March 11, 1930. G. C. MARTIN 1,750,113

METHOD FOR FORMING SLABS

Filed March 6, 1928

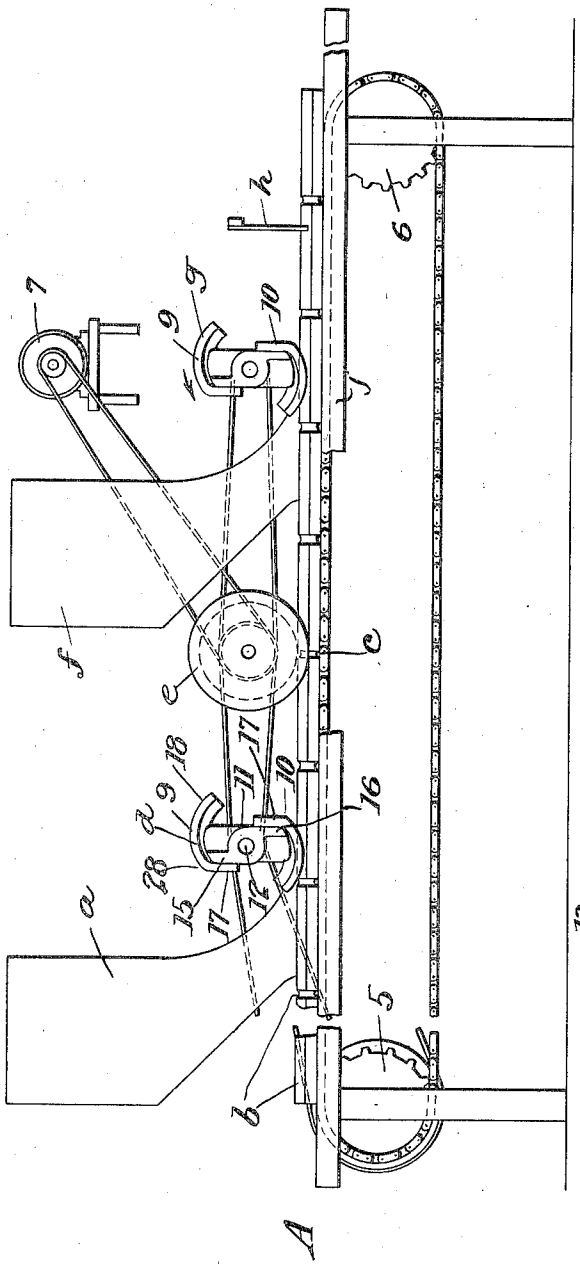

Fig. 1.

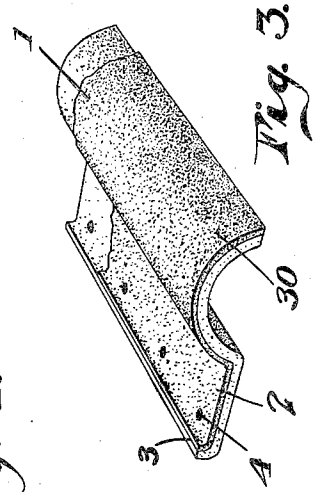

Fig. 3.

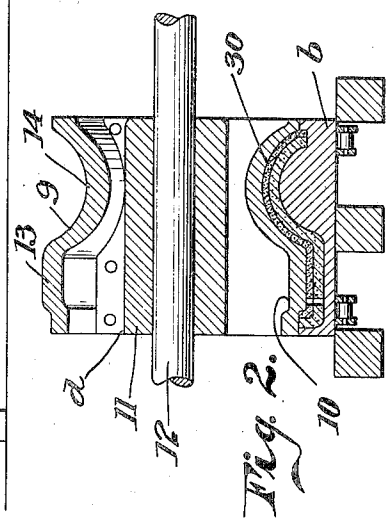

Fig. 2.

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Patented Mar. 11, 1930 1,750,113

UNITED STATES PATENT OFFICE

GEORGE C. MARTIN, OF LOS ANGELES, CALIFORNIA

METHOD FOR FORMING SLABS

Application filed March 6, 1928. Serial No. 259,473.

This invention contemplates an improvement upon my device for forming slabs, Patent No. 1,663,805, issued March 27, 1928.

The invention has for an object the provision of a method for forming tile in such a manner that the resultant tile is waterproof. Concrete tile is water absorbent with the result that when it rains, the weight of the tile is materially increased by reason of such water absorption. When this occurs, heavy roof construction is necessary. With my method of forming the tile, the tile is not only waterproofed, but is waterproofed in such a manner that the tile retains its attractive appearance.

Another object of my invention is the method of waterproofing a tile with asphaltum and in such a manner that said asphaltum does not melt under the influence of heat such as would result upon the hot rays of the sun contacting therewith.

Another object is the provision of a tile which is so waterproofed that a portion of the cement of such tile is drawn to the surface to the end that the surface of said tile may have any color desired.

Another object is the provision of tile of great strength and durability.

Other objects will appear as the specification proceeds, and with such objects in view, the invention consists in the novel and useful provision, formation, construction, association and relative arrangement of parts, members and features, as well as the process of forming the tile, all as shown and described in the accompanying specification and in the drawing, and finally pointed out in the claims.

In the drawing:

Figure 1 is a side elevation of the improved device for forming tile,

Figure 2 is a cross sectional view illustrating the improved tile in the process of being formed, and

Figure 3 is a perspective view, partly broken away, of the formed tile.

Referring to Figure 1, the improved tile making machine as an entirety is designated as A, and the same includes in the present embodiment a hopper *a* adapted to hold tile making material, such as concrete, which concrete is adapted to be deposited upon die members *b*, which die members are supported upon a conveyor *c* to in turn be fed beneath a packer *d* which closely compacts the concrete to shape in the die members, after which the die is fed beneath a smoother *e* immediately followed by said die being passed beneath a second hopper *f* containing a waterproofing material, which waterproofing material is then deposited upon a surface of the formed tile, whereupon this waterproofing material is closely compacted by a second packer *g* similar in construction to the packer *d*. The tile then continues to where it is acted upon by a scraper *h* which removes any excess material from the sides. The pan containing the formed tile is then automatically removed from the conveyor *c* and permitted to cure in the usual manner.

In my issued Patent No. 1,663,805, I have described the tile making machine which describes in detail the elements *a* to *e*, inclusive. This invention, however, relates more particularly to the method of waterproofing the tile after it has been formed by the elements aforesaid, and includes the additional elements *f* and *g* for this purpose, although the elements *a* and *f* correspond, as do likewise the elements *d* and *g*.

It will be noted upon reference to Figure 3 that the tile is of the usual shape, being provided with a curved part 1 which connects with a substantially flat portion 2 terminating in an up-turned end 3. This is in order that the tile may have the curved part overlapping the up-turned end 3 in each instance, as the tile is placed upon the roof. Likewise said tile is provided with the usual pin opening so that the tile may be pinned to the roof and held in position, this pin opening being shown at 4.

As a brief résumé of the invention which has been described in my issued Patent No. 1,663,805, will say that the conveyor *c* may comprise, as shown, a chain or a plurality of chains passed over sprockets 5 and 6 and which sprockets are adapted to be driven by any suitable means, such as shown at 7. The means 7 would constitute a motor having a

chain drive with the smoother *e* with a drive between the smoother and the packers *d* and *g*. A chain drive might likewise be interposed between the packer and the sprocket 6. It is, of course, understood that all of these elements would be mounted in suitable bearings and secured to any form of suitable framing *j*. The hoppers *a* and *f* may assume any form desired, the principle being to deposit the material directly upon the dies in measured quantities. The smoother *e* would have its periphery formed to the shape of the resulting tile and, of course, the die which is illustrated in Figure 2 at *b* would conform to the under surface shape that the tile is to assume.

The packers *d* and *g* are identical in construction and the same include in the present instance two packer heads or dies 9 and 10 of identical construction, and which packer heads are adapted to be secured to a hub member 11, which hub member is mounted upon a shaft 12, the hub being keyed to the shaft so that rotation of the shaft produces rotation of the packer. The periphery of each packer head 9 and 10 in transverse section will conform to the peripheral shape of the dies *b*. In other words, the periphery of each packer head will be formed with a substantially flat portion 13 followed by a concaved portion 14. However, all points on the periphery of said packer head are not equidistantly spaced from the center of rotation of the packer. In other words, each packer head is substantially segmental with the periphery spirally formed. The hub 11 is formed with two arms 15 and 16, which are substantially parallel with one surface of each arm which is substantially tangential to the periphery of the hub. The said packer heads are secured to said arms in any approved manner, each packer head to this end being provided with an arm 17. The periphery of each packer head curves upwardly and outwardly from said arm 17, the portion of less radius relative to the axis of rotation being at the zone where the curve merges with the arm 17, and the portion of greatest radius at the opposite end portion of the packer head. The portion 18 of each of the packer heads just described will be termed the spiral packer blade.

The operation of the device in the making of concrete slabs and considering the elements *a* to *e* inclusive, will be as follows:—We assume that concrete is used, and said concrete is placed in the hopper *a*. A workman would stand at one end of the table or framing *j* and would place the dies *b* on the conveyor and as the conveyor moved forward, the dies would be drawn under the mouth of the hopper *a* and a certain amount of concrete would be deposited therein. The packer *d* would be rotated in the direction of the arrow of Figure 1 and the concrete would be acted upon by the curved leading edge 28 of the spiral packer blades immediately followed by a greater compression of the material between the said packer blades and the die. In other words, this spiral construction permits the material to be progressively acted upon in such a manner as to densely pack the material to a determined thickness. After the tile has had both surfaces formed as just described, the said concrete is acted upon by the smoother *e* which rolls the surface. The die containing the formed tile is next passed under the hopper *f* and there is deposited upon the surface of said formed tile a waterproofing material, which may be hydrocarbon or bituminous material, such as a mixture of emulsified asphaltum and sand, or diatomaceous earth, although I do not wish to be restricted to any particular waterproofing material. However, assuming that asphaltum is used, the sand or whatever material is used with the asphaltum renders the asphaltum sufficiently dense so as not to cling readily to the packer *g*. After this asphaltum has been deposited upon the formed concrete slab, and while the slab is still in its wet condition, the packer *g* will act thereon and pack the asphaltum onto the surface of the slab and under a pressure. It has been found that when this asphaltum is acted upon by the packer *g* that some of the cement in the concrete is actually pulled through the mixture of asphaltum and sand or diatomaceous earth in such a manner as to leave a concrete tile with a layer of asphaltum and on top of the asphaltum a thin layer of cement. The tile is then passed under the scraper *h* which removes any excess material from the sides of the formed concrete slab. The general appearance during the forming of the waterproofed layer on the slab and the packing thereon is illustrated in Figure 2, which shows the waterproofing material at 30.

As has previously been pointed out, concrete tile is water absorbent and for that reason requires a strong roof to support the same. If straight asphaltum was painted upon the surface of the tile, or otherwise placed thereon other than by the method just described, the asphaltum would make a black, ugly tile which from a commercial standpoint would be unsaleable. Furthermore, such a tile would be open to the objection that the asphaltum would melt under the influence of the hot rays of the sun which would cause a running thereof and spoil it as a roofing material. However, the packer *g* acts upon the asphaltum and the concrete slab in such a manner that the cement is drawn through the asphaltum and provides a protective outer covering for said asphaltum with the result, first, that the asphaltum does not run or melt and, second, if the concrete is mixed to begin with with some coloring material, the thin layer of cement on top of

the asphaltum will have the same color as was put in the mix. Tile made in this way has the strength and other durable qualities of concrete. The asphalt covering protects the concrete from water absorption with the result that the roof framing does not need to be as heavy as the weight of the concrete slabs will not increase because there is no water absorption. The cement top provides a base for coloring matter and as has been stated protects the asphalt from the water.

It is obvious that various changes and modifications may be made in practicing the invention in departure from the particular showing of the drawing, without departing from the spirit of the invention.

Having thus disclosed my invention, what I claim and desire to secure by Letters Patent is:

1. The method of forming waterproof concrete tile which consists in first forming the concrete tile to shape, and while it is still wet packing thereon a waterproof substance to draw a thin layer of cement from the concrete to the surface of said waterproof material.

2. The method of waterproofing concrete tile which consists in applying asphaltum to a surface of said tile followed by covering said waterproofing material with a cement.

3. The method of waterproofing concrete tile which consists in first forming the concrete tile to shape and while it is still wet, applying a bituminous material to a surface of said concrete tile under pressure to draw a thin layer of cement through said bituminous material to cover the surface of said bituminous material.

4. The process of forming a concrete slab which consists in providing a colored concrete, forming the colored concrete to shape, applying a bituminous waterproofing material to a surface of said concrete slab and under pressure to draw a thin layer of colored cement to the surface of said bituminous waterproofing material.

5. The method of forming a concrete tile which consists in providing a die, placing concrete within said die, packing the concrete in said die, smoothing the concrete, then placing on a surface of said concrete in said die asphaltum, then packing said asphaltum to provide an intimate bond between said asphaltum and said concrete.

In testimony whereof, I have signed my name to this specification at Los Angeles, California, this 23rd day of February, 1928.

GEORGE C. MARTIN.