United States Patent [19]

Walters

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[54] **COMBINATION CORNER LOCK AND HANGER**

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[52] **U.S. Cl.**.....**287/189.36 H,** 52/656, 160/381

[51] **Int. Cl.**.....**F16b 7/22**

[58] **Field of Search** .287/189.36 H; 160/381; 52/656

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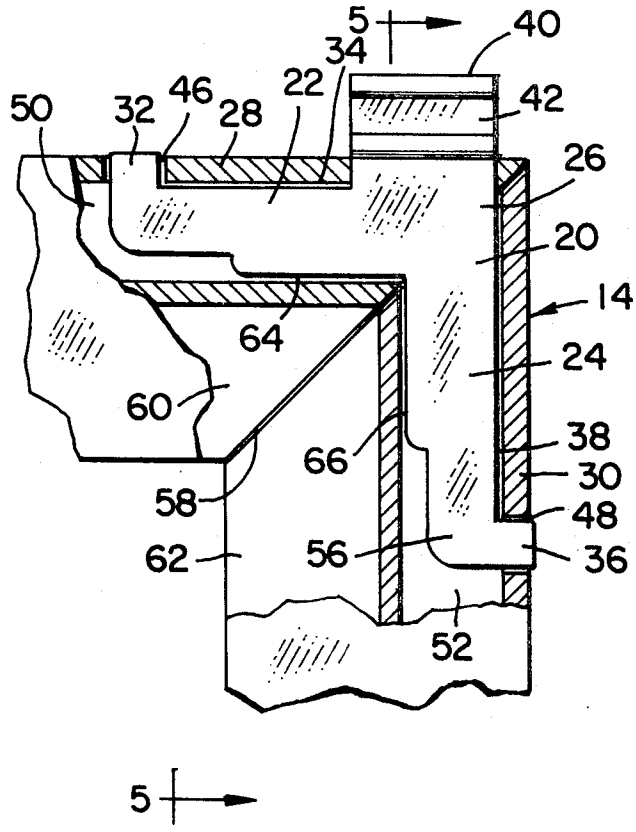
[57] **ABSTRACT**

A combination corner lock and hanger for use with extruded frame members including a horizontal leg angularly disposed from a depending leg, both of the legs terminating in short projections extending at right angles thereto. The said corner lock terminates upwardly in a hanger which extends from the junction of the horizontal and depending legs. The adjoined frame members angularly connect in a mitered junction which is interiorly reinforced by the legs. Each frame member forming the corner is pre-punched to receive the short projections to securely lock the frame members upon the combination corner lock and hanger.

1 Claim, 5 Drawing Figures



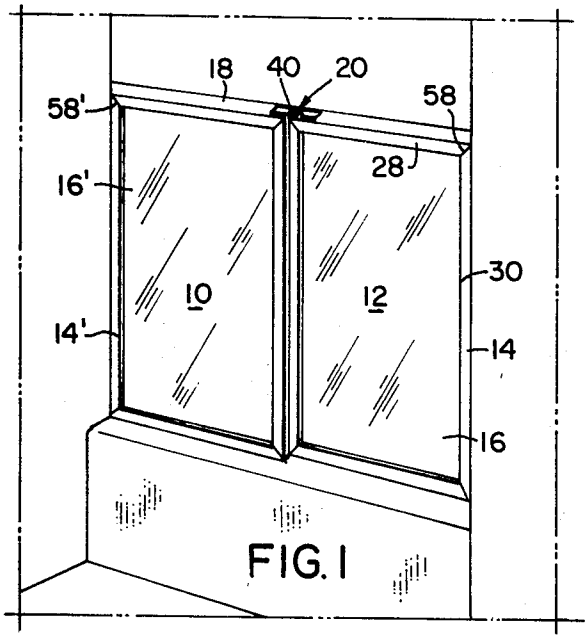


FIG. 1

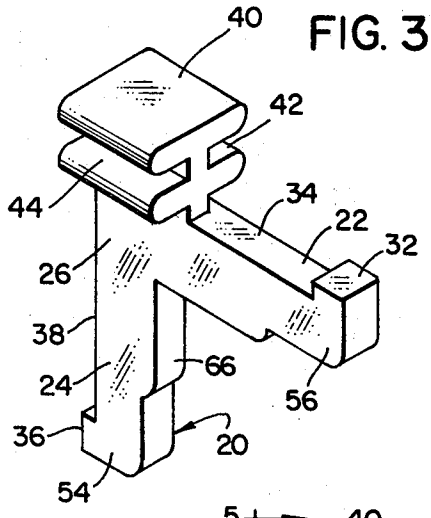


FIG. 3

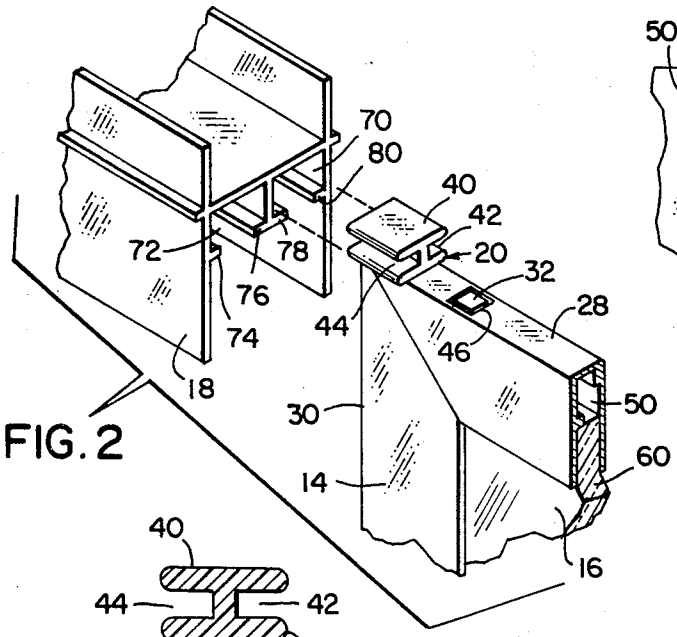
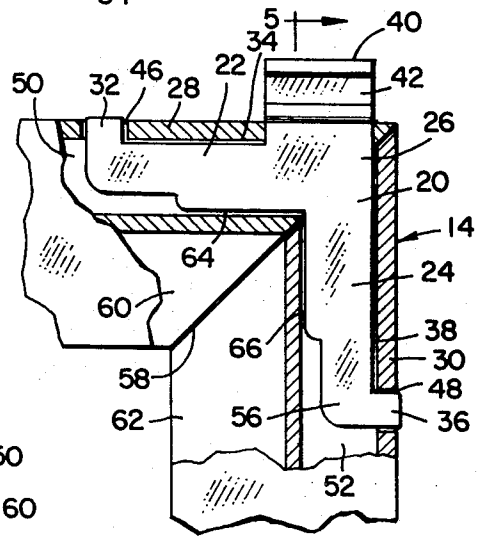


FIG. 2



5 FIG. 4

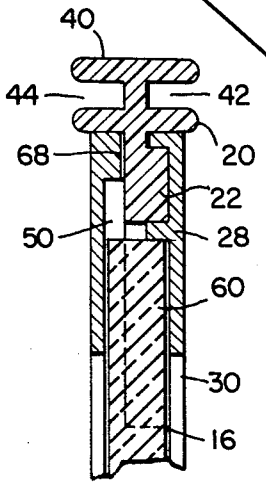


FIG. 5

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COMBINATION CORNER LOCK AND HANGER

BACKGROUND OF THE INVENTION

This invention relates generally to the field of building materials, and more particularly, is directed to a frame corner construction insert for reinforcing, locking and hanging the peripheral frame members of cabinet doors and the like.

It has become a common practice in the building industry to employ extruded aluminum or other metal peripheral frames for such items of building construction as cabinet doors, shower doors, sliding mirrors and the like. Such extruded aluminum frames are generally extruded to the desired shape and then shipped to the manufacturer for fabrication to the correct size and for installation of glass, mirrors or similar sheet material within the frame construction. In view of the frangible nature of glass and mirrors, frame angular junctions must necessarily be strong and rugged enough to withstand the stresses of continuous service without separation or undue flexing. Prior workers in the filed have long sought adequate strengthening members at the frame corners for securing the frame construction. One such prior corner joint of which I am familiar incorporates a connecting member having angularly disposed legs. The legs are provided with pairs of identical grooves which extend across the outer faces of the leg for insertion into the angularly disposed members. Pairs of fastening tongues are struck from the outer edge forming wall of each frame member and then turned inwardly into each of the grooves to provide a sturdy joint.

Another prior art construction of which I am familiar includes a frame corner fastener assembly which incorporates a connector member having a plurality of triangular teeth which extend therefrom. The connective member interfits within the channel sections of the frame which are provided with transfer grooves to receive the teeth to strengthen the corner joint. Other prior workers in the field have devised other methods of strengthening the corner junction of metallic framing members. However, all of the prior art devices are deficient in that they generally require considerable expenditure of skilled labor to properly seat the strengthening members within the frame construction. Also, most of the prior art reinforcing members of which I am familiar are relatively complicated in fabrication and therefore greatly increase the cost of manufacturing the complete frame assembly. Additionally, no prior art device is known which incorporates the functions of both reinforcing the angular junction of the frame members and also serving as a hanger for sliding engagement within a horizontal track. All presently known types of reinforcing joint construction require the installation of a completely separate hanger system, all of which results in increased costs.

SUMMARY OF THE INVENTION

The present invention relates to a novel hard plastic corner lock and hanger assembly and cooperating extruded metallic frame members which have been especially designed to receive the corner lock assembly and to cooperate therewith to provide an inexpensive, strong and readily assembled joint.

In one embodiment, a nylon corner lock has been provided which includes a horizontal leg and a vertical leg depending from one end thereof in substantially right angle relationship. Both the horizontal leg and the depending leg terminal in short projections which form at right angles thereto for securing and locking the respective frame members comprising the corner junction. An integral hanger rises from the corner lock at the angular portion thereof and includes horizontal grooves for sliding within a horizontal track to thereby impart horizontal sliding travel to the finished frame assembly. The upper frame members intersect at right angles in a mitered joint and each of the angularly intersecting members is provided with punched openings which align with the corner lock projections when the frame members are assembled in finished angular relationship. The short projections insert into the openings to securely lock the angularly intersecting frame members in tight, inexpensive junctions.

It therefore an object of the present invention to provide an improved corner lock and hanger of the type set forth.

It is a further object of the present invention to provide a novel, combination corner lock and hanger assembly incorporating formed nylon insertion pieces cooperating within extruded metallic frame members.

It is a further object of the present invention to provide a novel combination corner lock and hanger which includes an angular, plastic insertion piece provided with projections at the ends thereof, the projections interfitting within and locking into openings provided in metallic frame members which in turn are secured in angular relationship by the lock.

It is a further object of the present invention to provide a combination corner lock and hanger assembly incorporating a formed, plastic angular joint reinforcing member, the reinforcing member being provided with integral hanger means for sliding engagement within a horizontal track.

It is a further object of this invention to provide a novel combination corner lock and hanger incorporating a resilient plastic member having lock means secured within the frame construction by utilizing the natural resiliency of the material.

It is a further object of the present invention to provide a novel combination corner lock and hanger that is inexpensive in manufacture, simple in assembly and trouble-free when in use.

Other objects and a fuller understanding of the invention will be had by referring to the following description and claims of a preferred embodiment, taken in conjunction with the accompanying drawings, wherein like reference characters refer to similar parts throughout the several views and in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view showing a pair of horizontally sliding doors employing the combination corner lock and hanger, partially broken away to expose interior construction.

FIG. 2 is an enlarged, exploded, perspective view of the broken away area of FIG. 1.

FIG. 3 is an enlarged, perspective view of the combination corner lock and hanger.

FIG. 4 is an enlarged, partial, elevational view of the corner of a frame member, partially broken away to expose internal reinforcing arrangement.

FIG. 5 is a cross-sectional view taken along Lines 5—5 of FIG. 4, looking in the direction of the arrows.

DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

Although specific terms are used in the following description for the sake of clarity, these terms are intended to refer only to the particular structure of my invention selected for illustration in the drawings and are not intended to define or limit the scope of the invention.

Referring now to the drawings, I show in FIG. 1 a pair of sliding doors **10, 12** which may be of the type generally employed for cabinets, shower doors or the like. Each door comprises a peripheral frame **14, 14'** which is preferably fabricated of extruded aluminum sections which are mitered at the corners thereof in well known manner to form a rectangular enclosure. The area enclosed within the frame members **14, 14'** may be a panel **16, 16'** of thin, relatively rigid material such as glass, plastic or other desired construction. The doors **10, 12** position in horizontal, sliding arrangement in conjunction with a horizontal track **18** as hereinafter more fully set forth.

A combination corner lock and hanger **20** is fabricated to a generally L-shaped configuration from a relatively hard, machinable material having limited resiliency and a relatively low co-efficient of friction. I have found solid nylon plastic to be suitable for this purpose. As best seen in FIGS. 3 and 4, the combination corner lock and hanger includes an upper horizontal leg **22** and a vertical leg **24** which depends at right angles from one end of the horizontal leg **22** to form a corner **26** of precisely 90° angular relationship for joining the horizontal and vertical frame members **28, 30** in the manner hereinafter more fully set forth. The horizontal leg **22** terminates outwardly in an upwardly facing, short, vertical projection **32** which rises above the horizontal top surface **34** of the horizontal leg **22**. Preferably, the projection **32** extends a distance equal to the thickness of the top of the frame member **20**. Similarly, the vertical leg **24** terminates downwardly in a short, horizontal projection **36** which extends horizontally beyond the side **38** of the vertical leg **24**. The projection **36** extends a distance equal to the thickness of the side of the frame member **30**.

An integral hanger **40** rises above the corner **26** and rearwardly terminates at a vertical plane drawn through the side surface **38** of the vertical leg **24**. The hanger **40** extends inwardly from the vertical plate above the side surface **38** towards the vertical projection **32** a distance sufficient to provide adequate strength for hanging and sliding of the doors **10, 12** as hereinafter more fully set forth. The hanger **40** is formed with a pair of right and left horizontal slots **42, 44** for sliding and hanging engagement upon the horizontal track **18** as hereinafter more fully set forth.

As best seen in FIGS. **2** and **4**, the horizontal frame member **28** is punched or otherwise treated to provide a top opening **46** to receive the short vertical projection **32** therein in locking engagement. Similarly, the vertical frame member **30** is punched or otherwise treated to provide a side opening **48** to receive a short horizontal projection **36** of the corner lock hanger **20** in locking engagement therein. As illustrated in FIGS. **2, 4** and **5**, both the horizontal and vertical frame members **28, 30** are extruded to provide a respective corner lock receiving horizontal channel **50** and a vertical channel **52** of generally rectangular configuration and of dimensions to closely overfit the cross sectional dimensions of the respective horizontal and vertical legs **22, 24** of the combined corner lock and hanger **20**. It will be noted that the extremities **54, 56** of the corner lock legs **22, 24** are narrower at the projection ends to provide limited flexibility for assembling the frame corner mitered joints **58, 58'**. A second channel **60, 62** peripherally inwardly forms in the respective horizontal and vertical frame members **28, 30** and inwardly opens to receive the glass or other panel **16** therein in peripheral engagement.

In order to make up the joints **58, 58'**, the ends of the horizontal and vertical frame members **28, 30** are angularly cut to 45° to form a mitered junction in well known manner. The horizontal and vertical channels **50, 52** which have been extruded in the frame members remain available to receive the corner lock **20**. The horizontal leg **22** of the corner lock **20** inserts into the horizontal channel **50** of the horizontal frame member **28**. As can best be observed in FIG. **4**, the vertical distance from the bottom **64** of the horizontal leg **22** to the top of the short projection **32** is greater than the height of the channel **50**. Thus, the leg **22** must bend slightly at the extremity **54** as the leg **22** inserts into the channel **50** until the short projection **32** reaches the top opening **46** which aligns therewith when the leg **22** is fully seated in the channel **50**. The natural resiliency of the material of the corner lock **20** then serves to return the leg **22** to its initial position at the extremity **54** with the projection **32** firmly seated within the top opening **46** to thereby lock the horizontal leg **22** within the horizontal channel **50**. Similarly, the overall length from one side **66** of the vertical leg **24** to the outermost surface of the horizontal projection **36** is greater than the width of the channel **52**. Thus, the vertical arm **24** flexes at the extremity **56** as the arm inserts into the vertical channel **52** until the projection **36** reaches the side opening **48**. The natural resiliency of the material of the corner lock **20** urges the projection **36** into the opening **48** for locking purposes and returns a vertical arm **24** to its original condition at the extremity **56**. Thus, the respective projections **32, 36** securely seat within the openings **46, 48** to securely lock the arms **22, 24** within the respective channels **50, 52**. The natural resiliency and the 90° angular relationship of the legs **22, 24** serve to lock the frame members **28, 30** angularly together. The dimensions of the respective members are carefully controlled to tightly draw the horizontal and vertical frame members **28, 30** together to form tight miter joints **58, 58'** when the corner lock **20** is fully seated. The horizontal frame member **28** is slotted at its junction end to provide an opening **68** to receive the upwardly extending hanger portion **40** therein. See FIG. **5**. Inasmuch as the slotted opening **68** extends only the length of the hanger **40**, there is no structural weakness imposed by this opening.

In order to use the invention, a horizontal track **18** comprising a pair of right and left tracks **70, 72** is affixed at the top of the cabinet or opening and is rigidly secured in position in the usual manner. The top hangers **40** of the sliding door **10** position within one track

70 at the right and left slots 42, 44 and the top hangers 40 of the second door 12 position within the second track 72 at the right and left slots 42, 44 thereof to thereby permit side by side, horizontal sliding arrangement within the tracks. As best seen in FIG. 2, the right and left horizontal projections 74, 76, and 78, 80 of the tracks 72, 70 ride within the respective hanger grooves 42, 44 to thereby support the doors hangers 10, 12 in horizontal, sliding engagement. As hereinbefore mentioned, the material of the hangers 40 preferably has low co-efficient of friction characteristics to facilitate sliding engagement of the hangers 40 within the tracks 70,72. In order to adequately support a door 10, 12 both of the upper right and upper left corners should be provided with the combination corner lock and hanger construction 20 in the manner hereinbefore set forth.

I claim:

1. In a frame construction comprising horizontal and vertical members which define the outer periphery of a door or window and which intersect at the corners thereof, wherein the said horizontal and vertical members are formed of extruded shapes having respective horizontal and vertical channels therein, the combination of

A. a corner lock for reinforcing the said intersection between the horizontal and vertical members, said corner lock having a horizontal leg and a vertical leg,

1. the said legs joining at an angle of 90° to form an angular junction.

2. the said legs each being generally rectangular in cross sectional configuration.

a. each said leg being of cross sectional configuration to slidingly fit within the respective horizontal and vertical channels,

3. each leg having a planar outer surface which faces the outer periphery and a planar inner surface which is parallel with the outer surface,

4. each leg terminating endwardly in a resilient extremity having cross sectional configuration which is less than the cross sectional configuration of its associated leg,

a. each extremity carrying a locking projection, said locking projection extending peripherally outwardly from the said planar outer surface of its associated leg terminating in a top, and

b. the overall height measured perpendicularly from the planar inner surface to the top of the locking projection being greater than the height of the respective associated horizontal and vertical channels,

5. each horizontal and vertical frame member being provided with an opening which receives one said locking projection therein when the corner lock fully seats to reinforce the said intersection,

a. the said extremities flexing to allow the projections to insert into the channels when the corner lock is being positioned for use,

b. the natural resiliency of the extremities serving to force the projections into the said openings when the corner lock fully seats to lock the corner to the horizontal and vertical frame members; and

B. a hanger integrally formed with the corner lock and having two ends, said hanger rising above the planar outer surface of the horizontal leg,

1. said hanger terminating at one end thereof in a surface which lies in the same vertical plane as the outer surface of the vertical leg,

2. said hanger incorporating a pair of horizontally juxtaposed track receiving grooves, and

3. said horizontal leg being provided with an opening to receive a portion of the hanger therein when the corner lock in fully seated in operating position.

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