April 22, 1969 R. E. OMHOLT 3,439,464

FLOOR AND WALL SYSTEM

Filed April 12, 1967 Sheet 1 of 2

FIG. 1

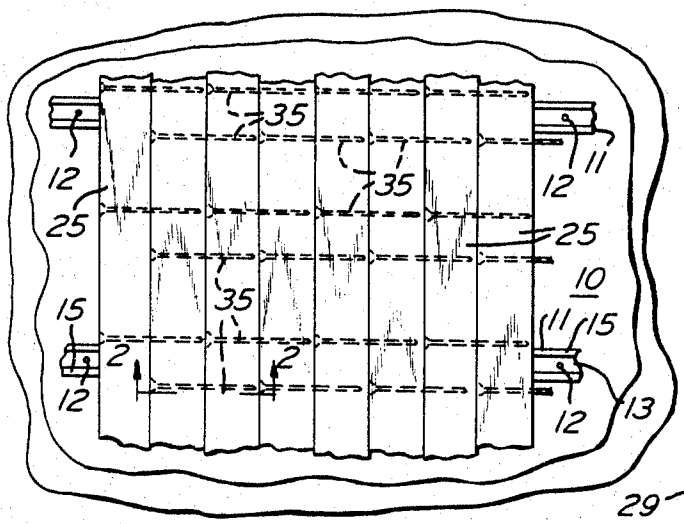
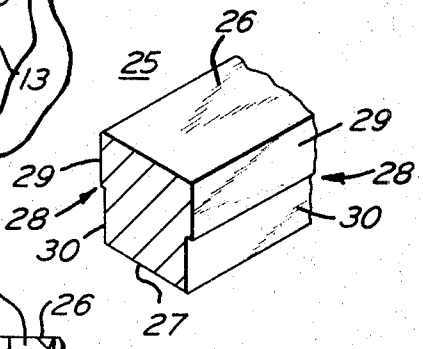


FIG. 4



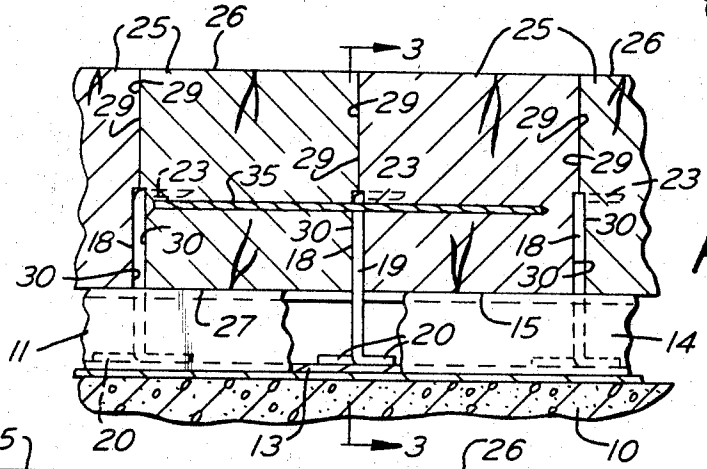


FIG. 2

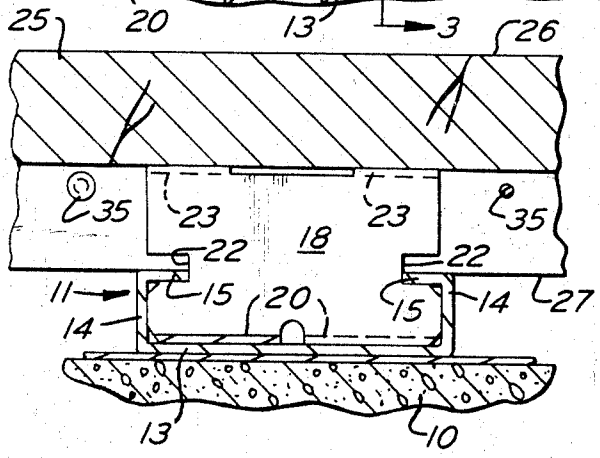
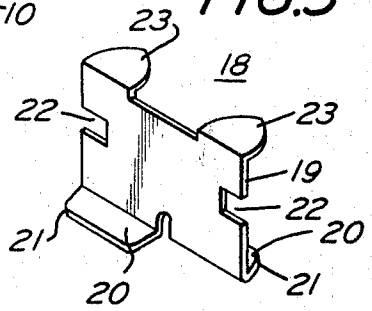


FIG. 3

FIG. 5



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FIG. 9

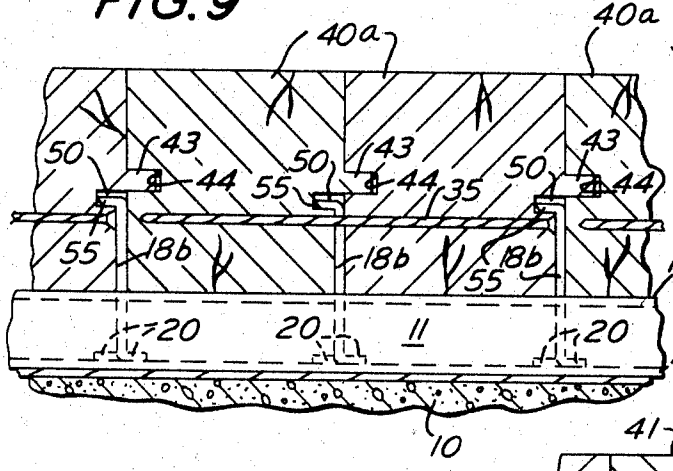


FIG. 8

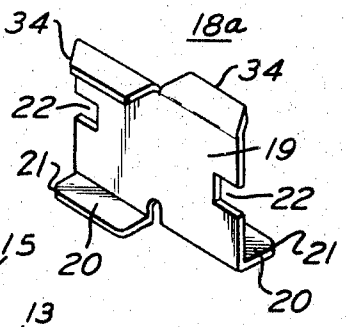


FIG. 7

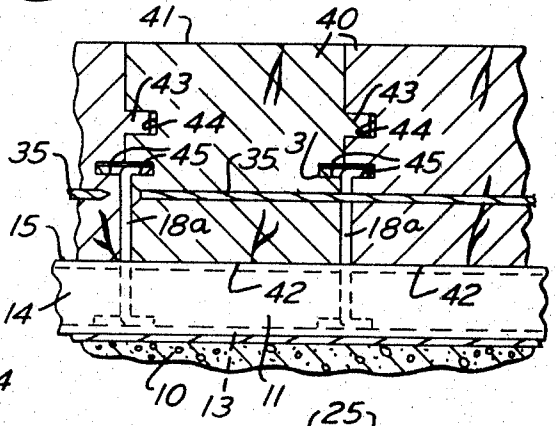


FIG. 6

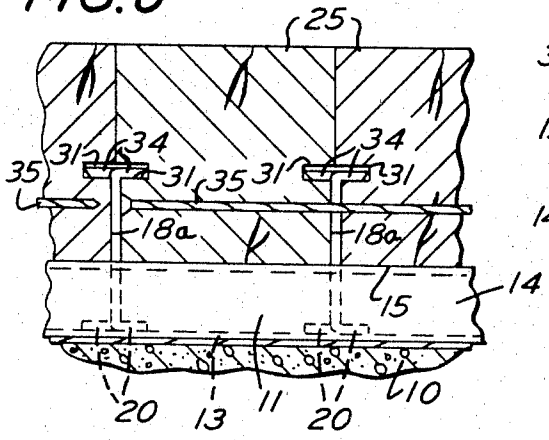


FIG. 12

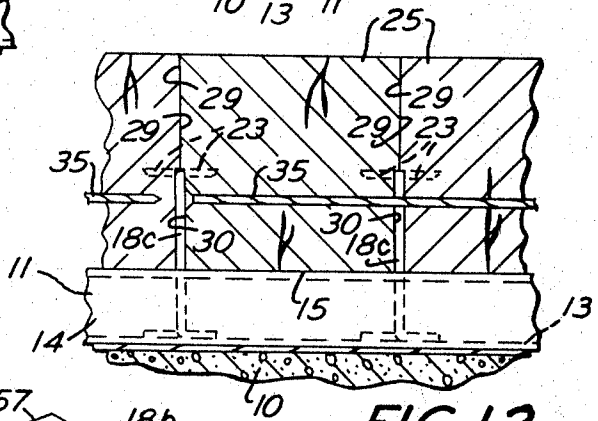


FIG. 10

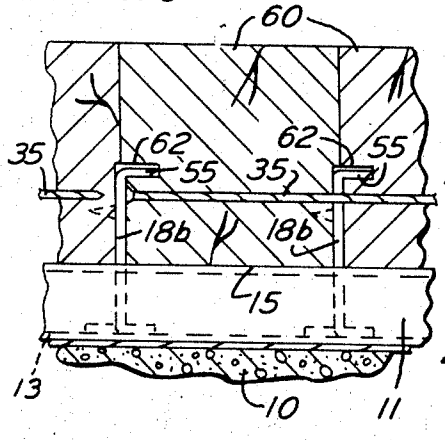
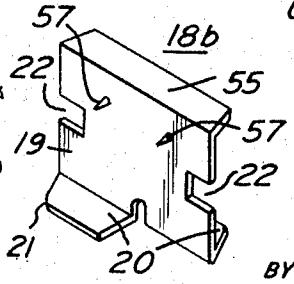


FIG. 11



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United States Patent Office 3,439,464
Patented Apr. 22, 1969

3,439,464

FLOOR AND WALL SYSTEM

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Filed Apr. 12, 1967, Ser. No. 630,266
Int. Cl. E04b 5/08
U.S. Cl. 52—479 9 Claims

ABSTRACT OF THE DISCLOSURE

A system for floor and wall construction employing a plurality of parallel wooden boards whereby the individual boards are restrained against crosswise growth by members driven across their width and which may also extend into adjacent boards to hold together the system so that it is restrained from crosswise growth, longitudinal movement and mid-span differential deflection.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates to systems for floors and walls employing a plurality of parallel wooden boards in which the individual boards are restrained from crosswise growth and mid-span differential deflection by members driven across the individual boards and if desired into adjacent boards restraining crosswise growth, holding the boards together, and restraining longitudinal movement and mid-span differential deflection.

Description of the prior art

Flooring systems such as those shown in my prior Patent No. 3,267,630 and application Ser. No. 534,371, filed Nov. 15, 1966, utilize clips which may or may not engage grooves in sides of floor boards, the clips being engaged in channels and which clips restrain the boards from movement toward and away from the channels as well as along the channels. These systems work satisfactorily to hold the boards with respect to the channels. The boards however, have a tendency to grow across grain thereby loosening in time and permitting dirt to get between the boards and cause damage, as well as to create an unsatisfactory appearance.

No satisfactory provisions have previously been proposed to as effectively prevent cross grain growth. In addition with the prior systems having non-tongued and grooved boards, mid-span differential deflection of individual boards can occur with attendant damage to the boards.

The system of the present invention prevents crosswise growth, reduces longitudinal movement and reduces mid-span deflection for non-tongued and grooved boards.

SUMMARY OF THE INVENTION

The principal object of the present invention is to provide a system for flooring and for vertical walls having a plurality of parallel wooden boards wherein the individual boards are restrained from crosswise growth.

A further object of the present system is to provide a system for floors and vertical walls having a plurality of parallel wooden boards wherein the entire span of boards may be secured together and restrained from crosswise growth.

A further object of the present invention is to provide a system for floors and vertical walls, having a plurality of parallel wooden boards, which can use tongued and grooved boards or non-tongued and grooved boards as desired.

A further object of the present invention is to provide a system for floors and vertical walls employing a plurality of parallel wooden boards, held by clips, and which

may use single or double sided holding clips with or without projecting barbs on one or both side faces.

A further object of the present invention is to provide a system for floors and walls with a plurality of wooden boards in parallel relation wherein the clips are secured in pre-milled grooves, or driven directly into the wood.

A further object of the present invention is to provide a system for floors and walls employing a plurality of wooden boards in parallel relation where the mid-span differential deflection for non-tongued and grooved boards may be greatly reduced or eliminated.

A further object of the present invention is to provide a system for floors and walls with a plurality of parallel boards wherein longitudinal movement of the individual boards is reduced.

Other objects and advantageous features of the invention will be apparent from the description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The nature and characteristic features of the invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part thereof, in which:

FIGURE 1 is a top plan view of a construction in accordance with the present invention and having particular reference to flooring;

FIG. 2 is a vertical sectional view, enlarged, taken approximately on the line **2—2** of FIG. 1, showing one preferred embodiment of the present invention;

FIG. 3 is a vertical sectional view taken approximately on the line **3—3** of FIG. 2;

FIG. 4 is a view in perspective illustrating one form of board used with the invention;

FIG. 5 is a view in perspective showing one form of holding clip which may be used in conjunction with the present invention;

FIG. 6 is a view similar to FIG. 2 illustrating another preferred embodiment of the present invetnion;

FIG. 7 is a view similar to FIG. 2 illustrating another preferred embodiment of the present invention;

FIG. 8 is a view in perspective showing another form of holding clip which may be used with the invention;

FIG. 9 is a view similar to FIG. 2 illustrating another preferred embodiment of the present invention;

FIG. 10 is a view similar to FIG. 2 illustrating another preferred embodiment of the present invention;

FIG. 11 is a view in perspective of another form of holding clip which may be used with the invention; and

FIG. 12 is a view similar to FIG. 2 illustrating another preferred embodiment of the present invention.

It should, of course be understood that the description and drawings herein are illustrative merely, and that various modifications and changes can be made in the structures disclosed without departing from the spirit of the invention.

Like numerals refer to like parts throughout the several views.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now more particularly to the drawings, and specifically FIGS. 1, 2, 3 and 4 thereof, a base **10** which may be of wood, or of concrete, which may be a subfloor, or which may be a vertically disposed support, is provided upon which a plurality of channels **11** are secured in parallel relation such as by the use of explosively applied fasteners **12.**

The channels **11**, if turned on edge, are of substantially C-shape in cross section and have a base web **13** to which side marginal portions **14** are joined and which extend outwardly for walls and upwardly for floors, with inwardly extending rims **15** substantially parallel to web **13.**

The channels 11 are preferably formed of mild steel and may be coated with a rust resisting coating such as galvanizing or other suitable material.

A plurality of metallic holding clips 18 are provided, such as those shown in my prior application Ser. No. 534,371 or those shown in FIG. 5, each having a central vertical plate portion 19, and lower oppositely extending horizontally disposed feet 20, the corners 21 of the feet being rounded to aid in assembly in the channels 11.

Notches 22 are provided in the central plate portion 19 extending inwardly to a depth which would allow the clips 18 to fit in channels 11 between the rims 15 and the web 13. The central plate portions 19 at the top thereof are provided with a pair of inwardly extending flange portions 23, which are U-shaped for easier wood penetration and with reduced tendency to split the wood.

The floor boards 25 as shown in FIGS. 2 and 4 have top and bottom flat horizontal faces 26 and 27. The boards 25 have longitudinal edge faces 28 on either side thereof which faces 28 have vertical upper portions 29 and recessed lower portions 30. The boards 25 have the flange portions 23 of clips 18 engaged with their edges 28 below the upper portion 29 and facing to the right as shown in FIG. 2.

The notches 22 of central body portion 19 are engaged with the rims 15 of the channels 11 and serve to hold boards 25 in firm engagement with the channels 11 and reduce longitudinal movement of the boards 25 with respect to the channels 11.

Nails 35 are provided which may be of the spiral type and preferably are machine driven and which as illustrated extend at least across the width of one board 25 and may also extend beyond the width of a single board 25 and into an adjacent board 25 as shown in FIG. 2. The locations of the nails 35 and the number of nails 35 per foot of length is determined by the extent or restraint desired against crosswise growth and also the restraint desired on mid span differential deflection.

The example shown in FIGS. 2 and 3 illustrates the use of a single sided holding clip which does not require pre-milled grooves in the longitudinal edge faces of the boards 25 and has no barbs on the central body portion 19.

In FIG. 6 the use of a double sided holding clip 18A is illustrated. The holding clip 18A as shown in detail in FIG. 8 is provided with a central body portion 19 with notches 22 in its sides as for clip 18, and lower oppositely extending feet 20. Flange portions 34 are provided at the margin of body portion 19 remote from the feet 20 and oppositely extending in gripping engagement in precut grooves 31 with adjacent boards 25 as shown in FIG. 9. Nails 35 are engaged as before across at least one board 25 and preferably into an adjacent board 25 providing a restraint against crosswise growth at their respective locations and further providing at locations between channels shear resistance to mid-span differential board deflections and longitudinal movement of individual boards.

In FIG. 7 is illustrated one form of the invention similar to that of FIG. 6 but using tongued and grooved board construction which is more fully illustrated in my prior application Ser. No. 534,371, filed Nov. 15, 1966. The boards 40 include flat horizontal top and bottom faces 41 and 42 with side opposite longitudinal tongues and grooves 43 and 44. Longitudinal precut grooves 45 are provided extending the board length of the boards 40 and below the tongues 43. Channels 11 are provided on which the boards 40 are retained by clips 18A. The clips 18A in engagement with the channels 11 and with the boards 40 restrain the boards 40 from movement with respect to the base or foundation 10.

Nails 35 are provided extending across the grain of each board 40 and into an adjacent board 40 which provides resistance to crosswise growth and relative longitudinal movement and also to mid-span differential deflection.

In FIG. 9 one embodiment of the invention using

tongued and grooved boards 40A similar to boards 40 as shown in FIG. 7 is illustrated. The boards 40A have additional longitudinal grooves 50 milled into the edge of the boards below the tongue receiving grooves 44 which grooves 44 are closer to the top face 41 than for the board 40 but in other respects are identical to boards 40. A holding clip 18B used with boards 40A is illustrated in FIG. 11. The clip 18B has a central body portion 19, notches 22, lower oppositely extending feet 20, and an upper flange portion 55. Edge face engaging barbs 57 extending outwardly from the body portion 19 and opposite to the flange portion 55 may be provided if desired.

The flange portion 55 is engaged in the precut groove 50, and the notches 22 of central body portion 19 are engaged with the rims 15 of channels 11 thereby restraining boards 40A from movement away from the channels 11. Nails 35 extend across a board 40A and an adjacent board 40A thereby restraining crosswise growth of boards 40A, longitudinal relative board movement, and mid span differential deflection.

In FIG. 10 is illustrated another embodiment of the invention for non-tongued and grooved boards 60 similar to the boards 25 of FIG. 2.

The clips 18B shown in FIG. 11 are employed and the boards 60 have longitudinal grooves 62 milled into one of their edges with which flanges 55 of clip 18B engage and restrain the boards from vertical movement as described for the boards 40A of FIG. 9.

Nails 35 extend crosswise into a board 60 and into an adjacent board 60 restraining crosswise growth of boards 60 and reducing board crosswise separation. In addition the nails 35 provide shear resistance between the edges of boards 60, reduce relative board longitudinal movement and reduce mid-span differential deflection.

FIG. 12 illustrates another form of the invention using non-tongued and grooved boards 25.

The clips 18C used to hold down the board 25 are similar to the clips 18 except that the flange portions 23 extend in opposite directions, like the flange portions 34, and engage the boards 25 below their meeting faces 29.

Nails 35 are provided extending crosswise into a board 25 and into an adjacent board 25 restraining the boards 25 from crosswise growth and providing shear resistance to vertical movement of the boards 25 which reduces mid-span differential deflection, as well as reduces relative longitudinal board movement.

It will thus be seen that the objects of the invention have been attained.

I claim:

1. A wood floor and wall system which comprises
a support,
a plurality of channels in spaced parallel relation on said support,
a plurality of wooden boards on and spanning said channels and having clip receiving recesses,
holding clips engaging said channels and said boards in said recesses and restraining the boards against movement with respect to said channels,
means for restraining crosswise growth of such boards,
said means comprising driven members having projections along their lengths engaging within the boards,
whereby said boards are held tightly together at their exposed faces.

2. A wood floor and wall system as defined in claim 1 in which
said holding members are in engagement with a plurality of contiguous boards.

3. A wood floor and wall system as defined in claim 1 in which
said boards are provided with interengaged longitudinal edge tongues and grooves.

4. A wood and wall system as defined in claim 1 in which

at least one edge of each board has for said clip receiving recesses a longitudinal edge groove therealong in spaced relation to the channel, and

said holding clips each has a flange portion in engagement in said edge groove.

5. A wood floor and wall system as defined in claim 4 in which

both edges of each board have longitudinal edge grooves, and

said holding clips have flange portions in engagement in said grooves.

6. A wood floor and wall system as defined in claim 1 in which

said holding clips are provided with upper oppositely extending flange portions engaged in facing edge portions of said boards.

7. A wood floor and wall system as defined in claim 3 in which

at least one edge of each board has for said clip receiving recesses a longitudinal edge groove therealong between said tongues and grooves and said channels, and

said holding clips each has a flange portion in engagement in said edge groove.

8. A wood floor and wall system as defined in claim 7 in which

said holding clips each has a flange portion in driven engagement in said recessed face portions.

9. A wood floor and wall system as defined in claim 1 in which

said holding clips have barbs extending into a vertical face of one of said boards.

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JOHN E. MURTAGH, *Primary Examiner.*

U.S. Cl. X.R.

52—483, 489, 582

U.S. DEPARTMENT OF COMMERCE

PATENT OFFICE

Washington, D.C. 20231

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,439,464 April 22, 1969

Ray E. Omholt

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 2, line 38, "invetnion" should read -- invention -
Column 4, line 74, before "and" insert -- floor --.

Signed and sealed this 7th day of April 1970.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR
Commissioner of Patent