

[54] **PACKAGE OF MOISTURE-SENSITIVE METAL PLATES**

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[56] **References Cited**

UNITED STATES PATENTS

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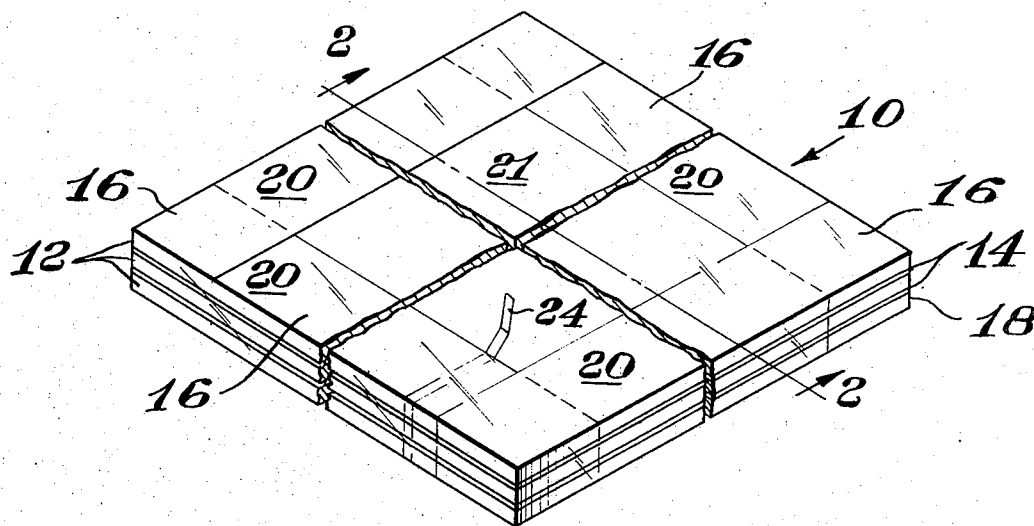
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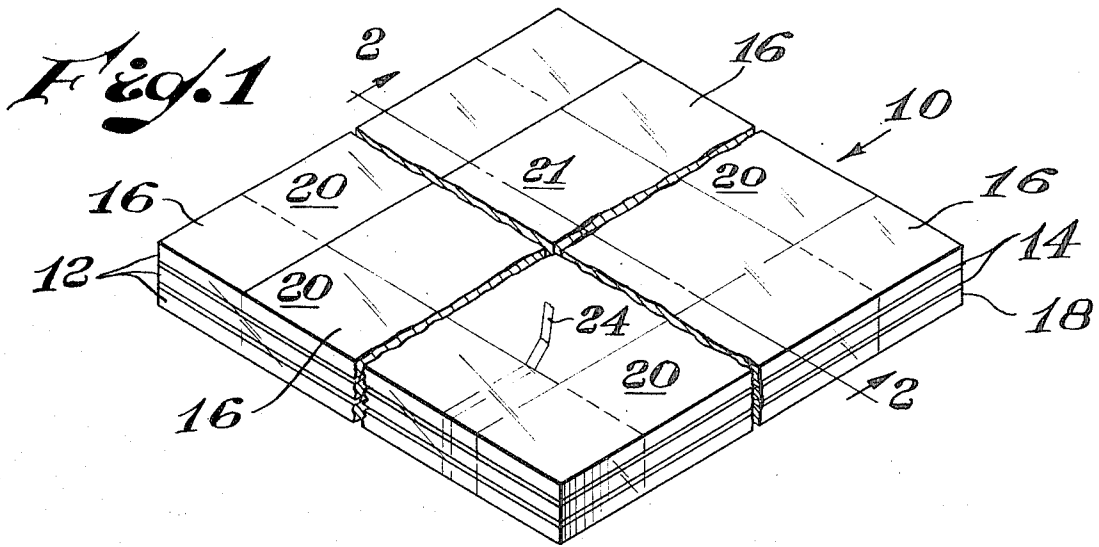
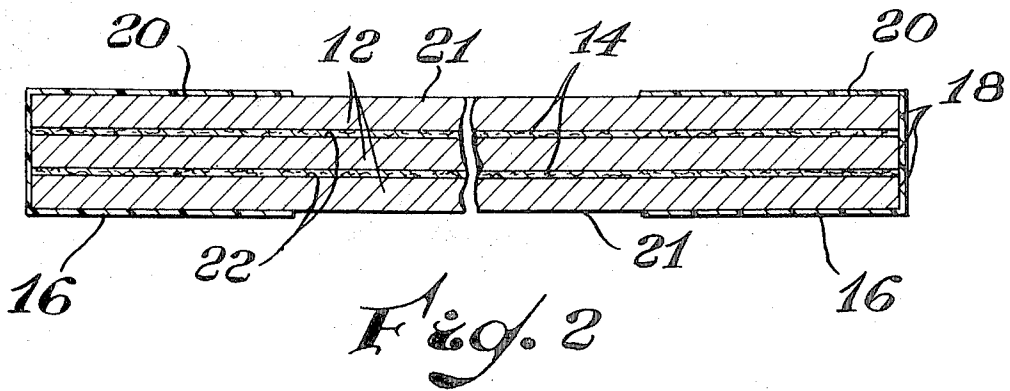
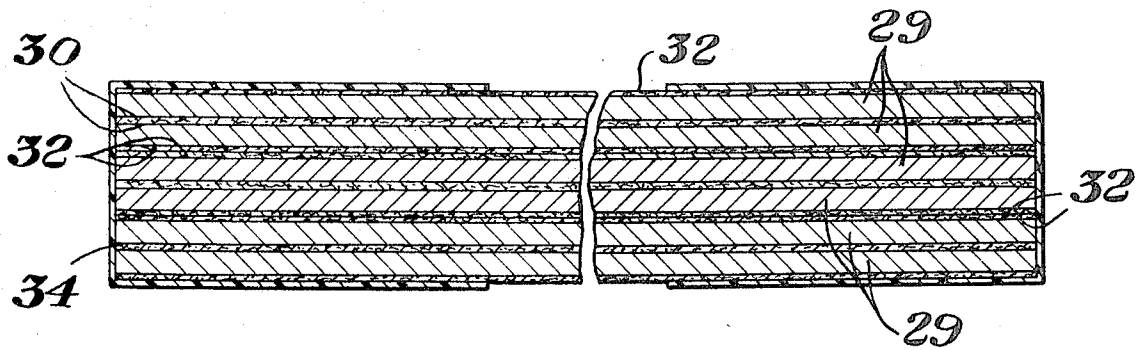
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ABSTRACT

Described herein is a package of moisture-sensitive metal plates such as are used in photoengraving work. The plates have sheets of neutral interleaving material between them. The package is held together by a polymeric film barrier positioned along the edges of the superposed plates thereby to encompass all the edges. The film also serves as a moisture barrier protecting the interior surfaces of the plates from the atmosphere. The package permits moisture-sensitive plates to be shipped or stored without streaking, discoloration or other damage from "water-marking."

6 Claims, 3 Drawing Figures





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PACKAGE OF MOISTURE-SENSITIVE METAL PLATES

BACKGROUND OF THE INVENTION

Moisture-sensitive plates, such as magnesium photoengraving plates, are widely employed in the printing industry. Before use in printing, the plates are etched to form an image in relief. A problem has arisen, however, in that during shipment or storage of the un-etched metal, the plates, which are usually back-coated with a protective finish, tend to develop black or brownish streaks on the uncoated side which interfere with obtention of the desired image during etching.

Applicant has discovered that discoloration of the magnesium plates is due primarily to corrosion of the plates by moist air. Accordingly, it is a principal object of the invention to provide a package wherein the plates are exposed to a minimum amount of moisture. When packaged according to the present invention, moisture-sensitive metal plates can be shipped and stored for long periods of time without appreciable discoloration or other damage from moisture.

In the drawing,

FIG. 1 depicts a package of magnesium plates.

FIG. 2 is an enlarged and foreshortened cross-sectional view of the package of FIG. 1.

FIG. 3 is a view in section similar to FIG. 2 showing a preferred package of the invention.

DESCRIPTION OF THE INVENTION

The article of the invention is a package comprising a plurality of similarly shaped plates consisting of magnesium, aluminum, zinc or alloys thereof. The plates are positioned adjacently to one another in an intimate, superposed face to face relationship. Each of the plates has at least one moisture-sensitive surface. The package also comprises at least one sheet of neutral interleaving material and generally comprises a plurality of such sheets. At least one of the sheets is positioned in intimate face to face relationship with each moisture-sensitive surface of the plates. Covering the edges of the plates and in sealing engagement therewith is a substantially moisture-impermeable polymeric film barrier. Generally, the moisture barrier is formed from one or more strips of plastic film bonded to the plates with a suitable adhesive. The film overlaps and completely encloses all the edges of the sheets and is in sealing engagement with the edges and/or the surface areas adjacent the edges of exterior plates.

In a preferred package of the invention, each plate has a moisture-sensitive surface and a reverse surface covered with a protective coating. The plates are disposed in pairs, i.e., the moisture-sensitive surfaces are disposed in a face to face relationship with one another. The reverse or coated surfaces are also disposed in face to face relationship. At least one sheet of material is interleaved between each pair of moisture-sensitive surfaces.

In the embodiment of the invention depicted in FIGS. 1 and 2 of the drawing, the package (indicated by reference numeral 10) comprises a plurality of rectangular moisture-sensitive magnesium plates 12 formed of a magnesium alloy comprising by weight 3 percent of aluminum, 1 percent of zinc, about 0.01 to 0.04 percent of calcium with the balance being magnesium and normal impurities with the exception of iron which is largely settled out during preparation of the alloy. Plates of this type are described in U.S. Pat. No. 2,813,023 (issued Nov. 12, 1957), and incorporated herein by reference. Rectangular sheets of kraft paper 14 are interleaved between the plates 12. Strips of moisture resistant plastic tape or film 16 having a pressure-sensitive adhesive thereon enclose the edges 18 of the plate 12. The tape is in sealing engagement with the edges 18 and also with peripheral portions 20 of the exterior surfaces 21 of the exterior plates to form a package

which is completely enclosed with respect to the uncoated metal surfaces within the package. The tape serves both as a moisture barrier protecting the interior surfaces of the plates 22, and also as a container member holding the package of plates together. To facilitate removal of the plates, the package is fitted with a tear strip 24.

With reference to FIG. 3, a preferred package of the invention comprises a plurality of magnesium, or magnesium alloy plates 29 each having a moisture-sensitive surface 30 and a reverse surface 32 coated with a protective coating. The plates 29 are disposed with moisture-sensitive surface 30 in face to face relationship with one another. The protectively coated surfaces 32 are also disposed in face to face relationship. At least one sheet of neutral kraft paper 34 is interleaved between each of the moisture-sensitive surfaces.

Moisture-sensitive plates which are packaged according to the invention include magnesium or magnesium alloy plates having at least one uncoated surface. The opposite surface of such a plate can be coated, if desired, with an acid-resistant coating. Other types of plates are pre-sensitized magnesium, aluminum or zinc plates, or plates formed of an alloy of any of magnesium, aluminum or zinc. By pre-sensitized, it means that the plate is coated with a light sensitive organic polymer coating which can be exposed to light through a master or photographic negative and then heated briefly to create crosslinked aqueous and acid resistant polymer areas which constitute a partial resist for subsequent powderless etching as well understood in the photoengraving art.

The plastic tape 16 employed should be substantially impermeable to water or moisture. Suitable tapes are, for example, organic polymer tapes comprising polyethylene or polyvinylidene chloride. It is desirable that the tape be coated on one side with a contact adhesive to facilitate fabrication of the package. Coatings applied to the exposed surfaces of the plates 20 are generally resistant to acid and do not react detrimentally with the plates. Vinyl type coatings or coatings containing epoxy resins are suitable. These coatings are applied by known methods such as roll-coating followed by baking.

The paper interleaved between the sheets should contain only trace amounts of sulphuric acids or chloride residues, i.e., the paper should be substantially neutral when placed in water. Neutral kraft paper is suitable.

What is claimed is:

1. A package comprising a plurality of similarly shaped plates consisting of magnesium, aluminum, zinc or alloys thereof, each of said plates having at least one moisture-sensitive surface, said plates superposed in intimate, face to face relationship with one another; sheets of interleaving material, at least one of said sheets positioned in intimate face to face relationship with each moisture-sensitive surface of the superposed plates; and a substantially moisture-impermeable polymeric film barrier positioned in sealing engagement along the edges of the superposed plates thereby to encompass all the edges and provide a sealed package.

2. A package as in claim 1 wherein each plate has a moisture-sensitive surface and a reverse surface coated with a protective coating, said plates disposed with the moisture-sensitive surfaces in face to face relationship with one another, with at least one sheet of material interleaved between said moisture-sensitive surfaces.

3. A package as in claim 1 wherein the plastic sheeting is fitted with a tear strip.

4. A package as in claim 1 wherein the plates are pre-sensitized magnesium photoengraving plates.

5. A package as in claim 1 wherein the plates are pre-sensitized aluminum plates.

6. A package as in claim 1 wherein the plates are pre-sensitized zinc plates.

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