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FLOORING SYSTEMS

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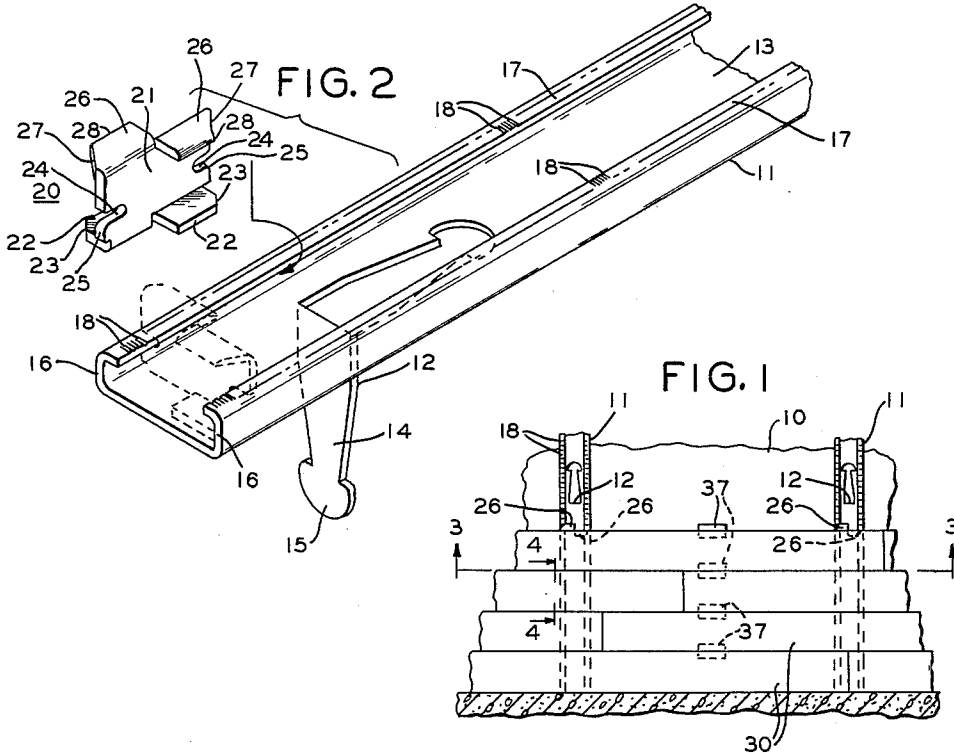


FIG. 3

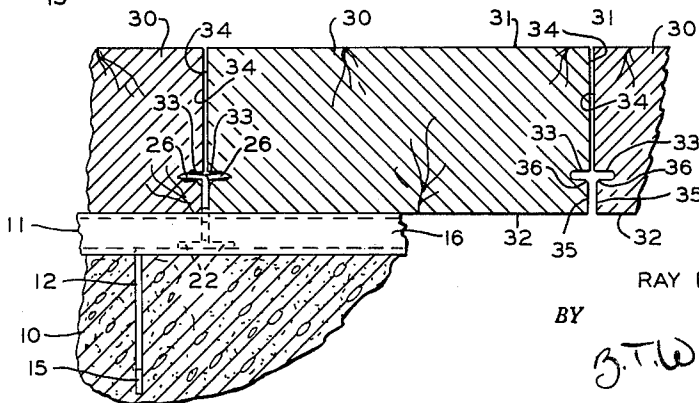
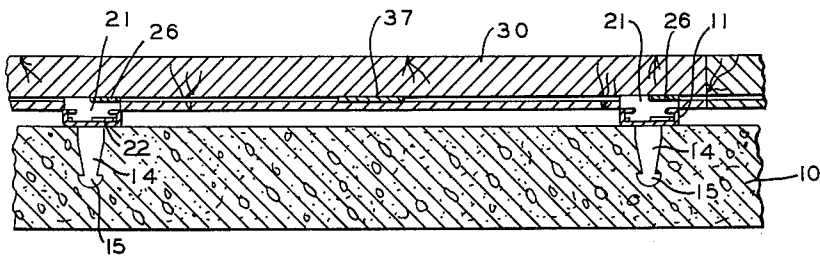


FIG. 4

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## FLOORING SYSTEMS

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4 Claims. (Cl. 20—8)

This invention relates to flooring systems.

Various systems for applying, mounting and securing floor boards upon a subflooring of concrete or the like have heretofore been proposed, but none of these has proven wholly satisfactory.

It has heretofore been proposed to provide a flooring system in which steel channels are utilized in parallel spaced relation on a concrete slab. The floor boards, of conventional tongued and grooved type, were held in position by clips engaged with the channels and at the tongued and grooved edges of the floor boards. This system involved serious problems of mounting the channels on the upper surface of the slab because of the surface irregularities. It is essential that the channels be disposed in a plane as this plane determines the plane of the upper surface of the boards after their assembly. This system also was relatively expensive and time consuming in its installation.

The system referred to as well as others heretofore available had the further disadvantage that a large proportion of its depth was required or was utilized for hold down and the depth available for wear was unduly restricted.

In other systems the floor boards were not retained in level condition, or were uneven, or lacked the resiliency desired in certain types of floors, such as those for gymnasiums and public buildings where heavy traffic and hard usage are encountered.

It is the principal object of the present invention to provide an improved wood floor system which is adequately held and retained in position after application, in which the cost thereof is considerably less than systems presently available, and which has a greater wearing surface than systems heretofore available.

It is a further object of the present invention to provide a flooring system in which the floor boards are applied in a relatively simple and expeditious manner.

It is a further object of the present invention to provide a flooring system in which the floor boards are held against displacement but have accommodation for expansion.

It is a further object of the present invention to provide a flooring system in which the floor boards can be readily assembled to the subflooring at the place of installation by relatively inexperienced or unskilled workmen.

It is a further object of the present invention to provide a wood flooring system in which the boards are held both vertically and horizontally against undesired displacement.

It is a further object of the present invention to provide a wood flooring system in which the components are readily assembled and when assembled retain their assembled condition.

It is a further object of the present invention to provide a wood flooring system in which clips are employed, the clips being capable of being made of heavier gage metal with increased strength and holding power.

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:

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FIGURE 1 is a top plan view of flooring in accordance with the present invention;

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

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

FIG. 4 is a fragmentary sectional view, enlarged, taken approximately on the line 4—4 of FIG. 1.

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.

In the event that the supporting base 10 is of concrete, it is preferred to simultaneously mount or secure a plurality of the channels 11 in a group and for this purpose the channels 11 can each be provided with leveling props 12 struck from the central web 13 thereof and having a downwardly extending and inwardly tapering leg portion 14 with an enlargement 15 at the terminal end thereof.

If the supporting base 10 is of concrete, with channels 11 of this type, the props 12 may be inserted in the concrete and leveled while the concrete is still wet. If the channels 11 are to be employed upon a different base then the leveling props 12 can be omitted and the channels 11 fastened in place in any other desired manner.

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 upper faces of the rims 17 are provided with a plurality of grooves 18 to provide an enhanced holding action lengthwise of the rims 17.

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

A plurality of metallic clips 20 are provided, 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 grooves 33, in accordance with the present invention, can be about one-third 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 floor board 30 has an upper vertical side wall face 34 extending upwardly from the groove 33 and 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 depth of each of the grooves 33 is slightly less than the length of the clip fingers 26 so that the ends of the fingers 26 will be imbedded in the boards 30 at the root portions of the grooves 33 when the boards 30 are in assembled positions.

The faces 34 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 there is a clearance space between the faces 34 to accommodate expansion of the boards 30 due to moisture changes.

The grooves 33 also serve for the reception of holding inserts 37 which are positioned intermediate the clips 20 and channels 11 for retaining the boards 30 against independent deflection between the clips.

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.

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 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 with these embedded at the roots of each of the grooves 33. The holding fingers 26 urge the boards 30 downwardly into gripping engagement with the serrated upper faces of the rims 17.

At predetermined locations between the clips 20, the holding inserts 37 are provided and prevent independent movement or deflection of one floor board 30 with respect to the next at the locations at which the inserts 37 are provided.

The engagement of the holding fingers 20 at the roots of the grooves 33 prevents longitudinal movement of the floor boards 30 while the clips 20 and the holding inserts 37 prevent vertical movement of the boards 30.

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 portions in gripping engagement with each of said channels and having upper oppositely extending portions above said channels, a plurality of parallel floor boards 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, said boards each having opposite longitudinally extending side marginal grooves with bottom horizontal faces, said marginal grooves 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, said upper clip portions including upwardly and outwardly inclined gripping fingers, said fingers extending into opposite grooves and engaging said bottom faces and urging said boards downwardly into engagement with the rims of the channel, and holding inserts between said channels in spaced relation to said clips and in engagement in said grooves preventing independent vertical movement of one of said boards with respect to the other.

2. A flooring system as defined in claim 1 in which said channels have serrations on the upper faces of the rims, and said inclined finger portions urge said boards into engagement with said serrations.

3. A flooring system as defined in claim 1 in which the opposite side marginal grooves have upper vertical side wall faces extending upwardly therefrom and lower vertical side wall faces extending downwardly therefrom, said lower side wall faces being spaced to a greater extent than said upper side wall faces and providing surfaces for abutting portions of said clip and retaining said upper side wall faces in spaced relation to provide a clearance therebetween.

4. A flooring system as defined in claim 1 in which each of said clips has a central plate portion, each of the opposite side marginal grooves has an upper vertical side wall face extending upwardly therefrom and a lower vertical side wall face extending downwardly therefrom, said lower side wall faces being offset towards the central portions of said boards and providing surfaces for abutting a plate portion of said clip and retaining said upper side wall faces in spaced relation to provide a clearance therebetween.

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