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METHOD OF MAKING A FLOOR COVERING INCLUDING PLACING CHIPS IN A GRID PATTERN

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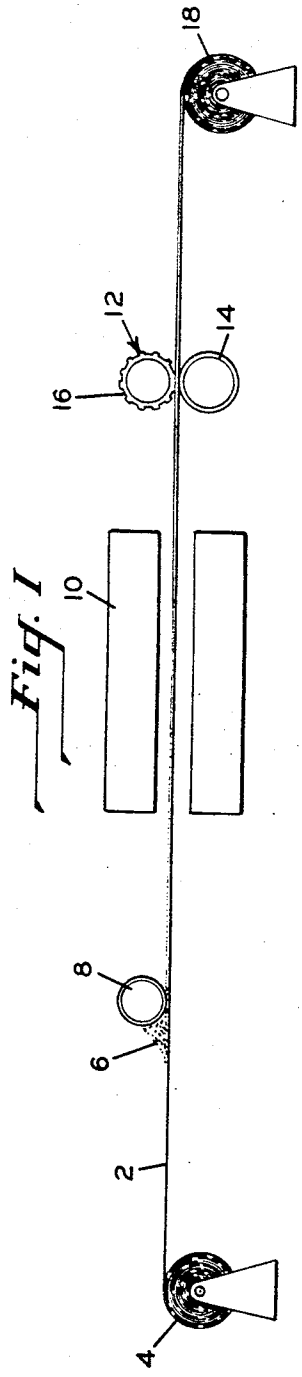


Fig. I

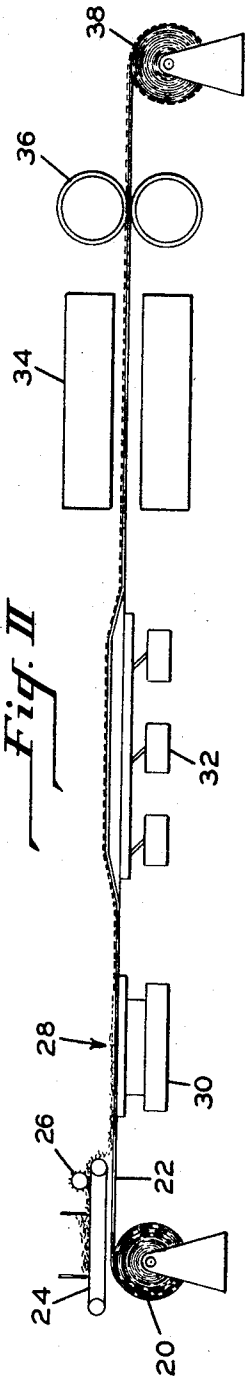


Fig. II

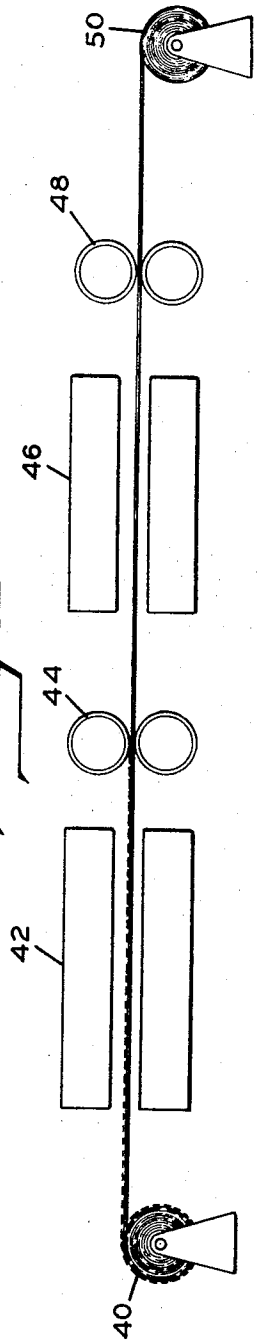


Fig. III

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METHOD OF MAKING A FLOOR COVERING INCLUDING PLACING CHIPS IN A GRID PATTERN

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U.S. Cl. 264—70 1 Claim

ABSTRACT OF THE DISCLOSURE

The sheet material is provided with a plurality of pockets in a grid-like pattern. A plurality of chips sized to fit in the pockets are dumped upon the sheet material. The sheet material passes across a horizontal vibrating table which positions the chips in the pockets of the grid. The sheet material then passes across a slanted vibrating table which removes excessive chips from the sheet material. The chips are now consolidated to the sheet material by appropriate heat and pressure.

BACKGROUND OF THE INVENTION

Field of the invention

The invention is directed to a method of making a flooring material and, more particularly, to a technique for placing decorative chips in a pocketed grid pattern of the sheet material.

Description of the prior art

U.S. Pat. No. 3,056,224 discloses one technique for arranging chips on the surface of the sheet material. The chips are dumped onto the sheet material and a vibrator is used to distribute the chips across the surface of the sheet material. The dumping of the chips onto the sheet material is controlled so that one does not get "doubles," that is, a chip placed upon a chip. The chips are oriented in a random manner on the sheet material. U.S. Pat. No. 3,150,022 discloses another technique for placing chips upon the sheet material, and likewise here the chips are placed upon the sheet material in a random manner.

U.S. Pat. No. 3,359,354 discloses a method of making ceramic tile structures from a plurality of individual pieces. The individual pieces are placed in a grid-like pattern to secure the desired arrangement of the pieces. Appropriate binder structure is then used to hold the tiles in their rearranged locations.

The first two above-mentioned patents deal with floor covering structures, but in no way are interested in the placing of the chips in preselected positions. While the third patent may disclose the prepositioning of ceramic tiles in a mold for their later assembly as a unitary structure, this third patent in no way suggests the modification of the first two structures to provide for a flooring structure which is capable of having the prearranged placement of chips. That is, the inventive technique herein provides for the selective placement of color chips in a definite pattern arrangement to provide a coordination of the color with a geometric distribution of the chips.

SUMMARY OF THE INVENTION

The subject invention relates to a floor covering consisting of small opaque and transparent square chips arranged in a grid pattern having correspondingly square-shaped apertures or pockets in which the chips are placed. When the chips are in proper position, the assembly is consolidated to form the floor covering.

The chips are assembled into the grid by a method which comprises spreading the chips across the moving grid by use of a peg roll feeder. The chip-covered grid is then moved across a horizontal vibrating table. This vibration causes 100% filling of the pockets in the grid and leaves a large number of excess chips on top of the grid surface. Removal of these excess chips occurs when the grid is passed over another vibrating table having a surface which slopes downwardly at each side or on only one side at an angle of about 2 degrees. The slope plus the vibration causes the excess chips to slide off the sides of the grid.

The grid itself is formed by doctoring a layer of dry blend onto a "Hydrocord" backing, which is a trademarked material of Armstrong Cork Company. The dry blend and "Hydrocord" are then passed under or through a heating oven in order to place the dry blend in a molten state. The material then passes to an embossing roll which places the desired pattern holes or pockets in the surface of the grid while the vinyl is still in its molten condition. After the forming and filling of the grid in the above-mentioned manner, the entire mass is then consolidated by heating and roll pressing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. I is a showing of the apparatus utilized to form the grid member;

FIG. II is a showing of the apparatus used to place the chips in the grid pockets; and

FIG. III is a showing of the apparatus used to consolidate the chips on the grid backing.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The product herein is manufactured by the use of the materials disclosed in U.S. Pat. No. 3,056,224. Referring to FIG. I, the backing layer **2** of "Hydrocord" is fed off a roll assembly **4**. The dry blend material **6** is placed on the top of the backing material, and a leveling roll **8** distributes the dry blend to the required height. The backing layer with the dry blend passes through a heat area **10** which melts the dry blend. While the dry blend is still in its molten state, it is passed through an embossing roll assemby **12** composed of a backup roll **14** and an embossing roll **16** which has thereon a plurality of raised areas to form the pockets or grid pattern in the dry blend resting upon the backing layer. After embossing, the dry blend and backing layer are permitted to cool and then rolled up on a roll-up assembly **18**. There has now been produced the grid surface on which chips are to be positioned. The grid configuration is designed to provide for the selective layout and arrangement of the chips in the desired pattern.

The grid surface is unrolled from the unrolling apparatus **20**, and the grid surface **22** passes under a chip dispensing structure. This structure is nothing more than a conveyor **24** which has a hopper structure thereabove holding the plurality of chips. A peg roll or feed roll **26** controls the level of chips which move across the conveyor. The peg roll also spreads the chips out across the conveyor **24** so that, when they drop upon the grid surface **22**, they will be somewhat spread traversely across the grid surface sheet. As can be seen in area **28**, the chips are placed on the grid surface with a large number of excess chips. That is, there are more chips present on the grid surface than there are pockets to receive the chips. The grid surface sheet passes across a horizontal vibrator **30** which vibrates the sheet and chips and provides for a 100% filling of the pockets of the grid surface by the chips. Naturally, the chips are sized so that they will readily slide into the pockets.

The grid surface sheet, with its pockets full, and the excess chips are now fed to a second vibrator **32** which is inclined. This vibrator may be inclined like the ridge of a roof with a raised area in the center and slopes down either side, or there may be a single incline from the high

side to a low side. The incline is about 2 degrees. The incline plus the vibration will cause the excess chips, which are not retained in a pocket, to slide off the grid surface sheet. However, the vibration and incline are not such as to cause chips to jump out of the pockets in which they are retained. As the sheet leaves vibrator **32**, all the pockets should be filled with chips and all excess chips should be removed from the sheet. The chips which could be of various color combinations have now been placed in selective positions to provide a particular pattern layout for the chips. This differs from the prior art structures, which provided only a random chip pattern displacement. The sheet material now passes to a heating means **34** which softens both the chips and back-up layer or the previously melted dry blend. The assembly then passes on to a roll press **36** which presses the chips slightly into the softened former dry blend structure so that there is a certain degree of adherence of the chips to the grid pattern material.

At this point the grid pattern sheet could be moved on to the operation of FIG. III or it could be rolled up on a roll-up assembly **38** and then later unrolled in an unrolling assembly **40** and passed into a heating area **42**. Likewise, the heating area **34** could be used to perform the function of the heating area **42**. In area **42** the former dry blend material and the chips are heated sufficiently so that the chips may be pressed into the former dry blend material by a roll press **44** to yield a flat surface sheet. Obviously, the degree of softening of the former dry blend material and the degree of pressing by the roll press structure **44** could provide an embossed-like structure by not pressing the chips completely into the grid pattern sheet, but allowing the chips to be slightly raised above the surface of the grid pattern sheet. A second heating area **46** and a second roll press **48** may also be utilized to further consolidate the chips and the grid surface material to provide the finished product which, after cooling, is rolled up on assembly **50**.

As previously indicated, the particular material utilized is basically the material disclosed in U.S. Pat. No. 3,056,224. The operating temperatures for the different heating areas are basically the same as that set forth in the above-

mentioned patent. The method herein differs from the above-mentioned patent and the bulk of the prior art in that the provision of a grid surface sheet with a prearranged pocket pattern now permits the selective placement of chips in a predetermined pattern, and, therefore, something other than a random design may be utilized.

What is claimed is:

1. The method of manufacturing a floor material comprising the steps of: forming a thermoplastic sheet material with a plurality of pockets embossed therein in a predetermined pattern configuration, depositing a large excess of thermoplastic chips on the surface of the sheet, said chips being sized to fit into the pockets of the sheet with one chip per pocket, passing the sheet and chips across a vibrating structure to cause vibration of the chips and sheet so that the pockets of the sheet are 100% filled with chips, passing the sheet material with its filled pockets and excess chips across a second vibrator with the sheet inclined slightly from the horizontal so that the vibration of the second vibrator causes the excess chips to slide off the sheet without the dislodging of any chips from the pockets of the sheet, and then consolidating the chips and sheet material by heat and pressure to permanently affix the chips to the sheet material with the chips in the prearranged pattern determined by the pockets in the sheet.

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156—73, 209, 293, 298, 303.1, 306; 264—245, 251, 284