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H. B. WOOD

2,337,703

LIGHT REFLECTING ELEMENT

Filed Feb. 26, 1940

Fig. 1.

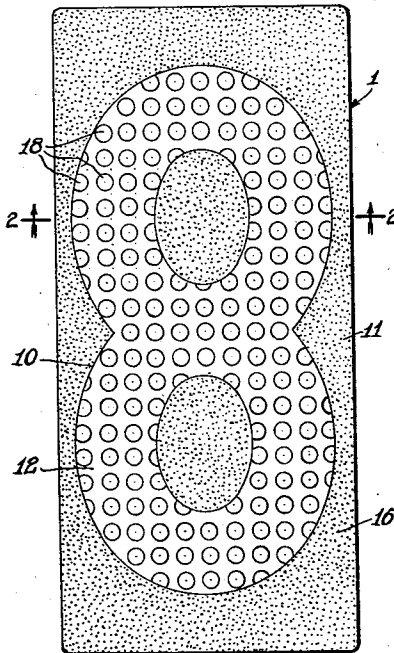
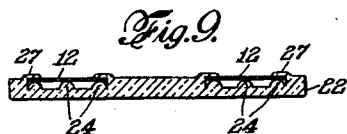
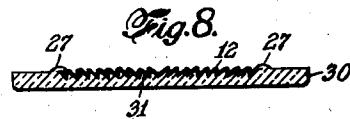
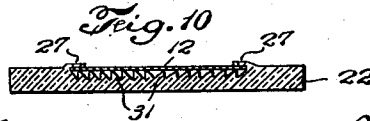
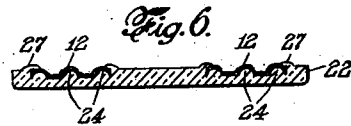
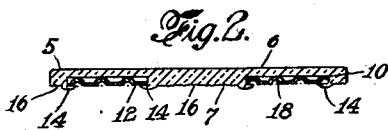
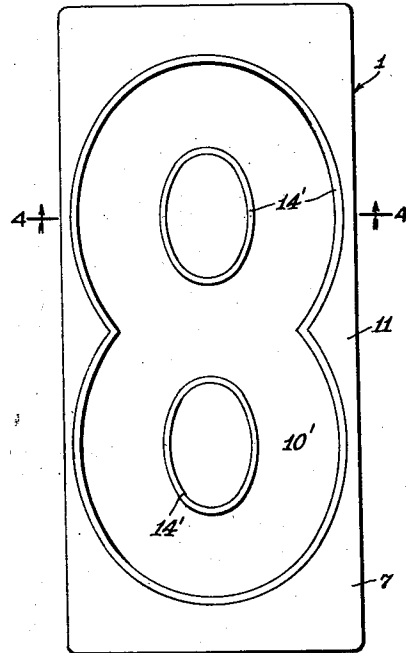


Fig. 3.



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LIGHT-REFLECTING ELEMENT

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14 Claims. (Cl. 40—125)

This invention relates to signs, and more particularly to elements which will reflect light rays impinging thereon, whereby the elements and particularly the indicia thereof will be readily visible and discernible.

The nature and objects of the invention will become apparent from the following description, appended claims and accompanying drawing forming a part of this specification and wherein:

Figure 1 is a front elevation of a sign embodying the principles of this invention;

Figure 2 is a section taken on the line 2—2 of Figure 1;

Figure 3 is a rear view of the blank shown in Figure 1 during one stage of the process of making the sign;

Figure 4 is a section taken on the line 4—4 of Figure 3;

Figure 5 is a section of a modified blank;

Figure 6 is a section of a sign including the blank shown in Figure 5;

Figure 7 is a section of another modification of a blank;

Figure 8 is a section of a sign utilizing the blank shown in Figure 7;

Figure 9 is a section of the preferred sign; and

Figure 10 is a section of a modification of the preferred sign.

The instant invention is particularly useful in the display of numerals to indicate the number of a house or residence. For this reason, the invention will be specifically described in connection with such a numeral. It is, however, to be understood that the invention is not restricted to numerals, since it is equally applicable in signs and particularly those used in places which are subject to severe conditions of the weather elements.

Referring now to the drawing wherein like reference numerals designate like parts, the reference numeral 1 designates one form of a sign embodying the principles of the invention and, for illustrative purposes, the sign 1 is shown as displaying the numeral 8. The sign 1 is formed of a blank 5 which is provided with a front surface 6. The front surface 6 constitutes the front face of the sign 1 and, preferably, is smooth and plain. The rear surface 7 of the blank is provided with a depression 10 which is of a shape and form corresponding to the numeral 8. A reflecting element 12, also in the form of the numeral 8, is disposed in the depression and is secured therein by means of flanges 14 which extend over onto the rear surface of the reflect-

ing element 12. It is to be noted that the flanges 14 are adjacent the edges of the reflecting element and overlap onto the normal free edges thereof.

The area of the front surface of the blank directly opposite to the depression 10 on the rear surface thereof is transparent, whereby the reflecting element 12 is visible and exposed to view. The remaining portion 11 of the front surface of the blank may also be transparent. However, if desired, the portion 11 may be of such a nature as to provide a contrast between it and the visible reflecting element, whereby the visibility of the reflecting element is enhanced. For example, the portion 11 or the rear thereof may be made opaque or of a color which provides the desired contrast. Highly satisfactory results are secured when the rear of the portion 11 is stippled, as shown by the reference numeral 16.

The reflecting element 12, in the preferred form of the invention, is formed of a highly polished sheet metal, and specifically highly polished aluminum. In order to render the reflecting surfaces of the reflecting element 12 more effective, the front face of said reflecting element is provided with means to reflect the light impinging thereon at various angles.

Since the invention in its preferred form is intended for use in the marking of a number of a house or residence, and therefore should be visible when viewed at an angle, the front surface of the reflecting element is provided with reflecting surfaces comprising parabolic or cup-shaped protuberances 18. It is to be understood that if desired the front surface of the reflecting element may be provided with other forms and shapes of reflecting surfaces, such as, for example, corrugations. The form and shape of the protuberances 18 and the angular disposition of the corrugations depend on the angles at which it is desired the numeral shall be visible.

In the preferred embodiment of this invention, the blank 5 is made of an acrylate resin, such as a methacrylate resin, and specifically, "Lucite." "Lucite" is preferred because it will successfully resist and withstand the elements of the weather. Also, it is rugged and strong and will not warp. In addition, light rays passing therethrough will not be distorted. As a consequence, when light rays emanating from some external source impinge thereon, they will pass therethrough and impinge on the reflecting element without distortion. Similarly, the light

rays reflected by the reflecting elements will pass therethrough also without distortion.

In the manufacture of the sign 1, a blank is molded from "Lucite" into the desired shape and form. An illustrative blank is shown in Figures 3 and 4. Referring now to Figures 3 and 4, it is to be noted that a depression 10' is formed in the rear surface of the blank and that adjacent the edges thereof there are provided upstanding beads 14'. After the blank has been formed, the reflecting element 12, which has been previously provided with the desired reflecting surfaces in the front surface thereof, is cut to a size and shape corresponding to the depression. The thus-prepared reflecting element is then introduced into the depression and the assembly is introduced into a mold whereby the beads 14' are rolled over onto the marginal edges of the reflecting element 12 forming the flanges 14 and tightly securing the reflecting element 12 in place.

The appropriate mold member is also provided with means which will provide the stipples 16. If necessary, the mold member cooperating with the front of the blank may be such as to impart the desired smooth, plane surface.

In some cases it has been found that, when the reflecting element is provided with a plurality of reflecting surfaces, some of the said reflecting surfaces, either during handling or manufacture, will be marred, distorted or even destroyed. To overcome this, the instant invention contemplates the provision of means in the depression which will inhibit marring, distortion or destruction of the reflecting surfaces. Specifically, the instant invention provides means in the depression which are complementary to the reflecting surfaces of the reflecting element and in assembled condition are in most intimate relationship with each other. Thus, when the reflecting surfaces are cup-shaped depressions, the projections may be of a shape and size so that the depressions will intimately conform to said projections and the latter will be received and seated in the cup-shaped depressions. When the reflecting surfaces are in the form of corrugations, the depressions may likewise be corrugated so that the reflecting surfaces will fit thereon. Figures 5 to 8 inclusive show illustrative embodiments of the forms of the invention just described.

Referring now to Figures 5 and 6, the blank 22 is of the same general construction as the blank 5, previously described, except that the blank 22 is provided with rearwardly extending projections 24 in the depression. The projections 24 are made of the same material as the blank and integral therewith. The projections are of a shape so that, when a smooth sheet of the reflecting element is positioned thereon and pressure is applied thereto, the reflecting element will conform to the shape and form of said projections and form a plurality of reflecting surfaces.

In this embodiment, a blank having the details of construction shown in Figure 5 is first molded. Thereafter the reflecting element, which is in the form of a flat sheet material cut to the shape and form of the depression, is inserted therein. This assembly is then introduced in a press whereby, upon the application of pressure, the reflecting element is made to intimately conform to the projections 24, and at the same time the beads 26 are rolled over to form flanges 27 securely positioning the reflecting element in place. In this embodiment of the invention, the

projections 24 serve as a support for the reflecting surfaces in the reflecting element and prevent distortion or marring thereof.

It is to be understood that the projections 24 may be made of shapes and forms other than semi-spherical, producing semi-spherical or parabolic depressions, as shown in Figures 5 and 6. The size and shape of the projections 24 depend on the size and shape of the desired reflecting surfaces of the reflecting element.

Figures 7 and 8 illustrate an embodiment of the invention wherein the reflecting surfaces are obtained by corrugations in the reflecting element. In this embodiment, the blank 30 is of the same general construction as the blank 22, the only difference being that the depression is provided with corrugations 31. In producing the sign shown in Figure 7 and 8 the same mode of procedure as described above in connection with Figures 5 and 6 is employed.

With respect to the embodiments shown in Figures 5 to 8 inclusive, it is to be understood that the form and shape of the reflecting surfaces in the reflecting element depend on the angle at which the indicia is desired to be visible when viewed by an observer.

In the preferred embodiment of the invention, a blank 22 of the type and nature shown in Figure 5 is utilized. In this preferred embodiment (see Figure 9) the reflecting element 12, previously cut to the shape and form of the depression, is laid flat in the depression and the beads 26 rolled over to form a flange 27 and secure the reflecting element 12 in position. In this embodiment, in the final product, as shown in Figure 9, the reflecting element 12 is flat and the reflecting surface thereof is in contact with and supported by the projections 24 and does not conform to the shape of the projections 24 as is the case in the embodiment shown in Figure 6. In other words, the reflecting surface is planar.

If desired, in the preferred embodiment the semi-spherical projections 24 may be replaced and substituted by corrugations 31, in which case the blank will be of the type and nature shown in Figure 7. Such an embodiment is shown in Figure 10.

If desired, in each of the preceding embodiments a backing (not shown) may be applied to the rear surface of the sign.

A sign element produced in accordance with the instant invention is very strong and rugged. It successfully withstands the elements of the weather and substantially retains its shape and form even after prolonged usage.

The sign 1 may be provided with appropriate means whereby it may be attached or secured in the desired position. If desired, a plurality of the signs 1 may be assembled and positioned in a frame and used in this manner.

It is further to be understood that, though the sign element illustrated in the drawing has been shown as rectangular, the invention is not restricted thereto. The element may be of any desired and appropriate shape. Also, the invention is not restricted to letters or numerals, since any other indicia may be utilized.

Since it is obvious that various changes and modifications may be made in the above description without departing from the nature or spirit thereof, this invention is not restricted thereto except as set forth in the appended claims.

I claim:

1. A light-reflecting element comprising a blank formed of an acrylate plastic and provided

with a front surface and a depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed by said element, a plurality of projections in said depression, a reflecting element corresponding to the size and shape of said depression disposed in said depression, said reflecting element comprising a sheet material having a surface provided with depressions conforming to the said projections and receiving said projections therein, and a flange formed integrally with said blank and extending over the normal free edges of said depression to secure said reflecting element in said depression, said blank being transparent at least at that portion opposite to said depression.

2. A light-reflecting element comprising a blank formed of an acrylate plastic and provided with a front surface and a depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed by said element, said depression being provided with a plurality of projections, the convex surface of each projection being substantially parabolic in shape, a reflecting element corresponding to the size and shape of said depression disposed in said depression, said reflecting element comprising a sheet material having a surface provided with depressions conforming to said projections and receiving said projections, and a flange formed integrally with said blank and extending over the normal free edges of said depression to secure said reflecting element in said depression, said blank being transparent at least at that portion opposite to said depression.

3. A light-reflecting element comprising a blank formed of an acrylate plastic and provided with a front surface and a depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed by said element, said depression being corrugated, a reflecting element corresponding to the size and shape of said depression disposed in said depression, said reflecting element comprising a sheet material having corrugations conforming to and complementary to the corrugations of said depression, and a flange formed integrally with said blank and extending over the normal free edges of said indicia to secure said reflecting element in said depression, said blank being transparent at least at that portion opposite to said depression.

4. A light-reflecting element comprising a blank formed of an acrylate plastic and provided with a front surface and a depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed by said element, said depression being provided with a plurality of projections, a reflecting element corresponding to the size and shape of said depression disposed in said depression, said reflecting element comprising a sheet material and the reflecting surface thereof being supported on said projections, and a flange formed integrally with said blank and extending over the depression to secure said reflecting element in said depression, said blank being transparent at least at that portion opposite to said depression.

5. A light-reflecting element comprising a blank formed of an acrylate plastic and provided with a front surface and a depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed by said element, said depression being provided with a plurality of projections, each of said projections having a rounded convex surface, a reflecting element corresponding to the size and shape of said

depression disposed in said depression, said reflecting element comprising a sheet material and the reflecting surface thereof being supported on said projections, and a flange formed integrally with said blank and extending over the depression to secure said reflecting element in said depression, said blank being transparent at least at that portion opposite to said depression.

6. A light-reflecting element comprising a blank formed of an acrylate plastic and provided with a front surface and a depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed by said element, said depression being provided with a plurality of projections, each of said projections having a rounded convex surface substantially parabolic in shape, a reflecting element corresponding to the size and shape of said depression disposed in said depression, said reflecting element comprising a sheet material and the reflecting surface thereof being supported on said projections, and a flange formed integrally with said blank and extending over the depression to secure said reflecting element in said depression, said blank being transparent at least at that portion opposite to said depression.

7. A light-reflecting element comprising a blank formed of an acrylate plastic and provided with a front surface and a depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed by said element, said depression being corrugated, a reflecting element corresponding to the size and shape of said depression disposed in said depression, said reflecting element comprising a sheet material and the reflecting surface thereof being supported on the projecting portions of said corrugations, and a flange formed integrally with said blank and extending over the depression to ensure said reflecting element in said depression, said blank being transparent at least at that portion opposite to said depression.

8. A method of preparing a light-reflecting element comprising molding an acrylate plastic to simultaneously produce a blank having a depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed, projections in said depression and an upstanding bead adjacent the edges of said depression, the portion of the blank directly opposite to the depression being transparent, introducing into said depression a sheet material having reflecting properties and corresponding in size and shape to said depression, and submitting the assembly to pressure whereby said sheet material is formed with depressions constituting light-reflecting surfaces and conforming to and receiving said projections therein and the beads are rolled over and onto said reflecting element to secure the same in position.

9. A method of preparing a light-reflecting element comprising molding an acrylate plastic to simultaneously produce a blank having a depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed, semi-spherical projections in said depression and an upstanding bead adjacent the edge of said depression, the portion of the blank directly opposite to the depression being transparent, introducing into said depression a sheet material having reflecting properties and corresponding in size and shape to said depression, and submitting the assembly to pressure whereby said sheet material is formed with semi-spherical depressions constituting light-reflecting surfaces and con-

forming to and receiving said depression therein and the beads are rolled over and onto said reflecting element to secure the same in position.

10. A method of preparing a light-reflecting element comprising molding an acrylate plastic to produce a blank having a corrugated depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed and an upstanding bead adjacent the edges of said depression, the portion of the blank directly opposite to the depression being transparent, introducing into said depression a sheet material having reflecting properties and corresponding in size and shape to said depression, and submitting the assembly to pressure whereby said sheet material is corrugated and conforms to the corrugations in said depression and the beads are rolled over and onto said reflecting element to secure the same in position.

11. A light-reflecting element comprising a blank formed of an acrylate plastic and provided with a front surface and a depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed by said element, said depression being provided with a plurality of projections, the convex surface thereof being substantially parabolic in shape, a reflecting element corresponding to the size and shape of said depression disposed in said depression and on said projections, and a flange formed integrally with said blank and extending over the normal free edges of said indicia to secure said reflecting element in said depression, said blank being transparent at least at that portion opposite to said depression.

12. A light-reflecting element comprising a blank formed of an acrylate plastic and provided with a front surface and a depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed by said ele-

ment, said depression being provided with a plurality of projections, a reflecting element corresponding to the size and shape of said depression disposed in said depression, said reflecting element comprising a sheet material having a planar reflecting surface supported on said projections, and means to secure said reflecting element in position, said blank being transparent at least at that portion opposite to said depression.

13. A light-reflecting element comprising a blank formed of an acrylate plastic and provided with a front surface and a depression in the rear surface thereof corresponding to the size and shape of the indicia to be displayed by said element, said depression being provided with a plurality of projections, each of said projections having a rounded convex surface, a reflecting element corresponding to the size and shape of said depression disposed in said depression, said reflecting element comprising a sheet material having a planar reflecting surface supported on said projections, and means to secure said reflecting element in position, said blank being transparent at least at that portion opposite to said depression.

14. A light-reflecting element comprising a blank formed of an acrylate resin and having a depression in the rear surface thereof corresponding to the indicia to be displayed, said depression being provided with projections, each of said projections having a rounded convex surface, a sheet material having reflecting properties disposed in said depression and having its reflecting surface in contact with said projections, and a rolled bead integral with said blank to secure the reflecting element in place, the portion of the blank directly opposite to the depression being transparent.

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CERTIFICATE OF CORRECTION.

Patent No. 2,337,703.

December 28, 1943.

HOWARD B. WOOD.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 18, for "Figure" read --Figures--; page 3, second column, line 40, claim 7, for "ensure" read --secure--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 29th day of February, A. D. 1944.

Leslie Frazer

(Seal)

Acting Commissioner of Patents.