

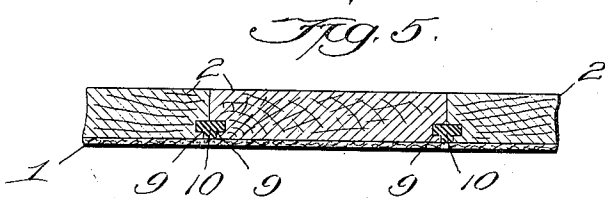
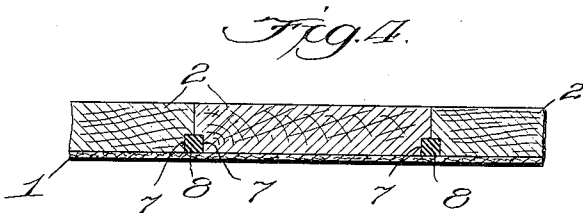
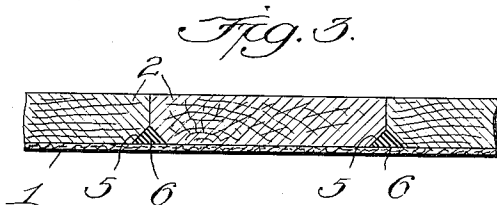
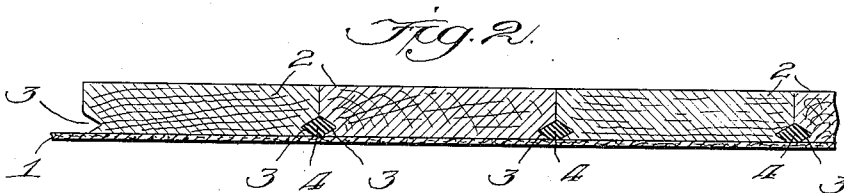
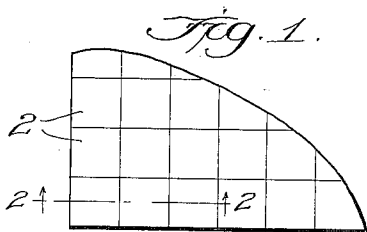
Aug. 31, 1937.

A. ELMENDORF

2,091,476

FLEXIBLE WOOD FLOORING

Filed Dec. 12, 1935



Inventor:
Armin Elmendorf,
by Wm. F. Freudenreich,
Att'y.

UNITED STATES PATENT OFFICE

2,091,476

FLEXIBLE WOOD FLOORING

Armin Elmendorf, Winnetka, Ill.

Application December 12, 1935, Serial No. 54,037

7 Claims. (Cl. 20—75)

The present invention has for its object to produce a simple and novel flooring or floor covering, composed mainly of wood; which shall be inexpensive, which can be laid quickly and easily in much the same way as floor coverings of the linoleum type, for example; which may be caused to follow the contour of a subfloor and be effectively secured to the latter, which shall initially be free from open joints, and in which no objectionable changes shall occur under variations in moisture content.

In carrying out my invention, I employ what may be termed tiles of wood which are more in the nature of blocks than long boards and thus reduce to a minimum the likelihood of warping; these tiles being made comparatively thin. While the dimensions of the tiles and their shapes may vary within comparatively wide limits, as may also their thickness, ordinarily the transverse dimensions of the tiles will not be less than an inch or greater than a few inches, and the thickness will vary from about one-quarter of an inch to three-eighths of an inch. These tiles are placed edge to edge upon and form a covering for a flexible backing sheet having special properties, and are bonded to said sheet. The bonding material between the tiles and the backing sheet may be any suitable cement, although I prefer that it be elastic. The backing sheet must possess sufficient thickness or body and be composed of such materials that after the composite sheet has been bonded to a subfloor the interior of the backing sheet remains in a condition that permits at least a slight shear slippage in a plane parallel to the tiles. By providing a backing of this kind, even though the subfloor be of concrete and does not therefore shrink in dry weather and expand in wet weather, although the subfloor be of wood in which expansion and contraction in one direction occur as the moisture content changes, the slippage in the backing enables the tiles to adjust themselves to changing atmospheric conditions regardless of the character or state of the subfloor. Consequently, the tiles do not break loose from the backing as would be likely to occur if the backing were of tough, unyielding material or of a material that has become impregnated with glue that has become hard and rigid.

In the preferred arrangement, I provide additional tie means between the tiles. This is accomplished by so shaping the edge faces of the tiles that inter-connected grooves or channels are created when the tiles are assembled, and

filling such grooves or channels with an elastic bonding material. The bonding material forms a grid in which the tiles lie and by which the tiles are firmly held in place, due to the adhesion of this bonding material to the wood. These grooves or channels may open out through the upper faces of the tiles, although they preferably are on the underside in which case the grid may be of the same material and be integral with the layer of material that bonds the tiles to the backing. It will be seen that in this latter construction the backing sheet may be provided with a thick coating of bonding material in a more or less plastic condition so that, when the tiles are pressed down upon this coating, the bonding material flows underneath the tiles and up into the grooves or channels until the same are filled. The grid must not be of material that remains plastic or that becomes hard, because a plastic grid would have no holding power and a grid of hard material would break. Having an elastic grid, however, the flooring remains flexible and even if the bond between the bottom faces of a tile and the backing should be destroyed, the tile would still be held in place by the grid.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but, for a full understanding of my invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a plan view of a fragment of a panel or sheet of flooring embodying the present invention; Fig. 2 is a section, on a larger scale on line 2, 2 of Fig. 1; and Figs. 3, 4, 5, and 6 are views similar to Fig. 2, each illustrating a different modification of the invention.

Referring to Figs. 1 and 2 of the drawing, 1 represents a sheet of flexible material, preferably felt, although some types of woven fabrics as, for example, burlap, may be employed. Overlying and glued to the member 1 are tiles 2 of wood arranged edge to edge and preferably contacting with each other. Generally speaking, any suitable adhesive may be employed between the tiles and the flexible backing. The tiles are preferably pieces of wood from a quarter of an inch to three-eighths of an inch thick. The only limitation as to length and width of the tiles is that these dimensions be such as substantially to eliminate warping or distortion of the tiles in the use of the flooring. If the tiles are square, as

shown in Fig. 1, the sides of the square may be an inch long, if desired, or any other length up to several inches, depending upon the kind of wood and the thickness of the tiles.

5 In laying the flooring, the subfloor is conveniently coated with an adhesive upon which my improved flooring, with the backing on the underside, is laid. Because the tiles are not united or fastened together in the form of a rigid
10 panel, the flooring adapts itself to the surface configuration of the subfloor and a good glue joint between the backing and the subfloor results.

If the tiles are not too dry, they will not be
15 required to take up moisture from the air, when the flooring is laid, and therefore will not necessarily expand after being laid. However, the moisture content of the wood will inevitably vary between considerable limits during the use of the flooring, and therefore the tiles alternately contract and expand. If the subfloor be of concrete, for example, and there be a rigid bond between the tiles and the same, the joints between the tiles and the subfloor frequently will
20 be subjected to comparatively large shearing stresses and may therefore fail. To prevent such failure, I make certain that the tiles may expand and contract to some extent on the face that is bonded to the backing. This is accomplished by insuring that the backing material contains within itself at least a definite stratum of material which permits slight shear slippage. If the backing be a paper-like sheet, it should be
25 of felt that has considerable thickness or body. If it be desired to employ a cloth backing, the cloth must not be so thin or so open that it will become permeated with the adhesives and thus become hard and unyielding. In other words, the cloth must be comparatively thick and capable of being bonded to the tiles on the one side
30 and the subfloor on the other side, while a central or intermediate stratum retains its virgin condition. Of course, the backing sheet may be saturated with asphalt or other material which remains more or less plastic and does not prevent the slight shear slippage that must be permitted to take place within the sheet. Where a waterproof belt backing is desired, the consideration of cost ordinarily necessitates the use of comparatively thin felt, say from one thirty-second to
35 one sixteenth of an inch thick; but, otherwise, felts or other sheet cushioning materials that are much thicker may be employed. For example, fibrous insulation boards that are somewhat flexible will be satisfactory for some purposes.

If it should happen that a tile becomes loose, it might rise up above the adjacent tiles and give to the floor a rough surface. To guard against this, the tiles may be tied together by
40 means independent of the bonds between them and the backing. In the arrangement shown, each tile has a groove 3 extending around the edge of the same adjacent to the bottom face. When the tiles are assembled on the backing, the
45 registering grooves in the meeting edges form larger grooves or channels opening out through the underface of the wood layer. By filling these grooves or channels with a suitable cement or binder, a grid is formed that holds all of the tiles
50 together. This grid must be elastic and must be bonded to the wood. Plastic compounds, such as asphalt, which gradually yield under stress, and compounds that become hard and non-elastic do not meet the requirements of a com-
55 pound suitable for the grid. Among the elastic

adhesive materials which produce satisfactory grids are some of the rubber latex compounds which produce a grid that is adequately bonded to the tiles, is sufficiently elastic to permit the flooring to be flexed, and is strong enough to
5 prevent the tiles from being displaced relatively to each other out of their common plane when not otherwise held.

The material of the grid may conveniently be the same as that which bonds the tiles to the
10 backing and the grid may therefore comprise one or more series of ridges rising from the adhesive layer between the tiles and the backing.

In Fig. 2 the grooves 3 are actual V-shaped
15 grooves, whereas in Fig. 3 the lower corners of the tiles are simply chamfered, as indicated at 5, so that the channels formed between meeting tiles are triangular in section instead of diamond shaped as in Fig. 2. The bars 6 of the grid are therefore also diamond shaped in cross section.
20

In Fig. 4, little rectangular marginal sections are removed from the tiles adjacent to the lower
25 faces thereof, as indicated at 7, so that square channels are produced between the meeting edges of the tiles. When these channels are filled with elastic cement, a grid having bars 8 that are square in cross section results.

In Fig. 5, the grooving 9 in the edges of the tiles is such as to result in undercut or T-shaped
30 slots or channels and T-shaped grid bars 10, after the channels are filled.

In Fig. 6, the tiles are the same as those shown in Fig. 3, excepting that the tiles are placed up-
35 side down. The grid 6 is therefore in the top of the tile layer and seals the joints between the tiles so that no moisture can enter.

While I have illustrated and described with particularity only a single preferred form of my invention, together with a few simple modifica-
40 tions, I do not desire to be limited to the exact structural details thus illustrated and described; but intend to cover all forms and arrangements which come within the definitions of my invention constituting the appended claims.

I claim:

1. A flexible wood flooring comprising a flexible
45 backing sheet of such thickness or body and material as to permit a small amount of shear slippage within the same parallel to the broad faces thereof, wooden tiles disposed over the length
50 and breadth of the backing in edge contact with each other and securely bonded to the adjacent face only of the backing, and means yieldably connecting the tiles together in such a manner that each tile assists in holding contiguous tiles
55 against upward displacement and at the same time permitting each tile to expand and contract in the plane of the flooring independently of the other tiles.

2. A flexible wood flooring comprising a flexible
60 backing sheet of such thickness or body and material as to permit a small amount of shear slippage within the same parallel to the broad faces thereof, and wooden tiles disposed over the length
65 and breadth of the backing in edge contact with each other and securely bonded to the adjacent face only of the backing, the bonding material between the wood and the backing being of such a character that the backing sheet does not be-
70 come hardened by the presence of the bonding material.

3. A flexible wood flooring comprising a flexible
75 backing sheet of such thickness or body and material as to permit a small amount of shear slippage within the same parallel to the broad faces

thereof, and wooden tiles disposed over the length and breadth of the backing in edge contact with each other and securely bonded to the adjacent face only of the backing, the meeting edges of the tiles being shaped to form channels of substantial size between such meeting faces, and a pliable bonding material filling said channels and bonded to the tiles.

4. A flexible wood flooring comprising a flexible backing sheet of such thickness or body and material as to permit a small amount of shear slippage within the same parallel to the broad faces thereof, wooden tiles disposed over the length and breadth of the backing in edge contact with each other, the meeting edge faces of the tiles being cut away adjacent to the backing to produce grooves or channels, and there being pliable bonding material between the wood and the backing and extending into and filling the grooves or channels.

5. A flexible wood flooring comprising a flexible backing sheet of such thickness or body and material as to permit a small amount of shear slippage within the same parallel to the broad faces thereof, wooden tiles disposed over the length and breadth of the backing in edge contact with each other and securely bonded to the backing, the meeting edges of the tiles being shaped to form grooves or channels of substantial size be-

tween such meeting faces adjacent to the backing, and an elastic and pliable bonding material filling said channels and bonded to the tiles and to the backing.

6. A flexible wood flooring comprising a flexible backing sheet of such thickness or body and material as to permit a small amount of shear slippage within the same parallel to the broad faces thereof, wooden tiles disposed over the length and breadth of the backing in edge contact with each other and securely bonded to the backing, the meeting edges of the tiles being shaped to form grooves or channels of substantial size opening out through the top of the structure, and an elastic and pliable bonding material filling said channels and bonded to the tiles.

7. A flexible wood flooring comprising a flexible backing sheet of such thickness or body and material as to permit a small amount of shear slippage within the same parallel to the broad faces thereof, wooden tiles disposed over the length and breadth of the backing in edge contact with each other, the meeting edge faces of the tiles being cut away adjacent to the backing to produce grooves or channels, and there being an elastic rubber latex compound between the wood and the backing and extending into and filling the grooves or channels.

ARMIN ELMENDORF.