

United States Patent

[15] 3,686,703

Ray

[45] Aug. 29, 1972

[54] **TROWEL FOR BOTH APPLYING
GROUTING MATERIAL AND
REMOVING THE EXCESS MATERIAL**

1,825,080	9/1931	Morford	15/235.4 X
2,586,472	2/1952	McKown.....	15/236 R
3,119,138	1/1964	Davis	15/236 R
3,013,291	12/1961	Matrick.....	15/245

[72] Inventor: **Glenn E. Ray**, Louisville, Ky.

[73] Assignee: **American Olean Tile Company, Inc.**,
Lansdale, Pa.

[22] Filed: **Feb. 13, 1970**

[21] Appl. No.: **10,072**

Related U.S. Application Data

[63] Continuation of Ser. No. 649,713, June 28,
1967, abandoned.

[52] U.S. Cl. **15/235.4**, 15/245

[51] Int. Cl. **E01c 19/12**

[58] Field of Search 15/236 R, 235.3, 235.4, 245;
52/744

References Cited

UNITED STATES PATENTS

1,306,135. 6/1919 Bricker.....15/235.4

FOREIGN PATENTS OR APPLICATIONS

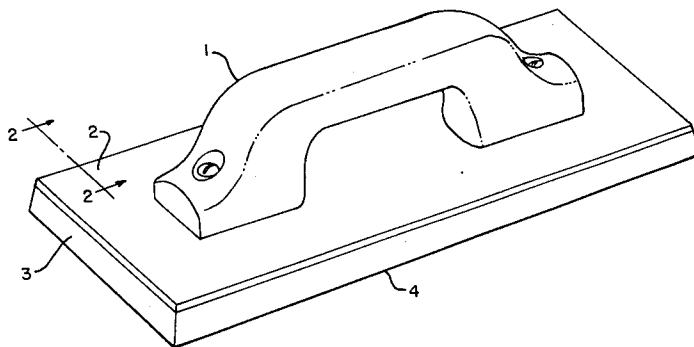
1,753 1/1909 Great Britain.....15/245

Primary Examiner—Daniel Blum
Attorney—Paul & Paul

[57] **ABSTRACT**

All of the excess grouting material, remaining on a newly laid tile floor after the performance of an epoxy grouting operation, is scraped from the floor with a vulcanized natural gum rubber trowel rather than a steel trowel.

8 Claims, 2 Drawing Figures



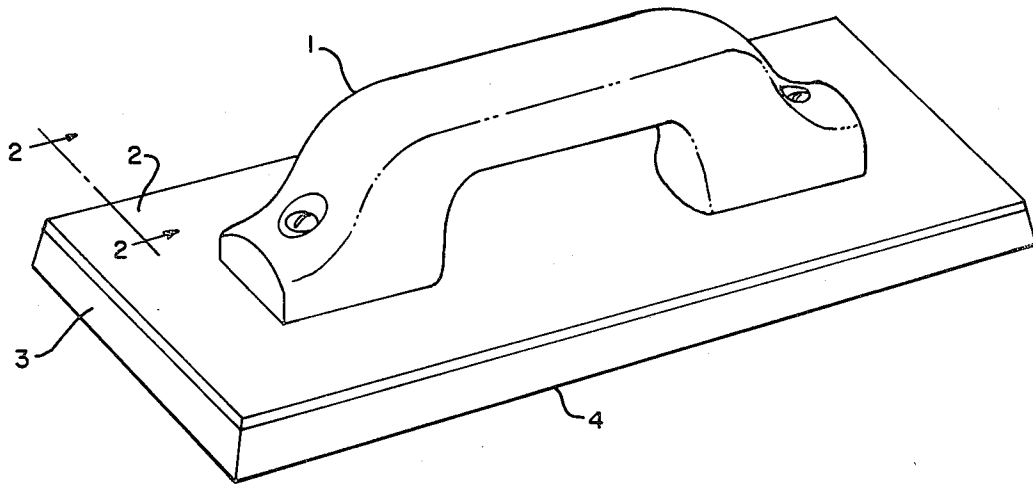


FIG. 1

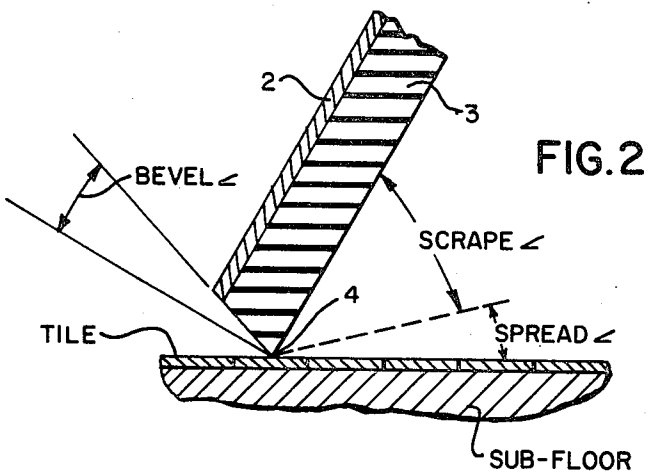


FIG. 2

INVENTOR.
GLENN E. RAY
BY *Arthur Robert*
HIS ATTORNEY

TROWEL FOR BOTH APPLYING GROUTING MATERIAL AND REMOVING THE EXCESS MATERIAL

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation of application Ser. No. 649,713, filed June 28, 1967, now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to the problem of removing the excess epoxy grouting material which remains on newly laid tile after an epoxy grouting operation.

2. Description of the Prior Practical Art

In laying a tile floor, it is common practice to place the tile upon an adhesively coated base with narrow open joints between adjacent tiles. After the tile adheres firmly to the base, the joints are filled (and thus "grouted" with an epoxy resin compound. All epoxy groutings react to a hard impervious state. During and after the reaction, they do not expand or shrink; hence, they have the important advantage of providing strong long-lasting leak-proof joints.

Epoxy grouters normally pour the epoxy mixture over the open-joint surface of the tile and use the straight edge of a steel trowel to scrape that grouting back and forth over the surface of adjacent tiles until the open joints between them are filled. This leaves the floor surface smeared with a mess of epoxy grouting material which must be completely removed in order to leave the floor in a satisfactorily clean condition.

One manually-performed method of cleaning an epoxy-smeared surface may be described as follows: wet floor with hot soapy water; hand rub the surface with abrasive pads to loosen the excess epoxy; and pick up residue with rags or mop and hot soapy water using rubber gloves to protect the hands of the operator. The successful practice of this method involves hard work, a considerable number of man hours, and the waste of a substantial amount of material.

Another representative prior art epoxy grouting practice, as used on a large tile floor, may be stated as follows: (1) five grouters, acting individually over five adjacent 2 x 5 foot areas of the floor, each pour a syrup-like liquid epoxy into and over the joints, each man using an excess quantity over that required to fill the joints, and then each grouter works his grouting material into the joints by holding a steel trowel at a small spreading angle of about 10° to 15° while scraping the trowel back and forth over adjacent tiles until the joints therebetween appear to be filled; (2) about 5 minutes later, a sixth man examines the five areas covered by the five grouters and fills in any low spots in the joints with grouting material usually obtained from the excess remaining on the floor; (3) then a seventh man, while holding a steel trowel at a scraping angle of about 60° and under as heavy a downward pressure as he can reasonably exert, scrapes off as much of the excess as he can; and (4) immediately thereafter an eighth man wets the scraped floor with hot soapy water while a ninth man operates a scrubbing machine over the wet floor, the eighth man following up behind the machine to finish the floor by (a) squeegeeing it to remove the soapy water and epoxy debris, (b) hand rubbing the low corners missed by the machine, (c)

wetting the floor with hot soapy water and (d) picking up the remaining residue with a mop or soft cloth.

Although more floor can be scrubbed with a machine than by hand, it is still very expensive because of the rapid deterioration of the scrubbing pads and the excessive damage which scrubbing causes to the joints. Since the damage to the joints cannot be readily noticed until the floor has cured for several hours, the pointing operation, required to repair such damage usually cannot be started until the following day.

The pointing operation often requires as much time as the original operation. Also, it is not unusual to find it necessary to follow one pointing operation with one or more subsequent pointing operations. Such repairs are objectionable not only because of the man-hour cost but also because the appearance of the floor usually deteriorates to some extent with each repair.

SUMMARY OF THE INVENTION

Objects of the Invention

The principal objects of the present invention are to accomplish one or more of the following objectives, namely: substantially reduce the use of water in all cases and eliminate it in many cases; substantially reduce the time and labor involved in grouting a floor with epoxy; substantially minimize the waste of materials; and substantially eliminate the necessity of pointing or otherwise repairing the grouted joints.

Another important object is to accomplish the foregoing objectives in a manner which enables the excess epoxy grouting material to be more or less completely removed from both smooth and somewhat rough tile and like floors by a simple scraping operation.

Accordingly, in order to accomplish the aforementioned objects of grouting a floor and of scraping excess grouting material from a floor, an improved grouting trowel is provided, which is particularly suited for use in both applying grouting material to surfaces to be grouted and scraping excess grouting material from grouted surfaces.

Statement of the Invention

I have found that the foregoing objects can be achieved by scraping the excess grouting from the floor with a vulcanized natural gum rubber trowel rather than a steel trowel. A trowel, having a sharp, yieldable-but-firm cutting or scraping edge composed of vulcanized natural gum rubber, will cut or scrape the epoxy grouting from a tile surface so completely as to render unnecessary, in some cases, the use of any other cleanup. It substantially reduces the time required to clean the surface and eliminates the use of squeegees and abrasive pads. Furthermore, the yieldability of the vulcanized natural gum rubber enables it to conform to the surface irregularities often found in a tile and like floor and to scrape those surfaces clean despite such irregularities. It doesn't pull the joint material out of place; hence, "hole-pointing" and repair operations are practically eliminated. On floors requiring an even cleaner appearance, the troweling operation can be followed with a mop and hot soapy water to remove any trace of the extremely thin transparent film left from the troweling operation.

BRIEF DESCRIPTION OF THE DRAWING

The invention is illustrated in the accompanying drawing wherein:

FIG. 1 is a perspective view of an epoxy-removing "rubber" trowel constructed for use in accordance with the present invention; and

FIG. 2 is an enlarged fragmentary sectional view taken along a line corresponding to line 2—2 of FIG. 1 showing the angular relationship of the trowel to the tile surface being scraped during an epoxy removal operation.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

The trowel illustrated in FIG. 1 comprises: an inverted U-shaped handle 1 located on the top side of and securely mounted to a metal (preferably aluminum) backing plate 2, which carries, along its opposite major face or bottom side, a mass of solid VNG rubber (i.e., vulcanized natural gum rubber) preferably in the form of a rectangular pad or base block 3 having cutting edges 4 where the bottom surface intersects the perimetric surfaces in a backwardly raked angle, as illustrated in FIG. 2.

By "vulcanized natural gum" rubber, or VNG rubber, I mean the elastic incompressible solid rubber which is variously described as gum rubber, pure gum rubber, raw gum rubber, and vulcanized crude rubber in order to distinguish it from "raw crude rubber," the basic hydrocarbon of the original latex, and from "unvulcanized crude rubber," the raw crude rubber after compounding but before curing. VNG rubber normally has a durometer approximating 40 plus or minus 5 but its durometer may be very substantially increased with processing, including compounding. In the present case, a durometer of about 40 is preferred but durometers ranging from about 35 to about 60 may be employed.

While the size of a trowel, made in accordance with my invention, may vary, it should be large enough to be adequate and yet not so large as to be cumbersome. I have obtained good results with trowels having a bottom face area approximating 4 to 4¼ inches in width, 9½ to 12 inches in length and about 3 inches in height. A thickness of about one-half inch is recommended for the VNG rubber base block pad 3 because the quality of the performance of the trowel progressively decreases as the thickness is made progressively smaller than one-half inch. Performance does not appear to improve with thicknesses greater than one-half inch. These greater thicknesses appear only to increase the weight and cost of the trowel. It is not necessary to bevel the perimetric edge of the VNG rubber pad 3 but a bevel angle of 10° to 15° appears to improve its ability to conform to surface irregularities without deleteriously decreasing its ability to cut off the excess epoxy from any part of the surface of the tile.

In practicing my invention, on newly laid or old floors of brick, tile and the like, each grouter pours an excess quantity of the epoxy grouting material upon the floor and trowels it into the joints of the floor over an area usually approximating 2 × 5 feet. Thereafter, the grouting material may be and usually is permitted to set for 5 to 10 minutes. Now the grouter returns to his in-

dividual area to work into the low spots in the joints whatever quantity of excess material it requires. Thereupon he uses the VNG rubber trowel, under the conventional scraping-angle and trowel-pressure conditions, to remove all of the excess epoxy from the floor except for an extremely thin transparent film which has the "wet" appearance of an oily or waxy residue and which appears to be free of the inert solid particles normally employed in epoxy groutings to give them a desired color.

In some installations, such as packing plants, for example, this thin transparent residue film is permitted to remain on the floor where it forms a hard impervious film having the good properties of conventional epoxy films. In other cases, such as bottling plants, the residue film can be removed by an easily and quickly performed wet mopping operation with hot soapy water.

A VNG rubber trowel made and used in accordance with my invention for epoxy grouting operations has many advantages. It effects a very substantial reduction in the number of men and man hours required by the total operation. It eliminates all hand scrubbing and machine scrubbing operations and the equipment and mess involved in such operations and it practically eliminates "point up"; in fact it substantially eliminates all operations other than joint filling, low spot filling and grout removing operations and enables one man to perform all of the requisite operations over a 2 × 5 foot area in a relatively short time.

A VNG rubber trowel can be kept in good operating condition simply by washing it in hot soapy water at the end of each day. When its cutting edges become worn and dulled, it can be restored by belt sanding the perimeter of the trowel to the requisite degree. Such cutting edge restoring operations should normally be performed after 2 days of use on rough surfaces and 4 days or longer of use on smooth surfaces. Finally, while a VNG rubber trowel has the foregoing substantial advantages when used on epoxy grouting, it may be used like (and in place of) any steel trowel on cement and other grouting materials, which do not present the problems presented by epoxy groutings.

A base block of VNG rubber may be in the form of a ½ inch thick perimetric strip of rubber of desired width mounted to provide the margins of the bottom face of the trowel.

What is claimed is:

1. An improved grouting trowel which is particularly suited for use in both applying grouting material to surfaces to be grouted and scraping excess grouting material from grouted surfaces, comprising a plate support having a bottom side or face, and having a handle thereon, a base block carried by said support and having a lower surface substantially parallel to said support surface, said lower surface being defined in part by at least one straight cutting edge, said edge being yieldable-but-firm and composed of rubber, wherein said straight cutting edge is defined by base block surfaces which intersect in an acute angular relationship into backwardly raked relation relative to said base block lower surface.

2. An improved grouting trowel which is particularly suited for use in both applying grouting material to surfaces to be grouted and scraping excess grouting material from grouted surfaces, comprising a plate-like

5

6

support having a bottom side or face, and having a handle thereon, a base block carried by said support, and having a lower surface substantially parallel to said support face, said lower surface being defined in part by a least one straight cutting edge, said edge being yieldable-but-firm and composed of vulcanized natural gum rubber, wherein said straight cutting edge is defined by base block surfaces which intersect in an acute angular relationship into backwardly raked relation relative to said base block lower surface.

3. The trowel of claim 2, wherein said handle protrudes from said support only an amount sufficient for grasping in the hand of a user, and wherein said base block has an upper surface substantially coextensive with said support bottom face.

4. The trowel of claim 2, wherein the yieldable-but-

firm vulcanized natural gum rubber has a durometer hardness within the range of 35 to 60.

5. The trowel of claim 2, wherein the yieldable-but-firm vulcanized natural gum rubber has a durometer hardness within the range of 38 to 40.

6. The trowel of claim 2, with said base block lower surface being at least as coextensive as said support face.

7. The trowel of claim 2, wherein there are four said cutting edges, each defined by base block surfaces which intersect in an acute angular relationship.

8. The trowel of claim 2, wherein said rubber cutting edges are of predetermined hardness characteristics, compatible with scraping an epoxy type grouting material.

* * * * *

20

25

30

35

40

45

50

55

60

65