

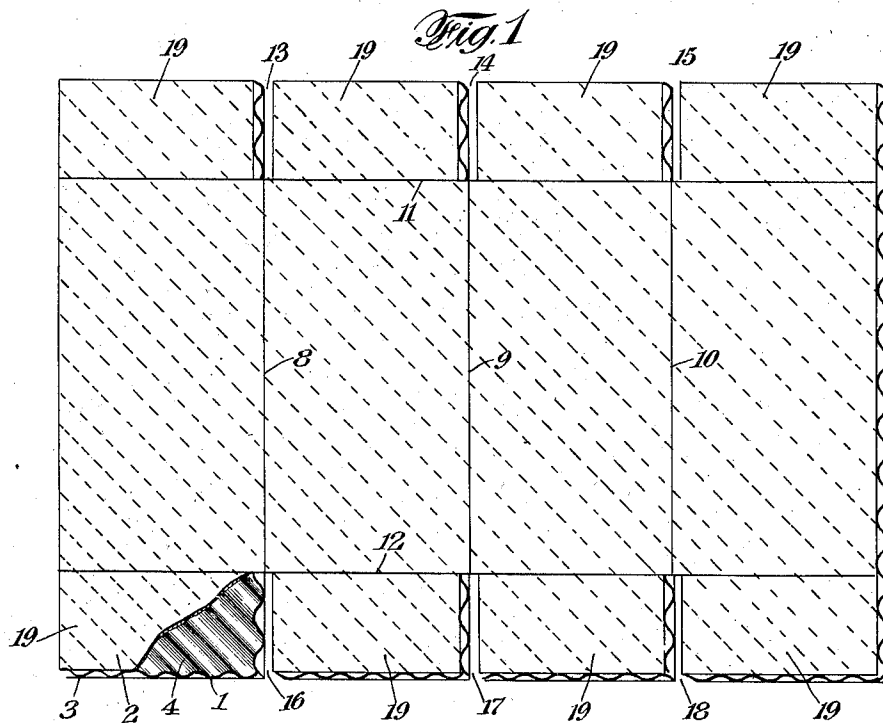
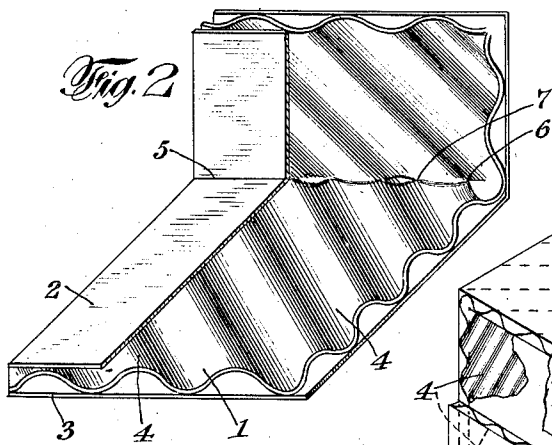
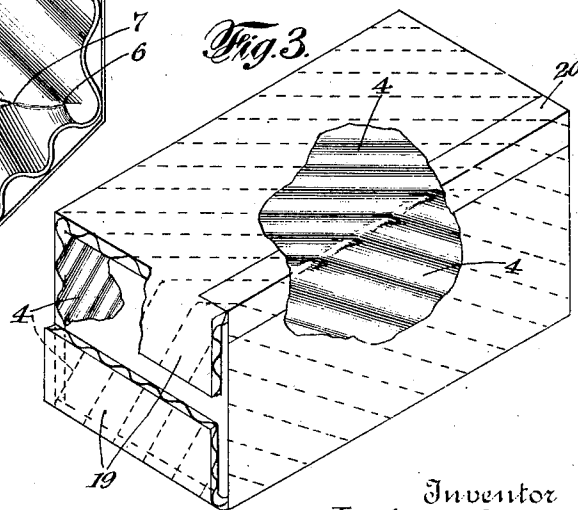
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J. WAGNER

CARTON

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UNITED STATES PATENT OFFICE.

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CARTON.

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The invention relates to corrugated sheet material of the type wherein a corrugated sheet of paper or the like, is combined with one or more plane sheets to form a composite single or double faced sheet-material adapted to be folded or combined with other sheets to form a protective container.

Another object is to provide cartons of the above material which will possess relatively high resistivity to change in shape, or crushing.

Further objects and advantages of the invention will be in part obvious and in part specifically pointed out in the description hereinafter contained, in which are disclosed certain embodiments of the invention; such embodiments, however, are to be considered merely as illustrative of its principles. In the drawings:

Fig. 1 is a plan view of a sheet of material made in accordance with the invention, a portion of the sheet appearing in section.

Fig. 2 is a view of a similar sheet bent to form an angle.

Fig. 3 is a perspective view of a carton formed of sheet material as shown in Figs. 1 and 2.

If a corrugated sheet be formed for instance in rectangular shape, with the corrugations running parallel to its sides and perpendicular to its ends, the side edges of the sheet will be comparatively weak, since the material forming the corrugations adjacent such edges will be cut away so as to leave only a partial corrugation of comparatively little strength. The facing also tends to work loose from the corrugated sheet adjacent the side edges, further weakening the same. The side edges of the sheet therefore form but a weak protection to any article packed in the sheet material, and furthermore are of variable thickness so that they will not match up well with adjacent sheets. If slots be cut in the material parallel to the corrugations, the edges of the slots of course will be injured in a similar manner.

If the sheet material be bent into the form of a box, with the corrugations parallel to the sides of the sheet, the creasing of the material to form the side edges, and the folding of the sheet into box shape, also tends to break down the side edges of the box so as to weaken them materially, and the folds at the ends of the box, directly across the corrugations, tend to crush the end edges of the box. The result is that the edges of the box, particularly the side edges, afford comparatively little protection to articles contained therewithin. Furthermore, since the corrugations run parallel to the sides of the box, they present very little resistance to collapse of the structure.

In accordance with the present invention, a corrugated sheet material is formed of a corrugated sheet 1, combined with a facing 2, and if desired a further facing 3, in such manner that the corrugations 4 of the sheet 1 run oblique to the side edges of the sheet. This is preferably accomplished by corrugating the rectangular sheet 1 in the first instance with the corrugations running oblique to its side edges, which may be done for instance by a corrugating machine, in which the rolls have corrugations running helically instead of longitudinally, although a sheet of this character of course may be cut out of a sheet which originally had its corrugations running parallel to the side edges.

With the sheet material formed in the above manner, the side edges do not consist of a single corrugation, but of a series of ridges forming the ends of a plurality of corrugations running at an oblique angle to the edges. This series of ridges presents substantially the full resistance of each corrugation to crushing, with the result that the side edges are relatively strong and tend to maintain their proper thickness at all times. If the material be rectangular in form, the end edges of the sheet will also be relatively stronger, since the corrugations are not so readily crushed when cut on a bias to form the end edges, as would be the case if the cut were made directly across the corrugations. It is further obvious that the end edges may be made substantially identical with the side edges, in all respects, by inclining the corrugations at an angle in the neighborhood of 45° to the sides.

Also, if a rectangular sheet material of the above form be bent into angular shape with the crease parallel to its sides, as indicated at 5 in Fig. 2, as may be often desired, the edge at the apex of the angle will be relatively strong, since the corrugations are not crushed to the same extent as they would be if bent directly across, nor is the benefit of the corrugations lost, as would be the case if the sheet were bent along the line of the corrugations. As appears from Fig. 2, when the material is bent into angular

shape with the corrugations running oblique to the edge at the apex of the angle, the material in a corrugation tends to be displaced laterally into the valleys on both sides of the corrugations, as indicated at 6 and 7 (Fig. 2) respectively, instead of being crushed to the extent which would happen if bent directly across the corrugations. Thus the corner of the angle will be relatively strong, and if the material be bent parallel to both the side and end edges, the corners will all be of the character above indicated, and uniformly strong throughout.

A corrugated sheet of the above character may be creased to enable the same to be readily folded into the form of a rectangular box by providing the creases indicated by the lines 8, 9 and 10, parallel to the sides of the sheet, thus marking out four rectangles which will form the sides of the box. A pair of creases indicated by the lines 11 and 12, parallel to the ends of the sheet, may also be formed to form the end corners of the box, and slots 13 to 18 provided extending from the ends of the sheet to the creases 8, 9 and 10 respectively, whereby flaps 19 are provided which may be folded in to form the ends of the box. The sheet material as shown in Fig. 1 may then be folded into a box as indicated in Fig. 3, the side edges of the sheet being suitably fastened together, for instance by a glued strip of paper 20 extending lengthwise of the box or carton.

The carton thus formed will be of relatively great strength for several reasons. None of the side edges of the box will extend parallel to the corrugations, so that each side edge will be reinforced by corrugations which are not broken down. The end edges will also be formed of corrugations which extend oblique thereto, with the result that such edges will possess the same qualities as the side edges, throughout. Furthermore, the corrugations on any given side of the box will run in a direction transverse to the corrugations on the opposite side, thus providing a sort of diagonal bracing for the box which resists collapse or change in shape to a high degree, which would not be the case if the corrugations on the sides of the box ran lengthwise. While certain specific embodiments of the invention have been described, it is obvious that changes may be made therein without departing

from the invention, as described in the following claims.

I claim:

1. A carton of polygonal shape, comprising a sheet of paperlike material having all parallel corrugations, said sheet being bent to form edges and faces of the carton, and the corrugations being oblique to the edges of the carton, the corrugations on opposite faces of the carton running in opposite directions and running obliquely across the faces thereof.

2. A carton of polygonal shape, comprising a sheet of paperlike material having all parallel corrugations, said sheet being bent to form edges and side faces for the carton, and having flaps folded over to form an end face thereof, the corrugations of the sheet being directed obliquely to both the side and end edges of the carton.

3. A carton of polygonal shape, comprising a sheet of paperlike material having all parallel corrugations, the paper being bent to form side edges and faces of the carton, and the corrugations running oblique to the edges and running obliquely across the side faces.

4. A box-like paper container formed of a corrugated sheet filler having a covering or binder, all the corrugations of the sheet being parallel, the lines marking the juncture of the walls being scored and the corrugations extending diagonally so that when the box is assembled the corrugations will afford support in a vertical as well as a horizontal direction and the scored lines will not be at right angles to or parallel with the corrugations.

5. A box-like paper container formed of a corrugated filler having a covering or binder, all the corrugations of the filler being parallel, the lines marking the juncture of the walls being scored and the corrugations extending diagonally so that when the box is assembled the corrugations will afford support in a vertical as well as a horizontal direction and the scored lines will not be at right angles to or parallel with the corrugations.

In testimony that I claim the foregoing, I have hereunto set my hand this 17th day of May, 1920.

JOSHUA WAGNER.