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Concrete Wall - Plastic Modular Form Block

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Purpose

The purpose of this invention is to enable contractors and “do-it-yourselfers” to build concrete walls in an efficient, cost effective, esthetically appealing manner without the need for excessive manpower and without the use of custom-built forms. Custom-built forms often utilize wood or wood laminates that can only be used once and discarded. Even when the wood forms can be reused, the labor involved in the setup, assembly and bracing can be excessive, and combined with the cost of removing, handling and storing the forms after the wall is completed, the overall cost is doubled. Our product provides a plastic interlocking block system that can be easily assembled with minimal additional materials, and becomes part of the final wall, eliminating the need for disassembly.

Although this was initially developed for use in building retaining walls, it is also useful and efficient for the construction of foundations, sound walls, property barriers, etc. The strength and stability of the finished wall using this system will be considerably greater than a cinder block wall, or concrete block & mortar wall of any kind.

Concept

The blocks used for the wall assembly are made of a rigid “High Impact Polystyrene” (HIPS) plastic material. The blocks themselves are interlocking (almost like the leggo blocks used by children) and when assembled provide a network of interconnected cavities that will ultimately be filled with liquid concrete. The plastic blocks are designed to provide for the insertion of steel reinforcement bar (rebar) in a vertical and horizontal configuration, as well as a rear-attached rebar for connecting the form to what is commonly called a “dead-man” anchoring system.

This wall assembly will be adaptable to many applications, terrains, slopes, obstacles, etc., and will be effective at various heights as well as variable heights.

The marketing and distribution of the finished product would involve an instruction manual addressing such issues as base preparation, rebar installation, bracing and dead-man requirements, maximum pouring height, end parts and accessories, capping, drainage, etc. There will also be a well explained method of stabilization to prevent the assembly from “floating” as the concrete is introduced into the form.

Specifications

The specifications cited here are merely suggestions or examples, and ultimately subject to the engineering requirements, application testing, strength and capacity requirements, etc. Specifications will be referred to throughout this document, and are again subject to

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this same disclaimer. All are subject to change or modification as the we seek to address the many applications that may arise.

The basic specifications of the main part are as follows (subject to change):

- Height 8 inches
- Length 18 inches
- Width 9 inches

Production of this part will be done by injection molding.

Long range plan:

Because this wall-forming system will ultimately involve a number of structural variations and versatility, requiring the use of a variety of supplemental component parts, it is important that the development of the “main” part be done in a manner that will lend itself to the implementation of the parts scheduled for later development. Connecting points and interlocking features must be designed with a high degree of precision so that all parts will match correctly.

Examples of this are as follows:

- A cap part, which is basically a plastic snap on ring might be used to lock the top row of blocks, and to create a smooth top surface (and cover the interlocking pins) when necessary.
- A plastic snap pin might be used to plug the rear dead-man rebar slot when not used.
- 90 degree (Right) and 90 degree (Left) wall turns require that the pins of the block sidewalls, align with the receptacles on the under side of the block end walls.
- As demand dictates, additional blocks might be designed with different facing designs, colors, textures (such as imitation stone), etc.

Assembly

The finished plastic parts will be assembled in the following manner:

A row of plastic blocks will be laid along a level and straight configuration, interlocking the blocks using the male and female interlocking protrusions and channels.

A second row will be laid on top of the first row, with each plastic block being offset laterally $\frac{1}{2}$ block from the first row; a construction technique known as “breaking joints”. The second row will interlock with the first row using the male and female interlocking points.

Rebar can be placed horizontally and vertically in accordance with installation instructions (or as needed) and the placement of and connection to dead-man anchors can

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be accomplished as needed through the rebar slots at the bottom of each part. Unused slots can be plugged using a plastic cap inserted inside the part to avoid the loss of liquid concrete and prevent air pockets.

Bracing and leveling will be very simple and the instructions will address these functions.

The textured plastic facing will be visible on the face of the finished wall. The wall can be capped in a number of ways (wood, metal, stone, etc.) although no finishing technique is required.

Drainage can be accomplished in wet areas by inserting a section of PVC pipe in one or more sections of the wall form (from back to front) and then after pouring, removing a circular section of the plastic facing and back panels at the location of the drains.

The resulting interconnected cavities from this assembly form a solid concrete wall, complete with steel reinforcement bars as needed.