March 31, 1970 J. E. JESTER ET AL 3,503,583

PROFILED STRUCTURAL CEMENT SLAB FORM

Filed Jan. 3, 1967 2 Sheets-Sheet 1

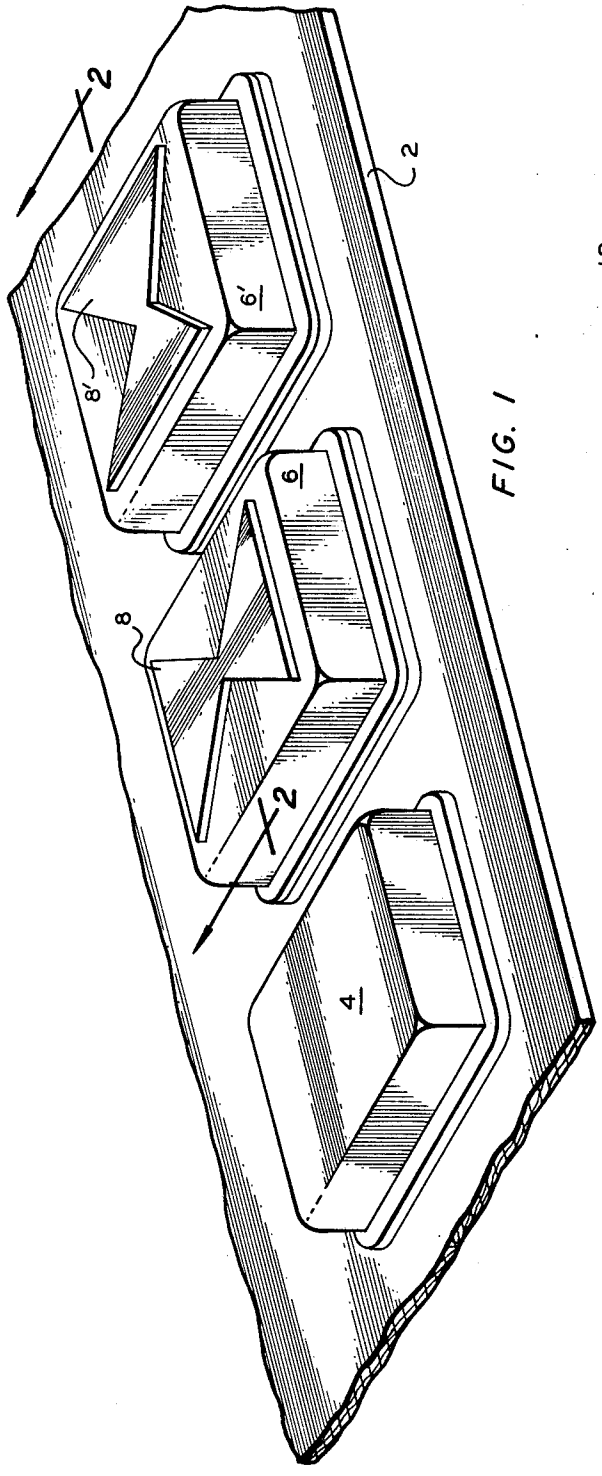


FIG. 1

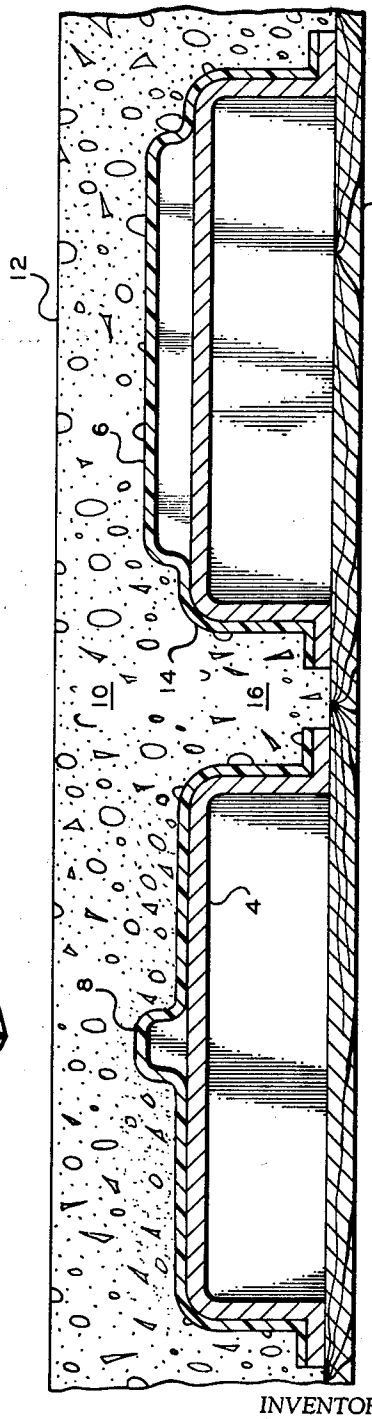


FIG. 2

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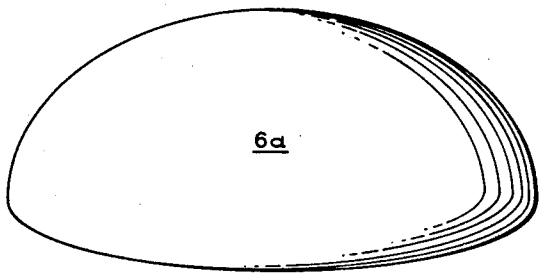


FIG. 3a

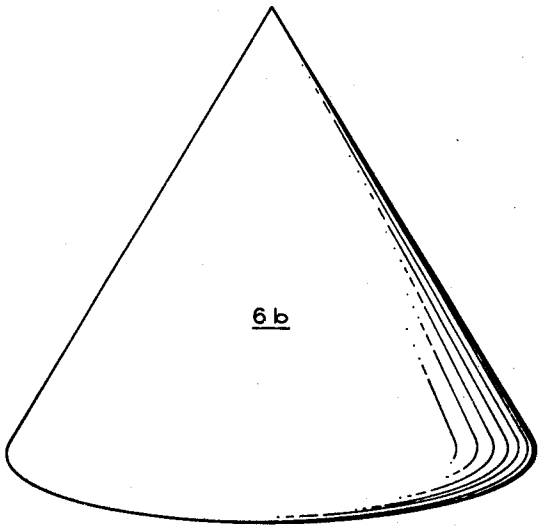


FIG. 3b

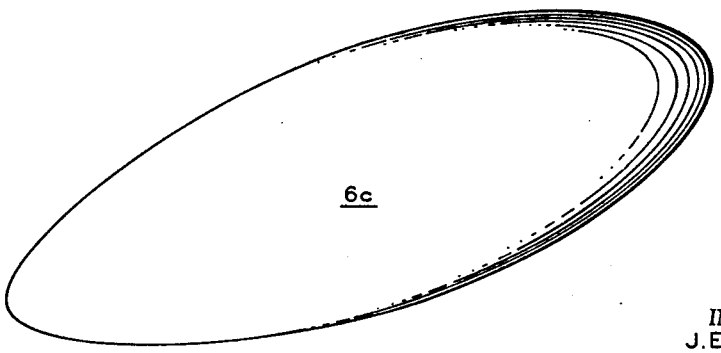


FIG. 3c

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PROFILED STRUCTURAL CEMENT SLAB FORM

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U.S. Cl. 249—176 3 Claims

ABSTRACT OF THE DISCLOSURE

A mold arrangement for casting profile structural cement slabs with the use of a plurality of reinforcing shapes, the shapes being made out of a rigid plastic material which is reinforced.

This invention relates to profiled structural cement slabs. In one of its aspects it relates to an arrangement for casting finished profiled structural slabs in which cement is cast over a plurality of supported reinforced shapes and wherein a rigid plastic is used for the reinforcing shape to contact the cement thereby facilitating removal of the shape without sticking of the cement to the shape.

In concrete floor construction there is a system known as the waffle slab. Its name is derived from the underside appearance of the slab which resembles the breakfast waffle. To form the open spaces in this slab pans are set face down on a supporting surface, reinforcing steel is placed on all sides of the pan and the slab is poured.

The steel pans used presently for the forming of concrete waffle slabs are subject to surface corrosion from being in contact with the concrete mix. Each time a pan is removed from the hardened concrete it must be cleaned and then have a coating of light oil applied to it. Thus, corrosion and surface treatment of the pans make the use of the same expensive in the forming of the waffle slab.

A further problem is encountered with the use of the steel pans. This problem is due to the fact that the concrete will wet the surface of the metal pan causing the pan to stick to the hardened concrete surface. In order to remove the pan, wedges are inserted and hammering must take place. In addition to reducing the life of the pans, the hammering and sticking of the concrete to the pan surface causes the interior surface adjacent the pans to become marred and disfigured due to the sticking of some concrete to the surface of the pans. Thus the formed slab, if used for a finished ceiling, must be hand finished for completion.

Kell, 3,109,217, discloses a solution to the problems encounted with the metal pans. Kell discloses a cardboard or fiber concrete form which form is held in position with respect to a supporting surface upon which the concrete is to be poured, there being a frame initially secured to the supporting surface and then secured to the form assembly whereby to retain the form in a fixed position relative to the supporting surface during and after the pouring of the concrete. Kell also discloses that the cardboard can be impregnated with asphalt and coated with polyethylene. Since cement contains items such as sand and rocks which are harder than the polyethylene coating during the pouring of the concrete and removal of the forms from the hardened concrete, the polyethylene surface is scratched very heavily. This allows the concrete, either during the initial pouring or subsequent pourings, to wet the paper surface thereby causing the same to stick. This involves many problems in removing the forms from the hardened concrete. Additionally, the cardboard forms can be made only in square shapes. The square shapes give rise to sharp corners in the waffle structure. The sharp corners are undesirable for a supporting structure since

they are the areas in which crack initiation is prevalent.

We have now discovered that the above-mentioned problems can be overcome by employing a rigid plastic form which is supported by a metal or other type of structure in making the structural profile slab, the rigid plastic surface being contiguous with the concrete and easily removable therefrom.

By various aspects of this invention, one or more of the following aspects can be attained.

It is an object of this invention to provide a finish profiled structural slab by casting without any substantial hand finishing thereto.

It is a further object of this invention to provide a reusable form for casting cement shapes.

It is a further object of this invention to provide an easily removable shape for casting cement profiled slabs.

It is still another object of this invention to provide a form which can be used in making decorative and ornamental cast cemented slabs for use for ceilings.

It is yet another object of this invention to prevent corrosion of metal forms used in the casting of profiled cement slabs.

Still another object of this invention is to provide a molding shape for use in casting of profiled structural cement slabs of concrete, cement and the like wherein the slabs are non-wettable by the casting material.

Other aspects, objects, and the several advantages of this invention are apparent to one skilled in the art from a study of this disclosure, the drawings, and the appended claims.

According to the invention there is provided an arrangement for casting profiled structural cement slabs wherein a plurality of reinforcing shapes are positioned on a planar support member and the cement is poured over the reinforcing shapes and hardened to form the profiled structure. The structural configuration of the cement slabs is formed due to the presence of the reinforcing shapes on the support member and the planar support member and the reinforcing shapes are removed from the structure after the same has hardened. According to the invention, the reinforcing shape comprises a rigid plastic material which is positioned contiguously with the cement and supported by suitable stronger material. In this manner the removal of the reinforcing shape from the hardened cement or concrete is accomplished with greater facility without any substantial sticking and consequent removal of portions of the profiled structure.

In one embodiment, a metal pan whose shape is similar to that of the rigid plastic material is used to support the plastic material.

In another embodiment, wherein foamed cement is used, the rigid plastic material shape is placed directly on the supporting member and no reinforcement is required therefor.

In still another embodiment, the plastic material has rounded corners and one surface thereof is embossed with an oranmental design with ornamental design is reflected in the finished concrete shape.

The plastic material which is used for the arrangement or mold is preferably vacuum formed from tough resin such as polyolefins including polyethylene, polypropylene, and copolymers of these, butadiene, styrene, acrylonitrile copolymers (ABS), polyvinylchloride and copolymers thereof and and other suitably tough, resilient plastic compositions or blends. Fillers and commonly used additives which improve workability and stability of these resins may be present.

As understood by one skilled in the art, the use of these rigid plastic materials which can be vacuum formed to make the molds, can contain designs or texturing, such as swirl lines, diamonds, etc.

Additionally, release agents such as silicon grease or oil can be applied to the molding surface of the plastic material to permit easier removal of the same from the cement.

The invention will now be exemplified by reference to the accompanying drawings in which FIGURE 1 shows a preferred embodiment of the invention and FIGURE 2 is a view along line 2—2 of FIGURE 1 after concrete has been poured onto the arrangement shown in FIGURE 1. FIGURES 3*a*, *b*, and *c* are exemplary of other shapes which can be used to form concrete forms according to the invention.

Referring now to the drawings, a structural support member **2** which can be made out of plywood or similar flat planar materials is positioned in an area in which the concrete slab is desired to be poured. For example, a ceiling and floor could be poured with the arrangement according to the invention. Positioned on structural support **2** are metal pans **4** in predetermined arrangement. Positioned on the metal pans **4** are plastic pans **6** which generally conform to the shape of metal pans **4** and contain rounded corners. Embossed on top of plastic pans **6** is decorative portion **8** which is integrally formed with the plastic shape. The plastic pan and the metal pan together form a reinforcing shape which imparts the waffle-like shape configuration to the cement slab. The plastic pan **6'** is turned at a 90-degree angle with respect to the pans **6** so that embossed portion **8'** will be rotated 90 degrees from embossed portion **8**. In this manner a decorative and ornamental shape can be imparted to the concrete surface.

As can be seen in FIGURE 2, the concrete **10** whose surface **14** is contiguous with the surface of plastic pans **6** takes the shape of the arrangement comprising the supporting shape **2** and plastic pans **6** including the ornamental shape **8**. An integral joist **16** is formed when the concrete is poured. After the concrete has set, the supporting surface **2** is removed and metal pans **4** and plastic pans **6** are pulled out of the concrete surface. Thus, in this manner an integral ceiling and floor can be formed with the ceiling portion being that profiled shape formed by the arrangement of the reinforcing shapes and the upper floor being formed at surface **12**.

As is understood by one skilled in the art, any type of configuration can be integrally molded into plastic supporting shapes **6**. For example, a textured surface can be provided or swirls or diamonds, etc. Further, the supporting shapes can be rectangular, circular, semicircular, ovid, oval, star-shaped or conform to any architectural design provided it can be molded by suitable means. FIGURES 3*a*, 3*b*, and 3*c* illustrate other shapes which can be used. A dome shape, **6***a*, a cone shape, **6***b*, and a teardrop shape, **6***c* can all of used to make the profiled structural cement slabs.

The plastic shapes can be used numerous times. It may be desirable occasionally to hose down the plastic pans to remove all traces of concrete and to apply periodically a release agent as has been hereinbefore described.

Whereas the invention has been described with reference to the making of a floor and ceiling, it is obvious that other structural shapes such as walls and column supports can be formed according to the invention. Thus the invention provides an arrangement by which many decorative structural shapes can be used and is very well suited for architectural purposes.

The arrangement can be used for pouring any kind of cement including blown cement, sorrel cement, plaster of Paris and concrete.

Other forms of supporting members for the plastic shape can be provided. For example, metal rings or simply supporting columns can be used.

In addition to the formation of decorative and ornamental designs in the finished concrete by the plastic molds, other indentations such as fluorescent light sockets and conduit holes can be provided. The thickness of the plastic shapes will vary with the material used, the weight of the cement used and other factors. Generally, when casting cement with a reinforcing metal pan behind the same, using high-density polyethylene, the thickness of the sheets will be in the range of 10 to 100 mils, preferably 30 to 80 mils.

Reasonable variation and modification are possible within the scope of the foregoing disclosure and drawings without departing from the spirit of the invention.

We claim:

1. A reusable form for casting profiled cement slabs comprising in combination: a planar structural support member having positioned thereon a plurality of metal pans in a spaced apart relationship; and a corresponding plurality of rigid plastic pans positioned on said metal pans to form a waffle-shaped mold configuration, said rigid plastic being selected from the group consisting of polyolefins, ABS, and polyvinyl chloride, each of said plastic pans being in general contact with the shape of said metal pans, said plastic pans having rounded corners and being further characterized by having an integrally formed decorative portion which is spaced apart from said metal support pans, said plastic having a thickness in the range of 30 to 80 mils, a surface of said rigid plastic mold being so disposed as to be in contiguous relationship with material which is cast in said mold.

2. A form according to claim **1** wherein said plastic is polyethylene.

3. A form according to claim **1** wherein said plastic is polypropylene.

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U.S. Cl. X.R.

18—47; 249—134