United States Patent

Pierce et al.

[15] **3,643,393**

[45] **Feb. 22, 1972**

[54] BUILDING CONSTRUCTION

[72] Inventors: **Edwin A. Pierce; Richard W. Knob; Samuel O. Roth,** all of Piqua; **Emery L. McKinney,** Troy, all of Ohio

[73] Assignee: **Inland Systems, Inc.,** Piqua, Ohio

[22] Filed: **Mar. 30, 1970**

[21] Appl. No.: **23,816**

[52] **U.S. Cl.** **52/287,** 52/309

[51] **Int. Cl.** **E04b 1/40,** E04c 1/40

[58] **Field of Search** 52/287, 288, 309, 241, 242, 52/281, 282

[56] **References Cited**

UNITED STATES PATENTS

3,444,657	5/1969	Swanson	52/288
3,350,257	10/1967	Hourigan et al.	52/309 X
2,565,251	8/1951	Malmstrom	52/309 X
3,109,207	11/1963	Cooper	52/278 X
1,979,206	10/1934	Brand	52/288

FOREIGN PATENTS OR APPLICATIONS

690,554	7/1964	Canada	52/288
983,809	2/1965	Great Britain	52/288

OTHER PUBLICATIONS

Architectural Record; dtd. Sept. 1948; pg. 229

Primary Examiner—H. Hampton Hunter
Attorney—Marechal, Biebel, French & Bugg

[57] **ABSTRACT**

Modular building construction in which the walls of each module are manufactured as panels consisting of one or more gypsum board subpanels secured to a core of studs and plates and overlaid with a continuous sheet of embossed, polyvinyl chloride, and in which the corner joints of the module are covered by a strip of polyvinyl chloride of the same color and texture as the continuous sheets and secured to the adjacent edges of the panels by means of a pressure-sensitive adhesive.

9 Claims, 4 Drawing Figures

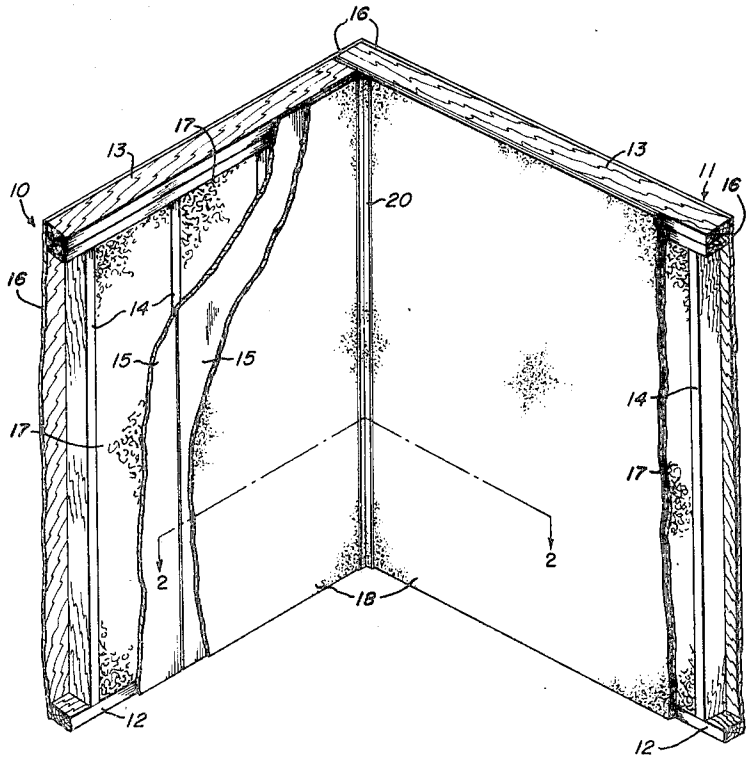


FIG-1

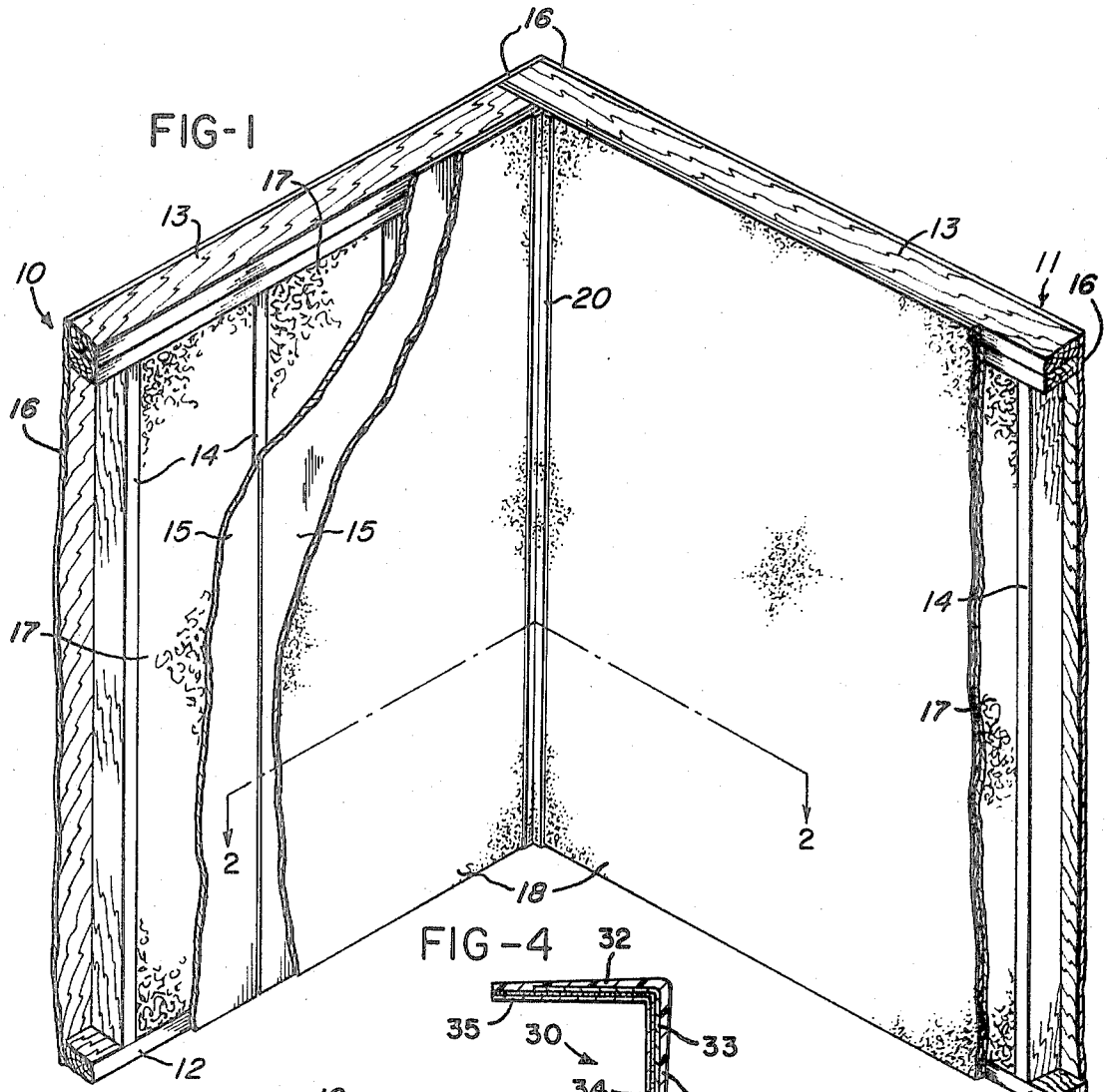


FIG-4

FIG-2

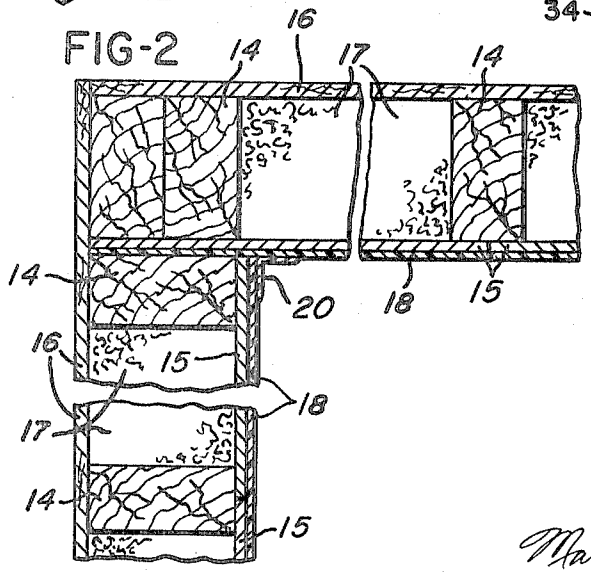
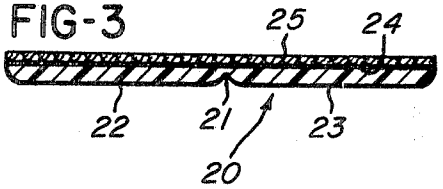


FIG-3



INVENTORS
EDWIN A. PIERCE,
RICHARD W. KNOB,
SAMUEL O. ROTH &
BY EMERY L. McKINNEY

Marechal, Biebel, French & Bugg
ATTORNEYS

BUILDING CONSTRUCTION

BACKGROUND OF THE INVENTION

In conventional building construction panels of paper-covered gypsum board or the like are nailed to a series of vertically extending studs, which in turn are nailed, adjacent their upper and lower ends, to header and sill plates, respectively. Paper tapes are then applied over the joints between adjacent subpanels and spackling is applied over the paper tapes. Where two walls abut, as for example, at an interior corner of a room, the same procedure is generally followed and the joint between the two walls first taped and then spackled. Similarly, when two walls abut at an outside corner conventional procedure is to nail a metal corner cove over the adjacent wall surfaces and apply spackling to the cove.

With this type of construction it will be apparent that skilled, onsite labor will be required in order to obtain an acceptable joint between adjacent panels. Since labor, particularly skilled labor, is one of the major factors in building construction expense, it will be seen that the taping and spackling of each of the corner joints of a building will appreciably add to the cost thereof.

In response to an increasingly critical need for housing, modular housing systems have been designed in which a building is manufactured from a series of factory-constructed modules which are joined at the building site to provide a complete building structure, thereby permitting the application of assembly line manufacturing techniques to building construction and reducing the requirement of onsite skilled labor to a minimum.

In utilizing this approach, however, it will be apparent that attempting to tape and spackle each of the wall joints in the modules would still require the time and skilled labor required in conventional, onsite construction methods and constitute a prime source of bottlenecks in the manufacturing process.

Additionally, modules used in modular housing must possess great structural integrity, similar to an airframe structure, to withstand the stresses imposed on them in handling and assembly. Obviously even the most carefully and skillfully constructed conventional dry wall construction would have a marked tendency to crack, particularly in the joint areas, if subjected to the stresses normally imposed on factory-constructed modules during shipping and assembling.

SUMMARY OF THE INVENTION

The present invention utilizes a series of factory-assembled modules, the walls of which are formed with a continuous sheet of a flexible, synthetic resinous material, such as polyvinyl chloride, extending across and glued to the surfaces of the one or more subpanels of gypsum board or the like, which in turn are glued and nailed to a core of studs and plates. The sheet covering the subpanels bridges and masks the joints between adjacent subpanels and obviates the necessity of taping and spackling each of these joints.

At the corners of the modules the space between adjacent wall surfaces is bridged by a strip of material, which may also conveniently be polyvinyl chloride, and which is of substantially the same color and texture as the wall panel coverings and provided with a coating of pressure-sensitive adhesive on its rear surface so that it may be adhered in place over the joint between adjacent panels to substantially conceal it.

The cornerpiece for interior corners is preferably manufactured as a continuous extruded strip having a score line formed therein extending longitudinally thereof so that the strip may be shipped flat in roll form with a paper backing covering the adhesive for ease in handling. Thus, to apply the tape all that is required is the removal of the masking, folding of the tape about its score line and application to the corners of the modules.

Although it will be apparent that the strip described above may find utility in outside as well as interior corners, it most instances where an outside corner is to be covered the strip will take the form of a substantially rigid cornerpiece of right angular cross section provided with a layer of pressure-sensitive adhesive covered with paper backing which is stripped from the adhesive when the cornerpiece is to be applied. Additionally, it may be desirable to reinforce the outside corner strip with a suitable reinforcing material, such as metal, since exterior corners are more likely to receive potentially damaging blows during normal use.

As a result, a durable, attractive corner joint is formed with a minimum of effort and without the necessity of the use of onsite skilled labor. Additionally, any relative movement between wall panels in a module, as for example, during shipping and assembling, is easily accommodated by the flexible synthetic resinous material covering the joints without cracking.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view with portions broken away showing a typical corner construction according to the present invention;

FIG. 2 is a view taken substantially on line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional view through one form of corner strip according to the present invention; and

FIG. 4 is a cross-sectional view through a second preferred embodiment of a corner strip for exterior corners.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to FIGS. 1 and 2 of the drawings it will be seen that a corner assembly of a building module constructed according to the present invention is formed of a pair of wall panels 10 and 11, with the panel 10 abutting the side of panel 11 adjacent the edge thereof and secure thereto by adhesive and mechanical fasteners. Each wall panel includes a horizontally extending sill plate 12, a doubleheader plate 13 and vertically extending studding 14 mounted between the sill and header plates and secured thereto by adhesive and mechanical fasteners. A plurality of subpanels 15 and panels 16 are secured in overlying relationship to the studs and plates, again, by means of adhesive and mechanical fasteners, and an insulating material 17 fills the cavities bounded by the studding, plates, panels and subpanels. A seamless sheet 18 of a flexible, thermoplastic material overlies the subpanels 15 and is adhesively secured thereto.

Where the panels 10 and 11 abut at an interior corner of a module, an elongated strip 20 of flexible sheet material is applied to the adjacent portions of the panels 10 and 11, bridging any gap therebetween. The strip 20, as best seen in FIG. 3, is provided with a longitudinally extending score line 21 which serves to divide the strip into a pair of substrips 22 and 23. The rear surface of the strip 20 is provided with a coating of pressure-sensitive adhesive 24 and a masking layer of paper or the like is applied over the pressure-sensitive adhesive to facilitate handling and storage of the strip.

Typically, the sill and header plates comprise single and double 2×4's, respectively. The studding 14, for exterior walls, may also comprise 2×4's placed on 16-inch centers, while in the case of interior wall panels, 2×3's on 16-inch centers are sufficient. The subpanels 15 may comprise ⅜-inch-thick sheets of gypsum board and the panels 16, ⅜-inch plywood, while the insulating material 17 may be formed of fiber glass bats frictionally held in the cavities defined by the studding, plates, panels and subpanels 15. The seamless sheets 18 may advantageously be formed of polyvinyl chloride suitably colored and provided with a random pattern of embossing to present a pleasing, decorative appearance. Similarly, the corner strip 20 may also be formed of polyvinyl chloride, colored and embossed to match the sheets 18 as closely as practical to thereby substantially conceal the corner joint and present the appearance of a substantially continuous covering about the walls of each module.

From the above it will be apparent that after the wall panels 10 and 11 are secured together as shown in FIGS. 1 and 2 with their surfaces disposed at approximately 90° to each other, the

corner strip **20** may be applied thereto by simply removing the backing strip **25**, folding the two substrips **22** and **23** inwardly toward each other about the score line **21** and then pressing the strip **20** in place in the corner of the module in overlying relationship to the adjacent edges of the two panels **10** and **11**, in which position it will be retained by means of the coating of pressure-sensitive adhesive **24** applied to the rear surface of the strip **20**. Since, as noted above, the strip **20** is of substantially the same color as the color of the sheets **18** and, if the sheets **18** are provided with a decorative pattern, such as embossing, the strip **20** is similarly patterned, application of the strip **20** to the corner will substantially conceal the corner joint between adjacent wall panels.

Although in the foregoing illustration the corner strip **20** is described in connection with an interior corner of a module as shown, for example, in FIGS. **1** and **2**, it will be apparent that corner strip **20** also finds utilization in connection with the covering of exterior corners. Thus, when the angle between adjacent panel surfaces is approximately 270° it will be apparent that it is merely necessary to reverse the direction of folding of the two substrips **22**, i.e., fold the two substrips upwardly as shown in FIG. **3** about the score line **21**, to form an exterior cornerpiece.

However, in most instances it will, in fact, be desirable to use a second embodiment of the invention when dealing with exterior corners. Thus, as seen in FIG. **4**, a special cornerpiece **30** for exterior corners comprises a pair of substrips **31** and **32** disposed at right angles to each other. The corner strip **30**, although it is formed, similarly to the corner strip **20**, of a material such as polyvinyl chloride which matches the color and texture the wall coverings **18**, will desirably be somewhat more rigid than strip **20**, although it will retain some limited degree of flexibility.

Additionally, it will often be desirable to provide the exterior corners with some form of reinforcement since exterior corners are more likely to be subject to potentially damaging blows during normal usage. Strip **30**, therefore, may be provided with a right angularly cross-sectioned metal strip **33** embedded or otherwise secured to the strip **30**. Of course, the strip **30** will also preferably be provided at its rear surface with a coating of a pressure-sensitive adhesive **34** and a backing of masking paper **35** which is removed when the strip is applied to an exterior corner.

From the above it will be apparent that the present invention not only obviates the necessity of individually taping and spackling each of the joints in a building construction, but also provides a joint of a sufficient flexibility to withstand any flexure and relative movement between the building components which may occur during handling and assembly of the modules, while at the same time provides an esthetically pleasing appearance.

While the forms of apparatus herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise forms of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. Building construction comprising:
a. a plurality of wall panels,
b. each of said wall panels including:
i. horizontally extending header and sill plates,
ii. a plurality of vertically extending studs extending between and attached to said header and sill plates and defining a supporting framework therewith,
iii. a plurality of panel means secured to opposite faces of said supporting framework,
iv. a continuous sheet of synthetic resinous material overlying said plurality of panel means on at least one face of each of said wall panels and providing a continuous, uninterrupted covering therefor,
c. means securing said wall panels together with vertically extending edges thereof positioned in abutting relationship to each other,
d. a continuous strip of synthetic resinous material of substantially the same color and texture as said continuous covering on said wall panels, and
e. means securing longitudinally extending portions of said continuous strip to adjacent portions of continuous coverings on adjacent wall panels to cover the seam therebetween and present the appearance of a continuous wall facing.

2. The construction of claim **1** wherein:
a. said covering has a pattern embossed therein, and
b. said strip has substantially the same pattern embossed therein.

3. The construction of claim **1** wherein:
a. said covering and said strip are formed of polyvinyl chloride.

4. The construction of claim **1** wherein:
a. said strip is adhered to said covering by means of a pressure-sensitive adhesive.

5. The construction of claim **1** wherein:
a. said panels are angularly disposed with respect to each other, and
b. said strip has means defining a score line extending longitudinally thereof with portions of said strip on opposite sides of said score line attached to portions of said covering adjacent said edges of each of said panels.

6. The construction of claim **5** wherein:
a. the angle between said surfaces of said panels is substantially 90° to form an interior corner.

7. The construction of claim **1** wherein:
a. the angle between said surfaces of said panels is substantially 270° to form an exterior corner.

8. The construction of claim **7** wherein:
a. said strip is formed of a substantially rigid material.

9. The construction of claim **8** further comprising:
a. reinforcing means secured to said strip.

* * * * *