Nov. 25, 1969 D. E. MOCK 3,479,770

STRUCTURAL MEMBERS AND DOORS AND RELATED STRUCTURES FORMED FROM THE SAME

Filed Aug 16, 1968

FIG. 1.

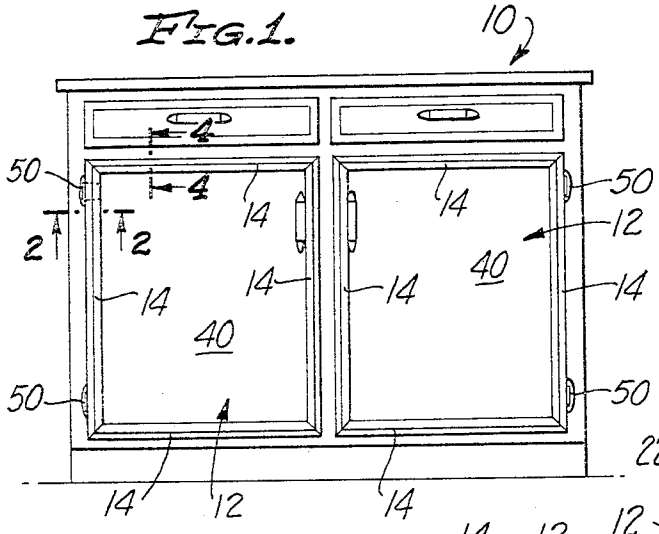


FIG. 4.

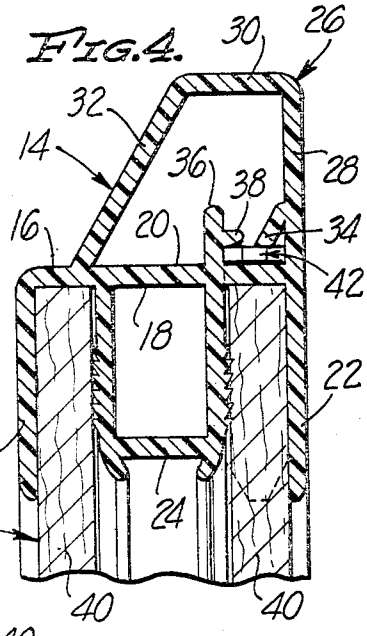


FIG. 2.

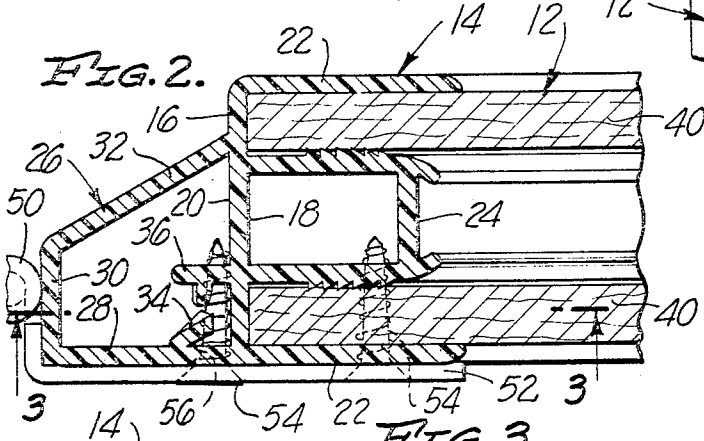


FIG. 5.

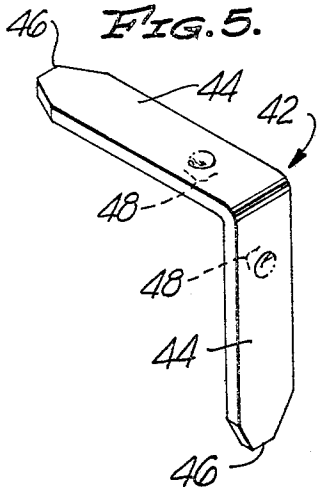
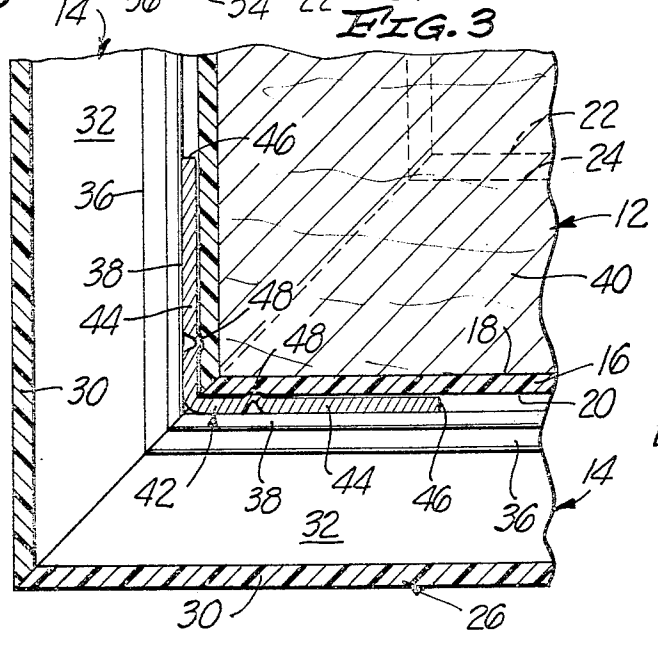


FIG. 3



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STRUCTURAL MEMBERS AND DOORS AND RELATED STRUCTURES FORMED FROM THE SAME

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Continuation-in-part of application Ser. No. 696,879, Jan. 10, 1968. This application Aug. 16, 1968, Ser. No. 753,202

Int. Cl. E06b 1/16, 1/28

U.S. Cl. 49—501 4 Claims

ABSTRACT OF THE DISCLOSURE

Structural members or surrounds for use in forming doors and related structures are disclosed. Each of these members as a back wall, means for holding at least one panel attached to one side of the back wall and trim means attached to the other side of the back wall. The trim means in such a member includes an exterior wall extending from the back wall, a deflecting lip attached to the exterior wall so as to extend from it towards the back wall and an attaching wall extending from the back wall so as to be spaced from the exterior wall and the deflecting lip. If desired, this attaching wall may include a beveled lip spaced from the back wall and extending from the attaching wall towards the exterior wall.

This structure is designed so that in the formation of a door or related construction, a fastener, such as a screw may be inserted through the exterior wall in such a manner as to be deflected by the deflecting lip so as to extend along the back wall into the attaching wall. When the beveled lip is used, this lip also aids in deflecting the fastener against the back wall. As a result of this type of construction, the trim means can be of relatively light weight material and yet still will adequately hold any fasteners used.

CROSS-REFERENCES TO RELATED APPLICATIONS

This application is a continuation-in-part of the Donald E. Mock application Ser. No. 696,879 filed Jan. 10, 1968 for "Door or Related Structure," now Patent No. 3,426,482.

BACKGROUND OF THE INVENTION

This invention pertains to the field of light-weight, comparatively inexpensive, neat-appearing doors and related structures formed utilizing structural members serving to hold at least one panel so as to create a door. In this field, the structural members may be referred to as "surrounds" since they surround one or more panels in a completed door so as to in effect frame or encase such a panel. With this type of structure, it is considered at least desirable and from a commercial standpoint necessary to utilize structural angles or reinforcements as the adjacent ends of the surrounds in order to firmly connect these structural members to one another so that an entire door or similar structure is of a comparatively rigid character.

Doors and related structures of the type described in the preceding are disclosed in the co-pending Mock application Ser. No. 696,879 filed Jan. 10, 1968 entitled "Door or Related Structure." From a detailed consideration of the specification of this co-pending case, it will be apparent that the structural members or surrounds used in creating the type of doors and related structures described in it may be easily and conveniently formed by conventional extrusion techniques out of various common thermoplastic materials. Many of these materials have comparatively limited strength characteristics. In general these materials can be considered relatively expensive.

As a result of the costs involved, it is desired to make the structural members or surrounds for use in doors and other related structures of the type described, using walls which are comparatively thin. This is because when such walls are comparatively thin, the amount of thermoplastic material used in them is decreased and cost savings result. Such walls, however, must be sufficiently thick so as to satisfactorily serve their intended functions in the creation of a door or the like. Such walls can normally serve these functions satisfactorily when they are so thin that they will not provide adequate support for conventional fasteners such as are used with hinges for mounting doors.

As a result of this a problem has been encountered as to how to manufacture surrounds or structural members for use in doors or the like of the type described which use walls which are too thin to adequately support or hold screws but which are still sufficiently thick to serve adequately for other purposes in such a door or related structure. To a degree, this problem is essentially an economic one. It relates to providing a structural member or surround which is as inexpensive as reasonably possible, yet which will adequately serve for mounting purposes and other purposes within a door or the like.

SUMMARY OF THE INVENTION

An object of the present invention is to provide new and improved surrounds or structural members which overcome the type of problem indicated in the preceding discussion. Another object of this invention is to provide such structural members and surrounds which may be easily and conveniently manufactured at a comparatively nominal cost from known thermoplastic materials by extrusion techniques. A further objective of the present invention is to provide structural members or surrounds which are constructed in such a manner as to be capable of adequately holding or supporting a conventional fastener such as a screw and which are still constructed so as to utilize walls which are sufficiently thin so as to conserve on material.

In accordance with this invention, these objectives are achieved by providing a structural member or surround having a back wall, means for holding at least one panel attached to one side of the back wall and trim means attached to the other side of the back wall. In a structural member of this invention the trim means includes an exterior wall extending from the back wall, a deflecting lip attached to the exterior wall so as to extend at an angle from it towards the back wall and an attaching wall extending from the back wall and spaced from the exterior wall and the deflecting lip. Preferably this attaching wall also includes a beveled lip located on the attaching wall which is spaced from the back wall so as to extend generally towards the exterior wall.

This structure is designed so that in use of the structural member or surround in a door or the like, a fastener such as a common screw may be inserted through the exterior wall adjacent to the back wall between the back wall and the deflecting lip. This lip is designed so that as such a fastener is so inserted, it will resiliently engage the fastener so as to deflect it so that it will normally extend along the back wall. As the fastener is further inserted it will be further deflected in this manner by the beveled lip if such a lip is used and will engage the attaching wall adjacent to the back wall. When so engaged, the fastener will extend along the centermost structural part of the strucural member or surround and will be secured in place so as to be held by both the exterior wall and the attaching wall. Also, when so used the fastener will to at least a degree be engaged by the deflecting lip so as to be secured in place to at least a degree by this lip.

As a result of these holding actions, the fastener will be adequately held on the structural member so that there is no reasonable chance of it being dislodged during use, even if the walls and lips employed are sufficiently thin so as to otherwise be incapable of providing adequate structural strength to hold the fastener in place.

BRIEF DESCRIPTION OF THE DRAWINGS

The actual details of this invention, as well as many objectives of it, will be apparent from a careful consideration of the remainder of this specification, the appended claims and the accompanying drawing in which:

FIG. 1 is a front-elevational view of a cabinet employing doors utilizing a presently preferred embodiment or form of structural members or surrounds of this invention;

FIG. 2 is a partial cross-sectional view taken at line 2—2 of FIG. 1;

FIG. 3 is a partial cross-sectional view taken at line 3—3 of FIG. 2;

FIG. 4 is a partial cross-sectional view taken at line 4—4 of FIG. 1; and

FIG. 5 is an isometric view of a structural angle used in the door shown in FIG. 1.

Although the accompanying drawing only illustrates a single presently preferred embodiment or form of structural members of the present invention, those skilled in the art will realize from a careful consideration of the drawing and this specification that the features of this invention can be embodied within other structural members or surrounds differing from those shown by routine engineering or esthetic design considerations.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1 of the drawing there is shown a cabinet **10** having identically formed doors **12** utilizing structural members or surrounds **14** of this invention. These surrounds **14** may be formed by common extrusion techniques out of various rigid thermoplastic materials such as rigid polyvinyl chloride. Each of these surrounds includes a back wall **16** which carries and is integrally formed with other parts. This wall **16** has sides **18** and **20**.

The side **18** of a back wall **16** is preferably formed so as to include what may be referred to as means for holding at least one panel. Such means as illustrated includes two outer walls **22** attached to the edges of a back wall **16** so as to extend from it and a centrally-located positioning means **24** attached to the back wall **16** so as to extend from it between the walls **22**. This positioning means **24** is preferably shaped as a box-like panel as shown. The walls **22** and the positioning means **24** are preferably constructed as described in the previously noted co-pending application Ser. No. 696,879. In the interest of brevity, the entire disclosure of this co-pending application is incorporated herein by reference.

In a surround **14** what may be considered a trim means **26** may be located on the other side **20** of the back wall **16** so as to extend from this side **20**. This trim means **26** illustrated includes an exterior wall **28** which extends from the back wall **16** in alignment with one of the walls **22**, a terminal wall **30** and a sloping decorative wall **32**. The walls **28**, **30** and **32** are attached to one another and to the back wall **16** so as to in effect define an enclosed channel.

A small deflecting lip **34** is formed as an integral part of the wall **28** so as to be spaced from the back wall **16** and so as to extend towards this back wall **16** at an acute angle with respect to the wall **28**. With most or practically all materials which can be used in the manufacture of the surround **14** this lip **34** will be somewhat resilient in character. An attaching wall **36** is formed on the back wall **16** so as to extend outwardly from this back wall **16** parallel to the exterior wall **28**

into the space within the trim means **26**. Preferably this attaching wall **36** carries a beveled lip **38** on its side adjacent to the lip **34** and the exterior wall **28**. This lip **38** is beveled so as to slope a slight amount towards the junction of the attaching wall **36** and the back wall **16**.

With this structure in erecting a door **12**, panels **40** of any desired character may be inserted between the surrounds **14** in the spaces between the walls **22** and the positioning means **24** as indicated in the drawing. This is described in greater detail in the co-pending application Ser. No. 696,879. During such insertion, the surrounds **14** used in a single door **12** may be easily connected through the use of a metal or other structural angle **42**, one of which is shown in FIG. 5 of the drawing. Such an angle **42** consists of flat legs **44** located at right angles to one another provided with more or less pointed ends **46**. Each of the legs **44** preferably include a slightly extending bump **48**.

It will be noted that the angles **42** are constructed and that the attaching wall **36** and that the lips **34** and **38** are dimensioned so that the legs **44** will fit tightly between the walls **28** and **36** against the back wall **16** so as to be held in place against this wall by the lips **34** and **38**. When so positioned, the bumps **48** engage the back walls **16** of adjacent surrounds **14** so as to in effect create a type of a locking or welding action securing these surrounds to one another.

When a door **12** has been created through the use of the panels **40** and surrounds **14** held together by structural angles **42**, a hinge **50** may be used as indicated in FIG. 2 of the drawing with such a door. This hinge **50** has a leaf **52** which can be secured to such a door through the use of conventional screws **54**. One of such screws can be inserted in a conventional manner through a wall **22** and a panel **40** and the positioning means **24** as shown. This invention is of primary importance in connection with the insertion and holding of the other screw **54** illustrated.

When this other screw **54** is used, it may be inserted through an opening **56** in the exterior wall **28** or directly driven through this wall to the position illustrated in FIG. 2. As the screw **54** moves through the exterior wall **28** it will be contacted by the deflecting lip **34** so as to be caused to move generally along the back wall **16**. As it is moved further it will be similarly deflected by the beveled lip **38** so as to enter the attaching wall **36** adjacent to the back wall **16**. If desired this attaching wall **36** can be pre-drilled to receive the screw **54** or it can be directly forced into position within it.

When in this position the screw **54** along the back wall **16** is firmly supported and held by the walls **28** and **36** so that it receives structural support and strength as a result of its proximity to the back wall **16**. Also the deflecting lip **34** will tend to engage this screw **54** so as to prevent it being inadvertently dislodged and so as to provide additional support. To a degree it is considered that the lip **34** acts somewhat in a ratchet manner in serving these functions.

It will be realized from this discussion that the use of surround such as the surround **14** in a door such as door **12** is highly beneficial. It enables such a door to be adequately attached to an appropriate member such as a hinge by a conventional screw fastener. Yet at the same time the structure of a particular surround used is such that comparatively little plastic is required in its construction. Because of the nature of this invention it is to be considered as being limited solely by the appended claims forming a part of this disclosure.

I claim:

1. In a structural member for use in enclosing a panel, said structural member including a back wall having sides, means for holding at least one panel attached to one side of said back wall so as to extend therefrom and trim means attached to the other side of said back wall

so as to extend therefrom, the improvement which comprises:

said trim means including an exterior wall extending outwardly from said back wall;

an integral deflecting lip attached to said exterior wall adjacent to said back wall so as to extend from said exterior wall at an angle to said exterior wall towards said back wall, said deflecting lip terminating so as to be spaced from said back wall; and

an attaching wall extending from said back wall in the same direction as said exterior wall, said attaching wall being spaced from said exterior wall and said deflecting lip;

said exterior wall being adapted to receive a fastening member so that as said member is inserted through said exterior wall between where said deflecting lip extends from said exterior wall and said back wall, it is deflected by contact with said deflecting lip so as to extend along said back wall into said attaching wall adjacent said back wall so that said fastening member is supported by said exterior and attaching walls adjacent to said back wall.

2. A structural member as claimed in claim 1 including:

an integral beveled lip located on the side of said attaching wall adjacent to said exterior wall, said beveled lip being capable of directing said fastening

during insertion thereof into said attaching wall adjacent to said back wall.

3. A structural member as claimed in claim 1 wherein:

said deflecting lip is resilient and resiliently engages said fastening member after the insertion of said fastening member.

4. A structural member as claimed in claim 1 including:

an integral beveled lip located on the side of said attaching wall adjacent to said exterior wall, said beveled lip being capable of directing said fastening member during insertion thereof into said attaching wall adjacent to said back wall and wherein:

said deflecting lip is resilient and resiliently engages said fastening member after the insertion of said fastening member.

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KENNETH DOWNEY, Primary Examiner

U.S. Cl. X.R.

49—401; 52—627