March 27, 1945. N. RUBIN 2,372,520

INTERLINKED PLATE STRUCTURE

Filed Oct. 17, 1942

Fig. 1

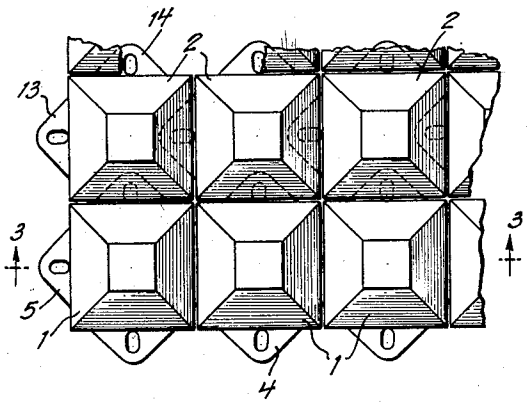



Fig. 2

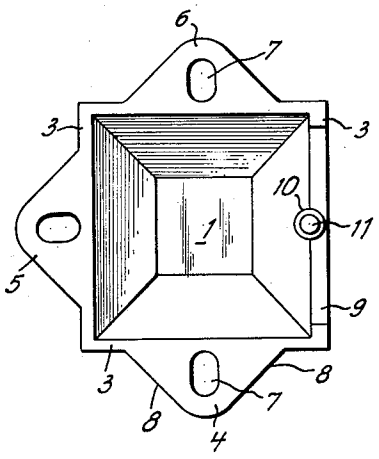



Fig. 3

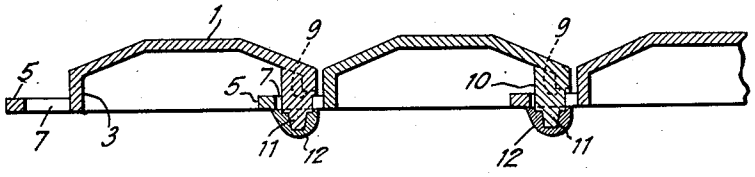



Fig. 4

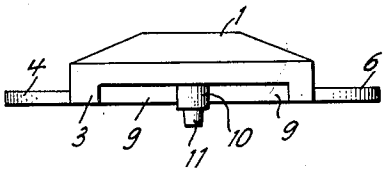
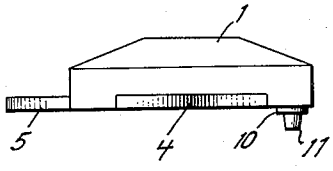



Fig. 5




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# UNITED STATES PATENT OFFICE

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## INTERLINKED PLATE STRUCTURE

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Application October 17, 1942, Serial No. 462,442

2 Claims. (Cl. 41—10)

This invention relates to a fabric made of articulated members each of which is relatively rigid and which are so interconnected as to provide a flexible sheet of material. More specifically, the invention is directed to the provision of a series of plates, preferably made of plastic material, which are so joined as to form a relatively large sheet, each of the elements of which is movable relatively to the other elements.

Flexible fabrics of this general nature have been known for a considerable time. For instance, on one such structure which was used to form a bracelet or the like, a series of metal plates rectangular in cross-section were stamped to form ears and pintles at opposite sides. To form a fabric, the pintles were inserted into the ears and bent around to form a hinged joint. A series of such links provided the bracelet.

In another construction there was provided a series of flat plates each of which had certain cut-out portions forming ears and certain extended portions which formed pintles. These were interlinked by inserting the pintles in the ears and then bending the pintles to complete a hinged joint. While such devices gave a measure of flexibility to the resulting fabric, the flexibility was of a very limited character in that there was a limited movement around the hinge formed by the interlocking members, but there was no means of allowing stretching of the fabric or similar relative movement of the plates. Furthermore, it was necessary that the plates be made of a good quality of metal in order that the bending of the extensions might be accomplished without danger of damage to the metal. It was not feasible in structures of this kind to make the plates of a plastic or similar material which is incapable of being bent in a manner similar to metal. Also, because of the use of metal, it was difficult to obtain decorative effects by various color combinations without additional expense of coating or otherwise treating the metal members.

The present invention is intended and adapted to overcome the difficulties and disadvantages of prior structures of this type and to provide a fabric made up of individual, relatively rigid members, said fabric being highly flexible and capable of being bent to a considerable degree.

It is also among the objects of the present invention to provide a structure of plate for producing a flexible fabric which is adapted to be molded in large quantities at a rapid rate and which does not require to be bent or otherwise deformed after the molding thereof.

It is still further among the objects of the present invention to provide a flexible fabric which may be utilized for ornamental purposes, as for instance, as the covering or outer portions of a lady's handbag.

In practicing the present invention I provide a series of plates of any desired form and having an outline which may be considered as geometrical in character. Preferably, the plates are made in the form of rectangles. Each of the plates has a body portion with depending sides. At two or three of such sides lateral extensions are formed integral with the body portion, having elongated openings therein. At one or two of the other sides, as the case may be, the depending portions are recessed and a pin is provided centrally thereof. Each of the pins is intended to cooperate with one of the elongated openings by being inserted therein and locked in place. The pin has a diameter which is relatively small when compared to the length of the opening. Thereby, a considerable lateral movement of each of the plates relative to the other plates is obtained. The extensions on adjacent sides of each of the plates have openings at right angles to each other. Thereby, when the plates are linked together, some of the openings provide lateral movement in one direction and other openings provide lateral movement in a direction at right angles thereto. The length of the pin is such that a vertical movement between adjacent plates is provided. By such construction, there has been provided relative movement of the individual pieces in three directions at right angles to each other, so that it may be said that the plates have universal motion. This flexibility is highly desirable and gives important new effects.

In the accompanying drawing constituting a part hereof and in which like reference characters indicate like parts:

Fig. 1 is a fragmentary plan view of a piece of fabric made in accordance with the present invention, the fabric being viewed from above;

Fig. 2 is a view from below, considerably enlarged, of a single plate having three lateral extensions and one pin on its four sides;

Fig. 3 is a vertical cross-sectional view of the fabric taken along the line 3—3 of Fig. 1;

Fig. 4 is a side elevational view of the plate shown in Fig. 2; and

Fig. 5 is a view similar to Fig. 4 taken at right angles to Fig. 4.

A series of plates 1 are provided, each of the plates having three extended portions and a single pin. A plurality of plates 2 are provided which link with each other and with plates 1

and which have two extended portions on adjacent sides and two pins on the other sides.

Each of the plates is provided with downwardly extending flanges 3 along all of the four sides thereof. Lateral extensions 4, 5 and 6 project from the lower ends of flanges 3 of plates 1. Each of said extensions has an elongated opening 7, the long axis of which is at right angles to flange 3 from which the extension projects. The sides 8 of the projections extend towards the corners of the plates to form a strengthening rib and to provide a relatively wide base where the extension joins the flange. Such a structure has been found to be highly desirable in providing a rigid extension which will withstand the service to which the fabric may be subjected.

On the fourth side of plate 1 is provided a recess 9, as more particularly shown in Fig. 4, and a pin 10 of relatively large diameter extends through the central portion of said recess to a point below the lower edge of flange 3. It will be noted from Fig. 3 that the pins are not only formed as part of flange 3, but are integrally united with the top of plate 1 to give sturdiness to the structure. The outer end of each of the pins is provided with a reduced portion or neck 11 which is adapted to receive a cap 12, the latter being cemented in place.

In order to provide the fabric, a series of plates 1 are interlinked with pins 10 passing through opening 7 of extension 5. This forms the lower or outer row of the fabric, as shown particularly in Fig. 1. After the interlinking, caps 12 are placed in position so as to hold the plates 1 in their relative positions. Plates 2 have only two extensions 13 and 14 on adjacent sides, the other sides being provided with pins 10. A series of plates 2 are interlinked with plates 1, as shown in Fig. 1, to complete the fabric. The use of plates similar to Fig. 2 for the outer row has the advantage that when the fabric is completed all of the edges thereof are provided with extensions. These extensions may be considered as decorative in character when the fabric is to be used as such. In some cases, particularly in the making of ladies' handbags, where the two sides of the handbags are covered with the fabric of the present invention, it is desirable to unite the two pieces of fabric. The openings 7 in the extensions provide eyelets whereby the two pieces of fabric may be laced together over the edge of the bag. Also, other means such as individual links may be used in uniting such fabrics. The openings 7 along the edges of the fabric also serve as means whereby staples or the like may be used for attaching the fabric to any desired surface. They may also be used as means for stitching the fabric to the desired base.

Although I have described my invention, setting forth a single specific embodiment thereof, the illustration is not to be considered as limiting the invention, since many changes in the details may be made within the spirit of the invention. For instance, the pin need not be circular in cross-section, but may be of other shapes. Its sides need not be parallel or cylindrical, but may taper from the plate to its free end. The openings 7 may be of various shapes and may even be circular, it being essential that the dimensions of the openings be greater than the dimensions of the pins, particularly along an axis at right angles to the side from which the extension projects. While I have shown caps 12 at the ends of the pins, other means for holding the plates together may be provided, as for instance, rings may be slipped over the ends of the pins and cemented in place, or heat or pressure, or both, may be applied to the ends of the pins to distort the same and form rivet heads. The extensions may be of different shape than shown, as for instance, the base may be thicker than the free ends thereof. The number of pins and of extensions on the several plates may be varied at will in order to produce desired effects. These and other changes in the details of construction may be made within the spirit of the invention, the scope of which is not to be limited except by the claims appended hereto.

What I claim is:

1. As an article of manufacture a plurality of plates linked together, said plates being quadrilateral in shape, having a decorative upper surface and depending sides, and having at adjacent sides means for linking the same, said means comprising a lateral extension on one plate having an opening therein and in a plane approximately parallel to said plate, said plane defining the lower surface of said plate, a round pin on the adjacent side of an adjacent plate, said pin being approximately normal to said plate, the dimensions of said opening being sufficiently greater than said pin to allow free relative movement of said plates, and a recess in said adjacent side extending between said plane and surface into which said extension fits, whereby said linked plates are held in approximately the same plane, and a head on the free end of said pin to maintain the linkage, the diameter of said head being greater than that of said opening.

2. As an article of manufacture a plurality of plates linked together, said plates being quadrilateral in shape, having a decorative upper surface and depending sides, and having at adjacent sides means for linking the same, said means comprising a lateral extension on one plate having an opening therein and in a plane approximatelyly parallel to said plate, said plane defining the lower surface of said plate, a round pin on the adjacent side of an adjacent plate, said pin being approximately normal to said plate, the dimensions of said opening being sufficiently greater than said pin to allow free relative movement of said plates, and a recess in said adjacent side extending between said plane and surface into which said extension fits, whereby said linked plates are held in approximately the same plane, at least one of said plates having said extension along three of its sides and a pin at the fourth side.

NOAH RUBIN.