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[54] **PLASTIC SHELL CONSTRUCTION BLOCK**
19 Claims, 8 Drawing Figs.

[52] U.S. Cl. **52/415,**
52/309, 52/593, 52/606

[51] Int. Cl. **E04b 2/18,**
E04c 2/20

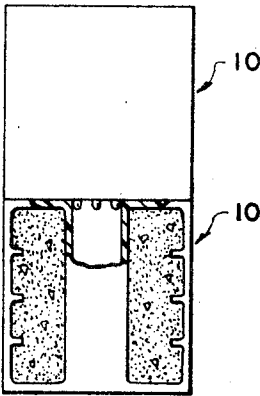
[50] Field of Search **52/309,**
404, 405, 606, 607, 612, 593, 436, 415

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ABSTRACT: A construction block and block assembly thereof is disclosed comprising a formed, finished appearing plastic shell having cavities filled with cementitious material which are separated by pocket means to provide dead air or insulating spaces, having a chemical composition adaptable to fire proofing, resistance to moisture permeation, resistance to rotting and other deterioration, and having high-strength characteristics when filled with said cementitious material.



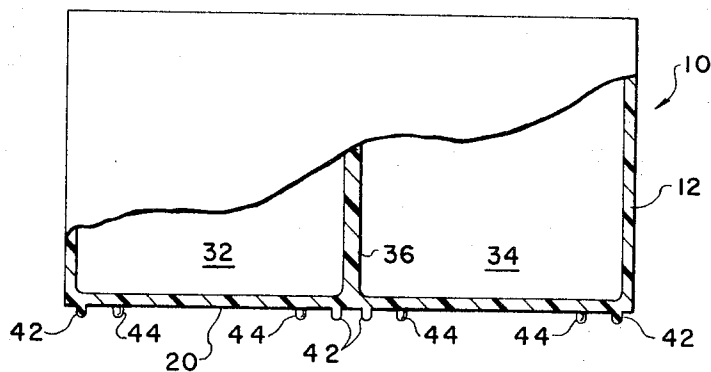


FIG. 1

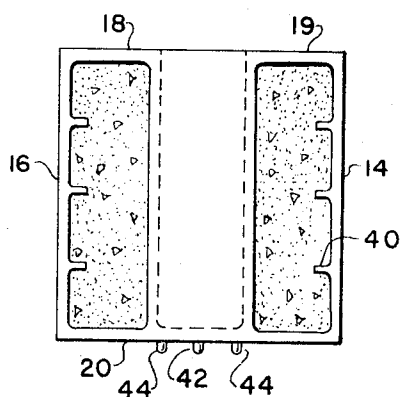


FIG. 2

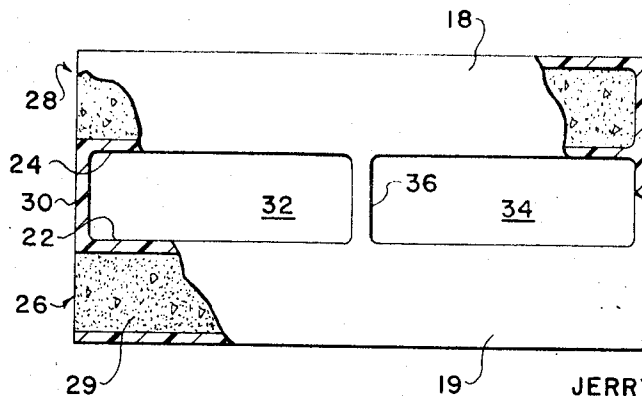


FIG. 3

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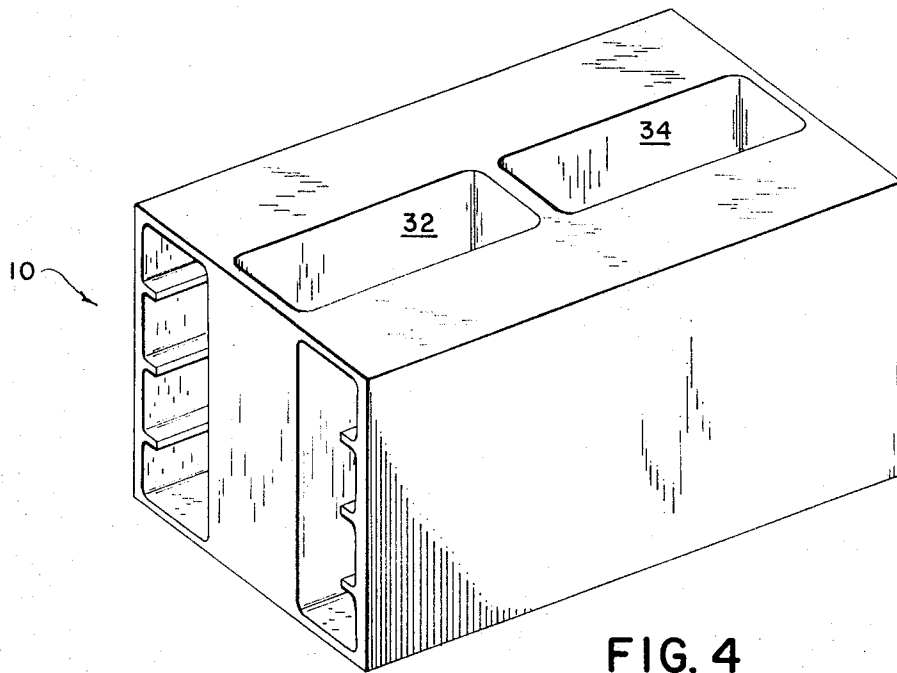


FIG. 4

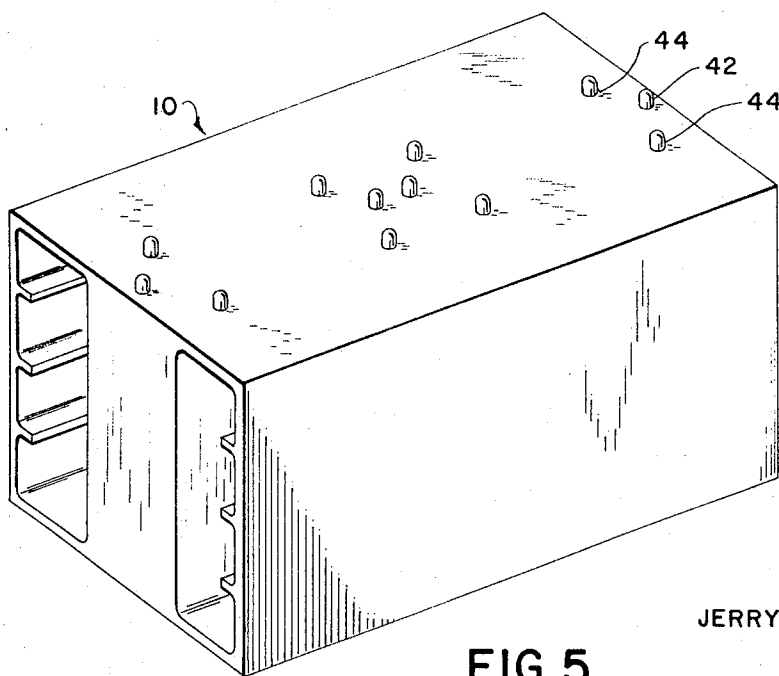


FIG. 5

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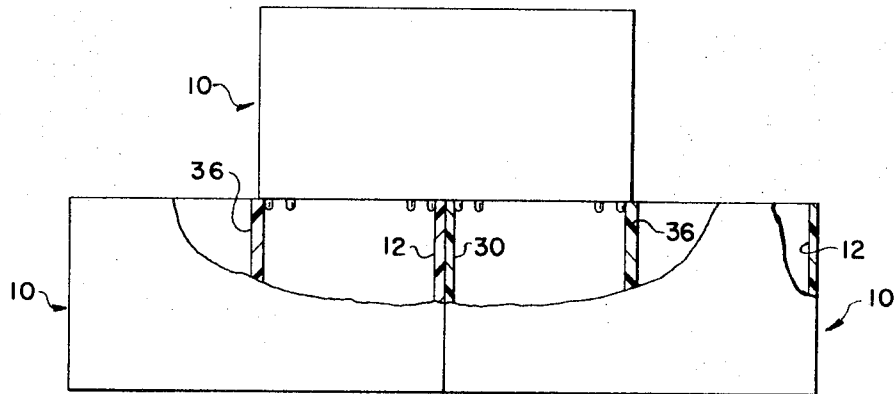


FIG. 6

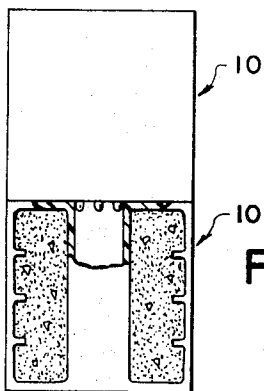


FIG. 7

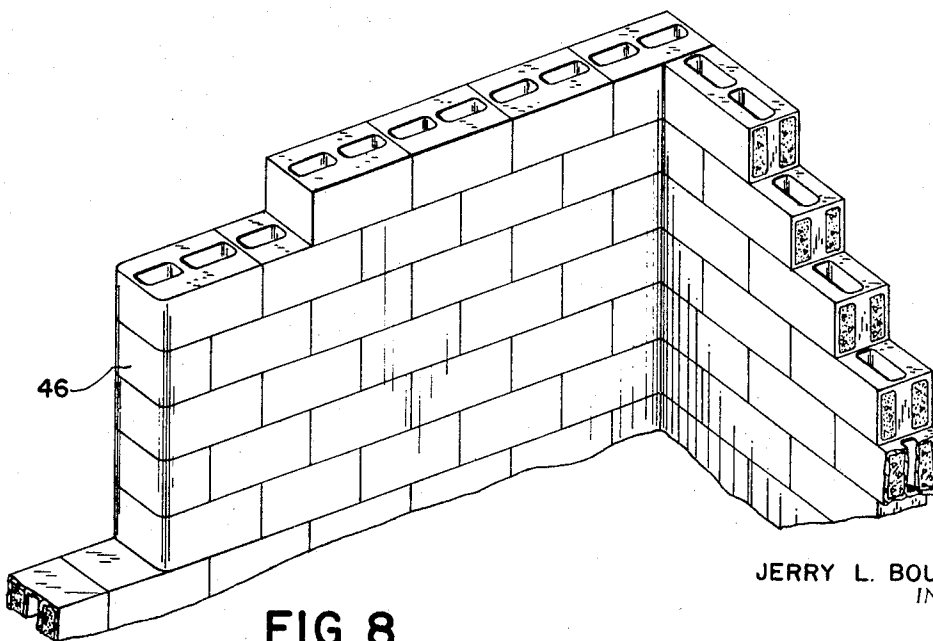


FIG. 8

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PLASTIC SHELL CONSTRUCTION BLOCK

This invention concerns a novel building block construction, and particularly an improved plastic shelled block containing cementitious material.

Conventional cement or cinder building blocks are, of course, of proven suitability for rough wall construction in regard to strength and durability. In certain other aspects, however, such as ease of handling, transportation and installation, resistance to moisture and gas transmission, insulation against temperature differentials and sound, esthetically finished surface appearance, and nondust producing surface, they leave room for considerable improvement.

The weight and construction of conventional cement and cinder blocks present obvious problems in the many handling and transportation steps necessary to place them at the construction site. Their construction and the method of their installation employing mortar requires highly skilled labor to assure their proper alignment and securement in the wall. In this regard, special care must be exercised in constructing basement or other load-bearing walls since even slight misalignment, unevenness or slanting thereof could create involved construction problems for the superstructure.

Home owners are acutely aware of the permeability of cement or cinder blocks to moisture. In addition to the poor heat insulation resulting from this permeability, such moisture seepage through basement walls often directly or indirectly through excessive humidity, damages finished basement construction or articles therein. This problem is quite serious and attempted solutions have been to cover the wall exterior below ground level with heavy plastic sheeting, and to cover the wall interior with heavy coatings of moisture impermeable material.

These problems and many others associated with such construction blocks give considerable added cost particularly to the construction of home basements, schools, commercial structures including kitchens, showers, and other installations where, for example, cleanliness, appearance and dryness are important considerations. Moreover, the considerable skill necessary to properly construct a wall of such blocks further adds to the overall cost of the completed structure and seriously diminishes their utility for low-cost housing wherein, for example, the exterior walls of the house are of construction block.

An object of the present invention, therefore, is to provide a construction block of integrally molded or fabricated construction which has high-strength properties, finished appearance without the need for facing block, surface coatings or the like, which is considerably easier to transport to the construction site and to install than conventional cement and cinder blocks, and which can be readily used in a wide variety of constructions, and in particular, in low-cost housing.

Another object is to provide a permanent type, high-strength construction block having excellent moisture, gas and sound transmission resistance, and excellent weather resistance.

A further object is to provide a permanent type, high-strength, durable, essentially indestructible construction block having plastic exterior surfaces which are essentially fire proof, rot and insect proof, and which can be used directly for interior walls such as in hospitals, service stations, showers, school halls, and food lockers and commercial storage freezers without surface finishing, painting or the like to provide an esthetically pleasing, readily cleanable, and nondust producing surface of any desired color.

A further object is to provide wall structures comprised of construction blocks having the characteristics of the above objects, wherein the wall structure is essentially seamless.

A still further object is to provide a construction block as in the above objectives which can be installed readily by unskilled labor.

These and other objects hereinafter appearing have been attained in accordance with the present invention by means of a novel plastic shelled block containing cementitious material in certain portions thereof. Further understanding of the present invention may be had from the following detailed description and drawings wherein:

FIG. 1 is a side view of a construction block according to the present invention with portions broken away to show dead air spaces;

FIG. 2 is a view of the open end of the block of FIG. 1 with cementitious material therein;

FIG. 3 is a top view of the block of FIG. 1 with portions broken away to show filled portions;

FIG. 4 is a perspective view of the block looking toward the top, open end and side;

FIG. 5 is a perspective view of the block looking toward the bottom, open end and opposite side from that of FIG. 4;

FIG. 6 is a side view of assembled blocks with portions of the bottom blocks broken away to show the longitudinal assembled position of the projecting alignment means in the pocket means;

FIG. 7 is an end view of assembled blocks of FIG. 6 with portions broken away to show the lateral assembled position of the projecting alignment means in the pocket means; and

FIG. 8 is a perspective view of a wall section of assembled blocks of the present invention.

Referring to the drawings and particularly FIGS. 1—5, the block generally designated 10 comprises a shell having an end wall 12, sidewalls 14 and 16, top wall segments 18 and 19, and a bottom wall 20. A pair of interior walls 22 and 24 extend the length of the shell to end wall 12 and in conjunction therewith and with sidewalls 14 and 16 and top wall segments 18 and 19 define cavities 26 and 28 which are adapted to contain cementitious material 29.

Walls 22 and 24 conjoin with an end wall segment 30 to thereby form pocket means, which is the particular embodiment shown comprises pockets 32 and 34. A web 36 which may, but does not have to, completely separate pockets 32 and 34, may be provided to strength the shell and finds use for alignment purposes described hereinafter in detail. Longitudinally extending strengthening ribs such as 40, of any desired number, may be provided, however, if the plastic walls are sufficiently strong without them, they may be eliminated.

The type of plastic from which the shell may be formed is limited only by such practical considerations as strength, hardness, flowability under stress, and the like, as related, of course, to the use to which the blocks are to be put. Among the useful types may be mentioned the thermoplastic polyolefins polyvinyls, polyesters, and cellulose, the thermosetting polyesters and polyvinyls, the formable elastomeric materials, phenol/formaldehyde molding resins, melamine resins, and the like. These resins may contain the well known stabilizers, fillers, pigments, dyes, fire retarding agents, antifungicides, insect repellants, and the like, again the choice of additive reflecting the use made of the blocks.

The dimensions of the shell may, of course, be varied according to structural requirements of the wall. Moreover, the shell may be formed by a single molding operation or fabricated by adhesively securing together, preferably in a convenient jig structure, the separately formed end wall 12, sidewalls 14 and 16, top wall segments 18 and 19, bottom wall 20, interior walls 22 and 24, end wall segment 30 and web 36.

Suitable adhesives for fabricating and assembling the finished blocks in a wall for these conventional plastics are well known and include elastomeric cements in water emulsion or solution, particularly for the molded polyolefins where the surface thereof has been oxidized, vinyl acetate or vinyl acetate alloy cements, polyurethane (slow curling). Solvents such as ketones and esters are particularly useful for molded cellulose and polystyrene. Epoxy cements are generally useful for molded polyesters and polyvinyls.

An important aspect of a preferred embodiment of the present invention resides in the projecting alignment means

comprising longitudinal aligning studs 42 and lateral aligning studs 44, each preferably integrally formed on the bottom wall 20 and having a convenient diameter and length, for example, of about one-fourth inch. Aligning studs 42 are preferably spaced inwardly from the ends and midportion of the shell as shown in FIG. 5 a distance essentially equal to the thickness of end wall 12 or end wall segment 30, both preferably being of the same thickness. It is further preferred that aligning studs 42 and 44 have rounded ends such that they will readily and snugly fit the length and width dimension of the aforesaid pockets as shown in FIGS. 6 and 7. Stud 44 preferably provide an overall width dimension essentially equal to the width of pockets 32 and 34. Such stud structure will assure essentially perfect longitudinal and lateral alignments of the blocks. Variations in the shape and size of these studs can, of course, be readily made.

In accordance with the embodiment of the present invention wherein the blocks are to be longitudinally offset as shown, for example, in FIG. 6, the web 36 is preferably twice the thickness of end wall 12 and is positioned midway along the longitudinal axis of the block. This double thickness of web 36 allows a standard block to be employed, that is, a block on which the aligning studs 42 can be longitudinally positioned such that the blocks can be stacked directly on top of each other or offset as shown in said FIG. 6.

It may be convenient in certain block assemblies to either remove some of the aligning studs or not to provide them in the production of the shell. For example, where the blocks are superimposed at right angles to each other, it may be necessary to remove the stud or studs from the superimposed block which might interfere with its placement. Removal of the studs can be accomplished, of course, by a simple cutting or hammer blow operation, depending on the toughness of the plastic employed.

Referring further to FIG. 6, an extremely advantageous embodiment of the present invention is shown. In this figure, the aligning studs 42 positioned adjacent the midpoint of bottom wall 20 are shown as actually clamping end wall 12 and end wall segment 30 securely together. This feature prevents spreading apart of the blocks in a longitudinal direction before the adhesive cement has dried or cured. This feature allows the use of adhesives or solvents of slow cure or slow drying rates with the advantage of being able to apply the adhesive in a careful manner over entire layers of block without concern for premature curing or drying thereof. Moreover, such adhesives allow the job to be unattended for periods of time such as lunch hours and the like even though the adhesive has already been applied to the blocks.

It may be necessary to employ half blocks such as 46 shown in FIG. 8 for corners, windows or door openings or the like. These half blocks have essentially the same construction as full block 10, except that the ribs 36 are seldom needed, and the aligning studs may be omitted from the midportions of the block.

In actual use of the present block, the shell may be transported to the construction site where the cavities 26 and 28 can be filled with cement preferably from a bulk source. Suitable confining forms may be employed to support the walls of the shell and prevent bulging thereof during the filling operation and the initial setting-up period of the cementitious material. Excess cement is readily skimmed from the open end of the shell which is conveniently filled in an upright position and rows of shells may be filled from a bulk source in a substantially continuous manner. The cement is sufficiently hardened after a day or so to allow block assembly.

The invention has been described in detail with particular reference to preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinabove and as defined in the appended claims.

I claim:

1. A plastic shell for a construction block, said shell having a generally rectangular exterior configuration and comprising

sidewalls, an end wall, a pair of spaced top wall segments each extending the length of said shell and being joined with one each of said sidewalls and with said end wall, a bottom wall conjoint with said side and end walls, interior walls extending between one each of said top wall segments and said bottom wall for the internal length of said shell and spaced inwardly from said sidewalls to form thereby longitudinally extending cavities open at the end of the shell opposite said end wall, and an end wall segment extending between and conjoint with the end portions of said bottom and interior walls opposite said end wall to form thereby pocket means opening at the top of said shell.

2. The plastic shell of claim 1 wherein projecting alignment means are provided on said bottom wall and adapted to nest in the pocket means of an underlying shell.

3. The plastic shell of claim 2 wherein a web connects the internal walls essentially midway the length of the shell.

4. The plastic shell of claim 3 wherein said web is twice as thick as said end wall, wherein said projecting alignment means is spaced longitudinally from said end wall and end wall segment a distance essentially equal to the thickness of said end wall, and wherein said end wall and end wall segment are essentially the same thickness.

5. The plastic shell of claim 2 wherein said projecting alignment means have an overall width dimension essentially equal to the width of said pocket means.

6. The plastic shell of claim 4 wherein said projecting alignment means have an overall width dimension essentially equal to the width of said pocket means.

7. The plastic shell of claim 1 wherein longitudinally extending ribs are provided on the insides of the sidewalls.

8. The plastic shell of claim 1 comprising an integral single piece molding.

9. The plastic shell of claim 1 wherein the various portions thereof are adhesively secured together.

10. A construction block comprising the plastic shell of claim 1 wherein the said longitudinally extending cavities are filled with cementitious material.

11. A construction block comprising the plastic shell of claim 2 wherein the said longitudinally extending cavities are filled with cementitious material.

12. A construction block comprising the plastic shell of claim 4 wherein the said longitudinally extending cavities are filled with cementitious material.

13. A construction block comprising the plastic shell of claim 6 wherein said longitudinally extending cavities are filled with cementitious material.

14. The plastic shell of claim 3 wherein the said end wall and end wall segment are essentially the same thickness, wherein the said web is essentially twice the thickness of said end wall, and wherein the said alignment means comprises aligning studs positioned on opposite sides of the transverse center line of the said bottom wall and each spaced equidistantly therefrom a distance equal to the thickness of said end wall.

15. A construction block comprising the plastic shell of claim 14 wherein said longitudinally extending cavities are filled with cementitious material.

16. A wall section comprising layers of the construction block of claim 15 wherein the blocks in each layer are offset from the blocks in an adjacent layer by essentially one-half the length of the block.

17. A wall section of layers of adhesively connected construction blocks, each of said blocks comprising a plastic shell having a generally rectangular exterior configuration and comprising sidewalls, an end wall, a pair of spaced top wall segments each extending the length of said shell and being joined with one each of said sidewalls and with said end wall, a bottom wall conjoint with said side and end walls, interior walls extending between one each of said top wall segments and said bottom wall for the internal length of said shell and spaced inwardly from said sidewalls to form thereby longitudinally extending cavities open at the end of the shell opposite

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said end wall, and an end wall segment extending between and conjoint with the end portions of said bottom and interior walls opposite said end wall to form thereby pocket means opening at the top of said shell, said longitudinally extending cavities being filled with cementitious material.

18. The wall section of claim 17 wherein said shell has pro-

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jecting alignment means on the bottom wall thereof nesting in the pocket means of an underlying shell.

19. The wall section of claim 17 wherein the blocks in each layer are longitudinally offset from the blocks in an adjacent layer by essentially one-half the length of the block.

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