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(54) **An airing device**

(57) An airing device comprises an airing rack (5,6) arranged to extend from a relatively flat storage state to a deployed state in which the rack is extended to provide a surface from which clothes may be hung; and a radiator

(1) arranged to move from a storage state in which the radiator is disposed substantially vertically to a deployed state in which the radiator extends away from a wall on which it is mounted. In its deployed state, the airing rack locates over the radiator when in its deployed state.

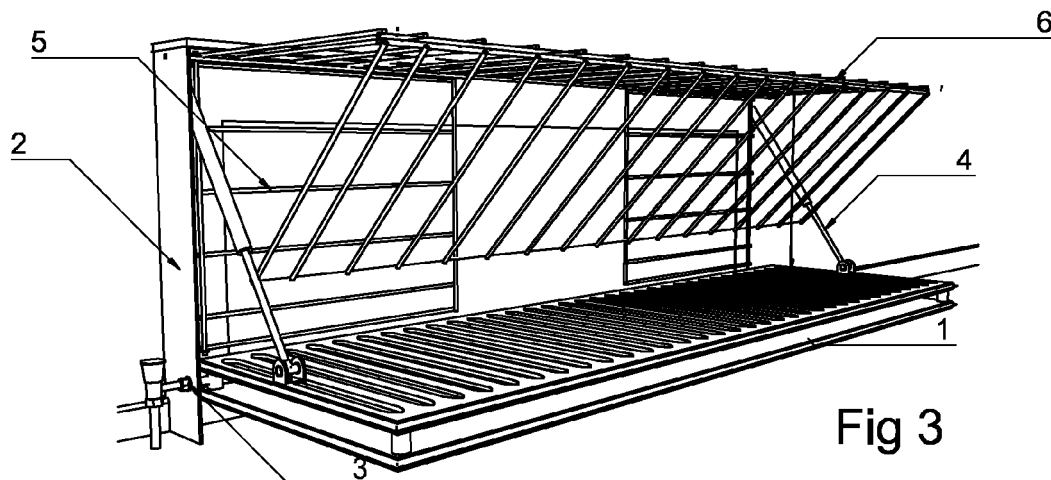


Fig 3

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Description

Field of Invention

[0001] The present invention relates to an airing device. In particular, the airing device is employed in conjunction with an existing radiator and/or a factory-modified radiator, to maximise and to expand usage of an existing convection heat source.

Background

[0002] Most home owners use existing radiators to dry or air clothes in addition to heating their living spaces. Such radiators are generally installed flush to walls with the majority of the surface heating area facing out to the living space.

[0003] Home radiators only provide limited drying/airing space for clothes placed directly onto the radiator.

[0004] Clip-on racks for radiators are available but since these are relatively small, they are suitable only for airing/drying smaller or relatively few items of clothing.

[0005] Free-standing drying racks are also available and those which require electricity involve added expense for a home owner.

Summary

[0006] According to the present invention there is provided an airing device comprising: an airing rack arranged to extend from a relatively flat storage state to a deployed state in which the rack is extended to provide a surface from which clothes may be hung; and a radiator arranged to move from a storage state in which the radiator is disposed substantially vertically to a deployed state in which the radiator extends away from a wall on which it is mounted, the airing rack in the deployed state being arranged to locate over the radiator when in the deployed state.

[0007] Embodiments of the invention comprise a radiator; drying/airing rack/s comprising a number of lightweight racks; a wall frame to enclose and to secure the drying/airing rack/s when not in use; a locking system to secure the airing device to the wall frame or to the existing wall; a spring-loaded hinge mechanism to control the downward release of the radiator from its stowaway position to its lowered drying position; and catch and lock systems to secure the airing/racks in position over the lowered radiator.

[0008] Existing or new water supplies can be connected through the wall frame to the radiator by means of flexi-water connectors, which act as pivoting support points for the radiator. A detachable handle made of a non-heat-conducting material; and a further support leg to carry the weight of the airing device made of a non-heat-conducting material can also be provided.

[0009] Preferably, a swivel mechanism system is utilised to pivot the radiator from the vertical storage state

to its horizontal deployed state, the existing or new water supplies being connected through the wall frame to the radiator by swivel water connectors.

[0010] Preferably, a bolt-through wall bracket containing the swivel connector is located at a height suiting the water supply valves at either side of a radiator; and a lockable catch secures the radiator to the wall when in the storage state.

[0011] The drying/airing rack/s are foldable and in some embodiments can be stored away from the radiator location.

[0012] The present invention makes use of pre-existing heating systems and this in itself is environmentally friendly. The invention offers increased airing capacity in a relatively enclosed/confined space. The invention provides extra drying/airing space, particularly in an existing small or medium sized apartment or flat or home. When not required to air clothes, the radiator and airing device are retracted and the radiator locked back into its original position. The drying/airing rack/s can be neatly concealed behind the radiator and both can be contained in a decorative wall frame, or the drying/airing rack/s can be folded and stored separately in another storage area.

[0013] This invention aims to maximise usage of existing heat sources within a home by providing additional drying/airing space when combined with drying/airing rack/s. This invention aims to maximise usage of the existent rising heat from the radiator by increasing the surface area under the drying/airing rack/s.

Brief description of the Drawings

[0014] The invention will be clearly understood from the following description of embodiments thereof, given by way of an example only, with reference to the accompanying drawings, in which:

Fig 1 to 5 show perspective views of an airing device according to an embodiment of the invention in conjunction with a radiator and moving from a storage stage through a sequence of intermediate states to a deployed state.

Fig 6 shows a section view of the radiator without the airing device of Figures 1-5 in various states.

Fig 7 shows a typical section view of the radiator in an upright state, with the movement of heated air direction denoted by arrows.

Fig 8 shows the same section view of the radiator of fig 7 in horizontal state, with movement of heated air denoted by arrows.

Fig 9(a) to 9(c) show views of an airing device according to a second embodiment of the present invention moving from a storage state to a deployed state.

Description of the Preferred Embodiments

[0015] Referring to the drawings and initially figures 1

to 5 there is illustrated perspective views of an airing device (5,6) according to an embodiment of the invention in conjunction with a radiator (1). The successive figures illustrate the device/radiator in different states between a storage state in Figure 1 and a deployed state in Figure 5. Starting at fig 1 where the radiator (1) is in a stowaway or vertical position, where it is locked in position against a wall, with a decorative wall frame unit (2) surrounding it and concealing airing /drying racks (5, 6). In this embodiment the water valves are connected to a conventional type radiator through the frame unit (2) by means of swivel connectors and/or flexi-pipes (3). This allows an existing radiator to be utilised without or only little modification.

[0016] Following on from this, in fig 2 the radiator (1) begins to pivot/hinge downwards away from its storage state. The airing/drying racks (5, 6) and the hinging mechanisms (4) are now revealed. The weight of the radiator (1) in this embodiment is supported and pivot/hinged from the wall frame (2) which is in turn rawl-bolted or screwed securely to the wall structure.

[0017] In the embodiment, the drying/airing rack/s (5, 6) comprises a number of lightweight racks with horizontal and vertical bars, much like typical clothes racks/'horses', made from materials such as chromed steel, plastic coated metal, timber etc., spaced at regular intervals to accommodate the hanging of damp clothing etc.

[0018] The side panels (5) are positioned at each side of the wall-frame unit and are simply hinged outwards from the wall frame to assist in supporting the upper rack. The rack/s sits on top of the radiator and are held in place by means of a simple clips/catches, e.g., plastic or metal catches. The intermediate horizontal bars of these side racks can be utilised to carry small items of damp clothing. The front rack (6) which is hinged to the top rack folds out to sit over the horizontally positioned radiator and acts as to support the top rack.

[0019] The top panel is made of the same materials as the side panels but with a higher/stronger gauge in size to facilitate the extra loading and weight of damp clothes. The front panel is secured to the radiator by means of a series of simple clips/catches, etc. Both the top and front panels can be also attached to the already unfolded side panels for added stability. Figures 3 and 4 illustrate the un-folding of the airing/drying racks (5, 6) in a particular order. The top and front racks (6) are lifted up to release the side racks (5) in order to secure these in the correct position on and over the radiator (1). These side racks (5) are secured to radiator (1) and/or the top/front racks, for example, by simple clips (not shown).

[0020] Figure 5 illustrates the deployed state of the top and front airing racks (6) above the radiator (1). The airing device is now ready for items of damp clothing to be hung on the airing/drying racks (5,6)

[0021] In addition or as an alternative to the hinges 4, different radiators with different weights can be supported while in the deployed state with a foldable/hinged leg support.

[0022] Figure 6 illustrates a typical section through a radiator when it is in an upright or closed position against the wall as well as showing the radiator (1) being pivoted or hinged downwards into its deployed state ready to receive its airing/drying racks (5, 6). A locking mechanism (7, 8) is shown at the top of the radiator (1) and also an optional clip-on type support leg (9) is shown pivotally connected to the underside of the radiator (1) and appropriately constructed depending on the radiator weight, etc.

[0023] When the locking system (7, 8) is released, the spring-loaded hinge mechanism (4) controls the downward release of the radiator from its wall frame (stowaway) position (fig 1) to its lowered horizontal airing position (fig 3) above the floor. The radiator is attached to the wall frame by the hinge mechanism or other such mechanisms. When not in use, clothes are removed, and the airing racks re-fold into their concealed position and the radiator is then hinged back to its upright and closed position and locked into place in the wall frame.

[0024] Figure 7 illustrates the movement of heated air over a typical radiator when it is in its normal position against wall.

[0025] Figure 8 illustrates the movement of heated air over a radiator when it is in its deployed state over a floor. These drawings illustrate the increase in heating surface area gained by the lowering of the radiator.

[0026] The airing device can be supplied as one complete unit comprising a modified radiator (1), drying rack/s (5,6) and decorative wall frame (2), complete with wall fixing brackets, a spring loaded hinge mechanism (4) and flexi-water pipe connectors (3). Alternatively, the drying racks/s and/or wall frame can be supplied for fitting to an existing radiator with suitable pipe connectors

[0027] The existing or new water supply for the radiator can be advantageously provided through the wall frame (2) by flexi-water pipe connectors (3) to facilitate simple installation.

[0028] The radiator (1) can be standard or modified, for example, with swivel connectors and/or integral clips and can be either double or single panelled.

[0029] The wall frame (2) encloses the radiator in its upright position. It can be constructed in lightweight metal, for example, aluminium or steel. It can also be constructed as a timber/metal combination, where the metal component is encased in a timber casing.

[0030] In some embodiments, the wall frame comprises two side panels, a top panel and a back panel which provides the main support mechanism for the radiator hinge/pivot and secures the complete unit firmly to the wall. All of the above panels can be louvered. The back panel can have any number of fixing holes to assist installation to different wall types, for example, block, timber or metal frame walls etc.

[0031] A detachable handle made of a non-heat-conducting material can be utilised when the radiator is to be lowered or raised when still hot.

[0032] In variations of the illustrated embodiment, the

rack system comprises an already-assembled or foldable airing rack which can be stored away in a separate storage area of the home and which is simply attached over the lowered radiator by clips or catches or the like. Such an implementation would not necessarily require a wall frame. A simple hinging mechanism such as swivel fittings, or spring-loaded hinge, etc., and which could also be motorised, could be utilised to lower and raise a new or modified radiator. A locking system would secure the radiator safely to the wall when in the storage state. These hinge and locking mechanisms can be made from various materials such as metal, etc., and are bolted or screwed securely to the various wall build-ups e.g. block, timber, etc. When not in use, the airing rack can be folded up and secured in a convenient storage place and the radiator returned to its original upright position on the wall.

[0033] In a further embodiment of the invention as illustrated in Figure 9, an airing rack 6 is stored within a set of fins 10 extending from the back of a single panel radiator 1. Referring to Figure 9(a), when in the storage state, the airing device appears similar to a conventional radiator with solid side panels 11 and a vented top panel 12. A catch 8 is located in the top panel and when pressed this releases the radiator from a wall catch 7 formed in a wall frame 2, allowing the radiator to pivot away from the wall with its movement controlled by a pair of gas pistons 4. In this case, the wall frame 2 comprises a flat bracket with a pair of hinges 13 disposed along its lower edge, about which the radiator pivots. Similar to the radiator of the first embodiment, the radiator includes swivel connectors 3 for connection to the water supply. Similar to conventional radiators, the set of fins 10 is formed on the rear surface of the radiator panel. However, in the embodiment of Figure 9, three slots running horizontally across the width of the radiator are defined in the fins. As well as the slots within the fins, a space is defined between the underside of the top panel 12 and the top edge of the fins 10 and a space is also defined along the bottom edge of the fins. A conventional type concertina airing/drying rack 6 can be stored within the spaces/slots when the airing device is in a stored state. When stored, the side drying bars 5 of the rack extend across the entire internal height of the radiator and so collapse into the spaces running along the top and bottom of the fins 10 and with the centre drying bar locating in the centre slot defined within the fins. Once the radiator is in the deployed state, Figure 9(b), the airing rack 6 can be lifted and extended, Figure 9(c). In this deployed state, the side drying bars extend by less than the height of the radiator according to the height the rack is extended. Once the rack is extended as required, it can then sit within any two of the slots or spaces defined on the rear surface of the radiator panel 1 as shown to maintain the airing rack in the deployed state.

[0034] In another embodiment, the drying/airing rack is attached to the wall above the radiator without the use of the wall frame and extended when needed by simply pulling outwards from the wall and locked into position

over the lowered radiator. Side hanging space is lost in this embodiment. The radiator is hinged separately to the wall using the various mechanisms described above.

[0035] In a still further embodiment the drying/airing rack is concealed above the radiator in a purpose-built decorative wall unit and the doors opened when drying is required.

[0036] In a yet still further embodiment the drying/airing rack is comprised of a series of drying racks on a rope-and-pulley system suspended from the ceiling above the radiator.

[0037] In another embodiment the drying/airing rack side-panels and the front panel are covered in a meshed cloth material, for example, canvas, to maximise the benefit of the drying power of the rising heat above the radiator.

[0038] All of the various embodiments described above and hereafter can utilise various hinging or pivoting mechanisms in the lowering and raising of the radiator. This is to facilitate the range of radiator sizes and weights.

[0039] In one embodiment a swivel mechanism system to allow the radiator to pivot requires:

(A) a wall frame unit complete with built-in rack system where an existing radiator is utilised with little modification ; and/or

(B) a bolt-through wall bracket containing the swivel connector located at convenient height to suit the existing water supply valves at either side of radiator with a lockable catch to secure the radiator to the wall when not in use (upright position). The drying/airing rack/s would be a foldable system and only utilised when required.

[0040] Both above systems require a full drain-down of the heating system to facilitate the water connectors to existing radiator.

[0041] In an alternative embodiment, a hinge mechanism system operates in the same manner as in the illustrated embodiment but requires a modified radiator and wall frame. Flexible water connectors are used, thus allowing more freedom in the positioning of airing unit and the water heating system does not need to be drained. This embodiment is typically used for 'new builds' and involves a simplified installation procedure.

[0042] The lowering and raising of the radiator in all instances described above can be achieved by various mechanisms to aid safety and ease of operation, taking into account the radiator weight, etc., and can also include but not exclusively, the following:

1) Motorised swing arm (exp. Skylight opening, attic stairs, etc.)

2) Pulley and rope system

3) Spring loaded hinge system

4) Spring loaded swing arm

5) Spring loaded pistons

6) A ratchet hoist

7) A wind-up attachment

8) Motorised control unit

9) A small hydraulic ram

10) A motor with a chain or wire mechanism

11) Spring loaded ram

12) A detachable handle made of a non-heat-conducting material

[0043] The lockable catch system to hold and release the airing device in the first instance, further to that described above can also be, for example:

1) Push button

2) Push and pull lever

3) Motorised/electric catch

[0044] In one embodiment an electrical fan can be utilised near, in or around the airing rack to assist airflow through the clothing items and thus greatly speeding up the drying process. For example, a water-driven fan can be attached to the airing device. Another example could have fins fitted to increase air output. In another example, electrical heated wires or an air-fan or a heated air-fan can increase the circulation of heated air.

Claims

1. An airing device comprising: an airing rack (5,6) arranged to extend from a relatively flat storage state to a deployed state in which the rack is extended to provide a surface from which clothes may be hung; and a radiator (1) arranged to move from a storage state in which the radiator is disposed substantially vertically to a deployed state in which the radiator extends away from a wall on which it is mounted, the airing rack in its deployed state being arranged to locate over the radiator when in its deployed state.
2. An airing device according to claim 1 wherein the airing rack comprises a plurality of racks.
3. An airing device according to claim 1 further com-

prising a wall frame (2) to enclose and to secure the airing rack when not in use.

4. An airing device according to claim 1 wherein said radiator comprises a single panel on a rear facing surface of which a plurality of rows of fins are formed, a plurality of slots defined between said rows of fins and running across the width of said radiator, said airing rack comprising a concertina airing rack arranged to locate in said slots when in one of a storage state or a deployed state.

5. An airing device according to claim 3 or 4 further comprising a locking system (7,8) to secure the airing device to one of said wall frame or said wall.

6. An airing device according to claim 1 or 4 further comprising a hinge mechanism (4) to control a downward release of the radiator from the storage state to the deployed state.

7. An airing device according to claim 1 further comprising a catch to secure the airing rack in position over the deployed radiator.

8. An airing device according to claim 3 further comprising flexi-water connectors, arranged to act as pivoting support points for the radiator and to allow water supplies to be connected through the wall frame to the radiator.

9. An airing device according to claim 1 further comprising a detachable handle made of a non-heat-conducting material.

10. An airing device according to claim 1 further comprising a support leg (9) made of a non-heat-conducting material, to carry the weight of the airing device when in the deployed state.

11. An airing device according to claim 3 or 4 further comprising swivel connectors (3) arranged to enable the radiator to pivot from the storage state to the deployed state, and to allow water supplies to be connected through the wall frame to the radiator.

12. An airing device according to claim 11 when dependent on claim 3 further comprising bolt-through wall brackets, each containing a respective swivel connector, each bracket disposed at opposite ends of the radiator.

13. An airing device according to claim 1 or 4 further comprising a lockable catch (7,8) arranged to secure the radiator to the wall when in the storage state.

14. An airing device according to claim 2 wherein the airing racks are foldable and arranged to be stored

separately from said radiator.

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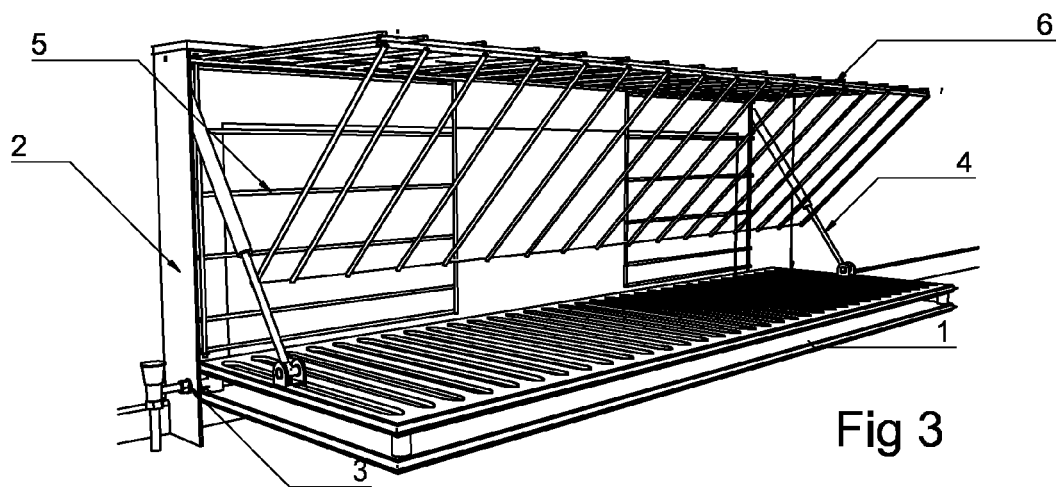
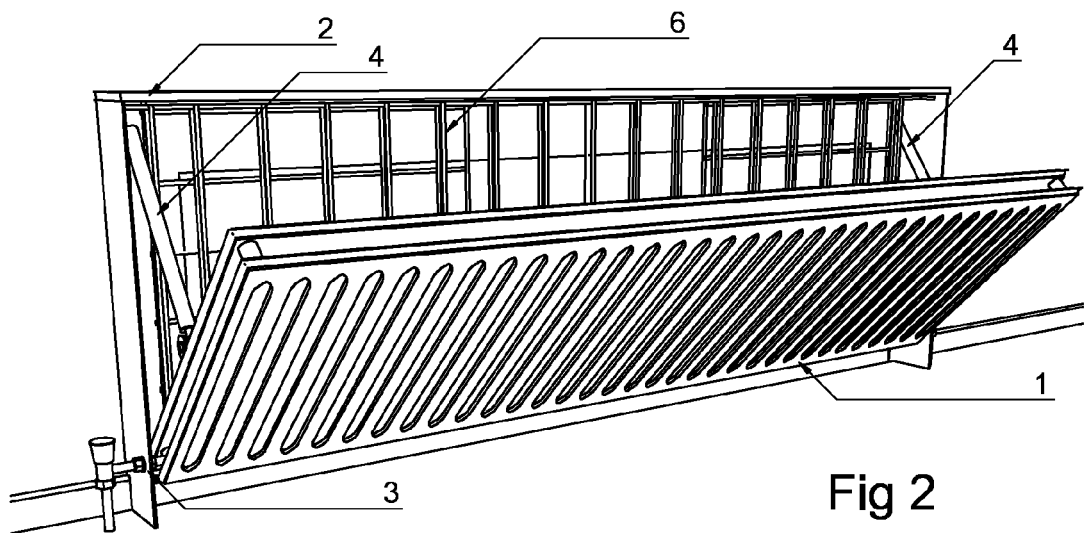
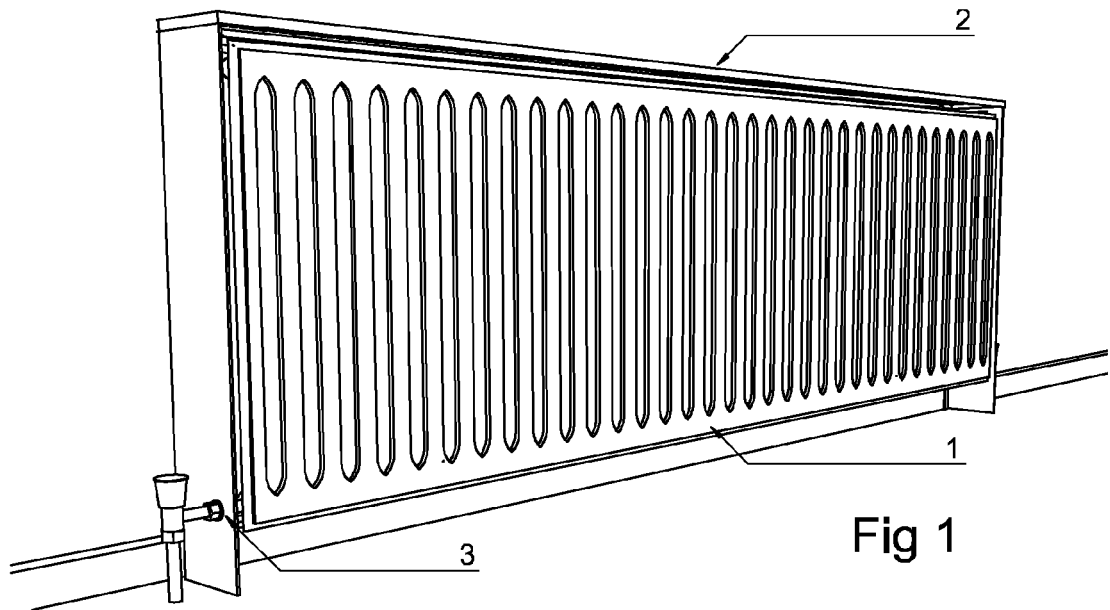
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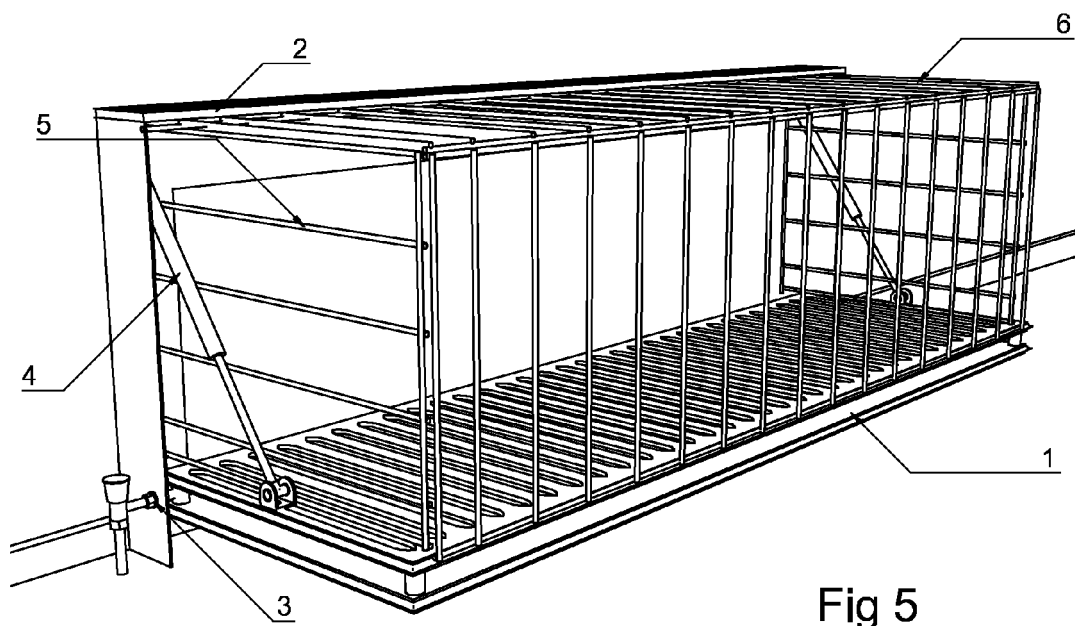
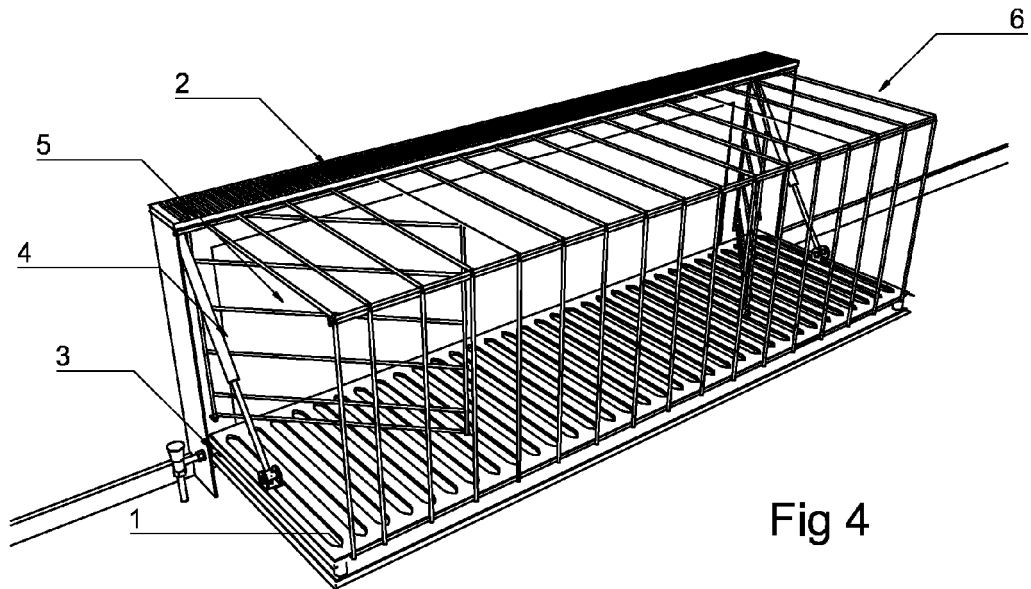


Fig 6

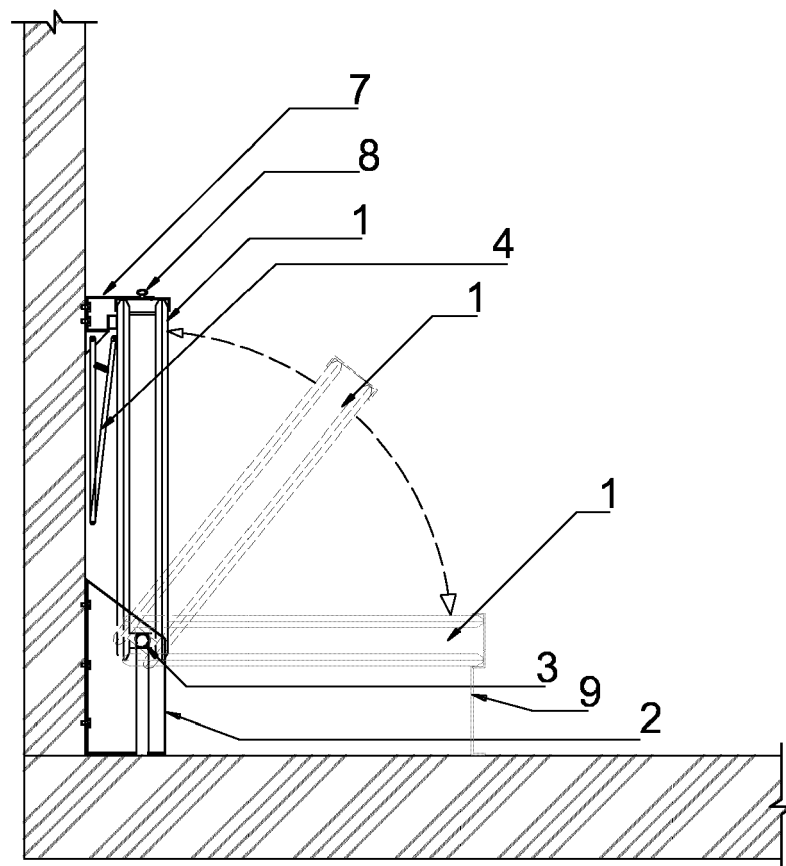


Fig 8

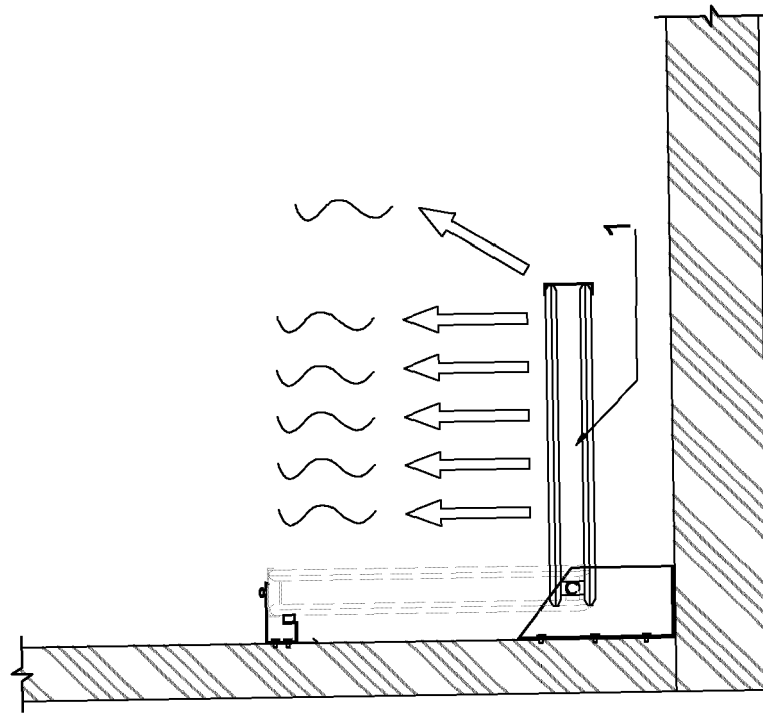
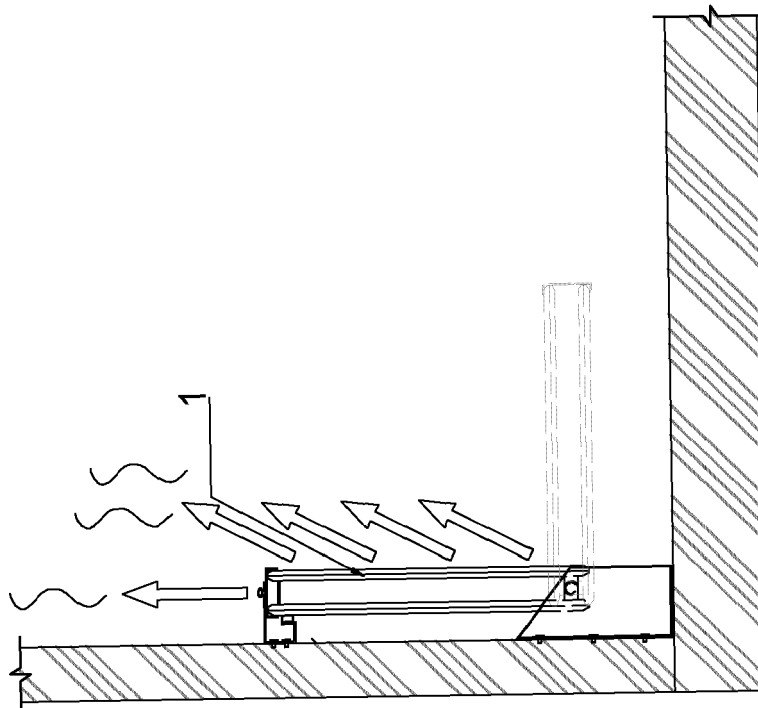


Fig 7



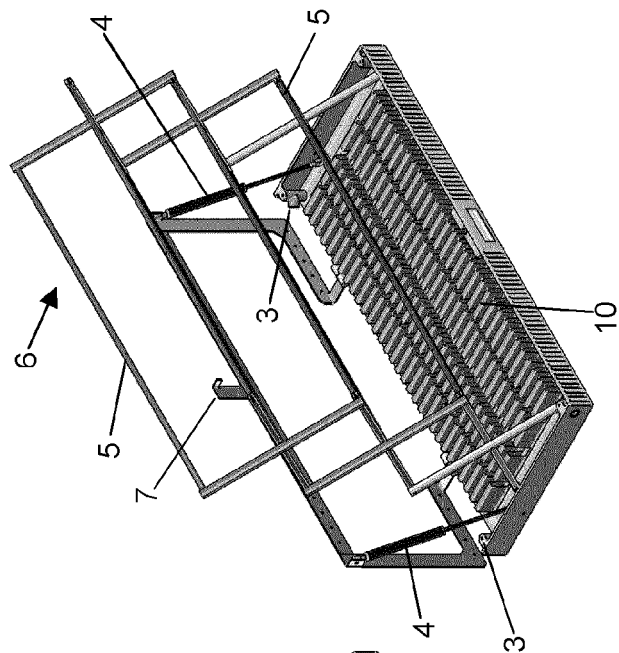


Fig 9(c)

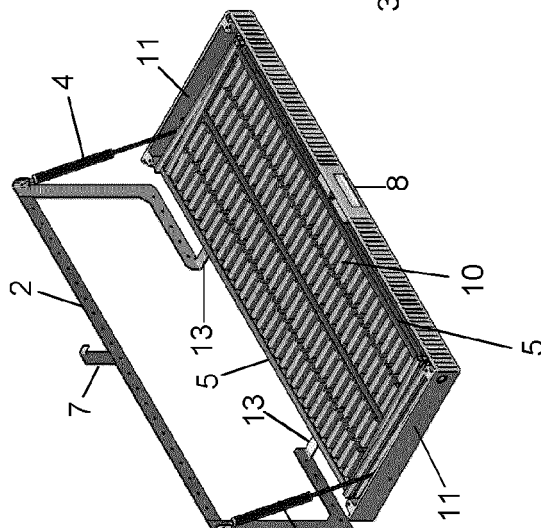


Fig 9(b)

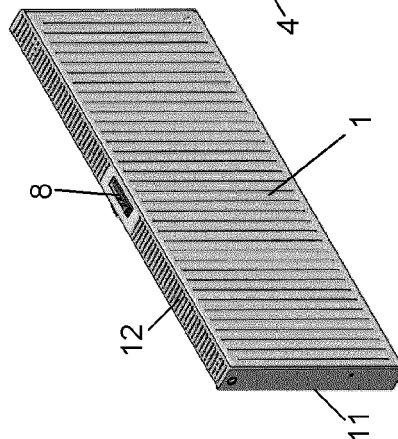


Fig 9(a)