

- [54] **PANEL ASSEMBLY SYSTEM**
- [75] Inventor: **Bohdan Prokop**, Warren, Mich.
- [73] Assignee: **Fruehauf Corporation**, Detroit, Mich.
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- [52] **U.S. Cl.**52/211, 52/241, 52/403, 52/580, 52/594
- [51] **Int. Cl.**E06b 1/12, E06b 5/06, E04c 1/10
- [58] **Field of Search**.....52/580, 586, 211, 241, 238, 52/486, 502, 594, 591, 714, 720, 738, 403

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Primary Examiner—Alfred C. Perham
Attorney—Harness, Dickey & Pierce

[57] **ABSTRACT**

This disclosure pertains to a system for assembling prefabricated wall panel units for use in the construction of homes, buildings and other structures of a permanent or mobile nature. The panel assembly system is comprised of a panel receiving bracket, disposed along one vertical edge of a panel, which includes a plurality of vertically spaced, outwardly extending hook shaped projections, and a channel column, disposed along an adjacent edge of a second panel, having a plurality of vertically spaced slots disposed therethrough its web. The bracket and the hook shaped projections are adapted to be received therein a groove, defined by the inward surfaces of the channel, and the vertically spaced slots respectively, with interlocking being accomplished by relative vertical sliding movement therewith. Various embodiments of the above system are disclosed which include an interlocked connection with a door frame and an attachment method to a wall surface wherefrom the partition is to be extended.

[56] **References Cited**

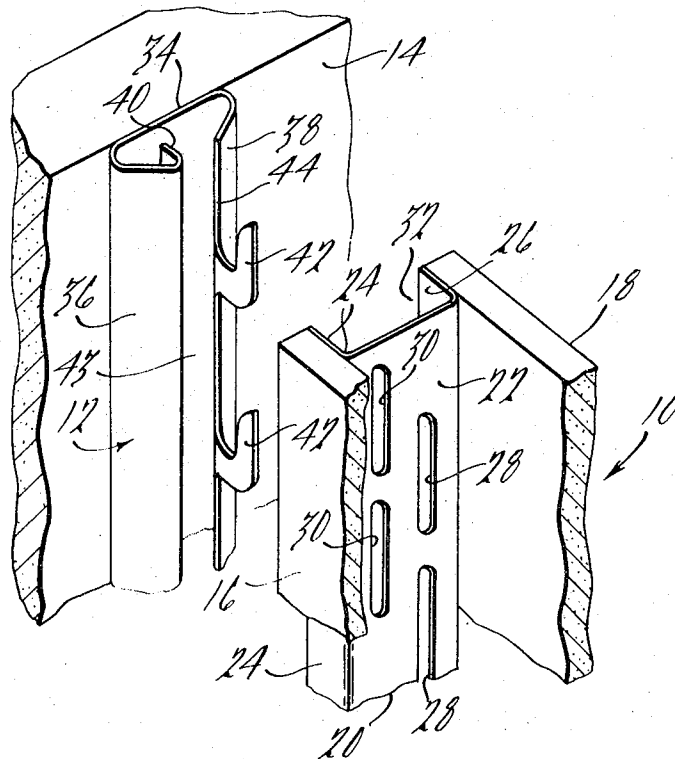
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13 Claims, 10 Drawing Figures



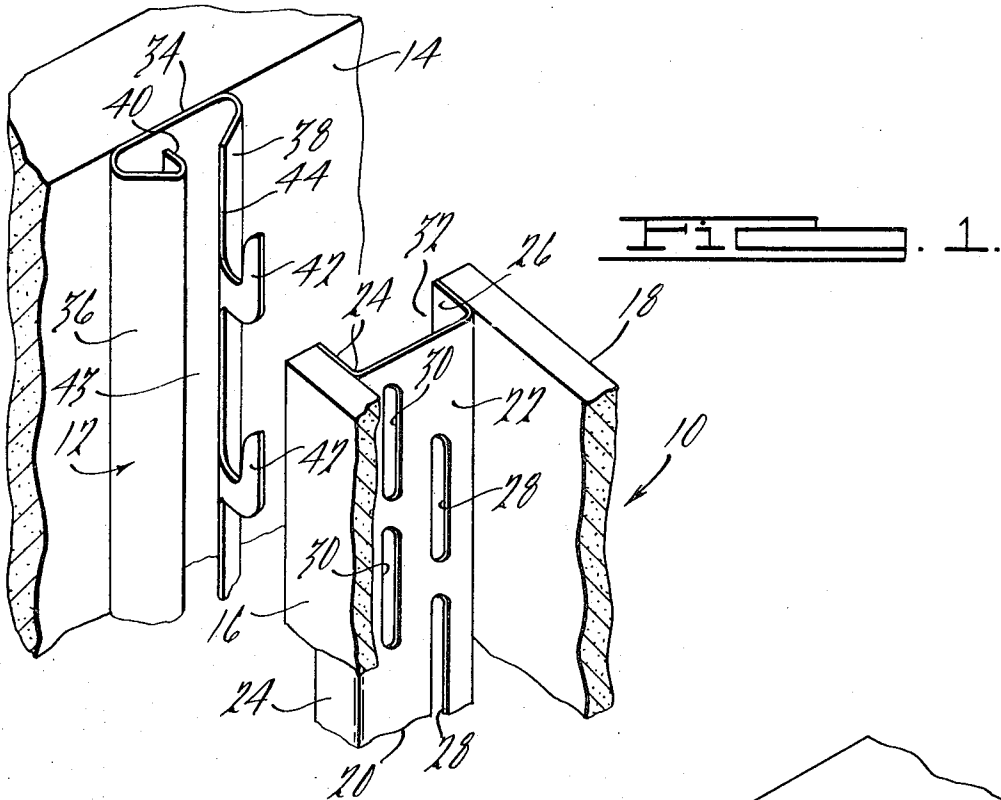


FIG. 1.

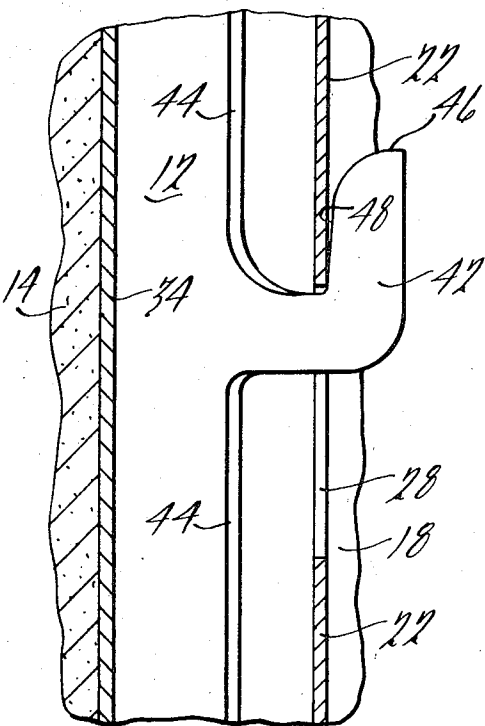


FIG. 2.

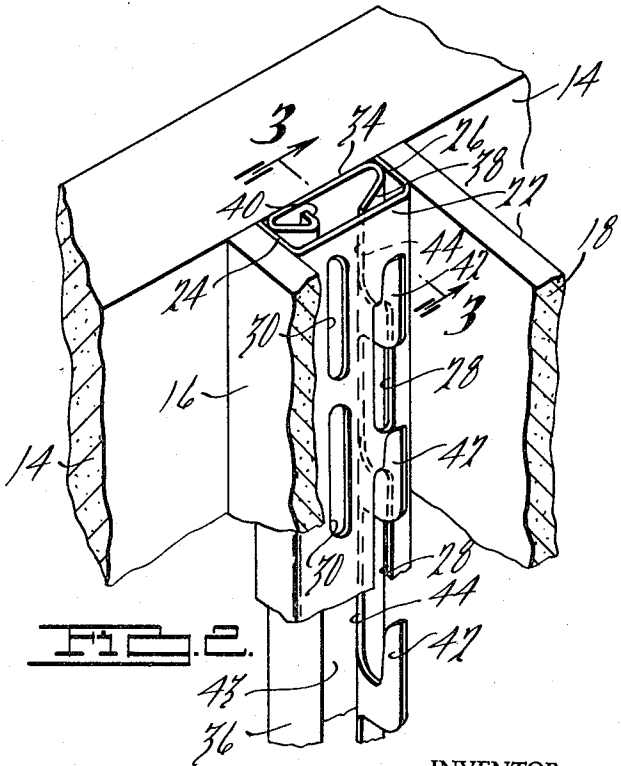


FIG. 3.

INVENTOR
 BY *Bohdan Prokop*
Wm. J. Pickett
 ATTORNEYS

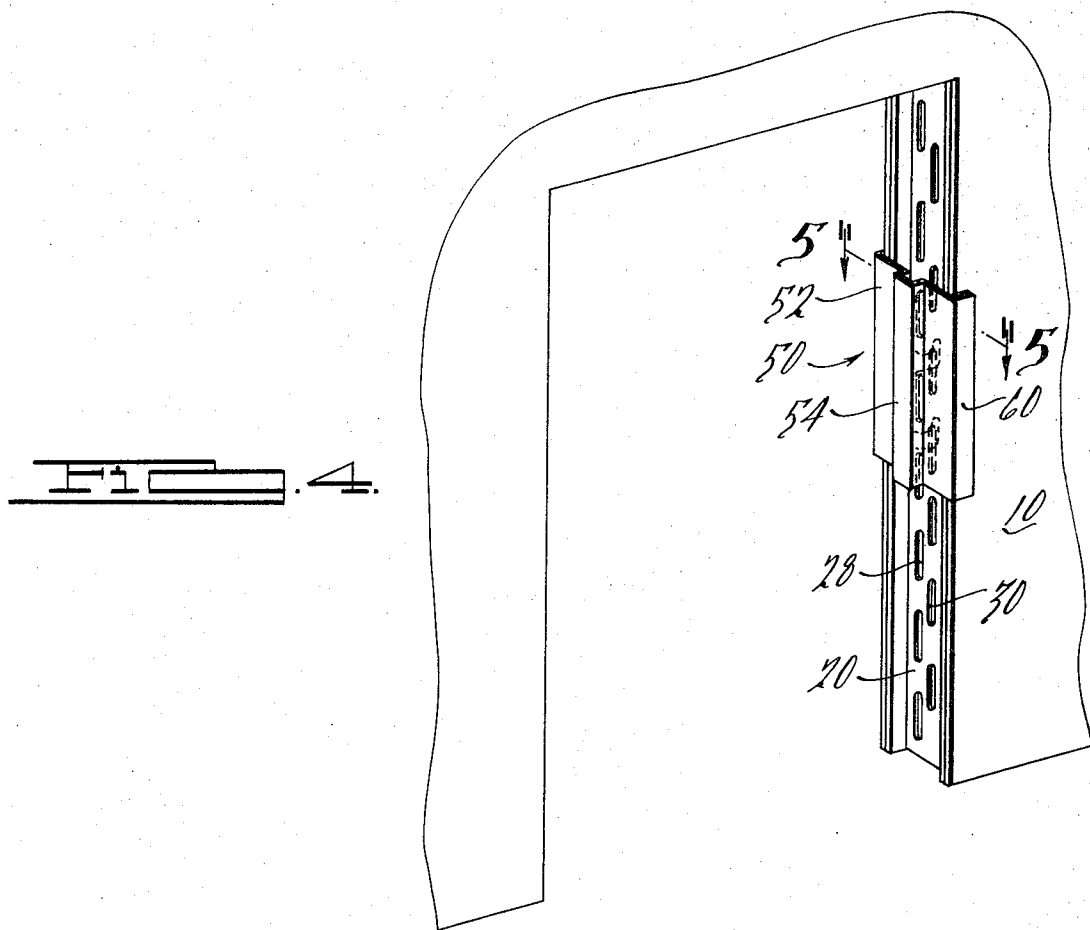


FIG. 4.

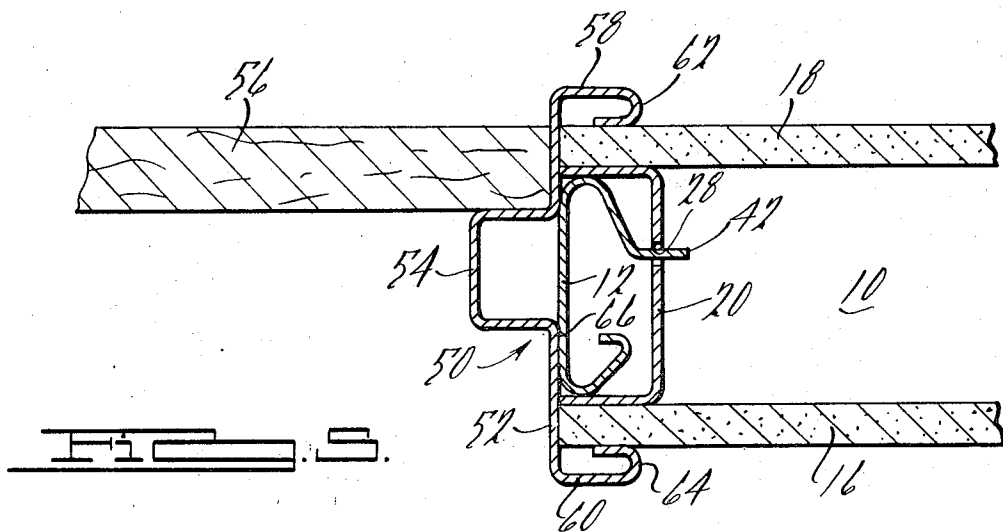
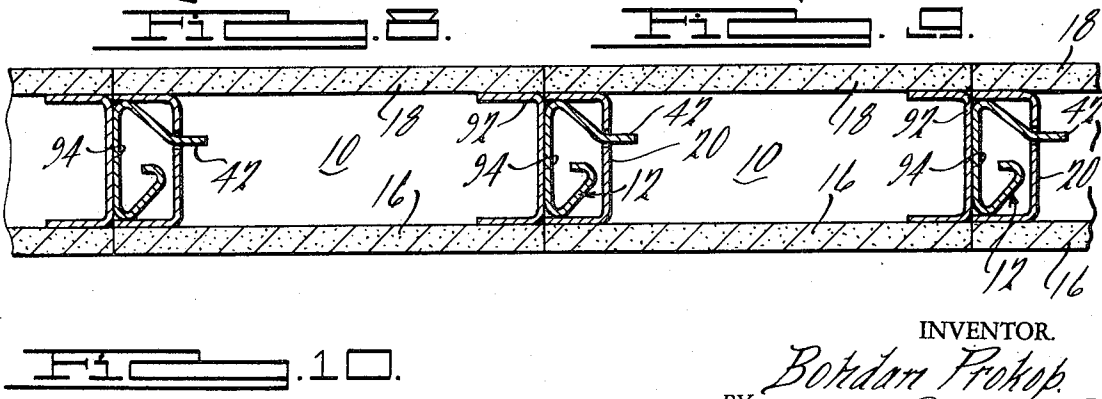
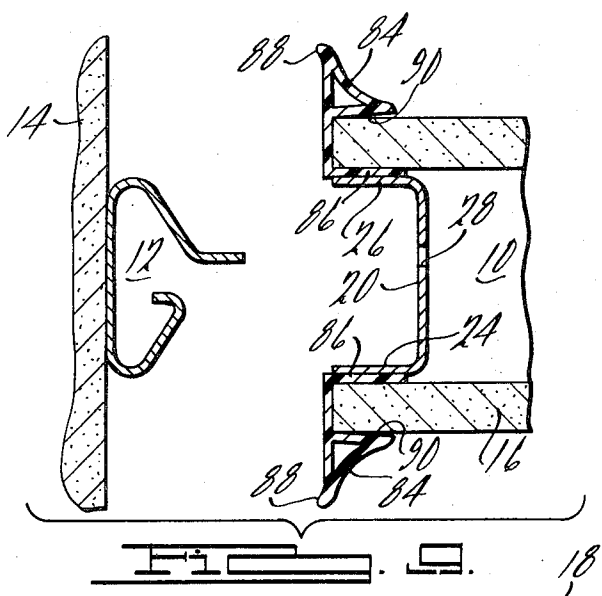
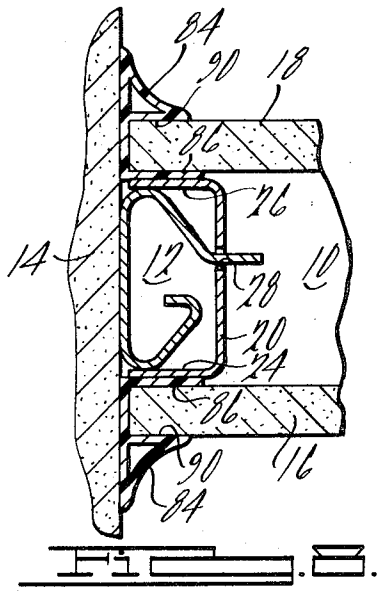
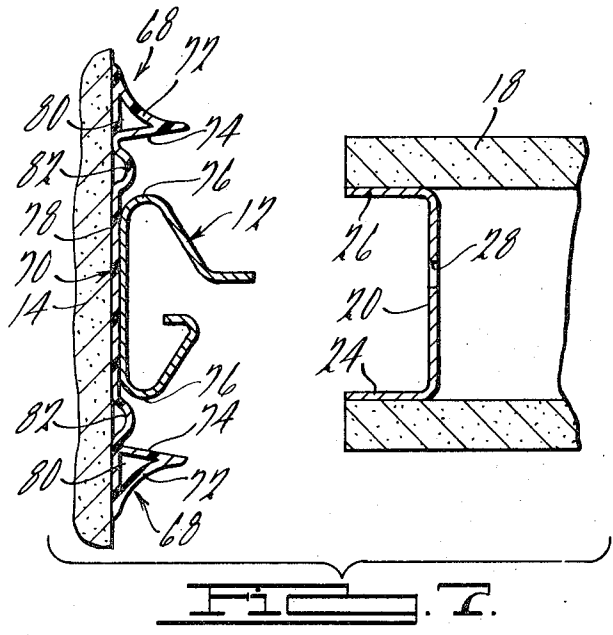
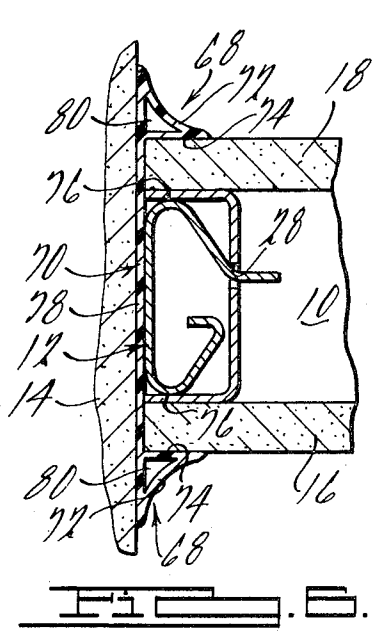


FIG. 5.

INVENTOR.
Borlan Prokop
BY
Harness, Dickey & Fierce
ATTORNEYS.



INVENTOR.
Botdan Prokop
 BY
Harness, Dickey & Fieue
 ATTORNEYS.

PANEL ASSEMBLY SYSTEM

BACKGROUND AND SUMMARY OF THE INVENTION

Heretofore, various panel assembly systems have been developed which are not totally satisfactory because of various exposed brackets, and miscellaneous connecting elements such as screws, bolts, and the like. Moreover, for practical reasons, most systems are unsatisfactory because they require skilled assemblers and the use of many tools, the combination of which has been found to increase the cost of the structure wherein the assembly is utilized, which tends to offset the advantage of the prefabricated structure itself. What is required is a panel assembly system wherein the connecting brackets, etc., are unexposed and one in which may be assembled without the need of skilled workmen and special assembly tools. The panel assembly system of the present invention is addressed to this aspect.

The present invention is comprised of a channel shaped column, having a plurality of vertically extending slots disposed therethrough its web, which are adapted to be received by a plurality of outwardly extending projections disposed on a panel receiving bracket. The panel receiving bracket is adapted to be received therewithin a vertically extending groove defined by the inward surface of the web and flanges of the channel, and interlocked therewith by relative sliding movement between the members. Thus, the connecting means of the respective panel portion is virtually concealed upon interlocking connection therewith of the panels.

With respect to the above then, it is accordingly the primary object of the present invention to provide a new and improved method of interlocking prefabricated panel members without the need of skilled workmen and special tools.

It is another object of the present invention to provide an assembly system wherein the connecting interlocking brackets and fastener are unexposed.

It is still another object of the present invention to provide an assembly system which may be connected by relative sliding movement of adjoining panels.

It is yet another object of the present invention to provide a system which is suitable for use in the modular form of building constructions.

It is another object of the present invention to provide a system which is simple of design, economical from a material standpoint, and because nonskilled labor may be used, is economical to assemble.

Other objects and advantages of the present invention will become apparent from the following detailed description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary perspective elevation indicating a pair of interlocking brackets attached to members to be connected in relative disassembled relationship.

FIG. 2 is a fragmentary perspective elevation of the same pair of interlocking brackets illustrated in FIG. 1 in assembled relationship.

FIG. 3 is a side elevation of the pair of interlocking brackets taken along the line 3—3 of FIG. 2.

FIG. 4 is a perspective elevation of the present invention illustrating the construction in relationship with a door frame.

FIG. 5 is a transverse cross section of the present invention with respect to the door frame, taken on the lines 5—5 of FIG. 4.

FIG. 6 is a cross-sectional view of an assembled second embodiment of the present invention wherein a corner trim is provided.

FIG. 7 is a cross-sectional view of the same embodiment illustrated in FIG. 6 in unassembled relative relationship.

FIG. 8 is a cross-sectional view of an assembled third embodiment of the present invention also incorporating a corner trim portion.

FIG. 9 is a cross-sectional view of the same embodiment illustrated in FIG. 8 in unassembled relative relationship.

FIG. 10 is a cross-sectional view of the preferred embodiment of the present invention indicating the assembled form of three body panels.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference now to FIGS. 1, 2 and 3 of the drawings, a first embodiment of the present invention will now be described. In FIG. 1, a prefabricated panel, indicated generally at 10, is illustrated in disassembled relationship with a panel receiving bracket 12 affixed to a wall surface 14 at a selected location wherefrom a partition is to be extended. The prefabricated panel 10 is comprised of a pair of wall boards 16 and 18 having sandwiched therebetween one end thereof, a U-shaped channel column 20.

The U-shaped channel 20 includes a web section 22, set inwardly from the ends of the wall boards 16 and 18, and a pair of flanges 24 and 26. A row of uniformly spaced vertically extending slots 28 are disposed along a common vertical centerline therethrough the web section 22, the centerline being located approximately one-third of the distance of the width of the web section 22 inward from the flange 26. Preferably, a second row of uniformly spaced vertically extending slots 30 are also disposed along a vertical centerline disposed inwardly from flange 24 a distance also conforming to approximately one-third of the width of web section 22 for the purpose of providing a so-called "dummy proof" panel construction; the dual row of slots 28 and 30 eliminating the need of orienting the panel with respect to a top or bottom surface thereof.

The outer surface of each of the flange portions 24 and 26 are attached to the corresponding inward surfaces of wall boards 16 and 18 respectively by bonding therewith, or by conventional fastener means such as nails or screws or a combination thereof. The inward surface of the flanges 24 and 26 and the outward surface of the web section 22 define a vertically extending groove 32, rectangularly shaped in cross section, which is adapted to receive therein the panel receiving bracket 12 and be interlocked thereto as shall become apparent as this specification proceeds.

The panel receiving bracket 12 is comprised of a flat rearward base portion 34 and a pair of forwardly extending side wall portions 36 and 38 which are arcuately folded so that the plane of each of the side walls

defines an acute angle with the plane of the base portion 34. Further, the outside width of the receiving bracket 12, measured from the outside radius of each of the arcuate folds, is slightly greater than that of the inside width between the flanges 24 and 26, as defined by the groove 32 to provide a generally interference engagement therewith upon assembly of the receiving bracket 12 therewithin the groove 32, and as best observed in FIG. 2.

An extreme outer end 40 of the side wall portion 36 is arcuately folded inward which defines a plane surface which is generally perpendicular to the base portion 34 for purposes of eliminating a sharp edge, and further for providing an outer access opening 43 to the base portion for use in affixing the bracket 12 by means of fastener elements should this mode of attachment be desired.

Turning now to the side wall portion 38, a plurality of hook shaped projections 42 are selectively spaced and extend outwardly from an extreme outer edge 44 thereof. The plane of the hook shaped projections 42 is generally perpendicular to the plane of the base portion 34 and is adapted to be received therewithin the slots 28 of the channel column 20. As best observed in FIG. 3, an upper edge 46 of each of the hook shaped projections defines a radius which on its lower end is tangent to an inward edge 48. The inward edge 48 is tapered downwardly with respect to the upper edge 46 and inwardly with respect to the base 34, and as shall now become apparent is adapted to compressively engage the web section 22 of the channel column 20 by relative sliding movement therewith.

To unite the prefabricated panel 10 to the wall surface 14 having the panel receiving bracket 12 attached thereto, the prefabricated panel 10 is lifted by means of a chain fall, or the like, and is urged inwardly thereagainst so that each of the hook shaped projections 42 engages the slots 28 therein the channel column 20. In this position, it will be noted that the flanges 24 and 26 of the channel column 20 snugly engage the arcuate folds of the panel receiving bracket 12 and compressively nest the receiving bracket 12 therewithin the channel column 20. Downward movement thereof of the prefabricated panel 10 thereby urges the prefabricated panel 10 inwardly as the upper edge of each of the slots 28 rides upon first the curved upper edge 46 of each of the hook shaped projections 42 and subsequently to the tapered inward edge 48 which affords a final seating engagement. As best observed in FIG. 2, the final seating engagement is adapted to communicate the vertical outer edges of each of the wall boards 16 and 18 flush with that of the wall surface 14 which affords a strong, good appearing partition-wall surface joint, with the interlocking members concealed.

With reference now to the embodiment depicted in FIG. 4 of the drawings, a fragmentary portion of a door frame is indicated generally at 50 in assembled relationship to a panel 10 which is of identical construction as the panel described in FIGS. 1 and 2, and therefore, is denoted by numerals corresponding therewith. The door frame 50 is comprised of a flat door jamb portion 52 having an outward, rectangularly shaped, in cross section, vertically extending projection 54 which is adapted to receive and function as a stop for a door 56 in a conventional manner well known in the art.

As best observed in FIG. 5, a pair of engaging side trim members 58 and 60 extend from each side of the door jamb 52, and project thereover the outer ends of the wall boards 18 and 16 respectively. The width of the door jamb 52 is purposely selected to be slightly larger than the width of the panel 10, and by means of folding over the extreme end portions 62 and 64 of the side trim members 58 and 60 through an angle approximating 180°, a compressive fit is achieved therebetween the door frame 50 and the panel 10.

For purposes of interlocking the panel member 10 to the door frame 50, a panel receiving bracket 12, identical to the bracket described previously with respect to FIGS. 1 and 2 and denoted as such by the same numerals, is attached to the inward surface 66 of the door frame 52, again by either conventional fastener or bonding techniques. As described previously, the union of the panel 10 to the door frame 50 is accomplished in the same identical manner as previously described by interlocking the panel receiving bracket 12 to the channel column 20 and as before, the interlocking structure is concealed from an exterior vantage thereof.

In FIGS. 6 and 7, a second embodiment of the structure illustrated in FIGS. 1 and 2 is depicted having the additional feature of a corner fillet indicated generally at 68. The prefabricated panel 10 and the panel receiving bracket 12 are identical to the previously described embodiment, but the variance is the incorporation therewith of a corner trim member 70 interposed between the wall surface 14 and the receiving bracket 12. A vertically extending fillet surface 72 is arcuately inclined outward from each vertical outer edge of the trim member 70 and terminates on a guiding portion which defines an inward face 74. The width between the inward face 74 and the outer extremity 76 of the arcuate fold of the panel receiving member 12 is slightly less than the combined thickness of the panel board 16 or 18, and the flange 24 or 26 of the channel column 20 for purposes to be explained.

As observed in FIG. 7, the corner trim member 70 is comprised of a generally flat base portion 78 having substantially triangular shaped end portions 80 on opposite sides thereof, and a vertical forwardly extending projection 82 arcuate in cross section, interposed therebetween each of the triangular shaped end portions 80 and the arcuate folds 76 of the panel receiving bracket 12. While this embodiment is assembled similarly to the embodiment disclosed in FIGS. 1 and 2, the ends of the panel boards 16 and 18 are resisted from achieving a flush confrontation with the wall surface 14 due to the arcuate projections 82 and the interference of the lesser width between the inward face 74 of the end portions 80 and the arcuate fold 76 of the panel receiving bracket 12. The interlocking attachment of the hook shaped projections 42 and the slots 28 in this instance urge the vertical ends of the panel boards 16 and 18 against the projections 82 and the aforementioned interference, with the result that the projections 82 are flattened. Hence, the inward engaging face 74 of the generally triangular shaped end portions 80 is forced into intimate engagement with the respective outer surface of the panel boards 16 and 18. As best observed in FIG. 6, which is an assembled view of the members, a fully seated corner fillet 68 is accomplished on opposite sides of the panel 10 and as before, the attaching components are concealed from exterior vantage.

A third embodiment also featuring a corner fillet is illustrated in FIGS. 8 and 9. In this embodiment, a pair of corner fillets 84 are disposed along the engaging end of each of the wall boards 16 and 18 having a vertical forwardly extending flange 86 which is interposed between the flange portions 24 and 26 of the channel column 20 and the adjacent inward surface of the wall boards 16 and 18. The corner fillet portion 84 is substantially identical with the corner fillet 68 of FIGS. 6 and 7 with the exception that the extreme outer end 88 thereof is curved inwardly toward the wall surface 14. In its disassembled form, the inward engaging face 90 of the corner fillet is slightly inclined therewith the outer surface of the wall board 16 or 18. Upon assembly, however, the inwardly curved outer ends 88 upon contact with the wall surface 14 slightly pivots the corner fillet about an axis located at the outer edge of the panel board 16 or 18 with the result that upon complete seating of the members, the curved end 88 is generally flattened and the inward face 90 of the corner fillet 84 is pivotably urged into a flush relationship with the outer surface of the wall board 16 or 18; the final appearance resembling the construction depicted in FIGS. 6 and 7 and an equivalent structure for all practical purposes.

In FIG. 10, a plurality of prefabricated panels 10 are illustrated in assembled relationship. In this instance the panel receiving brackets 12 are connected by any conventional means, as by fasteners or bonding, to a second channel member 92 sandwiched therebetween the wall boards but oriented therewith having its base flush with the opposite ends of the wall boards 16 and 18 thereof. The second channel members 92 may be similar to those provided at the opposite end for the interlocked connection, but it will be appreciated that this is a matter of choice because there is no need for the dual row of slots 28 and 30 in the second channel as only the flat outer surface 94 is utilized. Any number of prefabricated panels 10 may be used to accomplish a partition; each being installed, one to another, in exactly the same aforementioned sequence, with each panel 10 affording the same rapport having its interlocking connecting means concealed once each prefabricated panel 10 is seated one to another.

While it will be apparent that the preferred embodiments illustrated herein are well calculated to fulfill the objects above stated, it will be appreciated that the present invention is susceptible to modification, variation and change without departing from the scope of the invention.

What is claimed is:

1. A panel assembly system for adjacently located first and second wall sections comprising: a channel connected to one of said sections including a web spaced inwardly relative to an edge of said sections and having a plurality of longitudinally spaced apertures, said channel also including a pair of laterally spaced flanges located along opposite edges of said web; and an interlocking bracket connected to the other of said sections including a longitudinally extending base and a pair of laterally spaced, rolled over side sections adapted to be guidably and snugly received between the spaced flanges of said channel, said bracket also including a plurality of longitudinally spaced hook shaped sections located along an outer edge of one of said side sections and each adapted for reception in one

of said apertures whereby the sections are fixedly interconnected via relative sliding movement therebetween.

2. The panel assembly system, as set forth in claim 1, wherein each of said pairs of side sections are arcuately folded from opposite sides of said base whereby to be resiliently supported therefrom.

3. The panel assembly system, as set forth in claim 2, wherein the plane of each of said side walls is acute to said base portion.

4. The panel assembly system, as set forth in claim 2, wherein said hook shaped sections extend outwardly and generally perpendicularly relative to said base.

5. The panel assembly system, as set forth in claim 2, wherein an outer edge of one of said side sections is further folded inwardly and generally perpendicular relative to said base.

6. The panel assembly system, as set forth in claim 1, wherein each of said hook shaped sections further includes an upper arcuate edge which tangentially communicates an inward edge which is tapered downwardly and inwardly toward said base portion.

7. The panel assembly system, as set forth in claim 2, wherein said channel is sandwiched between interior surfaces of one of said sections and bondingly connected to the outer surface of each of said pair of flanges.

8. The panel assembly system, as set forth in claim 1, wherein one of said sections is a door frame, and said panel receiving bracket is attached to a rear surface thereof.

9. The panel assembly system, as set forth in claim 8, wherein said door frame includes a pair of side walls which extend from opposite sides of a jamb portion for compressively receiving said one of said sections therebetween.

10. The panel assembly system, as set forth in claim 1, wherein a second channel is disposed at the opposite end of one of said sections and includes a panel receiving bracket attached thereto.

11. The panel assembly system, as set forth in claim 1, wherein one of said sections is a wall surface, and wherein the system further includes a pair of fillet surfaces disposed along opposite edges of said other section and communicating said wall surface.

12. The panel assembly system, as set forth in claim 11, wherein said fillet surfaces are disposed along opposite vertical edges of a bracket interposed therebetween said wall surface and said panel receiving bracket.

13. A panel assembly system for connecting first and second wall sections comprising: a longitudinally extending U-shaped channel having a plurality of longitudinally spaced apertures, and including a web and a pair of laterally spaced flanges, said channel being located in an upright edge of one of said wall sections with said web being located inwardly relative to said upright edge to form a generally rectangular shaped recess therein; a C-shaped bracket connected to the other of said sections and including a flat base and a pair of rolled inwardly inclined walls located on opposite lateral sides of said base, said bracket also including a plurality of longitudinally spaced hook shaped sections located along an inward edge of one of said walls, each hook shaped section being adapted to be slidably engaged in one of said apertures; and fillet

forming means connected to one of said sections and compressively urged against the other of said wall sections for providing a fillet surface therebetween.

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