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# (54) SEPARATE BUILDING SERVICE ELEMENTS AND SHAFT ELEMENTS

SEPARATE GEBÄUDESERVICEELEMENTE UND SCHACHTELEMENTE

ÉLÉMENTS DE SERVICE DE BÂTIMENT ET ÉLÉMENTS D'ARBRE SÉPARÉS

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EP 4 121 617 B1

## Description

**[0001]** The invention relates to a system comprising interacting building service elements and shaft elements for an individual and location independent fastening in front of an outer wall of a building and in particular of an existing building. The system can in particular be used within the context of energetic building restoration, but are also suitable for use in new builds.

**[0002]** An extensive restoration of the existing building stock is inter alia necessary to achieve the target set by a large number of governments to reduce emissions and energy consumption as comprehensively as possible. The restoration should preferably ultimately enable a $CO_2$ neutral operation of the buildings. A large number of approaches have already been developed and tested in the past for energetic building restoration that were, however, problematic for different reasons or that have at least not established themselves to a real extent. A "serial restoration" into $CO_2$ neutral buildings based on the principles of the passive house standard is currently discussed as a very promising concept in Germany.

**[0003]** A method of energetic building restoration is disclosed in the German patent application DE 10 2021 107 398.7 that comprises as the major method element the covering of the outer walls of existing buildings with prefabricated planar building face elements and building service elements. The building service elements are described in detail in the German patent application DE 10 2021 118 086.4 and comprise a reception region having preinstalled building service components and a shaft region running through the building from top to bottom.

**[0004]** The building service components installed in the building service element should include as far as possible the required building services for the supply of housing units to be able to dispense with greater construction work within the building and above all within the apartments as part of a restoration. All the lines (fluid lines, cables, etc.) required for the supply should be accommodated in the shaft region. At the same time, the building service element should be flat to be able to form a flush new outer surface of the building together with the building face elements.

**[0005]** The building service element necessarily has a certain width due to these demands. This can be obstructive in the restoration of some existing buildings where there are wider building face sections having windows or balcony doors arranged with only a small spacing from one another that can only be mapped in building face elements, but not building service elements as part of the restoration concept of DE 10 2021 107 398.7.

**[0006]** A combination comprising building service elements and shaft elements for mounting on the outer wall of buildings according to the preamble of claim 1 is known from JP 2012-002038 A. JP 2007-046273 A discloses a design for shaft elements for mounting on the outer wall of buildings. WO 2012/046273 discloses a design of a building service element. DE 20 2017 104 624 U1 discloses heated reveal elements for insertion in window openings of buildings.

**[0007]** It is the object of the invention to disclose a solution for this limitation.

**[0008]** Against this background, the invention relates to a system comprising: a combination of at least one building service element and at least one building service-free shaft element for an individual and location independent fastening in front of an outer wall of a building and in particular of an existing building; and at least one reveal element for insertion into a door opening or window opening in the outer wall of the building.

**[0009]** The building service element has a housing that comprises at least one reception region having preinstalled building service components as well as a shaft region, wherein the building service element has a large-area or full-area access opening at the front side that is reversibly closed using a closure element and through which the reception region is accessible, and wherein the shaft element has a housing that defines a shaft region running through from top to bottom, wherein the shaft element has a large-area or full-area access opening that is reversibly closed using a closure element and through which the shaft is accessible from the outside.

**[0010]** The reveal element has side panels that correspond to a respective edge of the door opening or window opening and that are lined with a heating acting over a large area thereat, with the heating being connected to a building service component of the building service element or to a line conducted in the shaft element for the energy supply, the heating preferably being a heating mat whose heating elements are formed as electrical resistance heatings.

**[0011]** When a building service-free shaft element is spoken of in the context of the present invention, it is meant by this that no building service components for the supply of a housing unit with hot water or for an air exchange and for providing air-conditioned air to the housing unit are installed in the shaft element.

**[0012]** The closure element of the building service element and of the shaft element can, respectively independently of one another, be a door pivotable about a perpendicular axis, a flap pivotable about a horizontal axis, or screwed boards or coverings, for example. In an embodiment, an access opening, in particular the as a rule somewhat wider access opening of the building service element, can also be closed using two such closure elements.

**[0013]** Suitable closure elements are thermally insulated in an embodiment. Provision can, for example, be made that the total building service element and/or the total shaft element is/are thermally insulated at least to the front and to the sides. The building service element can in particular also be thermally insulated at the top and at the bottom. Suitable thermal insulations are preferably implemented by a renewable and biodegradable insulating material such as cellulose material or wooden fiber material. In an embodiment, a vacuum insulation is

particularly preferred since such insulations have particularly good insulating properties that allow a high insulation effect to be achieved despite a comparatively small depth.

**[0014]** The abutment surfaces between the closure element and the housing of the building service element and/or shaft element are preferably provided at at least one side with a peripheral seal to achieve an air leakage rate that is as low as possible and a housing tightness that is as high as possible with respect to an exchange of air, moisture penetration, etc.

**[0015]** In an embodiment, the housing of the building service element and/or of the shaft element is produced in a frame construction. The closure elements can also be produced in a frame construction or as boards. The frames are composed of wood material supports in a preferred variant of the invention. Closed surfaces of the frame can be formed by boards of wood materials, gypsum fiber boards, sheet metal, or other construction materials.

**[0016]** The housing of the building service element in the shaft region and/or the housing of the shaft element is/are preferably open to the top and bottom or has/have corresponding passages in the floor or ceiling.

**[0017]** The housing is preferably closed at least to the top or bottom, in particular to the top and bottom, in the reception region of the building service element by a ceiling or by a floor. The ceiling and/or floor can be insulated for fire prevention reasons in this respect.

**[0018]** With respect to the housing at which the building service elements or shaft elements are to be used, they are preferably as high as one story.

**[0019]** The rear side of the building service element and/or of the shaft element is open in an embodiment. This results in a maximum utilization of the available space, in particular in the depth direction, that is limited due to the required flat design of the building service element or shaft element. At least one of the elements can have a rear wall in another variant of the invention.

**[0020]** in an embodiment, the building service element and/or the shaft element has/have at least one pair and preferably at least two partis of fastening elements via which the respective element can be fastened in front of the outer wall of the housing. The fastening elements of each pair are respectively preferably arranged at the same height to the left and right of the housing, either at the rear side or preferably to the side of the housing. A pair of fastening elements is here as a rule arranged in the upper region of the respective element; in the case of two or more pairs, a second pair can be arranged in the lower region of the respective element. An arrangement to the side of the housing has the advantage that no construction depth is lost in depth for the fastening in the application. The fastening elements can be downwardly open hook-in contours such as hooks for hanging into corresponding counter contours, for example horizontally extending pins, or metal sheets at the outer building wall.

**[0021]** Provision can in particular be made that the reception region of the building service element for fastening the building service components comprises a shelf system having traverses or bottoms flexibly insertable into the housing at or on which individual building service components can be fastened. The traverses can be fastened to vertical structural elements of the housing at holders such as strips arranged at different heights. In a variant, only one subgroup of these holders is used. This can occur as a consequence of a concept in which a uniform housing is to be equipped in accordance with a modular principle with different traverses for different fixtures of building service components.

**[0022]** The building service element can in particular be selected from one of the three groups of an air heating building service element, a ventilation building service element, and a hot water building service element. These building service elements differ by the components installed therein. Combined air heating building service elements, ventilation building service elements, and/or hot water building service elements can, however, also be used with components of two different groups.

**[0023]** The (preferably small) shaft region of all these building service elements serves to be able to connect the components received in the reception region at all. The shaft elements in contrast do not comprise or include any building service components, but only lines.

**[0024]** It is particularly preferred if the combination of a system in accordance with the invention comprises hot water building service elements and shaft elements. Together with an electric heating reveal such as will be described below and, for example, ventilation systems integrated in window frames of the existing building and having thermal recovery, the total requirements of an apartment can be covered in a minimally invasive manner using such a combination.

**[0025]** In an embodiment, the building service components comprise at least one ventilation system. The ventilation system can comprise ventilators for inlet air and/or outlet air or outside air and/or outgoing air as well as air filters. Sensors such as temperature sensors can furthermore be provided for one or more airflows. The ventilation system can furthermore have a heat exchanger for thermal recovery, preferably a crossflow heat exchanger. Building service elements that have these components, but do not have any elements for an active air heating or for the hot water supply of a housing unit, are called ventilation building service elements in the given context.

**[0026]** The ventilation plant can furthermore comprise a heating register, for example an electric heating register, for heating inlet air or outside air. Building service elements that have these components, but do not have any elements for the hot water supply of a housing unit are called ventilation building service elements in the given context.

**[0027]** A ventilation opening that can be adapted in an embodiment, according to position and size, to associated air conducting elements of the ventilation system

can be arranged in a part of the closure element of the ventilation building service element or air heating building service element disposed in front of the reception region. Sealing elements can be present at the closure element or at the ventilation system that seal an interface between the ventilation opening and the associated air conducting element with a closed door to ensure an effective air conducting and to prevent an unwanted reduction of the insulating effect of the closure element. The ventilation openings can be lined for protection or for air conducting with a ventilation grating or ventilation fins. In this respect, a short-circuit between the outside air and the outgoing air should be avoided.

**[0028]** The ventilation system or outlet air system can be arranged in the upper part or in the middle part of the reception region in an embodiment. It can be equipped with sound absorbers for inlet air and outlet air.

**[0029]** In an embodiment, the building service components can comprise a hot water tank that can have a flat design. The capacity of the hot water tank can be adapted in dependence on the size of the building service element and can amount, for example, to between 100 and 200 liters, in particular between 120 and 160 liters. A water line is preferably located in the shaft region to be able to supply the hot water tank with fresh water. The water tank can extend planar to the rear side of the housing in an embodiment or can also project beyond the rear side in another embodiment (so that it projects into the railing region of the adjacent space in the installed state of the building service element) to achieve more depth and for the tank. The railing of the existing wall can be extended to implement the last-named variant. To heat hot water inside the tank, a heat pump and/or an electrical resistance heating can be provided within the tank. The hot water tank can be arranged in the lower part of the reception region in an embodiment. Building service elements that furthermore have these components, but do not have any elements for an air supply of a housing unit are called hot water building service elements in the given context.

**[0030]** Further components present in the building service element or in the shaft element can be fuses, distributors, and switches for power or data lines, sensors, or measurement devices.

**[0031]** Line sections, channel sections, or cable sections can be preinstalled in the shaft element. It is, however, also possible that lines such as power lines, signal lines, risers, waste water lines are only pulled on site through a vertical shaft which the shaft regions form after a vertical stacking of two or more shaft elements.

**[0032]** The reveal element preferably has three or four side panels that are lined with a heating and that correspond with the four edges, top, bottom, right, and left, of the corresponding and typically rectangular door openings or window openings. Provision can, however, be made in variants of the invention that either not all the four side panels are lined with a heating, that is, for example, not the bottom and/or the top, or that the reveal element only comprises two or three side panels, for example for the side edges and, optionally the bottom or top of the door opening or window opening.

**[0033]** The system can have a building service element and two or more reveal elements in a preferred embodiment. One building service element per housing unit or per building region is typically used in the application of the system in accordance with the invention, with the housing unit or the building region typically having more than one window or having a balcony door or an escape door in addition to the windows. A reveal element is preferably provided for each of these windows and doors in the system in accordance with the invention.

**[0034]** The heating is preferably a heating mat whose heating elements are formed as electrical resistance heatings. Heating pipes flowed through by water are alternatively possible.

**[0035]** Further details and advantages of the invention result from the embodiments described in the following with reference to the Figures. There are shown in the Figures:

- Figure 1: a schematic overview representation of the method of energetic building restoration using a system in accordance with the invention;
- Figure 2: a vertical section through the upper region of a building restored using the method;
- Figure 3: views of a hot water building service element;
- Figure 4: views of a ventilation building service element;
- Figure 5: views of an air heating building service element;
- Figure 6: views of a shaft element;
- Figure 7: sections through a region of a window provided with a reveal element; and
- Figure 8: an image of a heating mat of such a reveal element.

**[0036]** Figure 1 shows a schematic overview representation of a serial building restoration method in which different building face elements 100 of the types 100a, 100b, 100c are arranged in a vertical gradation in front of different strip-like sections of a face of the building 910.

**[0037]** Each building face element 100 extends over one story 901 or 902 of the building 900. Each type of building face elements 100 comprises one or more cutouts 121, 122 for windows or doors whose positions and sizes correspond to window and/or door openings 921, 922 in the face of the building 910 covered by the respec-

tive types 100a, 100b, 100c. The building face elements 100 are each adapted to the building face 901 such that the cutouts 121, 122 are flush with the window and/or door openings 921, 922 in the face of the building 910.

**[0038]** The building services should also be installed as much as possible in the building face region as part of the building restoration method. For this purpose, the system of the invention comprises building service elements 200 and shaft elements 300, not shown in Figure 1, that are fit together or separately into vertically extending gaps that are left free laterally between two adjacent building face elements 100.

**[0039]** Figure 2 shows a vertical section through the upper region of a building 900 restored using the system in accordance with the invention. The building face elements 100 positioned in front of the face of the building 910 and having cutouts 212 corresponding to and flush with window openings 921 can also be recognized in this Figure. Unhung fastening rails 400 for building face elements 100, building service elements 200, and shaft elements 300 can likewise be recognized.

**[0040]** Figure 3 shows views of a building service element 200 of a combination of a system in accordance with the invention that is formed as a hot water building service element. Figure 4 shows views of a building service element 200 of a combination of a system in accordance with the invention that is formed as a ventilation building service element. Figure 5 shows views of a building service element 200 of a combination of a system in accordance with the invention that is formed as an air heating building service element.

**[0041]** Figure 6 shows views of a shaft element 300 of a combination of a system in accordance with the invention.

**[0042]** The building service elements 200 and shaft elements 300, also like the building face elements 100, are positioned in front of a strip-like section of the face of the building 910 and are fastened to unhung fastening rails. The elements 200 and 300 also extend over the height of a story like the building face elements 100.

**[0043]** The building service elements 200 and shaft elements 300 of a system in accordance with the invention can be arranged directly next to one another between the two same building face elements 100 or also in a separate arrangement between different building face elements 100. The selection options between these two variants makes it possible to flexibly take account of the circumstances at the building, in particular the arrangement of the windows or balcony doors with respect to one another. If there is a building section in which the horizontal spacing between two windows is wide enough to accommodate both a building service element 200 and a shaft element 300, they can be arranged next to one another. If there is no such section or if it is in an unfavorable position, the building service elements 200 can be arranged at a suitable position without shaft elements 300 taking up additional space, while the shaft elements are conducted at a spacing therefrom.

**[0044]** A full-area access opening at the front side that can be reversibly closed by doors 230 and 330 respectively is common to the different building service elements 200 of Figures 3-5 and to the shaft element 300 of Figure 6. The removal openings serve to make the building service components or shafts accessible from the outside for installation, servicing, etc.

**[0045]** Starting from the building service elements 200 or the shaft elements 300, lines (differing in dependence on the embodiment of the building service element 200) for individual housing units are guided horizontally into the housing unit through tap holes in the building wall. The lines can then be laid under the ceiling of the respective housing unit. Such a laying of lines for hot and cold water, electricity, signals, or the like, for example, below the ceiling of existing buildings is least disruptive and can be implemented in a simple manner. Waste water lines can always be laid below the ceiling of a housing unit for the housing unit disposed thereabove.

**[0046]** The building service elements 200 each have a flat and rectangular housing that is produced in a wooden frame construction and that comprises a reception region having preinstalled building service components or a shaft region. The depth of the building service element 200 or of the shaft element 300 can, for example, amount to less than 50 cm and preferably less than 35 cm. The rear sides of the elements 200 and 300 respectively are preferably open and are seated directly at the existing wall of the building in the installed state of the building service element 200. This results in a maximum utilization of the available space in the depth direction.

**[0047]** To fasten the elements 200 and 300 in front of the outer wall of the building, the former have pairs of fastening elements, not shown in the Figures, in the form of downwardly open hang-in hooks that are respectively attached at the same height at both sides of the housing. The fastening elements are fastened to the side of the vertical frame elements so that no space for the fastening is lost in the depth direction. The counter contours arranged in front of the outer wall ae located correspondingly to the side of the elements 200 and 300 respectively.

**[0048]** A row of traverses 221 that are held at the housing are located in the reception region of the building service elements 200. The building service components are fastened to these traverses 221. The traverses 221 can be flexibly inserted into the housing and form a shelf system by means of which the available construction space can be used ideally and flexibly for different compositions of building service components.

**[0049]** The building service components are composed individually depending on the type of the building service element 200.

**[0050]** A control unit 241 is arranged directly below the upper frame termination in the hot water building service element 200 of Figure 3. Beside it, the tap holes for the guiding of cables and lines into the building that are led directly below the ceiling and are sealed in an airtight and smoke-tight manner and that are not provided with ref-

erence numerals in the Figures. in the right region of the building service element 200, a shaft region is arranged for power lines, for draining condensate, for control lines, and for hot and cold water lines.

**[0051]** An evaporator 242 and an external air/water heat pump 243 are located beneath the control unit 241. The total lower region of the building service element 200 of Figure 3 is filled by an insulated hot water tank 244. Its capacity can amount to at least > 120 liters in an embodiment to be able to cover all typical apartment sizes in apartment buildings therewith.

**[0052]** Tap holes not provided with reference numerals and that are guided directly below the ceiling are likewise sealed in an airtight and smoke-tight manner in the ventilation building service element 200 of Figure 4. A shaft region is in turn located in the right region of the building service element 200, in this case for power lines, for draining condensation, and for control lines.

**[0053]** Sound absorbers 261 for outlet air and inlet air are located below the tap holes. in the building service element. The central ventilation system 262 is arranged therebelow that is seated in a sound decoupled manner between horizontal traverses 221. The ventilation system 262 comprises an inlet air line and an outlet air line. The connectors 263 of the inlet air lines and the outlet air lines end at the outer side of the building service element 200 at a ventilation opening of the door 230 of the building service element. The connectors 263 are provided with a peripheral rubber seal to prevent an unwanted air exchange next to the lines. The openings, not shown, at the floor are provided with protective grids. An outflow line 264 for condensate is seated at the lower side of the ventilation system 262.

**[0054]** The air heating building service element 200 of Figure 5 initially differs from the ventilation building service element of Figure 4 in that an electrical reheating register 271 is arranged between the ventilation system 262 and the sound absorbers 261 in the inlet air line. The ventilation system 262 itself is equipped with a crossflow heat exchanger to recover heat. A bypass line, not shown in the Figure, to the inlet air line can lead past the crossflow heat exchanger. A heat pump 272 whose evaporator or liquefier heat exchanger 273 is seated between the ventilation system and the openings at the inlet air and outlet air lines is furthermore arranged below the ventilation system in the air heating building service element 200.

**[0055]** The shaft element 300 of Figure 6 does not comprise any of the building service components of the building service elements relating to the ventilation supply or hot water supply. The inner space rather provides sufficient room for all the line strands of a building installation to conduct them from the cellar region to the roof region of the building into individual housing units or to conduct them to and fro between the cellar region and the roof region. Strands potentially conducted in this shaft element 300 comprise lines for power, signals (control, IT) cold water, hot water, waste water, or condensation water.

**[0056]** The free region in the inner space of all the variants of the building service element 200 and of the shaft element 300 can be filled with an insulation material.

**[0057]** Figure 7 shows a window opening 921 in the outer building wall 910 provided with a reveal element 500. The reveal element 500 has the design of a rectangular frame and is composed of four side panels 510 that each line one side of the window opening 921. Insertion takes place from the inner side of the building into the window opening 921. The depth of the side panels 501 is greater than the depth of the outer wall 910 or of the window opening 921 so that the side panels 501 also conceal a gap S between building face elements 100 arranged in front of the outer wall 910 and the outer wall 910 with respect to the window opening 921.

**[0058]** The side panels 501 of the reveal element 500 are lined with a heat mat 502 as shown in Figure 8 at its side remote from the window opening 921, said heat mat 502 having electric heating elements 503 in the form of meandering resistance wires. All four side panels 501 are preferably lined in this manner, as shown in Figure 7; however in other variants of the invention, three or fewer side panels 501 can also be lined with heating elements. These heating elements 503 are connected to a distributor in the building service element 200 for the supply with electrical power. Suitable heating mats, for example, have heating powers of between 200 and 500 $W/m^2$ or can be set at a maximum to temperatures of between 40°C and 60°C.

**[0059]** As also with the building service element 200 and the shaft element 300 of a system in accordance with the invention, the heating reveal element 500 can also be a prefabricated part that forms a system for the temperature control of a housing unit together with the ventilation system 223. In this respect, the reveal elements 500 should in particular cover peak loads, while base loads are preferably mapped by the normally energy efficient ventilation system 223. They can be installed fast and simply, for example, via plug-in or latch connections in the window opening 921.

**[0060]** The heated reveals are additional heatings that are used as support and peak load coverage of the inlet air heating via the ventilation system. Whereas the air heating can preferably cover a base load up to, for example, 18°C inside temperature, the heating reveals can individually supplement the heating requirements using a connection to room-by-room thermostats, for example, in this way, rooms of different heat levels can be made possible, and indeed while making use of a pleasant radiation heat directly at the thermal weak point, the window.

**[0061]** Alternatively, the heated reveal elements can also take over the total heating load.

**[0062]** After arranging the reveal elements 500 in the window openings 921, windows 954 and blinds 955 are inserted therein, as can be seen in Figure 7.

## Claims

1. A system comprising:

   a combination of at least one building service element (200) and at least one building service-free shaft element (300) for an individual and location independent fastening in front of an outer wall (910) of a building (900) and in particular of an existing building;
   wherein the building service element (200) has a housing that comprises at least one reception region having preinstalled building service components and a shaft region, and wherein the building service element (200) has a large-area or full-area access opening that is reversibly closed using a closure element (230) and through which the reception region is accessible;
   wherein the shaft element (300) has a housing that defines a shaft region running from top to bottom, and wherein the shaft region has a large-area or full-area access opening that is reversibly closed using a closure element (330) and through which the shaft region is accessible; **characterized in that** the system further comprises:

      at least one reveal element for insertion into a door opening (922) or window opening (921) in the outer wall (910) of the building (900); and
      wherein the reveal element (500) has side panels (510) that correspond to a respective edge of the door opening (922) or window opening (921) and that are lined with a heating acting over a large area thereat, with the heating (502, 503) being connected to a building service component of the building service element (200) or to a line conducted in the shaft element (300) for the energy supply, the heating preferably being a heating mat (502) whose heating elements (503) are formed as electrical resistance heatings.

2. A system in accordance with claim 1, **characterized in that** the closure elements (230, 330) of the building service element (200) and/or of the shaft element (300) are formed by doors pivotable about perpendicular axes or by flaps pivotable about horizontal axes, or by screwed coverings.

3. A system in accordance with one of the preceding claims, **characterized in that** the closure elements (230, 330) are thermally insulated, in particular have a vacuum insulation; and/or **in that** a seal runs between the closure elements (230, 330) and the housings.

4. A system in accordance with one of the preceding claims **characterized in that** the housing of the building service element (200) in the shaft region and/or the housing of the shaft element (300) is open to the top and to the bottom or has passages in the floor and ceiling respectively.

5. A system in accordance with one of the preceding claims, **characterized in that** the reception region of the building service element (200) is closed to the top and the bottom and the bottom and/or the top of the building service element (200) is/are insulated for fire prevention in the reception region.

6. A system in accordance with one of the preceding claims, **characterized in that** the rear sides of the building service element (200) and/or of the shaft element (300) are open.

7. A system in accordance with one of the preceding claims, **characterized in that** the building service element (200) and/or the shaft element (300) has/have at least one pair of fastening elements arranged to the left and right at the housing, preferably to the side of the housing at the same level, to be able to fasten it in front of the outer wall (910) of the building (900), with the fastening elements preferably being downwardly open hook-in contours.

8. A system in accordance with one of the preceding claims, **characterized in that** the building service element (200) comprises a shelf system having traverses (221) that are flexibly insertable into the housing in its reception region and to which the building service components are fastened, with the traverses (221) being fastened to the vertical structural elements of the housing of the building service element (200).

9. A system in accordance with one of the preceding claims, **characterized in that** the building service components comprise a hot water tank (244).

## Patentansprüche

1. Ein System umfassend:

   eine Kombination aus wenigstens einem Haustechnikelement (200) und wenigstens einem haustechnikfreien Schachtelement (300) zur individuellen und ortsunabhängigen Befestigung vor einer Außenwand (910) eines Gebäudes (900) und insbesondere eines Bestandsgebäudes;
   wobei das Haustechnikelement (200) ein Ge-

häuse aufweist, das mindestens einen Aufnahmebereich mit vormontierten Haustechnikkomponenten sowie einen Schachtbereich umfasst, und wobei das Haustechnikelement (200) an der Vorderseite eine großflächige oder vollflächige, anhand eines Verschlusselements (230) reversibel verschlossene Zugangsöffnung aufweist, durch die der Aufnahmebereich zugänglich ist;
wobei das Schachtelement (300) ein Gehäuse aufweist, das einen von oben bis unten durchlaufenden Schachtbereich definiert, und wobei das Schachtelement an der Vorderseite eine großflächige oder vollflächige, anhand eines Verschlusselements (330) reversibel verschlossene Zugangsöffnung aufweist, durch die der Schachtbereich zugänglich ist; und
**dadurch gekennzeichnet, dass** das System ferner umfasst:

wenigstens ein Laibungselement zum Einsetzen in eine Tür- (922) oder Fensteröffnung (921) in der Außenwand des Gebäudes (900); und
wobei das Laibungselement (500) zu je einer Kante der Tür- (922) oder Fensteröffnung (921) korrespondierende Seitentafeln (510) aufweist, die mit einer großflächig daran wirkenden Heizung hinterkleidet sind, wobei die Heizung (502, 503) zur Energieversorgung mit einer Haustechnikkomponente des Haustechnikelements (200) oder einer in dem Schachtelement (300) geführten Leitung verbunden ist, wobei es sich bei der Heizung vorzugsweise um eine Heizmatte (502) handelt, deren Heizelemente (503) als elektrische Widerstandsheizungen ausgebildet sind.

**2.** System nach Anspruch 1, **dadurch gekennzeichnet, dass** die Verschlusselemente (230, 330) des Haustechnik- (200) und/oder des Schachtelements (300) durch um senkrechte Achsen schwenkbare Türen oder um waagrechte Achsen schwenkbare Klappen oder um verschraubte Verkleidungen gebildet werden.

**3.** System nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Verschlusselemente (230, 330) wärmegedämmt sind, insbesondere eine Vakuumdämmung aufweisen; und/oder dass zwischen den Verschlusselementen (230, 330) und den Gehäusen eine Dichtung verläuft.

**4.** System nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Gehäuse des Haustechnikelements (200) im Schachtbereich und/oder das Gehäuse des Schachtelements (300) nach oben und unten offen ist oder Durchgänge im Boden bzw. der Decke aufweist.

**5.** System nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Aufnahmebereich des Haustechnikelements (200) nach oben und unten geschlossen ist und der Boden und/oder die Decke des Haustechnikelements (200) im Aufnahmebereich brandschutzisoliert sind.

**6.** System nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Rückseiten des Haustechnikelements (200) und/oder des Schachtelements (300) offen sind.

**7.** System nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Haustechnikelement (200) und/oder das Schachtelement (300) wenigstens ein Paar an links und rechts am Gehäuse, vorzugsweise seitlich des Gehäuses auf gleicher Höhe angeordneten Befestigungselementen aufweisen, um es vor der Außenwand (910) des Gebäudes (900) befestigen zu können, wobei es sich bei den Befestigungselementen vorzugsweise um nach unten offene Einhängekonturen handelt.

**8.** System nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Haustechnikelement (200) in seinem Aufnahmebereich ein Regalsystem mit flexibel in das Gehäuse einsetzbaren Traversen (221) umfasst, an denen die Haustechnikkomponenten befestigt sind, wobei die Traversen (221) an den vertikalen Strukturelementen des Gehäuses des Haustechnikelements (200) befestigt sind.

**9.** System nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Haustechnikkomponenten einen Warmwasserspeicher (244) umfassen.

**Revendications**

**1.** Système comprenant :

une combinaison d'au moins un élément (200) de service de bâtiment et d'au moins un élément cage (300) sans services de bâtiment, destinés à une fixation individuelle, et indépendante de l'emplacement, devant un mur externe (910) d'un bâtiment (900) et en particulier d'un bâtiment existant ;
dans lequel l'élément (200) de service de bâtiment comporte une enveloppe comprenant au moins une région de réception comportant des composants préinstallés de service de bâtiment,

et une région de cage, et dans lequel l'élément (200) de service de bâtiment comporte une ouverture d'accès à grande surface ou à surface entière, laquelle est fermée de manière réversible à l'aide d'un élément de fermeture (230) et à travers laquelle la région de réception est accessible ;
dans lequel l'élément cage (300) comporte une enveloppe définissant une région de cage allant de haut en bas, et dans lequel la région de cage comporte une ouverture d'accès à grande surface ou à surface entière, laquelle est fermée de manière réversible à l'aide d'un élément de fermeture (330) et à travers laquelle la région de cage est accessible ;

**caractérisé en ce que** le système comprend en outre :

au moins un élément tableau de baie permettant l'insertion dans une ouverture de porte (922) ou une ouverture de fenêtre (921) dans le mur externe (910) du bâtiment (900) ; et
dans lequel l'élément tableau de baie (500) comporte des panneaux latéraux (510) qui correspondent à un bord respectif de l'ouverture de porte (922) ou de l'ouverture de fenêtre (921) et qui sont revêtus d'un chauffage agissant sur une grande surface associée, le chauffage (502, 503) étant relié à un composant de service de bâtiment de l'élément (200) de service de bâtiment ou à une conduite acheminée dans l'élément cage (300) permettant l'alimentation en énergie, le chauffage étant de préférence une nappe chauffante (502) dont les éléments de chauffage (503) prennent la forme de chauffages par résistance électrique.

2. Un système selon la revendication 1, **caractérisé en ce que** les éléments de fermeture (230, 330) de l'élément (200) de service de bâtiment et/ou de l'élément cage (300) sont formés par des portes pouvant pivoter autour d'axes perpendiculaires ou par des volets pouvant pivoter autour d'axes horizontaux, ou par des éléments de couverture vissés.

3. Un système selon l'une des revendications précédentes, **caractérisé en ce que** les éléments de fermeture (230, 330) sont isolés thermiquement, comportant en particulier une isolation sous vide ; et/ou **en ce qu'**un joint d'étanchéité est situé entre les éléments de fermeture (230, 330) et les enveloppes.

4. Un système selon l'une des revendications précédentes, **caractérisé en ce que** l'enveloppe de l'élément (200) de service de bâtiment dans la région de cage, et/ou l'enveloppe de l'élément cage (300), sont ouvertes vers le haut et vers le bas ou comportent des passages dans le plancher et le plafond respectivement.

5. Un système selon l'une des revendications précédentes, **caractérisé en ce que** la région de réception de l'élément (200) de service de bâtiment est fermée vers le haut et vers le bas, et le bas et/ou le haut de l'élément (200) de service de bâtiment sont isolés afin de permettre la prévention contre les incendies dans la région de réception.

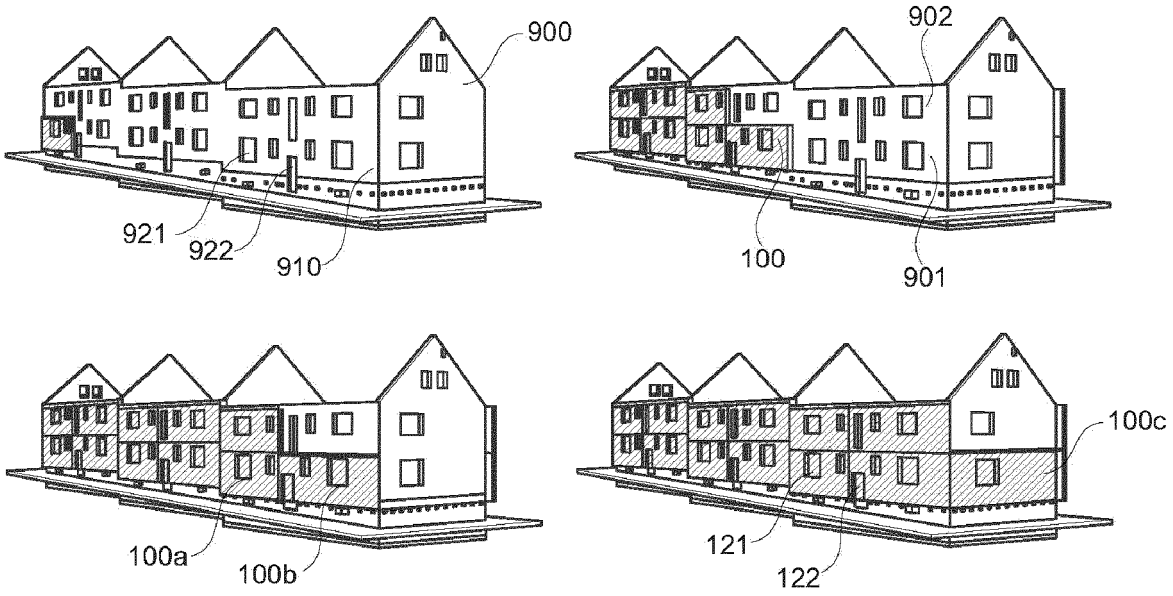
6. Un système selon l'une des revendications précédentes, **caractérisé en ce que** les côtés arrière de l'élément (200) de service de bâtiment et/ou de l'élément cage (300) sont ouverts.

7. Un système selon l'une des revendications précédentes, **caractérisé en ce que** l'élément (200) de service de bâtiment et/ou l'élément cage (300) comportent au moins une paire d'éléments de fixation agencés vers la gauche et vers la droite au niveau de l'enveloppe, de préférence vers le côté de l'enveloppe au même niveau, afin de pouvoir les fixer devant le mur externe (910) du bâtiment (900), les éléments de fixation étant de préférence des contours à accrocher ouverts vers le bas.

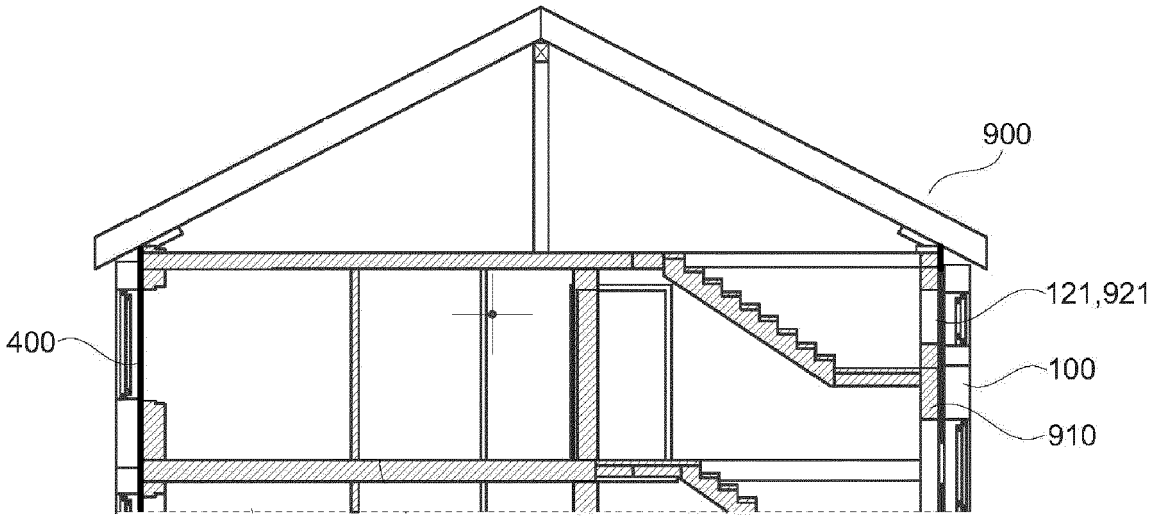
8. Un système selon l'une des revendications précédentes, **caractérisé en ce que** l'élément (200) de service de bâtiment comprend un système d'étagère comportant des traverses (221) pouvant être introduites de manière flexible dans l'enveloppe dans sa région de réception et auxquelles les composants de service de bâtiment sont fixés, les traverses (221) étant fixées aux éléments structurels verticaux de l'enveloppe de l'élément (200) de service de bâtiment.

9. Un système selon l'une des revendications précédentes, **caractérisé en ce que** les composants de service de bâtiment comprennent un réservoir d'eau chaude (244).

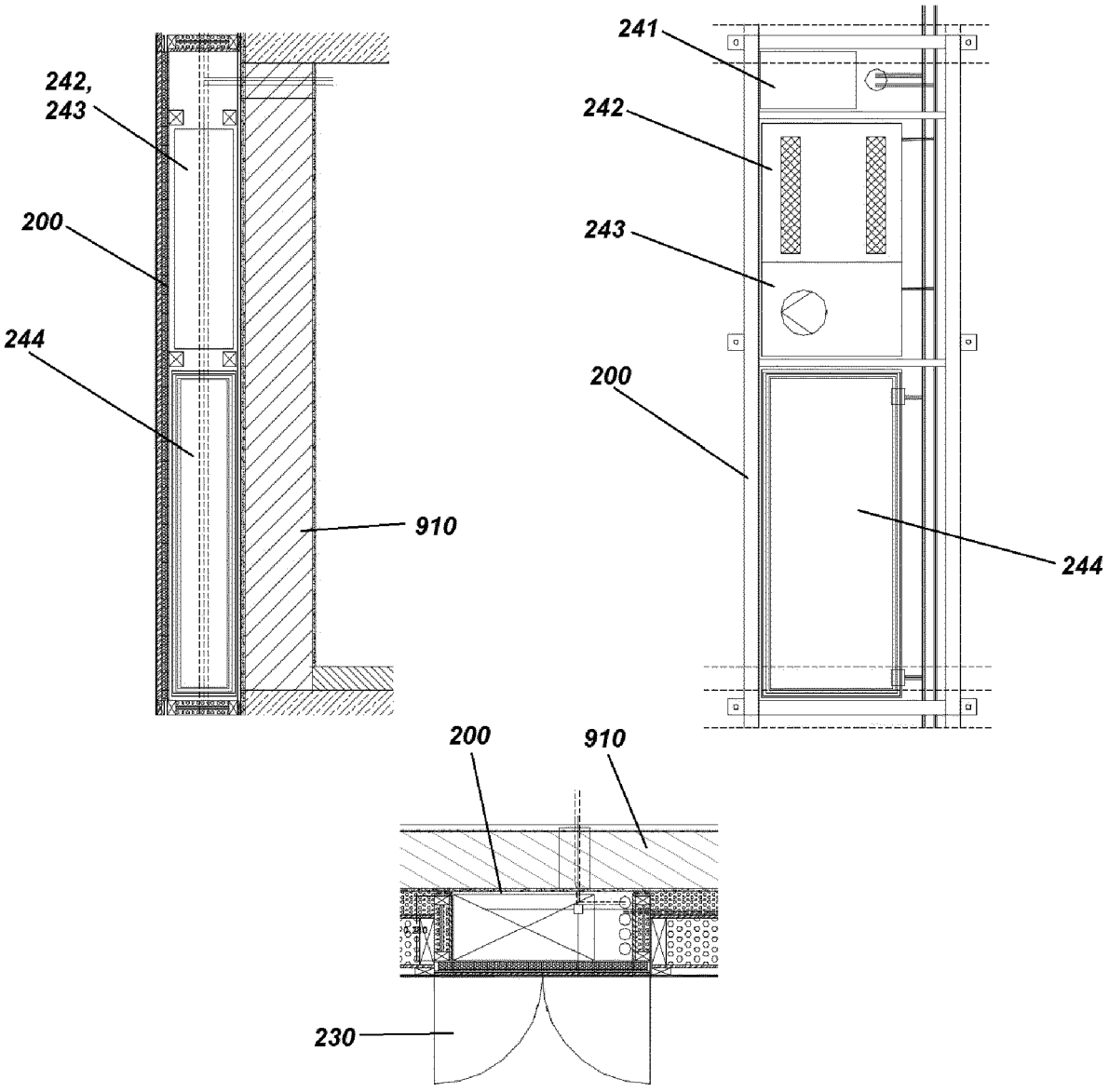
Figur 1



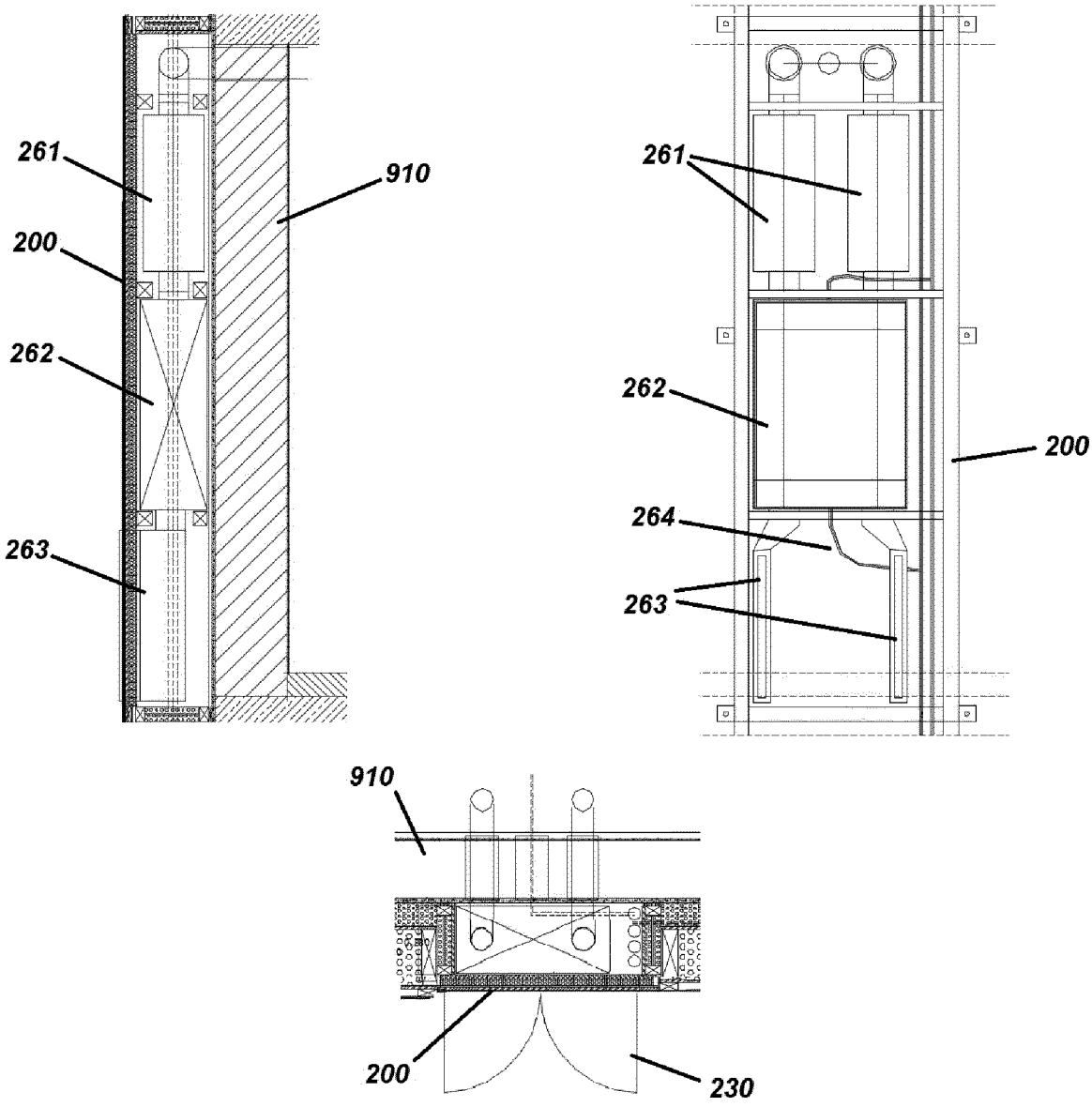

Figur 2



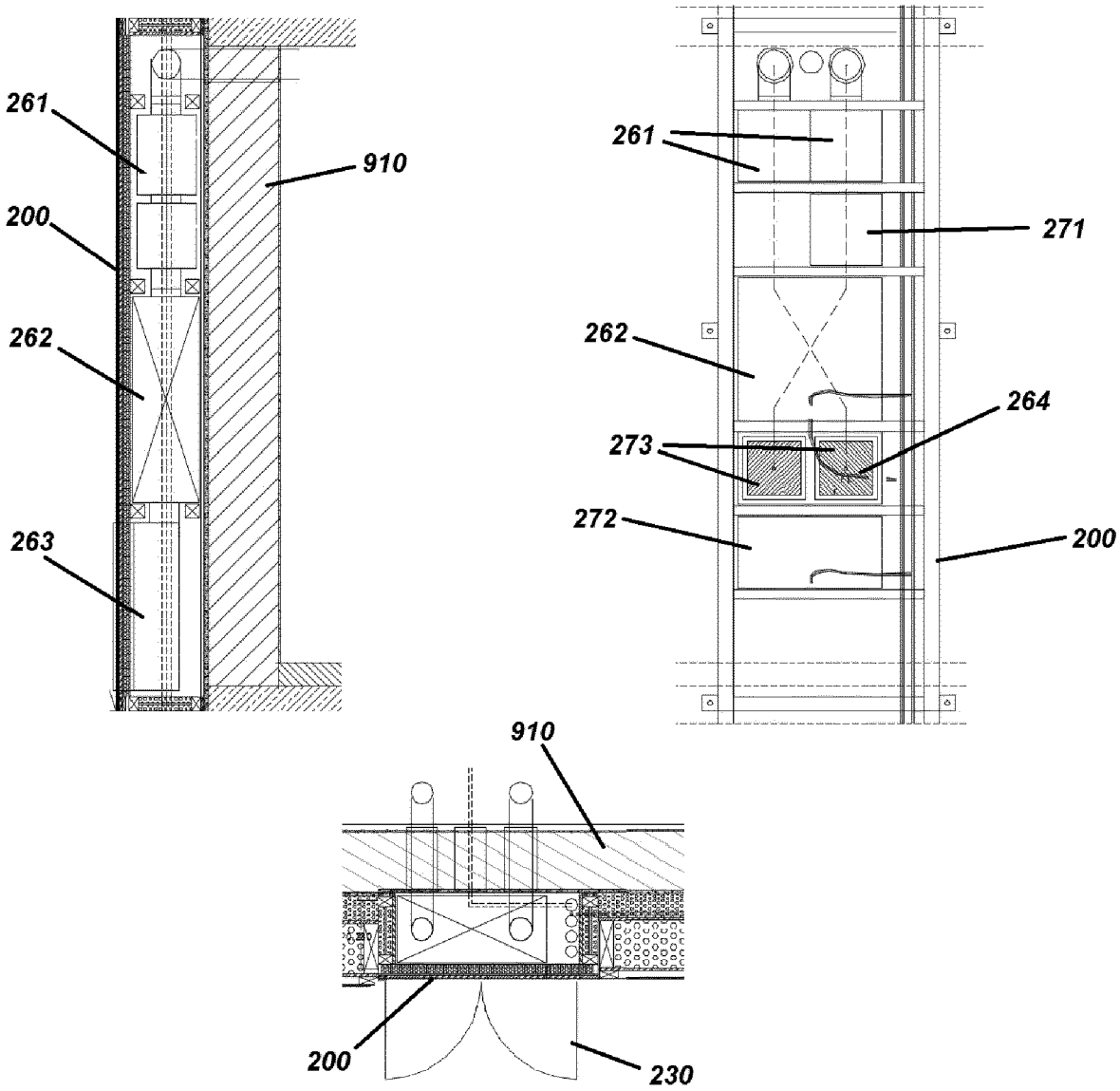
Figur 3



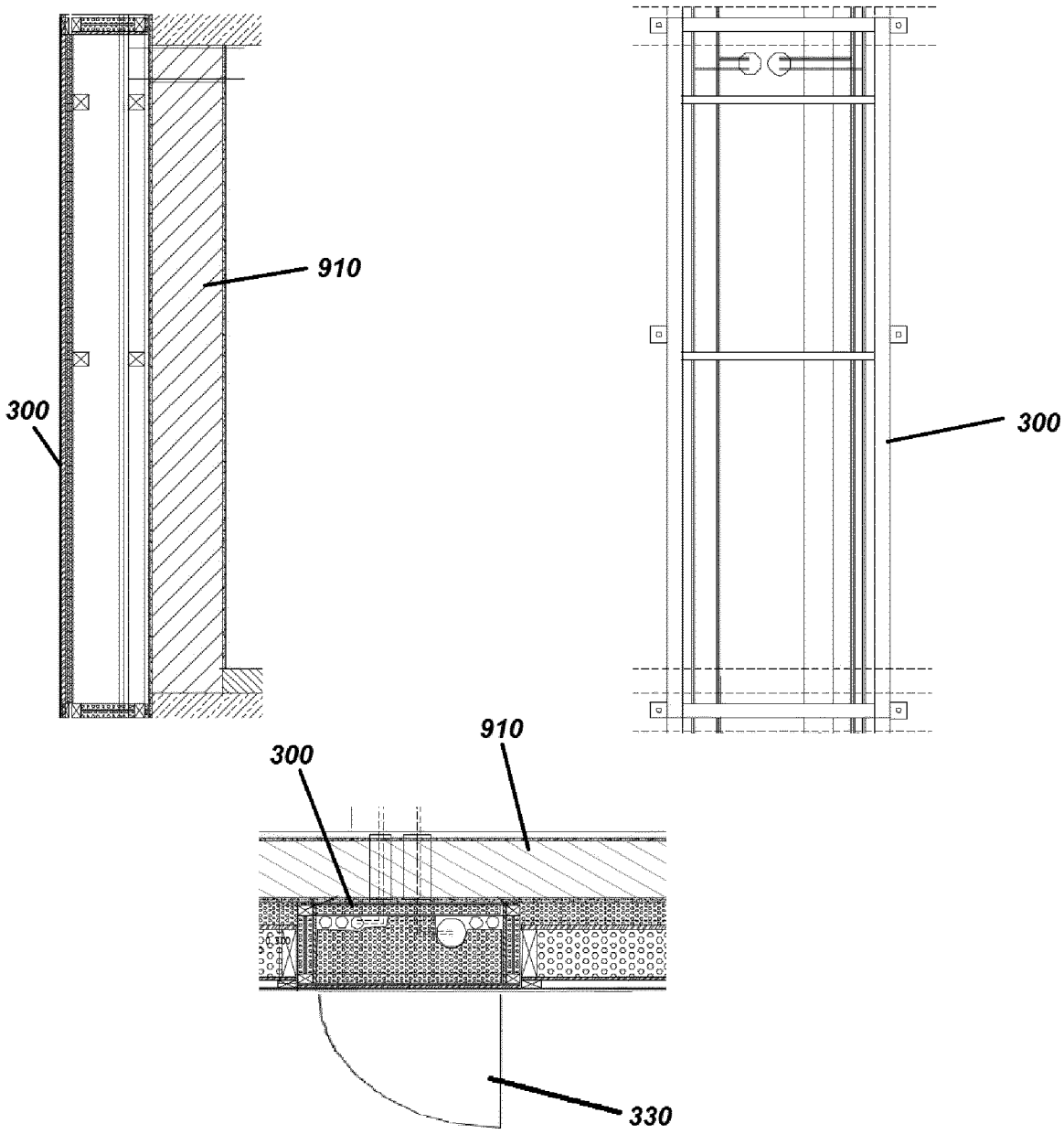
Figur 4



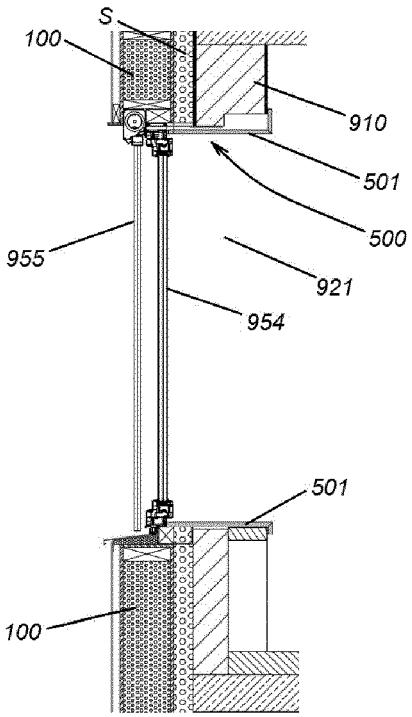
Figur 5

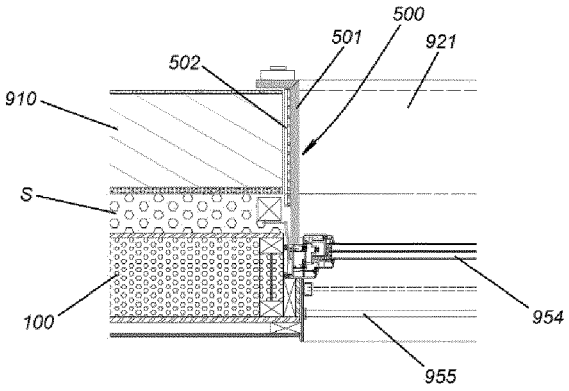


Figur 6

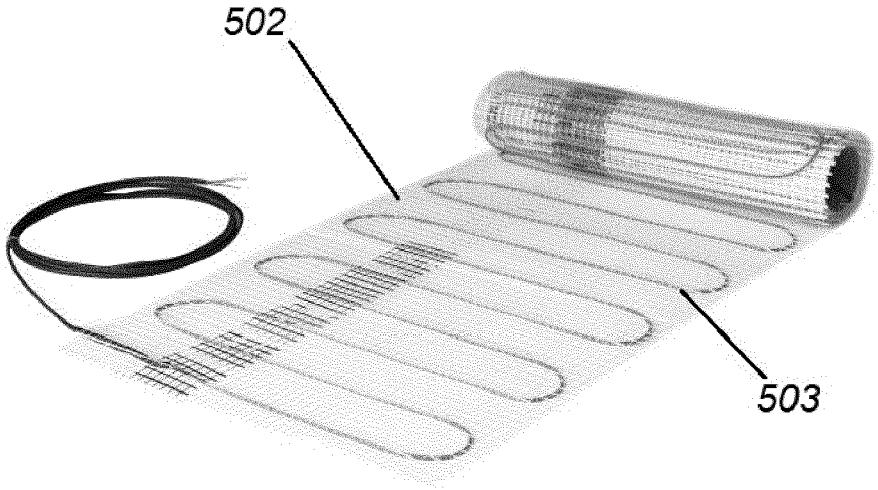


Figur 7




Figur 8



## REFERENCES CITED IN THE DESCRIPTION

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