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(54) **WALL SYSTEM**

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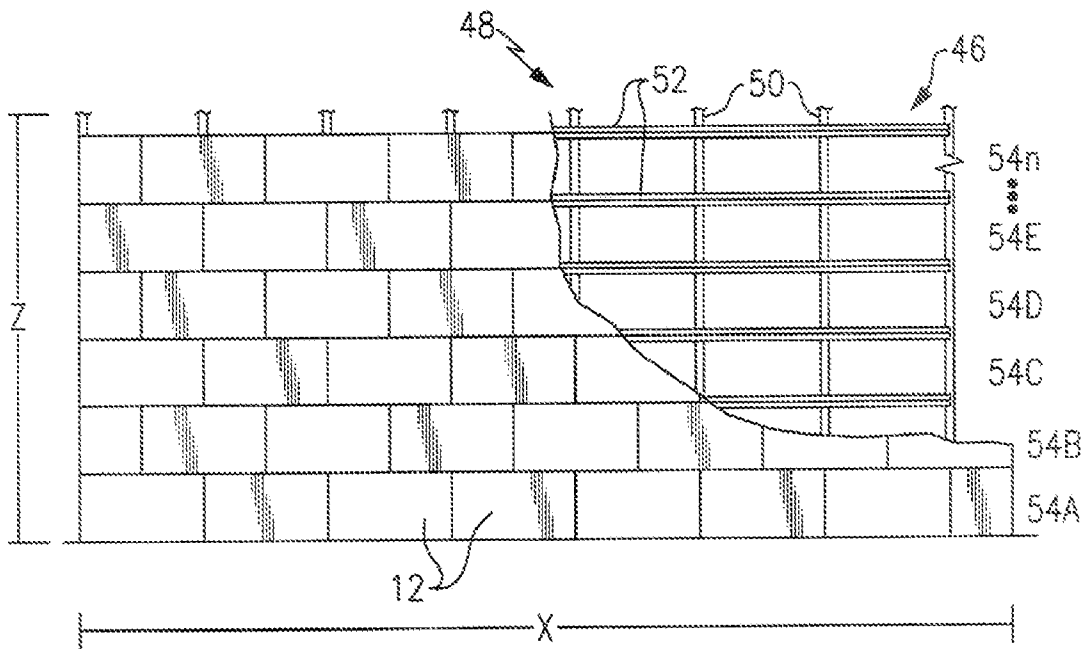
(57) **ABSTRACT**

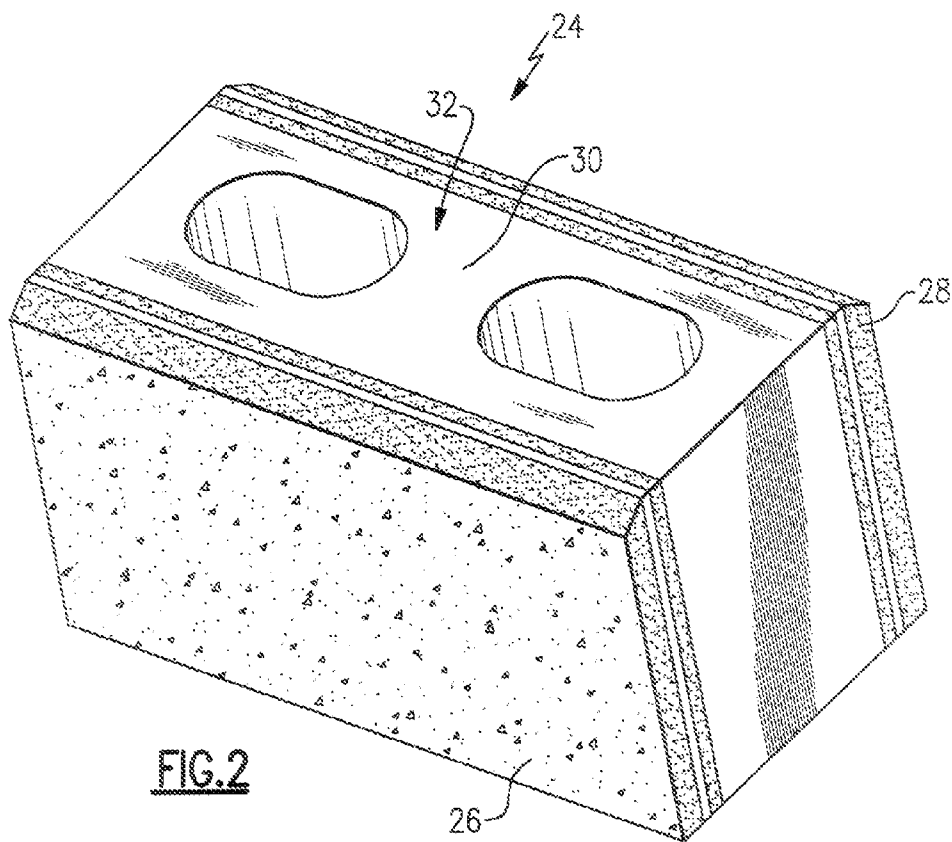
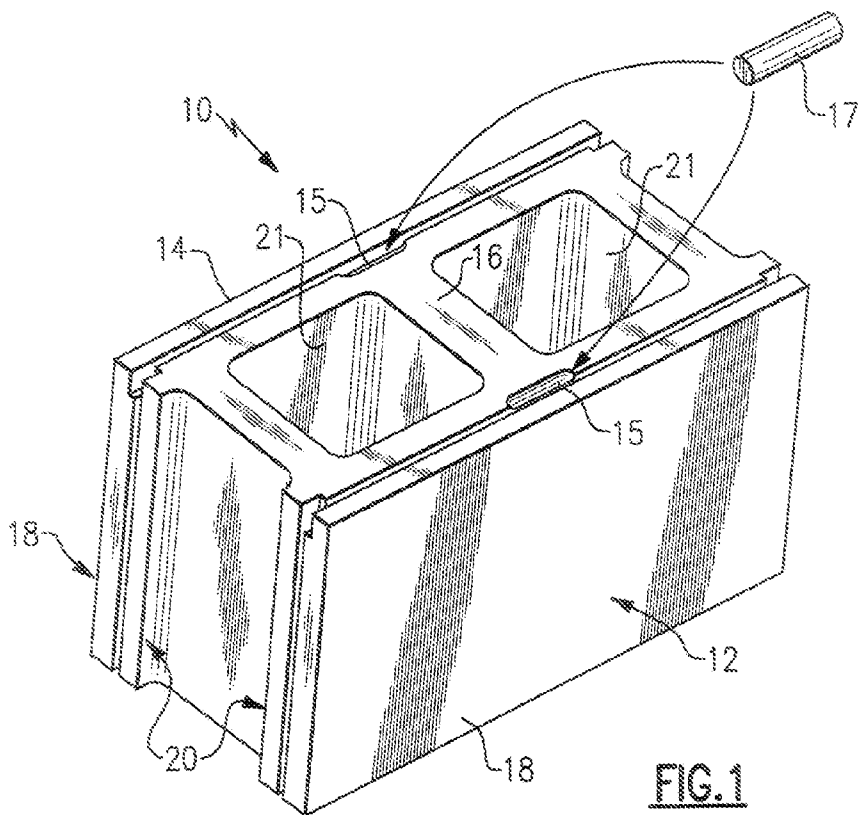
(22) Filed: **Feb. 25, 2009**

Related U.S. Application Data

(63) Continuation-in-part of application No. 11/675,906,
filed on Feb. 16, 2007, which is a continuation-in-part
of application No. 11/615,200, filed on Dec. 22, 2006.

A wall system includes a stud member, a bracket assembly mounted to the stud member, and at least one block member supported by the bracket assembly. An adhesive is applied at least between the stud member and the at least one block member. The stud member and the at least one block member establish a composite wall unit.





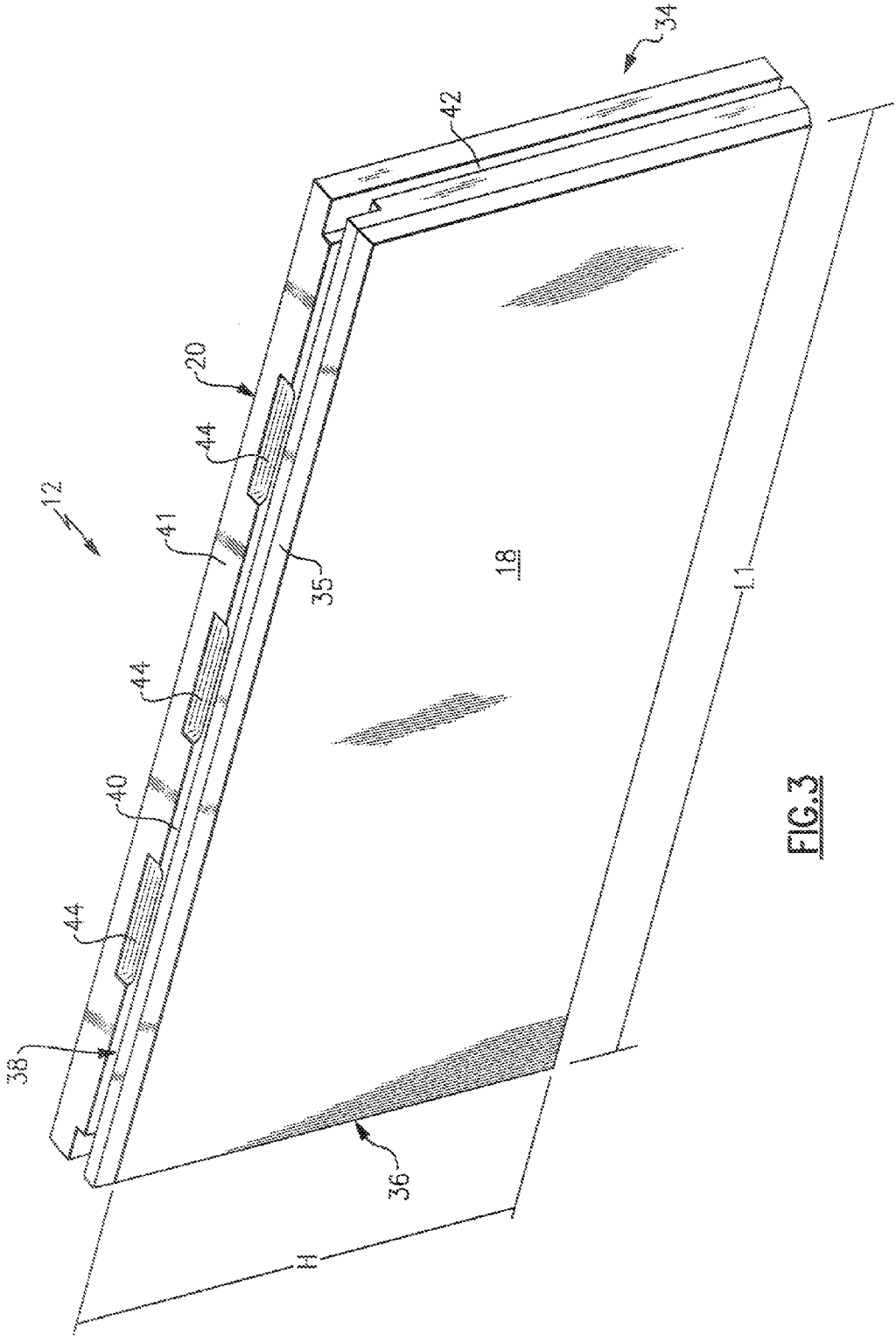


FIG. 3

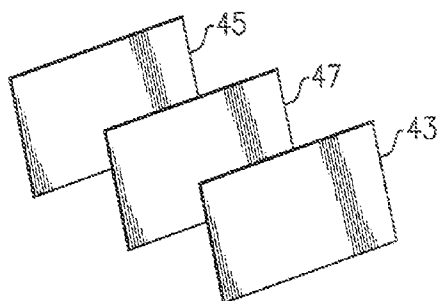


FIG. 4

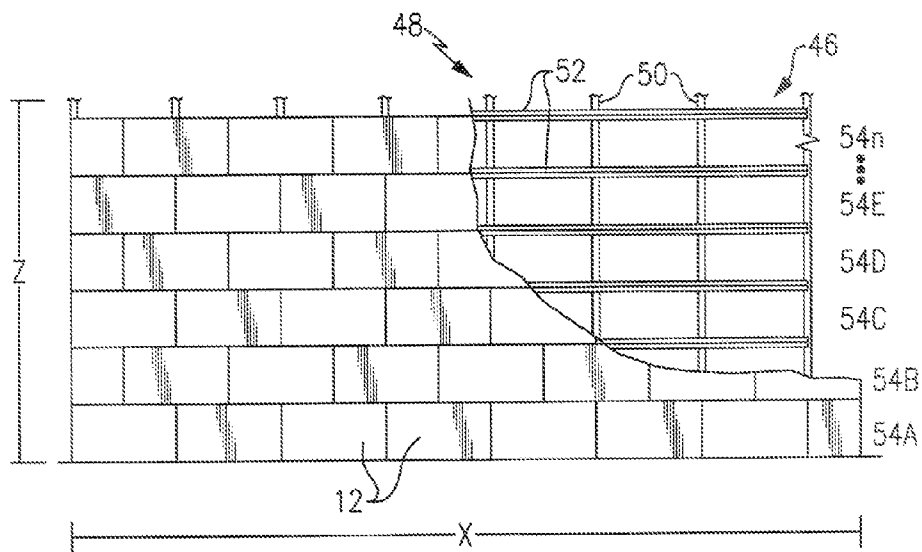


FIG. 5

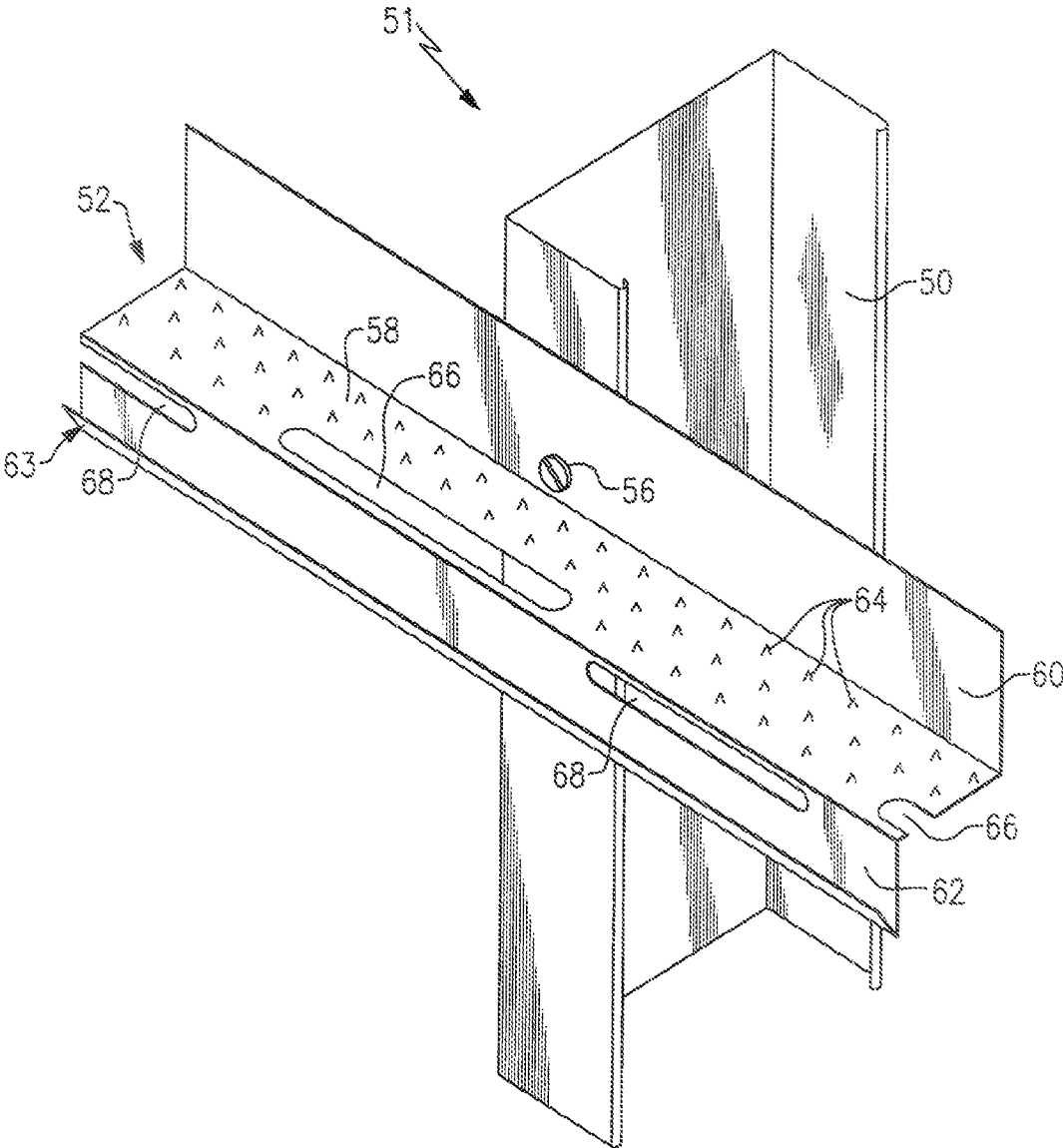


FIG.6

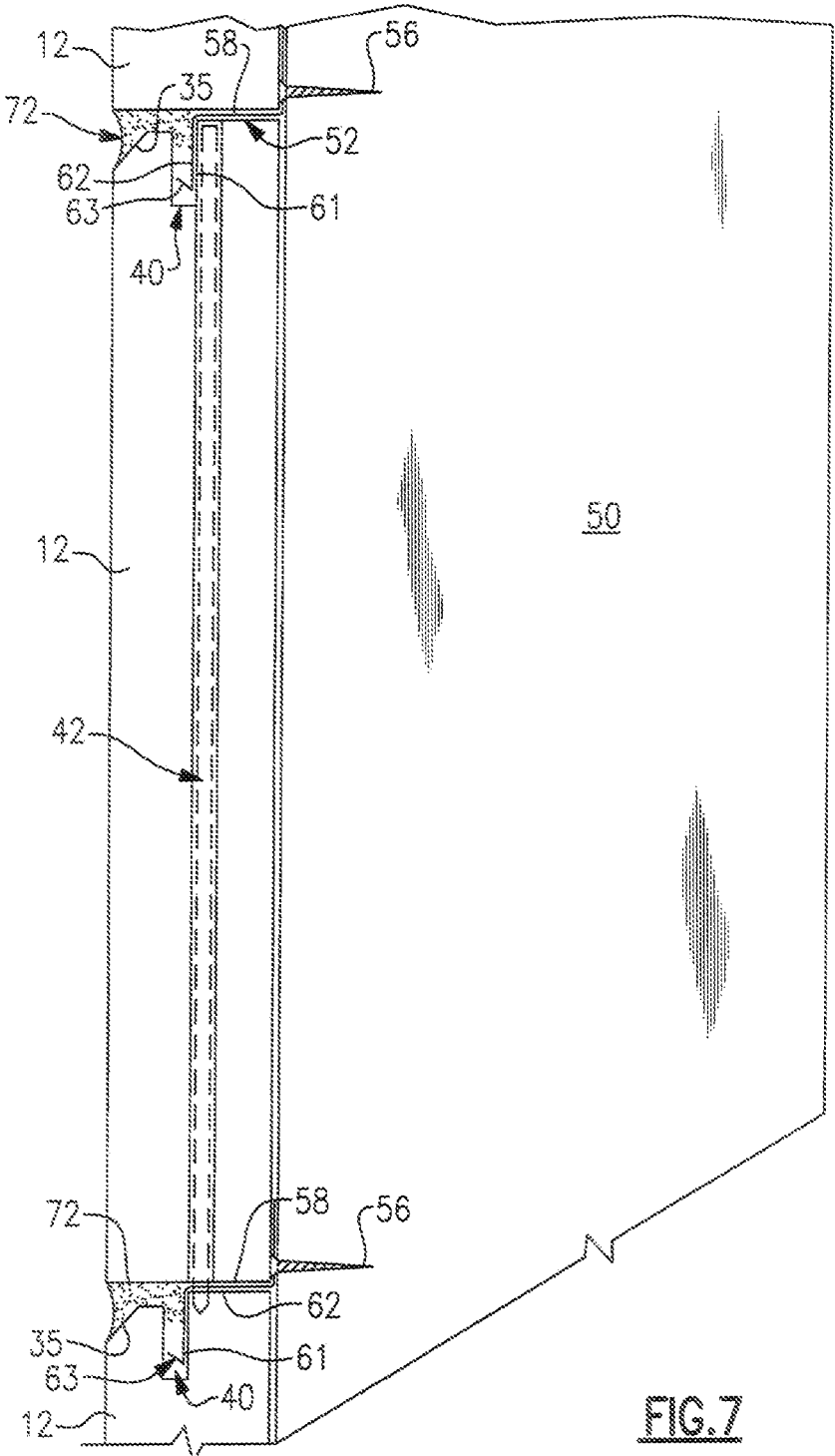


FIG. 7

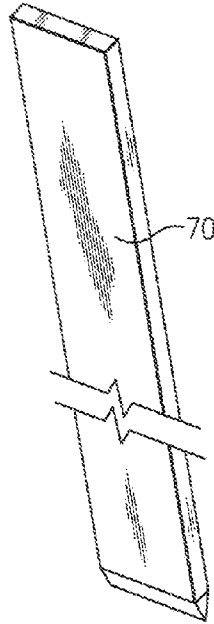


FIG. 8

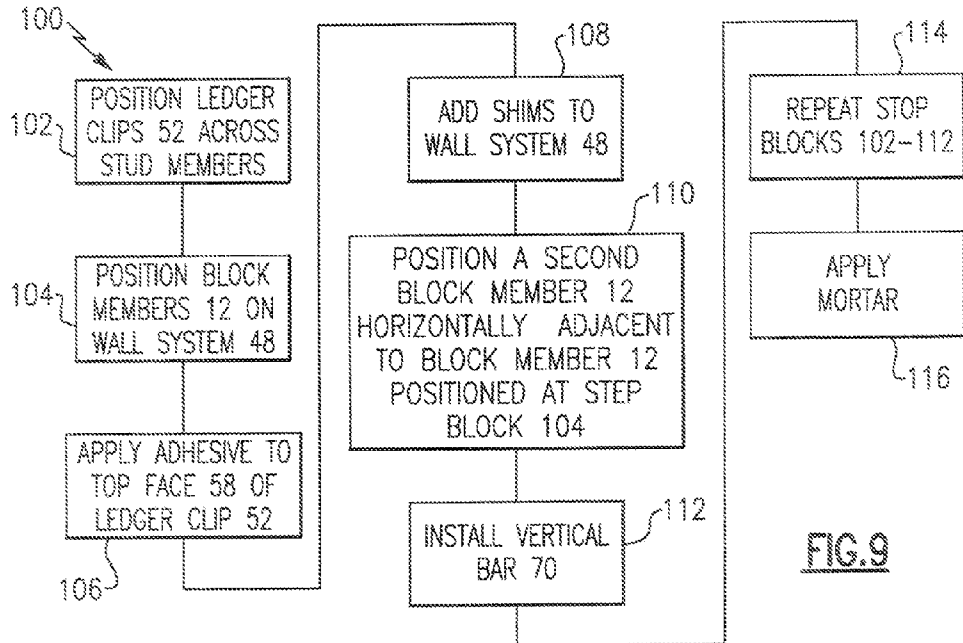


FIG. 9

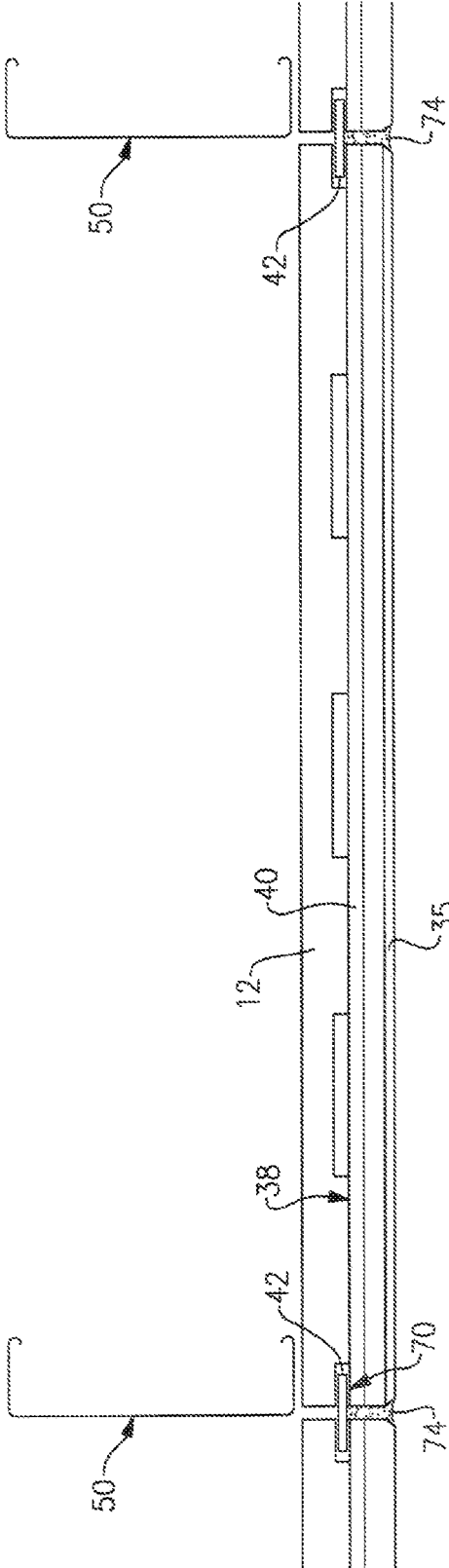


FIG.10

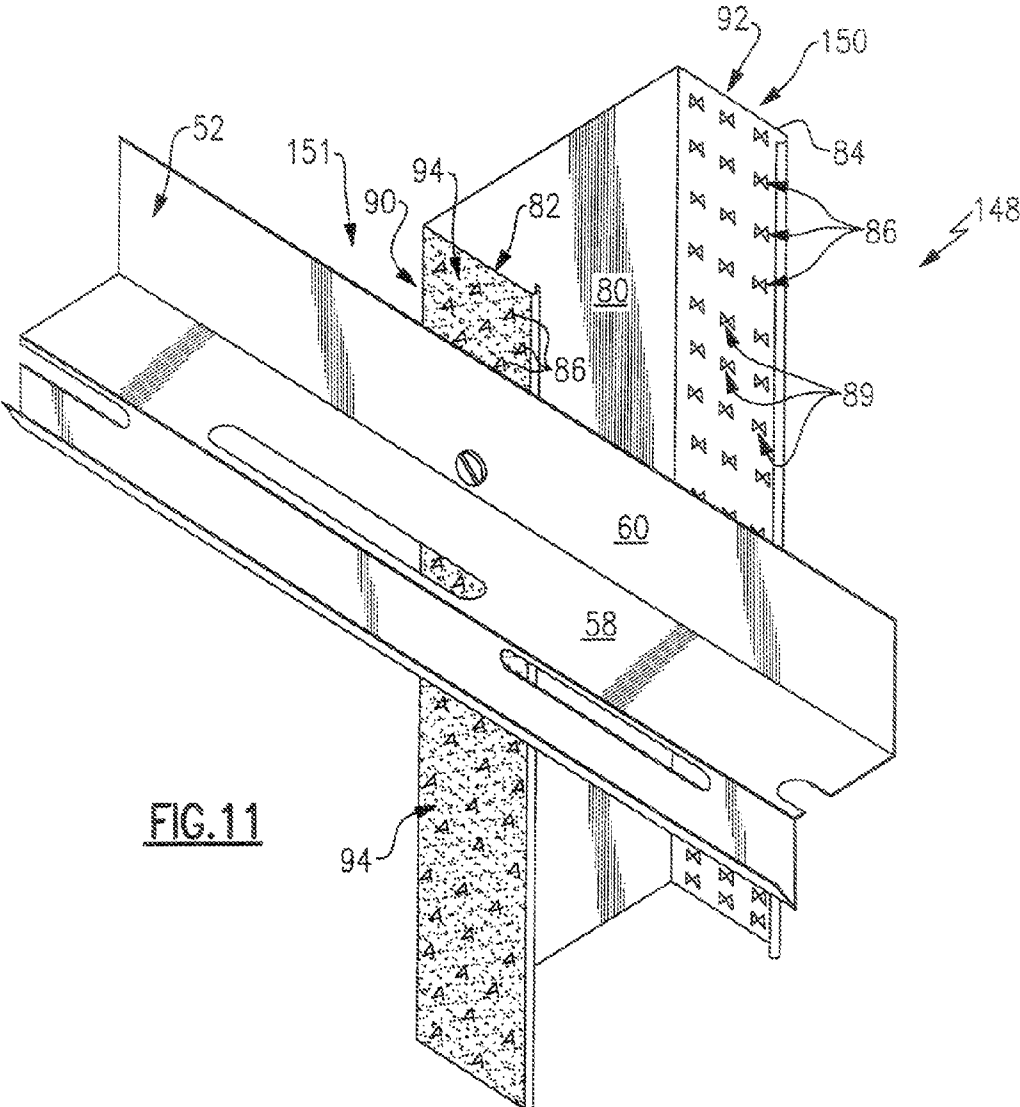


FIG. 11

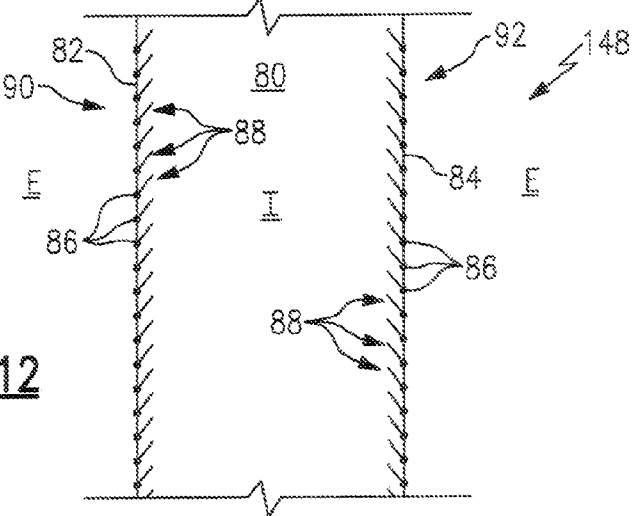


FIG. 12

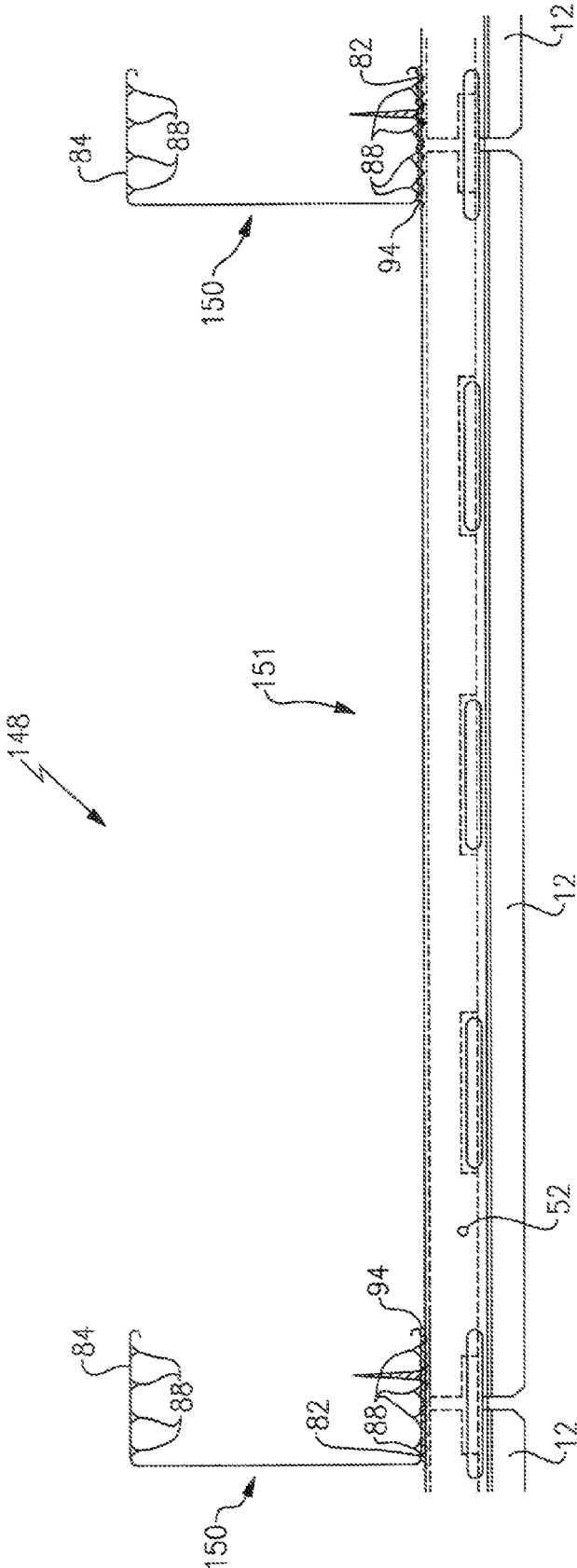


FIG.13

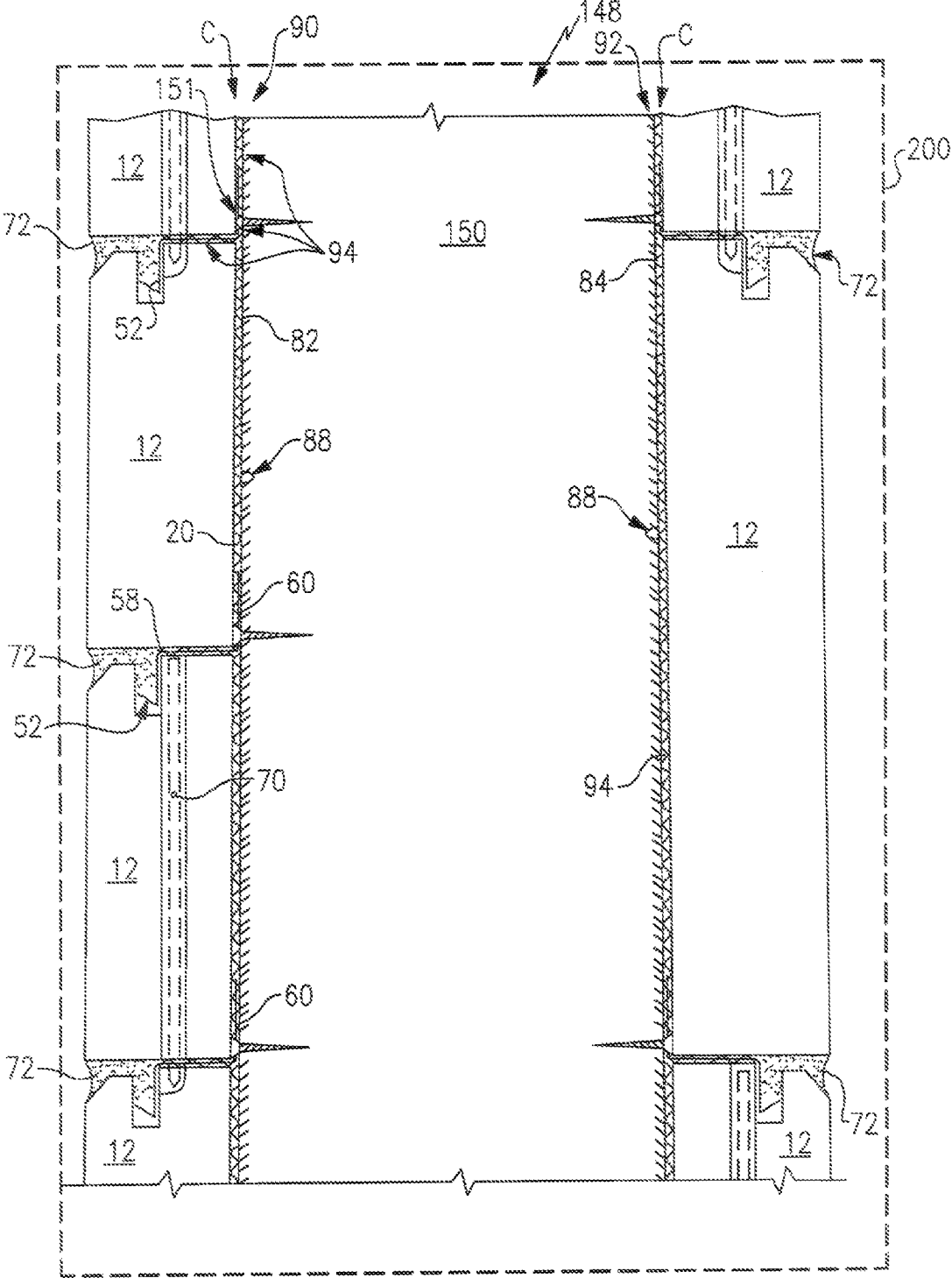


FIG.14

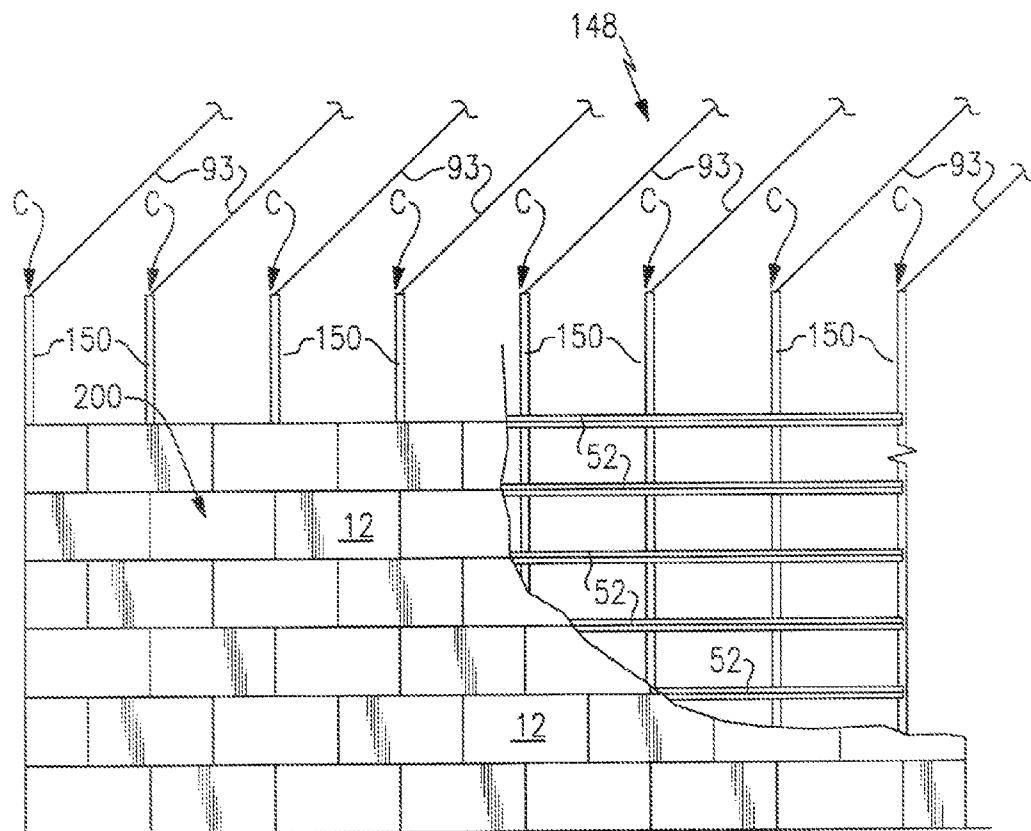


FIG.15

WALL SYSTEM

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation-in-part of co-pending U.S. patent application Ser. No. 11/675,906, filed Feb. 16, 2007, which is a continuation-in-part of co-pending U.S. patent application Ser. No. 11/615,200, filed Dec. 22, 2006.

BACKGROUND OF THE INVENTION

[0002] This disclosure generally relates to building components, and more particularly to composite wall systems.

[0003] Modern day building construction, including construction of commercial and residential buildings, often includes the construction of concrete block wall systems. A plurality of masonry blocks are stacked in a plurality of rows to construct the wall systems. Typical masonry blocks include masonry face members which are outwardly aligned and parallel and include structural cross members that extend between the parallel faces. Traditional concrete masonry blocks are of unitary construction, with the cross members and face members all formed of a concrete material.

[0004] Traditional masonry blocks include a one-piece construction. Therefore, the masonry blocks must be transported, in finished form, from the point of fabrication, storage, and/or sale, and ultimately to the construction site. Utilization of concrete cross members increases the weight of each individual unit. The relatively high weight of the individual masonry block members is undesirable from the viewpoint of an installer who must lift, transport, and possibly re-lift the masonry block members several times during the installation process.

[0005] Brick wall systems for commercial and residential buildings are also known. These wall systems utilize studs or furring strips of an existing building frame to construct exterior walls. Wood sheathing or building wrap (such as a plastic moisture barrier) may be installed over the studs and/or furring strips of the building framework. The brick members are then stacked and mortared to one another and anchors are utilized to attach the brick members to the exterior of the wood sheathing and building wrap.

[0006] Attempts have been made to provide wall systems that are less complex, less expensive and of reduced weight. For example, masonry block assemblies are known that include a pair of masonry block members which are bridged by coupling members of a different material. Although masonry block assemblies of this type are lighter than traditional masonry blocks, these masonry block assemblies typically are difficult to assemble and impractical to manufacture. In addition, these masonry block assemblies must be installed using the same basic method as standard masonry blocks and may be difficult to insulate. Further, it may be difficult to assemble known wall systems during periods of cold weather due to the inability of the mortar to harden (i.e., set) during the cold temperatures.

SUMMARY OF THE INVENTION

[0007] A wall system includes a stud member, a bracket assembly mounted to the stud member, and at least one block member supported on the bracket assembly. An adhesive is applied at least between the stud member and the at least one

block member. The stud member and the at least one block member establish a composite wall unit.

[0008] A method of constructing a wall system includes positioning stud members at a desired spacing, attaching bracket members to the stud members and supporting block members on the bracket members. An adhesive is applied to at least the stud members prior to attaching the block members to the bracket members.

[0009] A stud member for a wall system includes a face portion, a first flange and a second flange. The face portion includes a first side and an opposing second side. The first flange extends transversely from the face portion at the first side, and the second flange extends transversely from the face portion at the opposing second side. Each of the first flange and the second flange include a plurality of openings, and each opening includes a flap that extends from the first flange and the second flange toward the opposite of the first flange and the second flange.

[0010] The various features and advantages of this disclosure will become apparent to those skilled in the art from the following detailed description. The drawings that accompany the detailed description can be briefly described as follows.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 schematically illustrates an example masonry block;

[0012] FIG. 2 schematically illustrates a second example masonry block;

[0013] FIG. 3 illustrates a block member for use with the masonry blocks illustrated in FIG. 1 and FIG. 2;

[0014] FIG. 4 schematically illustrates example features of the block member shown in FIG. 3;

[0015] FIG. 5 illustrates an example wall system;

[0016] FIG. 6 illustrates a perspective view of a bracket assembly of the wall system illustrated in FIG. 5;

[0017] FIG. 7 illustrates a cross-sectional side view of the example wall system illustrated in FIG. 5;

[0018] FIG. 8 illustrates a vertical bar of the bracket assembly illustrated in FIG. 6;

[0019] FIG. 9 is a flowchart of an example method for constructing the wall system illustrated in FIG. 5;

[0020] FIG. 10 illustrates a top view of the bracket assembly illustrated in FIG. 6;

[0021] FIG. 11 illustrates a bracket assembly of another example wall system;

[0022] FIG. 12 illustrates a portion of a stud member of the example wall system of FIG. 11;

[0023] FIG. 13 illustrates a top view of a portion of the example wall system of FIG. 11;

[0024] FIG. 14 illustrates a side view of the example wall system of FIG. 11 and FIG. 12; and

[0025] FIG. 15 illustrates another view of the example wall system of FIGS. 11-14.

DETAILED DESCRIPTION OF THE DISCLOSED EMBODIMENTS

[0026] FIG. 1 illustrates an example masonry block 10 that includes a first block member 12, a second block member 14, and a cross member 16. Each block member 12, 14 includes an outer face 18 and an inner face 20 opposite of the outer face 18. The cross member 16 extends between the inner faces 20 of the block members 12, 14. The cross member 16 may

include openings 21 to provide an installer of the masonry blocks 10 with the ability to insulate and vertically reinforce the masonry block 10.

[0027] In the illustrated example, the block members 12, 14 and the cross member 16 are formed of concrete as a single-piece construction. However, the first block member 12, the second block member 14 and the cross member 16 may include any other materials known to be suitable by those skilled in the art having the benefit of this description. The masonry blocks 10 are stacked and positioned in a plurality of rows to construct a free-standing wall system.

[0028] Each block member 12, 14 of the masonry block 10 includes a depression 44, for example. In another example, each block member 12, 14 includes a plurality of depressions 44. An insert 17 is receivable within the depressions 44. In one example, the insert 17 includes a porous material. In another example, the insert 17 is a Styrofoam rope. The inserts 17 reduce the build up of mortar or other substances within the depressions 44 during installation of the masonry blocks 10, thereby improving water drainage of the masonry blocks.

[0029] FIG. 2 illustrates a second example masonry block 24. The masonry block 24 also includes a first block member 26, a second block member 28 and a cross-member 30. The first block member 26 and the second member block member 28 are substantially identical to the first block member 12 and second block member 14 of the masonry block 10. In one example, the cross member 30 is a bracket member 32 which comprises a material different from that of the block members 26, 28. In one example, the bracket member 32 is metal, such as 25 gauge galvanized sheet metal, for example. In another example, the bracket member 32 is plastic. The example block members 12, 14, 26 or 28 of the masonry blocks 10, 24 may be utilized to construct various wall systems, as is further discussed below.

[0030] FIG. 3 illustrates the example block member 12. The block member 12 is shown and described as substantially typical of each of the block members 12, 14, 26 and 28. The block member 12 is formed of concrete, brick, or any other suitable material. In one example, the block member 12 includes a water resistant additive that reduces any susceptibility to cracking and water penetration. The example block member 12 includes a length L1. In one example, the length L1 of the block member 12 is approximately 16 inches. In another example, length L1 is approximately 8 inches. However, the block member 12 may be manufactured to the specifications of any desired length.

[0031] The length L1 extends between opposing end faces 34, 36. In one example, the block member 12 includes a slot 38. The slot 38 is positioned between the outer face 18 and the inner face 20 of the block member 12.

[0032] The slot 38 includes a horizontal portion 40 and a vertical portion 42. The vertical portion 42 is transverse to the horizontal portion 40, in one example. In another example, the vertical portions 42 of the slot 38 are perpendicular to the horizontal portion 40. The horizontal portion 40 of the slot 38 is coextensive with the length L1 of the block member 12. The horizontal portion 40 of the slot 38 extends along a top face 41 (which extends between the end faces 34, 36 and the inner face 20 and the outer face 18) of the block member 12, for example. The vertical portion 42 is coextensive with a height H of the block member 12 and extends along each of the first end face 34 and the second end face 36 of the block member 12. Therefore, the slot 38 extends along each of the first and second end faces 34, 36 and along the entire length L1 of the

block member 12. That is, the slot 38 of the block members 12 is continuous and uninterrupted along the height H and length L1 of the block member 12.

[0033] The slot 38 is positioned within a plane of the block member 12 which is offset from each plane defined by the outer face 18 and the inner face 20 of the block member 12. That is, no portion of the slot 38 extends into the outer face 18 or the inner face 20. In one example, the outer face 18 is positioned within a first plane 43, the inner face 20 is positioned within a second plane 45 different from the first plane 43, and the slot 38 is positioned within a third plane 47 which is different from both the first plane 43 and the second plane 45 (See FIG. 4).

[0034] In one example, the horizontal portion 40 and the vertical portions 42 of the slot 38 are positioned within the same plane. In another example, the vertical portions 42 of the slot 38 are offset from the horizontal portion 40 of the slot 38. The vertical portions 42 may be offset in either direction relative to the horizontal portion 40 (i.e., either towards the outer face 18 or towards the inner face 20 of the block member 12). A person of ordinary skill in the art having the benefit of this disclosure would understand how to design the slot 38 of the block member 12, including the various dimensions associated with the slot 38 such as the offset distance between the vertical portions 42 and the horizontal portion 40 of the slot, the slot depth, and numerous other dimensions.

[0035] The block member 12 may also include a plurality of depressions 44 disposed along the length of the block member 12 adjacent to the horizontal portion 40 of the slot 38. The depressions 44 are utilized to divert water into the horizontal portion 40 of the slot 38, which may enter through the joints (i.e., the horizontal and vertical gaps between adjacent block members 12 in a wall system) of a wall system from adjacent block members 12. The horizontal portion 40 communicates the water to the vertical portions 42 of the slot 38. The vertical portions 42 then communicate the water downwardly until the water escapes the wall system. Therefore, the depressions 44 and the slot 38 reduce water penetration and water build-up within the block members 12, as is further discussed below.

[0036] The block members 12 may include a beveled edge 35. The beveled edge 35 extends along both the top face 41 and the end faces 34, 36 of the block member 12 (See FIGS. 7 and 10). The beveled edges 35 allow adjacent block members 12 of a wall system to be positioned closer to one another thereby reducing the size of the mortar joints between the block members 12.

[0037] The block member 12 (which is typical of block members 12, 14, 26 and 28) may be utilized to construct numerous types of wall systems. In one example, the block members 12 are utilized to assembly a plurality of the masonry blocks 10, which are stacked and positioned in a plurality of rows to build a wall system. In another example, the block members 12 may be utilized with a preexisting wall 46 to establish a block veneer wall system 48, as is illustrated in FIG. 5.

[0038] The preexisting wall 46 includes a plurality of stud members 50 that extend adjacent to one another in a vertical manner, in one example. The spacing between the stud members 50 is not significant, and the stud members 50 can be spaced at 8" on center, 12" on center, 16" on center, or any other spacing requirements. Although the preexisting wall 46 is illustrated with stud members 50, it should be understood that the preexisting wall may include any type of wall having

any type of wall components. The stud members 50 may include metal studs, for example. In another example, the stud members 50 include wooden studs. In yet another example, the stud members 50 include plastic studs. A person of ordinary skill in the art having the benefit of this disclosure would understand that the block veneer wall system 48 may be utilized with any preexisting wall 46.

[0039] The block veneer wall system 48 includes a plurality of ledger clips 52 and a plurality of the block members 12. As is known, the stud members 50 are positioned horizontally adjacent to one another along a length X to establish the pre-existing wall 46. The stud members 50 extend vertically to a desired height Z of the wall system 48.

[0040] The ledger clips 52 extend horizontally across the stud members 50 to form a wall frame including a plurality of rows 54A-54n. The wall system 48 may include any number of rows 54. The example ledger clips 52 are manufactured in strips of approximately 10 to 12 feet in length, in one example. However, the ledger clips 52 may be manufactured to any specification. In one example, the stud members 50 are spaced apart a distance of approximately 16 inches and each ledger clip 52 is spaced apart a distance of approximately 8 inches. It should be understood that the spacing and other dimensional relationships that exist between the stud members 50 and the ledger clips 52 may vary to provide a block veneer wall system 48 of any size.

[0041] FIG. 6 illustrates a portion of the bracket assembly 51 of the block veneer wall system 48 that includes a ledger clip 52 attached to a stud member 50. In one example, the ledger clip 52 is attached to the stud member 50 with a threaded fastener 56. However, other attachment methods are contemplated as within the scope of this disclosure.

[0042] Each ledger clip 52 generally includes a Z-shaped body having a top face 58 and leg members 60, 62 extending transversely from the top face 58. The leg members 60, 62 extend away from the top face 58 in opposite directions relative to the top face 58. The leg member 60 is received against the stud member 50 and is attached to the stud member 50 with the threaded fastener 56, for example. The leg member 62 extends in a downward direction relative to the top face 58 and receives a slot 38 of the block member 12 to support the block member 12 on the block veneer wall system 48. Therefore, the block veneer wall system 48 establishes a wall framework independent of the block members 12. That is, placement of the block members 12 is dictated by the ledger clips 52.

[0043] The leg member 62 of each ledger clip 52 includes a flange portion 63. The flange portions 63 push the leg member 62 against a back wall 61 of the horizontal portion 40 of the slot 38 (See FIG. 7) to reduce the amount of "slop" in the wall. That is, the flange portions 63 secure the block members 12 to the ledger clips 52.

[0044] In one example, the top face 58 of each ledger clip 52 includes a plurality of teeth 64. The teeth 64 grip a bottom surface of a block member 12 from a vertically adjacent row 54 of the block veneer wall system 48 (see FIG. 7). The top face 58 also includes a plurality of openings 66 for receiving a vertical bar (see FIG. 8) installed between horizontally adjacent block members 12 once positioned onto the block veneer wall system 48. The example ledger clip 52 includes a second set of openings 68 provided on the leg members 62. The openings 68 receive shims to adequately secure the block members 12 to the ledger clips 52 and ensure that the top face

58 is level relative to the ground as the block members 12 are received onto the leg member 62 of the ledger clip 52.

[0045] FIG. 9, with continuing reference to FIGS. 1-8, illustrates an example method 100 of constructing a wall system, such as the block veneer wall system 48, for example. At step block 102, the ledger clips 52 are horizontally positioned across the stud members 50 of a pre-existing wall 46 to establish a wall frame including a plurality of rows 54. In one example, wood sheathing, such as plywood for example, is installed over top of the existing stud members 50. In another example, building wrap may be installed to cover the wood sheathing and provide a moisture barrier.

[0046] At step block 104, a block member 12 is positioned on the block veneer wall system 48. The top face 41 of the block member 12 is tilted toward the ledger clip 52 and pushed upward such that the horizontal portion 40 of the slot 38 of the block member 12 is received by the lower leg member 62 of the ledger clip 52. The bottom of the block member 12 is next pushed in an inward direction (i.e., toward the stud members 50) until the inner face 20 of the block member 12 rests against the upper leg member 60 of the ledger clip 52 (except for block members 12 of the first row 54A). The block member 12 is then eased slightly downward until a bottom face of the block member 12 is seated on the top face 58 of the ledger clip 52 (or a starting strip where installing the block members 12 of the first row 54A).

[0047] Next, at step block 106, an adhesive is applied to the top face 58 of a lowest exposed ledger clip 52 along the portion of the block member 12 which rests against the top face 58. That is, the adhesive is applied to the ledger clip 52 of the first row 54A of the block veneer wall system 48. Any known adhesive may be utilized at this step.

[0048] Shims may be inserted into the openings 68 of the bottom leg member 62 to improve the attachment of the block member 12 to the ledger clip 52 and to ensure that the block member 12 is level relative to the ground at step block 108. At step block 110, an additional block member 12 is positioned horizontally adjacent to the block member 12 positioned at step blocks 102 through 108.

[0049] At step block 112, and after the block members 12 are positioned side by side, the vertical bar 70 (FIG. 8) is installed downwardly through openings 66 of the ledger clips 52 to maintain the positioning of the adjacent block members 12. The vertical bars 70 are at least partially received within the vertical portions 42 of the slots 38 of the block members 12 (See FIG. 10). Next, at step block 114, step blocks 102 through 112 are repeated to construct the block veneer wall system 48 having a desired width and height. Finally, at step block 116, mortar is applied to each of a plurality of horizontal joints 72 (See FIG. 7) and vertical joints 74 (See FIG. 10) between the block members 12 after a desired number of block member 12 are attached to the ledger clips 52.

[0050] FIGS. 11-15 illustrate portions of another example wall system 148. In this example, the wall system 148 is similar to the wall system 48 described in FIGS. 5-10. In this disclosure, like reference numerals designate like elements where appropriate, and reference numerals with the addition of 100 or multiples thereof designate modified elements. It is to be understood that the modified elements incorporate the same features and advantages of the corresponding original elements, except where stated otherwise.

[0051] FIG. 11 illustrates a portion of a bracket assembly 151 of the wall system 148 that includes a bracket member 52 attached to a stud member 150 (no block members 12 shown

in FIG. 11 for clarity). In this example, the bracket member 52 is a ledger clip. Each stud member 150 includes a generally U-shaped body having a face portion 80 and flanges 82, 84 that extend transversely from the face portion 80 at opposite sides 90, 92 of the stud member 150. In the illustrated example, the flanges 82, 84 extend in the same direction away from the face portion 80.

[0052] The flanges 82, 84 of each stud member 150 also include a plurality of openings 86. In one example, the openings 86 are punctures that are formed through the flanges 82, 84. Other known methods for forming the openings 86 are known and would be recognized by those of ordinary skill in the art having the benefit of this disclosure.

[0053] In one example, the openings 86 are formed from an exterior surface E of each flange 82, 84 toward an interior I of the stud member 150 (See FIG. 12). That is, the openings 86 are formed toward the opposite flange 82, 84, respectively. Each opening 86 includes a flap 88 formed at a bottom portion 89 of each opening 86. The flap 88 is created during the forming operation of the opening 86.

[0054] An adhesive 94 is applied between the stud members 150 and the block members 12. In one example, the adhesive 94 is applied to each flange 82, 84 of the stud members 150 prior to affixing the block members 12 to the bracket assembly 151. The adhesive 94 may also be also applied to portions of the top face 58 and the leg member 60 of the ledger clips 52, for example (See FIG. 14). A worker of ordinary skill in the art would be able to select an appropriate adhesive to bond the block members 12 and the stud members 150 relative to one another. The flaps 88 of each opening 86 communicate the adhesive 94 in a direction away from an interior I of each stud member 150. Therefore, once the block members 12 are received on the bracket assembly 151, the adhesive 94 bonds the block members 12 and the stud members 150 to establish a composite wall unit 200 (See FIG. 14).

[0055] FIG. 13 illustrates the bracket assembly 151 of the wall system 148 with supported block members 12 (which are typical of block members 12, 14, 26 and 28). Although the wall system 148 is depicted having block members 12, a person of ordinary skill in the art having the benefit of this disclosure would be able to configure any block member for use with the bracket assembly 151. That is, slight modifications of the block member 12 are contemplated as within the scope of this disclosure.

[0056] The ledger clips 52 receive the block members 12 in a similar manner as described above with respect to the wall system 48. In addition, other details of the wall system 48 such as the use of shims, the use of the vertical bars 70, the application of mortar joints and the like are applicable to the example wall system 148 where necessary. Like the wall system 48, the wall system 148 establishes a wall framework independent of the block members 12. That is, placement of the block members 12 is dictated by the bracket members 52. In this example, the adhesive 94 (shown as wavy lines) extends between the block members 12 and the flanges 82 of each stud member 150.

[0057] FIG. 14 illustrates the wall system 148 having block members 12 positioned on both sides 90, 92 of the stud members 150. That is, the bracket assembly 151 and the block members 12 are positioned horizontally across, and are partially coextensive with, the flange 82 and the flange 84 of each stud member 150 of the wall system 148. In one example, the block members 12 positioned on the side 90 are of a different size from the block members 12 positioned on the side 92. For

example, a customer may request different block members for the exterior and interior portions of the wall system 148. The block members 12 may be the same size, or could include any different size.

[0058] In one example, the adhesive 94 is applied to the flanges 82, 84 of each stud member 150, the top face 58 and the leg member 60 of each ledger clip 52, each fastener 56, and the inner face 20 of each block member 12. After the adhesive 94 cures, the stud members 150 and the block members 12 establish a composite wall unit 200, similar to a reinforced concrete wall, for example. That is, the separate components 150 and 12 of the wall system 148 establish a single, composite wall unit. Therefore, the wall system 148 absorbs any compression forces C that act upon the wall system 148.

[0059] An additional aspect of the example wall system 148 is illustrated in FIG. 15. The wall system 148 at least partially supports a plurality of trusses 93. A person of ordinary skill in the art having the benefit of this disclosure would understand how to attach the trusses 93 to the wall system 148. The weight of the trusses 93 create compression forces C that act upon the wall system 148. These compression forces C are absorbed by the composite wall unit 200.

[0060] The foregoing description shall be interpreted as illustrative and not in any limiting sense. A worker of ordinary skill in the art would recognize that certain modifications would come within the scope of this disclosure. For these reasons, the following claims should be studied to determine the true scope and content of this disclosure.

What is claimed is:

1. A wall system, comprising:

a stud member;
a bracket assembly mounted to said stud member;
at least one block member supported by said bracket assembly; and
an adhesive applied at least between said stud member and said at least one block member, wherein said stud member and said at least one block member establish a composite wall unit.

2. The wall system as recited in claim 1, wherein said bracket assembly includes a plurality of bracket members attached to said stud member, and said plurality of bracket members extend horizontally across said stud member to establish a plurality of rows.

3. The wall system as recited in claim 1, wherein said bracket assembly establishes a self-supporting wall frame.

4. The wall system as recited in claim 1, wherein said stud member includes a face portion, a first flange, and a second flange, and said first flange and said second flange extend transversely from said face portion at opposite sides of said stud member.

5. The wall system as recited in claim 4, comprising a plurality of openings formed in each of said first flange and said second flange.

6. The wall system as recited in claim 5, wherein each of said plurality of openings includes a flap that extends toward an interior of said stud member.

7. The wall system as recited in claim 4, wherein said adhesive is applied to each of said first flange, said second flange and said at least one block member.

8. The wall system as recited in claim 1, wherein said bracket assembly includes a first bracket assembly and a second bracket assembly, and said first bracket assembly is

mounted to a first side of said stud member and said second bracket assembly is mounted to a second side of said stud member.

9. The wall system as recited in claim 1, wherein said bracket assembly comprises a first material and said at least one block member comprises a second material different from said first material.

10. A method of constructing a wall system, comprising the steps of:

- (a) positioning stud members at a desired spacing;
- (b) attaching bracket members to the stud members;
- (c) supporting block members on the bracket members; and
- (d) applying an adhesive to at least the stud members prior to supporting the block members on the bracket members.

11. The method as recited in claim 10, wherein the stud members include a first side and a second side, and said step (b) includes the step of:

attaching the bracket members on both the first side and the second side of the stud members.

12. The method as recited 10, wherein each of the stud members includes a face portion, and a first flange and a second flange that extend transversely from the face portion on opposite sides of the face portion, and said step (d) includes the step of:

applying the adhesive to the first flange and the second flange of each of the stud members.

13. The method as recited in claim 10, wherein said step (b) includes the step of:

establishing a self-supporting wall frame with the bracket members.

14. The method as recited in claim 10, comprising the step of:

(e) curing the adhesive such that the stud members and the block members act as a single, composite wall unit.

15. A stud member for a wall system, comprising:

- a face portion having a first side and an opposing second side;
- a first flange extending transversely from said face portion at said first side; and
- a second flange extending transversely from said face portion at said opposing second side, wherein each of said first flange and said second flange include a plurality of openings that each include a flap that extends from said first flange and said second flange toward the opposite of said first flange and said second flange.

16. The stud member as recited in claim 15, wherein said face portion, said first flange and said second flange form a generally U-shaped body.

17. The stud member as recited in claim 15, wherein said flap of each of said plurality of openings extends from a bottom portion of said plurality of openings.

18. The stud member as recited in claim 15, wherein said flap of each of said plurality of openings extends toward an interior of the stud member.

19. The stud member as recited in claim 15, wherein said plurality of openings are punctures.

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