Aug. 17, 1954 R. M. VAN DE VEER 2,686,344

FLOOR MAT

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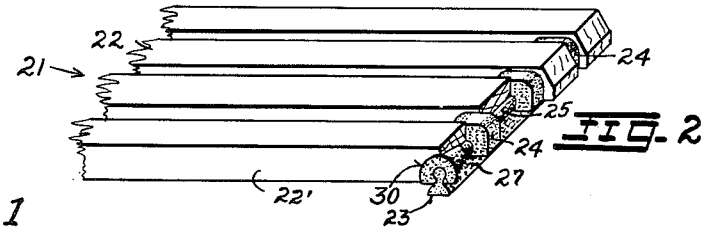


FIG. 2

FIG. 1

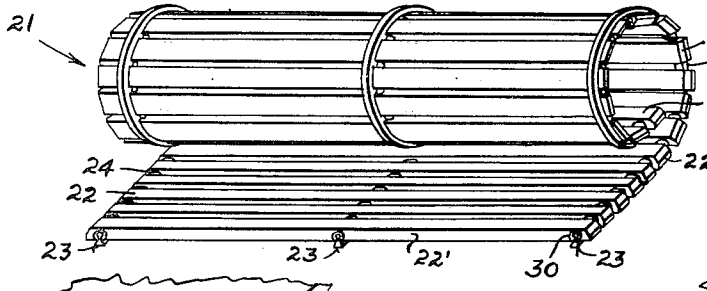
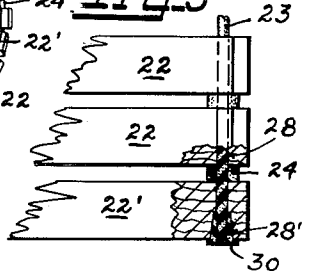


FIG. 3



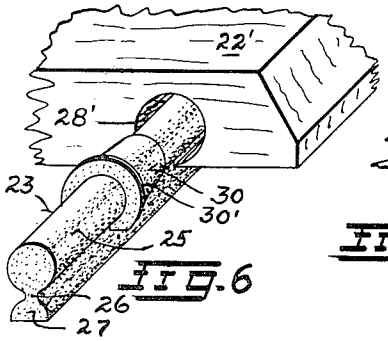


FIG. 6

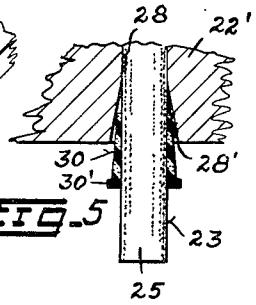


FIG. 5

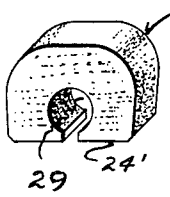


FIG. 4

FIG. 7

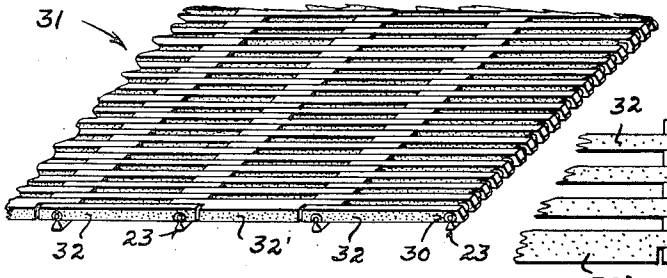


FIG. 8

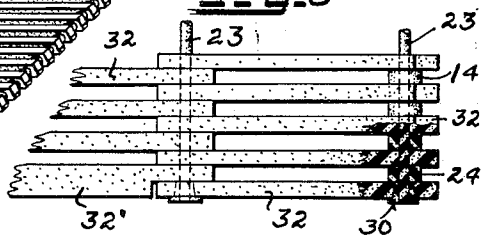
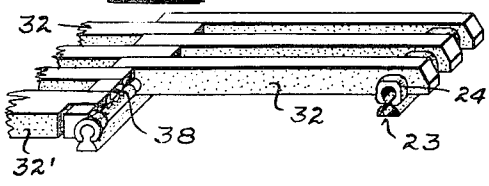


FIG. 9



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FIG. 10

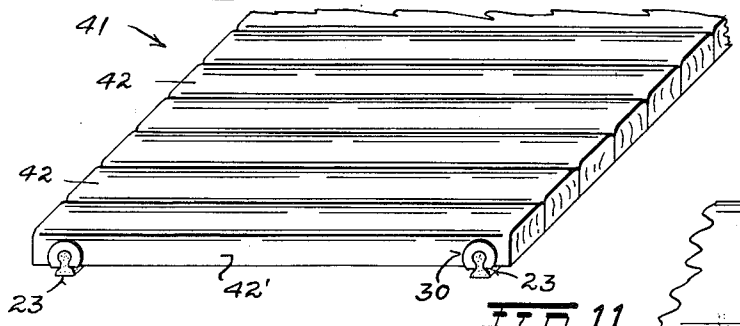


FIG. 11

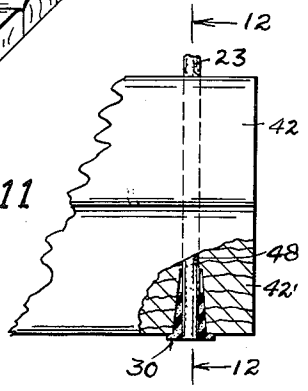


FIG. 12

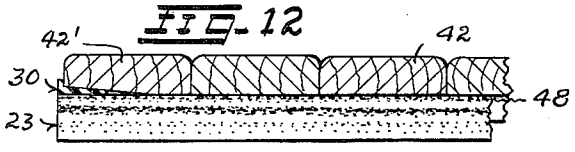


FIG. 13

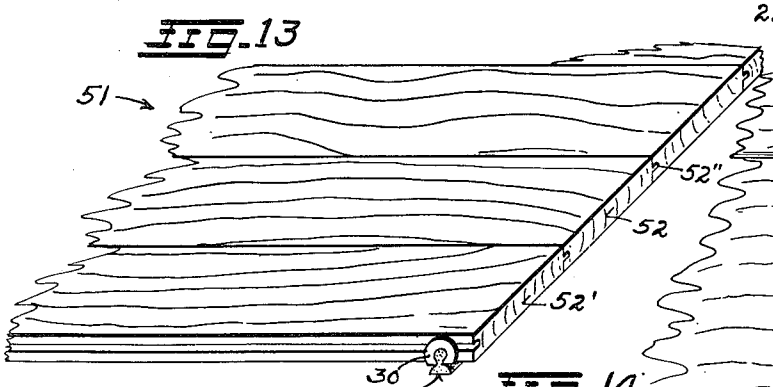


FIG. 14

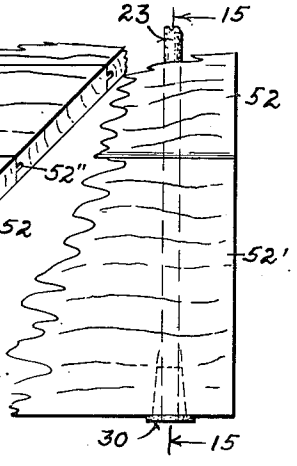


FIG. 15

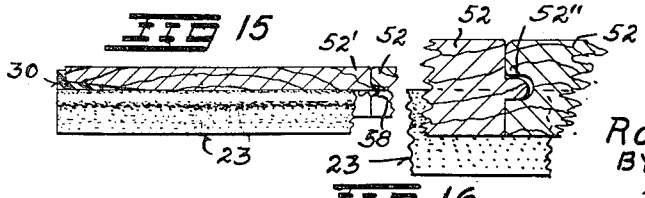


FIG. 16

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UNITED STATES PATENT OFFICE

2,686,344

FLOOR MAT

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Continuation of application Serial No. 57,280, October 29, 1948. This application December 13, 1949, Serial No. 132,765

6 Claims. (Cl. 20—78.3)

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The invention relates to a floor mat assembly which is arranged to provide a cushioned support from an underlying rigid floor, and this application comprises a continuation of my now abandoned copending application Serial Number 57,280, filed October 29, 1948.

An object of the invention is to provide an improved mat assembly of non-metallic elements.

Another object is to provide an improved mat structure comprising a plurality of tread elements which are unitarily assembled by the application of elongated tying elements thereto.

A further object is to provide a mat structure of the character described in which the typing elements provide the resilient support for the assembly.

An added object is to provide a mat structure in which the tying elements provide electrical insulation between the mat and a supporting floor.

Yet another object is to provide a particularly simple and effective application of the tying members to the tread elements in an assembly using only non-metallic securing elements.

A still further object is to provide a mat structure of the character described which may be readily disassembled for its reshaping or the replacement of tread elements.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth or be apparent in the following description of typical embodiment thereof, and in the accompanying drawings, in which,

Figure 1 is a perspective view of a mat of my invention in partly rolled-up condition.

Figure 2 is an enlarged fragmentary and partly sectional view of a corner of the mat of Figure 1.

Figure 3 is a broken-out plan view of the mat corner of Figure 2, tying and spacing and the anchoring elements of the assembly being shown in section at the same plane.

Fig. 4 is an enlarged perspective view of a tread element spacer.

Figure 5 is an enlarged partly sectional view showing the application of an anchor element to the tying element during the assembling of the mat.

Figure 6 is a perspective view showing an anchor element mounted on the tying element before the operative disposal of the anchor element is effected.

Figure 7 is a fragmentary prospective view of a mat having a different arrangement of tread elements, and having the tying and spacing and anchoring elements of the first embodiment incorporated in its structure.

Figure 8 is an enlarged fragmentary plan, and

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partly sectional view, of a corner of the mat assembly of Figure 7.

Figure 9 is a perspective view of the mat corner of Figure 8, with certain elements thereof shown in section of broken away.

Figure 10 is a fragmentary respective view of another mat assembly embodying certain feature of my invention.

Figure 11 is an enlarged partly sectional fragmentary plan view of a corner portion of the structure of Figure 10.

Figure 12 is a sectional view taken at the line 12—12 in Figure 11.

Figure 13 is a fragmentary perspective view taken at a corner of yet another mat structure embodying my invention.

Figure 14 is an enlarged fragmentary plan view of the structure of Figure 13.

Figure 15 is a sectional view taken at the line 15—15 in Figure 14.

Figure 16 is an enlarged fragmentary sectional view showing a tongue-and-groove connection of the tread elements of Figure 13.

The embodiment of Figures 1 to 6 inclusive essentially comprises a mat 21 having its tread members 22 in the form of relatively rigid strips or slats of uniform cross-section and connected by flexible tying members 23 of resilient material.

In the present mat, the tread slats 22 are fixedly spaced by means of spacer members 24 mounted on the tying members 23 between them.

A present tying member 23 comprises a flexible strip of resilient material of uniform cross-section having a cylindrical bead portion 25 connected integrally by a web portion 26 to a more or less triangular base portion 27. At corresponding points thereof, the tread slats 22 are provided with slots 28 extending across their under sides for complementarily receiving solely the bead and web portions of tying members 23 whereby the tying members may function as cleats connecting the succession of slats of the mat while the base portions 27 of the tying members extend transversely from the slats as support ribs for the mat; as indicated, the slats are of wood but they might be of another suitable material. The tying members 23 are preferably of such a material that they are flexible and longitudinally stretchable, their base portions being arranged to cooperatively function as a cushioned base for the mat; the material used is preferably non-conductive to electricity (as a rubber composition) whereby the tread portion of the mat may be electrically insulated from a floor supporting it.

A spacer 24, it will be noted, has a flat under

face 24' from which a slot 29 extends into it for its length for complementarily and slidably receiving the bead and web portions of a tying member 23 whereby these spacers may be operatively mounted on a tying member between slats 22 connected thereby. The thickness of the spacer members 24, as measured from their under faces 24', is no greater than the thickness of the tread slats, whereby the upper faces of the latter define the tread faces of the mat. While the spacers 24 may be formed of any suitable material, it is generally preferable that they be formed of a yielding and slightly flexible material such as rubber composition, whereby they may be strung on the bead portion 25 of a tying member 23 in frictional engagement therewith. A mat 21 is assembled by stringing tying members 23 through corresponding slots 28 of slats 22 and the slots 29 of spacers 24 alternately until a structure of desired length has been provided, it being understood that the tying members 23 are frictionally engaged in the slat slots 28 and spacer slots 29 for generally holding the mat together.

Means are preferably provided for positively anchoring the ends of the tying members of the assembled mat to the end slats 22' whereby to insure a maintenance of the mat assembly under severe use conditions thereof. Accordingly, and as brought out in Figures 3 and 5 and 6, anchor members 30 may be installed on the tying members 23 at the slats 22', said anchor members comprising conically tapering partial sleeves which are arranged to closely receive the bead and web portions of tying members 23 therethrough, and are arranged to wedgedly fit complementarily tapered counter-bore portions 28' of the slots 28 of the end slats 22'. At their larger ends, the anchor members 30 are provided with radial stop flanges 30' for limiting the extension of the members into the counter-bores 28'. An installation of an anchor member 30 is effected by stretchedly pulling out the end of a mounted tying member 23 beyond an end slat 22', mounting a member 30 on the extending tying member portion, and permitting a return of the pulled-out tying member portion as far as the resulting anchoring compression of the member in the counter-bore permits; the flange 30' of the installed anchor member is arranged to normally engage the outer side faces of the slat 22' receiving it in its counter-bore 28'.

Having a mat 21 assembled in the manner shown and described, it will be noted that the assembly is longitudinally flexible whereby it may be rolled up for carrying or storage. Also, such a mat may be of any desired width in accordance with the lengths of the tied slats 22, it being merely necessary that enough lines of tie-receiving slots 28 be provided across the slats for a proper distributed support of the mat on the cushioning base provided by the base portions 27 of the tie members 23. While I have particularly shown the part of the tie member section at the base portion 27 as generally triangular, it will be understood that this tie member portion may be of other forms, as wider or deeper or narrower, as may best serve to provide a desired degree of cushioning support in reference to the resiliency of its composition.

Figures 7 to 9 disclose an embodiment of my invention in which a mat 31 comprises link-like tread members 32 assembled in staggered and mutually lapped relation crosswise of the mat. Near their ends, the tread members 32 are provided with cross-slots 38 arranged for their mutual alignment at the lapped link ends, said slots being shaped to complementarily receive the tie members 23 in lines thereof. Noting that the lapping of the tread links 32 provides the desired mutual spacing thereof between their lapped portions interiorly of a mat 31, spacers 24 of a length equal to the horizontal thickness of the links are applied to the tie members 23 at the side edges of the mat.

In order to provide straight end lines at the mat extremities, tread link members 32' may be provided for installation alternately with link members 32 across the end of an assembled mat, a said link 32' having end portions of the same horizontal width as the links 32 for lapped engagement behind end links 32, and being of double width between its lapped portions for a disposal of its outer face in flush relation with the outer faces of the end links 32 in the mat assembly. The tread members 32 and 32' of a mat 31 may be of relatively stiff rubber or other plastic insulating composition as is indicated in the drawings. It will be understood that a present mat 31 is both longitudinally and laterally flexible. Anchor members 30 are preferably utilized at the ends of the ties as in the first embodiment, whereby to provide a mat structure which is completely non-conductive.

The embodiment of Figures 10 to 12 discloses the structure of a mat 41 wherein tread slats 42 are unitarily bound together by the members 23 having their bead and web portions engaged in complementary slots 48 provided across the under sides of the slat ends. In the present assembly, the slats 42 lack any spacing means between them whereby their opposed edges more or less abut. Anchor members 30 secure the ends of ties 23 to end slats 42' of the mat as in the other embodiments. The present mat 41 is also understood to be flexible for rolling up longitudinally of the ties by reason of the flexibility of the tie members.

Figures 13 to 16 disclose a mat 51 embodying certain features of my invention as applied to tread members which comprise boards 52 having tongue-and-groove connections 52'' at their mutually abutting edges. The boards 52 are unitarily tied together by the application of tie members 23 across their under sides and in slots 58 provided thereat and receiving their bead and web portions, end boards 52' of the assembly having their slots 58 counter-bored for the operative application of anchor members 30 thereat. The tongue-and-groove engagement of adjacent tread boards is preferably loose enough to permit a rolling up of the mat 51, if desired.

Referring generally to the form of a tie member 23, it will be noted that the precise cross-section of its bead portion 25 may vary somewhat from the circular form shown, provided only that this portion is wider than the web portion 26 for preventing a transverse removal of the tie member 23 from the board member engaged by it. While the bead portion 25 may, for instance, be of oval or polygonal cross-section, the circular form is generally preferable if an anchor member of the nature of an anchor member 30 is to be applied, it being understood that such an anchor member having a conically tapered exterior and a circular bore is particularly simple for its provision and application to eliminate any need of metal fasteners in a mat assembly.

It will, of course, be understood that the number of ties 23 provided along the lengths of like tread members may be such as will provide the

best cooperative support by the bead portions **25** of the ties for the tread members in terms of their relative stiffness. Furthermore, it will be understood that the cross-section of the base portion **27** of a tie **23** below the web portion **26** which is engaged through the narrower part, or mouth, of a tie-receiving slot of a tread member may be varied for best accomplishing the desired cushioned support of a mat having its tread members held together by the flexible tie members **23**; the extending base portion **27** may have the same or a lesser width than the web portion **26**, or may be wider with a rectangular or other form than that shown. It is also to be noted that the web portion **26** connecting the bead and base portions of the member **23** may be of various widths or be omitted, with the complementary tread member slots formed accordingly.

From the foregoing description taken in connection with the accompanying drawings, the advantages of the present floor mat structure will be readily understood by those skilled in the art to which the invention appertains. While I have described the principle of operation, together with arrangements which I now consider to be preferred embodiments thereof, I desire to have it understood that the showings are primarily illustrative, and that such changes and developments may be made, when desired, as fall within the scope of the following claims.

I claim:

1. In a mat, a line of relatively rigid tread members cooperatively providing the tread face of the mat and provided with mutually aligned grooves across their under faces expanding inwardly from said faces, a flexible tie member of resilient material having a portion thereof complementarily and slidably fitting the intermediate grooves of the line in laterally retained relation thereto and having another portion thereof extending appreciably from the under faces of the tread members as a support means for the mat thereat, said tie member being in longitudinally stretched condition, and means positively securing the ends of the tie member to the end tread members of the line thereof.

2. In a floor mat, a line of mutually coplanar tread members provided with mutually aligned openings extending laterally therethrough, a flexible tie member of resilient material complementarily and slidably engaged through a line of said openings in longitudinally stretched condition, means fixing one end of the tie member to an end tread member, and a tubular anchor member of resilient material complementarily receiving the other extremity of the tie member and in wedged engagement in a said opening of the other end tread member for frictionally gripping the stretched tie member to anchor the member thereat.

3. In a floor mat, relatively rigid tread members cooperatively providing the tread face of the mat and provided with mutually aligned grooves across their under faces and expanding inwardly from said faces, a flexible tie member of resilient material having a portion thereof complementarily fitting the grooves of the line and having another portion thereof extending appreciably from the under faces of the tread members as a support means for the mat thereat, and anchor members frictionally held on the ends of the tie member and wedgedly engaging the end grooves of the line of grooves to fix the engaged tie member ends to the tread members thereat.

4. In a floor mat, relatively rigid tread members cooperatively providing the tread face of the mat and provided with mutually aligned grooves across their under faces and expanding inwardly from said faces, a flexible tie member of resilient material having portions thereof complementarily fitting the grooves of the line and having other portions thereof extending appreciably from the under faces of the tread members as a support means for the mat thereat, said tie member being in a longitudinally stretched condition, and anchor members of resilient material mounted on the ends of the tie member and wedgedly engaging the end grooves of the line of grooves to fix the anchor members to the tie member ends and to the tread members thereat.

5. In a floor mat, relatively rigid tread members cooperatively providing the tread face of the mat and provided with mutually aligned grooves across their under faces and expanding inwardly from said faces, a flexible tie member of resilient material having cylindrical bead portions thereof complementarily fitting the grooves of the line and having other portions thereof extending from the under faces of the tread members as a support means, said tie member being in longitudinal stretched condition, and conically tapered tubular anchor members receiving the ends of the tie member and wedgedly engaging the end grooves of the line of grooves to fix the engaged member ends to the tread members thereat.

6. A structure in accordance with claim 5 wherein the tread members providing the end grooves of the line of grooves are conically counterbored to complementarily and wedgedly receive the anchor members.

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