Aug. 23, 1966 R. E. OMHOLT 3,267,630

FLOORING SYSTEMS

Filed April 20. 1964

FIG. 1

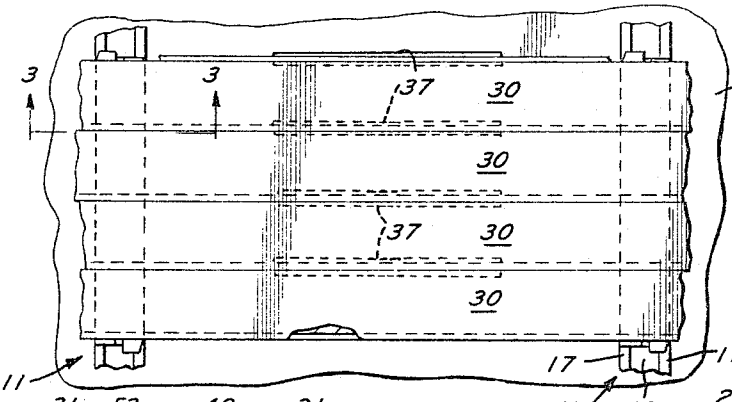


FIG. 2

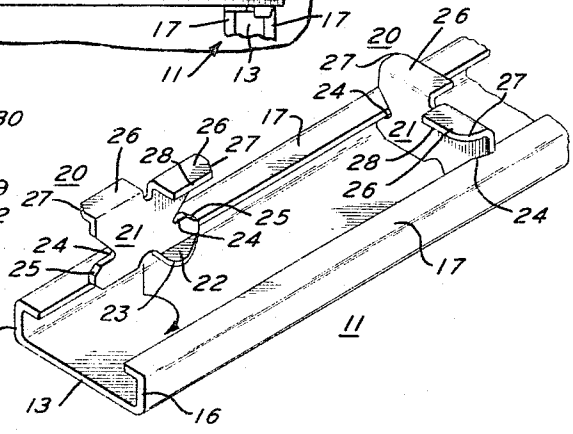


FIG. 5

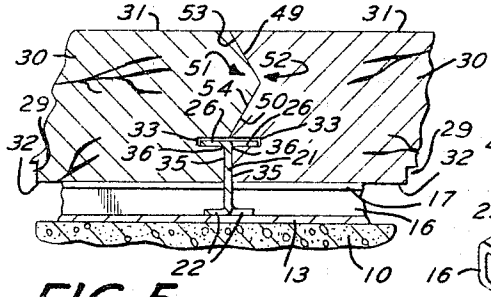


FIG. 3

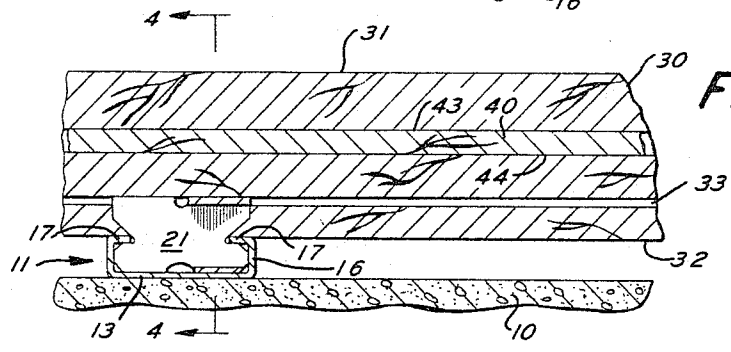
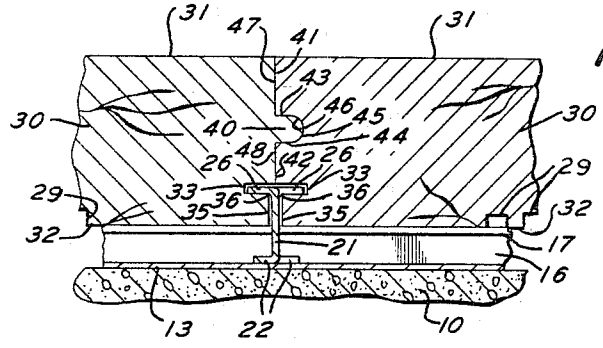


FIG. 4



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FLOORING SYSTEMS

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3 Claims. (Cl. 52—489)

This invention relates to flooring systems.

In my prior patent for flooring systems, U.S. Patent No. 3,031,725 there is shown a system in which spaced channels are provided with draw-down clips in engagement therewith and with the floor boards which has proven to be very effective in use.

The present invention relates to improvements in my prior flooring system which for some types of installation enhances the effect of and in other types installations eliminates the necessity for the splines or holding inserts.

The present invention further relates to improvements in flooring systems of the character aforesaid by which the effect of shrinkage of the boards is minimized by preventing passage of air with respect thereto.

The present invention further relates to improvements in flooring systems of the character aforesaid by which the advantage of tongued and grooved boards may be utilized with the hold down clips of my prior flooring system.

The present invention further relates to improvements in flooring systems which are highly advantageous from the viewpoint of decreased cost of installation.

The present invention further relates to flooring system of the character aforesaid but which are easier to install and do not require experienced or skilled workmen to install a floor having highly advantageous characteristics as to installation and performance.

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

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 flooring in accordance with the invention;

FIG. 2 is a fragmentary perspective view of a portion of one of the channels and of clips employed therewith;

FIG. 3 is a vertical sectional view, enlarged, taken approximately on the line 3—3 of FIG. 1;

FIG. 4 is a fragmentary vertical sectional view, taken approximately on the line 4—4 of FIG. 3; and

FIG. 5 is a view similar to FIG. 4 showing a modified form of the 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 structure disclosed without departing from the spirit of the invention.

Like numerals refer to like parts throughout the several views.

Referring now more particularly to the drawings, it will be noted that a supporting base **10**, which may consist of wood, concrete or other subfloor, is provided upon which a plurality of channels **11** are secured in parallel relation and in level condition as in my prior patent, but preferably by the use of explosively applied fasteners (not shown).

Each of the channels **11** has side marginal portions **16** extending upwardly from the web **13** with inwardly extending rims **17** substantially parallel to the web **13**.

The channels **11** are formed to close dimensional tolerances for enhancing their clip holding action, as hereinafter explained. The channels **11** can be made of any desired material of adequate strength and preferably of

mild steel with a heavy galvanizing or other resistant coating to prevent rusting.

A plurality of metallic clips **20** are provided, as in my prior patent, each having a central vertical plate portion **21**, and lower oppositely extending horizontally disposed feet **22**, the corners **23** of the feet **22** being rounded to aid in assembly to the channels **11**.

The central plate portions **21** are provided with notches **24** extending inwardly from each side marginal edge for the accommodation of the rims **17**.

The notches **24** have corner chamfers **25** for disposition at the intersection of the inner faces of the rims **17** and the inner faces of marginal portions **16** of the channels **11**.

At the upper end of the central plate portion **21** oppositely extending fingers **26** are provided with beveled end portions **27** and tapered margins **28**. The fingers **26** are slightly inclined upwardly and outwardly for a stronger holding action when in their final positions.

The floor boards **30** employed with the flooring system are of wood which can be milled or shaped to close dimensional tolerances, hard maple being particularly suitable.

Each of the floor boards **30** used in connection with the system of the present invention preferably has flat longitudinal top and bottom faces **31** and **32** and at a predetermined distance from the bottom face **32**, has a longitudinal slot or groove **33** formed therealong on each side thereof. The bottom faces **32** preferably have extending therealong substantially rectangular stress relieving cut outs or grooves **29**.

The grooves **33**, in accordance with the present invention, should be about one quarter of the distance between the top face **31** and the bottom face **32**, and closer to the bottom face **32** than to the top face **31**, so that an increased wearing part is provided on each board **30** while still providing adequate holding and avoiding splitting.

Each board **30** has a lower vertical side wall face **35** extending downwardly from the groove **33** with a beveled face **36** connecting the bottom of the groove **33** and the lower side wall face **35**.

The beveled face **36** is at a location such that the clip finger **26** at its intersection with the plate portion **21** engages thereon.

The faces **35** of contiguous boards **30** are located, and positioned by the plate portions **21** of the clips **20** between the faces **35**, so that when the boards **30** are in their assembled positions the portions of the boards above the grooves **33** are in meeting and engaging relation.

The grooves **33** may also serve for the reception of splines or holding inserts **37** which may be positioned intermediate the clips **20** and channels **11** for retaining the boards **30** against warping and also against independent deflection between the clips **20**, under certain conditions. For certain types of installation the holding inserts **37** will not be required, the edges of the boards **30** being held against relative vertical movement and warping by structure to be described.

Each floor board **30**, as shown in FIG. 4, and between the top face **31** and the slot or groove **33**, is provided with a longitudinal tongue **40**. The tongues **40**, in vertical cross section, can have from end to end thereof flat upper and lower faces **43** and **44** connected by an arcuate face **45**.

The tongues **40** each engage in a complemental longitudinal groove **46** in the adjoining board **30**, with upper and lower vertical longitudinal faces **47** and **48** respectively engaging the faces **43** and **44**.

The elevation of the tongues **40** and grooves **46** can be varied but are preferably not so close to the grooves **33** to weaken the board at this location nor so close to the

top face 31 as to reduce its effectiveness upon the occurrence of wear.

Each floor board 30, as shown in FIG. 5, and between the top face 31 and the slot or groove 33 has upper and lower outwardly disposed inclined meeting faces 49 and 50, providing longitudinal tongues 51 from end to end.

The tongues 51 each engage in a complemental groove 52 in the adjoining board 30 formed by inclined meeting edge faces 53 and 54.

The mode of assembly and of use will now be pointed out.

The channels 11 are mounted in spaced, parallel relation, as heretofore pointed out, on the sub floors.

While any preferred spacing of the channels 11 can be employed, a spacing of the order of 12 inches between centers has been found satisfactory.

With the channels 11 rigidly secured in place, a plurality of clips 20 are inserted in the channels 11 and turned so that the plate portions 21 thereof are transversely disposed with respect to the channels 11. Upon turning of the clips 20 they will be moved to a position so that the feet 22 are in firm gripping relation with the inner face of the central horizontal web 13. The upwardly facing portions of the notches 24 are in firm gripping engagement with the under sides of the rims 17 and to an extent to cut into and slightly deform the channel 11 for this purpose.

The floor boards 30 are now brought successively to positions with their lower faces 32 supported by the upper faces of the rims 17 and are moved to positions to engage the holding fingers 26 in the grooves 33. The holding fingers 26 urge the boards 30 downwardly into gripping engagement with the upper faces of the rims 17.

At predetermined locations between the clips 20, the holding insets 37 may be provided and if employed aid in preventing warpage and also independent movement or deflection of one floor board 30 with respect to the next, and permit sanding of the boards as required down to the grooves 33 and thus to greater depth than if reliance is had only on the tongues and grooves to prevent deflection which would only permit sanding down to the surface 43.

The engagement of the tongues 40 in their complemental grooves 46, or of the tongues 51 in their complemental grooves 52, provides positive holding of the edges of the boards 30 against relative vertical movement and warpage in a similar manner.

I claim:

1. A flooring system comprising:

a plurality of spaced parallel channels each with a pair of spaced rims having upper face portions,

draw-down clips having lower portions in gripping engagement with each of said channels and having at least one upper outwardly extending board engaging portion above said channels,

a plurality of parallel homogeneous floor boards of wood each having an upper wear face and a lower horizontal face transversely disposed with respect to the channel and in engagement with said channel face portions,

each of said boards on one side thereof spaced intermediate the upper and lower faces of the board having a tongue with upper and lower horizontal face portions and opposite thereto a tongue receiving groove with upper and lower horizontal face portions,

said upper and lower face portions of a tongue of one board being in substantially continuous engagement with said upper and lower face portions of a groove of the next board for restraining independent vertical movement of one of said boards with respect to the other and for preventing warpage,

said boards each having along at least one side margin thereof a longitudinally extending side marginal groove spaced below the tongues and tongue receiving grooves with a bottom horizontal face,

said marginal groove being in more closely spaced relation to the lower horizontal face than to said upper wear face,

said clips being disposed at the intersection of each of said boards with each of said channels and including a gripping finger extending into one of said marginal grooves and in engagement therewith and urging said boards downwardly into engagement with the rims of the channel.

2. A flooring system as defined in claim 1 in which

said clips on the sides thereof opposite said gripping fingers have additional outwardly extending board edge gripping portions.

3. A flooring system as defined in claim 1 in which

said boards have side marginal grooves along both side margins, and

said clips have portions in engagement with said side marginal grooves in contiguous boards.

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