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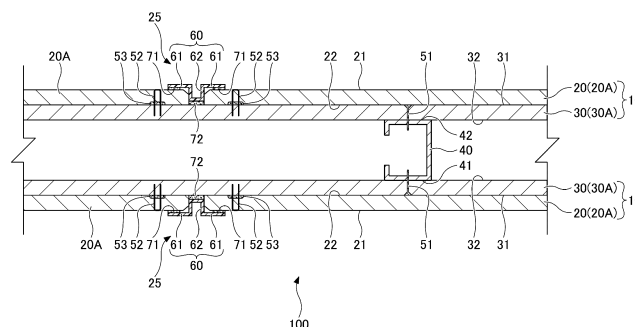
(54) **BUILDING WALL**

(57) Provided is a building wall capable of substantially preventing the falling-off of an overlay face member from an underlay face member caused by deformation of an overlay face member during a fire, even in a case where the amount of adhesive and the like used for connecting the underlay face member and the overlay face member is reduced.

A building wall 100 is provided with at least an underlay face member 30A and an overlay face member

20A, the underlay face member 30A directly or indirectly attached to a stud 40, the overlay face member 20A being an indoor-facing member and connected to the underlay face member 30A, a plurality of said overlay face members 20A are installed with a first joint 25, 26 therebetween, and wherein a pair of said overlay face members 20A, by which the first joint 25, 26 is interposed, are connected together by a connecting member 60, 60A, 60B that straddles the first joint 25, 26.

FIG.2



Description

TECHNICAL FIELD

[0001] The present disclosure relates to building walls.

BACKGROUND OF THE INVENTION

[0002] Conventionally, a method of constructing a building wall, such as a partition wall or an indoor-facing wall of an exterior wall by attaching a building face member to studs (intermediate posts), is performed by a method of connecting a single face member for construction to the studs erected at intervals in a horizontal direction with piercing-type connecting means, such as fastening members. Here, in a case where a building wall is formed of the single building face member, the single building face member is connected to a flange of a stud formed of, for example, channel steel.

[0003] In contrast to this, in a laminated configuration in which a building wall includes two building face members, for example, a method is performed by which an overlay face member that is a face member for construction is connected to studs by fastening members or the like, an adhesive, such as a vinyl acetate-based adhesive, is applied to a back surface of an overlay face member, and the back surface of the overlay face member is adhered to a surface of the underlay face member. In this adhesion-based connection method, since a certain time is required until the adhesive cures, a method is applied by which the overlay face member is tentatively attached to the underlay face member, and then the overlay face member is tentatively connected to the underlay face member by first piercing the surface of the overlay face member with connecting means, such as a staple. The staples are left in place, so that the underlay face member and the overlay face member are connected to each other by both the adhesive and the staples.

[0004] The amount of adhesive used on the underlay and overlay face members is generally on the order of 150 g/m² or more, and multiple staples are used to tentatively connect a single overlay face member. For example, Patent Document 1 also proposes a partition wall in which an underlay face member is fixed to studs by self-tapping screws, fastening members, or the like, and an overlying face member is fixed to the underlying face member by an organic adhesive and staples.

[0005] In order to alleviate the problems relating to, for example, the time and labor required for the connecting of the overlay face member to the underlay face member, and the complexities in construction management, it is conceivable to take measures to reduce the amounts of both the adhesive and staples to be used. However, when the amounts of both the adhesive and the staples to be used are reduced, the underlay face member gets displaced relatively largely with respect to the overlay face member by heat produced on a side where there are flames, and consequently the overlay face member has

a tendency to fall off from the underlay face member due to the relative displacement of both the overlay and underlay face members.

5 Related Art Documents

Patent Document

[0006] Patent document 1: Japanese Unexamined Patent Application Publication No. 2020-169468

SUMMARY OF THE INVENTION

Problems to be solved by the Invention

[0007] The present disclosure provides a building wall that can substantially prevent an overlay face member included in an overlay from falling off from an underlay when the underlay and the overlay get relatively displaced during a fire, even in the case where the amount of an adhesive or the like used for connecting the underlay face member and the overlay face member is reduced.

25 Means for Solving the Problem

[0008] A building wall according to an aspect of the present disclosure provided with at least an underlay face member and an overlay face member, the underlay face member directly or indirectly attached to a stud, the overlay face member being an indoor-facing member and connected to the underlay face member, wherein a plurality of said overlay face members are installed with a first joint therebetween, and wherein a pair of said overlay face members, by which the first joint is interposed, are connected together by a connecting member that straddles the first joint.

Effects of the Invention

[0009] According to the present disclosure, the overlay face member included in an overlay can be substantially prevented from falling off from the underlay face member when the underlay and the overlay get relatively displaced during a fire, even in a case where the amount of adhesive and the like used for connecting the underlay face member and the overlay face member is reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010]

[FIG. 1] is a perspective view illustrating an example of a building wall according to a first embodiment;
[FIG. 2] FIG. 2 is a longitudinal cross-sectional view of a general portion of the building wall, taken along line II-II of FIG. 1;
[FIG. 3] FIG. 3 is a longitudinal cross-sectional view

taken along the line III-III of FIG. 1, illustrating a portion of the building wall where a steel plate is installed;

[FIG. 4] FIG. 4 is a front view of the building wall, illustrating a state before a hat joiner is installed in a gapped joint that is a first joint of the overlay, and also illustrating a position of where a second bonding material is applied to the underlay face member;

[FIG. 5] FIG. 5 is an enlarged view of a portion V in FIG. 4;

[FIG. 6] FIG. 6 is a view taken along line VI-VI of FIG. 5;

[FIG. 7] FIG. 7 is a view illustrating a state in which a hat joiner is installed in a gapped joint illustrated in FIG. 6;

[FIG. 8] FIG. 8 is a view illustrating a state in which the hat joiner is installed in the gapped joint in a manner different from that of FIG. 7;

[FIG. 9] FIG. 9 is a longitudinal cross-sectional view illustrating an example of a building wall according to the second embodiment, the view being illustrated so as to correspond to FIG. 2; and

[FIG. 10] FIG. 10 is a longitudinal cross-sectional view illustrating an example of a building wall according to a third embodiment, the view being illustrated so as to correspond to FIG. 2.

DETAILED DESCRIPTION OF THE INVENTION

[0011] Hereinafter, an example of a building wall according to each embodiment is described with reference to the accompanying drawings. In the specification and drawings, components that are substantially the same are denoted by the same reference numerals, and redundant description thereof is omitted in some cases.

[Building Wall According to First Embodiment]

[0012] First, an example of a building wall according to a first embodiment is described with reference to FIGS. 1 to 8. FIG. 1 is a perspective view illustrating an example of the building wall according to the first embodiment. FIG. 2 is a longitudinal cross-sectional view of a general portion of the building wall, taken along the line II-II of FIG. 1, and FIG. 3 is a longitudinal cross-sectional view of a portion of the building wall, taken along the line III-III of FIG. 1, where a steel plate is installed.

[0013] Here, the building wall in the illustrated example is a partition wall having, on both sides of the studs, a layered-face structure having two layers one being an overlay and the other being an underlay, but instead of this, the building wall may be a partition wall having a layered-face structure having three or more face members on both surfaces of the studs. Alternatively, the partition wall may have the double-layer structure or the triple-layer structure on only one side of the studs. Further, the wall may be an indoor-side wall of an exterior wall, instead of the partition wall. As in the illustrated example

in the drawings, in the partition wall with the double-layer structure, the underlay is attached directly to the stud. In the case where the configuration is a layered-face structure in which three or more face members are overlaid, a separate face member that is in close contact with the underlay face member illustrated in the figure is attached to the stud, and therefore the underlay face member is attached to the stud indirectly.

[0014] A partition wall 100 illustrated in FIG. 1 is applied to a steel-framed building, a reinforced concrete (RC) building, a wooden building, or the like, and these buildings include a factory, a warehouse, and the like in addition to typical detached houses multiple dwelling complexes, such as condominiums.

[0015] The partition wall 100 has multiple studs 40, a lower runner 46 (or a floor runner), and an upper runner 45 (or a ceiling runner) constituting a main framework. The studs 40 extend in the longitudinal direction (vertical direction), and the upper runner 45 and the lower runner 46 extend in the lateral direction (horizontal direction).

[0016] Both the upper runner 45 and the lower runner 46 are formed of a lightweight steel frame, such as grooved steel, and the upper runner 45 is attached to an upper floor structure 47 with the opening facing downward, and the lower runner 46 is mounted to a lower floor structure 48 in a posture with the opening facing upward.

[0017] The studs 40 are formed of grooved steel with lips that are lightweight steel frames, but may be formed of groove steel or a square steel pipe.

[0018] An upper end 43 and a lower end 44 of each stud 40 are fixed to the upper runner 45 and the lower runner 46, respectively, and thus each stud 40 is fixed to the upper runner 45 and the lower runner 46. Here, although not illustrated, multiple stoppers extending in the horizontal direction may be provided at a predetermined pitch (e.g., 1,200 millimeter (mm) pitch) in the height direction of the studs 40.

[0019] The upper runner 45, the lower runner 46, and the studs 40 are, for example, lightweight steel frame members having a thickness of 0.4 mm or more, and steel runners and steel studs specified in Japanese Industrial Standards (JIS) A 6517 ("building steel base material"), or equivalent, compliant, or compatible materials may be used. In the partition wall 100, the multiple studs 40 are built between the lower runner 46 and the upper runner 45 at intervals of 606 mm or less (for example, intervals of 606 mm or 455 mm) in the width direction of the wall (longitudinal direction of the lower runner 46 and the like in FIG. 1).

[0020] In the partition wall 100, back surfaces 32 of underlay face members 30A arranged laterally are abutted against a pair of mounting surfaces 41 and 42 of the stud 40, and are connected to the mounting surfaces 41 and 42 on both sides of the stud 40 by fastening members 51, such as screws or the like from a front surface 31 side thereof. An underlay 30 is formed by multiple underlay face members 30A connected to the studs 40.

[0021] In contrast to this, a back surface 22 of an over-

lay face member 20A that is disposed vertically is adhered to the underlay 30 by an adhesive 53, and is connected to the underlay 30 by staples 52 driven in from an indoor-side surface 21 in front of the overlay face member 20A. The overlay 20 is formed by multiple overlay face members 20A connected to the underlay 30.

[0022] Thus, on both sides of the stud 40, a multi-layer structure 10 is formed of the underlay 30 and the overlay 20. Here, in addition to the illustrated example, a configuration in which the underlay face member 30A is vertically disposed and the overlay face member 20A is horizontally disposed may be adopted.

[0023] As the underlay face member 30A that is a face member for construction, a gypsum plate, a gypsum board, a calcium silicate board, a particle board, a hard-board, plywood, structural plywood, or the like can be applied, and among them, the gypsum plate or gypsum board can be suitably used.

[0024] In contrast to this, as the overlay face member 20A that is a face member for construction, a gypsum plate, a gypsum board, a calcium silicate board, or the like can be used, and among them, the gypsum plate or the gypsum board can be suitably used.

[0025] Here, in addition to a general gypsum board, the gypsum board includes a reinforced gypsum board, an ordinary hard gypsum board, a sheathing hard gypsum board, a moisture absorptive and desorptive reinforced gypsum board, a moisture absorptive and desorptive ordinary gypsum board, a moisture absorptive and desorptive sheathing hard gypsum board, a gypsum plate with a glass fiber nonwoven fabric, a glass mat gypsum board, and the like.

[0026] For example, in a case where the gypsum board is adopted, the dimensions of the short side, the long side, and the thickness thereof are 910 mm × 1,820 mm × 9.5 mm for quasi-non-combustible material or are 910 mm × 1,820 mm (2,420 mm or 2730 mm) × 12.5 mm (15 mm, 21 mm or 25 mm) for non-combustible material or the like. The width of the gypsum board may 606 mm, 1,000 mm, 1,220 mm, or the like, instead of 910 mm.

[0027] Further, for example, a vinyl acetate-based adhesive is used as the adhesive 53 for connecting the overlay face member 20A to the underlay 30.

[0028] In the underlay 30, second vertical joints 35 (an example of second joints), that are butt joints, and second horizontal joints 36 (another example of second joints) that are also butt joints, are provided between the multiple underlay face members 30A that are adjacent to each other in the vertical and horizontal directions.

[0029] In contrast to this, in the overlay 20, multiple first vertical joints 25 (an example of first joints) that are gapped joints, and first horizontal joints 26 (another example of first joints) that are also gapped joints, are provided between the multiple overlay face members 20A adjacent to each other in the vertical and horizontal directions.

[0030] The widths of the gapped joints 25 and 26 are set to be approximately 1 mm to 10 mm.

[0031] As illustrated in FIGS. 1 to 3, a hat joiner 60 is attached to both the first vertical joint 25 and the first horizontal joint 26. Here, the "hat joiner" includes a T-shaped joiner in addition to a perfectly hat-shaped joiner. Further, a flat-shaped joiner may be used instead of the hat joiner.

[0032] The hat joiner 60 includes two hat parts 61 (an example of a first component) and a protrusion 62 (an example of a second component) that connects the hat parts 61 together.

[0033] The two hat parts 61 straddle a gapped joint 25, extend over the indoor-side surface 21 of an overlay face member 20A on both sides, and are connected to the indoor-side surfaces 21 via an adhesive 71 (an example of a first bonding material).

[0034] In contrast to this, a protrusion 62 fitted into the gapped joint 25 is connected to the front surface 31 of the underlay face member 30A via a sealing agent 72 (an example of a second bonding material).

[0035] Here, as the adhesive that is the first bonding material 71, a vinyl acetate resin-based adhesive, an acrylic resin-based adhesive, a urethane resin-based adhesive, an epoxy resin-based adhesive, a polyamide-based adhesive, a polysulfide-based adhesive, a silicone-based adhesive, or a synthetic rubber adhesive, for example, can be used.

[0036] In addition, in a case where the sealing agent is used as the first bonding material 71, a polyurethane-based sealing agent, an acrylic-based sealing agent, an acrylic urethane-based sealing agent, a polysulfide-based sealing agent, a polyisobutylene-based sealing agent, and a silicone-based or modified silicone-based sealing agent, for example, can be used.

[0037] Further, in a case where a putty material is used as the first bonding material 71, a gypsum-based putty material, a calcium carbonate-based putty material, or a resin-based putty material, such as epoxy resin, can be used.

[0038] Any of the above-described sealing agents can be used as the sealing agent that is the second bonding material 72, and any of the above-described adhesives and putty materials can be used in the case where the adhesive or putty material is used as the second bonding material 72.

[0039] As described above, various adhesives, sealants, and putty materials can be used as the first bonding material 71 and the second bonding material 72, and in addition to those mentioned, adhesive tape, a screw, a nail, a fastening member, staple, or the like may be used as the first bonding material 71 and the second bonding material 72.

[0040] In this way, the multiple overlay face members 20A are connected to each other via the hat joiner 60 that is a connecting member provided in the gapped joints 25 and 26, and thus the integrity of the overlay 20 formed of the multiple overlay face members 20A is enhanced. Here, instead of the hat joiner 60, tape or the like may be used as the connecting member to connect the mul-

multiple overlay face members 20A while also covering the gapped joints 25 and 26 with the tape or the like. Alternatively, multiple overlay face members 20A may be connected together by using a sealing member as the connecting member, and this can be achieved by filling or coating the gapped joints 25 and 26 with a sealing member.

[0041] In the example illustrated in FIGS. 1 to 3, although the hat joiner 60 connects a pair of overlay face members 20A, by which the gapped joint 25 is interposed, by straddling the gapped joint 25, in the present specification, the expression "connects by straddling the first joint" may be a form other than a form in which the joiner, the tape, or the like is, in the literal sense, installed so as to straddle the first joint thereby connecting the pair of overlay face members 20A. For example, a form in which the pair of overlay face members 20A are connected by filling or coating the first gapped joint with a sealing member or the like is also included in the meaning of the expression "connects by straddling the first joint".

[0042] As illustrated in FIGS. 1 and 3, in the building wall 100, multiple pieces of steel plates 80 are disposed between the overlay 20 and the underlay 30.

[0043] As illustrated in FIG. 1, the multiple steel plates 80 are installed at a predetermined interval in the lateral direction (for example, horizontally) at a level that is a predetermined height t1 from the floor surface. Here, the steel plate 80 may be a single strip extending in the lateral direction, instead of the pieces illustrated in the drawings.

[0044] The steel plate 80 is bonded to the front surface 31 of the underlay 30 via an adhesive 91, and is connected to the overlay 20 by a fastening member 92 driven in from the indoor-side surface 21 of the overlay 20. Here, a vinyl acetate resin-based adhesive or the like is used as the adhesive 91.

[0045] The multiple steel plates 80 also function as a support base that supports, in a cantilever manner, a retrofit-type member (not illustrated) that is retrofitted to an indoor side that is located more inwardly than the overlay 20. For example, one end of a rod-shaped support member (not illustrated) is fixed to the steel plate 80, the other end of the support member protrudes into the room, and thus a retrofit-type member, such as a handrail, a wall hanger, a backrest, or an armrest, is fixed to the other end of the multiple support members.

[0046] As described above, the steel plate 80 is a rigid plate member, and thus is suitable as a member having a function as a support base that supports a retrofit-type member. Further, since the steel plate 80 is a relatively thin flat-shaped plate member, it is suitable as a member sandwiched between the underlay 30 and the overlay 20. Since it is desirable that the steel plate 80 has the minimum rigidity capable of supporting the retrofit-type member that is as thin as possible, the thickness of the steel plate 80 is preferably in the range of 0.4 mm to 1.2 mm.

[0047] In a case where the steel plate 80 is rectangular in plan view, the minimum dimensions are preferably 10

mm × 10 mm or more. However, the steel plate 80 is set to maximum dimensions that are 40 percent(%) or less of the total area of the laminated body 10, and preferably 22% or less.

[0048] Further, since the multiple steel plates 80 are used as a support base for supporting the retrofit-type member, it is preferable that the steel plates 80 are connected to both the underlay 30 and the overlay 20 via multiple connecting means, such as the adhesive 91 and the fastening member 92 as in the illustrated example. However, in a case where the steel plate 80 is fixed to the extent that the steel plate 80 can sufficiently exhibit the function as the support base for supporting the retrofit-type member only by the connection to the underlay 30 by the adhesive 91, connection by the fastening member 92 may be omitted.

[0049] The installation height t1 of the steel plate 80 from the floor surface is set in accordance with the planned installation level of the retrofit-type member, but quantitatively, it is preferably set in a range of about the 1,200 mm from the floor surface, and it is desirably set in range of 400 mm to 1,200 mm. The total height of the multi-layer structure 10 is set to, for example, approximately 3,000 mm.

[0050] While the steel plate 80 acts as a support base for the retrofit-type members, the steel plate 80 may become deformed due to the heat in the event of a fire, and this could adversely affect the integrity of the overlay 10. Since heat from the upper side (ceiling side) of the room increases, the height range can be defined as a range that satisfies: both a level as close to the floor surface as possible that is unlikely to have a high temperature; and a planned installation level of the retrofit-type member.

[0051] The numerical range of the maximum dimensions of the steel plate 80 of "40% or less" is defined from the viewpoint of diminishing the influence that deformation during a fire outbreak has on the integrity of the overlay 10 and from the viewpoint of the installation height range. Further, the effect of diminishing the influence on the integrity is further enhanced by setting the numerical range of the maximum size to "22% or less".

[0052] Next, with reference to FIGS. 4 to 8, an application position of the second bonding material 72 in the underlay 30, a method of installing the hat joiner in the gapped joint, and the like are described. FIG. 4 is a front view of the building wall, illustrating a state before the hat joiner is installed in the gapped joint that is the first joint of the overlay, and also illustrating the application position of the second bonding material in the underlay face member. Further, FIG. 5 is an enlarged view of a portion V in FIG. 4. FIG. 6 is a view taken along the line VI-VI of FIG. 5, and FIG. 7 is a view illustrating a state in which a hat joiner is installed in the gapped joint illustrated in FIG. 6.

[0053] The second bonding material 72, such as a sealing agent, may be applied to any position of the joint bottom of the gapped joints 25 and 26 that are the first joints, but as illustrated in FIGS. 4 and 5, it is preferable

to apply the second bonding material 72 to a joint intersection position N that is a position corresponding to the second joints 36 and 35 exposed to the gapped joints 25 and 26 that are the first joints.

[0054] In this way, by limiting the application position of the second bonding material 72 to the joint intersection position N with the second joints 36 and 35 exposed to the gapped joints 25 and 26 that are the first joints, the sealing performance of the second joints 36 and 35 can be enhanced while reducing the amount of the second bonding material 72 used as much as possible, and also the fire resistance of the multi-layer structure 10 can be improved.

[0055] As illustrated in FIGS. 5 and 6, the second bonding material 72 is applied to the joint intersection position N of the underlay 30, and the first bonding material 71 is applied along the gapped joint 25 and the like on the indoor-side surface 21 of the overlay face member 20A on both sides of the gapped joint 25 and the like.

[0056] Next, as illustrated in FIG. 7, by attaching the hat joiner 60 to the gapped joint 25 or the like, the hat part 61 is connected to the indoor-side surface 21 of the overlay face member 20A member via the first bonding material 71, and the protrusion 62 is connected to the front surface 31 of the underlay face member 30A via the second bonding material 72. Here, FIG. 7 illustrates a state in which the front surface 31 of the underlay 30 and the back surface 22 of the overlay 20 are connected to each other via the adhesive 53, yet the front surface 31 and the back surface 22 are illustrated as being separated from each other due to the relationship of the adhesive 53 illustrated in the figure. However, in actuality, the front surface 31 and the back surface 22 are close contact with each other.

[0057] FIG. 8 illustrates another installation configuration of the hat joiner in the gapped joint. Here, FIG. 8 is a view illustrating a state in which the hat joiner is installed in the gapped joint in a manner different from that of FIG. 7.

[0058] In the illustrated example, the hat joiner 60 is installed in such a manner that the two hat parts 61 of the hat joiner 60 are sandwiched between the underlay 30 and the overlay 20 and the protrusion 62 protrudes toward the indoor side. Here, FIG. 8 illustrates a state in which the front surface 31 of the underlay 30 and the back surface 22 of the overlay 20 are connected to each other via the adhesive 53, yet the front surface 31 and the back surface 22 are illustrated as being separated from each other due to the relationship of the adhesive 53 illustrated in the figure. However, in actuality, the front surface 31 and the back surface 22 are in close contact with each other.

[0059] One surface of the hat part 61 is connected to the back surface 22 of the overlay 20 via the first bonding material 71, and the other surface of the hat part 61 is connected to the front surface 31 of the underlay 30 via the second bonding material 72.

[0060] Even in the embodiment of the illustrated ex-

ample, the multiple overlay face members 20A are connected to each other via the hat joiner 60 that is the connecting member, and thus the integrity of the overlay 20 formed of the multiple overlay face members 20A is enhanced.

[0061] In both of the embodiments illustrated in FIGS. 7 and 8, the integrity of the overlay 20 formed of the multiple overlay face members 20A is enhanced. The enhanced integrity of the overlay 20 can substantially prevent the overlay face member 20A of the overlay 20 from falling off from the underlay 30 even if the underlay 30 and the overlay 20 get relatively displaced due to heat produced from a side where flames are during the fire, in the case where the amounts of the adhesive 53 and the staples 52 used to connect the underlay 30 and the overlay 20 are reduced. As for the relative displacement, the ceiling side of the room becomes high in temperature at an early stage, and thus the relative displacement may occur between the underlay 30 and the overlay 20 on the ceiling side. Since the integrity of the overlay 20 is enhanced as described above, even if the adhesive 53 or the staple 52 connecting the overlay 20 to the underlay 30 becomes detached due to such relative displacement, the overlay face member 20A included in the overlay 20 is substantially prevented from falling off from the underlay 30.

[0062] Therefore, reduction in the time and labor required, the complexities in construction management owing to a reduction in the amounts of both the adhesive 53 and the staples 52, and the like; and virtual prevention (improvement in fire resistance) of the overlay 20 from falling off from the underlay 30 due to relative displacement of the underlay 30 and the overlay 20 can both be realized.

[0063] In the building wall 100, in addition to the enhancement of the integrity of the overlay 20, since the protrusion 62 is connected to the underlay face member 30A, the integrity of the entire multi-layer structure 10 including the overlay 20 and the underlay 30 via the hat joiner 60, is also enhanced. Thus, the effect of substantially preventing the falling off of the overlay 20 from the underlay 30 during a fire is greatly enhanced.

[Building Wall According to Second Embodiment]

[0064] Next, an example of a building wall according to the second embodiment is described with reference to FIG. 9. Here, FIG. 9 is a longitudinal cross-sectional view illustrating an example of the building wall according to the second embodiment, the view being illustrated so as to correspond to FIG. 2.

[0065] A building wall 100A differs from the building wall 100 in that the overlay 20 has a butt joint 25A instead of the gapped joint. Although not illustrated, in the overlay 20, there is a first horizontal joint that is a butt joint, in addition to a first vertical joint 25A that is a butt joint.

[0066] In the butt joint 25A, a connecting member 60A formed of tape (another example of the first component)

is installed so as to straddle the indoor-side surfaces 21 of both of the overlay face surfaces 20A in a state where header surfaces of the overlay face members 20A are butted against each other. That is, the multiple overlay face members 20A on both sides of the butt joint 25A are connected to each other by the tape 60A.

[0067] Here, as the tape, paper tape, glass tape, butyl rubber tape, acrylic tape, or the like can be used.

[0068] According to the building wall 100A, the multiple overlay face materials 20A are connected to each other via the tape 60A that is the connecting member, and thus the integrity of the overlay 20 formed of the multiple overlay face members 20A is enhanced. The enhanced integrity of the overlay 20 can substantially prevent the overlay face member 20A of the overlay 20 from falling off from the underlay 30 even if the underlay 30 and the overlay 20 get relatively displaced due to heat produced from a side where the flames are during a fire, in the case where the amounts of the adhesive 53 and the staples 52 used to connect the underlay 30 and the overlay 20 are reduced. Here, a configuration may be adopted in which a flat-shaped joiner is used as the connecting member instead of the tape 60A, and the joiner is installed so as to span the joint 25A. Further, the sealing member may be used as the connecting member, and the butt joint 25A may be filled or coated with the sealing member.

[Building Wall According to Third Embodiment]

[0069] Next, an example of a building wall according to the third embodiment is described with reference to FIG. 10. Here, FIG. 10 is a longitudinal cross-sectional view illustrating an example of the building wall according to the third embodiment, the view being illustrated so as to correspond to FIG. 2.

[0070] Although a building wall 100B has a configuration in which the overlay 20 has a butt joint 25A as does the building wall 100A, the building wall 100B differs from the building wall 100A with respect to the manner in which multiple overlay face members 20A are connected.

[0071] In the building wall 100B, a connecting member 60B formed of a steel plate (another example of the first component) is installed so as to straddle the back surfaces 22 of both of the overlay face members 20A in a state where the header surfaces of the overlay face members 20A are butted against each other. That is, the multiple overlay face members 20A, by which the butt joint 25A is interposed, are connected to each other by the steel plate 60B.

[0072] Here, as described above, the steel plate 80 having a function as a support base for supporting the retrofit-type member may be provided in addition to the steel plate 60B. Alternatively, the steel plate 60B may have both the function of connecting the multiple overlay face members 20A and the function as the support base for supporting the retrofit-type member.

[0073] According to the building wall 100B, the plurality of overlay face members 20A are connected to each other

via the steel plate 60B that is the connecting member, and thus the integrity of overlay 20 formed of the multiple overlay face members 20A is enhanced. The enhanced integrity of the overlay 20 can substantially prevent the overlay face member 20A of the overlay 20 from falling off from the underlay 30 even if the underlay 30 and the overlay 20 get relatively displaced due to heat produced from a side where the flames are during a fire, in the case where the amounts of the adhesive 53 and the staples 52 used to connect the underlay 30 and the overlay 20 are reduced.

[0074] Note that other embodiments, such as those in which other elements are combined with the above configurations, may be used, and the present disclosure is not limited to the configurations illustrated here. The configurations of the present disclosure may be changed without departing from the purpose of the present disclosure, and the configurations can be appropriately determined according to the usage form.

[0075] The present international application is based upon and claims priority to Japanese Patent Application No. 2022-015764 filed on February 3, 2022, the entire contents of which are incorporated herein by reference.

EXPLANATION OF REFERENCE NUMERALS

[0076]

10	Multi-layer structure
20	Overlay
20A	Overlay face member
21	Indoor-side surface
22	Back surface
25	First joint (First vertical joint; gapped joint)
25A	First joint (First vertical joint; butt joint)
26	First joint (First horizontal joint; gapped joint)
30	Underlay
30A	Underlay face member
31	Front surface
32	Back surface
35	Second joint (Second vertical joint; butt joint)
36	Second joint (Second horizontal joint; butt joint)
40	Stud
45	Upper runner
46	Lower runner
47, 48	Floor structure
51	Fastening member
52	Staple
53	Adhesive
60	Hat joiner (Connecting member)
61	Hat part (First component)
62	Protrusion (Second component)
60A	Tape (Connecting member)

60B	Steel plate (Connecting member)	
71	First bonding material (Adhesive)	
72	Second bonding material (Sealing agent)	
80	Steel plate	5
91	Adhesive	
92, 93	Fastening member	
100, 100A, 100B	Partition wall (Building wall)	
N	Joint intersection position	10

Claims

1. A building wall provided with at least an underlay face member and an overlay face member, the underlay face member directly or indirectly attached to a stud, the overlay face member being an indoor-facing member and connected to the underlay face member,

wherein a plurality of said overlay face members are installed with a first joint therebetween, and wherein a pair of said overlay face members, by which the first joint is interposed, are connected together by a connecting member that straddles the first joint.

2. The building wall according to claim 1, wherein the connecting member has a first component straddling the first joint on an indoor-side surface of the overlay face member, and the first component is connected to an indoor-side surface of the overlay face member via a first bonding material.

3. The building wall according to claim 1, wherein the connecting member includes a first component that straddles the first joint on a back surface of the overlay face member opposite to an indoor side of the overlay face member, and the first component is connected to the back surface via a first bonding material.

4. The building wall according to claim 2, wherein the first joint is a gapped joint, and the connecting member further includes a second component fitted in the first joint, and the second component is connected to the underlay face member via a second bonding material.

5. The building wall according to claim 4, wherein a plurality of said underlay face members are installed with a second joint therebetween, and the second bonding material is provided at a position corresponding to the second joint exposed to the gapped joint.

6. The building wall according to claim 4 or claim 5, wherein the connecting member is formed of a hat

joiner that is provided with two hat parts and a protrusion connecting the two hat parts together, the two hat parts are the first component, and the protrusion is the second component.

7. The building wall according to any one of claims 1 to 6, further comprising a steel plate disposed between the overlay face member and the underlay face member, wherein the steel plate functions as a support base that supports, in a cantilever manner, a retrofit-type member that is retrofitted to an indoor-side that is located more inwardly than the overlay face member.

8. The building wall according to claim 7 depending from claim 3, wherein the first component is the steel plate, and the steel plate has both a function of connecting the pair of said overlay face members and a function of serving as the support base.

9. The building wall according to claim 8, wherein an area of the steel plate is 40% or less a total area of the building wall.

10. The building wall according to any one of claims 1 to 9, wherein the building wall is a partition wall, and a face member unit is installed on one or both surfaces of the stud, the face member unit including at least the plurality of said overlay face members and the underlay face member.

11. The building wall according to any one of claims 1 to 9, wherein the building wall is an indoor-side wall of an exterior wall, and a face member unit is installed on one surface of the stud, the face member unit including at least the plurality of said overlay face members and the underlay face member.

FIG.1

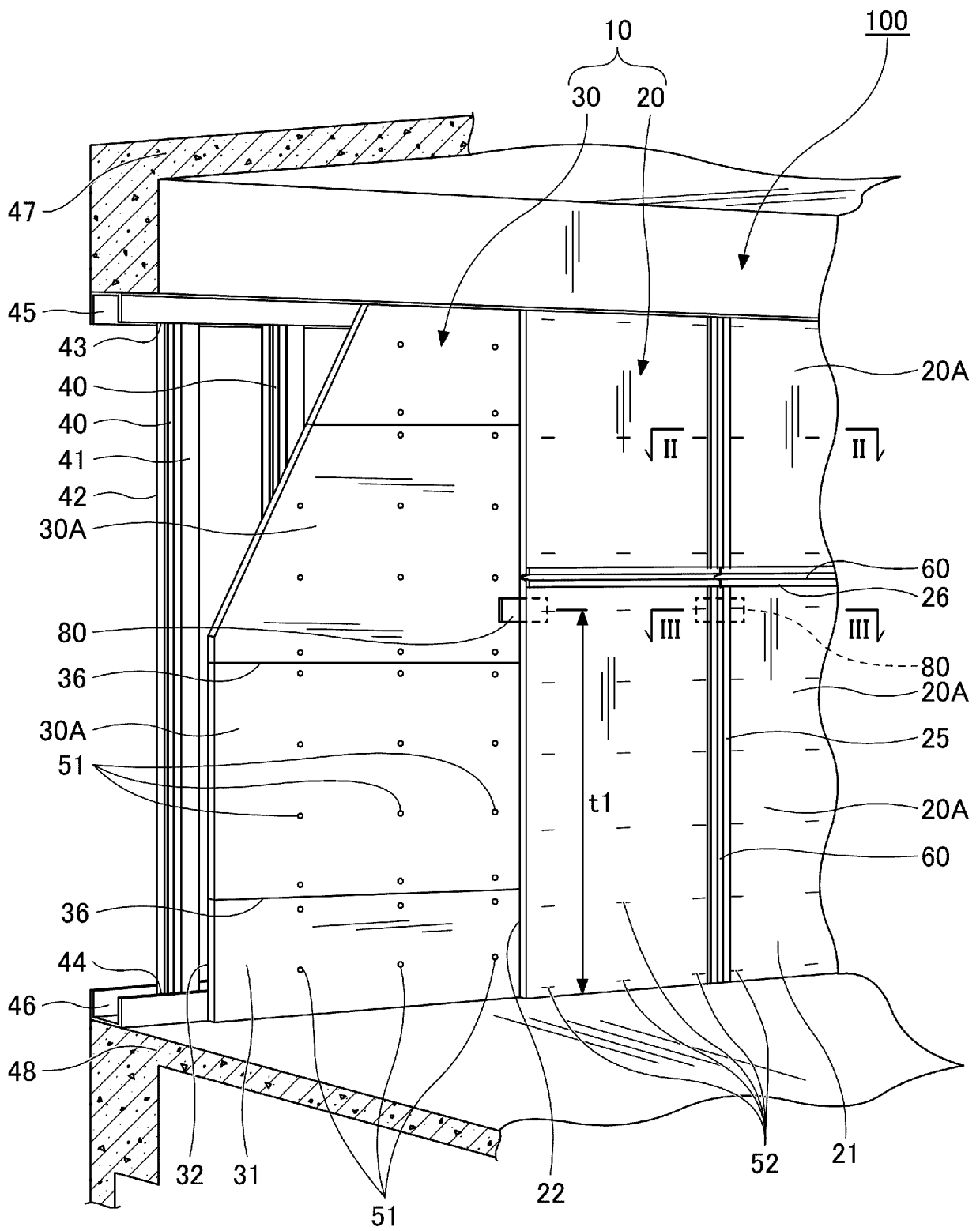


FIG.2

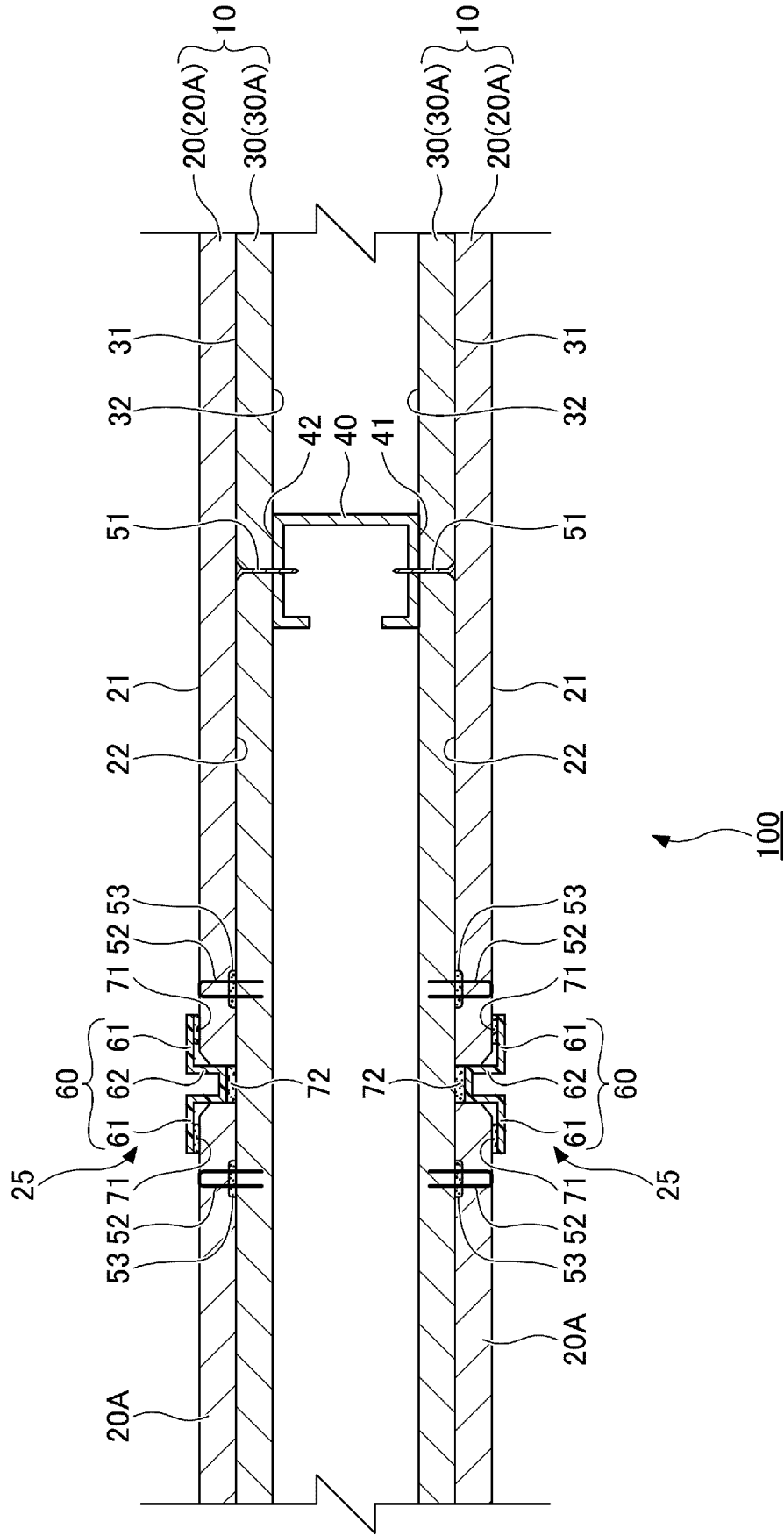


FIG.3

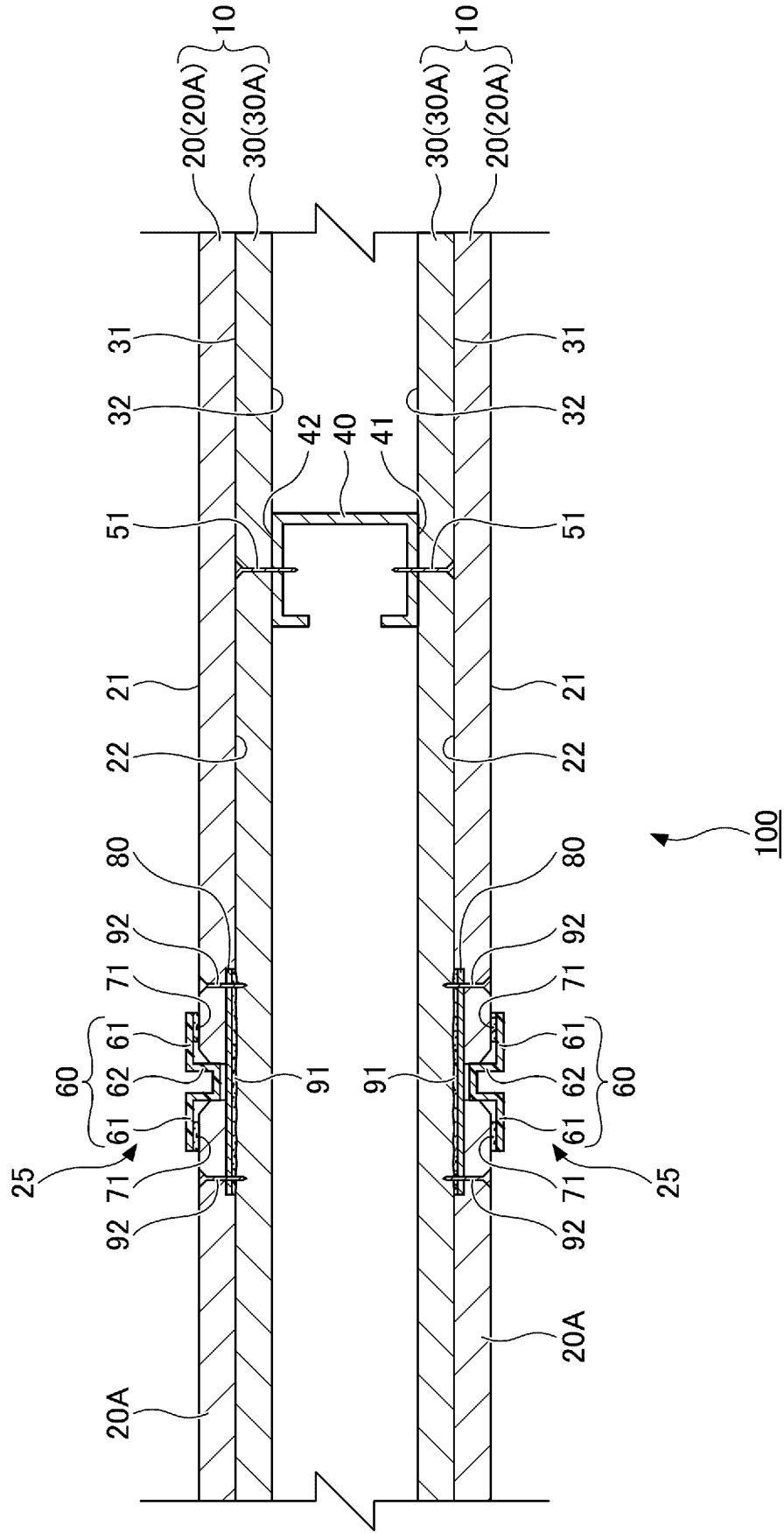


FIG.4

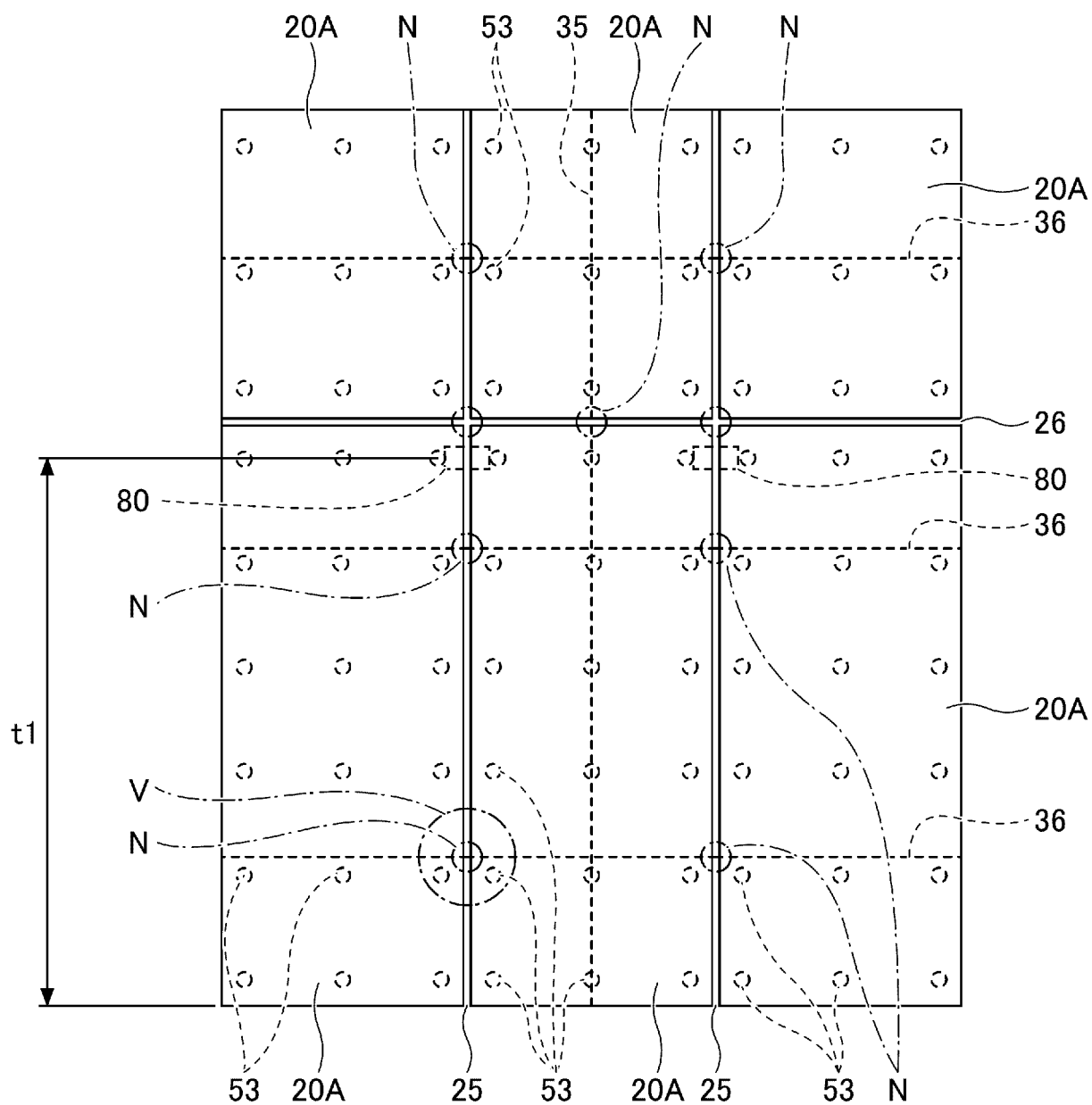


FIG.5

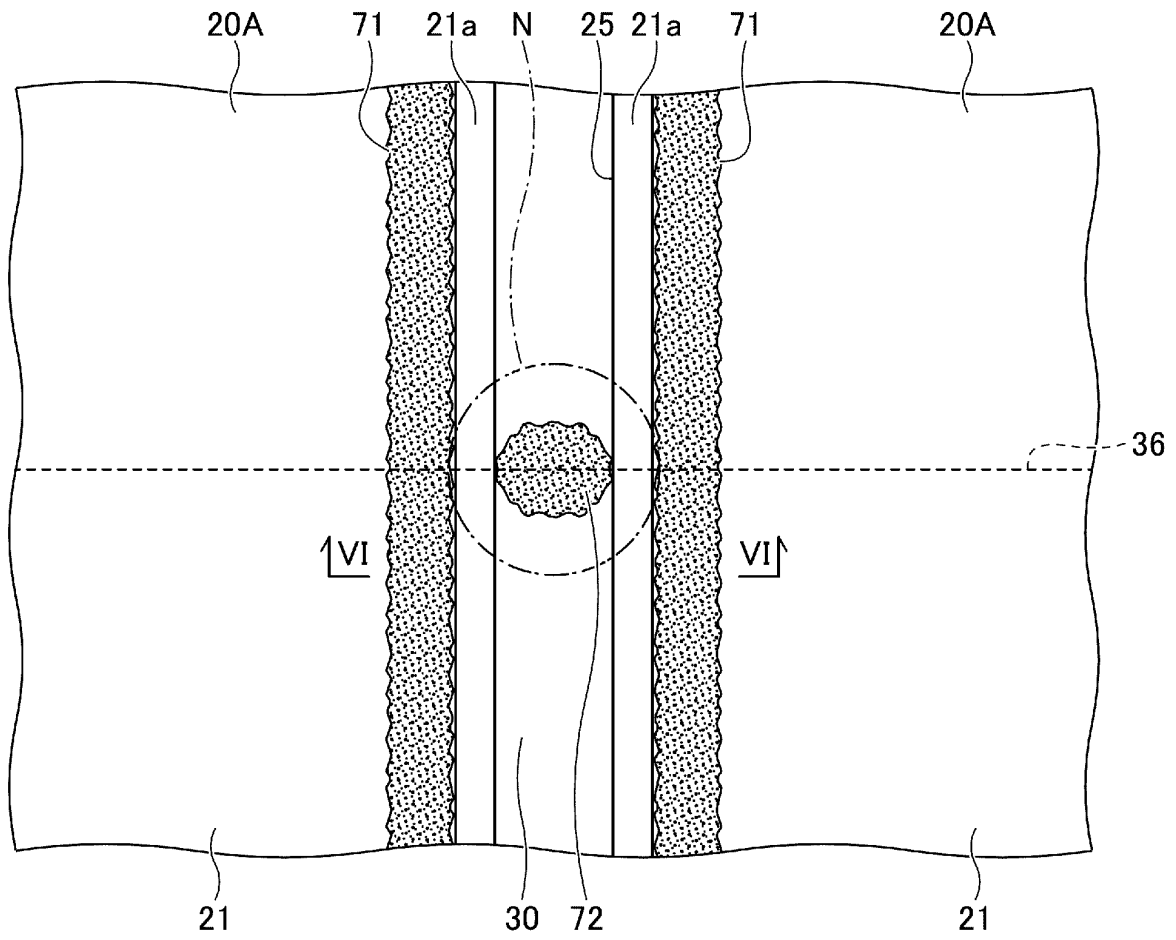


FIG.6

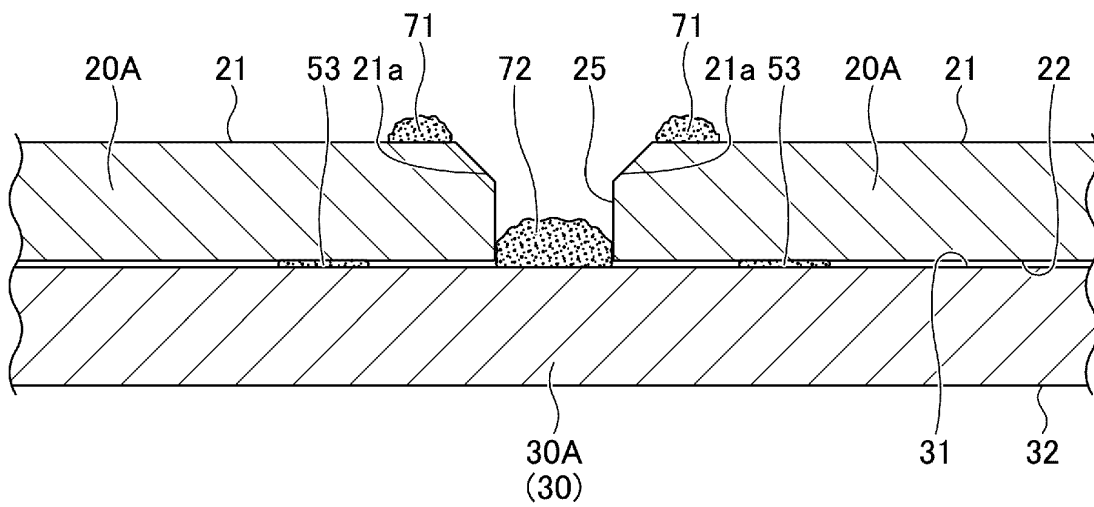


FIG.7

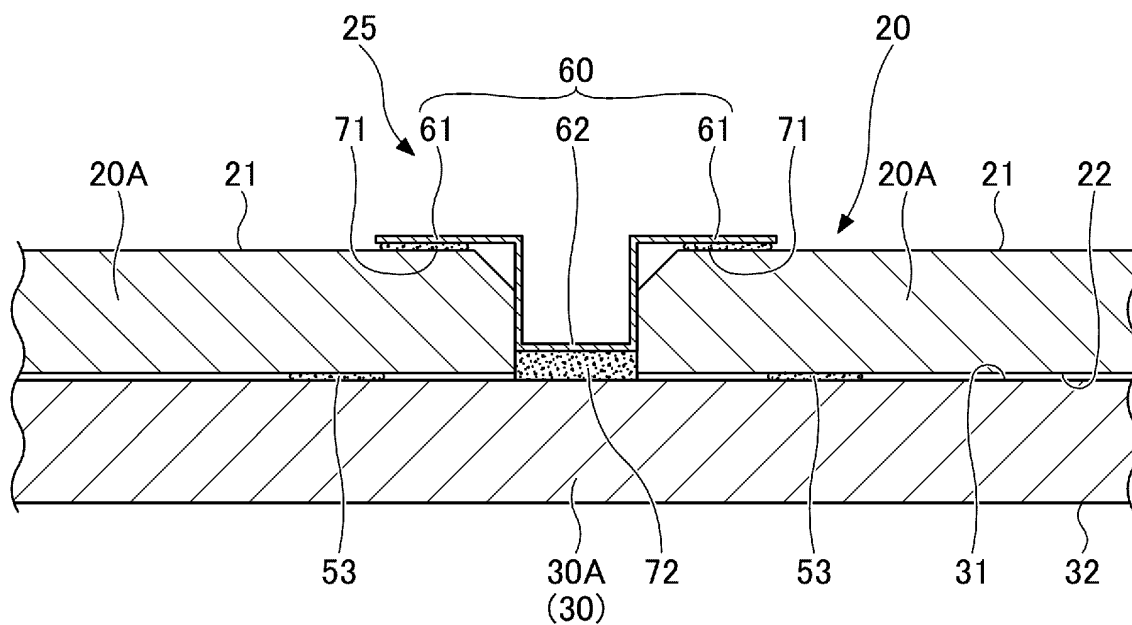


FIG.8

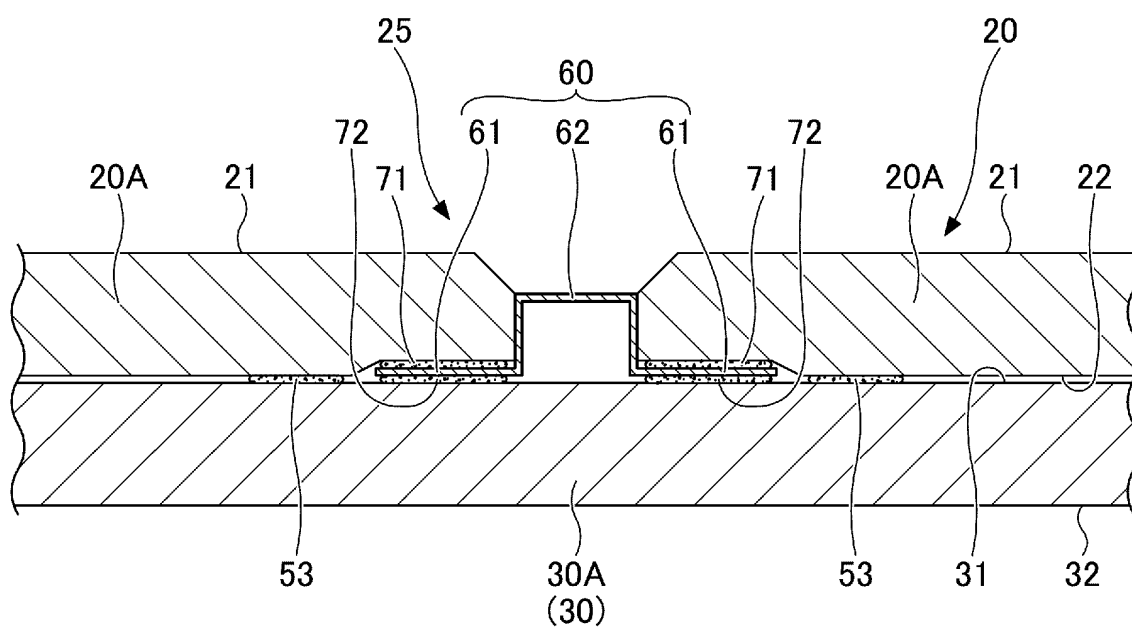


FIG.9

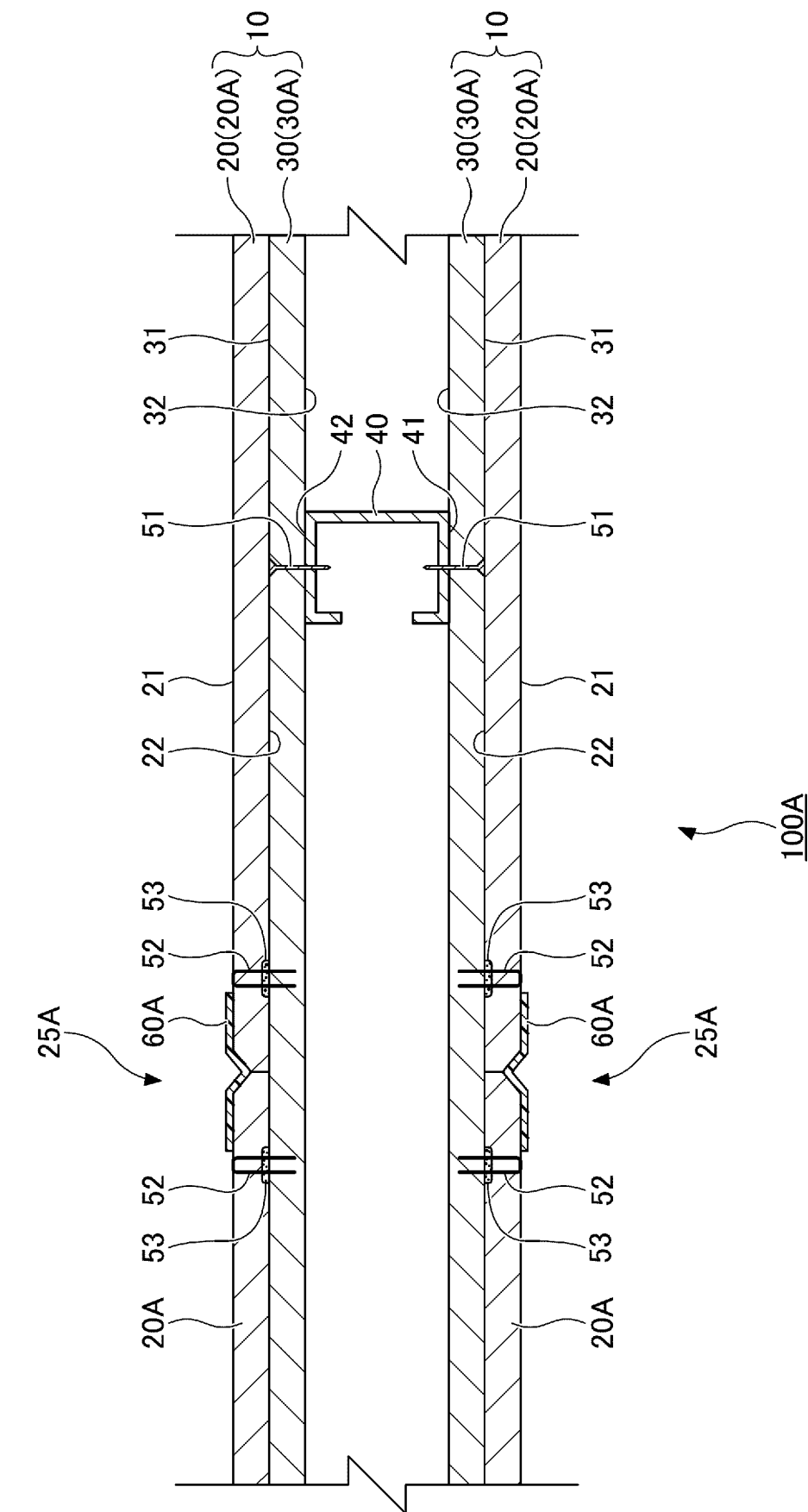
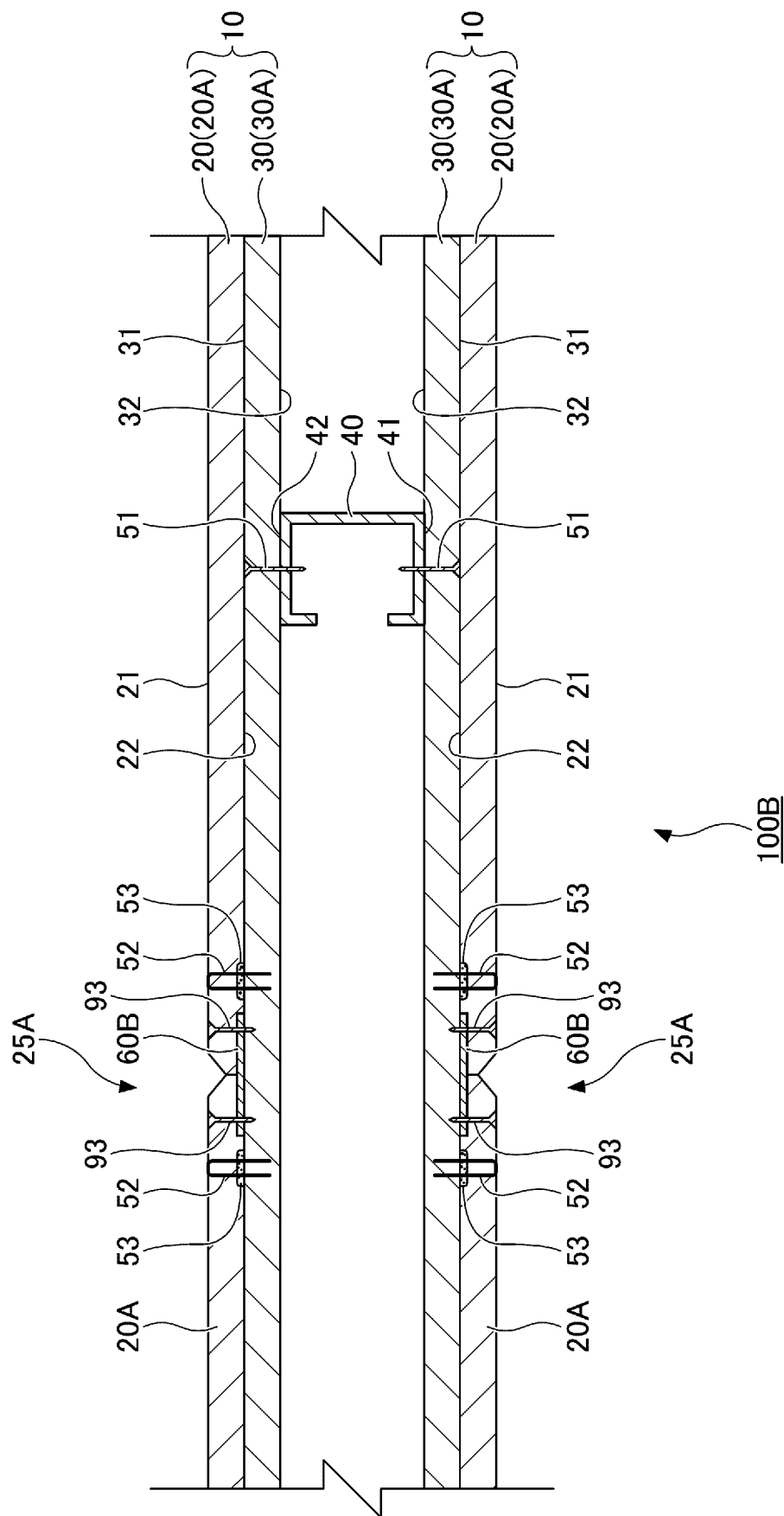


FIG.10



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2023/002277

A. CLASSIFICATION OF SUBJECT MATTER

E04F 19/06(2006.01)i; *E04B 1/94*(2006.01)i; *E04F 13/08*(2006.01)i; *E04B 2/74*(2006.01)i; *E04B 2/76*(2006.01)i
 FI: E04B2/76; E04F19/06 E; E04B2/74 511G; E04F13/08 101P; E04F13/08 Y; E04B1/94 L

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

E04F19/06; E04B1/62 - E04B1/99; E04F13/08 - E04F13/18; E04B2/72 - E04B2/82

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Published examined utility model applications of Japan 1922-1996
 Published unexamined utility model applications of Japan 1971-2023
 Registered utility model specifications of Japan 1996-2023
 Published registered utility model applications of Japan 1994-2023

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2002-364104 A (YOSHINO GYPSUM CO LTD) 18 December 2002 (2002-12-18) paragraphs [0001], [0013]-[0040], fig. 1-7	1-3, 10-11
Y	paragraphs [0001], [0013]-[0040], fig. 1-7	4-6, 10-11
A	paragraphs [0001], [0013]-[0040], fig. 1-7	7-9
X	JP 2002-309691 A (YOSHINO GYPSUM CO LTD) 23 October 2002 (2002-10-23) paragraphs [0001], [0016]-[0033], fig. 1-8	1, 3, 7-11
A	paragraphs [0001], [0016]-[0033], fig. 1-8	2, 4-6
Y	JP 6-212719 A (MATSUSHITA ELECTRIC WORKS LTD) 02 August 1994 (1994-08-02) paragraphs [0001], [0007]-[0018], fig. 1-8	4-6, 10-11

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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“&” document member of the same patent family

Date of the actual completion of the international search

04 April 2023

Date of mailing of the international search report

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Name and mailing address of the ISA/JP

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Authorized officer

Telephone No.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2023/002277

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
JP	2002-364104	A	18 December 2002	(Family: none)	
JP	2002-309691	A	23 October 2002	(Family: none)	
JP	6-212719	A	02 August 1994	(Family: none)	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2020169468 A [0006]
- JP 2022015764 A [0075]