(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 864 558 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
26.04.2017 Bulletin 2017/17

(21) Application number: **13735367.8**

(22) Date of filing: **25.06.2013**

(51) Int Cl.:
E04C 1/39 *(2006.01)* ***F24F 13/08*** *(2006.01)*

(86) International application number:
PCT/GB2013/051673

(87) International publication number:
WO 2014/001784 (03.01.2014 Gazette 2014/01)

(54) **VENTILATION UNITS**

BELÜFTUNGSEINHEITEN

UNITÉS DE VENTILATION

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **26.06.2012 GB 201211304**

(43) Date of publication of application:
29.04.2015 Bulletin 2015/18

(73) Proprietor: **MOUSEMESH LIMITED**
London N11 2UD (GB)

(72) Inventor: **CARR, Tony**
London N8 7LY (GB)

(74) Representative: **Wilson Gunn**
Blackfriars House
The Parsonage
5th Floor
Manchester M3 2JA (GB)

(56) References cited:
EP-A2- 1 054 114
DE-A1- 2 035 087
DE-A1- 3 149 054
FR-A- 1 287 951

EP 2 864 558 B1

Printed by Jouve, 75001 PARIS (FR)

Description

Technical Field of the Invention

[0001] The present invention relates to a ventilation unit such as an airbrick. The present invention also relates to a method of installing such a ventilation unit.

Background to the Invention

[0002] Buildings, both domestic and commercial, are generally subject to regulations which require that the building has a sufficient level of ventilation.

[0003] In order to provide such ventilation, it is known to use one or more ventilation units. One such ventilation unit is an airbrick. An airbrick is used in place of a masonry brick to provide for ventilation through a wall of a building. It has a generally similar external shape as a conventional masonry brick, but is substantially hollow and has front and rear faces that are fluidly connected to each other and open into their external surroundings, thereby allowing ventilation through the airbrick.

[0004] The level of ventilation required by a room of a building varies depending on, for example, the size of the room, its number of windows, etc. Accordingly, it is sometimes necessary to use more than one ventilation unit, in a stacked arrangement, in order to provide the required level of ventilation.

[0005] It is currently known to provide air-bricks that are stackable in alignment with each other, i.e. so that respective end faces of the airbrick in the stack are aligned (as well as their respective front and rear faces).

[0006] Although such a stacking arrangement increases the level of ventilation provided (as compared to with a single ventilation unit), it interrupts with the normal staggered arrangement of masonry bricks in the wall. This interferes with a builder's typical method of laying bricks, disrupts the structural continuity of the wall and is aesthetically displeasing.

[0007] In addition, known stackable ventilation units are engaged with each other by sliding one on top of the other, i.e. where the lower face of a ventilation unit in the stack is slid across the upper face of a ventilation unit adjacently below it in the stack. Such slidable engagement acts to knock cement off adjacent bricks, thereby causing damage to the structural integrity of the wall.

[0008] Furthermore, such a ventilation unit is susceptible to being forcibly removed from a wall by sliding it out of the wall, in order to gain access through the wall.

[0009] FR 1 287 951 A discloses a set of ventilation units according to the preamble of claim 1.

[0010] Embodiments of the present invention seek to overcome the above problems.

Summary of the Invention

[0011] According to a first aspect of the invention there is provided a set of ventilation units according to claim 1.

[0012] According to a second aspect of the present invention there is provided a first ventilation unit according to claim 12.

[0013] The features of the charactering part of claim 1 allow the first and second ventilation units to be engaged with each other by moving the first and second ventilation units together in direction that is substantially perpendicular to said surface of the first ventilation unit and/or said surface of the second ventilation unit, until the at least one formation and at least one co-operating formation engage. Accordingly, the ventilation units can be engaged with each other without having to slide one ventilation unit across a surface of the other ventilation unit.

[0014] This is advantageous in that it allows the ventilation units to be engaged with each other without causing cement to be knocked off adjacent masonry bricks, thereby avoiding damage to the structural integrity of a wall in which the ventilation units are installed.

[0015] Preferably said at least one formation and at least one co-operating formation are disengageable from each other in a direction that is substantially perpendicular to said surface of the first ventilation unit and/or said surface of the second ventilation unit.

[0016] This is advantageous in that, since the ventilation units cannot be disengaged from each other by sliding one relative to the other, it is harder to remove the ventilation units, from a wall in which they are installed, by forcibly sliding them out of the wall.

[0017] Preferably, the at least one formation and the at least one cooperating formation are arranged such that they are attached to each other when they are engaged. Preferably the at least one formation and at least one cooperating formation are arranged such that when they are engaged, the first and second ventilation units are constrained from relative movement in the length and/or width directions of the ventilation units.

[0018] Preferably the at least one formation and the at least one co-operating formation are engageable by a push-fit engagement. Preferably the at least one formation and the at least one co-operating formation are engageable by an interference fit.

[0019] The at least one formation and the at least one co-operating formation may be releasably engageable. Preferably the at least one formation and the at least one co-operating formation are permanently engageable.

[0020] According to the invention the at least one formation protrudes outwardly from said surface of the first ventilation unit in a direction which is substantially perpendicular to said surface. According to the invention the at least one formation has a longitudinal axis that is substantially perpendicular to said surface. Preferably the at least one formation is axisymmetric about its longitudinal axis.

[0021] According to the invention the at least one co-operating formation is arranged to receive said formation in a direction which is substantially perpendicular to said surface of the second ventilation unit. According to the invention the at least one co-operating formation com-

prises a surface that defines a space for receiving the at least one formation and said space has a longitudinal axis that is substantially perpendicular to said surface of the second ventilation unit. Preferably said surface is arranged to form an interference fit with the at least one formation, when the at least one formation is received within said space. Preferably said space is axisymmetric about its longitudinal axis.

[0022] Preferably the at least one formation and the at least one co-operating formation are engageable by slidably receiving the at least one formation within said space of the at least one co-operating formation. Preferably, the longitudinal axes of said at least one formation and said space are substantially parallel when the at least one formation is received within said space.

[0023] Preferably the first ventilation unit is stackable on or against the second ventilation unit. Preferably the first ventilation unit is stackable on or against the second ventilation unit about said surfaces of the first and second ventilation units.

[0024] Preferably said surfaces of the first and second ventilation units are substantially planar. Preferably said surfaces of the first and second ventilation units are arranged such that, when the at least one formation and the at least one co-operating formations are engaged, said surfaces are adjacent to each other. Preferably, when the at least one formation and the at least one co-operating formations are engaged, said surfaces are opposed to each other. Preferably, when the at least one formation and the at least one co-operating formations are engaged, said surfaces are substantially parallel.

[0025] Preferably the first and second ventilation units are arranged such that, when the at least one formation and the at least one co-operating formation are engaged, a space is provided between said surfaces. Preferably said space is in a direction which is substantially perpendicular to said surfaces of the first and second ventilation units. Preferably the space is for receiving an adhesive.

[0026] Preferably the at least one formation and/or the at least one co-operating formation is/are provided with a spacer element, which spaces said surfaces from each other when the at least one formation and the at least one co-operating formation are engaged. The spacer element may be formed by, or in part, by the at least one formation and/or the at least one cooperating formation.

[0027] Where the at least one cooperating formation comprises a surface that defines a space for receiving the at least one formation, said surface preferably comprises a section which is arranged to act in limiting abutment with the at least one formation when the at least one formation and the at least one cooperating formation are engaged and wherein said section is distanced from said surface of the second ventilation unit in a direction which is substantially perpendicular to the surface of the second ventilation unit.

[0028] This is advantageous in that cement may be provided in this space, as the ventilation units are engaged. Accordingly, once the adhesive sets, the ventilation units are fixedly secured to each other by the cement (as well as by the engagement of the at least one formation and the at least one co-operating formation). This maintains the structural integrity of the wall, and makes it difficult, if not impossible, to remove the ventilation units from a structure in which they are installed, for example by forcibly sliding the ventilation units out of the structure.

[0029] In addition, this allows the at least one formation and the at least one co-operating formation to key into the adhesive layer in the space, thereby increasing the strength of the bond between the ventilation units, or between a said ventilation unit and a respectively adjacent structural brick.

[0030] Preferably the first and second ventilation units are arranged such that, when the at least one formation and the at least one co-operating formation are engaged, respective lengthwise ends of the first and second ventilation units are substantially aligned. In order to provide this arrangement, the at least one formation and the at least one co-operating formation are preferably located substantially the same distance as each other from respective lengthwise ends of the first and second ventilation units respectively. This is advantageous in that it allows for automatic aligning of the first and second ventilation units, in the lengthwise direction, when the at least one formation and the at least one cooperating formation are engaged.

[0031] Preferably the first and second ventilation units are arranged such that, when the at least one formation and the at least one co-operating formation are engaged, the first and second ventilation units are staggered in the lengthwise direction. In order to provide this arrangement, the at least one formation and the at least one co-operating formation are preferably provided at different length-wise positions of the first and second ventilation units respectively. This is advantageous in that it allows the first and second ventilation units to be stacked in a staggered arrangement. Therefore, the stacked ventilation units do not interrupt the normal staggered arrangement of bricks as they can be laid like normal masonry bricks. Accordingly the ventilation units do not interfere with a builder's normal method of laying bricks and do not disrupt the structural continuity of the wall.

[0032] Preferably the first and second ventilation units are arranged such that when the at least one formation and the at least one co-operating formation are engaged, a lengthwise end of the first ventilation unit is substantially aligned with a perpendicular bisector that passes through the mid-point of the length of the second ventilation unit, or vice versa. In order to provide this arrangement, preferably the at least one formation is distanced from a lengthwise end of the first ventilation unit by substantially the same amount as the at least one co-operating formation is distanced from a perpendicular bisector that passes through the mid-point of the length of the second ventilation unit. This is advantageous in that it allows the ventilation units to be staggered such that they overlap by half their lengths, which corresponds to the staggered

arrangement of masonry bricks.

[0033] Preferably the at least one cooperating formation comprises first and second said cooperating formations, said first co-operating formation is at a corresponding position along the length of the second ventilation unit as the at least one formation of the first ventilation unit is along the length of the first ventilation unit and said second co-operating formation is spaced from the first co-operating formation in the length direction of the second ventilation unit. This is advantageous in that the first and second ventilation units can be stacked in both an aligned arrangement, in which the first co-operating formation of the second ventilation unit is engaged with the at least one formation of the first ventilation unit and in a staggered arrangement, in which the second co-operating formation of the second ventilation unit is engaged with the at least one formation of the first ventilation unit. Accordingly, this provides the above advantages of an aligned and a staggered arrangement of ventilation units, as required.

[0034] Preferably the first and second ventilation units are arranged such that, when the at least one formation and co-operating formation are engaged, width-wise ends of the first and second ventilation units are substantially aligned.

[0035] Preferably the at least one formation comprises a plurality of said formations and said formations are provided at different lengthwise positions on said surface of the first ventilation unit. Preferably the at least one cooperating formation comprises a plurality of said cooperating formations and said formations are provided at different lengthwise positions on said surface of the second ventilation unit. Preferably formations and cooperating formations provided at different lengthwise positions are engageable with each other. Preferably formations and cooperating formations provided at corresponding lengthwise positions are engageable with each other.

[0036] Preferably the first and/or second ventilation units each comprise an inlet fluidly connected to an outlet. Preferably the first and/or second ventilation unit comprises at least one surface which defines a space and said inlet is fluidly connected through the space to said outlet. Preferably the inlet and outlet are respectively provided on outer and inner faces of the ventilation unit, or vice versa.

[0037] Preferably the first and/or second ventilation unit is for providing ventilation through a structure of a building. Preferably the first and/or second ventilation unit is an airbrick. Preferably the first and/or second ventilation unit has substantially the same external dimensions as a structural brick.

[0038] Preferably the first and/or second ventilation unit is elongate. Preferably each ventilation unit has the general shape of a cuboid.

[0039] Preferably the first and second ventilation units are substantially identical.

[0040] The set of ventilation units may contain more than two said ventilation unts.

[0041] According to a third aspect of the invention there is provided a method of installing a set of ventilation units according to claim 13.

[0042] Preferably, where the first and second ventilation units are arranged such that, when the at least one formation and the at least one co-operating formation are engaged, the first and second air-bricks are staggered in the lengthwise direction, the first and second ventilation units are staggered in the lengthwise direction.

[0043] Preferably, where the first and second ventilation units are arranged such that, when the at least one formation and the at least one co-operating formation are engaged, the first and second air-bricks are aligned in the lengthwise direction, the first and second ventilation units are aligned in the lengthwise direction.

[0044] All of the features described herein may be combined with any of the above aspects, in any combination.

Detailed Description of the Invention

[0045] For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings in which:

Figure 1 shows a perspective view of a ventilation unit according to the present invention, with a screen of the ventilation unit shown in a partially detached position, for illustrative purposes;

Figure 2 shows a front elevational view of the ventilation unit of Figure 1, with the screen of the ventilation unit omitted for illustrative purposes;

Figure 3 shows a plan elevational view of the ventilation unit of Figure 2;

Figure 4 shows an underplan elevational view of the ventilation unit of Figure 2;

Figure 5 shows an end view of the ventilation unit of Figure 1, with the screen of the ventilation unit shown in a detached position, for illustrative purposes;

Figure 6 shows a cross sectional view of a region of a first surface of a first ventilation unit of the preceding figures with a formation taken along the line A-A in Figure 3 and a corresponding cross sectional view of a region of second surface of a second ventilation unit of the preceding figures, with a cooperating formation taken along the line B-B in Figure 4, where the formation of the first ventilation unit and cooperating formation of the second ventilation unit are positioned prior to engagement;

Figure 7 shows a corresponding view to that of Figure 6, but where the formation and cooperating formation are positioned in engage-

ment with each other;

Figure 8 shows a plan elevational view of one of the formations of the ventilation unit of Figures 1 to 6;

Figure 9 shows an underplan view of one of the co-operating formations of the ventilation unit of Figures 1 to 6;

Figure 10 shows a perspective view of an exterior side of a wall comprising a set of ventilation units according to the present invention, arranged in a first lengthwise staggered arrangement;

Figure 11 shows a front elevational view of an interior side of a region of the wall of Figure 10 that comprises the ventilation units;

Figure 12 shows a corresponding view to that of Figure 11, but with the ventilation units in a second lengthwise staggered arrangement, and

Figure 13 shows a corresponding view to that of Figures 11 and 12, but with the ventilation units in an aligned arrangement.

[0046] In the following the terms upper, lower, side and the like terms are used for convenience and refer to the ventilation unit(s) as shown oriented in the drawings, the orientation in which it/they is/are intended to be used, and should not be taken as otherwise limiting.

[0047] Referring to Figures 1 to 5 there is shown a ventilation unit in the form of an airbrick 1. The airbrick 1 is for location in a structure of a building, such as a wall, floor or roof of a building, to providing ventilation through the structure.

[0048] The airbrick 1 comprises a body 2 and a screen 3. The airbrick body 2 has a generally cuboidal shape formed by opposed inner and outer faces 4, 5, opposed first and second surfaces 6, 7 and opposed end surfaces 8, 9. The airbrick body 2 has a longitudinal axis 10.

[0049] The airbrick has substantially similar external dimensions to a conventional structural, e.g. masonry, brick and is for use, in a structure, in place of a structural brick.

[0050] Although in the current embodiment the airbrick body has a generally cuboidal shape, it will be appreciated that an airbrick body having different shapes may fall within the scope of the present invention, for example it may have the shape of a regular cube, etc.

[0051] The inner and outer faces 4, 5, of the airbrick body 2 are substantially open. The longer edges of the inner face 4 are joined to respectively opposed longer edges of the outer face 5 by the first and second surfaces 6, 7 respectively.

[0052] The shorter edges of the inner face 4 are joined to the opposed shorter edges of the outer face 5 by the end surfaces 8, 9 respectively.

[0053] The airbrick body 2 comprises an air-inlet fluidly connected to an air-outlet 12. The air-inlet 11 and air-outlet 12 are formed by the open outer and inner faces 5, 4 of the airbrick body 2 respectively (or vice-versa). The air-inlet 11 is fluidly connected to the air-outlet 12 by the body 2 of the air-brick 1.

[0054] The screen 3 is attachable to the outer face 5 of the airbrick body 2 so as to cover the air-inlet 11 of the air-brick 2. The screen 3 comprises a stainless steel mesh 13 housed within a generally rectangular plastic frame 14 that is sized and dimensioned so at to form a close fit over the open outer face 5 of the airbrick body 2. It will be appreciated that the screen 3 may alternatively, or additionally, cover the inner face 4 of the airbrick body 2 so as to cover the air-outlet 12 of the air-brick 1.

[0055] The screen 3 is releasably attachable to the airbrick body 2. In the current embodiment a tongue and groove arrangement is used with a pair of tongues 15 disposed along upper and lower ends of on an inner surface of the frame 14 of the screen 3 and cooperating grooves 16 disposed along upper and lower ends of the outer face 5 of the airbrick body 2. However, it will be appreciated that the reciprocal arrangement may be used, i.e. with the tongues 15 provide on the airbrick body 2 and the grooves 16 provided on the screen 3. In addition, it will be appreciated that any other suitable form of attachment of the screen 3 to the airbrick body 2 may be used.

[0056] When the screen 3 is attached to the air-brick body 2, it covers the air-inlet 11, thereby preventing vermin, such as rats, mice, slugs and birds from passing through the air inlet 11.

[0057] The airbrick body 2 is provided with internal webs 17, in order to provide strength and rigidity, while allowing ventilation through the airbrick body 2.

[0058] A plurality of formations 18 is disposed on the first surface 6 of the airbrick body 2. The formations 18 are uniformly distributed across the length and width of said first surface 6. A plurality of co-operating formations 19 is disposed on the second surface 7 of the airbrick body 2. The co-operating formations 19 are uniformly distributed across the length and width of the second surface 7, at corresponding spatial positions to those of the formations on the first surface 6.

[0059] The formations and cooperating formations 18, 19 are arranged in a generally rectangular array, with rows of the array extending in the length direction of the respective first and second surfaces 6, 7 and columns of the array extending in the width direction. The formations and cooperating formations 18, 19 in each row and column are uniformly spaced in said length and width directions respectively.

[0060] In the current embodiment the formations and cooperating formations 18, 19 are arranged in two rows and four columns. Accordingly, each row comprises four formations or cooperating formations 18, 19 distributed in the length direction of the respective surface. Each column comprises two formations or cooperating formations 18, 19 distributed in the width direction of the respective surface. However, it will be appreciated that different numbers of formations/cooperating formations 18,

19 in the length and width directions may be used. Furthermore, it is envisaged that the first and second surfaces could be provided with a single formation and co-operating formation respectively.

[0061] Reference will now be made to Figures 6 and 7 which both show a cross sectional view of a region of first surface 6 and a formation 18 of a first said airbrick 21 taken along the line A-A in Figure 3 and a corresponding cross sectional view of a region of second surface of a second said airbrick 22 and a cooperating formation 19 taken along the line B-B in Figure 4. The first and second airbricks 21, 22 are substantially identical to the above described airbrick 1. Accordingly, the first and second airbricks 21, 22 have substantially the same dimensions, including substantially the same width, length and depth. In Figure 6, the formation 18 of the first airbrick 21 and cooperating formation 19 of the second airbrick 22 are positioned prior to engagement. In Figure 7, the formation 18 and cooperating formation 19 are engaged with each other.

[0062] The formations 18 on the first surface 6 of the first airbrick 21 are engageable with the co-operating formations 19 on the second surface of a second said airbrick 22 in a direction that is substantially perpendicular to the first surface of the first airbrick and the second surface of the second airbrick. Similarly, the cooperating formations 19 on the second surface of the first airbrick 21 are engageable with the formations 18 on the first surface 6 of the second airbrick 22 in a direction that is substantially perpendicular to the first surface of the second airbrick and the second surface of the first airbrick (see below).

[0063] Each formation 18 comprises a generally elongate protrusion in the form of a generally cylindrical body that protrudes outwardly from the first surface 6 of the airbrick and has a longitudinal axis 23 which is substantially perpendicular to said first surface. The body has a step decrease in its radius along its length so as to form first and second sections 24, 25, with the first section 24 being of greater radius than the second section 25. The first and second sections 24, 25 are proximal and distal to the first surface 6 of the airbrick body 2 respectively.

[0064] It will be appreciated that the body of the formations 18 may form different shapes. For example, the boy of the formations 18 may have a cross-sectional shape which is substantially square, triangular, diamond shaped, etc.

[0065] Each co-operating formation 19 comprises a generally cylindrical body 26 having a longitudinal axis 27 that is substantially perpendicular to the second surface 7.

[0066] An end of the body 26 of the co-operating formation 19 that is distal to the second surface 7 of the airbrick body 2 is provided with a recess such that an inner wall of the recessed portion of the body 26 defines a space 28. The recessed space 28 is generally cylindrical and has a longitudinal axis 29 that is substantially coincident and substantially parallel to the longitudinal axis 27 of the body 26 of the co-operating formation 19. The longitudinal axis 29 of the recess 28 is substantially perpendicular to the second surface 7 of the airbrick body 2.

[0067] The recess 28 is sized and dimensioned to receive the second section 25 of the formation 18 such that an interference fit is formed between the second section 25 of the formation 18 an inner surface of the body 26 of the cooperating formation 19.

[0068] It will be appreciated that, in an alternative arrangement, the formations 18 may be provided on the second surface 7 of the airbrick body 2 and the cooperating formations 19 provided on the first surface of the airbrick body 2.

[0069] In order to engage the formation 18 and cooperating formation 19, they are moved from the position shown in Figure 6, to the position shown in Figure 7. Specifically, the longitudinal axis 23 of the body of the formation 18 is aligned with the longitudinal axis 29 of the recess 28 of the cooperating formation 19. The second section 25 of the body of the formation 18 is then slidably inserted into the recess 28, in a direction that is substantially parallel to the respective longitudinal axes 23, 29 of the body and recess, until the respective distal ends of the first section 24 of the body of the formation and of the body 26 of the cooperating formation 19 abut each other. At this point, an interference fit is formed between the second section 25 of the formation 18 and the inner surface of the body 26 of the cooperating formation 19.

[0070] When the formations 18 and cooperating formations 19 are engaged, the first and second airbricks are fixedly attached to each other. Accordingly they are prevented from relative movement in the length and width directions.

[0071] By virtue of the interference fit, the formations and cooperating formations are releasably attached to each other. It will, of course, be appreciated that an arrangement whereby the formations and cooperating formations are permanently attached is also envisaged.

[0072] Accordingly, the formation and cooperating formation 18, 19 are engageable in a direction that is substantially perpendicular to the first surface 6 of the first airbrick 21 and the second surface 7 of the second airbrick 22.

[0073] Therefore, the first and second airbricks 21, 22 can be engaged with each other without having to slide one airbrick across the first or second surface of the other airbrick.

[0074] This allows the airbricks 21, 22 to be engaged with each other without causing cement to be knocked off the airbricks 21, 22 or off adjacent masonry bricks in a building structure, e.g. a wall, in which the airbricks are installed (see below), thereby avoiding damage to the structural integrity of the structure. In addition, since the airbricks 21, 22 cannot be disengaged from each other by sliding one relative to the other it is difficult, if not impossible, to remove the airbricks from the structure by forcibly sliding them out of the structure.

[0075] It will be appreciated that, where the first surface 6 of the first said airbrick 21 is not substantially parallel to the second surface 7 of the second said airbrick 22 when the formations 18 of the first airbrick 21 are engaged with the cooperating formations 19 of the second airbrick 22, the formations and co-operating formations 18, 19 may be engageable in a direction that is substantially perpendicular to the first surface 6 of the first airbrick 21 and/or the second surface 7 of the second airbrick 22.

[0076] As can be seen from Figure 7, when a formation 18 on the first surface 6 of the first airbrick 21 is engaged with the cooperating formation 19 of the second surface 7 of the second airbrick 22, the first and second surfaces 6, 7 are spaced from each other, in a direction substantially perpendicular to said surfaces, by the combined length of the first section 24 of the body of the formation 18 and the body 26 of the co-operating formation 19.

[0077] This is advantageous in that cement may be provided in this space, before the formation and cooperating formations 18, 19 are engaged, i.e. before the first airbrick 21 is laid on the second airbrick 22. Accordingly, once the cement sets, the first and second airbricks 21, 22 are fixedly secured to each other by the cement (as well as by the engagement of the formations and co-operating formations 18, 19). This maintains the structural integrity of the wall, and makes it even more difficult, if not impossible, to remove the airbricks 21, 22 from the wall, for example by forcibly sliding the airbricks 21, 22 out of the wall.

[0078] In addition, this allows the formation and co-operating formation 18, 19 to key into the cement in said space, thereby increasing the strength of the bond between the first and second airbricks 21, 22, or between the airbricks 21, 22 and a respectively adjacent masonry brick (see below).

[0079] As stated above, the formations and co-operating formations 18, 19 of the first and second airbricks 21, 22 are provided at corresponding positions along the length of the respective surfaces of the airbricks 21, 22. In this respect, corresponding columns of formations and cooperating formations are located substantially the same distance as each other from the lengthwise ends of the respective first and second surfaces 6, 7 of the first and second airbricks 21, 22, i.e. from the ends of the airbrick that terminate in said end faces 8, 9.

[0080] The columns of formations 18 on the first surface 6 of the first airbrick 21 and of the cooperating formations 19 on the second surface of the second airbrick that are provided at substantially the same lengthwise positions on the respective airbricks are engageable. Accordingly the first and second airbricks 21, 22 can be engaged in lengthwise alignment with each other by engaging formations of the first airbrick with cooperating formations of the second airbrick that are at substantially the same lengthwise positions on the airbricks 21, 22.

[0081] Accordingly when the columns of formations 18 and cooperating formations 19 at corresponding lengthwise positions are engaged, the respective lengthwise ends of the airbricks 21, 22 are automatically aligned. This is advantageous in that it allows for automatic aligning of the first and second airbricks 21, 22, in the lengthwise direction, when the airbricks 21, 22 are engaged with other in this way.

[0082] Similarly, rows of formations 18 and co-operating formations 19 of the first and second airbricks 21, 22 are provided at corresponding positions along the width of the respective surfaces 6, 7 of the airbricks 21, 22. In this respect, corresponding rows of formations 18 and cooperating formations 19 are located substantially the same distance as each other from the width-wise ends of the respective first and second surfaces 6, 7 of the first and second airbricks 18, 19, i.e. from the ends of the airbricks 21, 22 that terminate in said inner and outer faces 4, 5.

[0083] The rows of formations 18 on the first surface 6 of the first airbrick 21 and the rows of cooperating formations 19 on the second surface 7 of the second airbrick 22 that are provided at substantially the same width-wise positions on the respective surfaces are engageable with one another. This is advantageous in that it allows for automatic aligning of the first and second airbricks 21, 22, in the width-wise direction, when they are engaged with each other in this way.

[0084] The columns of formations 18 on the first surface 6 of the first airbrick 21 and of the cooperating formations 19 on the second surface 7 of the second airbrick 22, that are provided at different lengthwise positions on the respective surfaces 6, 7 of the airbricks 21, 22 are also engageable. Accordingly the first and second airbricks 21, 22 can be engaged with each other in different relative lengthwise positions by engaging formations of the first airbrick with cooperating formations of the second airbrick that are at different lengthwise positions on the airbrick. Therefore the first and second airbricks can be engaged with each other different staggered lengthwise arrangements, i.e. with their lengthwise ends not in alignment.

[0085] Being able to stack the first and second airbricks 21, 22 in a staggered lengthwise arrangement is advantageous in that the stacked airbricks 21, 22 do not interrupt the normal staggered arrangement of masonry bricks in a building structure, such as a wall, as they can be staggered in substantially the same way as normal masonry bricks (see below). Accordingly the airbricks 21, 22 do not interfere with a builder's normal method of laying bricks and do not disrupt the structural continuity of the structure.

[0086] Referring now to Figures 10 and 11, there is shown a building structure, in the form of a wall 32, comprising a set of the above described airbricks 1, installed within the wall 32. The wall 32 comprises a plurality of rows of masonry bricks 33 laid one on top of the other, to form a substantially vertical wall. The set of airbricks comprises first, second and third said airbricks 21, 22, 34.

[0087] When installed in a structure, such as a wall 32, the first and second surfaces 6, 7 of each airbrick 21, 22,

34 are respectively adjacent and opposed to the second and first faces 7, 6 of airbricks 21, 22, 34, or masonry bricks 33, that are provided in adjacent rows in the structure and that overlap the airbrick 21, 22, 34 in the length direction of the airbrick 21, 22, 34.

[0088] For example, where the wall 32 is a substantially vertical wall, as in the current embodiment, the first and second faces 6, 7 of the airbricks 21, 22, 34 form substantially horizontal upper and lower surfaces respectively. It will be appreciated that where the inclination of the wall is different (e.g. substantially horizontal), the orientation of the first and second surfaces 6, 7 will vary accordingly.

[0089] The inner and outer faces 4, 5 of the airbrick are exposed to interior and exterior sides of the structure 32, or vice versa. For example, where the airbrick 21, 22, 34 is installed in a wall, as in the current embodiment, to provide ventilation through the wall, the inner face 4 of the airbrick 21, 22, 34 is exposed to the interior of a room defined by the wall 32 and the outer face 5 of the airbrick 21, 22, 34 is exposed to the exterior of the room, or vice versa.

[0090] The end surfaces 8, 9 of the airbricks 21, 22, 34 are adjacent and opposed to corresponding end surfaces 8, 9 of adjacent airbricks 21, 22, 34, or masonry bricks 33, in the same row in the structure.

[0091] With reference to Figure 11, the longitudinal axes 23 of the formations 18 provided on either side of the midpoint 30 of the length of the first surface 6 of the first airbrick 21 are distanced (x_1,y_1) from the lengthwise end of the first surface 6 on the same respective side of said midpoint 30 by substantially the same amount as the longitudinal axes 29 of the co-operating formations 19 on a correspondingly opposite side of the midpoint of the length of the second surface 7 of the second airbrick 22 are distanced (x_2,y_2) from a perpendicular bisector 31 that passes through the mid-point of the length of the second surface 7. This is advantageous in that it allows the engaged airbrick 21, 22 to be staggered in a lengthwise direction such that they overlap by substantially half their lengths, which corresponds to the typical staggered arrangement of masonry bricks. This arrangement is substantially the same for other airbricks 21, 22, 34 in the set.

[0092] Since the airbricks can be staggered and/or aligned with each other, when engaged, this allows the airbricks to be stacked in a large number of different arrangements, such as those shown in Figures 10 to 13. It will be appreciated that more than two airbricks may be stacked together in the above described aligned and/or staggered arrangements, in order to provide the desired levels of ventilation. This provides a flexible arrangement that can be varied in order to suit the desired application, for example to suit a building's ventilation and/or aesthetic requirements.

[0093] In order to install the airbricks 21, 22, 34 in a structure of a building, such as a wall 32, a first row of structural bricks 33, e.g. masonry bricks, is laid. As the structural bricks 33 are laid, a first airbrick 21 is included in the row, in place of a structural brick 33. Once the row has been laid, a layer of adhesive 40, in the form of cement, is placed on the first row. The cement 40 is placed on the first surface 6 of the first airbrick 21, between the formations 18. A second row of structural bricks 33 is placed on the first row. As the second row is laid, a second said airbrick 22 is placed on the first airbrick 21 and some or all of the formations 18 on the first surface 6 of first airbrick 21 are engaged with some or all of the cooperating formations 19 on the second surface 7 of the second airbrick 22. The formations 18 and cooperating formations 19 are engaged with each other as described above.

[0094] The first and second airbrick 21, 22 can be engaged in lengthwise alignment, by engaging formations 18 and cooperating formations 19 that are located at corresponding lengthwise positions. Alternatively, the first and second airbricks 21, 22 can be staggered in the lengthwise direction by engaging formations 18 and co-operating formations 19 that are located at different lengthwise positions, as described above.

[0095] When the formations 18 and cooperating formations 19 are engaged, the respective first and second surfaces 6, 7 of the first and second airbricks 21, 22 are spaced from each other by the combined length of first section 24 of the body of the formation 18 and the body 26 of the co-operating formation 19. The cement laid on the first airbrick is received within this space, as the formation and cooperating formations 18, 19 of the first and second airbricks 21, 22 are engaged.

[0096] Additional rows of bricks, with one or more airbricks, may be laid as required.

[0097] In conclusion, the present invention provides an airbrick that can be engaged with another said airbrick without causing cement to be knocked off adjacent airbricks or structural bricks in a building. In addition, the engaged airbrick are difficult, if not impossible, to remove from a structure in which they are installed by forcibly sliding them out of the structure.

[0098] Furthermore, the airbrick can be engaged with another airbrick, in an adjacent row in a structure of a building, in both an aligned or staggered arrangement as desired. Since the engaged airbricks can be staggered, they do not interfere with the normal staggered arrangement of masonry bricks.

[0099] The above embodiment is described by way of example. Many variations are possible without departing from the invention, as defined by the appended claims.

Claims

1. A set of ventilation units comprising first and second ventilation units (21, 22), wherein a surface (6) of the first ventilation unit (21) is provided with at least one formation (18) and a surface (7) of the second ventilation unit (22) is provided with at least one co-operating formation (19), wherein said at least one formation (18) and said at least one co-operating for-

mation (19) are engageable with one another in a direction that is substantially perpendicular to said surface (6) of the first ventilation unit (21) and/or to said surface (7) of the second ventilation unit (22), **characterised in that**:

the first and second units (21, 22) are arranged to provide between said surfaces (6, 7) of the first and second units (21, 22), when the at least one formation (18) and the at least one co-operating formation (19) are engaged, an intervening space for receiving a layer of cement (40);
the or each said at least one cooperating formation (19) comprises a generally cylindrical body (26) that protrudes outwardly from said surface (7) of the second unit (22) and defines a longitudinal axis (27) substantially perpendicular thereto, a distal end of the cooperating formation comprising a recess (28) that is substantially cylindrical and defines a longitudinal axis (29) substantially co-incident with and parallel to the longitudinal axis (27) defined by the body of the cooperating formation (19); and
the or each said at least one formation (18) comprises a generally cylindrical body that protrudes outwardly from said surface (6) of the first unit (21) and defines a longitudinal axis (23) substantially perpendicular thereto, the formation (18) having a step decrease in its radius toward its distal end to define proximal and distal parts of the of the formation (18), the distal part (25) being of lesser radius than the proximal part (24) and being receivable in a said recess (28) of the at least one cooperating formation (19).

2. A set of ventilation units according to claim 1 comprising a spacer element arranged to provide said intervening space.

3. A set of ventilation units according to claim 1 or claim 2 comprising a layer of cement (40) in said intervening space, such as wherein the first and second ventilation units (21, 22) are fixedly secured to one another by said cement.

4. A set of ventilation units according to any preceding claim wherein said surface of the at least one co-operating formation comprises a section which is arranged to act in limiting abutment with the at least one formation (18) when the at least one formation and the at least one co-operating formation are engaged and wherein said section is spaced from said surface (7) of the second ventilation unit (22).

5. A set of ventilation units according to any preceding claim wherein the at least one formation (18) and the at least one co-operating formation (19) are engageable by slidably receiving a said distal part (25) of the at least one formation (18) within a said recess (28) of the at least one co-operating formation (19), such as to form an interference fit between the distal part (25) and a surface of the recess (28).

6. A set of ventilation units according to any preceding claim wherein the longitudinal axis (23) of a said at least one formation (18) is substantially parallel to the longitudinal axis (29) of a said recess (28) of the at least one co-operating formation (19) when a said distal part (25) of the formation (18) is received within said recess (28).

7. A set of ventilation units according to any preceding claim wherein one or each of the first and second ventilation units (21, 22) is an air-brick.

8. A set of ventilation units according to any preceding claim wherein the at least one formation (18) and at least one co-operating formation (19) are disengageable from one another in a direction that is substantially perpendicular to said surface (6) of the first ventilation unit (21) and/or said surface (7) of the second ventilation unit (22), such as wherein the at least one formation (18) and at least one co-operating formation (19) are arranged so that, when they are engaged, the first and second ventilation units (21, 22) are constrained from relative movement in the length and/or width directions of the ventilation units (21, 22).

9. A set of ventilation units according to any preceding claim wherein the at least one formation (18) and the at least one co-operating formation (19) are arranged such that when they are engaged they are attached to one another, such as by means of an interference fit therebetween.

10. A set of ventilation units according to any preceding claim wherein the first ventilation unit (21) is stackable on or against the second ventilation unit (22) and wherein the at least one formation (18) and the at least one co-operating formation (19) are arranged to be mutually engageable both when stacking the units (21, 22) in a lengthwise staggered arrangement, such as wherein the units overlap one another by substantially half the length of a unit, and when stacking the units (21, 22) in an aligned arrangement wherein respective lengthwise ends (8, 9) of the first and second units (21, 22) are substantially aligned.

11. A set of ventilation units according to any preceding claim wherein the at least one formation comprises a plurality of said formations (18) provided at different lengthwise positions on said surface (6) of the first unit (21), the at least one co-operating formation comprises a plurality of said co-operating formations (19) provided at different lengthwise positions on

said surface (7) of the second unit (22), and the first and second units (21, 22) are mutually engageable at different relative lengthwise positions by engaging formations (18) of the first unit (21) with co-operating formations (19) at different lengthwise positions along the second unit (22).

12. A ventilation unit (1, 2, 21, 22) for use in set of ventilation units according to any preceding claim wherein the units of the set are substantially identical, said ventilation unit (1, 2, 21, 22) comprising a first surface (6) provided with at least one formation (18) and a second surface (7) provided with at least one co-operating formation (19), wherein said at least one formation (18) is engageable with the at least one co-operating formation (19) of a second said ventilation unit in a direction that is substantially perpendicular to said first surface (6), and/or to the second surface (7) of the second said ventilation unit, **characterised in that**:

the ventilation unit (1, 2, 21, 22) is arranged to provide between its first surface (6) and the second surface (7) of a second said unit, when said at least one formation (18) is engaged with the at least one co-operating formation (19) of the second said unit, an intervening space for receiving a layer of cement;
the or each said at least one cooperating formation (19) comprises a generally cylindrical body (26) that protrudes outwardly from said second surface (7) and defines a longitudinal axis (27) substantially perpendicular thereto, a distal end of the cooperating formation comprising a recess (28) that is substantially cylindrical and defines a longitudinal axis (29) substantially coincident with and parallel to the longitudinal axis (27) defined by the body of the cooperating formation (19); and
the or each said at least one formation (18) comprises a generally cylindrical body that protrudes outwardly from said first surface (6) and defines a longitudinal axis (23) substantially perpendicular thereto, the formation (18) having a step decrease in its radius toward its distal end to define proximal and distal parts of the of the formation (18), the distal part (25) being of lesser radius than the proximal part (24) and being receivable in a said recess (28) of the at least one cooperating formation (19) of a second said ventilation unit.

13. A method of installing a set of ventilation units according to any of claims 1 to 11 in a structure of a building (32), comprising laying a first row of structural bricks (33), providing the first ventilation unit (21) in said first row, laying a second row of structural bricks (33) adjacent said first row, providing the second ventilation unit (22) in said second row, and engaging the at least one co-operating formation (19) of the second ventilation unit (22) with the at least one formation (18) of the first ventilation unit (21) in a direction that is substantially perpendicular to said surface (6) of the first ventilation unit (21) and/or said surface (7) of the second ventilation unit (22), wherein the method includes providing a layer of adhesive material (40) between the first and second ventilation units (21, 22), such as by placing a layer of cement on the first row before laying the second row.

Patentansprüche

1. Gruppe von Belüftungseinheiten, aufweisend eine erste und eine zweite Belüftungseinheit (21, 22), wobei eine Oberfläche (6) der ersten Belüftungseinheit (21) mit wenigstens einer Ausformung (18) versehen ist und eine Oberfläche (7) der zweiten Entlüftungseinheit (22) mit wenigstens einer mitwirkenden Ausformung (19) versehen ist, wobei die besagte wenigstens eine Ausformung (18) und die besagte wenigstens eine mitwirkende Ausformung (19) miteinander in Eingriff bringbar sind, und zwar in einer Richtung, die im Wesentlichen senkrecht zu besagter Oberfläche (6) der ersten Belüftungseinheit (21) und/oder senkrecht zu besagter Oberfläche (7) der zweiten Lüftungseinheit (22) ist, **dadurch gekennzeichnet dass**:

die erste und die zweite Einheit (21, 22) so angeordnet sind, dass sie zwischen den Oberflächen (6, 7) der ersten und der zweiten Einheit (21, 22) einen Zwischenraum zur Aufnahme einer Zementschicht (40) zur Verfügung stellen, sobald die wenigstens eine Ausformung (18) und die wenigstens eine mitwirkende Ausformung (19) miteinander in Eingriff sind;
die erste oder die besagte wenigstens eine mitwirkende Ausformung (19) einen im Wesentlichen zylindrischen Körper (26) umfasst, der von der Oberfläche (7) der zweiten Einheit (22) nach außen wegragt und eine im Wesentlichen senkrecht dazu verlaufende Längsachse (27) definiert, wobei das entfernte Ende der mitwirkenden Ausformung eine Vertiefung (28), die im Wesentlichen zylindrisch ausgebildet ist, aufweist, und eine Längsachse (29) definiert, die im Wesentlichen parallel und zusammenfallend mit der Längsachse (27), die durch den Körper der mitwirkenden Ausformung (19) definiert ist, verläuft; und
die oder jede besagte wenigstens eine Ausformung (18) einen im Wesentlichen zylindrischen Körper aufweist, der von besagter Oberfläche (6) der ersten Einheit (21) nach außen wegragt und eine im Wesentlichen senkrecht dazu ver-

laufende Längsachse (23) definiert, wobei die Ausformung (18) eine stufenweise Verkleinerung in ihrem Radius hin zu ihrem entfernten Ende aufweist, um naheliegende und entfernt liegende Bestandteile der Ausformung (18) zu definieren, wobei der entfernt liegende Bestandteil (25) einen geringeren Radius aufweist, als der naheliegende Bestandteil (24) und in einer besagten Vertiefung (28) der wenigstens einen mitwirkenden Ausformung (19) aufnehmbar ist.

2. Gruppe von Belüftungseinheiten nach Anspruch 1, aufweisend ein derart angeordnetes Abstandselement, dass es besagten Zwischenraum zur Verfügung stellt.

3. Gruppe von Belüftungseinheiten nach Anspruch 1 oder 2, aufweisend eine Schicht aus Zement (40) in besagtem Zwischenraum, wobei beispielsweise die erste und zweite Belüftungseinheit (21, 22) durch besagten Zement starr aneinander befestigt sind.

4. Gruppe von Belüftungseinheiten nach einem der vorangehenden Ansprüche, wobei die Oberfläche der wenigstens einen mitwirkenden Ausformung einen Abschnitt aufweist, der so angeordnet ist, dass er als begrenzender Anschlag mit der wenigstens einen Ausformung (18) wirkt, wenn die wenigstens eine Ausformung und die wenigstens eine mitwirkende Ausformung in Eingriff sind und wobei besagter Abschnitt von der Oberfläche (7) der zweiten Belüftungseinheit (22) beabstandet ist.

5. Gruppe von Belüftungseinheiten nach einem der vorangehenden Ansprüche, wobei die wenigstens eine Ausformung (18) und die wenigstens eine mitwirkende Ausformung (19) durch gleitendes Aufnehmen des entfernten Bestandteils (25) der wenigstens einen Ausformung (18) innerhalb besagter Vertiefung (28) der wenigstens einen mitwirkenden Ausformung (19) in Eingriff bringbar sind, beispielsweise um eine Presspassung zwischen dem entfernten Bestandteil (25) und einer Oberfläche der Vertiefung (28) auszubilden.

6. Gruppe von Belüftungseinheiten nach einem der vorangehenden Ansprüche, wobei die Längsachse (23) der wenigstens einen Ausformung (18) im Wesentlichen parallel zur Längsachse (29) einer Vertiefung (28) der wenigstens einen mitwirkenden Ausformung (19) ist, sofern der entfernt liegende Bestandteil (25) der Ausformung (18) in besagter Vertiefung (28) aufgenommen ist.

7. Gruppe von Belüftungseinheit nach einem der vorangehenden Ansprüche, wobei ein oder jeder der ersten und zweiten Belüftungseinheiten (21, 22) ein Ziegelstein ist.

8. Gruppe von Belüftungseinheiten nach einem der vorangehenden Ansprüche, wobei die wenigstens eine Ausformung (18) und die wenigstens eine mitwirkende Ausformung (19) unverrückbar voneinander sind, in einer Richtung, die im Wesentlichen senkrecht zu besagter Oberfläche (6) der ersten Belüftungseinheit (21) und/oder senkrecht zu besagter Oberfläche (7) der zweiten Belüftungseinheit (22) ist, wobei beispielsweise die wenigstens eine Ausformung (18) und die wenigstens eine mitwirkende Ausformung (19) so angeordnet sind, dass, sofern sie miteinander im Eingriff sind, die erste und die zweite Belüftungseinheit (21, 22) in einer Relativbewegung in der Längen- und/oder Breitenrichtung der Belüftungseinheit (21, 22) eingeschränkt sind.

9. Gruppe von Belüftungseinheiten nach einem der vorangehenden Ansprüche, wobei die wenigstens eine Ausformung (18) und die wenigstens eine mitwirkende Ausformung (19) derart angeordnet sind, dass, sofern sie miteinander in Eingriff sind, sich untereinander, beispielsweise mithilfe einer Presspassung dazwischen, verbinden.

10. Gruppe von Belüftungseinheiten nach einem der vorangehenden Ansprüche, wobei die erste Belüftungseinheit (21) auf oder gegen die zweite Belüftungseinheit (22) stapelbar ist und wobei die wenigstens eine Ausformung (18) und die wenigstens eine mitwirkende Ausformung (19) derart angeordnet sind, dass sie miteinander verbunden sind, sowohl beim Stapeln der Einheiten (21, 22) in einer längsversetzten Anordnung, bei der die Einheiten sich einander im Wesentlichen um die Hälfte der Länge einer Einheit überlappen, als auch beim Stapeln der Einheiten (21, 22) in einer ausgerichteten Anordnung, wobei jeweilige Längsenden (8, 9) der ersten und zweiten Einheiten (21, 22) im Wesentlichen zueinander ausgerichtet sind.

11. Gruppe von Belüftungseinheiten nach einem der vorangehenden Ansprüche, wobei die wenigstens eine Ausformung eine Vielzahl von Ausformungen (18) aufweist, die an verschiedenen Längspositionen auf besagter Oberfläche (6) der ersten Einheit (21) vorgesehen sind, und wobei die wenigstens eine mitwirkende Ausformung (19) eine Vielzahl von mitwirkenden Ausformungen (19) aufweist, die an verschiedenen Längspositionen auf besagter Oberfläche (7) der zweiten Einheit (22) vorgesehen sind, und wobei die ersten und zweiten Einheiten (21, 22) in verschiedenen relativen Längspositionen miteinander, durch koppeln von Ausformungen (18) der ersten Einheit (21) mit mitwirkenden Ausformungen (19) an unterschiedlichen Längspositionen entlang der zweiten Einheit (22), in Eingriff bringbar sind.

12. Belüftungseinheit (1, 2, 21, 22) zur Verwendung in

einer Gruppe von Belüftungseinheiten nach einem der vorhergehenden Ansprüche, wobei die Einheiten der Gruppe im Wesentlichen identisch sind, wobei besagte Belüftungseinheit (1, 2, 21, 22) eine erste Oberfläche (6) mit wenigstens einer Ausformung (18) und eine zweite Oberfläche (7) mit wenigstens einer mitwirkenden Ausformung (19) aufweist, wobei die wenigstens eine Ausformung (18) mit der wenigstens einen mitwirkenden Ausformung (19) besagter zweiter Belüftungseinheit in Eingriff bringbar ist, und zwar in einer Richtung, die im Wesentlichen senkrecht zu besagter ersten Oberfläche (6) und / oder senkrecht zu der zweiten Oberfläche (7) der besagten zweiten Belüftungseinheit ist, **dadurch gekennzeichnet, dass**:

die Belüftungseinheit (1, 2, 21, 22) so angeordnet ist, dass sie zwischen ihrer ersten Oberfläche (6) und der zweiten Oberfläche (7) einer zweiten Einheit einen Zwischenraum zur Aufnahme einer Zementschicht (40) zur Verfügung stellt, sofern die wenigstens eine Ausformung (18) mit der wenigstens einen mitwirkenden Ausformung (19) der besagten zweiten Einheit in Eingriff ist;
die oder jede wenigstens eine besagte mitwirkende Ausformung (19) einen im Wesentlichen zylindrischen Körper (26) aufweist, der von der zweiten besagten Oberfläche (7) nach außen wegragt und eine Längsachse (27) definiert, die im Wesentlichen senkrecht dazu ist, wobei ein entferntes Ende der mitwirkenden Ausformung eine Vertiefung (28) aufweist, die im Wesentlichen zylindrisch ist und eine Längsachse (29) definiert, die im Wesentlichen mit der durch den Körper der mitwirkenden Ausformung (19) definierten Längsachse (27) zusammenfällt und parallel zu dieser verläuft; und
die oder jede besagte wenigstens eine Ausformung (18) einen im Wesentlichen zylindrischen Körper aufweist, der von der ersten besagten Oberfläche (6) nach außen wegragt und eine im Wesentlichen senkrecht dazu verlaufende Längsachse (23) definiert, wobei die Ausformung (18) eine stufenweise Verkleinerung in ihrem Radius hin zu ihrem entfernten Ende aufweist, um naheliegende und entfernt liegende Bestandteile der Ausformung (18) zu definieren, wobei der entfernt liegende Bestandteil (25) einen geringeren Radius aufweist, als der naheliegende Bestandteil (24) und in einer besagten Vertiefung (28) der wenigstens einen mitwirkenden Ausformung (19) einer besagten zweiten Belüftungseinheit aufnehmbar ist.

13. Verfahren zur Installation einer Gruppe von Belüftungseinheiten nach einem der Ansprüche 1-11 in der Struktur eines Gebäudes (32), umfassend das Legen einer ersten Reihe von Strukturziegeln (33) mit der ersten Belüftungseinheit (21) in besagter erster Reihe, und umfassend das Legen einer zweiten Reihe von Strukturziegeln (33) mit der zweiten Belüftungseinheit (22) in besagter zweiter Reihe, angrenzend an besagte erste Reihe, wobei die wenigstens eine mitwirkende Ausformung (19) der zweiten Belüftungseinheit (22) mit der wenigstens einen Ausformung (18) der ersten Belüftungseinheit (21) in Eingriff gebracht wird, in einer Richtung, die im Wesentlichen senkrecht zu besagter ersten Oberfläche (6) der zweiten Belüftungseinheit (21) und / oder senkrecht zu besagter zweiten Oberfläche (7) der besagten zweiten Belüftungseinheit ist, wobei das Verfahren die Verwendung einer Schicht adhäsiven Materials (40) zwischen den ersten und den zweiten Belüftungseinheiten (21,22) beinhaltet, beispielsweise durch das Aufbringen einer ersten Schicht Zement auf die erste Reihe, bevor die zweite Reihe aufgelegt wird.

Revendications

1. Ensemble d'unités de ventilation comprenant des première et seconde unités de ventilation (21, 22), dans lequel une surface (6) de la première unité de ventilation (21) est pourvue d'au moins une formation (18) et une surface (7) de la seconde unité de ventilation (22) est pourvue d'au moins une formation coopérante (19), dans lequel ladite au moins une formation (18) et ladite au moins une formation coopérante (19) peuvent s'engager l'une dans l'autre dans une direction qui est sensiblement perpendiculaire à ladite surface (6) de la première unité de ventilation (21) et/ou à ladite surface (7) de la seconde unité de ventilation (22), **caractérisé en ce que** :

les première et seconde unités (21, 22) sont agencées pour fournir entre lesdites surfaces (6, 7) des première et seconde unités (21, 22), lorsque la au moins une formation (18) et la au moins une formation coopérante (19) sont engagées, un espace interposé pour recevoir une couche de ciment (40) ;
la ou chaque dite au moins une formation coopérante (19) comprend un corps généralement cylindrique (26) qui fait saillie vers l'extérieur depuis ladite surface (7) de la seconde unité (22) et définit un axe longitudinal (27) sensiblement perpendiculaire à celui-ci, une extrémité distale de la formation coopérante comprenant un évidement (28) qui est sensiblement cylindrique et définit un axe longitudinal (29) sensiblement coïncidant avec l'axe longitudinal (27) défini par le corps de la formation coopérante (19), et parallèle à celui-ci ; et

la ou chaque dite au moins une formation (18) comprend un corps généralement cylindrique qui fait sailli vers l'extérieur depuis ladite surface (6) de la première unité (21) et définit un axe longitudinal (23) sensiblement perpendiculaire à celui-ci, la formation (18) ayant un diminution progressive de son rayon vers son extrémité distale pour définir des parties proximale et distale de la formation (18), la partie distale (25) étant de rayon inférieur à la partie proximale (24) et pouvant être reçue dans un dit évidement (28) de la au moins une formation coopérante (19).

2. Ensemble d'unités de ventilation selon la revendication 1, comprenant un élément d'espacement disposé pour fournir ledit espace interposé.

3. Ensemble d'unités de ventilation selon la revendication 1 ou la revendication 2, comprenant une couche de ciment (40) dans ledit espace interposé, dans lequel les première et seconde unités de ventilation (21, 22) sont fixement fixées l'une à l'autre par ledit ciment.

4. Ensemble d'unités de ventilation selon l'une quelconque des revendications précédentes, dans lequel ladite surface de la au moins une formation coopérante comprend une section qui est disposée pour agir en butée limite avec la au moins une formation (18) lorsque la au moins une formation et la au moins une formation coopérante sont engagées et dans lequel ladite section est espacée de ladite surface (7) de la seconde unité de ventilation (22).

5. Ensemble d'unités de ventilation selon l'une quelconque des revendications précédentes, dans lequel la au moins une formation (18) et la au moins une formation coopérante (19) peuvent s'engager en recevant de manière coulissante une dite partie distale (25) de la au moins une formation (18) à l'intérieur d'un dit évidement (28) de la au moins une formation coopérante (19), de manière à former un ajustement serré entre la partie distale (25) et une surface de l'évidement (28).

6. Ensemble d'unités de ventilation selon l'une quelconque des revendications précédentes, dans lequel l'axe longitudinal (23) d'une dite au moins une formation (18) est sensiblement parallèle à l'axe longitudinal (29) d'un dit évidement (28) de la au moins une formation coopérante (19) lorsqu'une dite partie distale (25) de la formation (18) est reçue à l'intérieur dudit évidement (28).

7. Ensemble d'unités de ventilation selon l'une quelconque des revendications précédentes, dans lequel une ou chacune des première et seconde unités de ventilation (21, 22) est une brique creuse.

8. Ensemble d'unités de ventilation selon l'une quelconque des revendications précédentes, dans lequel la au moins une formation (18) et la au moins une formation coopérante (19) peuvent être désengagées l'une de l'autre dans une direction qui est sensiblement perpendiculaire à ladite surface (6) de la première unité de ventilation (21) et/ou à ladite surface (7) de la seconde unité de ventilation (22), dans lequel la au moins une formation (18) et la au moins une formation coopérante (19) sont agencées de sorte que, lorsqu'elles sont engagées, les première et seconde unités de ventilation (21, 22) sont limitées à un mouvement relatif dans les directions de longueur et/ou de largeur des unités de ventilation (21, 22).

9. Ensemble d'unités de ventilation selon l'une quelconque des revendications précédentes, dans lequel la au moins une formation (18) et la au moins une formation coopérante (19) sont agencées de telle sorte que lorsqu'elles sont engagées, elles sont reliées l'une à l'autre, telle qu'au moyen d'un ajustement serré entre celles-ci.

10. Ensemble d'unités de ventilation selon l'une quelconque des revendications précédentes, dans lequel la première unité de ventilation (21) est empilable sur ou contre la seconde unité de ventilation (22) et dans lequel la au moins une formation (18) et la au moins une formation coopérante (19) sont agencées à la fois pour pouvoir être mutuellement engagées en empilant les unités (21, 22) dans un agencement longitudinal décalé, telle que dans lequel les unités se chevauchent les unes les autres de pratiquement la moitié de la longueur d'une unité, et en empilant les unités (21, 22) dans un agencement aligné dans lequel des extrémités longitudinales respectives (8, 9) des première et seconde unités (21, 22) sont sensiblement alignées.

11. Ensemble d'unités de ventilation selon l'une quelconque des revendications précédentes, dans lequel la au moins une formation comprend une pluralité desdites formations (18) agencées à différentes positions longitudinales sur ladite surface (6) de la première unité (21), la au moins une formation coopérante comprend une pluralité desdites formations coopérantes (19) agencées à différentes positions longitudinales sur ladite surface (7) de la seconde unité (22), et les première et seconde unités (21, 22) peuvent être mutuellement engagées à différentes positions longitudinales relatives en engageant des formations (18) de la première unité (21) avec des formations coopérantes (19) à différentes positions longitudinales le long de la seconde unité (22).

12. Unité de ventilation (1, 2, 21, 22) pour une utilisation

dans un ensemble d'unités de ventilation selon l'une quelconque des revendications précédentes, dans laquelle les unités de l'ensemble sont sensiblement identiques, ladite unité de ventilation (1, 2, 21, 22) comprenant une première surface (6) pourvue d'au moins une formation (18) et une seconde surface (7) pourvue d'au moins une formation coopérante (19), dans laquelle ladite au moins une formation (18) peut s'engager avec la au moins une formation coopérante (19) d'une seconde dite unité de ventilation dans une direction qui est sensiblement perpendiculaire à ladite première surface (6) et/ou à la seconde surface (7) de la seconde dite unité de ventilation, **caractérisée en ce que** :

l'unité de ventilation (1, 2, 21, 22) est agencée pour fournir entre sa première surface (6) et la seconde surface (7) d'une seconde dite unité, lorsque ladite au moins une formation (18) est engagée avec la au moins une formation coopérante (19) de la seconde dite unité, un espace interposé pour recevoir une couche de ciment ;
la ou chaque dite au moins une formation coopérante (19) comprend un corps généralement cylindrique (26) qui fait saillie vers l'extérieur depuis ladite seconde surface (7) et définit un axe longitudinal (27) sensiblement perpendiculaire à celui-ci, une extrémité distale de la formation coopérante comprenant un évidement (28) qui est sensiblement cylindrique et définit un axe longitudinal (29) sensiblement coïncidant avec l'axe longitudinal (27) défini par le corps de la formation coopérante (19), et parallèle à celui-ci ; et
la ou chaque dite au moins une formation (18) comprend un corps généralement cylindrique qui fait saillie vers l'extérieur depuis ladite première surface (6) et définit un axe longitudinal (23) sensiblement perpendiculaire à celui-ci, la formation (18) ayant une diminution progressive de son rayon vers son extrémité distale pour définir des parties proximale et distale de la formation (18), la partie distale (25) étant de rayon inférieur à la partie proximale (24) et pouvant être reçue dans un dit évidement (28) de la au moins une formation coopérante (19) d'une seconde dite unité de ventilation.

13. Procédé d'installation d'un ensemble d'unités de ventilation selon l'une quelconque des revendications 1 à 11 dans une structure d'un bâtiment (32), comprenant de poser une première rangée de briques de construction (33), agencer la première unité de ventilation (21) dans ladite première rangée, poser une seconde rangée de briques de construction (33) au voisinage de ladite première rangée, agencer la seconde unité de ventilation (22) dans ladite seconde rangée, et engager la au moins une formation coopérante (19) de la seconde unité de ventilation (22) avec la au moins une formation (18) de la première unité de ventilation (21) dans une direction qui est sensiblement perpendiculaire à ladite surface (6) de la première unité de ventilation (21) et/ou à ladite surface (7) de la second seconde unité de ventilation (22), dans lequel le procédé inclut d'agencer une couche de matériau adhésif (40) entre les première et seconde unités de ventilation (21, 22), tels qu'en plaçant une couche de ciment sur la première rangée avant de poser la seconde rangée.

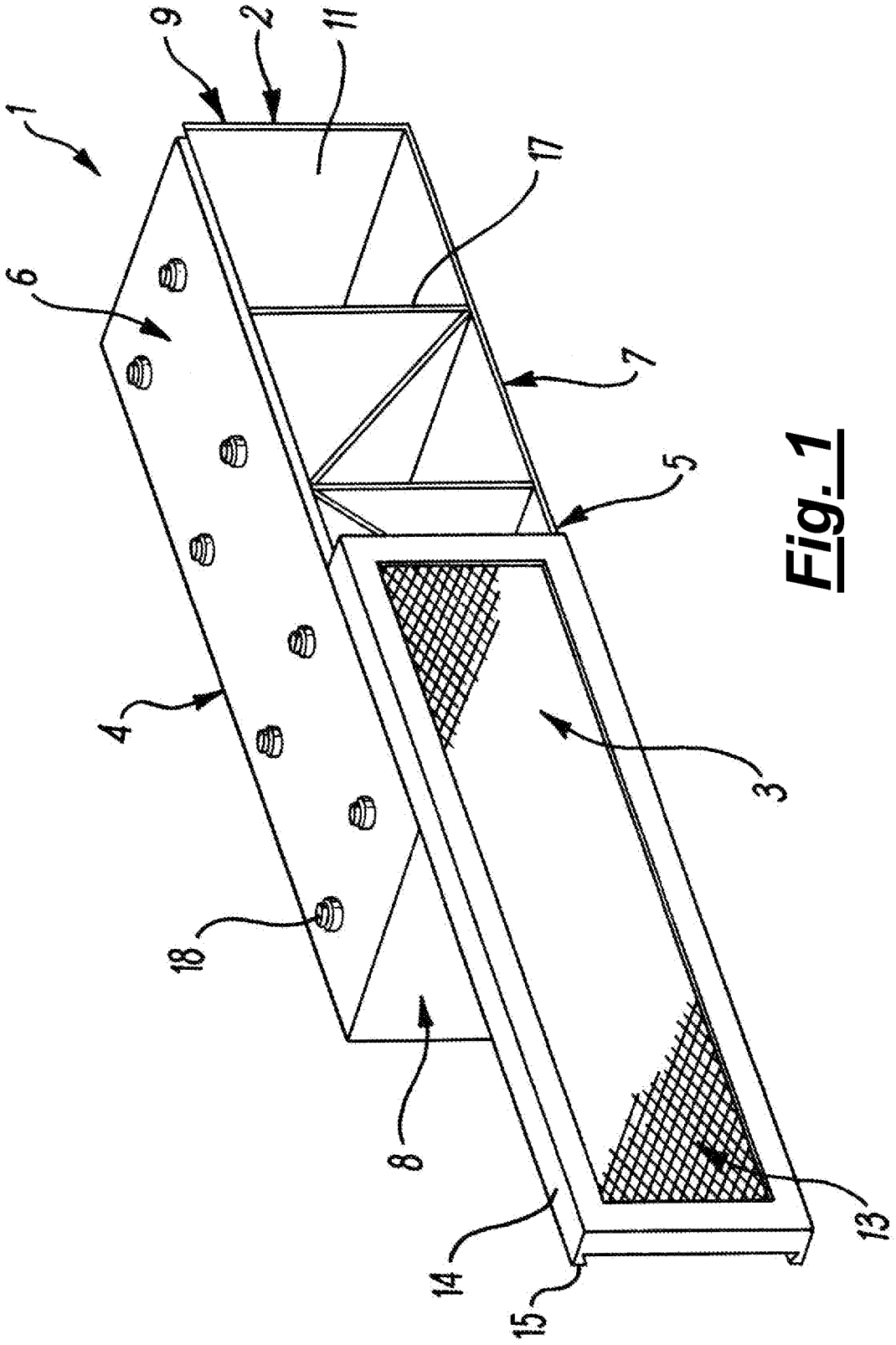

Fig. 1

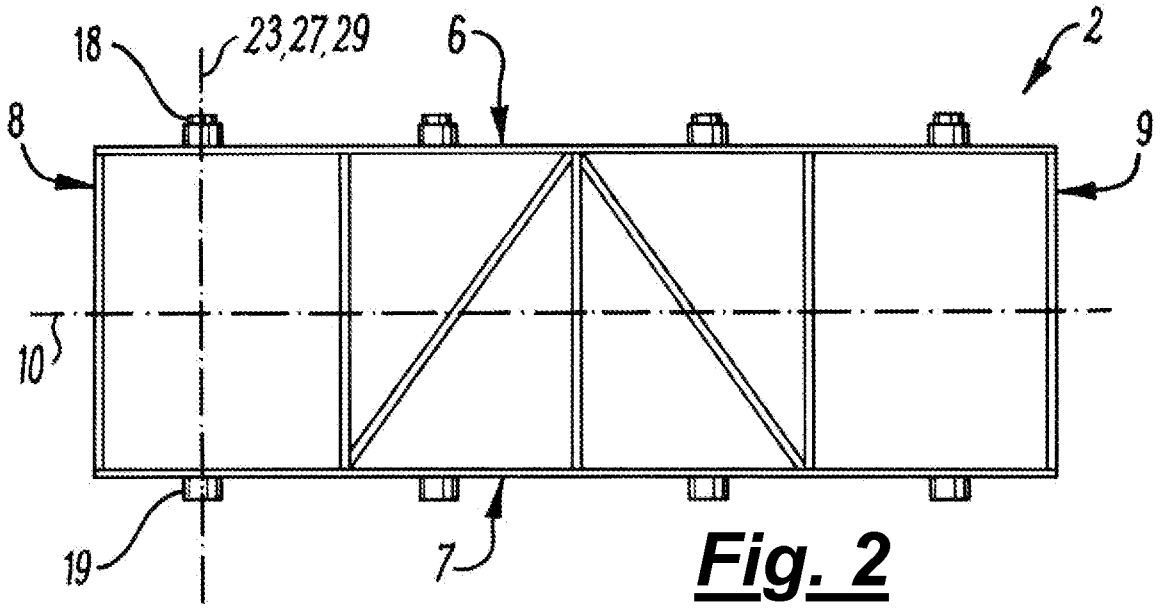

Fig. 2

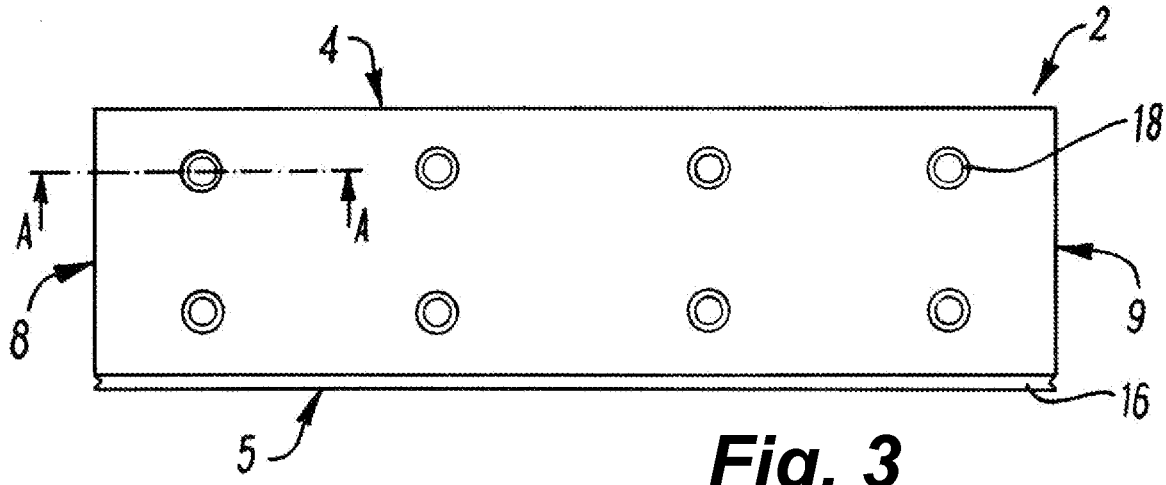

Fig. 3

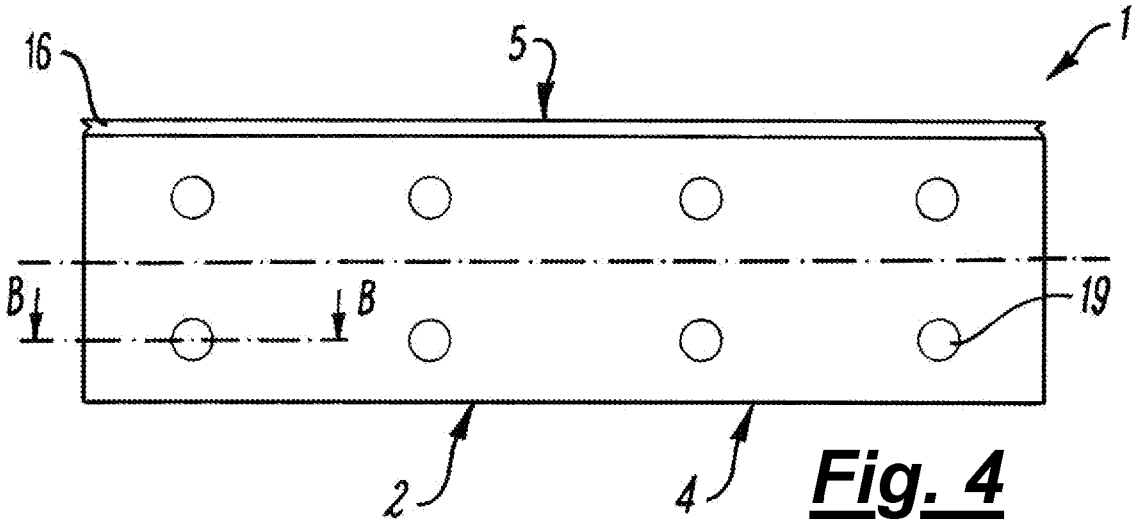

Fig. 4

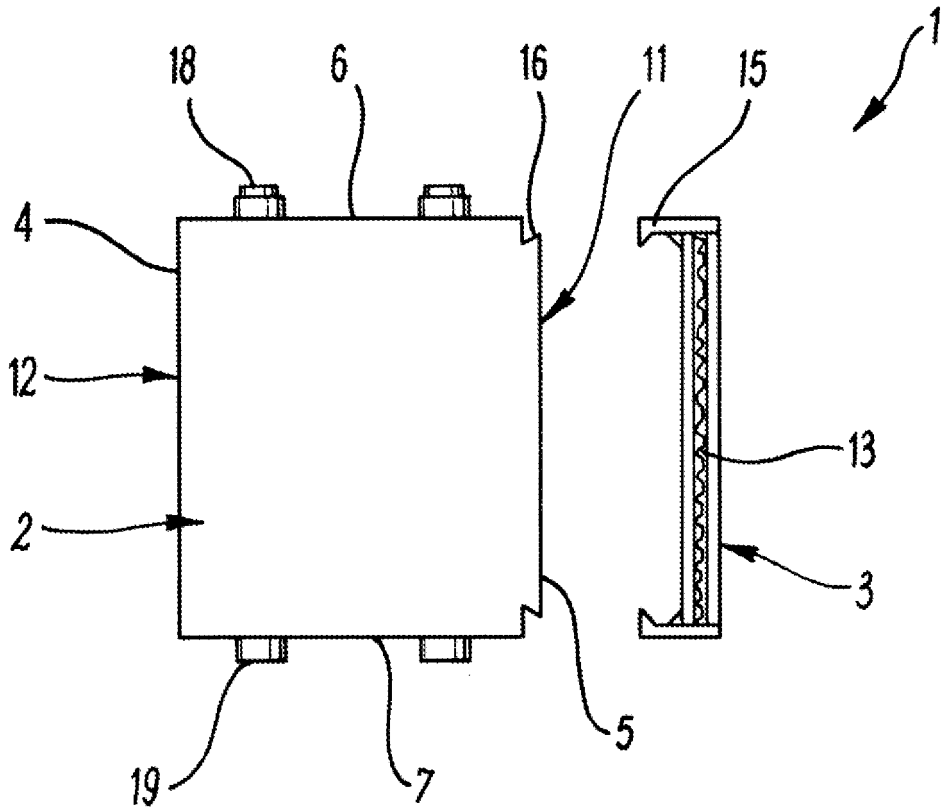

Fig. 5

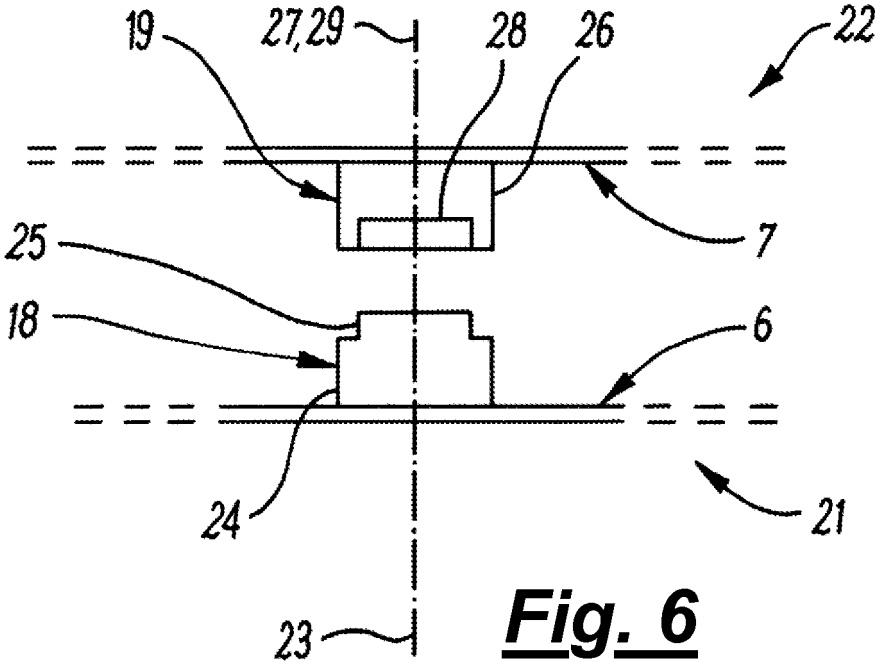

Fig. 6

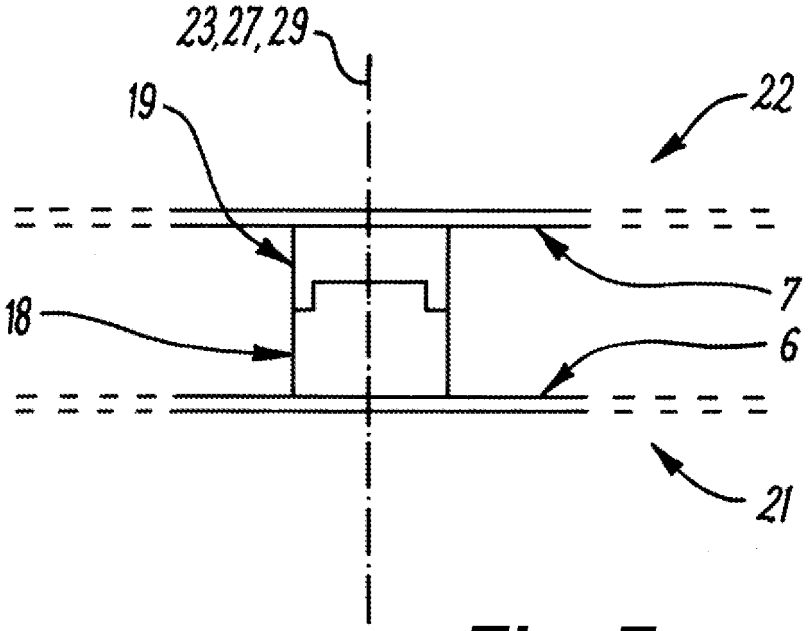

Fig. 7

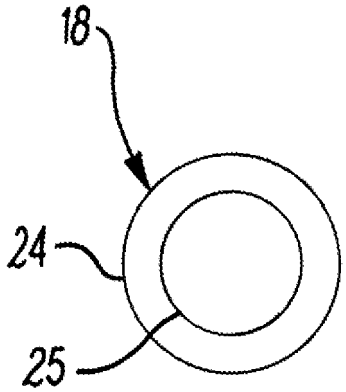

Fig. 8

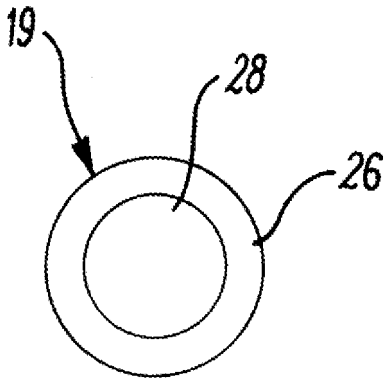

Fig. 9

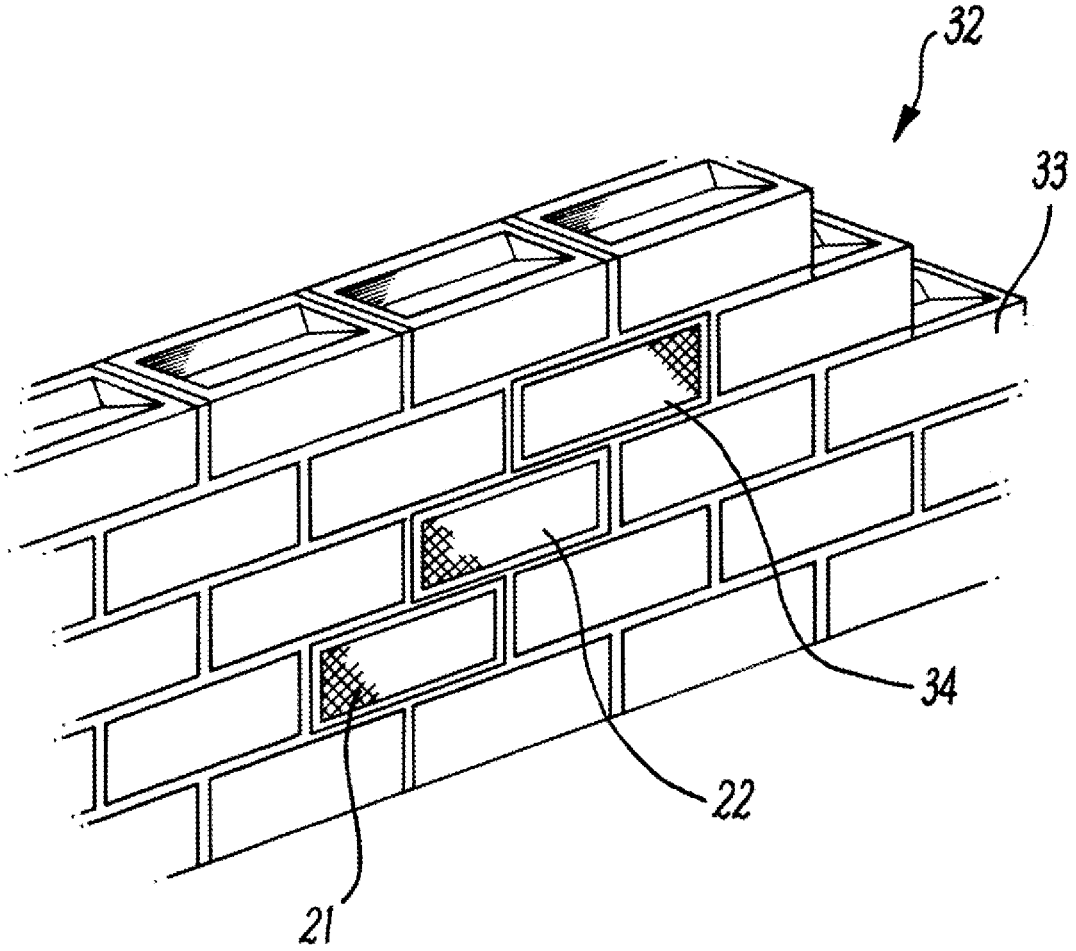

Fig. 10

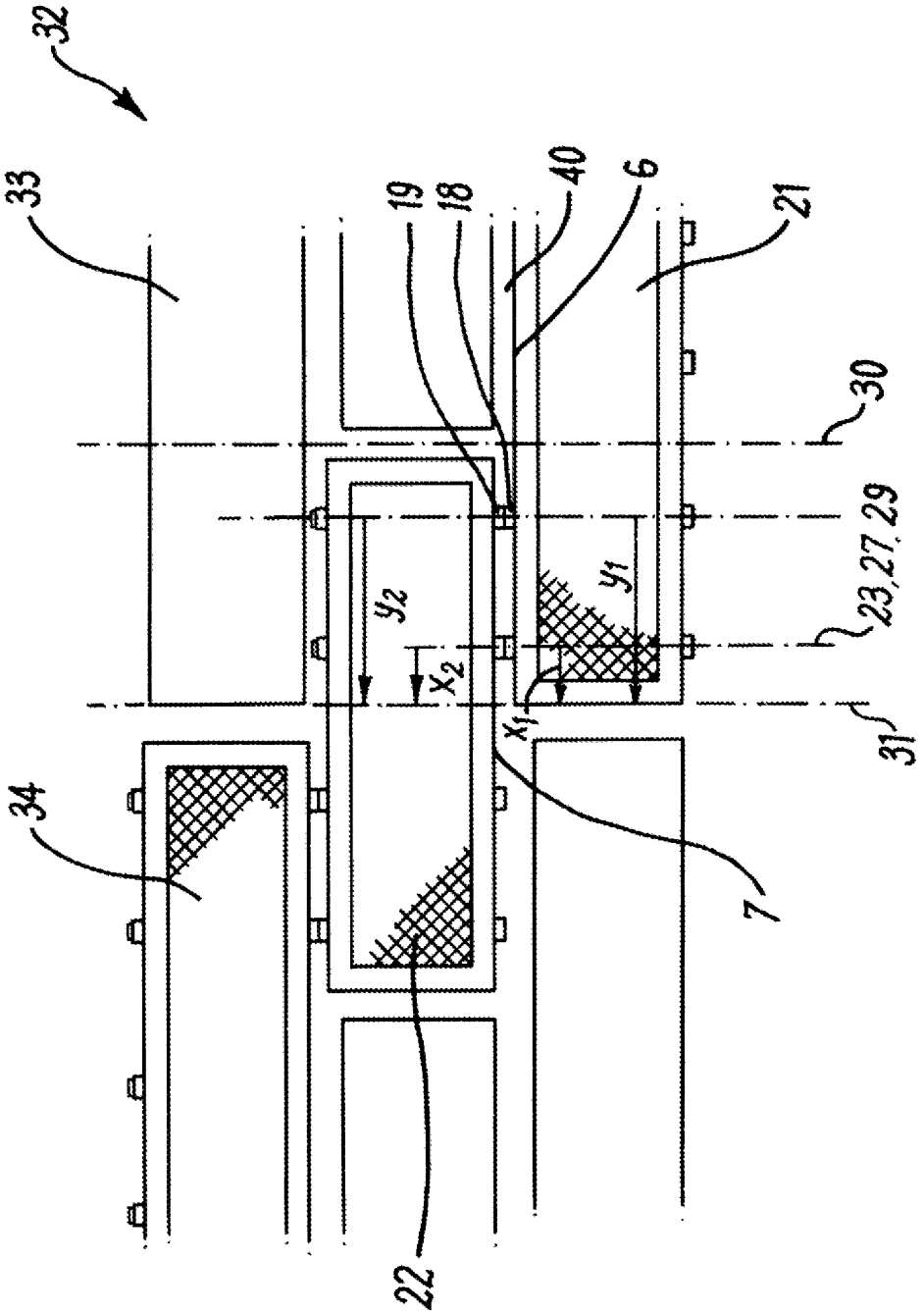

Fig. 11

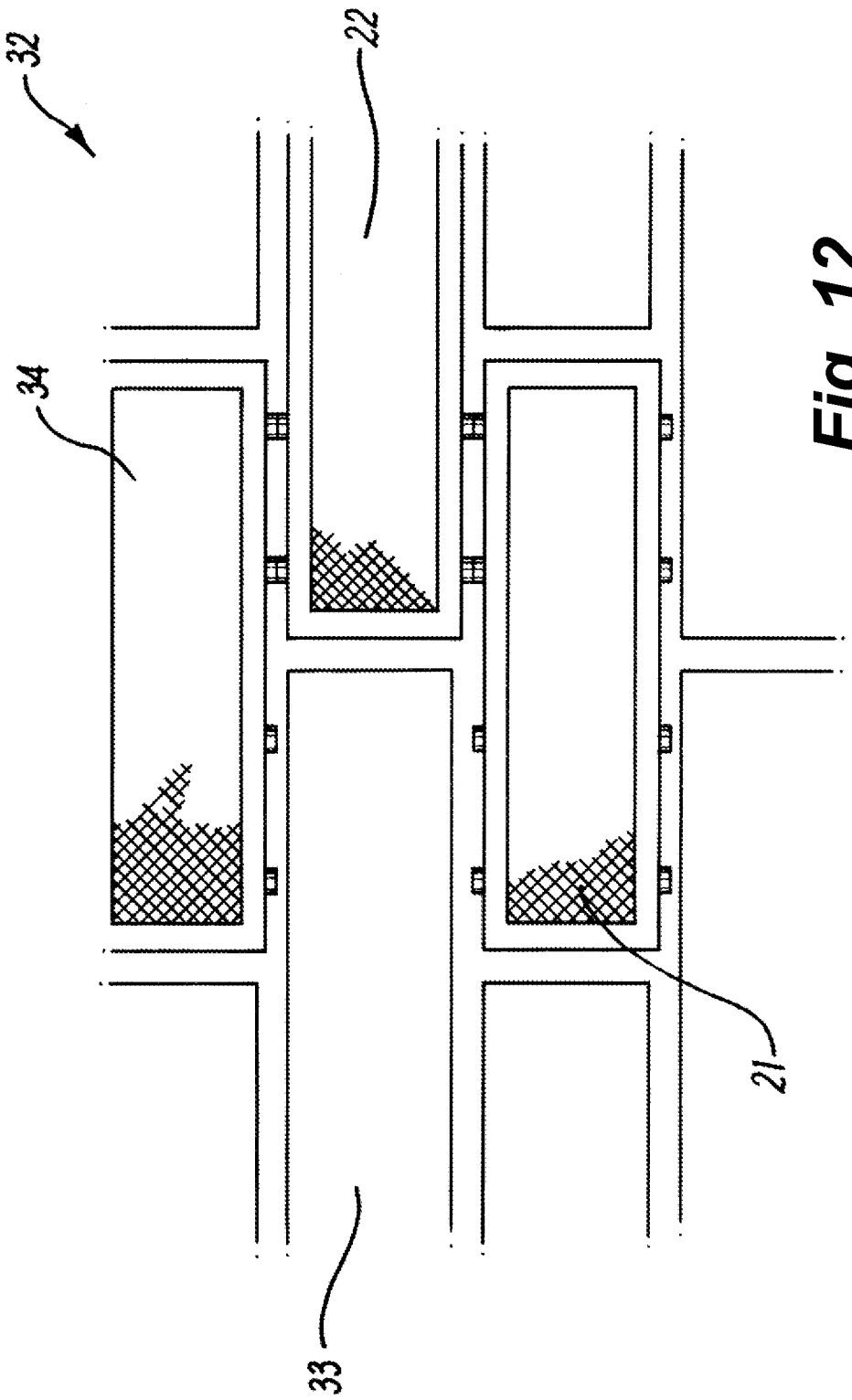

Fig. 12

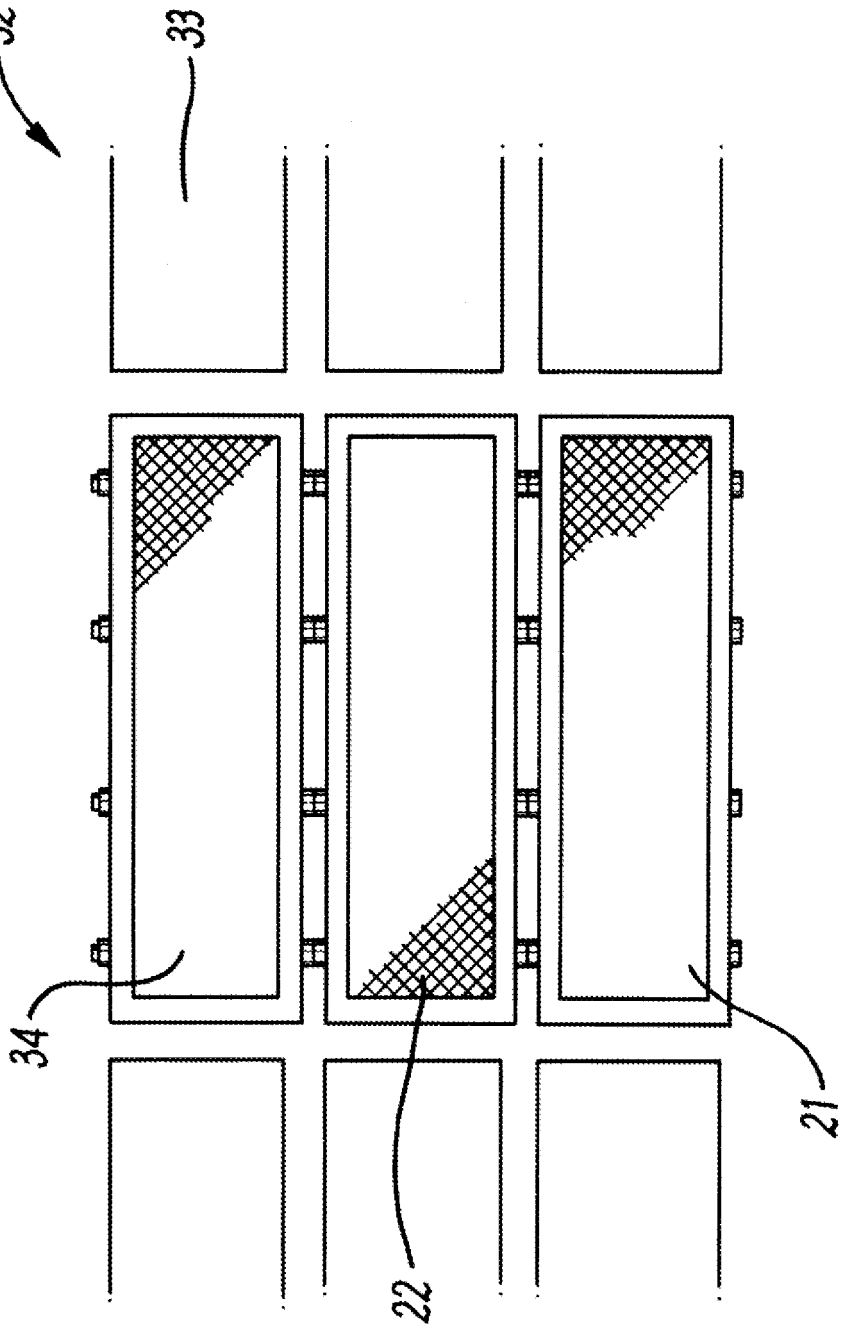

Fig. 13

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- FR 1287951 A **[0009]**