Nov. 12, 1974 J. R. GARRICK ET AL 3,848,043

METHOD OF MAKING CUT-IN-REGISTER CEILING TILE

Original Filed June 22, 1971

Fig. I

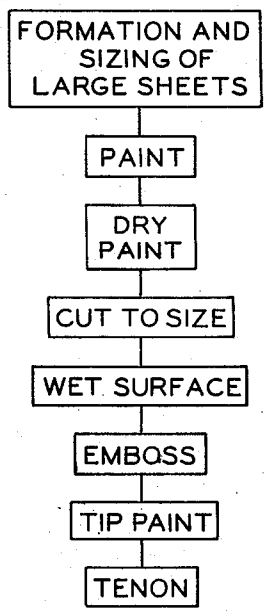
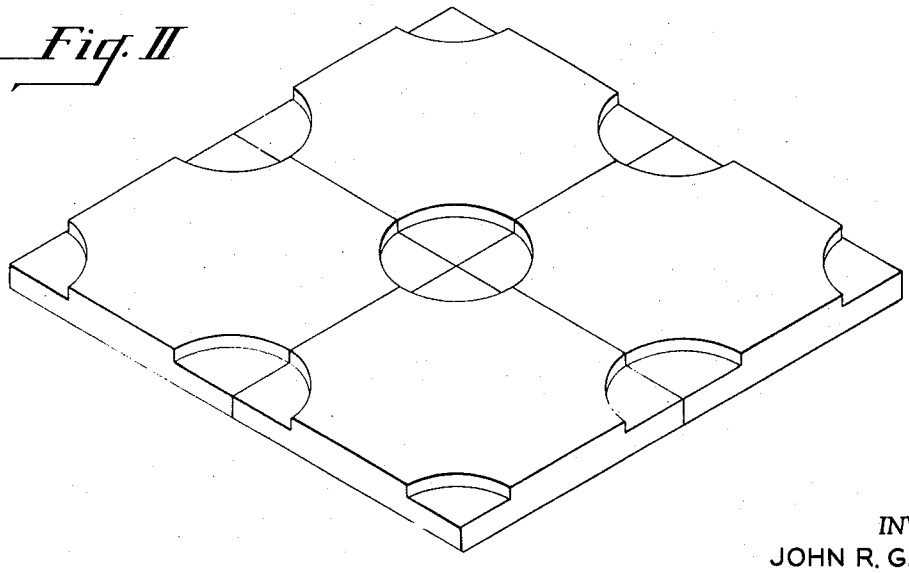


Fig. II



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METHOD OF MAKING CUT-IN-REGISTER CEILING TILE

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Continuation of abandoned application Ser. No. 155,417, June 22, 1971. This application Apr. 17, 1973, Ser. No. 352,026

Int. Cl. B29j 5/04

U.S. Cl. 264—134 4 Claims

ABSTRACT OF THE DISCLOSURE

Material to be used to make ceiling tiles is initially formed as large sheets. The large sheets will first be cut down to the required size for use as ceiling tile. A punch press with a heated embossing plate will then place a pattern in the surface of the individual tiles. It is obvious that the tile design must be such that the design flows from one tile to the adjacent tiles so that there is a need for registry between the designs on the individual tiles to give an overall design effect.

CROSS-REFERENCE TO RELATED APPLICATION

The particular press structure utilized herein for embossing is set forth in Application Ser. No. 155,418, filed June 22, 1971, in the name of John R. Garrick et al., entitled "Press for Embossing Ceiling Tile," and now abandoned.

This is a continuation of application Ser. No. 155,417, filed June 22, 1971, now abandoned.

BACKGROUND OF THE INVENTION

Field of the Invention

The invention herein is a method of making ceiling tile and, more particularly, to the making of ceiling tile which must be in registry with adjacent tile to provide an overall design effect.

Description of the Prior Art

To date, no one has been concerned with making ceiling tile which would require that the pattern on one ceiling tile be in register with the tile on an adjacent ceiling tile. There have been some attempts to provide a design on a ceiling tile which would tend to obscure the joint structures, but no attempts have been made to date to provide a design which would extend at approximate right angle to the tile joint.

Currently, when tile units are made with a design thereon, large 12′ x 24′ boards are made by the conventional water-laid process which is utilized in the paper industry to form a product from a water slurry. These boards, after they are dried, are cut into 4′ x 8′ sheet sizes. These are then fed into large embossing presses to provide the required design. The large sheets are then cut up into the individual tile size units.

U.S. Pat. No. 2,803,188 shows the use of a heated embossing roll for providing a design to a fibrous board product. U.S. Pat. No. 3,008,257 is another showing of both rotary and flatbed pressing of a design in a painted board structure. After the design has been provided on the large board, it is cut into the individual tile size units.

SUMMARY OF THE INVENTION

In the invention herein, the process involves the following steps. After the board product is formed, it is cut to the required tile blank size with a paint coat on the surface to which the embossing is to be placed. Just prior to going into the embossing press, the surface of the tile receives a rewet solution. The individual tiles are then placed

in the embossing press and are provided with the embossed pattern using the embossing press structure of the above-mentioned copending U.S. application of Garrick et al. The individual tile units may then be tip painted or left with simply their original paint coat. A tenoning operation is then provided so that there will be appropriate edge structure to mount the individual tiles in position.

It is the particular process carried out herein which provides for the making of individual tile units with a design which will be in register with a similar type design on adjacent tile units so that the plurality of adjacent tile units form an overall design in the ceiling system. Registry between adjacent tile units is necessary to provide a neat and uniform overall design in the ceiling system.

BRIEF DESCRIPTION OF THE DRAWING

FIG. I is a block diagram sequence of the basic steps of the method; and

FIG. II is a perspective showing of a ceiling tile arrangement with the required in-register design.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The ceiling tiles being made by the process herein are formed by the conventional water-laid technique such as is used in the paper industry to form paper. The boards are made of primarily a mineral wool material and are basically the boards which are set forth in U.S. Pat. 3,008,257. The boards are initially laid up as 12′ x 24′ nominal sheets. After the board has been dried in an appropriate oven, it is fed to a dry saw structure which simply cuts the dry boards into 4′ x 8′ board members. These board members would then be sanded on one side to secure the desired thickness. On the sanded surface, there is provided a prime coat of paint. The coat would be a conventional type of porous paint. It would be of the type which is used in U.S. Pat. No. 3,008,257. It is basically a paint which can stand an embossing action and not crumble and flake off the board.

The 4′ x 8′ board pieces are then fed through additional saw structures which cut them into 13″ x 8′ strips and then finally to 13″ x 13″ blanks. It is possible that blanks could be made as above or 1′ x 2′ or 1′ x 3′, etc. The painted surface of the board is then rewetted with a solution which is sprayed on the face of the tile. The rewet solution can be water or some similar type material such as water and a surfactant, such as sodium heptadecyl sulfate. The tile is then fed into a punch press such as that set forth in the above-mentioned copending application and the tile is provided with an embossed configuration on its face.

The tile is then permitted to dry and then may be passed through a roll coater which will tip coat the raised areas of the embossing structure. However, this particular step is not particularly necessary as the product could be sold with simply the original paint coat thereon.

Finally, the board moves on to a tenoning station wherein the appropriate edge structure is provided in the boards. Normally, this is a kerf which is cut in the edge or a square edge tongue and groove joint to provide tiles that will have a concealed joint. If it is desired, the ceiling could be provided with acoustical punchings, which are basically nothing more than round holes, or with round ventilating holes which will permit the passage of air through the tiles.

As shown in FIG. II, a plurality of tiles must be mounted in an adjacent manner to provide registration of the pattern thereon. As shown in FIG. II, each tile is provided with a ¼ arc at the corner thereof. When four tiles are placed adjacent each other, the four ¼ arcs must combine together to form a circle. Should there be lack of registration in the pattern as placed on the individual tiles,

the four arcs will not uniformly joint together to form a smooth line circle.

A rotary embossing press has the disadvantage in that there tends to be slippage relative to the board and the rotary embossing structure, and this tends to distort the pattern being placed on the tile. A flatbed press cannot be used since flatbed presses now are used primarily to emboss sheets with very slow cycle speeds.

What is claimed is:

1. A process for making ceiling tiles which are approximately one foot square with a pattern on each tile which must be in registry with the pattern on adjacent tiles to form an overall pattern, the steps comprising, applying a paint coating to a board structure which is several square feet in size, cutting said board structure into a plurality of tile units of approximately one square foot, wetting the surface of the painted surface, then embossing on the tile unit an embossed pattern which is accurately positioned relative to the edges of the tile unit, said embossing step is carried out by the use of a punch press with a heated embossing structure, said embossing being accurately positioned so that a plurality of adjacent tile units will have their individual patterns in registry with the pattern of adjacent tile units, and then providing the tile units with an edge structure means to hold the tile units mounted in position in a ceiling.

2. The method of claim 1 wherein the tile units are tip coated with a second coating immediately after they have been embossed.

3. A process for making ceiling tiles with a pattern on each tile which must be in registry with the pattern on adjacent tiles to form an overall pattern, the steps comprising, applying a paint coating to a board structure which is several square feet in size, cutting said board structure into a plurality of tile units of approximately one square foot, wetting the surface of the painted surface, then embossing on the tile unit an embossed pattern which is accurately positioned relative to the edges of the tile unit, said embossing step is carried out by the use of a punch press with a heated embossing structure, said embossing being accurately positioned so that a plurality of adjacent tile units will have their individual patterns in registry with the pattern of adjacent tile units, and then providing the tile units with an edge structure means to hold the tile units mounted in position in a ceiling.

4. The method of claim 3 wherein the tile units are tip coated with a second coating immediately after they have been embossed.

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RICHARD R. KUCIA, Primary Examiner

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