

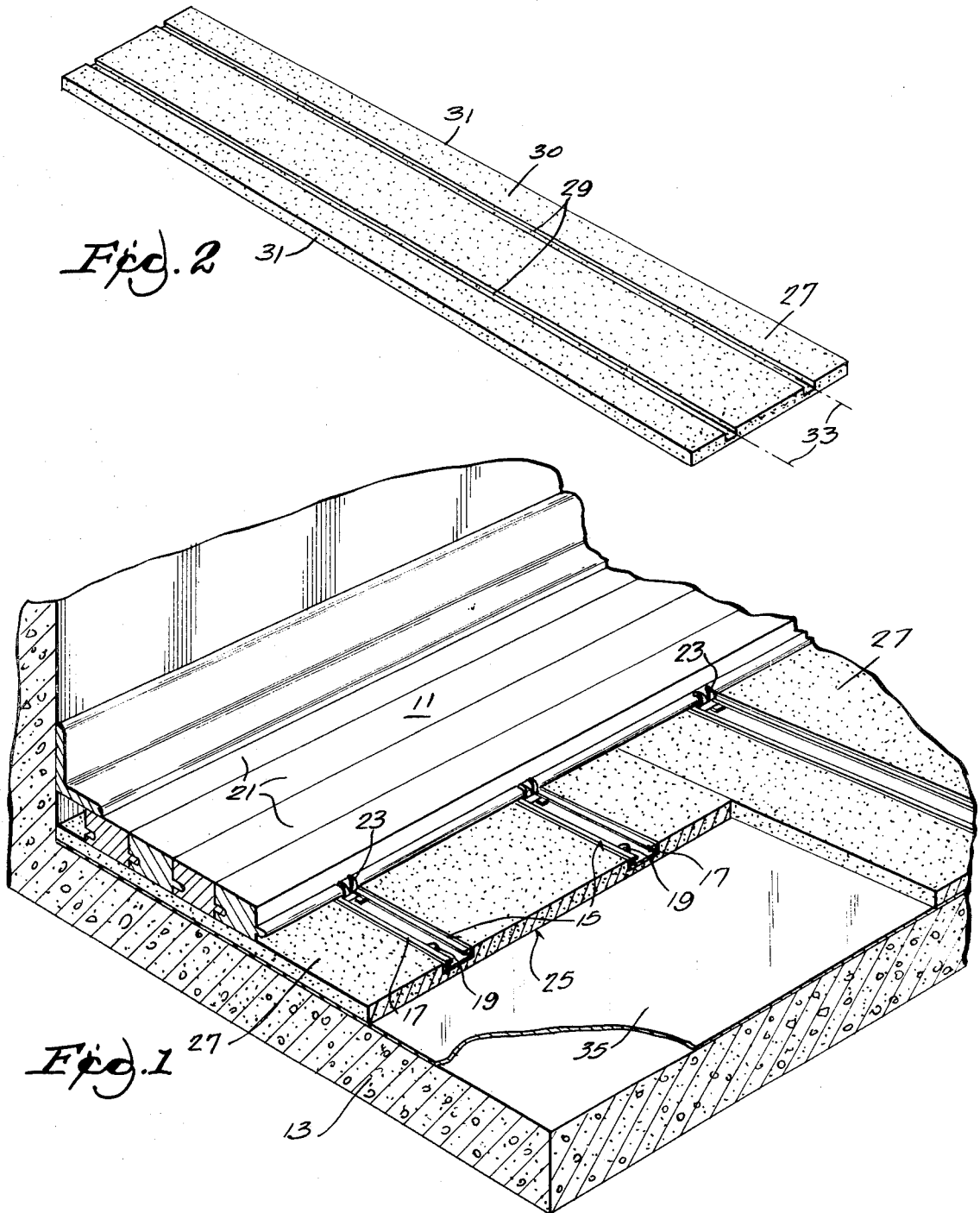
July 7, 1970

H. G. TANK
FLOORING SYSTEM

3,518,800

Original Filed March 24, 1967

2 Sheets-Sheet 1



INVENTOR
HENRY G. TANK

BY *Wheeler, Wheeler, House & Clemency*
ATTORNEYS

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Fig. 3

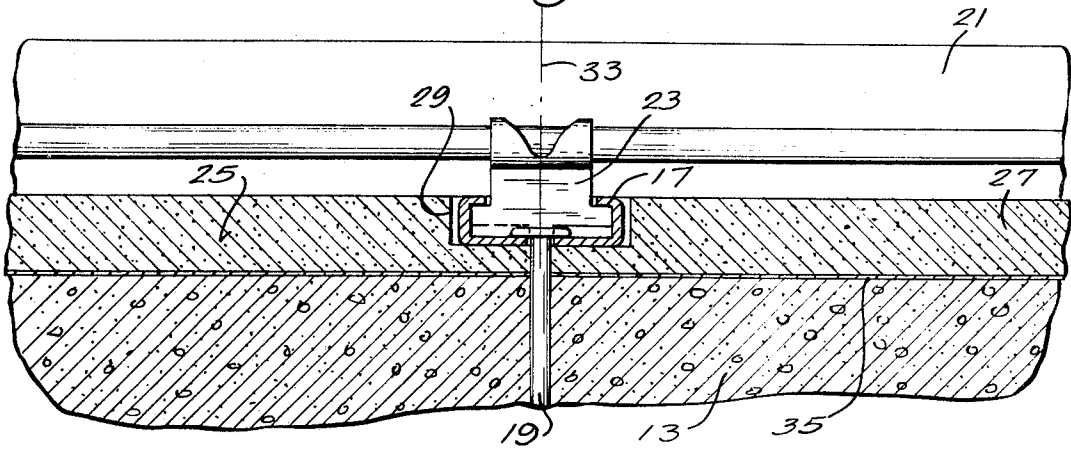
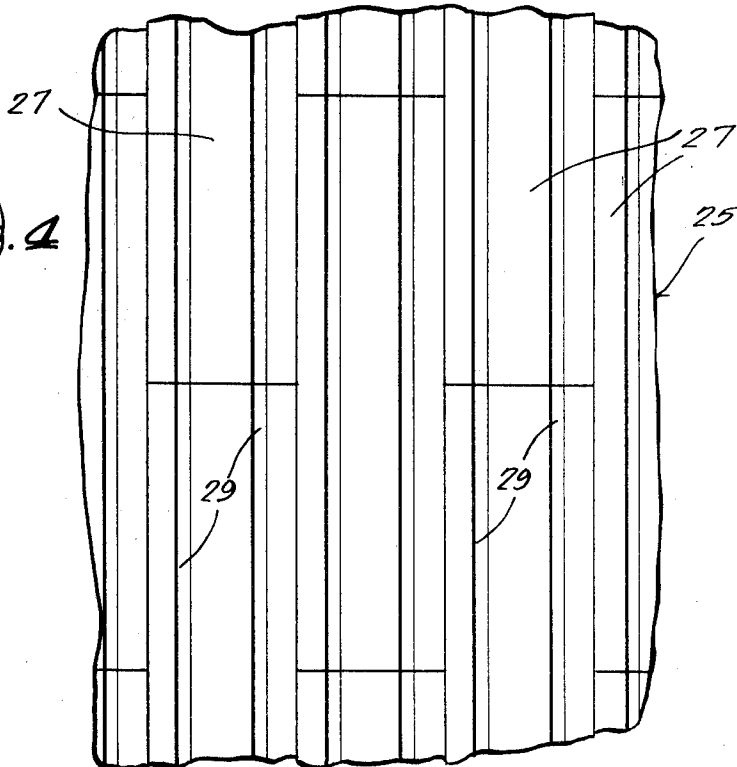


Fig. 4



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FLOORING SYSTEM

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Continuation of application Ser. No. 625,690, Mar. 24, 1967. This application June 24, 1969, Ser. No. 842,771
Int. Cl. E04f 15/18

U.S. Cl. 52—480

10 Claims

ABSTRACT OF THE DISCLOSURE

Disclosed herein is a flooring system which includes a series of spaced parallel channels supporting a series of abutting floor boards and which also includes an underlayer of fiberboard which extends under the floorboards and under and between the channels and which is secured to the foundation incident to securing of the channels to the foundation.

This is a continuation of my copending application S.N. 625,690, filed Mar. 24, 1967, and now abandoned.

BACKGROUND OF INVENTION

In the past, flooring systems have been employed including an underlayer of different materials separately fabricated and installed.

SUMMARY OF INVENTION

In accordance with the invention, there is provided an underlayer which extends under the conventional support members and from adjacent the foundation to adjacent the floorboards in the area between adjacent support members. The underlayer comprises a series of rectangular sheets of ligno-cellulose fiberboard which material has inherently generally uniform resiliency characteristics, and preferably cane fiber, which sheets are provided with one or more recesses for receipt of conventional support members. Also in accordance with the invention the underlayer sheets are secured to the foundation incident to securing of the support members in an otherwise conventional manner. The invention disclosed herein provides an improved floor system which is particularly economical to install, which affords uniformity of resiliency, which offers reduced moisture and sound transmission, and which provides a long and useful life.

Other objects and advantages of the invention will become known by reference to the following description and the accompanying drawings.

In the drawings:

FIG. 1 is a perspective view of a flooring system employing various of the features of the invention;

FIG. 2 is a perspective view of an underlay sheet which employs various of the features of the invention and which is incorporated in the flooring system shown in FIG. 1;

FIG. 3 is a fragmentary cross sectional view of a portion of the flooring system shown in FIG. 1; and

FIG. 4 is a fragmentary top plan view of the underlayer embodied in the flooring system shown in FIG. 1.

GENERAL DESCRIPTION

Shown in the drawings is a flooring system 11 which is adapted to be laid on a foundation 13 of concrete or the like. The flooring system 11 includes a plurality of parallel support members 15 in the form of aligned channel shaped sections 17 secured to the concrete foundation 13 by headed fasteners 19 which extend through longitudinally spaced apertures in the channel-shaped support members 15 and are impaled into the concrete

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foundation 13. Extending transversely across the support members 15 are flooring boards 21 which are located in generally abutting relation to one another and which are secured to the support members by means in the form of clips 23. Although clips of various forms can be used, in the disclosed construction, the clips 23 are constructed in general accordance with the clip construction shown in U.S. Pat. 2,046,593.

In accordance with the invention the support members 15 are spaced from the foundation 13 and the area between the foundation 13 and the floor boards 21 between the support members 15 is occupied by an underlayer 25 comprising a plurality of sheets 27 of fiberboard.

As shown in FIG. 2, each sheet 27 is generally rectangular in shape, one such sheet intended for commercial usage being, for example, 2' by 8' by 1/2" in depth or thickness. Extending longitudinally of each sheet 27 are a pair of recesses 29 which are located in the top face 30 and are adapted to receive an adjacent pair of support members 15. The recesses 29 are spaced from each other and from the side edges 31 of the sheet 27 such that the distance between the centerlines 33 of the recesses 29 is approximately equal to the sum of the distances from the side edges 31 to the centerlines 33 of the recess 29. In addition, the recesses 29 are generally of rectangular cross section having a depth which is substantially equal to the height of the support members 15 and having a width which is slightly in excess of the width of the support members 15. Although the specific sheets 27 disclosed herein includes a pair of spaced parallel recess 29, the invention also comprehends the use of sheets having more than two parallel recesses and at least some of the advantages of the invention can be obtained when using sheets having a single centrally extending recess.

The sheets 27 can be fabricated of fiberboard of the lignocellulose type. More particularly, the sheets can be fabricated of vegetable fibers and are preferably fabricated of cane or bagasse fiber due to the superior structural and compression and resiliency properties of this particular fiberboard.

As is conventional, the disclosed system 11 also preferably incorporates a vapor barrier 35 in the form of a suitable film which is laid on the foundation 13 and between the foundation 13 and the underlayer 25.

Use of an underlayer such as provided by the invention advantageously affords more economical installation than with previous arrangements, such as employed separately fabricated underlayer components which were separately installed beneath the support members 15 and other separated fabricated underlayer components which were installed between the support members and were constructed of different material having a different compressability from the separately fabricated underlayer components used beneath the support members.

Inasmuch as the invention contemplates relatively large sheets in the underlayer 25, which sheets are recessed at regular intervals to receive the support members, there is a great reduction in the number of parts to be handled and in the labor of installation. Instead of having the workmen traverse a floor several times in a manner required by some prior art constructions, the invention contemplates that workmen making installations need only traverse the floor once.

Thus, in accordance with the disclosed invention, the sheets 27 are serially laid in a first row at the margin of the foundation 13. As each sheet 27 is laid down, channel sections 17 are laid in the recesses 29 and the sections 17 and sheets are permanently attached to the foundation by fasteners 19. Additional support members 15 are automatically spaced in relation to one another

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and secured to the foundation 13 incident to laying of each further row of sheets 27 in laterally adjacent relation to the previously laid row. The space between support members 15 from the foundation 13 to the flooring board 21 is automatically filled and there is no need for multiple passes crosswise of the floor in order to lay each support member 15. Further, a number of support members 15 can be laid simultaneously depending upon the number of recesses 29 in the sheets 27.

Use of the disclosed underlayer 25 additionally provides for longer life of the resulting flooring installation. More specifically, in this regard, when using integral sheets or boards of cane fiber, there is less compressive set of the material under the support members 15 in the areas in which the support members 15 are fastened to the foundation 13 as compared to when using such materials as rubber or butyl strips. At least partially as a consequence of the reduced compressive set resulting from the use of fiberboard, under the support members, there is also less displacement, i.e., bodily lateral movement of the material under the support members. In addition, there is less distortion, i.e., areas of swelling or bunching of the underlying material between points of attachment. Such swelling or bunching results in uneven resiliency due to areas of increased depth of the underlying material and increased resiliency in such areas of swelling or bunching.

Under loading by the foot of an athlete or upon striking by a ball, the disclosed underlayer 25 has less tendency to move laterally from the point of impact than would be the case if butyl or rubber cushion strips were used under the support members. Use of the disclosed underlayers 25 has less tendency to rupture and less tendency to withdraw the fasteners 19 from the foundation 13.

The improved construction herein disclosed also results in a tendency on the part of the underlayer 25 to remain flat under the anchoring channels 17 instead of becoming distorted as sometimes occurs when using underlying cushion strips which are separately fabricated and have heretofore sometimes been made of rubber or butyl.

Support members attached to the foundation in accordance with the invention also provide uniformity in the distance to the upper edge of the support members from the foundation as compared to when using rubber or butyl cushion strips under the support members. Maintenance of the upper edge of the support members in conformity to whatever irregularities may exist in the foundation surface and avoidance of spanning by the support members over low spots or depressions in the foundation surface, is important in eliminating dead spots in the floor and obtaining uniform flooring resiliency.

Still another advantage of the invention resides in uniformly obtaining a planar relation of the top surface of the underlay to the top of the support members. This relation is uniformly obtained in a floor constructed in accordance with the invention because the depth of the recesses is substantially equal to the height of the support members and because the underlay sheets follow the contour of the foundation surface, as do the support members, due to securement to the foundation of the underlay sheets by the fasteners incident to securing the support members to the foundation. In the use of the disclosed invention, the underlayer sheets 27 necessarily follow the surface contour of the foundation to which they are fixed, thereby avoiding unnecessarily high stresses on the floor board engaging fingers of the attachment clips 23, which can occur when the area between support members is occupied by components which are not secured to the foundation. Thus, in the disclosed construction, the connection to the floor boards is much more secure than has been possible in prior art practices when using one underlayer material or component between the support members and a second and different underlayer material or component underneath the support members. This

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advantage of the disclosed construction is attributable in substantial part to the fact that the underlayer 25 extends from underneath the support members 15 into the area between the support members 15.

Still another feature of the invention resides in reduced transmissibility of moisture through the flooring. In this regard, the primary path for moisture flow from the concrete foundation is around the fasteners which are im-paled into the foundation. When using an underlay in accordance with the invention, a seal is provided between the underlay and the fastener and the path of least resistance to moisture travel is laterally from the point of attachment underneath the underlay sheet to the joints between adjacent sheets. In the disclosed construction, this path is inherently a long one because there is no joint or break in the underlayer 25 in immediate proximity to the support members 15. In addition, there are relatively few joints or breaks in the underlayer 25 as compared to various prior art constructions.

Still another advantage of the invention resides in reduction of sound transmissibility and increased impact noise resistance. In this regard, transmission of sound, including impact noises, is a particular problem at the joints in the underlay. In a flooring system in accordance with the disclosed construction, the number of joints or breaks in the underlayer 25 is substantially less as compared to various prior art constructions. In addition, employment of a single material extending continuously both underneath the support members and between the support members also permits rating of the floor in accordance with accepted standards with respect to sound transmission class (STC) and with respect to impact noise resistance (INR).

Use of an underlayer in accordance with the invention also permits use of a greater depth of fiberboard between the flooring boards and the foundation when using presently existing channel sections without requiring increased thickness of cushion strip material under the support members. Such increased depth of fiberboard provides decreased sound transmission.

Various of the features of the invention are set forth in the following claims:

What is claimed is:

1. A flooring system including a series of spaced parallel support members, a plurality of floor boards extending transversely above and connected to said support members, a sheet of material having resiliency of generally uniform characteristics and having a recess therein receiving one of said support members, said sheet extending underneath and to at least one side of said support member, said sheet extending on at least one side of said support member from adjacent the foundation to the under surface of said floor boards and fastening means extending through said one support member and said sheet into the foundation.

2. A system in accordance with claim 1 wherein said recess has a depth substantially equal to the height of said support member.

3. A flooring system in accordance with claim 1 wherein said sheet is fabricated of ligno-cellulose fiberboard.

4. A flooring system in accordance with claim 1 wherein said sheet is fabricated of cane fiber.

5. In a flooring system including a series of spaced parallel support members, a plurality of floor boards extending transversely above and connected to said support members, a sheet of material having resiliency of generally uniform characteristics and having a recess therein receiving one of said support members said sheet extending underneath and to each side of said support member, said sheet extending on each side of said one support member from adjacent the foundation to the under surface of said floor boards, and fasteners securing said one support member to the foundation with said sheet located in part, between said one support member and said foundation and with said sheet being secured between said one support member and said foundation by said fasteners.

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6. In a flooring system including a series of support members, means fixing said support members to a foundation in parallel spaced relation, and a plurality of floor boards extending transversely on and connected to said support members, the improvement comprising the combination therewith of an underlayer comprising a plurality of sheets of cane fiber of generally rectangular shape, each sheet having a pair of spaced parallel recesses in one face thereof, said recesses each having a depth substantially equal to the height of said support members and each receiving one of said support members, said underlayer extending underneath said support members and from adjacent to the foundation to said floor boards in the area between said support members.

7. In a flooring system including a series of spaced parallel support members secured to a foundation and a plurality of floor boards extending transversely above and connected to said support members, the improvement comprising the combination therewith of a sheet having a pair of recesses therein respectively receiving separate associated support members, said sheet extending underneath and to each side of said associated support members, said sheet extending on each side of said associated support member from adjacent the foundation to the under surface of said floor boards, said recesses having longitudinal center lines spaced from each other at a distance approximately equal to the sum of the distances from said center lines to the adjacent side edges of said sheet, and fasteners securing said associated support members to the foundation and wherein said sheet is also secured to the foundation by said fasteners securing said associated support members to the foundation.

8. A flooring system including a series of support members, means fixing said support members to a foundation in parallel spaced relation, a plurality of floor boards extending transversely on and connected to said members, and an underlayer comprising a sheet of fibrous material of generally rectangular shape having a recess with a depth substantially equal to the height of one of said support members and receiving said one support member, said sheet extending underneath said support member and from adjacent to the foundation to said floor boards in the area between said support members.

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9. A flooring system including a series of support members extending in parallel spaced relation, a plurality of floor boards extending transversely on and connected to said support members, an underlayer comprising a plurality of sheets of generally rectangular shape, said sheets having a pair of spaced parallel recesses in one face thereof, said recesses each having a depth substantially equal to the height of said support members and each receiving one of said support members, said sheets extending underneath said support members and from adjacent to the foundation to said floor boards in the area between said support members, and fasteners each extending through both said support members and said sheets to fix said support members and said sheets to the foundation.

10. A flooring system including a series of spaced parallel support members, a plurality of floor boards extending transversely above and connected to said support members, a sheet having a recess therein receiving one of said support members, said sheet extending underneath and to each side of said one support member, said sheet extending on each side of said one support member from adjacent a foundation to the undersurface of said floor boards, and fasteners securing said one support member to the foundation and wherein said sheet is also secured to the foundation by said fasteners securing said one support member to the foundation.

References Cited

UNITED STATES PATENTS

1,302,578	5/1919	Murphy	52—480	X
1,666,061	4/1928	Foster	52—372	X
1,672,255	6/1928	Gorman	52—480	X
2,882,560	4/1959	Plendl	52—710	X
2,895,704	7/1959	Urbain et al.	52—480	X
3,270,475	9/1966	Kodaras	52—480	
3,271,916	9/1966	Omholt	52—480	X
3,359,696	12/1967	Snaith	52—314	

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