

[54] **LIGHT REFLECTIVE COMPOSITE MOLDING**

[75] Inventors: Victor Shanok; Jesse P. Shanok, Brooklyn, N.Y.

[73] Assignee: Glass Laboratories Company, Brooklyn, N.Y.

[22] Filed: Feb. 9, 1971

[21] Appl. No.: 113,858

[52] U.S. Cl.161/5, 161/6, 161/45, 161/218, 161/220, 161/409, 161/410

[51] Int. Cl.B32b 15/08, E04f 19/02, B44f 1/02

[58] Field of Search.....161/5, 6, 43, 45, 168, 201, 161/204, 218, 220, 408-410

[56] **References Cited**

UNITED STATES PATENTS

3,590,768	7/1971	Shanok et al.161/5 X
3,440,129	4/1969	Anselm161/5
3,506,526	4/1970	Toyooka161/5
3,518,153	6/1970	Slosberg et al.161/5
3,556,635	1/1971	Schrenk et al.161/5 X
3,565,734	2/1971	Shanok et al.161/5
3,616,099	10/1971	Shanok et al.161/5
3,616,100	10/1971	Morita.....161/5
3,574,043	4/1971	Luber et al.161/6 X
3,574,044	4/1971	Shepherd161/6
3,629,045	12/1971	Dopera.....161/5
3,640,832	2/1972	Kurz161/408 X

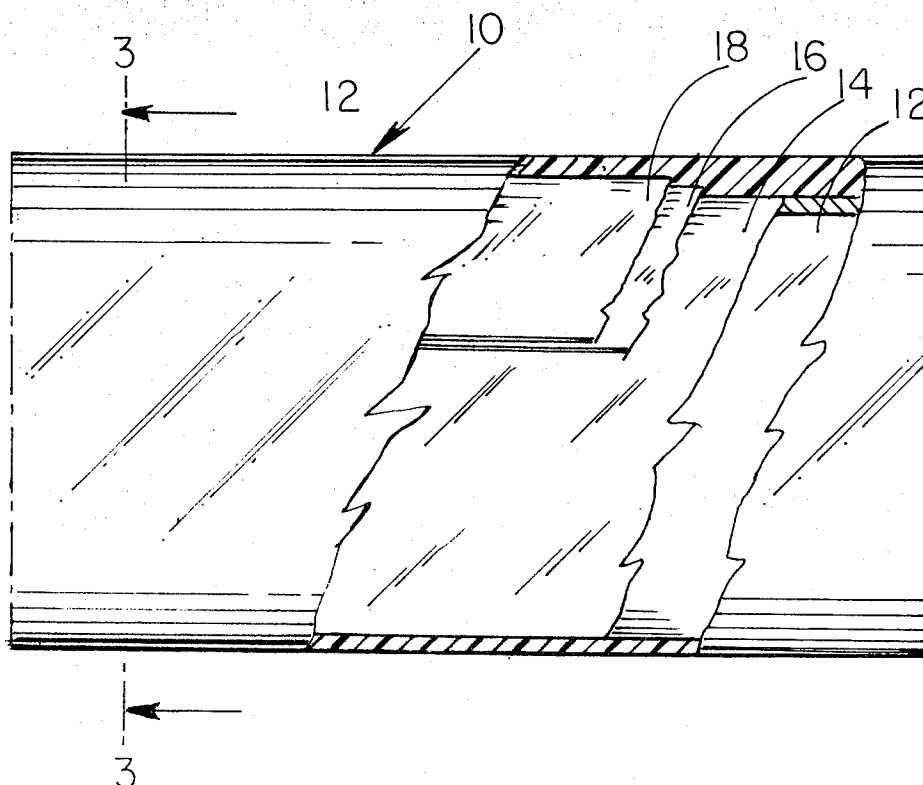
3,652,375	3/1972	Johnson.....161/168 X
3,660,211	5/1972	Brody.....161/5 X
3,661,686	5/1972	Armstrong.....161/409 X
3,681,180	8/1972	Kent.....161/5

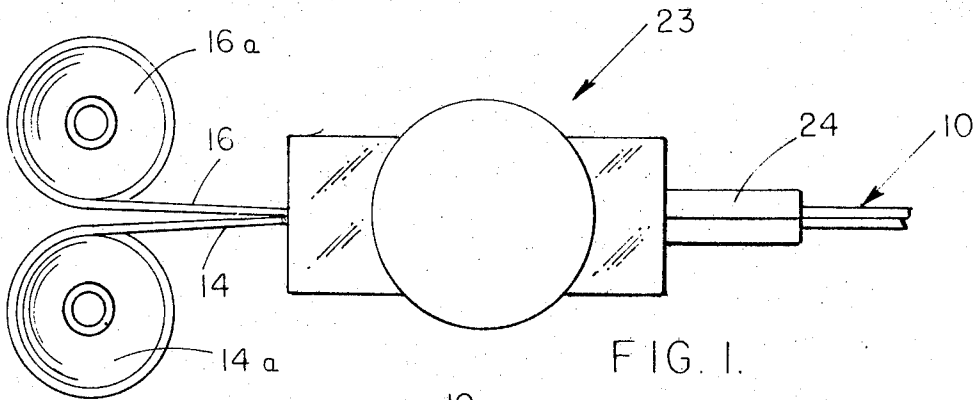
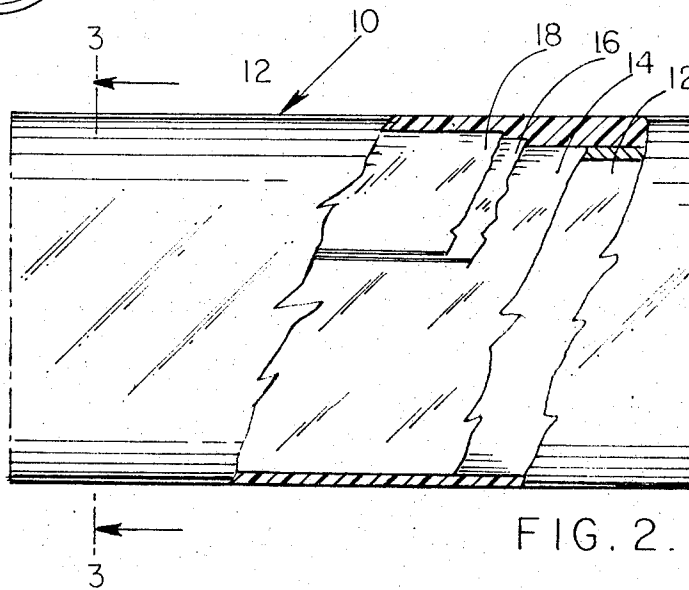
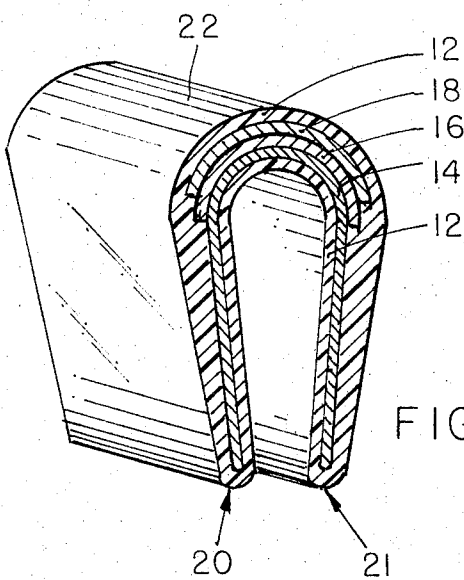
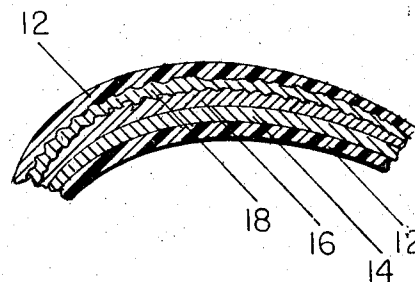
Primary Examiner—Harold Ansher
Attorney—Friedman & Goodman

[57] **ABSTRACT**

A composite molding comprising an elongate transparent casing adapted for operative association with an external source. The casing includes a pair of opposing faces one of which is adapted to contact and be concealed by the external source and the other of which is adapted to be exposed relative to the external source. A metallic strip extends in the casing proximate and generally parallel to the one of the faces which is adapted to contact the external source. A light-reflective strip extends in the casing generally parallel to the metallic strip and is separated from the latter of said faces by the metallic strip. A transparent self-hardening coating such as lacquer, varnish or the like extends on the light-reflective strip proximate the face which is adapted to be exposed relative to the external source. The coating is adapted to seal and eliminate air-cavities existing between the light-reflective strip and the exposed surface of said faces to obviate interference of light-rays to be reflected by the molding.

11 Claims, 7 Drawing Figures





JESSE P. SHANOK
VICTOR SHANOK

INVENTORS

BY *Friedman and Goodman*

ATTORNEYS

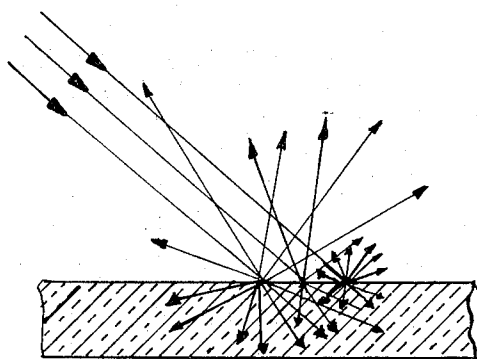


FIG. 5.

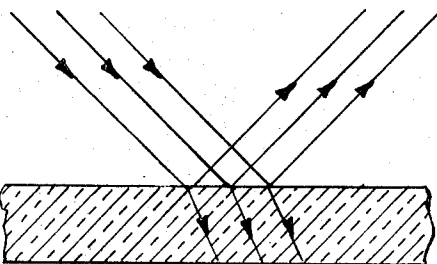


FIG. 6.

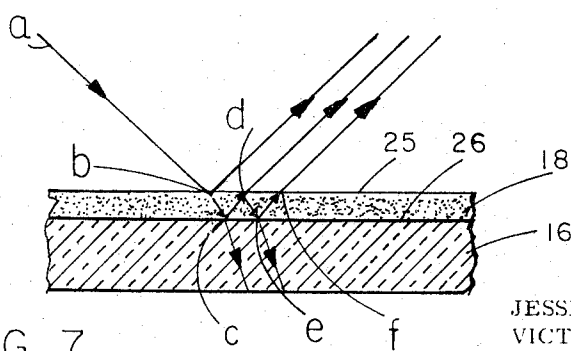


FIG. 7.

JESSE P. SHANOK
VICTOR SHANOK
INVENTORS

BY *Friedman and Goodman*
ATTORNEYS

LIGHT REFLECTIVE COMPOSITE MOLDING

BACKGROUND OF THE INVENTION

The present invention relates generally to a decorative trim strip assembly and more particularly to a trim strip or composite molding which is not merely decorative in appearance but also greatly enhances the visual impact of same to the viewer.

Many composite moldings or trim strip assemblies are conventionally well known for purposes of decoration and purposes of protection. In this respect, automobiles or the like are provided with these composite moldings on the door edges thereof so that when the door is opened, should the latter be inadvertently banged against an adjacent wall or vehicle, the composite molding acts to protect the door edge, upon which it is disposed, to prevent costly damage thereto. Furthermore, the composite molding is decorative in the sense that it is a thin strip and if arranged properly either alone or together with other thin strips similar thereto, the vehicle upon which it is placed is thereby provided with an enhanced decorative appearance.

However, notwithstanding the fact that the conventionally known composite moldings are useful in the decorative and protective senses, the conventional composite moldings do not, without complicated and expensive structure, afford adequate means for both markedly enhancing a visual signal of danger when a dangerous condition exists and obviating the signal of the dangerous condition when the dangerous condition no longer exists.

In this respect, if the composite molding is properly positioned on an automobile door and is properly constituted of elements such as that of the present invention, then when the door is opened, which is clearly a condition of potential danger, the composite molding can signal an observer, such as that in a passing automobile, that the door is in fact open so that the passing automobile may pass by the open door at a safe distance. Furthermore, when the door of the automobile is closed the elements of the composite molding which signal the unsafe condition can be disposed within the automobile to be concealed thereby so as not to distract an observer by its presence.

Since in fact, the conventional composite molding cannot be utilized and are not effective in the aforementioned manner, it is clear that there is a void in the art.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to provide an improved edge trim or composite molding which is not merely decorative and protective, but also is effective for signaling an unsafe or dangerous condition.

It is a further object of the present invention to provide a composite molding which can be easily fastened to an automobile door edge or to the like.

It is still a further object of the present invention to provide a composite molding which is constituted of a minimal number of elements and it is thereby economical itself and economical to produce.

It is another object of the present invention to provide a composite molding which reflects light with minimal distortion so that the light is sharply observable to more prominently indicate the presence of the

composite molding when the source upon which the molding is mounted is disposed in selected positions.

These objects are achieved by providing a composite molding comprising an elongate transparent casing adapted for operative association with an external source. The casing includes a pair of opposing faces, one of which is adapted to contact and be concealed by the external source and the other of which is adapted to be exposed relative to the external source. A metallic strip extends in the casing proximate and generally parallel to the one of the faces which is adapted to contact the external source. A light-reflective strip extends in the casing generally parallel to the metallic strip and is separated from the latter of said faces by the metallic strip. A transparent self-hardening coating such as lacquer, varnish or the like extends on the light-reflective strip proximate the face which is adapted to be exposed relative to the external source. The coating is adapted to seal and eliminate air-cavities existing between the light-reflective strip and the exposed surface of said faces to obviate interference of light-rays to be reflected by the molding.

BRIEF DESCRIPTION OF THE DRAWINGS

With the above and additional objects and advantages in view as will hereinafter appear, this invention comprises the devices, combinations, and arrangements of parts hereinafter described and illustrated in the accompanying drawings of a preferred embodiment in which:

FIG. 1 is a diagrammatic plan view of exemplary apparatus for manufacturing the composite molding according to the present invention;

FIG. 2 is a side elevational view, partially in cross-section and partially fragmentary, illustrating the composite molding according to the present invention;

FIG. 3 is a perspective view of the composite molding according to the present invention taken along the line 3—3 in FIG. 2;

FIG. 4 is an enlarged fragmentary elevational view of the composite molding as illustrated in FIG. 3 and illustrates more clearly the relationship of the various elements of the composite molding according to the present invention;

FIGS. 5 and 6 illustrate schematically the reflective characteristics of a light-reflective strip when in direct contact with air; and

FIG. 7 illustrates schematically the reflective characteristics of a light-reflective strip when coated with a transparent layer in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings as illustrated in FIG. 2, the composite molding generally denoted by reference character 10 comprises a body 12 of thermoplastic material or other suitable transparent material for constituting a casing encapsulating both a strip of metallic foil 14 such as aluminum or the like and a strip of light-reflective material 16, the latter being at least partially transparent such as glass or the like. The strip of light-reflective material 16 is provided on its face, opposite that face which is in contact with the metallic foil 14, with a thin coating such as a film of lacquer, varnish or other suitable transparent self-hardening material 18.

As illustrated in FIG. 3, the thermoplastic body 12, in transverse cross-section, is generally U-shaped so that it may be suitably mounted upon an external source such as the projecting edge of an automobile door (not shown) in embracing relation with the latter. Furthermore, as illustrated in FIG. 3, the extent of the metallic foil 14 is substantially co-extensive with that of the thermoplastic body 12 and is similarly U-shaped. The U-shaped thermoplastic body 12 is constituted of two opposing limbs 20 and 21 respectively which are interconnected integrally by a medial portion 22. The strip of light-reflective material 16 is disposed upon the metallic foil 14 and is specifically located within the medial portion 22 of the body 12. the function of the location of the light-reflective material 16 will be discussed below.

It is noteworthy, that the strip of light-reflective material 16 may be at least partially transparent and constituted for reflecting white light. Similarly, the light-reflective strip 16 may be constituted of a specific color so that it reflects a color generally identical to that of its own. It is also noteworthy, that the thermoplastic body 12 may be constituted of a synthetic resin such as polyvinyl chloride or cellulose acetate butyrate so as to be transparent and yet rather sufficiently strong for resisting impact without damage thereto.

It is clear that any of several commercially feasible manufacturing assemblies are available for producing the composite molding according to the present invention. However, the apparatus preferred is that of a conventional extrusion head generally designated by the reference character 23 such as is diagrammatically illustrated in FIG. 1. In the operation of the extrusion head, the metallic foil 14 is provided on a supply roll 14a and the strip of light-reflective material 16 is similarly provided on a roll 16a. The metallic foil 14 and the strip of light-reflective material 16 are then fed into the extruder head 23. During the passage of these materials through the extruder head 23, the strip of light-reflective 16 is covered with the coating 18 which is a thin film of lacquer or varnish and thereafter, the metallic foil 14, the strip of light-reflective material 16 and the film 18 of lacquer are all encapsulated within the clear plastic body 12 of the composite molding 10. The composite molding 10 is then fed through a shaping die 24 which shapes the plastic encapsulated composite molding 10 into its U-shape as illustrated in FIG. 3. It is clear that the above apparatus or assembly for manufacturing the composite molding according to the present invention is conventional, well known and, therefore, further description of same is absent herefrom for the sake of clarity.

As illustratively exaggerated in FIG. 4, during the manufacturing of the composite molding according to the present invention, there are irregularities in the contour of the contacting portions of the thermoplastic 12 and the upper surface of the strip of light-reflective material 16. These irregularities in the contour of the thermoplastic inherently define air-pockets or air-cavities which act to distort and interfere with incoming light rays to be reflected by the strip of light-reflective material 16. This interference tends to diminish the efficiency of the reflective properties of the composite molding and thus in the absence of the film 18 as provided pursuant to the present invention for filling and obviating the air-pockets the composite molding would

not be most effective. In this respect, the film 18 is provided on the upper face of the strip of light-reflective material 16 so as to deform somewhat upon hardening during the manufacturing of the composite body and fill any air-pockets that would otherwise form in the absence of the provision of the film 18. Lacquer, or varnish as is well known, is transparent and self-hardening and therefore can be easily applied to the upper face of the strip of the light-reflective material 16 with great results achieved thereby.

Reference is now made to FIGS. 5-7, wherein by way of non-limiting example, there is illustrated the optic characteristics of a strip of light-reflective material 16 when in contact with the air, i.e., FIGS. 5 and 6, and when separated from the air through the intermediary of the film 18 according to the present invention.

As illustrated in FIG. 5, when incoming rays contact a strip of light-reflective material 16 through the medium of the air, the incoming rays are partially reflected and partially refracted, and all of these rays tend to interfere with one another. Therefore, only a few of these rays survive the interference and the reflective capacity of the strip of light-reflective material 16 is thereby less than most effective as may be appreciated by comparing FIGS. 6 and 7. In FIG. 6 the number of incoming rays are partially refracted and partially reflected and therefore, the number of outgoing reflected rays is limited generally to the number of incoming rays and the rays are localized at the point of light-impingement.

However, as illustrated in FIG. 7, the number of outgoing reflected rays can be markedly increased and dispersed by providing a film 18 of lacquer or the like upon the surface of the light-reflective material 16 to create added reflection of the incoming rays between the interface 25 separating the film 18 from the thermoplastic body 12 and the interface 26 separating the film 18 from the strip of light-reflective material 16. In this respect, an incoming ray *ab* will impinge upon the interface 25 and be refracted partially through the film 18 so as to impinge upon the interface 26. Upon impinging upon the interface 26, the portion *bc* is partially refracted again through the strip 16 and also partially reflected away from the interface 26 to impinge against the interface 25 at *d*. At this point, the portion *cd* of the initial incoming ray *ab* is again reflected by the interface 25 downwardly against the interface 26 at *e* where in turn it is again partially refracted and then partially reflected once again upwardly to the interface 25 at *f*.

Thus, there is a continuous reflection without interference between the interfaces and partial reflection and refraction into the adjacent medium. This continuous reflection of the incoming rays causes a marked increase in the number and dispersion of outgoing reflected rays. This marked increase is greatly valuable in the instant case as the additional and dispersed reflected rays more prominently signal an observer of the presence of the composite molding. The importance of the film 18 is clearly appreciated since the provision of same enhances the fixed association of the light-reflective strip 16 relative to the body 12 of thermoplastic material and eliminates all air-cavities that would otherwise be inherent between the strip of light-reflective material 16 and the thermoplastic material 12. Thus, with the elimination of the air-cavities there

is the elimination of interference of the rays and the marked increase in the reflective capacity of the composite molding pursuant to the present invention.

As discussed above, the strip of light-reflective material 16 and the film 18 thereon are only disposed upon the medial portion 22 of the composite molding 10. As may be readily appreciated when the opposite limbs 20 and 21 of the U-shaped composite molding embrace the edge portion of a door of a vehicle, these limbs 20 and 21 serve as decorative and protective trim. However, the portion 22 of the U-shaped composite molding is only observable from vantage points which are exposed to the presence of the portion 22. In this respect, when the door of the vehicle is opened, the portion 22 of the composite molding is readily observable. However, when the door of the vehicle is closed, the portion 22 of the composite molding is concealed by the remaining portions of the door support or by the adjoining door. Therefore, it is clear that the composite molding pursuant to the present invention, may be utilized for indicating that the door has been opened, a condition clearly which is potentially dangerous, and is concealed when the door is closed so as not to distract observers and passers-by.

It is noteworthy, that because of the provision of the film 18 on the strip of light-reflective material 16, the composite molding 10 need be only provided with a minimal number of elements which are readily encapsulated fixedly relative to one another in the body of thermoplastic material 12 in an economical and sufficient manner. The composite molding need not necessarily therefore, be provided with colorful or color reflecting elements which would, in the absence of the provision of the film 18 be necessary for more adequately signalling the presence of the composite molding.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates to a preferred embodiment of the invention which is for purposes of illustration only and not to be construed as a limitation of the invention.

What is claimed is:

1. A composite molding for use on a portion of an automobile, said molding comprising an elongate transparent casing, said casing including a pair of opposing faces, one of said faces defining a concealable face for contacting the automobile portion, the other of said faces defining an observable face for being exposed relative to the automobile portion, a metallic strip ex-

tending in said casing proximate and generally parallel to said concealable face, a light-reflective strip extending in said casing generally parallel to said metallic strip, said metallic strip being disposed between and separating said light-reflective strip and said concealable face, and coating means for eliminating air-cavities between said light-reflective strip and said observable face to obviate potential interference of light rays reflected by said light-reflective strip, said coating means including a transparent self-hardening coating extending on said light-reflective strip proximate said observable face.

2. A composite molding as claimed in claim 1, wherein said elongate transparent casing is constituted of a thermoplastic composition.

3. A composite molding as claimed in claim 1, wherein said casing fully encapsulates said metallic strip, said light-reflective strip and said coating in fixed relation.

4. A composite molding as claimed in claim 1, wherein said metallic strip is constituted of aluminum foil.

5. A composite molding as claimed in claim 1, wherein said light-reflective strip is at least partially transparent and constituted for reflecting white light.

6. A composite molding as claimed in claim 1, wherein said light-reflective strip is at least partially transparent and constituted of a color for reflecting light of its own color.

7. A composite molding as claimed in claim 1, wherein said casing and metallic strip are substantially co-extensive transversely with one another.

8. A composite molding as claimed in claim 1, wherein said light-reflective strip has a transverse extent which is substantially less than that of said metallic strip and is disposed generally medially on the latter.

9. A composite molding as claimed in claim 1, wherein said casing has a transverse cross-sectional U-shaped extent defining a pair of opposing limbs and a medial portion integrally interconnecting said opposing limbs.

10. A composite molding as claimed in claim 9, wherein said metallic strip is generally co-extensive with said pair of opposing limbs so as to be visible universally from any vantage point.

11. A composite molding as claimed in claim 9, wherein said light-reflective strip is generally disposed along said medial portion so as to be visible only at vantage points generally perpendicular to said medial portion.

* * * * *