Nov. 8, 1966 W. M. HOWELL 3,284,113

PICTURE FRAME STRUCTURE

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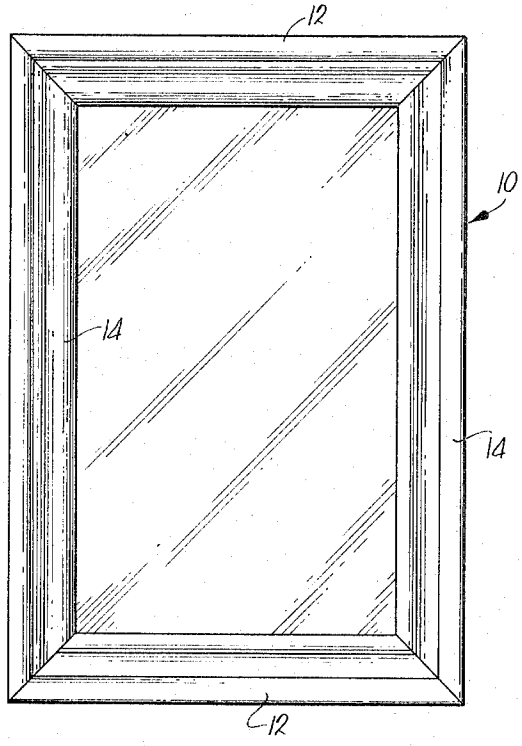


Fig.1.

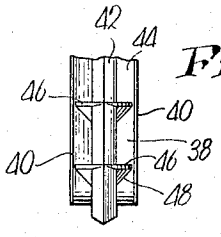


Fig.5.

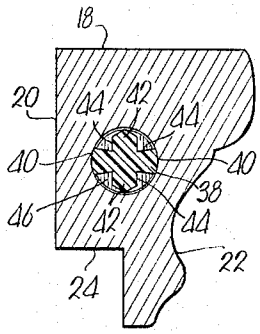


Fig.4.

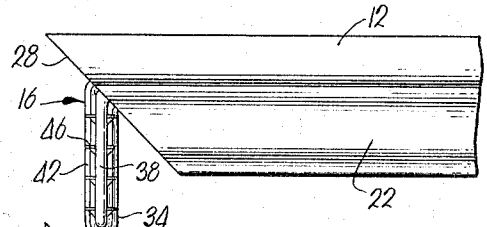
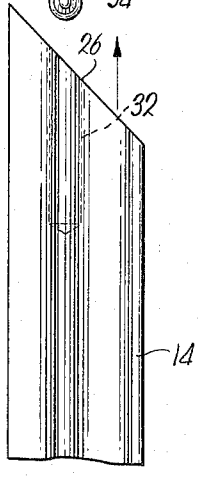


Fig.2.



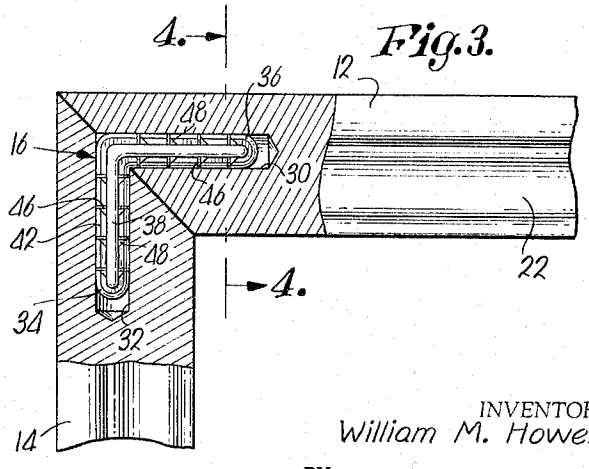


Fig.3.

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PICTURE FRAME STRUCTURE

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This invention relates to frame construction, and more particularly, to structure for forming the joints between the members of picture frames and the like.

It has long been considered desirable to make picture frame members which could be quickly and easily assembled by relatively unskilled craftsmen so that frames of any desired size could be readily formed from prefabricated members. Attempts have been made to merchandise pairs of frame members which could be combined with other selected pairs of members to provide the four sides for the frame. The full benefits to be gained by such attempts at providing prefabricated frame members have not been realized, however, largely because of the difficulty encountered in forming the joints between the frame members. It has been virtually impossible with frame members heretofore available, for relatively unskilled workman, such as the ordinary homeowner, to properly assemble the frames without the aid of special tools. The difficulty of effecting a strong, clean joint having a neat appearance discouraged the use of such prefabricated frame construction.

Accordingly, it is the most important object of this invention to provide prefabricated frame structure which may be quickly and easily assembled by relatively unskilled workmen without the aid of special tools.

Another important object of this invention is to provide frame structure which insures the formation of strong, neat-appearing, close-fitting joints.

A further object of the invention is to provide frame structure having a hidden reinforcing element to assist in proper alignment of the members and to hold the members for gluing, thus obviating the necessity for the use of corner clamps or the like.

Still another obejct of the invention is to provide a joint wherein glue is received in apertures in the members for increasing the surface area coated with glue to strengthen the joint.

Yet another object of this invention is to provide frame structure utilizing a reinforcing element configured to prevent glue from running within the apertures in the members, thus insuring uniform distribution of the glue for effecting a strong bond for holding the members together.

These and other important objects will be more fully described or will become apparent as the specification progresses.

In the drawing:

FIGURE 1 is a front elevational view of a picture frame embodying the principles of this invention;

FIG. 2 is an enlarged, fragmentary, front elevational view of a frame joint showing the retainer element in place within the aperture in one frame member and the other frame member in place for engagement with the retainer element;

FIG. 3 is a view similar to FIG. 2 showing the members joined, portions being broken away and shown in cross section to illustrate the retainer element in place in the apertures;

FIG. 4 is a vertical, cross-sectional view on a still larger scale taken along line 4—4 of FIG. 3; and

FIG. 5 is a frangmentary, top plan view of a retainer element on the same scale as FIG. 4.

A frame 10 embodying the principles of this invention comprises a pair of elongated, horizontally disposed frame members 12, a pair of elongated, vertical frame members 14, and retainer elements 16 joining the members 12 and 14 at the corners of frame 10. The frame members 12 include a generally flat, horizontally extending, upper face 18, a flat back face 20, and an irregular front face 22 which may be suitably configured to present a pleasing appearance to frame 10. A groove 24 which may be provided in back face 20 is adapted to receive the outer peripheral edges of the picture to be framed and a covering glass or the like as may be desired.

Members 14 are identical with members 12 and are provided with generally flat end faces 26 which are shaped to complementally engage the flat end faces 28 of members 12 for forming corner joints as is conventional. In the embodiment of the invention chosen for illustration, the flat end faces 26 and 28 are disposed at a 45° angle from the longitudinal axes of the respective members 12 and 14.

In constructing a frame pursuant to the principles of this invention, the members 12 and 14 are first bored to present apertures 30 and 32 in faces 28 and 26 respectively the apertures 30 and 32 extending generally on the longitudinal axes of the corresponding members 12 and 14. Care is taken to insure that apertures 30 and 32 are in precise axial alignment so that a perfect 90° corner is effected upon the joining of the apertures 30 and 32 as shown best in FIG. 3 when the frame members 12 and 14 are moved into abutting relationship.

Retainer element 16 comprises a pair of elongated legs 34 and 36 received within apertures 30 and 32 respectively. Each leg 34 and 36 comprises an elognated body 38 extending transversely across the respective apertures 30 and 32 and terminating in arcuate, outer faces 40 complementally engaging the inner side wall of apertures 30 and 32. As illustrated in FIG. 4, the vertical dimension of body 38 is substantially less than the horizontal dimension thereof so that only the faces 40 of body 38 are in physical contact with the inner wall of the apertures.

A pair of elongated, longitudinally extending ribs 42 integral with body 38 extends into physical engagement with the side wall of apertures 30 and 32 to add rigidity to body 38 and serve additionally to stabilize the latter within the corresponding apertures. Thus, four longitudinally extending grooves 44 spaced peripherally around the respective legs 34 and 36 presented between body 38 and the ribs 42, are conveniently provided to permit the inclusion of a substantial amount of glue in the apertures 30 and 32 and around the respective legs 34 and 36 for firmly bonding retainer element 16 to the members 12 and 14.

A plurality of generally circular fins 46 are spaced longitudinally along each leg 34 and 36 and extend transversely across the respective apertures 30 and 32. The fins 46 are integral with body 38 and the ribs 42 for further stabilizing the legs 34 and 36 and adding rigidity thereto. The fins 46 perform the added function of compartmentalizing the grooves 44 to prevent flowing of the glue when the retainer 16 is in place within the apertures. Thus, the glue is required to harden in place so that there is a substantially uniform distribution of the glue within the respective apertures. Without fins 46 the liquid glue has a tendency to flow, resulting in insufficient glue on some of the surface to provide the requisite adhesion for firmly securing the members 12 and 14 to the retainer element 16.

In use, the members 12 and 14 may be merchandised in pairs, there being offered for sale sufficient sizes of pairs so that a prospective purchaser desiring to construct a frame, may select a pair of members 12 and a pair of members 14 of lengths to provide a frame of a size suitable to fit his particular needs. Each pair of members

12 and 14 may be packaged with a pair of retainer elements 16, the members 12 and 14 being bored at the factory to present an aperture 30 and 32 in each end thereof.

To assemble the picture frame, the purchaser need merely dispose the frame members 12 and 14 in corresponding opposed relationship as illustrated in FIG. 1. Retainer elements 16 are positioned in place as shown in FIGS. 2 and 3 with sufficient glue being included as the element 16 is inserted into the apertures 30 and 32 for adhering element 16 to the members 12 and 14. The precise alignment of the apertures 30 and 32 insure that the complementally abutting faces 26 and 28 will be secured in close abutting relationship to effect a neat, clean looking frame joint. The frictional engagement of the legs 34 and 36 of element 16 within the apertures 30 and 32, holds the members 12 and 14 in proper disposition without the necessity of additional clamping means as has heretofore been necessary. The inherent rigidity of the elements 16 prevents inadvertent misalignment of the joint prior to the setting of the glue. When the glue is set, the elements 16 are bonded to the members 12 and 14 for reinforcing the joints.

It has been found that desirable results may be achieved if the elements 16 are formed from synthetic resin material such as nylon or the like. The slight flexibility of such material permits ready insertion of the legs 34 and 36 into apertures 30 and 32 with a minimum of force, yet the frictional engagement of the element on the members is sufficient for holding the joint together.

It should be pointed out that the fins 46 are provided with a generally inclined face 48 in the direction of the outermost ends of the corresponding legs 34 or 36. These faces assist in stabilizing the fins 46 and are slanted in a direction to insure easy insertion of the legs within their respective apertures.

It is now readily apparent that a frame of the construction heretofore described may be assembled quickly and easily without the necessity for any auxiliary tools and neat-appearing, strong joints between the frame members are assured.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. Frame structure comprising in combination:

a first elongated frame member provided with an aperture extending longitudinally thereof, said aperture communicating with an end surface of said first member;

a second elongated frame member disposed at an angle to said first member and provided with an aperture extending longitudinally thereof, said aperture communicating with an end surface of said second member, the end surfaces of the first and second members being configured for complemental engagement with one another; and

an angled retainer element comprising a pair of elongated legs, there being a leg disposed in each of said apertures, each leg having a longitudinally extending body engaging the inner surface of a respective aperture for holding the corresponding member at said angle with respect to the other member, said bodies being smaller in one cross-sectional dimension than the respective aperture to provide spacing for glue in the aperture for bonding said element to the members there being a rib on each of said bodies and extending into engagement with the inner surface of the corresponding aperture.

2. Structure as set forth in claim 1, wherein is provided a second rib on each body disposed on the opposite side thereof from the respective first ribs, said second ribs extending into engagement with the inner surface of the corresponding apertures, the ribs and bodies being disposed to present grooves therebetween extending longitudinally of the bodies for receiving glue in the apertures for bonding the elements to the members.

3. Structure as set forth in claim 2, wherein is provided a plurality of fins integral with the body and said ribs and spaced longitudinally along said legs for stabilizing the latter in the apertures and preventing flow of said glue within the apertures.

4. Structure as set forth in claim 3, wherein said fins are circular and extend transversely across said apertures.

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