W. H. CHAPMAN.

TERRAZZO SAFETY TREAD.

APPLICATION FILED JULY 12, 1919.

1,419,019.

Patented June 6, 1922.

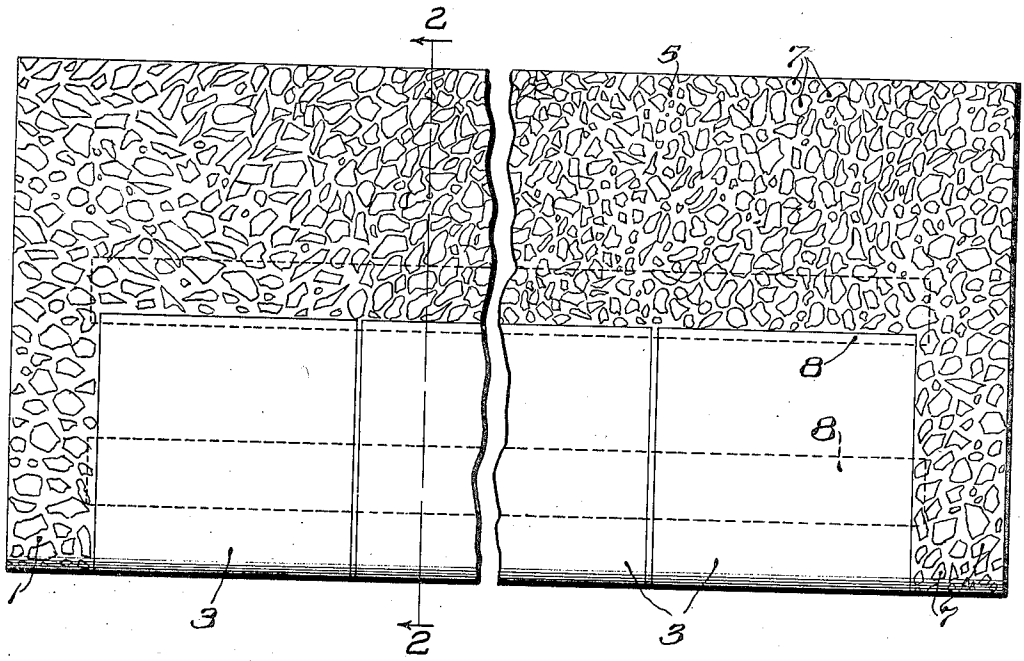


FIG. 1.

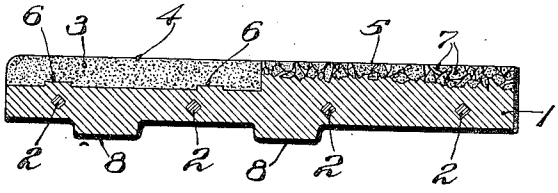


FIG. 2.

INVENTOR

WILLIAM H. CHAPMAN

BY

Clayton L. Jenkins

ATTORNEY

UNITED STATES PATENT OFFICE.

WILLIAM H. CHAPMAN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO NORTON COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

TERRAZZO SAFETY TREAD.

1,419,019. Specification of Letters Patent. Patented June 6, 1922.

Application filed July 12, 1919. Serial No. 310,505.

To all whom it may concern:

Be it known that I, WILLIAM H. CHAPMAN, a citizen of the United States of America, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Terrazzo Safety Treads, of which the following is a full, clear, and exact specification.

My invention relates to safety treads and more particularly to concrete constructions having anti-slipping elements embedded therein, which are especially adapted for stair-treads and platform edges.

Architectural designs ordinarily involve the use of concrete for stairways, platform edgings, etc., but concrete has not been found satisfactory for such uses when considered from the standpoint of safety engineering. Being relatively soft and brittle, it tends to break away on the edge of a stair and to wear under the abrasions of footgear, thus rendering the stair unsafe and requiring it to be rebuilt. Furthermore, if anti-slipping devices are placed on the nose of a stair-tread and concrete is exposed in the rear, the softer material tends to wear away and so produce a rough uneven surface which is likely to cause a pedestrian to trip thereon.

It is accordingly the principal object of my invention to overcome such difficulties and provide an anti-slipping surfacing for stair-treads, platform edgings, etc., which may be built up of setting plastic material having anti-slipping elements fixed in the tread surface thereof; which has a continuous, substantially plane tread surface offering no obstructions to footgear; which is extremely hard, wear-resisting and permanently anti-slipping on the nose of the tread; which is wear-resistant in the rear of the nose whereby the tread may wear substantially uniformly throughout its surface; and which always retains its anti-slipping and wear-resisting qualities.

In the drawings:

Fig. 1 is a top plan view of a stair tread slab unit embodying my invention; and

Fig. 2 is a section on the line 2—2 of Fig. 1.

In accordance with the illustrated embodiment of my invention, I provide a flooring or safety tread surfacing by laying a setting plastic cement, such as Portland cement or concrete, asphalt, magnesium oxychloride, bituminous preparations, etc. In order to provide the flooring with a safety tread, I locate an anti-slipping, wear-resisting safety element, such as a ceramic tile, on the stair nose or in other places of maximum wear and danger to pedestrians and I embed in the cement in the rear of this nosing, fragments or chips of hard material adapted to resist wear and make the tread wear substantially uniformly.

As illustrated, this construction may involve a unitary slab made of reenforced concrete and bearing the anti-slipping elements adapted to form a safety tread, this slab being preferably manufactured at the factory and shipped complete to the point of use where it will be fastened in place by suitable means, such as bolts, cement, etc. This invention, however, relates equally well to a surfacing built in situ of the plastic and anti-slipping elements and materials.

The slab in the present embodiment is made of a cement foundation, such as Portland cement 1, with or without sand, gravel and other similar materials, and which may have reenforcements, such as rods 2, embedded therein to give it strength. The front top surface or nosing of this slab is provided with an anti-slipping appliance which, in the present embodiment, comprises a row of ceramic tiles 3 embedded in the cement, each of which has a plane top surface 4 continuous with the surface 5 of the slab in the rear of the tiles.

For this anti-slipping body, I preferably use a tile which comprises hard, wear-resisting, anti-slipping granular material bonded into an integral mass. Such material should be of great hardness and have high abrasive characteristics to form a satisfactory safety tread, and I preferably use material of a hardness of 8 or more on Moh's scale, such as crystalline alumina and silicon carbide. Crystalline alumina, which best serves my purposes, may comprise the various forms of corundum and emery, which have varying degrees of impurities, but I preferably utilize the crystallized aluminous material made in the electric furnace by fusing bauxite or other substances bearing alumina, the resulting product being mainly crystalline alumina combined with impurities generally present as a slag.

The aluminous material, herein referred to as crystalline alumina, irrespective of its

source and degree of purity, is crushed to the desired sizes, which should preferably include coarse grains because of their desirable anti-slipping qualities, and may be made up of a combination of large and small grain sizes such as the general run of the mill which will pass through a screen of 30 meshes to the inch.

These grains are bonded by a suitable medium, such as ceramic materials, vulcanized rubber, silicates, resinous materials or other bonds adapted to form a strong union between the crystalline grains. The ceramic bonds are preferably used and, depending upon the relative amount of grain present, may be made up of glass fusing materials or those which are adapted to be vitrified like a porcelain, the methods of manufacture not forming part of this invention but being carried on in accordance with well known or desirable operations. These tiles are preferably in the form of flat plates having continuous tread surfaces 4 and irregular under surface portions comprising grooves 6 or other provisions for interlocking with or adhering to the cement. As illustrated, the tiles are located preferably in the medial portion of the nose, it not being necessary to put them adjacent the ends where the pedestrian does not ordinarily walk.

To avoid the expense of making the whole tread surface of these tiles and yet to make the tread body hard and wear-resisting, I form the surface 5 in the rear of the tiles or any other exposed surface which is not subject to excessive wear by incorporating in the cement, chips or mosaic inserts 7 of hard, wear-resisting material adapted to withstand the ordinary abrasions of pedestrian traffic and protect the cement foundation. These chips should preferably have the same degree of hardness, wear-resisting qualities and anti-slipping characteristics as those of the tile, in order that the slab may have uniform wearing qualities throughout its tread surface, and I prefer to form them of the same general materials as are used in the tiles. These terrazzo chips are in various sizes and shapes, but preferably are irregularly surfaced in order to adhere firmly to the cement. They are formed of broken fragments of the bonded alumina tiles and for certain types of slabs each piece may be provided with a plane surface to form the tread, especially where it is desirable that the terrazzo chips constitute the major portion of the surface in the rear of the tiles. They may vary in size depending upon the requirements of the particular tread, but ordinarily are less than 1″ in diameter.

The concrete body of the slab illustrated is made in accordance with well known operations but is preferably made of a mixture of sand and Portland cement in desired proportions. If an aggregate is added to the mixture one might utilize therefor the chips of ceramic bonded alumina. This slab is made ordinarily in a mould by placing the tiles at the bottom adjacent one edge of the mould and the loose chips in the rear thereof, after which the cement may be poured over the mass and a reenforcement of rods or wire fabric embedded therein and the cement permitted to harden. The top surface 5 of the terrazzo may be made slightly higher than the tile surface 4 and then ground off by an abrasive wheel to the plane of the tiles to provide the chips with large plane top surfaces, or these may be formed with plane surfaces and laid as a mosaic either in a pattern or irregularly positioned. In order that the slab may be firmly held on the stair frame work and be prevented from sliding forward over the stair riser, I may provide projections 8 on the under side of the slab and any other suitable means for accomplishing this purpose. It is ordinarily feasible to embed the slab in a mastic of asphaltum placed on the stair foundation. Similarly, the tile 3 may be provided with any suitable means instead of grooves 6, if desired to supplement its naturally porous irregular surface, to aid in securing the tile to the cement slab.

What I claim as new, is:

1. A safety tread comprising a foundation, a wear-resisting, anti-slipping element which includes an edge of the tread and a rear surfacing of wear-resisting chips spaced by a more wearable tread material, said chips forming a considerable portion of the rear surface and protecting said wearable material.

2. A safety tread comprising a foundation, an edging of wear-resisting, anti-slipping, plane surfaced tiles thereon and wear-resisting chips embedded in and spaced by a relatively soft, cementitious matrix forming a terrazzo surface in the rear of and level with the tiles, said tiles and chips having about the same wear-resisting characteristics and receiving substantially all of the wear.

3. A safety tread comprising a cement foundation, an edging of wear-resisting, anti-slipping tiles of bonded abrasive grains embedded therein and a rear surfacing of bonded abrasive chips of substantially the same wear resistance as the tiles spaced by a wearable cementitious medium of lower anti-slipping characteristics than said chips.

4. In a safety tread, a foundation, an edging thereon of tiles of ceramic bonded abrasive grains of a hardness of 8 or more and a terrazzo surfacing in the rear thereof comprising a relatively soft, cementitious matrix and spaced, irregularly shaped chips of ceramic bonded abrasive grains, of substantially the same wear-resisting quali-

ties as the tiles, embedded in the surface of and protecting said matrix from wear.

5. A safety tread comprising a body of cement, a tile of ceramic bonded crystalline alumina embedded adjacent an edging of the tread to form an anti-slipping surface in positions of extreme wear and terrazzo chips of ceramic bonded crystalline alumina embedded in the cement in the rear of the tile in positions of less wear, said terrazzo having a substantially plane surface continuous with that of the tile.

6. As a new article of manufacture, a slab unit for constructing stairs comprising a cement body, slip-proof tiles of ceramic bonded abrasive grains embedded in the cement and forming one edge of the slab, terrazzo chips of about the same wear-resisting characteristics as the tiles embedded in the surface of and protecting the relatively soft cement in the rear of the tiles and means for holding the slab in place on a stair foundation.

Signed at Worcester, Massachusetts, this 9th day of July, 1919.

WILLIAM H. CHAPMAN.