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(54) **INSULATING WALL STRUCTURE**

(57) The present application provides an insulating wall structure comprising a wall; first and second insulation sheets covering adjacent parts of said wall; a support profile comprising a first support face attached to said wall and a second support face, said support faces being interconnected via an intermediate portion which is interposed between said first and second insulation sheets; and a building board which is fixed to said second support face with a fastener selected from an adhesive and a hook and loop fastener.

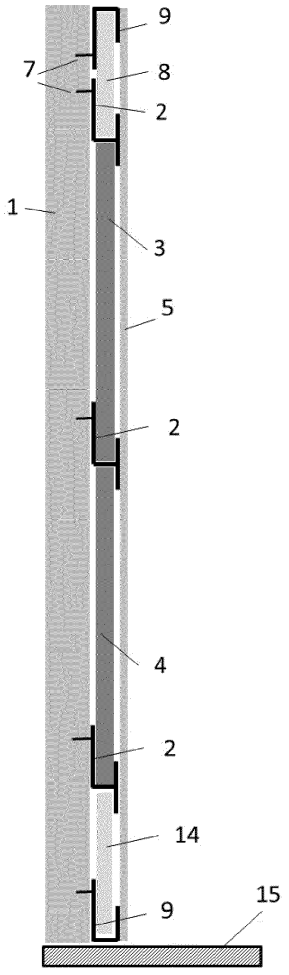

Fig. 1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates insulating wall structures, and to related methods for lining walls.

BACKGROUND OF THE INVENTION

[0002] The insulation of external walls is an important aspect in the renovation of buildings. Often, this is done by applying insulation material to the exterior of the building. However, in many situations this is not possible, in particular in urban areas. In such cases, the insulation must be applied to the interior side of the external walls. After application of the insulation, the wall is typically finished with a layer of a facing material, such as plasterboards.

[0003] Providing insulation from the inside can result in a considerable decrease of the living space inside the building, given the thickness of the insulation materials. There is a need for solutions which result in a lower loss of living space. Existing solutions typically focus on improved insulation materials, having a reduced thickness. Currently, Vacuum Insulated Panels (VIPs) are among the best insulation materials on the market. VIPs contain a gas-tight enclosure surrounding a porous rigid core, from which the air has been evacuated. Such panels offer a high thermal insulation, even when using very thin panels compared to conventional insulation materials. A disadvantage of VIPs is that their insulating properties depend on the integrity of the gas-tight enclosure. Indeed, the panels must not be cut or drilled. Therefore, the panels require care during handling and installation. Also the user of the building must be careful with subsequent interventions, e.g. when drilling holes in the wall.

[0004] In view of the fragility of VIPs, existing insulating wall structures typically provide a gap between the VIPs and the facing material which forms the internal side of the wall. The provision of such gap increases the total thickness of the insulating wall structure to such extent, that the economic benefits of VIPs are largely nullified. There remains a need of insulating wall structures causing a minimal loss of living space.

SUMMARY OF THE INVENTION

[0005] It is an object of the present application to provide (heat) insulating wall structures, which allow for minimizing the loss of living space, while minimizing the risk of degrading VIP panels during installation or usage phase. The present inventors have found that this can be obtained using certain support profiles, and by fixing a facing material to the support profiles using an adhesive.

[0006] More particularly, the present application provides the following aspects:

Aspect 1. An insulating wall structure comprising:

- a wall;
- first and second insulation sheets covering adjacent parts of said wall;
- a support profile comprising a first support face attached to said wall and a second support face, said support faces being interconnected via an intermediate portion which is interposed between said first and second insulation sheets; and
- a building board which is fixed to said second support face with a fastener selected from an adhesive and a hook and loop fastener.

Aspect 2. The insulating wall structure according to Aspect 1, wherein each of said insulation sheets is provided with a protective panel facing said building board.

Aspect 3. The insulating wall structure according to Aspect 1 or 2, wherein said first and second insulation sheets are Vacuum Insulated Panels (VIPs).

Aspect 4. The insulating wall structure according to any one of Aspects 1 to 3, wherein said support profile is made of one or more materials selected from the list consisting of poly(vinyl chloride), polyethylene, polystyrene, and polyurethane.

Aspect 5. The insulating wall structure according to any one of Aspects 1 to 4, wherein said protective panel comprises one or more materials selected from the list consisting of melamine, phenolic resins, metal, and aramid polymers.

Aspect 6. The insulating wall structure according to any one of Aspects 1 to 5, wherein the distance between said insulation sheet and said building board is less than 10 mm.

Aspect 7. The insulating wall structure according to any one of Aspects 1 to 6, wherein said support profile is fixed to said wall with screws, wherein the heads of said screws are covered with an elastic material.

Aspect 8. The insulating wall structure according to any one of Aspects 1 to 7, wherein on one side of said intermediate portion, the first support extends further from the intermediate portion than the second support face.

Aspect 9. The insulating wall structure according to any one of Aspects 1 to 8, further comprising a plurality of support profiles supporting said insulation sheets; each support profile providing a support face onto which said building board is fixed.

Aspect 10. The insulating wall structure according to any one of Aspects 1 to 9, wherein said building board is made of gypsum, cement, fiber cement, or wood.

Aspect 11. A method for lining a wall, comprising:

(i) covering a portion of a wall to be lined with a

first insulation sheet;
(ii) providing a support profile, said support profile comprising first and second support faces separated by an intermediate portion; wherein said support profile is attached to said wall via said first support face; and wherein

- said first support face, said intermediate portion, and said wall and/or second support face provide a first channel, said first channel receiving said first insulation sheet;
- said first and second support faces and said intermediate portion provide a second channel; and

(iii) positioning a second insulation sheet inside said second channel, thereby covering a second portion of said wall; and
(iv) fixing a building board to said support profile via its second support face using an adhesive, thereby covering said first and second insulation sheets.

Aspect 12. The method according to Aspect 11, wherein each of said first and second insulation sheets are further provided with a protective panel facing away from said wall.
Aspect 13. The method according to Aspect 11 or 12, wherein step (ii) involves fixing said support profile to said wall with screws, followed by covering the heads of said screws are covered with an elastic material.
Aspect 14. The method according to any one of Aspects 11 to 13, wherein the fixation in step (iv) does not involve the use of fixation means piercing said building board.
Aspect 15. A kit for lining a wall, comprising:

- a plurality of insulation sheets;
- one or more support profiles, each comprising first and second support faces separated by an intermediate portion, said support faces and intermediate portion providing a second channel; and said second support face and said intermediate portion providing a first channel opposing said second channel;
- one of more building boards;
- an adhesive for fixing said one or more building boards to said support profile.

[0007] The insulating wall structure can allow for insulating an external wall from the interior, with a minimal loss of living space. The structure is particularly suitable for use with vacuum insulated panels (VIPs), as it allows for installing VIPs with a minimal risk of destroying the integrity thereof.
[0008] The independent and dependent claims set out particular and preferred features of the invention. Features from the dependent claims may be combined with features of the independent or other dependent claims, and/or with features set out in the description above and/or hereinafter as appropriate.
[0009] The above and other characteristics, features and advantages of the present invention will become apparent from the following detailed description which illustrates, by way of example, the principles of the invention. This description is given for the sake of example only, without limiting the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The accompanying Figures are provided by way of example only and should not be considered to limit the scope of the present invention.

Fig. 1 Schematic illustration of a cross-section of a particular embodiment of the insulating wall structure described herein.
Fig. 2 Cross-section of a detail of an insulating wall structure according to a particular embodiment of the insulating wall structure described herein.
Fig. 3 **S**upport profile suitable for use in the insulating wall structure described herein.

[0011] In the Figures, the following numbering is used:

1 - Wall; 2 - Support profile; 3, 4 - Insulation sheet; 5 - Building board; 6 - Protective panel; 7 - Fixation element; 8 - Insulation; 9 - Support profile; 11 - First support face; 12 - Second support face; 13 - Intermediate portion; 14 - Insulation; 15 - Floor.

DETAILED DESCRIPTION

[0012] The present invention will be described with respect to particular embodiments.
[0013] It is to be noticed that the term "comprising", used in the claims, should not be interpreted as being restricted to the means listed thereafter; it does not exclude other elements or steps. It is thus to be interpreted as specifying the presence of the stated features, steps or components as referred to, but does not preclude the presence or addition of one or more other features, steps or components, or groups thereof. Thus, the scope of the expression "a device comprising means A and B" should not be limited to devices consisting only of components A and B. It means that with respect to the present invention, the only relevant components of the device are A and B.
Throughout this specification, reference to "one embodiment" or "an embodiment" are made. Such references indicate that a particular feature, described in relation to the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrases "in one embodiment" or "in an embodiment" in various

places throughout this specification are not necessarily all referring to the same embodiment, though they could. Furthermore, the particular features or characteristics may be combined in any suitable manner in one or more embodiments, as would be apparent to one of ordinary skill in the art.

The following terms are provided solely to aid in the understanding of the invention.

The terms "plasterboard" and "gypsum board" as used herein interchangeably and refer to a panel or board comprising a gypsum core, obtainable from a plaster slurry as described herein. Accordingly, the term "plasterboard" refers to a board or panel which is obtainable via the setting (hydration) of plaster. The term "board" or "panel" as used herein refers to any type of wall, ceiling or floor component of any required size.

[0014] The term "about" as used herein when referring to a measurable value such as a parameter, an amount, a temporal duration, and the like, is meant to encompass variations of +/-10% or less, preferably +/-5% or less, more preferably +/-1% or less, and still more preferably +/-0.1% or less of and from the specified value, insofar such variations are appropriate to perform in the disclosed invention. It is to be understood that the value to which the modifier "about" refers is itself also specifically, and preferably, disclosed.

[0015] Provided herein is an insulating wall structure, also referred to herein as "the structure". The structure allows for providing a wall of a building with (thermal) insulation materials. Accordingly, the insulating wall structure described herein comprises a wall and insulation sheets. In particular, the structure comprises at least first and second insulation sheets, covering adjacent parts of the wall surface. The structure further comprises a support profile for holding and supporting the insulation sheets. The support profile comprises first and second support faces are interconnected by an intermediate portion. The support profile is fixed against the wall via its first support face, wherein the support faces and the intermediate portion is interposed between the first and second insulation sheets. The structure further comprises a building board or facing material, which is fixed to the second support face with a fastener. This will be explained further herein below.

[0016] The insulating wall structure described herein contains a wall. The type of wall is not critical to the invention, as long as it can carry the support profiles and insulation sheets. For example, the wall may be made of bricks, concrete, wood, etc. The wall is typically an external wall, i.e. forming the boundary between the interior and the exterior of a building. However, in certain embodiments, the wall may be an interior wall. Typically, the wall has a planar shape and is vertically oriented. However, other shapes and orientations are not excluded. For example, in particular embodiments, the construction may be curved and/or slanted. The term "wall" as used herein also includes sloped ceilings. Prior to the installation of the insulating wall structure, any protruding nails, screws, and the like are typically removed from the wall, or covered. No other particular preparation of the wall is required. For example, it is not necessary to remove wall paper or any other finish prior to installing the support profile.

[0017] The insulating wall structure further comprises a support profile. The support profile typically is a straight elongated object, typically having a length/width ratio of at least 5, preferably at least 10. In particular embodiments, the support profile has a length between 50 cm and 300 cm, and a width between 20 mm and 100 mm. The support profile comprises a first support face, a second support face, and an intermediate portion. The intermediate portion connects the first support face with the second support face. Accordingly the first and second support faces are provided on opposite edges of the intermediate portion, typically along the length of the intermediate portion.

[0018] The intermediate portion is adapted to be interposed between two (rows of) insulation sheets. Therefore, the intermediate portion preferentially typically has a planar shape. The first and second support faces typically also each have a preferentially planar shape, and are oriented perpendicularly to the intermediate portion. In preferred embodiments, the first support face is provided with pre-drilled screw holes in order to facilitate fixation to the wall. In preferred embodiments, the surface of the second support face for contacting a building board is not smooth. More particularly, the surface may be at least partially textured or roughened, e.g. ribbed or studded. This increases the surface area of the support face, which can improve the adhesion of the building board to the support face with adhesive.

[0019] The support profile is attached to the wall via its first support face, such that the second support face faces away from the wall. The support profile may be attached to the wall with conventional fixation means known in the art. In preferred embodiments, the support profile is screwed to the wall. In further embodiments, the screw heads may be covered with an elastic material such as a compressible foam, rubber, or other elastomers. The elastic material is preferably provided along the full length of the support profile (and thus not only on the screw heads). This helps to increase the air tightness of the insulating wall structure, thus improving the overall thermal insulation. Moreover, this helps to prevent the screw heads from damaging the insulation material, in particular when using VIPs.

The support profile keeps the insulation sheets of the insulating wall structure in place. More particularly, the support faces and intermediate portion form two channels (one on each side of the intermediate portion) for receiving the insulation sheets. The channels generally are U-shaped, i.e. have a U-shaped cross section, preferably a rectangular U-shaped cross section. A first (U-shaped) channel is formed by the second support face and the intermediate portion, together with the wall and/or first support face. The first support face, second support

face, and intermediate portion together form a second (U-shaped) channel.

[0020] The first and second support faces need not be arranged symmetrically with respect to each other and with respect to the intermediate portion.

[0021] The second support face typically extends from both sides of the intermediate portion, preferably over a distance of at least 10 mm on each side. This allows for keeping an insulation sheet in place on each side of the intermediate portion, when the support profile is attached to the wall.

The main function of the first support face is not to hold the insulation sheets, but to fix the support profile to the wall. Therefore, the first support face only needs to extend from one side of the intermediate portion. It is not excluded, however, that the first support face extends from both sides of the intermediate portion.

[0022] In preferred embodiments, the height of the first support face exceeds the height of the second support face; on one side of said intermediate portion. The difference in height is preferably between 10 mm and 75 mm. This allows for screwing the support profile to the wall via the first support face, without interference from the second support face. In other words, in certain embodiments, the first and second support faces both extend from one side of the intermediate portion over a certain distance, preferably at least 10 mm; wherein the first support face extends further away from the intermediate portion than the second support face; preferably between 10 mm and 75 mm further away.

[0023] The first support face of the support profile may or may not directly contact the wall. In particular embodiments, a strip of a (visco)elastic and/or vibration damping material is provided between the wall and the support profile. This is particularly preferred when using delicate insulation sheets such as VIPs. More particularly, the strip may avoid that small granulates fall behind the insulation sheets when drilling fixing holes, thereby further decreasing the risk of damaging the sheets during installation. The strip of elastic and/or vibration damping material may be provided as a double sided and slightly compressible foam tape, for example a foamed acrylic tape.

[0024] The support profile is typically mounted horizontally. In such configuration, the first channel typically is a lower channel; and the second channel an upper channel. Accordingly, the first insulation sheet is then positioned below the support profile, and the second insulation sheet above the support profile. The insulating wall structure is not limited to horizontal configurations. In particular, also a vertical configuration is envisaged.

[0025] The support profile can be made of various materials as known by the skilled person. Non-limitative examples of suitable materials include (plastics, metal, and wood. Preferred plastics include poly(vinyl chloride), polyethylene, polystyrene, polyurethane, and the like. Such plastics are particularly preferred for use with delicate insulation sheets such as VIPs, as they limit at maximum damage when inserting the VIP and limit thermal bridging by the profiles.

[0026] The support profile supports each of the first and second insulation sheets on one edge thereof. Preferably, each insulation sheet is supported on two opposite edges. Accordingly, the insulating wall structure provided herein may comprise a plurality of support profiles. The support profiles will typically arranged parallel to each other. The amount of profiles typically depends on the size of the wall and the size of the insulation sheets. The distance between the support profiles may depend on the size of the insulation sheets and the type of building board used.

Each of the support profile will typically have a support face onto which the building board can be fixed, similar to the second support face of the support profile as described above.

At least one of the support profiles of the insulating wall structure is a support profile as described above. Preferably, all support profiles interposed between insulation sheets are support profiles as described above.

In many cases, the support profiles at the edges of the wall (e.g. the top and bottom profiles for horizontal profiles; or the outer left and right profiles for vertical profiles) only needs to provide a single channel for support an insulation sheet. Such profiles may be different from the profiles described above. A particularly suitable profile for such cases is a (rectangular) U-shaped profile. Optionally, one of the edges of the profile may be higher than the other, as to facilitate fixation of the profile to the wall, in a similar way as described above for the first support face.

[0027] The insulating wall structure described herein comprises at least two (heat) insulation sheets, i.e. panels or blankets of insulation material. The type of insulation material is not critical. In preferred embodiments, the insulation sheets are insulation panels, more particularly rigid insulation panels.

[0028] In particular embodiments, the insulation sheets may be vacuum insulated panels (VIPs), mineral wool or aerogel boards, or foamed polymer (e.g. polyurethane foam, expanded or extruded polystyrene, polyisocyanurate foam) boards. The insulation sheets typically have a rectangular shape.

The insulation wall structure described herein is particularly suitable for VIPs, as it maximizes the benefits thereof (thinner layers of insulation) and minimizes the downsides (risk of damaging VIPs). VIPs are well known in the art and generally comprise an insulating porous core material maintained under vacuum by a gas-tight barrier envelope or membrane. The porous core material generally is a rigid, highly-porous material, such as fumed silica, aerogel, perlite or glass fiber, to support the membrane walls against atmospheric pressure once the air is evacuated. In particular embodiments, VIPs may further contain chemicals to collect gases (known as "getters") leaked through the membrane or offgassed from the membrane materials. Vacuum insulation panels are

highly effective insulation materials because the vacuum practically eliminates convection and also reduces conduction. In particular embodiments, the panels have a thermal conductivity below 20 mW/(m.K), preferably below 15 mW/(m.K), more preferably below 10 mW/(m.K), or even below 7 mW/(m.K).

[0029] In particular embodiments, more than one type of insulation materials may be used. In particular in the case of insulation sheets which must not be cut (such as VIPs), a second insulation material will be needed to fill any remaining gaps. In many cases, the insulating wall structure also needs to accommodate conduits, cables and the like. Therefore, it is envisaged that in certain embodiments, the first and second insulation sheets are VIPs, wherein the structure further comprises a row of one or more insulating materials not including VIPs. The row of non-VIP insulation material typically has a height ranging from 5 cm to 50 cm, preferably 5 cm to 30 cm. For example, a row of mineral wool may be provided at the bottom of the wall, thus providing the possibility to house cables and the like.

[0030] In preferred embodiments, each of the insulation sheets is provided with a protective panel facing away from the wall (and thus facing the building board). The protective panel can protect the insulation sheet against accidental damage, e.g. during installation of the building board, or when drilling through the building board. This is particularly useful when using delicate insulation sheets such as VIPs.

The protective panels are positioned adjacent to the insulation sheets, but are not necessarily fixed thereto. The use of separate protective panels allows for using standard insulation sheets and building boards. Typically, the protective panels and insulation sheets are held together by the support profile. More particularly, they are both positioned in the channels provided by the support profile. The protective panels and corresponding insulation sheets are typically in direct contact, but this is not critical.

The protective panel can be made of any material strong enough to provide some degree of protection to the insulation sheets. Preferred materials include, but are not limited to, metal and plastics (polymers), or combinations thereof. Also composite materials comprising said preferred materials in combination with one or more other materials may be used. Preferred metals include steel and aluminium. Preferred polymers include melamine, phenolic resins, high density polyethylene, and aramides. In particular embodiments, the protective panel may be made at least partially of melamine or a phenolic resin. In certain embodiments, the protective panel may be a composite material comprising cellulose fibers in combination with melamine and/or a phenolic resin.

[0031] The thickness of the protective panels is typically chosen such that an adequate protection is offered, without contributing too much to the total thickness of the insulating wall structure. In preferred embodiments, the protective panel typically has a thickness between 0.2 mm and 5 mm, preferably between 1.5 mm and 3.0 mm.

[0032] In many cases, the protective panel is made of a material which resists the diffusion of moisture. In those embodiments, the protective panel may also function as a vapour barrier. The joints between the protective panel and the support profile are then typically sealed (e.g. with a silicone, tape, or other sealing material which is impermeable to moisture). Also the joints at the other edges of the protective panel (typically this is a joint between the protective panel and a neighbouring wall) can be sealed. In this way, a structure can be obtained which is impermeable to moisture (or air).

[0033] The insulating wall structure described herein comprises one or more building boards, which cover the support profile(s) and insulation sheets.

The building board is fixed to the support profile(s) of the insulating wall structure, with a fastener, more particularly a fastener selected from adhesives, hook and loop fasteners (such as Velcro®), and the like. The use of such fasteners allows for positioning the building board close to the insulation sheets, while keeping the risk of damaging the insulation sheets low; in particular in combination with a protective panel as described above. The risk of damaging the insulation sheets is much higher when using conventional fixation means such as screws or nails. Accordingly, the fixation of the building board(s) is generally done without fixation elements such as screws, nails, and bolts. More particularly, the fixation preferably does not involve the use of any fixation means which pierce the building board.

Typically the distance between the building board and the first and second insulation sheets is less than 10 mm, preferably between 1 mm and 8 mm; more preferably the distance ranges from 3 mm to 5 mm. The distance is the shortest distance from the surface of the building board which faces the insulation sheet; to the surface of the insulation sheet facing the building board.

Preferred fasteners include adhesives. The adhesive may be a glue or an adhesive tape. In case the adhesive is a glue, a solventless glue is preferred. This is particularly preferred where VIPs are used, as accidental contact between the VIPs and the solvent could damage the VIPs. Suitable adhesives are well known in the art. An example of a commercially available adhesive is MSP 108 from Bostik.

[0034] The type of building board is not critical. Examples of suitable building board include boards made of gypsum, cement or concrete, fiber cement, wood, wood cement, metal, plastic, composite, and glass. In preferred embodiments, the building boards are gypsum boards.

[0035] The insulating wall structure typically contains a single layer of building boards, covering the remainder of the insulating wall structure. However, it is not excluded that in specific embodiments, multiple layers of building boards are used.

[0036] Further provided herein is a method for lining a wall, in particular a method of installing an insulating wall structure as described herein. The method for lining a wall comprises:

(i) covering a portion of a wall to be lined with a first insulation sheet;
(ii) providing a support profile, said support profile comprising first and second support faces separated by an intermediate portion; wherein said support profile is attached to said wall via said first support face; and wherein

- said first support face, said intermediate portion, and said wall and/or second support face provide a first channel; said second channel receiving and holding said first insulation sheet; and
- said first and second support faces and said intermediate portion provide a second channel;

(iii) positioning a second insulation sheet inside said second channel, thereby covering a second portion of said wall; and
(iv) fixing a building board to said support profile via its second support face using an adhesive, thereby covering said first and second insulation sheets.

[0037] In preferred embodiments, step (i) includes - prior to covering a portion of the wall with the first insulation sheet - the installation of an edge profile at an edge of the wall (e.g. the top and bottom profiles for horizontal profiles; or the outer left and right profiles for vertical profiles). As described above, the edge profile provides a single channel for supporting the first insulation sheet; and preferably has a (rectangular) U-shaped profile.

[0038] In particular embodiments, the first and second insulation sheets are provided with a protective panel as described above. The protective panels of the first and second insulation sheets are typically provided in the respective channels of the support profile. In particular embodiments, the method further comprises the step of sealing any joints at or near the edges of the protective panel (such as the joint between the protective panel and the support profile). In this way, the structure can be made resistant to the transfer of air and/or moisture, as described above.
In particular embodiments, step (ii) involves fixing the support profile to the wall with screws, followed by covering the heads of the screws with an elastic material. In particular embodiments, step (ii) includes providing a strip of a (visco)elastic and/or vibration damping material between the wall and the support profile, as described above.

[0039] In preferred embodiments, said first and second insulation sheets are VIPs.
In preferred embodiments, the fixation in step (iv) does not involve the use of fixation means piercing said building board, such as screws, nails, and bolts.

[0040] Further provided herein is a kit for lining a wall, more particularly a kit for making an insulating wall structure from a wall to be insulated. The kit provided herein comprises:

- a plurality of insulation sheets;
- one or more support profiles, each comprising first and second support faces separated by an intermediate portion, said support faces and intermediate portion providing a second channel; and said second support face and said intermediate portion providing a first channel opposing said second channel;
- one of more building boards;
- an adhesive for fixing said one or more building boards to said support profile.

In particular embodiments, the kit may further comprise a plurality of protective panels as described above. In certain embodiments, the kit may also comprise a sealing material as described above, for sealing the joints between the protective panels and the support profile(s).
In certain embodiments, the kit may also comprise a tape of elastic material for covering screw heads. In particular embodiments, the kit may also comprise a double sided tape of elastic material for use between the wall and the support profile(s).

EXAMPLES

[0041] The following examples are provided for the purpose of illustrating the present invention and by no means are meant and in no way should be interpreted to limit the scope of the present invention.

[0042] **Fig. 1** shows a cross-section of a particular embodiment of the insulating wall structure described herein. The structure comprises a wall (1), which is typically an external wall of a building. On the interior side, the wall is provided with upper and lower VIPs (3, 4), and sheets of other insulation materials (8, 14), all held in place by support profiles (2, 9).

[0043] **Fig. 2** shows a detail of the structure around the support profile (2) interposed between the insulation sheets (3). **Fig. 3** is a schematic drawing of the support profile (2) alone.

[0044] The support profile (2) contains a first support face (11) and a second support face (12), interconnected via an intermediate portion (13).
As seen in Fig. 1, the profiles (2) are attached to the wall (1) via their first support face (11), using fixation elements (7) such as screws. Optionally, a double faced compressible (e.g. foamed) tape (not shown) may be provided between the support profile (2) and the wall (1). Also optionally, the heads of the screws (7) may be covered with an elastic material such as a compressible foam (not shown). Preferably, the elastic material is provided along the full length of the profile (2).
The height of the first support face (11) exceeds the height of the second support face (11), thereby facilitating the fixation. The profiles (2) are shaped such that they provide upper and lower channels for accommodating the insulation sheets (3, 4, 8, 14).
Each of the VIPs (3, 4) is provided with a protective panel (6) (see Fig. 2, not shown in Fig. 1). The protective panels

(6) are also positioned in the channels provided by the support profiles (2, 9). Optionally, the joints between the protective panel (6) and the profile (2) may be sealed, e.g. using a silicone or tape (not shown).

In Fig. 1, non-VIP insulation materials (8, 14) are provided at the top and bottom of the wall, although this is optional. The top and bottom insulation materials (8, 14) may be the same or different. The bottom insulation material (8) is typically mineral wool or the like, thereby facilitating the positioning of conduits and cables (not shown) inside the structure. The top insulation material (14) mainly functions to fill the remaining gap between the upper VIP (3) and the ceiling (not shown). Accordingly, this insulation material (14) is a non-VIP material which can be cut to the desired size - unlike the VIPs (3, 4). Of course also the top insulation material (14) can be selected such that it can facilitate the positioning of conduits and cables.

The insulation materials at the top and bottom are supported by U-shaped support profiles (9), each providing a single channel. The support profiles (9) are attached to the wall (1) via fixation means (7) in a similar way as the profile (2) which is interposed between the VIPs (3, 4). Accordingly, no fixation of the lower profile (9) to the floor (15) is needed; and no fixation of the top profile (9) to the ceiling (not shown) is needed.

[0045] A building board (5) covers the remainder of the structure. The board (5) is fixed to the second support face (12) of the support profile (2) with an adhesive, e.g. a glue or tape. The building board (5) may further be painted, plastered, or otherwise decorated or finished.

[0046] Installation of the insulating wall structure typically starts with installing the bottom profile (9), followed by inserting the lower insulation sheet (14) into the channel provided by the profile. Then, a profile (2) as shown in Fig. 3 is fixed to the wall (1) such that it holds the lower insulation sheet (14) in its lower channel. Then, the first VIP (4) and its corresponding protective panel (6) are inserted in the upper channel provided by the profile (2). Preferably, any visible part of the fixation means (7) is first covered with an elastic material (not shown) for protect the insulation sheet (2) against damaging. A further profile (2) is then provided on the top of the VIP (4) (and corresponding protective panel); and another VIP (3) and its corresponding protective panel (6) are positioned in the channel of that profile (2). The remaining gap is filled with a non-VIP insulation material (8) which is cut to the desired size. Finally, the building board is fixed to the support profiles (2, 9) with an adhesive. Whereas Fig. 1 shows two rows of VIPs (3, 4), it will be clear to the skilled person that more than two rows of VIPs (or just one row of VIPs) can be used, depending on the sheet size and wall height.

Claims

1. An insulating wall structure comprising:

- a wall;
- first and second insulation sheets covering adjacent parts of said wall;
- a support profile comprising a first support face attached to said wall and a second support face, said support faces being interconnected via an intermediate portion which is interposed between said first and second insulation sheets; and
- a building board which is fixed to said second support face with a fastener selected from an adhesive and a hook and loop fastener.

2. The insulating wall structure according to claim 1, wherein each of said insulation sheets is provided with a protective panel facing said building board.

3. The insulating wall structure according to claim 1 or 2, wherein said first and second insulation sheets are Vacuum Insulated Panels (VIPs).

4. The insulating wall structure according to any one of claims 1 to 3, wherein said support profile is made of one or more materials selected from the list consisting of poly(vinyl chloride), polyethylene, polystyrene, and polyurethane.

5. The insulating wall structure according to any one of claims 1 to 4, wherein said protective panel is made of or comprises one or more materials selected from the list consisting of melamine, phenolic resins, metal, and aramid polymers.

6. The insulating wall structure according to any one of claims 1 to 5, wherein the distance between said insulation sheet and said building board is less than 10 mm.

7. The insulating wall structure according to any one of claims 1 to 6, wherein said support profile is fixed to said wall with screws, wherein the heads of said screws are covered with an elastic material.

8. The insulating wall structure according to any one of claims 1 to 7, wherein on one side of said intermediate portion, the first support extends further from the intermediate portion than the second support face.

9. The insulating wall structure according to any one of claims 1 to 8, further comprising a plurality of support profiles supporting said insulation sheets; each support profile providing a support face onto which said building board is fixed.

10. The insulating wall structure according to any one of claims 1 to 9, wherein said building board is made of gypsum, cement, fiber cement, or wood.

11. A method for lining a wall, comprising:

(i) covering a portion of a wall to be lined with a first insulation sheet;
(ii) providing a support profile, said support profile comprising first and second support faces separated by an intermediate portion; wherein said support profile is attached to said wall via said first support face; and wherein

- said first support face, said intermediate portion, and said wall and/or second support face provide a first channel, said first channel receiving said first insulation sheet;
- said first and second support faces and said intermediate portion provide a second channel; and

(iii) positioning a second insulation sheet inside said second channel, thereby covering a second portion of said wall; and
(iv) fixing a building board to said support profile via its second support face using an adhesive, thereby covering said first and second insulation sheets.

12. The method according to claim 11, wherein each of said first and second insulation sheets are further provided with a protective panel facing away from said wall.

13. The method according to claim 11 or 12, wherein step (ii) involves fixing said support profile to said wall with screws, followed by covering the heads of said screws are covered with an elastic material.

14. The method according to any one of claims 11 to 13, wherein the fixation in step (iv) does not involve the use of fixation means piercing said building board.

15. A kit for lining a wall, comprising:

- a plurality of insulation sheets;
- one or more support profiles, each comprising first and second support faces separated by an intermediate portion, said support faces and intermediate portion providing a second channel; and said second support face and said intermediate portion providing a first channel opposing said second channel;
- one of more building boards;
- an adhesive for fixing said one or more building boards to said support profile.

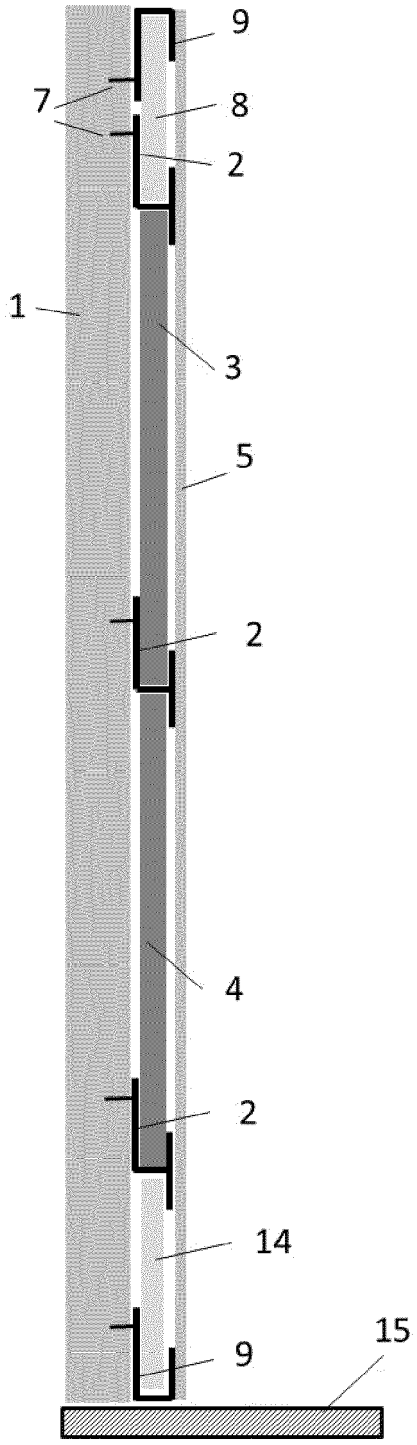

Fig. 1

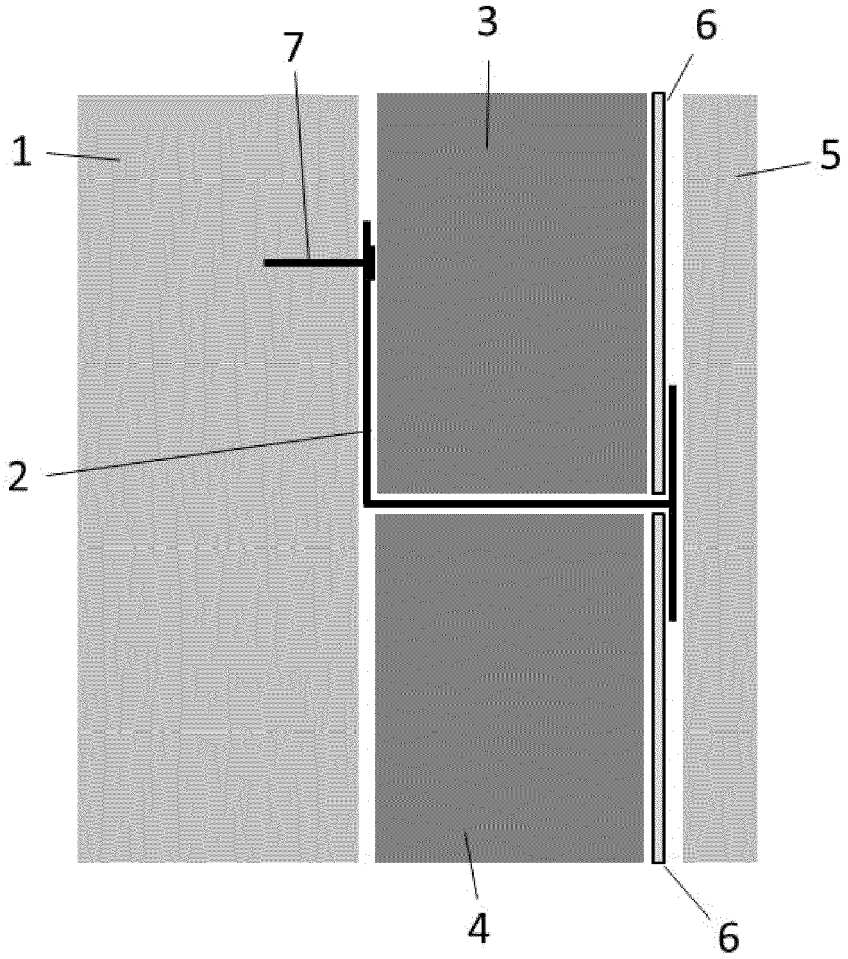

Fig. 2

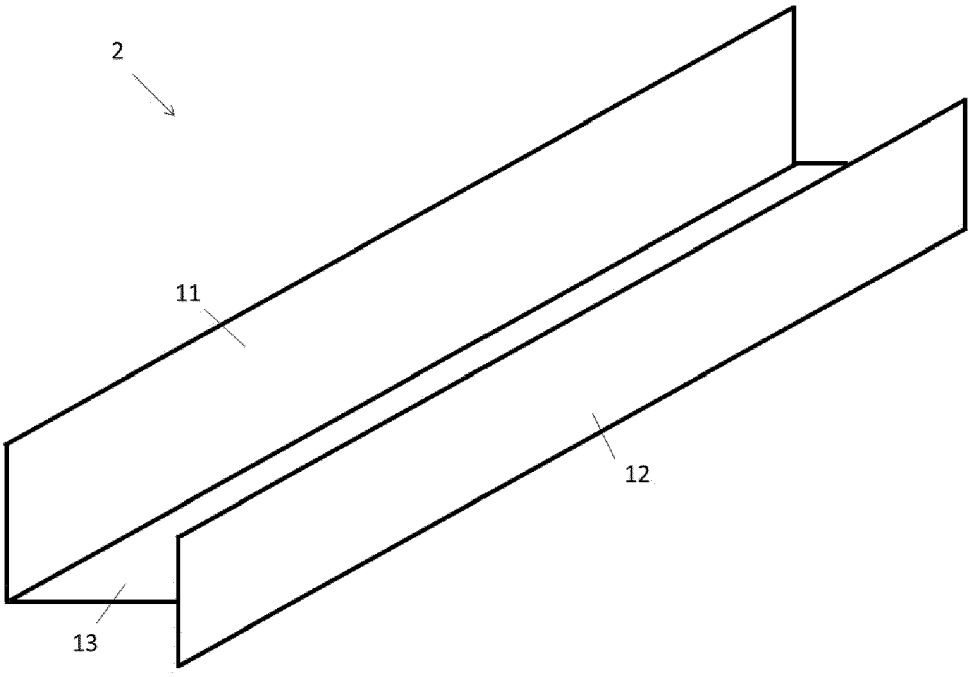

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 17 30 5578

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 November 2017	Arsac England, Sally

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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