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(54) Method of making a concrete or like building construction and a constructional mould unit for use in the method.

(57) Hollow, interengaging mould units 10 are built-up to provide a hollow mould for a retaining, or other, wall. The hollow mould is filled with a flowable composition such as concrete. Some lower units 40 may have side apertures through which a first portion of concrete flows to form footings 44 for the wall. A ring beam of a retaining wall may be formed similarly by use of apertured upper units 40.

The mould units 10,40 are each generally cuboid and have apertured tops, bottoms and opposed ends. An upstanding collar on each unit fits inside the lower walls of another unit in building the hollow mould. Each mould unit may comprise two or three sub-units which are square in plan to allow a mould having right-angled corners to be made.

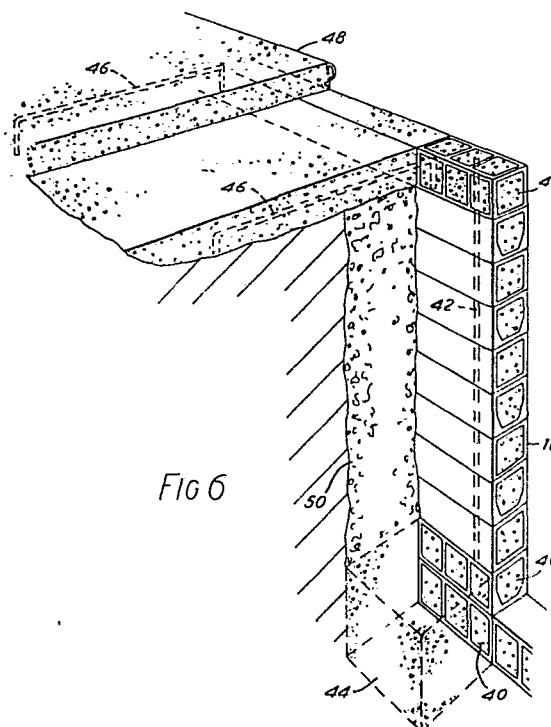


Fig 6

METHOD OF MAKING A CONCRETE OR LIKE BUILDING
CONSTRUCTION AND A CONSTRUCTIONAL MOULD UNIT
FOR USE IN THE METHOD

This invention relates to a method of making a building construction, especially a retaining wall, such as may be used in the construction of swimming pools, and to a constructional mould unit for use in the method.

5 In order to construct a concrete building construction, for example a wall, it is customary to provide metal or wooden shuttering defining the outer surface or surfaces of the intended construction. The space thus defined is then filled with concrete, and when the concrete is sufficiently hard the shuttering can be
10 removed. This is not a procedure which is well suited for the amateur. Erection of the shuttering is a heavy job, and yet the accuracy of the construction will define the finish of the resultant wall.

 With these problems in mind, the present invention provides
15 in a first aspect a method of making a building construction, comprising the steps of providing a plurality of hollow mould units capable of interengaging with one another, erecting shuttering by building up the mould units to provide a hollow mould of inter-engaged mould units and filling at least the interior of the hollow
20 mould with a flowable, settable building composition.

 Preferably, the method also includes the steps of providing at least one mould unit having an apertured side face, erecting the shuttering such that the apertured mould unit is in a lower portion of the hollow mould, supplying building composition to the lower
25 portion, whereby building composition flows from the mould through the aperture and allowing the building composition to set, the building composition which has flowed from the mould providing a footing for the construction. The building composition may be supplied in a first portion which forms at least the footings of
30 the construction and a second portion to complete the construction. The building construction may be a retaining wall, for example of a swimming pool, and in this case, the method may include the further steps of providing at least one further apertured mould

unit, erecting the shuttering such that this further unit is in an upper portion of the hollow mould, and back-filling a cavity formed between the shuttering and earth to be retained by the wall, the second portion of building composition flowing through the aperture of the further mould unit to set into an anchoring beam, in the example of a swimming pool, a ring beam, integral with an upper portion of the wall.

The invention provides in a second aspect a constructional mould unit for use in the above-defined method, the mould unit being generally cuboid and defining a single hollow interior, one or both opposed side walls of the unit being solid, two opposed ends of the unit being apertured and the top and bottom of the unit being apertured and shaped for interengagement when two or more mould units are erected into shuttering to provide a mould for receiving building composition.

The invention will now be described in more detail by way of example with reference to the drawings, in which:-

Figure 1 is a perspective view of a mould unit embodying the invention;

Figure 2 is a section through the view of Figure 1 taken on the lines II-II in Figure 1;

Figure 3 is an elevational view of a wall constructed in accordance with the invention, with part of the top section broken away for clarity;

Figure 4 shows a modified mould unit provided with latching means for engaging with the units above and below;

Figure 5 shows a smaller similarly modified mould; and

Figure 6 illustrates the construction of a swimming pool wall in accordance with this invention.

Referring to the drawings, Figures 1 and 2 illustrate a generally cuboid constructional mould unit formed of plastics material. The unit 10 has opposed solid sides 12, opposed apertured ends 14, and a top 16 and bottom 18. The bottom is completely open, as seen in Figure 2 whereas the top has an arrangement of collars or sleeves 20, the outer periphery of which conforms to the inner periphery of the bottom 18 of the unit. Thus, units can be nested one on top of another with the sleeve portions

20 entering into the open bottom of another similar unit. The unit shown in Figures 1 and 2 is a three-element unit, in that there are three square-section sleeve portions 20 at the top of the unit, thus enabling the units to be built up in staggered fashion, as shown in Figure 3.

The dimensions of the unit shown are approximately 300 mm long by 100 mm wide by 100 mm high to the shoulder 22 on which the next higher block rests. The sleeves 20 extend approximately a further 20 mm higher than the shoulder 22. It will be appreciated that the unit may be of other dimensions, particularly multiples of basic element in the form of a 100 mm cube.

As will be seen from Figure 2, the unit defines a single communicating hollow interior, there being small supporting gussets 24 at the one-third and two-third positions along the length of the mould unit.

Figure 3 shows a wall in the process of being built using the units shown in Figures 1 and 2 to define shuttering for concrete 30. The concrete can be poured in through the open sleeves 20 of the uppermost line of mould units, and because of the apertures at the end of the units and the fact that the units are essentially hollow, the concrete will tend to flow along the shuttering to provide an essentially level top surface for the concrete. When the concrete has set the structure provides a solid concrete wall, the surface of which is defined by the surface of the mould units. It is thus possible to provide a wall the strength of which is provided by the concrete, but the finish to which is provided by the plastic mould units.

It will be appreciated that the building up of the mould units to provide permanent shuttering of the desired format is very much simpler than the known methods of constructing concrete shuttering. Furthermore, the shuttering does not have to be removed after use.

A shaped moulding may be provided to latch onto the sleeves 20 of the uppermost line of units to provide a desired top finish to the wall. Depending on the desired finish of the top surface, the mould units may be used the other way up if so desired.

As noted above, each of the three sleeve portions 20 is square in plan. It is therefore possible to form a right-angled corner using the mould units. In this case the apertured ends 14 at the corner may need to be covered by suitable clip-in blanks.

5 Figure 4 shows a modified mould unit which is approximately 200 mm long, having two square apertures along its top instead of three as shown in Figure 1. The unit also carried lugs 32 near its bottom edge on the inside which engage with holes 34 in the sleeves 20 at the top of the next block below. In this way the
10 blocks can be latched to each other in the vertical sense to improve the stability of the construction.

Small guide channels 36 can be provided above the holes 34 to enable the lugs 32 to slide into the holes under natural deformation of the plastics material from which the units are formed. A
15 single-element mould unit modified in the same way is shown in Figure 5.

The construction of a swimming pool retaining wall will now be described in more detail with reference to Figure 6. Initially a hole is dug of a size slightly larger than the size
20 of the required swimming pool. A wall is then built up of the mould units using appropriate bonding by staggering of the courses, as indicated in Figure 3. The bottom two courses or so can be formed of modified units 40 which are open to one side, the closed side then facing inwardly of the pool. The top course is likewise
25 constructed of similar units. The open sides can be formed by knock-out sections of the standard unit, or special units can be provided for these courses.

The top course is now checked to see whether it is level, and small wedges are inserted under the bottom of the wall until
30 it is.

Now vertical reinforcing rods 42 are inserted at defined spacings of e.g. 1.2 m. As an alternative to using reinforcing rods the wall can be constructed with piers to give it extra strength, but this greatly increases the amount of concrete
35 required and the complexity of the structure so it is preferred to use reinforcing rods.

Concrete can now be poured into the wall through the open top course, and as this is done some of the concrete will escape through the open side of the bottom two courses into the space behind the wall. In this way footings, diagrammatically indicated at 44, are formed integrally with the wall, giving considerable strength. When the footings are sufficiently high the concrete is allowed to set, the concrete then reaching typically half-way up the wall. The space behind the wall is then back-filled with gravel or other suitable material 50, to a level just below the top course of units 40.

Now, more concrete is poured into the wall to fill the wall almost to the top, and further reinforcing rods 46 are now inserted through the side holes in the top course of the wall. These rods are bent at each end as shown to act as tie rods. The wall is now finally filled up with concrete, which again pours out of the side openings in the top course of bricks to form a so-called ring beam around the wall in which the tie rods 46 are embedded, and the concrete allowed to set.

In this way a wall of integral and strong construction can be formed very simply. It is not necessary to dig down to provide footings for the wall as these are all part of it. Thus the bottom course of bricks can be laid on bare earth. Likewise the top of the wall is strong and well retained because it is integral with the ring beam.

The top of the wall can be finished attractively with paving slabs 48 laid on the ring beam.

Thus it is seen that the use of the mould units in this way enable a very professional finish to be obtained by inexperienced personnel by following a simple set of instructions.

While the use of concrete has been described, other flowable setting building compositions may be used instead. Examples are filled foamed plastics resins, for instance incorporating fly ash. Foamed or reinforced concrete could be used.

CLAIMS

1. A method of making a building construction, comprising the steps of providing a plurality of hollow mould units capable of interengaging with one another, erecting shuttering by building up the mould units to provide a hollow mould of interengaged mould units and filling at least the interior of the hollow mould with a flowable, settable building composition.
2. A method according to claim 1, in which the building construction is a retaining wall.
3. A method according to claim 1 or 2, in which the building composition is concrete.
4. A method according to any of claims 1 to 3 in which the mould units are of plastics material.
5. A method according to any of claims 1 to 4 including the steps of providing at least one mould unit having an apertured side face, erecting the shuttering such that the apertured mould unit is in a lower portion of the hollow mould, supplying building composition to the lower portion, whereby building composition flows from the mould through the aperture, and allowing the building composition to set, the building composition which has flowed from the mould providing a footing for the construction.
6. A method according to claim 5, in which the building composition is supplied in a first portion which forms at least the footings of the construction and a second portion to complete the construction.
7. A method according to claim 6 of making a retaining wall, including the steps of providing at least one further apertured mould unit, erecting the shuttering such that this further unit is in an upper portion of the hollow mould, and back-filling a cavity formed between the shuttering and earth to be retained by the wall, the second portion of building composition flowing through the

- 7 -

aperture of the further mould unit to set into an anchoring beam integral with an upper portion of the wall.

8. A method according to claim 6, including the step of positioning, prior to supplying the second portion of building composition, at least one tie rod to extend between the adjacent ground and the upper portion of the hollow mould and become embedded in the anchoring beam upon supply of the second building composition portion.

9. A method according to any of claims 1 to 8, including the step of positioning at least one generally vertically-extending tie rod in the hollow mould prior to supply of the building composition.

10. A constructional mould unit for use in a method according to any of claims 1 to 9, the mould unit being generally cuboid and defining a single hollow interior, one or both opposed side walls of the unit being solid, two opposed ends of the unit being apertured and the top and bottom of the unit being apertured and shaped for interengagement when two or more mould units are erected into shuttering to provide a mould for receiving building composition.

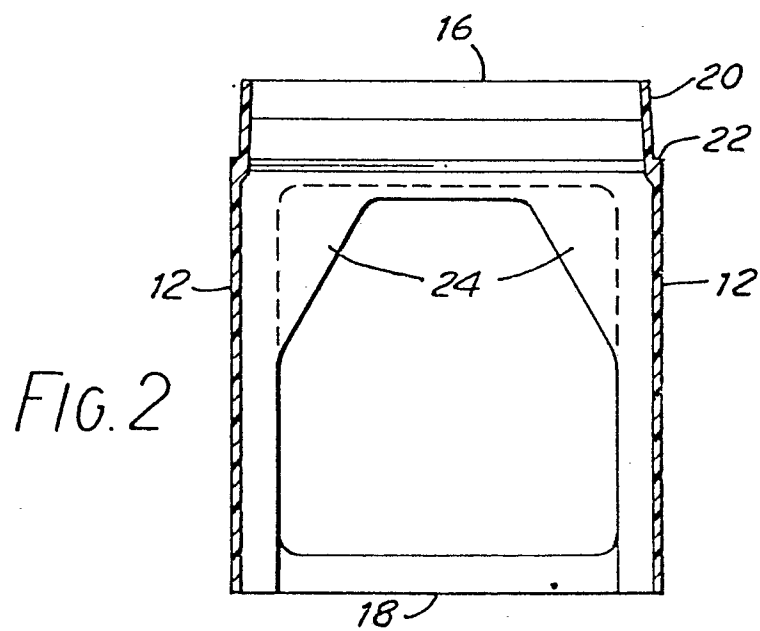
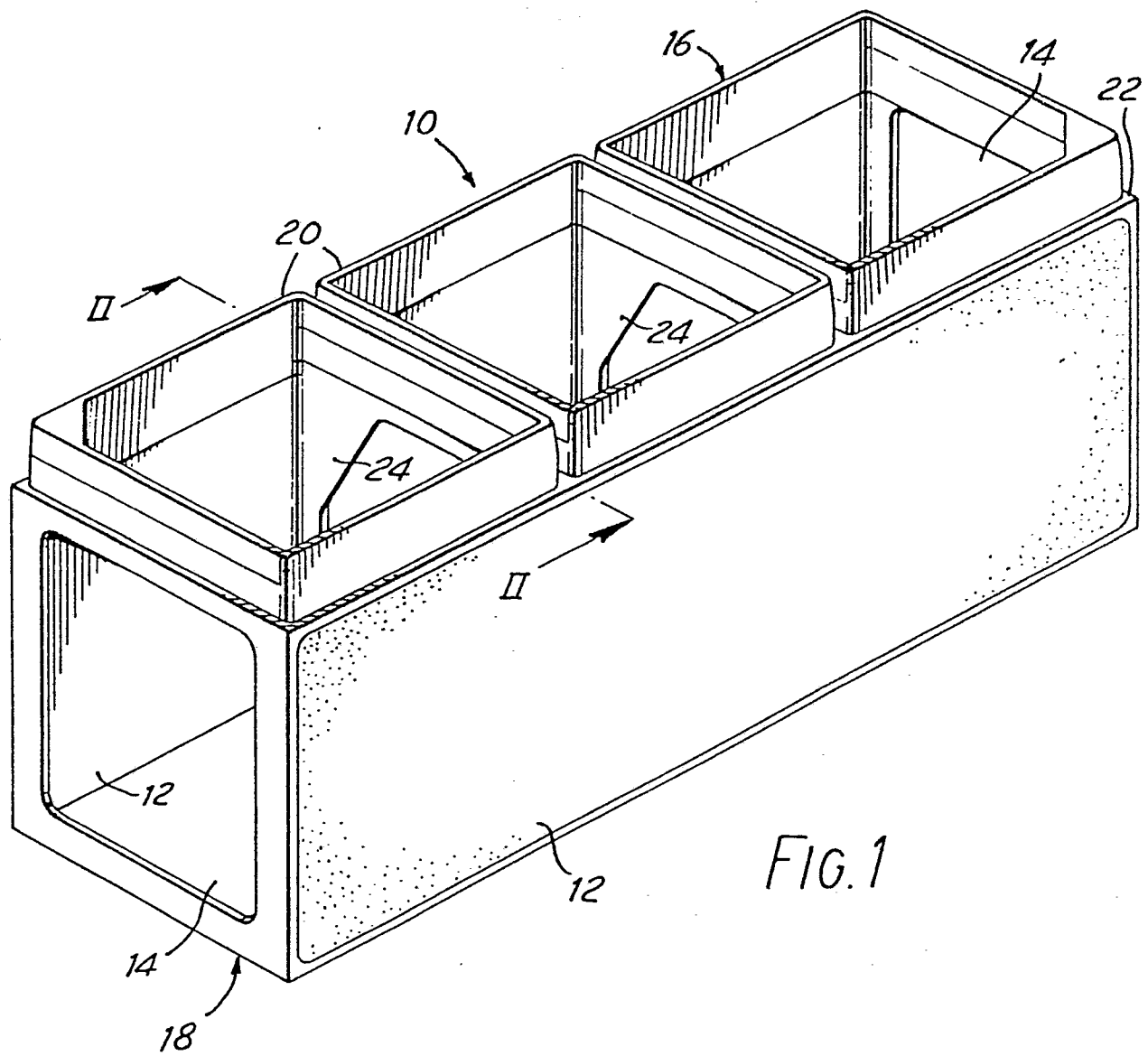
11. A mould unit according to claim 10, having a removable panel for closing one of its ends.

12. A mould unit according to claim 10 or 11, comprising at least two communicating sub-units, the top and bottom of each sub-unit being square and shaped for simultaneous interengagement of the sub-units of one mould unit with respective sub-units of at least two other mould units when the mould units are superimposed in the erection of shuttering.

13. A mould unit according to any of claims 10 to 12, in which the top or bottom of each unit or sub-unit has a projecting collar which, upon interengagement of the units, is received within bottom or top portions respectively of the side walls and ends of another unit.

- 8 -

14. A mould unit according to any of claims 10 to 13 and of plastics material.
15. A mould unit according to claim 13 or 14, in which the collar and the bottom or top portions have complementary formations for latching engagement with respective formations on other mould units.
16. A mould unit according to claim 15, in which the formations are a lug and an aperture which engage by resilient deformation of the material of the unit.
17. A mould unit according to any of claims 10 to 16, having one solid side opposite a side apertured for egress of building composition.
18. A mould unit according to any of claims 10 to 17, having one solid side opposite a side comprising a knock-out panel.



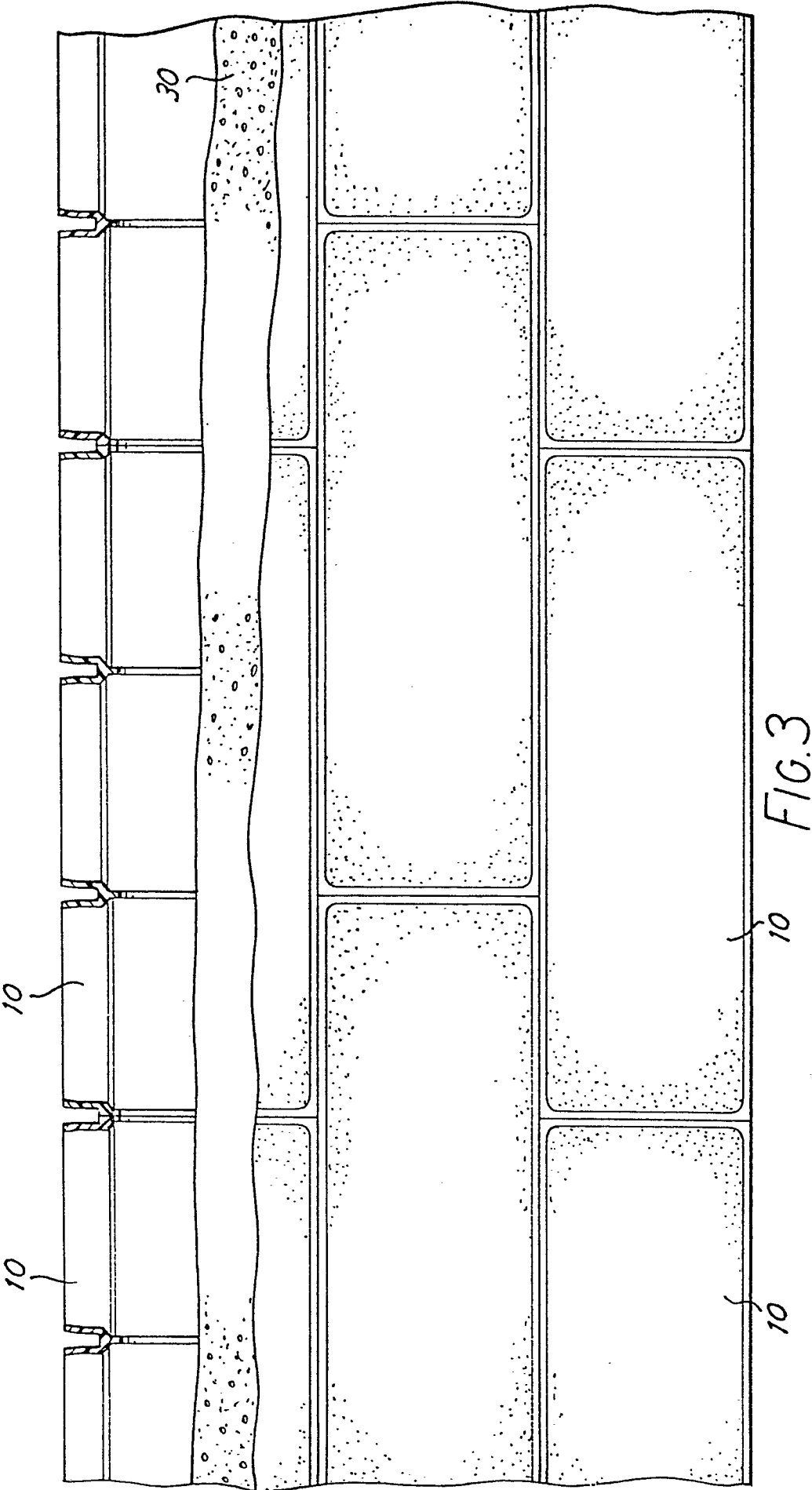


FIG. 3

