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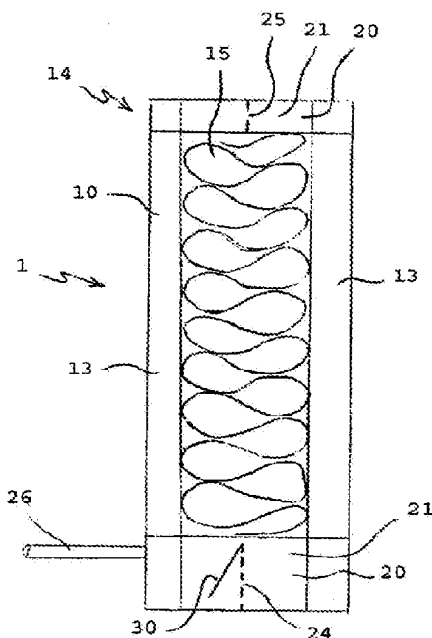
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Device having adjustable heat-insulating properties.

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A device (1) has adjustable heat-insulating properties on the basis of the fact that the device (1) may be put in at least two different conditions, wherein in one of the conditions, a heat-insulating quantity of still fluid is present in the device (1), and wherein in another of the conditions, the quantity of still fluid is absent.

In a specific embodiment, the device (1) comprises a heat-insulating core (15) and an assembly (14) of channels (13, 21) surrounding the core (15), wherein a passage (24) in the channels (13, 21), which is positioned between portions of the channels (13, 21) extending at opposite sides of the device (1), may be blocked or left open, depending on the desired functioning of the device (1). Furthermore, fluid may be supplied to the channels (13, 21), or there may be no fluid supply, or even a removal of fluid.



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Dit octrooi is verleend ongeacht het bijgevoegde resultaat van het onderzoek naar de stand van de techniek en schriftelijke opinie. Het octrooischrift wijkt af van de oorspronkelijk ingediende stukken. Alle ingediende stukken kunnen bij NL Octrooiencentrum worden ingezien.

Title: Device having adjustable heat-insulating properties

The present invention relates to a device that is adapted to be put in different conditions, and that is adapted to at least have a heat-insulating function in one of the possible conditions.

In many inhabited areas of the world, relatively cold periods
5 may occur, during which buildings are heated in order to realize a temperature inside the buildings that is higher than the outside temperature, so that the buildings are comfortable for people to stay in. In those areas, it is common practice to provide the buildings with heat-insulating devices. For example, sheets of glass
10 wool may be used for covering the inside of an outside wall or the roof of a building, which has the effect that during cold periods, a loss of heat from the building is less than a loss that would occur when the insulation would not be present. In general, the functioning of many heat-insulating devices is based on the use of
15 still air as a heat-insulator, in view of the fact that a transfer process of heat through still air takes place at a much lower rate than a transfer process of heat through materials which are commonly used in walls and roofs.

A disadvantage of the use of heat-insulating devices is that
20 when a relatively warm period occurs, the functioning of the heat-insulating devices opposes a desired process of realizing that heat is retained inside buildings to an as low as possible extent. It is not a practical option to remove the heat-insulating devices during relatively warm periods, and to put the heat-insulating devices back
25 in place again during relatively cold periods. Therefore, it is an objective of the present invention to provide a new type of heat-insulating device, in particular a heat-insulating device having adjustable heat-insulating properties, so that the extent to which the heat-insulating device fulfills its heat-insulating function can
30 be adjusted such as to meet varying requirements.

The objective of the present invention is reached by providing a device that is adapted to be put in different conditions, and that is adapted to at least have a heat-insulating function in one of the possible conditions, comprising:

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- a plurality of insulating units which are each containing hollow space, which hollow space is suitable to containing a fluid such as air or water, and which are each having portions which are located at opposite sides of the device;

5 - a core having heat insulating properties, which is positioned between the portions of the insulating units which are located at opposite sides of the device; and

- closing means which are adapted to be put in different conditions, and which are adapted to close a passage between the portions of the
10 insulating units which are located at opposite sides of the device, in one of the possible conditions, and to leave the said passage open in another of the possible conditions.

In the device according to the present invention, a plurality of insulating units is arranged, wherein each of the units has
15 portions which are located at opposite sides of the device, and wherein a heat-insulating core is positioned between these portions. Furthermore, the device comprises closing means for blocking or leaving open a passage between the portions of the insulating units. In the condition for blocking the passage, a flow of fluid from one
20 portion of the insulating units to another, i.e. from one side of the device to the opposite side, is hindered. When it is desired to have such a flow of fluid in the device, all that needs to be done is putting the closing means in the condition for leaving the passage open.

25 When the device according to the present invention is applied, it is possible to realize a condition of the device in which an optimal heat-insulating function of the device is realized by keeping the insulating units in a condition in which it is not possible for fluid to flow from one side of the device to another,
30 so that heat transfer on the basis of such a flow from the one side of the device to the other cannot take place. In this heat-insulating condition, it is possible to have still fluid inside the insulating units and/or to have as less as possible fluid inside the insulating units. In respect of the latter option, it is noted that
35 when the fluid is a gas such as air, an underpressure may be created by sucking the gas from the insulating units, so that there are less molecules which may contribute to a heat transfer process.

An important advantage of application of the device according to the present invention resides in the fact that the heat-
40 insulating function of the device may be cancelled. This is due to

the fact that the closing means of the device may be put in such a condition that a flow of fluid is actually possible from one side of the device to another. When such a flow is realized, a process of heat transfer from the one side of the device to the other takes place at a relatively fast rate. In such a case, a situation in which the insulating device is absent is approximated. In fact, in the device according to the present invention, a kind of short circuit effect can be created between those portions of the insulating units that are arranged at opposite sides of the device when it is not desired for the device to have a heat-insulating function.

It follows from the foregoing description of the device according to the present invention that the device is very well suitable to be applied in situations in which it may sometimes be desirable to have a heat-insulating function of the device, like a conventional, non-adjustable heat-insulating device, and in which it may sometimes be desirable not to have a heat-insulating function of the device, but to have an opportunity for fluid to freely pass from one side of the device to another. Hence, when the device according to the invention is applied, situations in which heat is retained in buildings where it is desired to remove the heat are avoided, while it is just as well possible to avoid heat loss from the building if so desired. In essence, all that is needed to switch functions of the device according to the invention is to change the condition of the closing means of the device.

All in all, the device according to the present invention may be used in various situations, including the following:

- when a temperature outside a building is relatively low and the building is heated, for keeping the heat inside the building as much as possible and thereby saving energy costs;
- when a temperature outside a building is relatively high and it is desired to keep the inside of the building as cool as possible;
- when a temperature outside a building is relatively high and the building is cooled by applying air conditioning, for example, for preventing the inside of the building from heating up under the influence of outside conditions as much as possible and thereby saving energy costs;
- when a temperature inside a building has become relatively high during daytime and it is desired to cool the inside of the building under the influence of cool night air; and

- when a temperature outside a building more or less corresponds to an average, comfortable ambient temperature for people, and the inside of the building is (still) chilly.

In a practical embodiment, the plurality of insulating units is formed like an assembly of channels, wherein the closing means which are adapted to be put in different conditions are adapted to constitute a blockage in the channels of the assembly of channels in one of the possible conditions, and to leave the channels of the assembly of channels open in another of the possible conditions.

In a device having the assembly of channels as mentioned in the foregoing, the channels provide for hollow space all the way from one side of the device to another, wherein the channels may be arranged such as to surround the heat-insulating core. In such arrangement, one length of the channels is extending at one side of the core, and another length of the channels is extending at another side of the core, wherein these sides of the core are associated with opposite sides of the device.

In one condition of the device, the channels are blocked by the closing means, and it is not possible to have a flow of fluid in the channels. As a result, the heat-insulating function of the heat-insulating core is supported. However, in another condition of the device, the channels are left open, so that it is possible to have a flow of fluid through the channels, circulating from one side of the device to another. If such a flow actually takes place, the heat-insulating core is by-passed, so that a transfer of heat from a side of the device where a higher temperature is prevailing to a side where a lower temperature is prevailing can be realized as if the device according to the invention and its heat-insulating core are not present.

In a very practical embodiment of the device according to the present invention, the heat-insulating core is incorporated in a panel, which further comprises lengths of the channels of the assembly of channels, wherein said lengths are arranged at opposite sides of the panel. Furthermore, besides the panel, two closing pieces are provided, which serve for interconnecting the channels which are located at the two opposite sides of the panel, at both ends of the channels. When the panel and the two closing pieces are in the assembled condition, a plurality of closed channels is obtained, wherein the channels are surrounding the heat-insulating

core of the panel. The number of channels may be chosen freely within the scope of the present invention.

In a commercial application of the present invention, the panel and the closing pieces may come in standard sizes, wherein any
5 desired size and a related number of channels may easily be obtained by sawing off portions of the panel and the closing pieces. Also, it is possible to arrange more than one panel between two closing pieces, wherein the panels are simply positioned one after another, and the channels of the panels are interconnected.

10 The closing pieces may be provided with connecting channels of which one end is suitable to be connected to channels which are located at one side of the panel, and of which another end is suitable to be connected to channels which are located at another side of the panel. The connecting channels of the closing pieces may
15 be provided as closed conduits extending through the closing pieces, but it is also possible that the connecting channels are realized on the basis of suitable grooves in a surface of the closing pieces that is intended for facing a panel. In principle, it is even possible that the connecting channels are not formed as separate
20 channels, but that at least one recess acting as a number of combined channels is provided in the closing pieces. In any case, the connecting channels may be interconnected.

In any case, when the connecting channels as mentioned are present in the closing pieces, it may be so that the closing means
25 are arranged in each of a continuous entirety of channels of the panel and the connecting channels of the closing pieces connected thereto, which closing means are adapted to be put in different conditions, and which are adapted to constitute a blockage in the entirety of channels and connecting channels in one of the possible
30 conditions, and to leave the said entirety open in another of the possible conditions. Furthermore, the closing means may be located in one of the closing pieces, in each of the connecting channels of that closing piece.

Advantageously, the device according to the present invention
35 comprises means for realizing a forced displacement of a fluid in the assembly of channels when the closing means are in the condition for leaving open the channels of the assembly of channels. The functioning of the device according to the present invention can be most effective when the channels are relatively narrow, as in that
40 case, natural circulation of a fluid that is present inside the

channels may be prevented as much as possible; so that a heat-insulating function of the device may be optimal in case this function is needed. To this end, it is also possible to have a restricted opening at a defined position in the connecting channels of the closing piece other than the closing piece in which the closing means are present, for example. In any case, by using means such as a pump or a ventilator for realizing a forced displacement of a fluid, heat transfer from one side of the device to another when the channels are open may be considerably enhanced, wherein it is ensured that the by-pass of the heat-insulating core of the device is functional.

Preferably, material of the structure of the device according to the present invention, such as the material of channel walls, is chosen such as to be a material having poor qualities when it comes to heat transfer. Otherwise, any desired heat insulating function of the device might get deteriorated to an unacceptable extent. A suitable material in this respect is a plastic material. An example of a suitable material is 25% glass reinforced polyamid. The heat-insulating core may be made of any suitable, known heat-insulating material such as glass wool.

The device according to the present invention may be provided with a plurality of channels extending through the core, which are connected to the assembly of channels which is arranged around the heat-insulating core, at both ends. The additional channels may be formed as gaps between two plates, for example, wherein these channels may be used for creating an underpressure in the device. Furthermore, in general, the device according to the present invention may be equipped with means having sound-insulating properties.

The closing means of the device according to the present invention may comprise a controllable valve construction, for example, but other embodiments of the closing means are feasible as well. In any case, the closing means may be adapted such as to be operated manually, or to be operated both manually or automatically, depending on a choice of a user of the device according to the present invention, or to be operated only automatically. In view of the possibility of realizing automatic control of the closing means, it may be advantageous to have means for detecting a temperature at least at one side of the device, particularly a side that is intended to be at an outside of a building in which the device is

applied. An additional advantage of having such means is that in a dangerous situation in which a fire starts somewhere in the building, the fire may be detected at an early stage, so that a fire alarm may be timely activated.

5 In general, in a device in which the closing means can be operated automatically on the basis of appropriate input such as a value of the outside temperature, controlling the condition of the closing means may be carried out by any suitable means such as a microcontroller.

10 A number of advantageous aspects of the device according to the present invention, and advantageous possibilities for application of the device, which have not been explicitly mentioned in the foregoing, are listed below.

- The device may easily be arranged in or on any building
- 15 construction. For example, the device may be arranged between a supporting outer wall of a building and a cladding structure.
- The device may be connected to any climate control system of a building, for example, to a heating system or a heat recovery system.
- 20 - A construction in which the device is incorporated may be provided with a foil or the like for blocking or deflecting radiation.
- A construction in which the device is incorporated may be provided with a foil or the like for preventing fungous growth.
- The device may be used for buffering heat and/or energy.
- 25 - The device may be arranged such as to play a role in equalizing air pressure differences in tall buildings.
- The manufacturing process of the device, in particular the manufacturing process of the panel having a plurality of channels on two opposite sides, may very well be carried out by bringing various
- 30 layers together, for example. Furthermore, the manufacturing process does not need to involve the production of much waste, and the device can be made such as to be recyclable.
- When the condition of the device is controlled automatically, the control system may be coupled to a system for detecting CO₂ at the
- 35 inside.

The present invention further relates to a device that is adapted to be put in different conditions, and that is adapted to at least have a heat-insulating function in one of the possible

40 conditions, comprising:

- a plurality of insulating units, which are each containing hollow space, and which are extending from one side of the device to the opposite side of the device, and
- closing means which are adapted to be put in different conditions, which are arranged at the insulating units, at one side of the device, and which are adapted to keep the insulation units closed in one of the possible conditions, and to open the insulating units in another of the possible conditions.

In the device having the plurality of insulating units as mentioned, a heat-insulating function of the device can simply be obtained by keeping the insulating units in a closed condition, as in that condition, the units are filled with still air, which is a very good insulator. When a heat-insulating function of the device is no longer required, the insulating units are opened. Preferably, the device according to the invention is applied in such a way that a side of the device where the insulating units can be opened is at the outside (of a building). When the insulating units are opened, the units are filled with outside air, and there is no longer an intermediate quantity of still air in the device, so that the heat-insulating effect of the presence of the device is lost.

The closing means of the device may be controlled in an automatic manner. In such a case, the device is equipped with any suitable means such as a microcontroller for determining the condition of the closing means. The closing means may comprise a suitable flap construction, for example.

The present invention will now be explained on the basis of the following description of embodiments of the device according to the invention with reference to the drawing, in which equal reference signs indicate equal or similar components, and in which:

figure 1 shows a perspective view of a portion of a panel which is part of a preferred embodiment of a first device according to the present invention;

figure 2 diagrammatically shows a sectional view of the panel shown in figure 1 and closing pieces arranged at ends of the panel;

figure 3 shows a perspective view of the panel and the closing pieces;

figures 4 and 5 show details of figure 3;

figures 6-9 diagrammatically show perspective views of portions of the closing pieces;

figure 10 diagrammatically shows an alternative of the sectional view of the panel shown in figure 1; and figures 11 and 12 diagrammatically show two different sectional views of an embodiment of a second device according to the present invention.

Figure 1 shows a portion of a panel 10 which is part of a preferred embodiment of a first device 1 according to the present invention, which is a device having adjustable heat-insulating properties. In the shown example, the panel 10 has a rectangular shape, and a certain thickness. At two main sides of the panel 10, a hollow structure 11 is present, in which a plurality of partitions 12 is located, so that a plurality of channels 13 is formed.

The panel 10 is intended to be used in combination with two closing pieces 20, as is illustrated in figures 2-5. An example of the closing pieces 20 is illustrated in more detail in figures 6-9, wherein portions of closing pieces 20 are shown. An important function of the closing pieces 20 is interconnecting the channels 13 from the two main sides of the panel 10, in such a way that a continuous entirety 14 is formed, which is a channel surrounding a central portion 15 of the panel 10. To this end, the closing pieces 20 may comprise a plurality of connecting channels 21, wherein one end of the connecting channels 21 is suitable to be connected to an end of channels 13 extending at one main side of the panel 10, and wherein another end of the connecting channels 21 is suitable to be connected to an end of channels 13 extending at the opposite main side of the panel 10. This option is illustrated in figures 6-9, wherein figure 8 illustrates an interior construction of one of the closing pieces 20 by means of dashed lines. Figure 9 serves to illustrate that the connecting channels 21 may be interconnected through holes 22 in partitions 23 which are present between the connecting channels 21.

The central portion 15 of the panel 10 has heat-insulating properties, and may comprise a block of any suitable heat-insulating material.

In one of the closing pieces 20, means 30 are arranged for closing a passage 24 that is present in the connecting channels 21. In figure 2, the passage 24 is diagrammatically indicated as a dashed line. Furthermore, the closing means 30 are diagrammatically indicated as a continuous line which represents a valve for closing

the passage 24. In another of the closing pieces 20, a restriction 25 is present in the connecting channels 21.

For the purpose of supplying a fluid such as air or water to the entirety 14 of channels 13 and connecting channels 21, a tube 26 or the like is provided, which is arranged such as to provide access to the said entirety 14, and which is suitable to be coupled to a system for supplying a fluid. Preferably, such a system is adapted to pump the fluid towards the channel entirety 14, so that it is possible to have a forced flow of fluid through the channel entirety 14, assuming that the closing means are in a condition for leaving the passage 24 in the connecting channels 21 open. A portion of a closing piece 20 having the tube 26 or the like as mentioned is shown in figure 6.

In case the fluid is air, it may be useful to have a ventilator (not shown) that is arranged at a suitable place in the channel entirety 14, which may be in the connecting channels 21 in the closing piece 20 where the passage 24 and the means 30 for closing the passage 24 are located.

The device 1 according to the present invention can be used in at least two conditions. In a first condition, which is a heat-insulating condition, the closing means 30 are kept in a position for closing the passage 24 in the connecting channels 21, and there is no supply of fresh fluid, so that it is ensured that the fluid that is present inside the channel entirety 14 is in a still condition. In this condition of the device 1, the heat-insulating effect of the central portion 15 of the panel 10 is supported, wherein direct contact between the channels 13 at one main side of the panel 10 and the channels 13 at the opposite main side of the panel 10 is hindered. A diameter of the channel entirety 14 and the restriction 25 may be small enough for preventing a natural flow of fluid under the influence of temperature. Hence, the channel entirety 14 has a heat-insulating function in the condition of the device 1 in which the closing means 30 are in a position for closing the passage 24 in the connecting channels 21, and in which there is no supply of fresh fluid under pressure.

When it is desired to cancel the heat-insulating function of the device 1, the closing means 30 are put to a position for leaving the passage 24 in the connecting channels 21 open, and the supply of fluid is initiated. In that condition, the fluid is forced to circulate around the heat-insulating central portion 15 of the panel

10, through the channel entirety 14. On the basis of the direct contact between channels 13 at opposite main sides of the panel 10, the heat-insulating central portion 15 of the panel 10 is by-passed, and the heat-insulating function of the device 1 is cancelled.

5 For example, when the outside temperature is higher than the inside temperature, a heating effect of the device 1 on the inside may be obtained instead of a heat-insulating effect due to the continuous displacement of fluid through the channel entirety 14. When it is desired to keep the heat out as much as possible, the device 1 may be operated such as to be in the condition as described in the foregoing, i.e. the condition in which there is practically no interaction between fluid that is present in the channels 13 on one main side of the panel 10 and fluid that is present in the channels 13 on the other main side of the panel 10. Another option is supplying a cold fluid to the channel entirety 14. In general, an important advantage of the device 1 according to the present invention is that it is possible to have a flow of fluid around a heat-insulating core 15, wherein the fluid may be supplied to the device 1 at any appropriate temperature.

20 For sake of completeness, it is noted that a heat-insulating function of the device 1 according to the present invention may be enhanced by sucking fluid from the channel entirety 14, such that an underpressure is obtained.

The central portion 15 of the panel 10 may comprise a single block of heat-insulating material, but it is also possible that more blocks 16, 17 of heat-insulating material are arranged in the panel 10, wherein these blocks 16, 17 are separated by channels 18. An example of a panel 10 having two blocks 16, 17 and channels 18 arranged between the blocks 16, 17 is illustrated in figure 10. In the shown example, the channels 18 are formed between two plates which are connected through suitable elements 19 such as dots of putty or pieces of double-sided adhesive tape. It is noted that when the panel 10 as shown is put in a heat-insulating condition, and fluid is sucked from the channels 13, 18 of the panel 10 in the process, it is possible to have separate systems for controlling the underpressure in each of the channels 13, 18.

It is noted that a valve construction or another suitable type of closing means may be present at more positions than in just one of the closing pieces 20. Actually, depending on the size of the device 1, it may be very advantageous to have more valves or the

like in order to allow for access to the channel entirety 14 at several positions. In the embodiment as described in the foregoing, in which the closing means 30 are provided in one of the closing pieces 20, and a restriction 25 is provided in another of the closing pieces 20, it is possible that a valve is arranged for closing the restriction 25 when a heat-insulating function of the device 1 is required.

Figures 11 and 12 illustrate an embodiment of a second device 2 according to the present invention. The second device 2 comprises a plurality of hollow insulating units 40, which are extending from one main side of the device 2 to an opposite main side.

Figure 11 shows a longitudinal section of a portion of the second device 2, and figure 12 shows a cross-section of a portion of the second device 2. At a side which is intended to be positioned at an outside, each of the insulating units 40 is provided with closing means 30 in the form of a flap construction or the like. Adjustment of the functioning of the device 2 is based on adjustment of the condition of the closing means 30. When the closing means 30 are in a closed condition, the device 2 fulfills a heat-insulating function on the basis of the fact that the insulating units 40 constitute insulators in the form of a quantity of still air that is trapped inside the units 40. When the closing means 30 are put to an open condition, as indicated in figure 11, the insulator is removed, as it were, and the heat-insulating function of the device 2 is cancelled.

In a practical embodiment of the second device 2 according to the present invention, a panel (not shown) having a certain number of insulating units 40 is provided, so that a number of insulating units 40 may be handled like an entirety and easily be put in any desired place.

In both devices 1, 2 as described in the foregoing, the condition of the closing means 30 may be controlled automatically, without the need of intervention of a user of the device 1, 2. However, that does not alter the fact that manual control is possible as well. In the case of an automatic control system, any suitable controlling means may be applied with the device 1, 2, and the controlling means may use any type of information as the basis

of the controlling process. An example of relevant information is a value of an outside temperature.

It will be clear to a person skilled in the art that the scope of the present invention is not limited to the examples discussed above, but that several amendments and modification thereof are possible without deviating from the scope of the invention as defined in the appended claims.

The present invention may be summarized as follows.

A device 1, 2 has adjustable heat-insulating properties on the basis of the fact that the device 1, 2 may be put in at least two different conditions, wherein in one of the conditions, a heat-insulating quantity of still fluid is present in the device 1, 2, and wherein in another of the conditions, the quantity of still fluid is absent.

The device 1 comprises a heat-insulating core 15 and an assembly 14 of channels 13, 21 surrounding the core 15, wherein a passage 24 in the channels 13, 21, which is positioned between portions of the channels 13, 21 extending at opposite sides of the device 1, may be blocked or left open, depending on the desired functioning of the device 1. Furthermore, fluid may be supplied to the channels 13, 21 in order to realize a forced flow of fluid through the channels 13, 21, or there may be no fluid supply, or even a removal of fluid.

The device 1, 2 according to the present invention is very well suitable to be applied in a wall, roof or floor of a building. In such a case, the device 1, 2 is positioned between an inner construction and an outer construction, wherein the device 1, 2 may be used to transfer heat or cold toward the inner construction. In the building, wall ties may be used for interconnecting the inner construction and the outer construction. It is no problem for such wall ties to extend through the device 1, 2 according to the present invention, as this would only involve a loss of functionality of a limited number of channels 13, 21 or insulating units 40.

The device 1, 2 according to the present invention functions such as to cooperate with its immediate surroundings in a sophisticated manner, wherein use is made of a heat resistance of surrounding air gaps, and of the inner construction and the outer

construction between which the device 1, 2 may be sandwiched. The characteristics of its surroundings are used to determine an optimal extent of heat insulation offered by the device 1, 2 in all circumstances. In this respect, it is even possible to have
5 different conditions of the device 1, 2 at different sides of a building, assuming a practical situation in which more than one device 1, 2 is applied in the building. In any case, when the device 1, 2 according to the present invention is applied, it is possible to create an interior climate in buildings according to desires of
10 people staying in these buildings, with the additional advantage that energy may be saved as much as possible, since use is made of environmental factors.

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CONCLUSIES

1. Inrichting (1) die in verschillende toestanden te brengen is, en die is ingericht om in één van de mogelijke toestanden tenminste een warmte-isolerende werking te hebben, omvattende:

- een veelvoud aan isolatie-eenheden (13, 21) die elk holle ruimte in zich hebben, welke holle ruimte geschikt is om een fluïdum als lucht of water in zich te hebben, en die elk gedeeltes hebben die zich aan tegenovergelegen zijden van de inrichting (1) bevinden;
- een kern (15; 16, 17) met warmte-isolerende eigenschappen, die tussen de gedeeltes van de isolatie-eenheden (13, 21) die zich aan tegenovergelegen zijden van de inrichting (1) bevinden, is gepositioneerd; en
- afsluitmiddelen (30) die in verschillende toestanden te brengen zijn, en die zijn ingericht om in één van de mogelijke toestanden een doorgang (24) tussen de gedeeltes van de isolatie-eenheden (13, 21) die zich aan tegenovergelegen zijden van de inrichting (1) bevinden, af te sluiten, en om in een ander van de mogelijke toestanden de genoemde doorgang (24) open te laten.

2. Inrichting (1) volgens conclusie 1, waarbij de veelvoud aan isolatie-eenheden (13, 21) is uitgevoerd als een kanalenstelsel dat rond de warmte-isolerende kern (15; 16, 17) is aangebracht, en waarbij de afsluitmiddelen (30) die in verschillende toestanden te brengen zijn, zijn ingericht om in één van de mogelijke toestanden een blokkade in de kanalen (13, 21) van het kanalenstelsel te vormen, en om in een ander van de mogelijke toestanden de kanalen (13, 21) van het kanalenstelsel open te laten.

3. Inrichting (1) volgens conclusie 1 of 2, omvattende een samenstel dat de volgende componenten omvat:

- een paneel (10) met de kern (15; 16, 17) met warmte-isolerende eigenschappen en zich aan twee zijden van de warmte-isolerende kern (15; 16, 17) uitstrekkende kanalen (13), en
- twee sluitstukken (20) voor het onderling verbinden van de kanalen (13) die zich aan de genoemde twee zijden van het paneel (10) bevinden, aan beide uiteinden van de kanalen (13).

4. Inrichting (1) volgens conclusie 3, waarbij de sluitstukken (20) voorzien zijn van verbindingskanalen (21) waarvan één uiteinde geschikt is om aan te sluiten op kanalen (13) die zich aan één zijde van het paneel (10) bevinden, en waarvan een ander uiteinde geschikt is om aan te sluiten op kanalen (13) die zich aan een andere zijde van het paneel (10) bevinden.

5. Inrichting (1) volgens conclusie 4, waarbij in elk van een aangesloten geheel (14) van kanalen (13) van het paneel (10) en daarop aansluitende verbindingskanalen (21) van de sluitstukken (20) afsluitmiddelen (30) zijn opgesteld die in verschillende toestanden te brengen zijn, en die zijn ingericht om in één van de mogelijke toestanden een blokkade in het geheel (14) van kanalen (13) en verbindingskanalen (21) te vormen, en om in een ander van de mogelijke toestanden het genoemde geheel (14) open te laten.

6. Inrichting volgens conclusie 5, waarbij de afsluitmiddelen (30) zich in één van de sluitstukken (20) bevinden, in elk van de verbindingskanalen (21) van dat sluitstuk (20).

7. Inrichting (1) volgens een willekeurige der conclusies 2-6, omvattende middelen voor het realiseren van een geforceerde verplaatsing van een fluïdum in het kanalenstelsel wanneer de afsluitmiddelen (30) zich in de toestand voor het openlaten van de kanalen (13, 21) van het kanalenstelsel bevinden.

8. Inrichting (1) volgens conclusie 7, waarbij de genoemde middelen voor het realiseren van een geforceerde verplaatsing van een fluïdum in het kanalenstelsel, een ventilator omvatten.

9. Inrichting (1) volgens een willekeurige der conclusies 2-8, omvattende een veelvoud aan kanalen (18) die zich door de warmte-isolerende kern (15; 16, 17) heen uitstrekken, en die aan beide uiteinden aansluiten op het kanalenstelsel dat rond de warmte-isolerende kern (15; 16, 17) is aangebracht.

10. Inrichting (1) volgens een willekeurige der conclusies 1-9, waarbij de afsluitmiddelen (30) een bestuurbare klepconstructie omvatten.

11. Inrichting (1) volgens een willekeurige der conclusies 1-10, omvattende middelen voor het detecteren van een temperatuur aan ten minste één zijde van de inrichting (1).

5 12. Inrichting volgens een willekeurige der conclusies 1-11, omvattende middelen die geluidsisolerende eigenschappen hebben.

13. Inrichting volgens een willekeurige der conclusies 1-12, omvattende middelen zoals een microcontroller voor het instellen van de
10 toestand van de afsluitmiddelen (30).

14. Inrichting (2) die in verschillende toestanden te brengen is, en die is ingericht om in één van de mogelijke toestanden tenminste een warmte-isolerende werking te hebben, omvattende:

15 -- een veelvoud aan isolatie-eenheden (40) die elk holle ruimte in zich hebben, en die zich van één zijde van de inrichting (2) naar de tegenovergelegen zijde van de inrichting (2) uitstrekken, en
-- afsluitmiddelen (30) die in verschillende toestanden te brengen zijn, die aan één zijde van de inrichting (2) bij de isolatie-eenheden (40) zijn aangebracht, en die zijn ingericht om in één van de
20 mogelijke toestanden de isolatie-eenheden (40) gesloten te houden, en om in een ander van de mogelijke toestanden de isolatie-eenheden (40) open te zetten.

25 15. Inrichting (2) volgens conclusie 14, omvattende een paneel met een veelvoud aan isolatie-eenheden (40) en bijbehorende afsluitmiddelen (30), en middelen zoals een microcontroller voor het instellen van de toestand van de afsluitmiddelen (30).

1/6

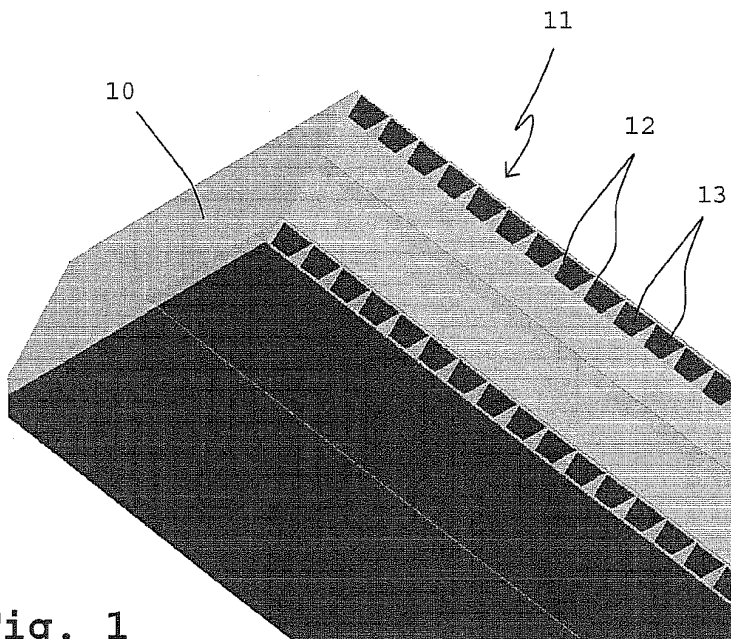


Fig. 1

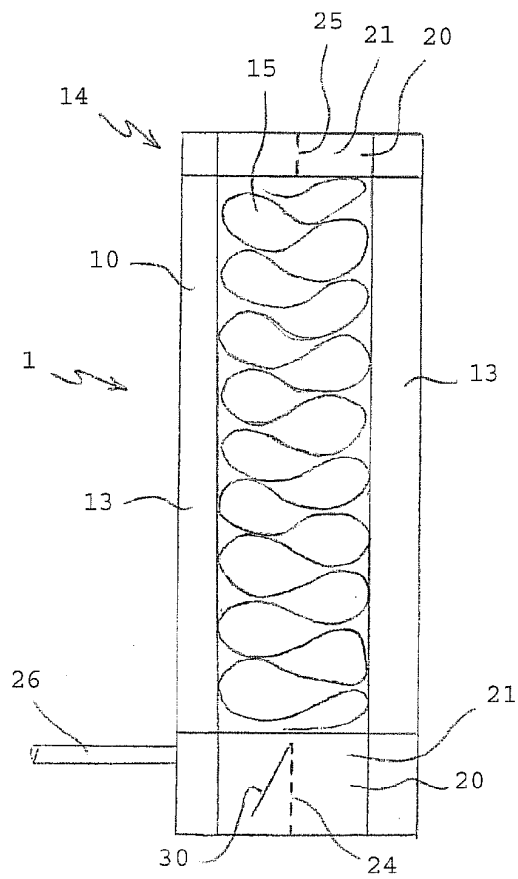


Fig. 2

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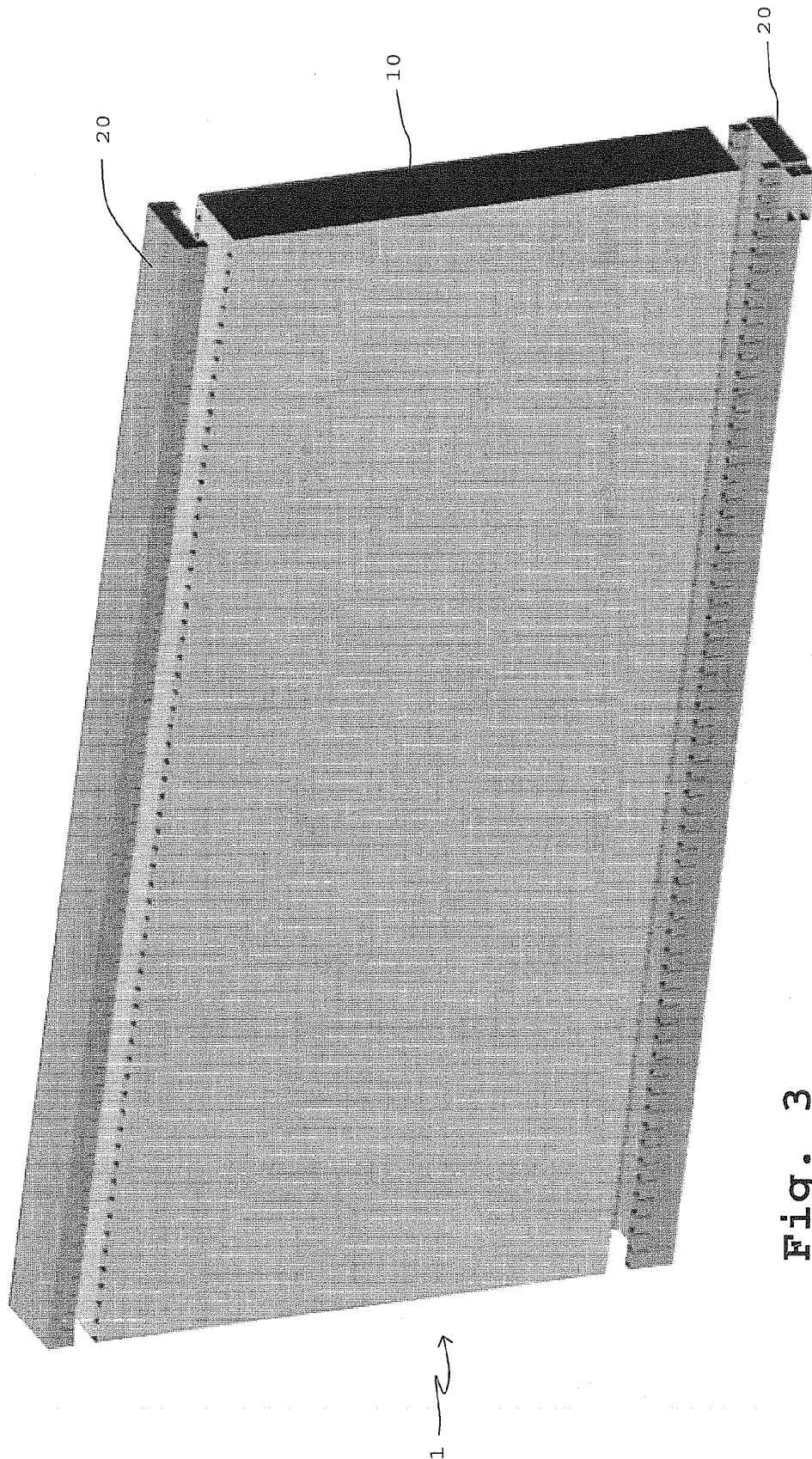
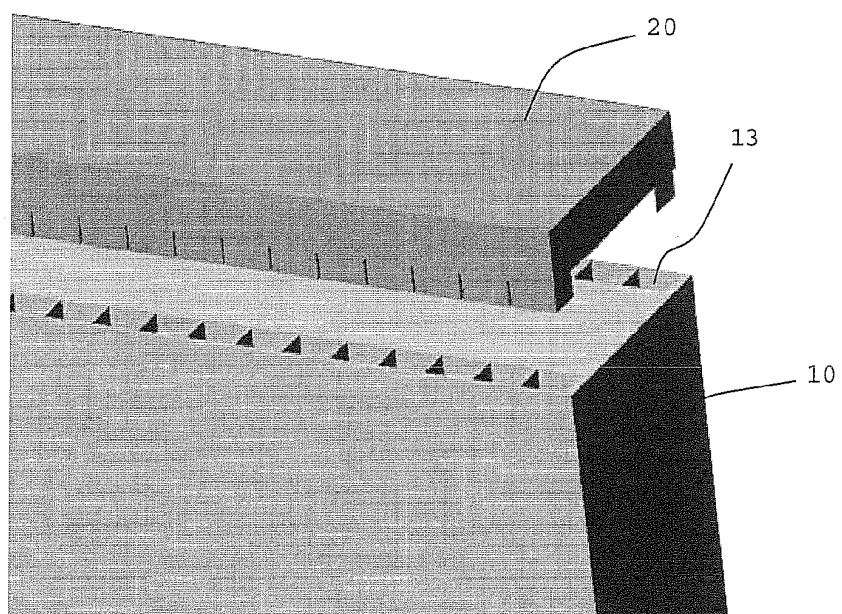
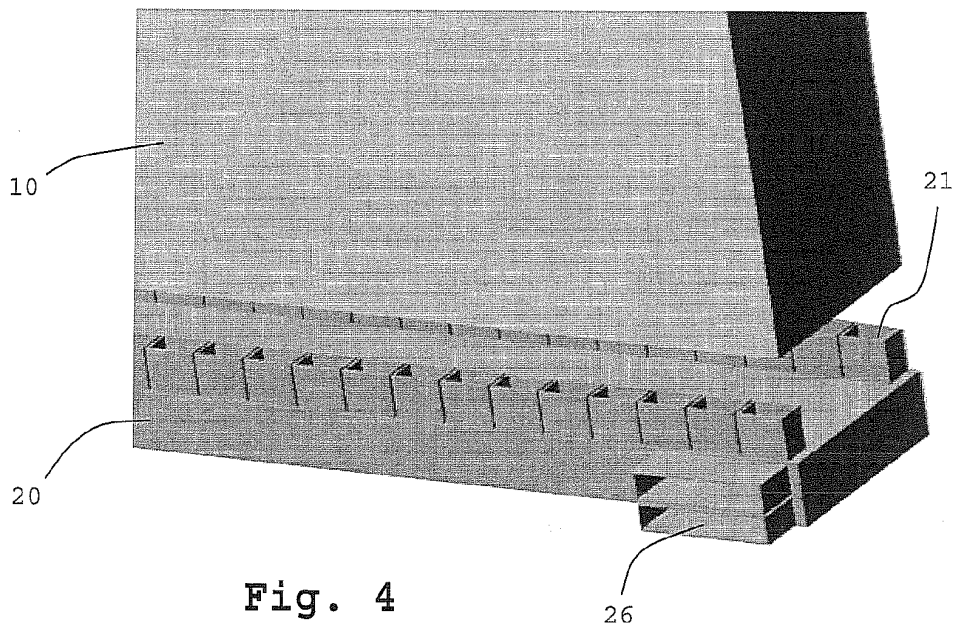


Fig. 3



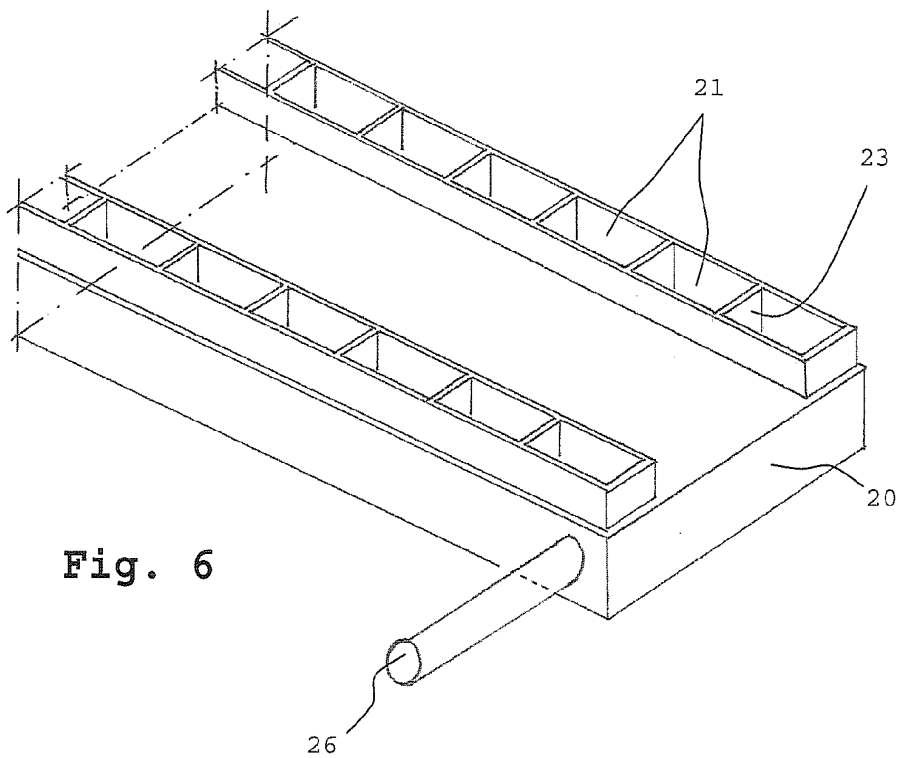


Fig. 6

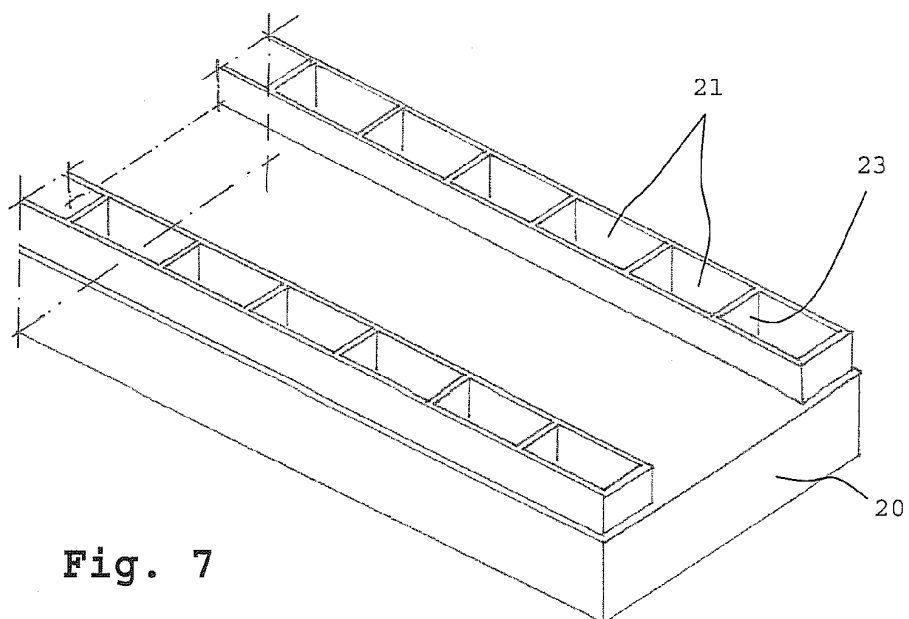


Fig. 7

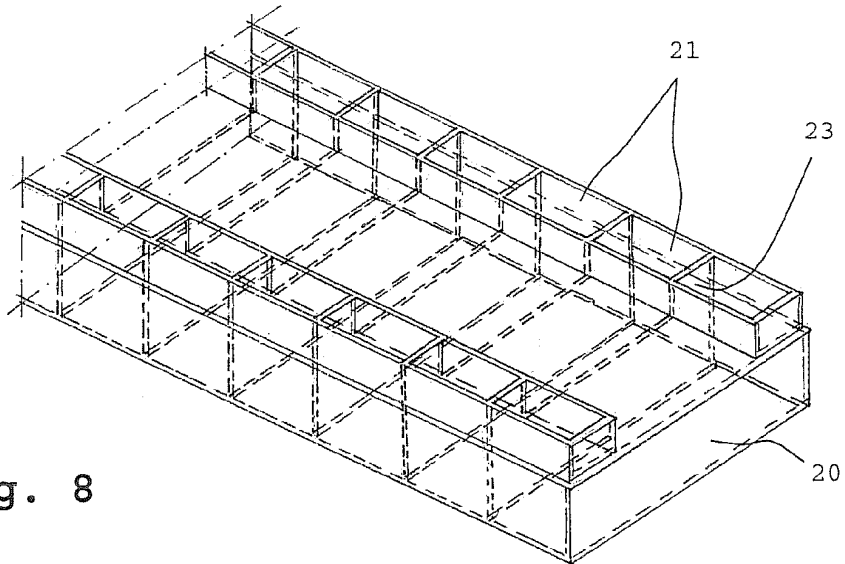


Fig. 8

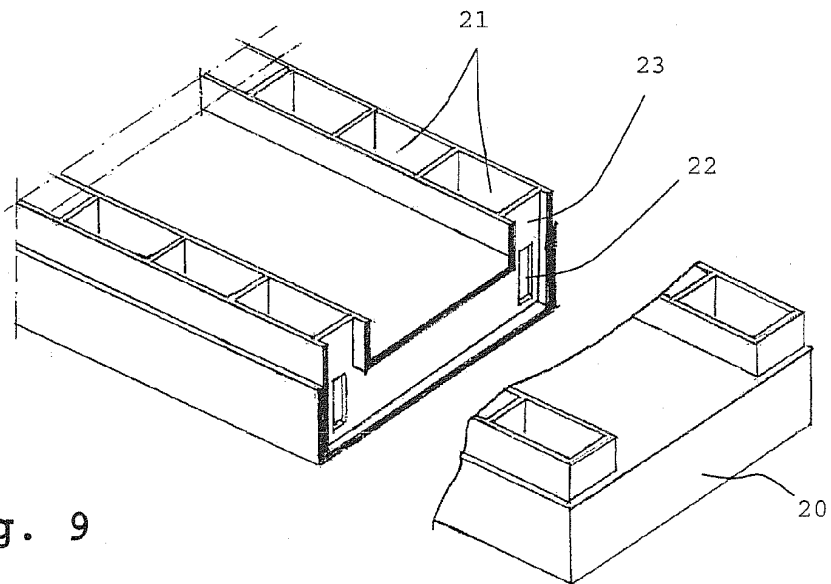


Fig. 9

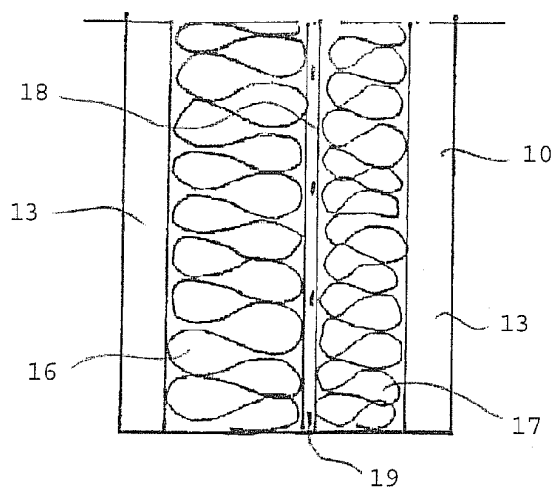


Fig. 10

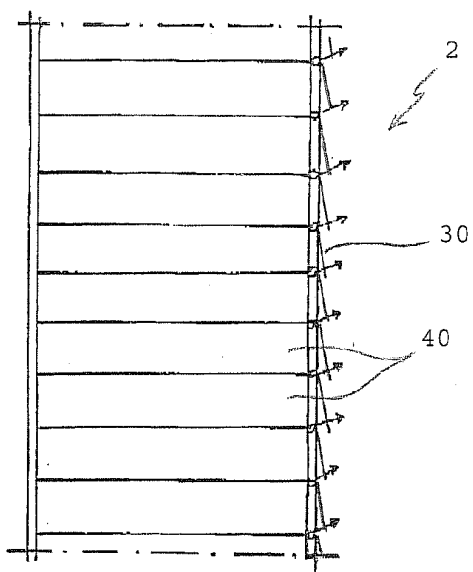


Fig. 11

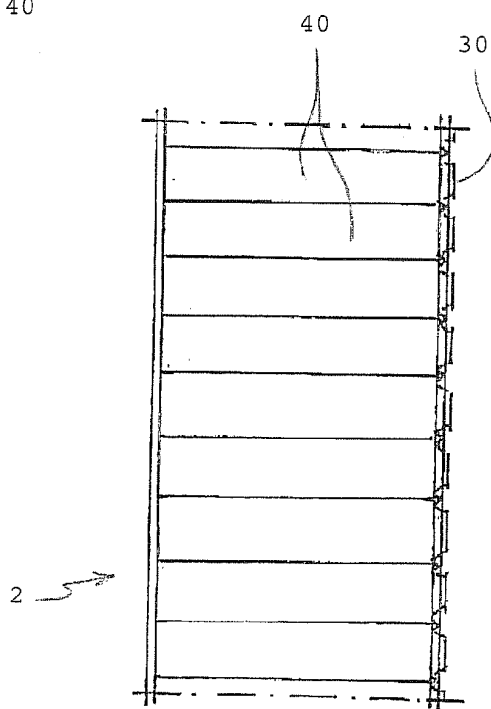


Fig. 12

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE
	P 2009 NL 026
Nederlands aanvraag nr.	Indieningsdatum
1036775	27-03-2009
	Ingeroepen voorrangsdatum
Aanvrager (Naam)	
P&H Adviseurs Bouw- en Vastgoed BV	
Datum van het verzoek voor een onderzoek van internationaal type	Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr.
31-07-2009	SN 52612
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)	
Volgens de internationale classificatie (IPC)	
E04B1/74	E04B1/80
II. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK	
Onderzochte minimumdocumentatie	
Classificatiesysteem	Classificatiesymbolen
IPC8	E04B
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen	
III. <input type="checkbox"/>	GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES (opmerkingen op aanvullingsblad)
IV. <input type="checkbox"/>	GEBREK AAN EENHEID VAN UITVINDING (opmerkingen op aanvullingsblad)

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek
NL 1036775

A. CLASSIFICATIE VAN HET ONDERWERP
INV. E04B1/74 E04B1/80

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen)
E04B

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)
EPO-Internal, WPI Data

C. VAN BELANG GEACHTE DOCUMENTEN

Categorie *	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X	US 4 526 225 A (STANTON AUSTIN N [US]) 2 juli 1985 (1985-07-02) * kolom 3, regel 53 - kolom 5, regel 16; figuur 5 *	1-15
X	WO 2009/025786 A1 (BLUNDELL JOSEPH TIMOTHY [US]; PERKINS SARAH GRACE [US]) 26 februari 2009 (2009-02-26) * het gehele document *	1,14
A	DE 35 07 594 A1 (SCHWARZ THEO DIPL ING) 27 maart 1986 (1986-03-27) * figuur 4 *	1,3

☐ Verdere documenten worden vermeld in het vervolg van vak C.

☒ Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

* Speciale categorieën van aangehaalde documenten

A niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

D in de octrooiaanvraag vermeld

E eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

L om andere redenen vermelde literatuur

O niet-schriftelijke stand van de techniek

P tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

T na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

X de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

Y de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

Z lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid

18 november 2009

Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type

Naam en adres van de instantie

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

De bevoegde ambtenaar

Zuurveld, Gerben

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 1036775

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
US 4526225	A	02-07-1985	GEEN
WO 2009025786	A1	26-02-2009	US 2009049763 A1 26-02-2009
DE 3507594	A1	27-03-1986	GEEN



OCTROOICENTRUM NEDERLAND

WRITTEN OPINION

File No. SN52612	Filing date (day/month/year) 27.03.2009	Priority date (day/month/year)	Application No. NL1036775
International Patent Classification (IPC) INV. E04B1/74 E04B1/80			
Applicant P&H Adviseurs Bouw-en Vastgoed B.V. te Veldhoven			

This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the application
- ☐ Box No. VIII Certain observations on the application

Examiner Zuurveld, Gerben

WRITTEN OPINION

Application number

NL1036775

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the application as filed.
 - ☐ filed together with the application in electronic form.
 - ☐ furnished subsequently for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes: Claims	3-6
	No: Claims	1-2, 7-15
Inventive step	Yes: Claims	
	No: Claims	1-15
Industrial applicability	Yes: Claims	1-15
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- 1 Reference is made to the following documents:
 - D1 US 4 526 225 A (STANTON AUSTIN N [US]) 2 juli 1985 (1985-07-02)
 - D2 WO 2009/025786 A1 (BLUNDELL JOSEPH TIMOTHY [US]; PERKINS SARAH GRACE [US]) 26 februari 2009 (2009-02-26)
 - D3 DE 35 07 594 A1 (SCHWARZ THEO DIPL ING) 27 maart 1986 (1986-03-27)
- 2 The present application does not meet the criteria of patentability, because the subject - matter of claim 1 is not new.

Document D1 discloses (cf. the cited passages in the search report):

een inrichting (cf. fig. 5) die in verschillende toestanden te brengen is, en die is ingericht om in één van de mogelijke toestanden tenminste een warmte-isolerende werking te hebben, omvattende:

 - een veelvoud aan isolatie-eenheden die elk een holle ruimte in zich hebben, welke holle ruimte geschikt is om een fluïdum als lucht of water in zich te hebben, en die elk gedeeltes hebben die zich aan tegenovergelegen zijden van de inrichting bevinden, en
 - afsluitmiddelen (60), die in verschillende toestanden te brengen zijn, en die zijn ingericht om in één van de mogelijke toestanden een doorgang tussen de gedeeltes van de isolatie-eenheden die zich aan tegenovergelegen zijden van de inrichting bevinden, af te sluiten, en om in een ander van de mogelijke toestanden de genoemde doorgang open te laten.

Therefore all the features of claim 1 are known from D1.
- 3 The features of claim 1 are also known from D2, cf the cited passages in the search report.
- 4 The features of similar device claim 14 are, mutatis mutandis, also known from documents D1 and D2, cf. the cited passages in the search report.
- 5 Dependent claims 2-13 and 15 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of novelty and/or inventive step, see documents D1 and D2 and the corresponding passages cited in the search report:
- 5.1 Document D1 discloses at least the features of claims 2, 3, 4, 5 (cf. citations in the search report), claim 8 (cf. fig. 12), claim 12 (cf. fig. 1) and claim 15 (cf. fig. 10). Therefore these features are not new.

- 5.2 The features of claim 3 are similar to the features of the "inrichting" from document D3, cf. fig. 4. Therefore, these features are considered as obvious for the skilled person and therefore lack inventive step.
- 5.3 The features of claims 4, 5 and 6 are merely some of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill. Therefore, these features cannot be considered as contributing to patentable ingenuity and therefore lack inventive step.