June 21, 1955 A. WITTMAN 2,711,039

METHOD OF MAKING THREE-DIMENSIONAL OBJECTS OF FLAT SHEETS

Filed April 28, 1953. 2 Sheets-Sheet 1

Fig. 1.

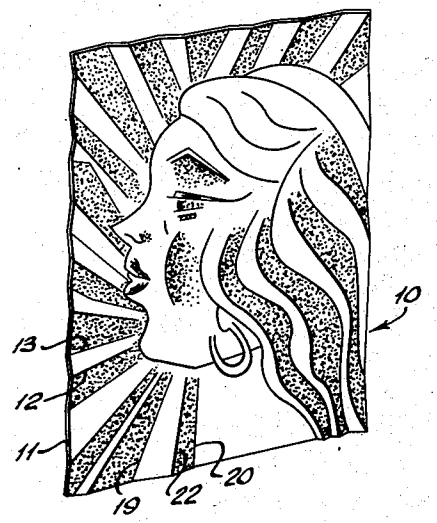


Fig. 2.

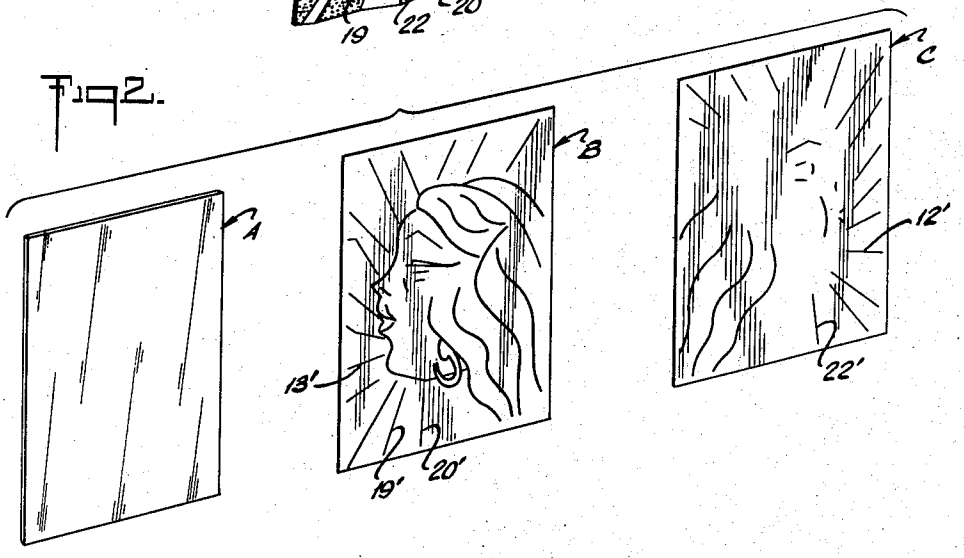
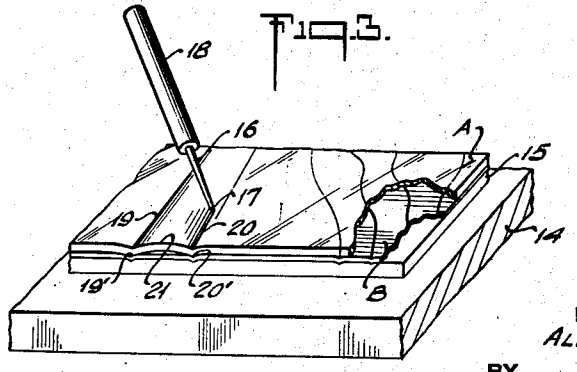


Fig. 3.



INVENTOR
ALEX WITTMAN

BY
Frederick Breitenfeld
ATTORNEY

June 21, 1955 A. WITTMAN 2,711,039

METHOD OF MAKING THREE-DIMENSIONAL OBJECTS OF FLAT SHEETS

Filed April 28, 1953

2 Sheets-Sheet 2

Fig. 4.

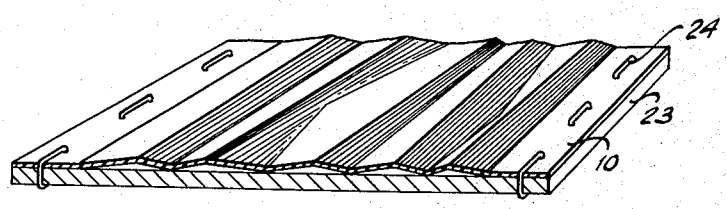


Fig. 5.

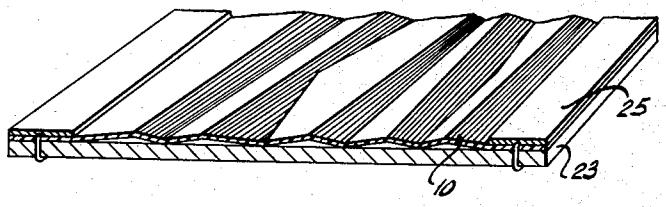
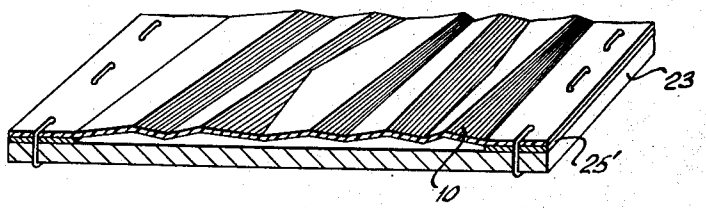


Fig. 6.



INVENTOR
ALEX WITTMAN

BY
Frederick Breitenfeld
ATTORNEY

United States Patent Office 2,711,039
Patented June 21, 1955

2,711,039

METHOD OF MAKING THREE-DIMENSIONAL OBJECTS OF FLAT SHEETS

Alex Wittman, Jamaica, N. Y.

Application April 28, 1953, Serial No. 351,597

11 Claims. (Cl. 41—24)

This invention relates generally to ornamentation, and has particular reference to pictures and designs formed in relief on deformable, initially flat, sheets of transparent, colored and opaque plastic or similar material, and to a method for making such pictures and designs to achieve a three-dimensional effect.

One of the objects of the invention is to provide a simple and effective method for making pictures and designs having three-dimensional characteristics, that does not require special training or tools and whereby attractive and interesting results are readily attainable by the hobbyist or amateur.

Another object of the invention is a method of making pictures in relief on sheet material such as plastic and the like by the deformation of the sheet along curved and straight linear paths to provide depressed and elevated areas of generally V-shaped section which produce a pronounced three-dimensional appearance.

Still another object of the invention is to provide a new and improved method of making decorative three-dimensional pictures and designs of distortable sheet material, that may be displayed not only alone but advantageously in combination with materials of complementary or contrasting color tones to produce a wide variety of ornamental effects.

Still another object of the invention is a method for producing pictures and designs in sheet material such as transparent, translucent, frosted and opaque plastic and the like, wherein the required materials for its execution are well-adapted to be arranged in kit form for amateurs, hobbyists and children as well as for specially skilled individuals.

The above and other objects and advantages of the invention will become more apparent from the following description and accompanying drawings forming part of this application.

In the drawings:

Figure 1 is a perspective of an article of ornamentation made in accordance with the invention;

Figure 2 is a perspective view of the material on which a design is to be formed and the patterns used in forming it;

Figure 3 is a perspective view showing one step in making the design shown in Figure 1; and

Figures 4, 5 and 6 show alternate structures for mounting the design of Figure 1 in accordance with the invention.

The fabrication of three-dimensional pictures and designs in accordance with the invention involves the distortion of a permanently deformable sheet material such as plastic and the like along predetermined paths and in such a manner as to cause the completed design to have substantial depth through the formation of alternate areas of elevation and depression of V-shaped section. The invention also includes means for mounting these three-dimensional pictures and designs to accentuate the effect of depth and provide harmonious and contrasting color effects.

Figure 1 illustrates a completed item that may be formed of a sheet of plastic material 10 such as cellulose acetate, cellulose nitrate, Bakelite, Vinylite or other similar material having readily deformable characteristics and form-retaining qualities. The alternate V-shaped effect obtainable with this invention can be observed along the edge 11 of the material 10 which shows alternate raised and depressed portions. For instance, the line 12 of the design is formed by the application of pressure along a path on the reverse side of the material while the adjacent line 13 is formed by the application of pressure on the front side of the material. This results in increasing the depth between the lines 12 and 13, and this may be further emphasized by displaying the finished product on a rigid backing or support, as will be described. Furthermore the design as shown in the figure may be formed on transparent, translucent, opaque, opalescent, or frosted material to produce any desired artistic effect.

In making a product as illustrated in Figure 1, a line drawing of the design to be reproduced is first prepared on paper or similar material. This drawing may be wholly original or copied from a photograph, print, painting or other artistic work. The lines are then divided into two groups, namely those to be in a raised position in the finished product and those to be in a depressed position. Each group of lines may then be transferred to a separate sheet of material such as paper or the like to form two separate but complementary patterns. These patterns are denoted by the letters B and C in Figure 2. The sheet of deformable material is denoted by the letter A in this figure.

By way of example, let it be assumed that the material A of Figure 2 is a transparent plastic so that the patterns B and C can be observed through the material. In this case the patterns B and C may be made on any type of paper or paper-like material with the group of lines of one pattern being reversed relative to the group of lines on the other pattern. For example, consider the lines 12 and 13 of Figure 1. The line 12′ on pattern C corresponds to line 12 of Figure 1 and appears at the right-hand side of this pattern while the line 13′ corresponds to line 13 of Figure 1 and appears on the left-hand side of pattern B. While the patterns B and C are shown on separate sheets of material it is quite apparent that they can be formed on opposite sides of a single sheet of opaque material or of a transparent or partially transparent paper with means for differentiating one group of lines from the other. For instance, the groups of lines could be of different colors or one group formed in solid lines and the other in dotted lines.

Having prepared the patterns such as those shown at B and C in Figure 2, a resilient work surface is prepared as shown in Figure 3 on which the deformable sheet A is distorted to produce the three-dimensional effect. In the figure the work table such as a table top or the like is denoted by the numeral 14. The resilient work surface 15 is placed on the table top 14 and is of course preferably slightly larger than the deformable material A on which the design is to be formed. This resilient layer may be of any suitable material such as felt, rubber, many layers of newspaper or cloth or any other yieldable material that is easily compressible under pressure. The pattern B is then placed on top of the resilient material and the transparent material A is placed over the pattern. As illustrated, the pattern B includes the group of lines that will ultimately form depressions in the finished article. Before proceeding with the actual deformation of the material A it is important to guard against any relative movement of the pattern and material. For this purpose guides or clamps may be used.

Deformation of the material may be accomplished by

any suitable instrument or tool having an appropriately shaped end that will not cut or damage the material A. Such an instrument is illustrated in Figure 3 and includes a tapered shank **16** of metal or the like having a rounded end part **17** that bears directly on the material A, and a suitable handle **18**. As the lines of pattern B show through the material A, the tool **16** can be guided over the material in paths corresponding to the lines of the pattern. At the same time sufficient pressure is exerted on the tool to permanently deform the material along these paths. In Figure 3 the material is shown as having been deformed along line **19'** while the line **20'** has been deformed part way. These two adjoining lines of depression form a gently rounded area **21** between them. These lines are also shown on pattern B of Figure 2 and the corresponding lines are denoted as **19** and **20** in Figure 1.

When all of the lines of pattern B are impressed in the material A, the material A and pattern B are removed and pattern C is placed in position on the resilient material **15**. The material A is then turned over and placed on the pattern so that the depressions such as lines **19'** and **20'** extend upwardly. The design part formed in material A is properly aligned with the pattern C and the material is then deformed along the lines of the second pattern. For example, the line **22'** of pattern C corresponds to the line **22** of Figure 1 and lies between lines **19'** and **20'** of pattern B. When this line is impressed in the material A, the gently rounded part **21** of Figure 3 will be further elevated and thus emphasize the three-dimensional effect, as clearly shown in the completed article of Figure 1.

Various effects can be secured on the deformable material A by producing the linear deformations with different types of tools **16**. The illustrated tool has a rather sharply rounded end **17** that produces a relatively sharp line on the material. More gently rounded deformations can be secured with tools formed with end parts **17** of a larger radius.

The foregoing description of the formation of the article in Figure 1 relates to the use of a transparent or frosted material A. In certain cases it may be desirable to use opaque materials in which case the patterns B and C may be formed directly on each side thereof or transferred to the plastic just before the tooling operation. It is apparent that other methods of accomplishing the objects of this invention may be used without departing from its scope.

The finished item is preferably mounted on a rigid frame or backing to emphasize the three-dimensional attributes of the invention, and may also be provided with colored mats and backings. By way of example, Figure 4 shows the finished article **10** of Figure 1 mounted on a stiff or rigid backing **23** by means of staples or other fastening means **24**. In the alternative the article **10** can be supported by a rigid frame and a semi-rigid backing. With the mounting shown in Figure 4, all of the depressed parts of the design will lie in a plane with the periphery of the picture and thereby emphasize the depth effects. For decorative purposes, particularly when the article **10** is formed of a transparent or translucent material, the backing **23** may be of a colored material or painted or covered with a colored paper.

Figure 5 illustrates the use of a peripheral border or mat **25** overlying the finished design **10**. The mat may of course be cut to conform to the outline of the design itself and may be of a rigid or semi-rigid material or it may be painted on the surface in any conventional manner. As an alternative the mat or painted border **25** may be placed on the underside of the design **10** as denoted by the numeral **25'** of Figure 6.

With this invention a wide variety of artistic effects can be achieved by the proper selection of materials and the method of distorting the deformable material. For instance, the areas between adjacent lines of depression may be gently rounded or sharply pointed, substantial areas may be raised while other areas are depressed, or alternate lines may be raised while the intermediate lines are depressed. The versatility of the procedure, coupled with variations in the mounting means, and the wide selection of available materials, enable the production of many interesting designs and effects even by relatively untrained persons such as amateurs, hobbyists and children; and the required materials for effecting these results are particularly suitable for arrangement and sale in kit form.

While only certain embodiments and modifications of this invention have been illustrated and described it is apparent that other changes and modifications can be made without departing from the true scope and spirit thereof.

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

1. The method of making designs in relief on deformable initially flat sheet material, comprising the steps of making a two-dimensional line drawing of the design, applying pressure along predetermined paths on one side of the material corresponding to selected lines of said drawing to permanently deform said material in one direction to create regions of V-shaped section, and applying pressure along predetermined paths on the other side of said deformable material corresponding to other lines of the drawing to permanently deform said material in the other direction to create regions of inverted V-shaped section.

2. The method of making designs in relief on deformable material comprising the steps of making a two-dimensional line drawing of the design, applying pressure along predetermined paths on one side of the deformable material corresponding to selected lines of said drawing to permanently deform said material in one direction, and applying pressure along predetermined paths on the other side of said deformable material corresponding to other lines of said drawing to permanently deform said material in the other direction.

3. The method of making designs in relief on deformable material comprising the steps of placing said deformable material on a resilient surface, applying pressure successively along predetermined paths on one side of said material to permanently deform it in one direction, reversing said deformable material on said resilient surface to expose the other side thereof and applying pressure successively along predetermined paths on said other side to permanently deform the material in the other direction.

4. The method of making designs in relief on deformable material comprising the steps of preparing a line drawing of the design, forming at least two patterns of said design with one pattern carrying selected lines thereof and the other pattern carrying the remaining lines, placing said deformable material on a resilient surface, deforming said material along paths corresponding to the lines of one pattern to permanently deform the material in one direction, reversing said material on the resilient surface and deforming the other side of said material along paths corresponding to the lines of said other pattern to deform the material in the other direction.

5. The method according to claim 4 wherein said patterns are formed on at least one sheet of material.

6. The method according to claim 4 wherein said patterns are formed directly on the deformable material itself.

7. The method of making designs in relief on deformable material comprising the steps of making at least one two-dimensional line drawing of the picture to be reproduced, applying pressure along predetermined paths on one side of the deformable material corresponding to selected lines of said drawing to permanently deform said material in one direction, applying pressure along predetermined paths on the other side of said deformable material corresponding to other lines of said drawing to

permanently deform said material in the other direction, and mounting said permanently deformed material on a substantially rigid member to hold the edges thereof in alignment with one another.

8. An article of manufacture comprising a piece of permanently deformed flat material having areas thereof deformed in one direction and having a substantially V-shaped section and other areas deformed in the other direction and having an inverted substantially V-shaped section; and a rigid backing member for said material holding the edges thereof in alignment with one another.

9. An article of manufacture according to claim 8 wherein said article includes a mask between said backing member and said deformed material.

10. An article of manufacture according to claim 8

wherein said mounting comprises a mask overlying the material and secured to the rigid backing member.

11. An article of manufacture according to claim 8 wherein said sheet material is at least partially transparent and said backing includes a colored surface at least partially visible through said sheet material.

References Cited in the file of this patent

UNITED STATES PATENTS

576,047	Fairchild	Jan. 26, 1897
615,026	Hulbert	Nov. 29, 1898
2,005,719	Hayden	June 25, 1935
2,616,198	Sewell	Nov. 4, 1952
2,656,634	Varner	Oct. 27, 1953