Aug. 4, 1936. E. S. DENK 2,049,429

TILE MOUNTING

Filed May 15, 1930

Fig. 1.

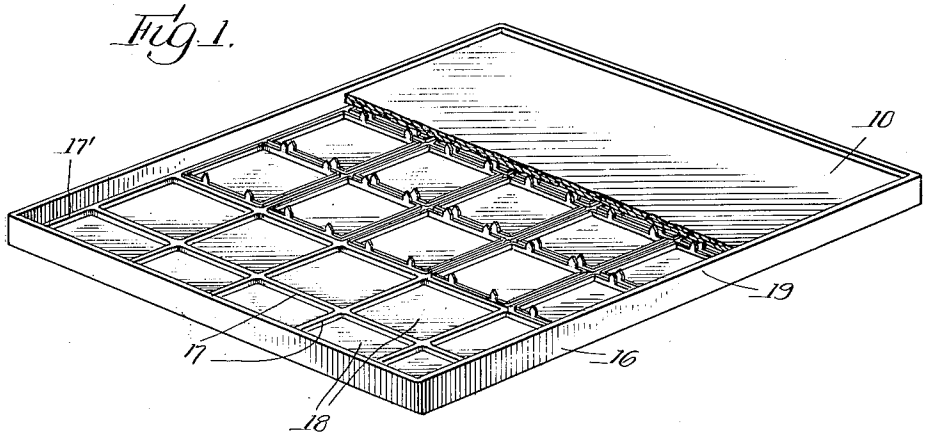


Fig. 2.

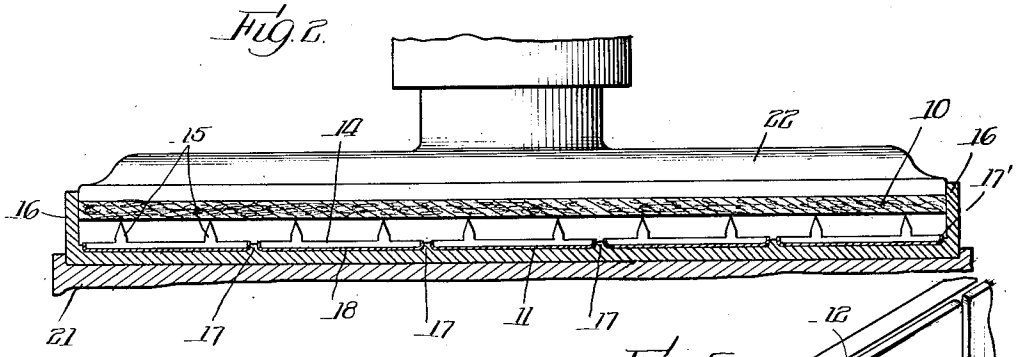


Fig. 3

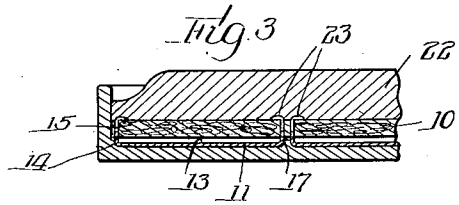


Fig. 4.

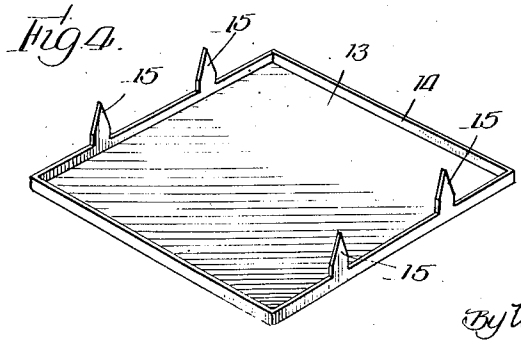
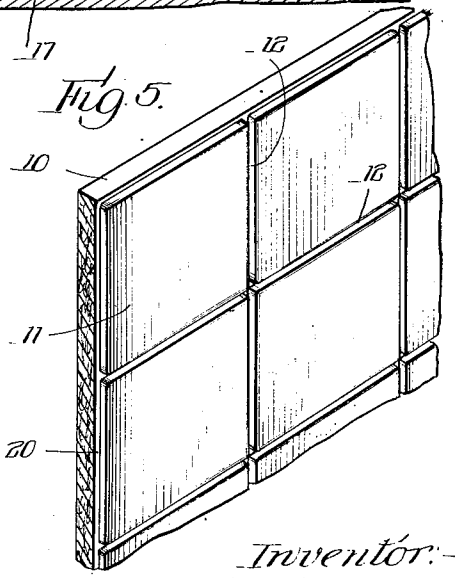


Fig. 5.



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2,049,429

TILE MOUNTING

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Application May 15, 1930, Serial No. 452,613

3 Claims. (Cl. 72—23)

This invention relates to a new and improved building material, such as tile and the like, and to the method by which this material is made.

It is an object of this invention to provide a material which may be termed tile panels, adapted to serve as a substitute for the ordinary tiles now in general use and which is more durable, offers the same pleasing appearance and yet is much cheaper and simpler to manufacture, and most of all is capable of installation by a simple, cheap process, requiring no particular skill, whereby it may be fixed in place against the walls or similar surfaces by a carpenter in much the same manner of affixing ordinary wall boards as distinguished from setting tiles piece by piece, in cement, as is now required with ordinary tiles.

The usual ceramic type of tile is well known and its installation is known to require the skill of specially trained men, who are expert in the art of setting the individual tiles, piece by piece, in the layer of mortar or cement previously applied to the wall or other surface, and accurately placing and spacing each additional piece with respect to the others as is required to produce the desired pleasing appearance and a finished job representative of the expected standard.

The tile setter is further required to finish off or "point up" the cement showing in the cracks between adjacent tiles all of which has resulted in the cost of labor being the element of great expense in any ordinary tile installation. Tile of the ordinary type, in addition to being subject to the above described expense and care of installation, have been in addition, subject to becoming uneven over their surface or unevenly spaced, with cracks appearing here and there, as the tiles move after the cement has set. Such deterioration is caused by warping or sagging of the walls of the building, even to a very slight degree, and of course offers an objectionable, unsightly appearance in addition to the fact that the wall or surface is actually permanently damaged insofar as that installation is concerned.

It is therefore apparent that two major objections are now present in ordinary tiles which are, first, the expensive labor required for installation and second, lack of stability and permanence in maintaining its original, even surface.

Effort has been made, see Haines Patent No. 1,594,614 and Haines Patent No. 1,704,537, to reduce the labor by providing a backing sheet which is constructed in a manner to locate the tile, whereby the tile setter will be relieved of the skillful work required in effecting the exact spacing desired between tiles.

The practice of these inventions, however, involve the necessity for setting each tile separately, by the use of cement, whereby considerable labor and time is still required for their installation, and the danger of the tiles coming loose and falling off, which is inherent with the use of cement, is also present.

It is therefore an object of the present invention to provide a tile material of novel construction which may be herein termed "tile panels" which is not only free from the above stated objections, but which is pre-formed in its course of manufacture, whereby the installation thereof, requires merely the application and affixing of the tile panels to the wall or other surface, much in the same manner as applying ordinary wall boards.

It is a further object of this invention, to provide a tile material in which the individual tiles are securely held with respect to each other and are thereby free from liability of becoming uneven over the wall or other surface, or otherwise disfigured or misplaced.

It is a further object to provide a tile which employs mechanical means for affixing the individual tiles to the backing material, whereby to avoid the requirement for cement, the latter being subject to deterioration such as will permit the tiles to work loose and fall out.

It is a further object of the present invention to provide a process for producing the tile above described, in which the individual tiles are positioned and maintained in their final pre-determined relationship and while in such position, are collectively secured mechanically, to a suitable backing material.

It is a further object of this invention to provide a process in which a plurality of tiles are affixed to a backing sheet to produce a tile panel in which all of the individual tiles are mechanically held on the backing sheet.

It is a further object to provide a process in which a plurality of tiles are held in predetermined spaced relationship and are subsequently affixed to a backing material, by a mechanical means which means are caused to engage and lock with the backing material by a forcing movement of the backing material into its final relative position with the tiles.

It is a further object of this invention to provide a tile panel material comprising a plurality of individual tiles secured to a backing sheet having a predetermined space between each tile, and having a space between the outer edges of the edge tiles and the edge of the backing sheet, sub-

stantially one-half of said predetermined space, whereby a plurality of panels in edge to edge engagement, provide the uniform spacing for all of the tiles on the various panels.

These and other objects not specifically enumerated are contemplated for the present invention, as will readily appear to one skilled in the art as the following description proceeds.

The present description is given by way of illustration and it is not to be considered as limiting the invention in any respect as the invention may be determined from the appended claims and from an understanding of the present embodiment and an appreciation of the advantages which the invention produces therein.

The invention may be more readily understood by referring to the accompanying drawing, in which—

Figure 1 is a perspective view, partly in cross section, of a means designed to position and maintain the tiles in predetermined relationship during the manufacturing process;

Figure 2 is a cross sectional view in elevation, showing the manner of affixing the tiles to the backing material;

Figure 3 is a fragmentary view, similar to Figure 2, showing the further operation of assembling process;

Figure 4 is the perspective view of a tile constructed in accordance with the present invention, shown in inverted position and

Figure 5 is a perspective view of a portion of a tile panel, constructed in accordance with the present invention.

By referring to the drawing, it will be noted that the present invention is illustrated as comprising a backing sheet **10**, having a plurality of tiles **11**, affixed to one surface thereof, with spaces **12** between the edges of adjacent tiles. The tiles **11** may be of any suitable construction, but it is preferred that they be formed of stamped sheet metal of any desired shape, whereby to provide a main portion **13**, having flanges **14** on the edges thereof. Projecting from the edges of the flanges **14**, are pointed prongs or projections **15**, which are employed for securing the tiles to the backing sheet. These prongs or projections may be of any number and may be located in any manner capable of producing the holding function, that is to say, there may be one or more prongs or projections on each side edge of the tile, or there may be one or more positioned on opposite sides only, as shown in Figure 4. One advantage for having the prongs only on two sides as shown in Figure 4, is that the stamping of the tiles from a sheet of metal may be effected with a considerable saving of metal, and yet an adequate holding means is provided.

Obviously great latitude is contemplated for this invention, as to the details of the location and number of prongs or projections. The tile of course, is provided on its outer face with the proper enameled or ceramic material, which is properly fused to produce the pleasing, smooth finish, prior to the time that the tiles are mounted on the backing material. Of couse, these may be supplied in any color or finish desired. In assembling the tile panels, a tile receiving tray **16**, is employed, having partitions **17** thereto, forming pockets **18**, of the exact shape of the tile, all in a manner to receive the tiles and position and maintain them in the predetermined spaced relationship that is desired for the finished panel. The partitions **17** are of less height than the flanges **14**, whereby the partitions will offer no obstruction, surrounding the prongs, such as will interfere with the application of the backing material, as shown in Figure 3.

The tile tray **16**, is provided with side walls **19**, and the tray is of a size and shape representing that of the finished panel, whereby the tray, after having the pockets **18** thereof, filled with tiles positioned prongs upward, may exactly receive a piece of backing material **10**, whereby the backing material will be caused to take a position relative to the tiles which is exactly that desired for the finished panel.

At this point, it is desirable to point out that the partitions **17'**, which are positioned around the edges of the tray, are approximately one half the width of the partitions **17**, whereby the space **20**, between the outer edge of the edge tiles and the edge of the backing sheet, is substantially one half the space of the spaces **12**. From this, it will be obvious that when two panels are put in edge to edge engagement, that the space between the edges of the adjacent tiles of the two panels will be equal to the space between the tiles on any one panel, all of which will produce a uniform appearance and will hide the location of the joints between panels.

When the tiles and backing material are mounted in the tray **16**, as shown in Figure 1, the tray is next placed on a table **21**, which positions the tray **16**, in exact relationship to a pressure plate **22**. The pressure plate is of a size and shape corresponding to that of the backing material and, as shown in Figure 2, is designed to exactly fit within the side walls **19** of the tray.

It is obvious that as the backing material is placed in the tray, that it will be supported on the prongs as shown in Figure 2, and that thereafter, the pressure plate may be lowered, whereby to engage the upper surface of the backing sheet and exert the necessary pressure thereon to force the backing sheet onto the prongs in intimate holding engagement with tiles positioned therebeneath. The pressure plate may be operated by any suitable means, such as fluid or hydraulic pressure, it being required merely, that suitable mechanism be employed for exerting the necessary pressure in a manner that is conveniently controlled.

After the parts are positioned as shown in Figure 2, the pressure plate is depressed as described, whereby to bring the parts into relationship shown in Figure 3. The under side of the pressure plate is provided with a plurality of small depressions or sockets **23**, which are positioned to receive the ends of the prongs, which are originally designed of sufficient length to extend entirely through the backing material.

This arrangement, upon depression of the plate, causes the backing material to be forced tightly against the tiles and the prongs to be clinched over in tight locking engagement with the backing material, all as shown in Figure 3. This operation effects the application and clinching of the various tiles in a single operation, to form a complete panel. After the panels are so mounted, the pressure plate may be lifted and the tile panel removed, from the tray, after which it is complete and ready for installation.

It will be obvious that the tiles mechanically mounted in the fashion described, will be tightly locked against the backing material, whereby all liability of working loose or becoming removed will be eliminated.

It will further be obvious, that the spacing of one tile with respect to the other, in making up

the panel, is positive and fixed and that all liability of becoming displaced or disfigured in any manner whatsoever is avoided.

If it is desired, the tray 16 may be provided with a suitable soft lining or inner surface for the sockets which will protect the enamel faces of the tiles during the pressing operation. The backing material may be of any suitable type, but is preferably of a synthetic fiber construction such as will present the degree of softness requisite for application of the tile by the pressing operation described and yet it is preferred to select a material which is not subject to warping or buckling after it is applied to the wall or other surface. There are a number of materials now on the market which have been found to serve satisfactorily in this use.

It is contemplated that the tile panels be formed of any suitable size and shape and it is obvious that a wall or other surface may be covered by applying the panels to their proper positions and affixing them to the studding or other supporting means, by nailing or otherwise securing at the location of the cracks or spaces between the tiles.

This may be done quickly and by a simple operation without requiring any unusual or high degree of skill. In fact, it is quite similar to the application of ordinary wall board. With the panels thus mounted, it is only necessary that suitable cement or other finishing material be introduced in the cracks or spaces between the tiles and subsequently smoothed or pointed up. Tile installations so made, are found to give the effect and appearance of ordinary tiles now in use and to be of very superior properties due to their permanence and stability.

It is further obvious that the manufacturing operation is extremely simple and cheap and that the installation entirely eliminates the expensive labor now required for ordinary tiles. Although the present illustration shows the prongs on the tile as pointed and of sufficient length to extend through the backing material whereby to be clinched over, it is of course obvious that any other form of mechanical holding means is satisfactory. For instance, by way of illustration, it is conceivable that the prongs or projections need not extend through the backing material but that they be provided with some means such as barbed edges, or perhaps a fish hook projection such that it is capable of being introduced into the backing material and yet securely held against outward movement.

The invention is not limited to the specific type of holding prong here shown.

This invention is claimed broadly in my application Serial No. 416,382, filed December 26, 1929.

I claim:

1. The process of producing preformed tile panels adapted for application to a wall or similar surface as a unit, which comprises providing a plurality of tiles formed of sheet-like material, having face portions, side flanges and penetrating holding prongs of greater length than said side flanges, arranging said tiles in the relationship to be finally occupied on the finished panel with said holding prongs exposed, and holding said tiles against displacement, then, with said tiles so arranged and held, providing an imperforate backing sheet in substantially coextensive association with said tiles and exposed holding prongs, and then forcing said backing sheet and tiles together, causing said prongs to penetrate said backing sheet to simultaneously position and attach all of said tiles to said backing sheet in their final positions.

2. The process of producing preformed tile panels adapted for application to a wall or similar surface as a unit, which comprises providing a plurality of tiles formed of sheet-like material, having face portions, side flanges and penetrating holding prongs of greater length than said side flanges, arranging said tiles in the relationship to be finally occupied on the finished panel with said holding prongs exposed, and holding said tiles against displacement, then, with said tiles so arranged and held, providing an imperforate backing sheet in substantially coextensive association with said tiles and exposed holding prongs, and then forcing said backing sheet and tiles together, causing said prongs to penetrate said backing sheet to simultaneously position and attach all of said tiles to said backing sheet in their final positions, and then clinching said prongs against the back of said backing sheet.

3. The process of producing a tiled unit consisting of a foundation sheet having the face thereof covered with a multiplicity of tiles, each of the tiles having tangs extending into the sheet, which consists in supporting the multiplicity of tiles in inverted position and properly spaced from one another and forcing the foundation sheet and said supported series of titles into engagement with each other whereby the tangs are forced into the sheet.

EMIL S. DENK.