formed of corrugated paper cut so that the corrugations will extend diagonally to the length of the board, folded to form flaps meeting intermediate of the edges, and having reinforcing means at the ends, substantially as described.

4. A lap board formed of corrugated paper, folded on a line oblique to the direction of the corrugations, with the flaps secured together so as to form a unitary structure with the corrugations crossing each other and having metal plates secured upon the opposite ends, substantially as described.

5. A lap board composed of corrugated paper, with side flaps of equal dimensions folded together on lines diagonal to the corrugations and held in position by a suitable adhesive material, substantially as described.

6. A lap board composed of corrugated paper, having side flaps and end flaps folded on lines oblique to the direction of the corrugations, and meeting at their edges so as to form a smooth and continuous surface on both sides of the board, substantially as described.

7. A lap board composed of corrugated paper, having end flaps folded over and secured upon the body, and a stiffening rod secured within each end flap along the folding line, substantially as described.

8. A lap board composed of corrugated paper having longitudinal flaps folded over on parallel lines so as to meet along an intermediate line on one side of the board, with means to secure said flaps in position, and means to protect the exposed ends thereof.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH PARK ROEHM.

Witnesses:

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HEPNER F. VAN HORN.