No. 836,638. PATENTED NOV. 20, 1906.

O. DUCKER.

PROCESS FOR MAKING TILES.

APPLICATION FILED JULY 24, 1906.

Fig. 1.

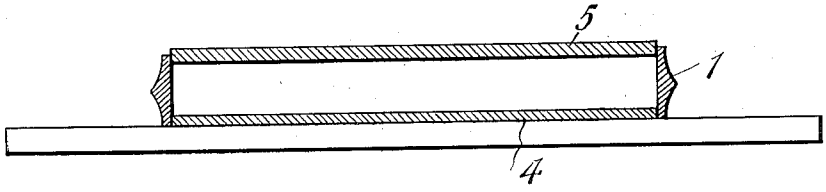


Fig. 2.

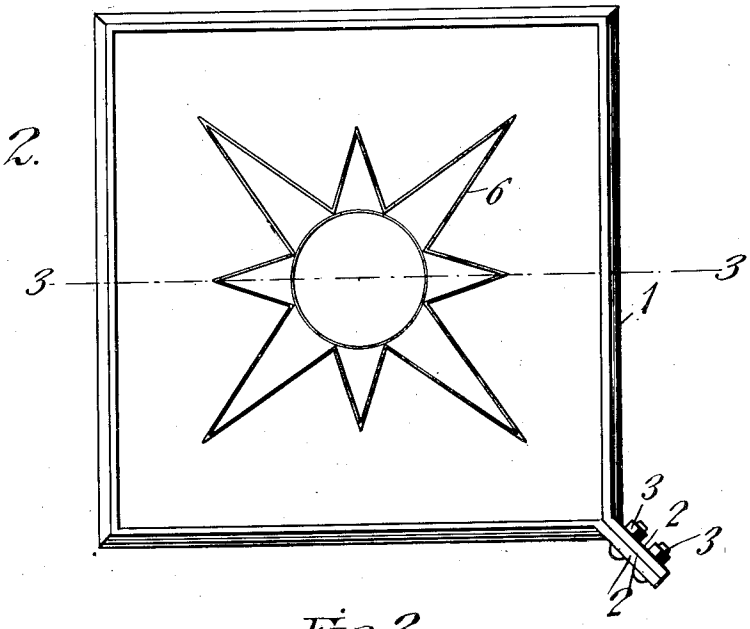
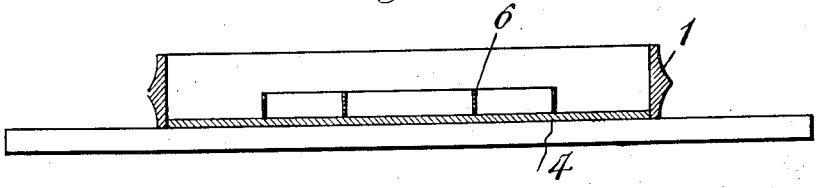


Fig. 3.



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PROCESS FOR MAKING TILES.

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To all whom it may concern:

Be it known that I, ORLANDO DUCKER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Processes for Making Tiles, of which the following is a specification.

The invention relates to an improved method of making tile and similar articles wherein the materials composing the tile are molded into desired form and subjected to pressure to complete the formation of the article.

The main object of the present process is to so arrange the materials composing the tile as to provide the article after application of the finishing pressure with a highly-polished surface.

In carrying out the present process the main materials used are sand and cement, with or without the addition of color, as desired, these materials being, however, used in different degrees of fineness and in different proportions for the surface layer and for the body of the article.

In connection with the present process I use a form of mold particularly adapted for the carrying out of the process, which mold is to be used in conjunction with the tile-pressing machine of commerce.

The specific details of the mold structure are described in the following specification, reference being had particularly to the accompanying drawings, in which—

Figure 1 is a transverse section of the mold used in conjunction with my improved process, the same being shown supported on the bed-plate of the pressing-machine. Fig. 2 is a plan of the same, a color-former being shown in position. Fig. 3 is a transverse section of Fig. 2 on the line 3 3.

The mold used in conjunction with the present process comprises wall-strips 1, connected to provide in outline shape the contour of the desired article. In the instance illustrated these strips are connected to provide a mold of square outline, though it is obvious that the mold may be shaped to provide a rounded contour or any desired angular contour.

By preference two of the approximate walls are each formed at their juncture with an angularly-projecting lip 2, which are designed to be secured in contact by bolts 3, whereby to secure said walls in connected mold-forming relation, while at the same time permitting a slight separation of the walls when desired to insure removal of the article without sticking. The mold also includes a bottom board 4 and a top or pressure board 5, each being of a size to fit snugly within the walls, as clearly shown in Fig. 1. The bottom board 4 is designed to directly receive and support the material composing the article and is preferably constructed of metal, as steel. The relatively upper surface of the bottom board—that is, the surface on which the material rests during the forming process—is highly polished, whereby in connection with the materials to be noted to impart a highly-polished surface to the completed article.

In carrying out the process the article is made up in two layers, hereinafter termed the "surface layer" and the "body" of the article. The surface layer is composed of equal parts of sand and cement, each of which materials is, by screening or grinding, reduced to an extreme degree of fineness, the cement particularly being practically in powdered form. A sufficient quantity of water is added to equal parts of the above-noted materials to produce a semiliquid mass, which is poured into the mold to a depth approximating one-quarter of the desired thickness of the finished article.

The second layer or body of the article is made up of sand and cement in proportions approximating five of the former to one of the latter. The materials forming this layer are of a less degree of fineness than the materials forming the surface layer and are mixed with a proper quantity of water to provide for a proper setting of the cement, the quantity of water necessary being materially less than used in connection with the materials of the surface layer.

Previous to adding the body layer to the mold the upper or exposed portion of the surface layer is dusted with a quantity of the mixture forming the surface layer in dry form, whereby to take up the excess moisture in the surface layer and provide for a proper cementing of the layers under pressure. After application of the dry material the body layer is arranged within the mold to the desired depth, the pressure-board 5 applied to the upper surface of the body layer, and the material subjected to the necessary pressure for a short time. After initial setting of the materials the side walls of the mold are removed and the article resting

upon the bottom board removed for the drying operation.

Owing to the highly-polished surface of the bottom board and the intimate mixture of the materials of the surface layer the surface of the finished article when removed from the bottom board will be found in a highly-polished condition.

In forming tiles or similar articles with ornamental or colored surfaces the above process is carried out exactly as described, except that a color-former 6 of skeleton outline and in the form desired for the ornamentation is first placed upon the bottom board 4, after which the surface layer described, with the desired color added, is poured into and around the former. It is of course obvious that the ornamental outline or configuration may be in several colors, in which event the materials of the surface layer, in the appropriate or desired colors, are poured into and around the former, each particular colored mass being applied in proper position. After the colored material has been properly applied to provide the surface layer said layer is dusted with the dry material, as before described, absorbing moisture from the surface layer to the degree necessary to transform said layer from a semiliquid mass into a condition to insure the separation of the differently-colored masses upon removal of the color-former. In this condition the former 6 is removed, the body layer applied as described, and the necessary pressure added to complete the article.

The primary object of the above process is providing the finished articles with a highly-polished surface, which is a direct incident of their method of manufacture. The essential steps to produce this result are, first, applying directly onto a highly-polished pressure-resisting surface a semiliquid mass of sand and cement in equal proportions and in an extreme degree of fineness; second, in applying to this semiliquid layer a dry layer of the same material to absorb a proportion of the moisture from the surface layer previous to subjecting said layer to the necessary pressure, and, third, in backing the surface layer with a body of sand and cement in the proportions of five to one and of a less degree of fineness than the surface layer.

The liquid condition of the surface layer insures the intimate mixture of the materials, while the extreme fineness of the latter, particularly that of the cement, insures the presentation of a non-porous layer next to the polished surface of the bottom plate. Furthermore, the fineness of the cement insures the most complete binding effect of such agent, so that the surface of the article is highly polished under pressure.

It is to be particularly understood in connection with the present process that while showing and describing the tile as made up to present a single polished face it is obvious that the process contemplates producing a tile having the opposite faces polished, in which event, after the addition of the body layer, an absorbing layer is applied, over which a second surface layer is poured. The pressing-board 5 in this instance will have the relatively lower surface highly polished, so that the finished tile will have a polished upper and lower surface. It is equally obvious that the walls of the mold may, if preferred, be polished on their relatively inner surfaces, so that a surface layer may be applied next to said surfaces. The tile formed under these conditions will have polished edges, it being understood that any desired configuration with or without color may be used in connection with the polished edges or surfaces. With the mold-wall of circular shape, with the relatively inner surface polished, the process is readily adapted to providing a polished column of hollow or solid section figured to the extent desired, the molding operation being well understood and needing no further description.

While preferring the relative proportions of materials noted in the above description for the surface and body layers it is to be understood that I do not limit myself thereto, as said proportions may be varied in accordance with the conditions and natures of the material and of the article to be produced. The particular proportions of the material of the surface layer have proven by experience to be best adapted for imparting an extreme polish to the surface; but the process is adapted for producing a variation of the polish degree by changing the relative proportions of the materials composing the surface layer.

Having thus described the invention, what is claimed as new is—

1. The herein-described process of forming tiles or the like, consisting in applying a surface layer of a semiliquid mixture of sand and cement to a polished mold-surface, adding an absorbing layer thereto, and finally adding a body layer to the absorbing layer.

2. The herein-described process of forming tiles or the like consisting in applying a surface layer of sand and cement in a semiliquid mixture of equal proportions to a highly-polished mold-surface, adding thereto an absorbing layer and finally adding a body layer of sand and cement.

3. The herein-described process of forming tiles or the like, consisting in applying a semiliquid layer of sand and cement to a highly-polished mold-surface, said materials being in equal proportions and in an extreme degree of fineness, adding thereto a dry layer of the same materials, and finally adding a body layer of sand and cement in unequal proportions.

4. The herein-described process, consist-

ing in applying a semiliquid layer of sand and cement to a highly-polished mold-surface, adding a second layer of sand and cement in a dry condition, adding a body layer of sand and cement in moistened condition, and finally subjecting the mass to pressure.

5. The herein-described process, consisting in applying a semiliquid layer of sand and cement to a highly-polished mold-surface, adding a second layer of sand and cement in a dry condition, adding a body layer of sand and cement in moistened condition and in the proportions of five parts of sand to one of cement, and finally subjecting the mass to pressure.

In testimony whereof I affix my signature in presence of two witnesses.

ORLANDO DUCKER.

Witnesses:
JOHN L. FLETCHER,
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