2005/10236.

SPOOR & FISHER

FORM P.8
(To be lodged in duplicate)

REPUBLIC OF SOUTH AFRICA
PATENTS ACT, 1978

PUBLICATION PARTICULARS AND ABSTRACT

(Section 32(3)(a) – Regulation 22(1)(g) and 31)

OFFICIAL APPLICATION NO.		LODGING DATE		ACCEPTANCE DATE	
21	01	22	31 MAR 2004	43	15.1.07

INTERNATIONAL CLASSIFICATION		NOT FOR PUBLICATION
51	B66B	CLASSIFIED BY: WIPO

FULL NAMES OF APPLICANT

71	INVENTIO AG

FULL NAMES OF INVENTOR

72	ROSSIGNOL, ERIC

EARLIEST PRIORITY CLAIMED

COUNTRY		NUMBER		DATE	
33	EP	31	03015047.8	32	3 JUL 2003

TITLE OF INVENTION

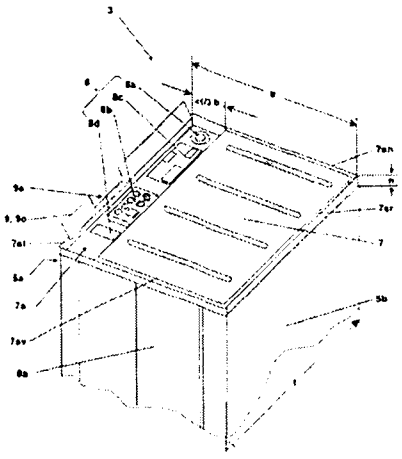
54	LIFT ASSEMBLY WITH CABIN ELECTRICS INTEGRATED IN THE CABIN ROOF

57	ABSTRACT (NOT MORE THAT 150 WORDS)	NUMBER OF SHEETS	22

If no classification is finished, Form P.9 should accompany this form.
The figure of the drawing to which the abstract refers is attached.

ABSTRACT

The cabin electrics (8), necessary on the cabin (3), such as cabin computer, connections, communication devices etc, are integrated in an equipment chamber (7a), itself integrated in the cabin roof (7). The equipment chamber (7a) is arranged along an edge (7s) of the cabin roof. The height (h) used for cabin reinforcement is correspondingly made use of. The cabin electrics (8) are accessible for servicing purposes by means of a pivoting lid. The lid (9) also forms a standing surface for service of the shaft, when in the closed position.



Description

The invention relates to a lift installation with cage electrical system integrated in the cage roof and a method for mounting a lift installation, according to the introductory part of the independent patent claims.

The lift installation comprises a lift cage movable in a lift shaft. The lift cage essentially consists of a cage floor, side walls, at least one cage entrance and a cage roof. Access to the cage takes place in normal operation of the lift installation by way of a floor entrance and the cage entrance.

Different electrical or electromechanical apparatus and installations necessary for operation of the lift installation are, as a rule, arranged in the region of the cage roof. These apparatus and installations are, for example, the door control, evaluating apparatus for shaft information and/or for door monitoring, apparatus for operation of the installation in service operation, communications apparatus, energy storage apparatus, parts of the cage lighting and/or cable connections or processors for control of further functional groups. These apparatus and installations form parts of the cage electrical system. A service operation serves for moving the cage in the shaft for the purpose of maintenance or similar tasks. In the case of service operation the lift installation can be controlled from the cage roof. The control elements necessary for that purpose are similarly arranged in the region of the cage roof. Further electrical components such as, for example, display elements, cage call transmitters, load measuring sensors or further parts of the cage electrical system, such as the door drive or space monitoring sensors, are due to function arranged in further locations on or in the cage.

A box fastened to the cage roof is shown in the patent specification US 4 043 430. The box contains parts of the door drive and offers space for the cage electrical system. The box is provided with a removable cover which is constructed to be able to be walked on. The box gives the cage roof additional strength. The disadvantage of this solution is:

- The box is placed on the cage roof and causes additional constructional height.
- In order to be able to walk on the cage roof the box has to be stepped over or steps

are formed which hamper the operations and, in particular, walking on the cage roof.

- The mounting effort is substantial, since the box is mounted and wired only on assembly of the cage at the construction site.
- The cover of the box is removed for the purpose of maintenance. This increases the risk of accident when the maintenance person, with the electrical covering removed, stands on the cage or when the cover is not mounted in the case of cage journeys which follow.

A cage is shown in the patent specification JP 2000-16725, in which the cage electrical system is arranged in part spaces of the cage roof. The cage electrical system is in that case accessible from above by way of hatches for maintenance or the cage electrical system is, for maintenance, accessible from below by folding up the centre zone of the cage roof or from the cage interior. The object of this invention consists in providing a cage roof which does not have any protruding subassemblies of the cage electrical system. The disadvantages of this solution consist in that control of the lift in service operation is not recognisable and that in the case of an open maintenance hatch the cage roof area which can be walked on is small.

The object of the present invention is now to arrange the cage electrical system, which is required for operation of the cage, in such a manner that control of the cage for service operation is possible, that sufficiently large standing areas are present, that it does not cause any additional constructional height, that it can be mounted with low cost and that the risk of accident is reduced as far as possible. In addition, the cage electrical system shall be arranged economically and, for the purpose of maintenance, it shall be accessible in simple, safe and rapid manner.

The solutions defined in the patent claims fulfil this object. As primary function the cage roof closes the passenger space of the cage at the top. It accepts the forces which are required for stiffening the entire cage body. In the case of self-supporting cages the cage roof additionally takes over the necessary force component for transfer of the supporting forces. At the same time it serves for the service personnel as a standing surface in the case of service operations within the shaft. With respect to the passenger space it serves as a carrier of possible roof design elements or itself forms the roof of the cage able to be seen by the passengers. In order to be able to take over these primary functions the cage

roof has to be provided in the requisite strength. For this purpose the cage roof is usually executed in the form of a pan. The height of the pan enables construction, appropriately in strength, of the cage roof in order to be able to ensure the primary functions. The cage roof thereby occupies a cage roof space which is defined by the plan area of the cage roof or of the cage multiplied by the pan height of the cage roof. A part of the thereby created cage roof space is used for arrangement of parts of the cage electrical system. This part of the cage roof space is termed apparatus space.

According to the invention the apparatus space which is used for arrangement of parts of the cage electrical system is now arranged along an outer boundary of the cage roof or along a cage roof edge. The cage roof space has in the region of the cage roof edge the fastening points required for fastening parts of the cage electrical system. The cage roof space given by the construction of the roof is thereby utilised in optimum manner and no additional constructional space is required. The mounting cost for the cage electrical system is substantially reduced, since the cage roof can be wired and equipped with the cage electrical system at the factory in the most suitable environment. The corresponding cost in the field is eliminated and the cost-efficiency of the product is improved particularly also because the cage electrical system can be largely checked with respect to function in the factory.

The apparatus space or the region of the cage roof containing the cage electrical system is preferably arranged along a lateral boundary of the cage roof, wherein this lateral boundary usually extends at right angles to the boundary which is associated with the main cage entrance. The lateral arrangement means that the apparatus space, considered from a floor access, is arranged at the lefthand or righthand boundary edge of the cage roof. The cage roof can thereby be easily walked on, for the purpose of maintenance, with use of a floor entrance, since no large parts of the cage electrical system are arranged in the region of the main entrance opening and the cage roof can thereby be freely walked on. The region of the cage roof which is constructed for accommodation of the cage electrical system is advantageously confined to a region which is less than 1/3 of the corresponding cage dimension or comprises less than 1/3 of the cage roof area. If the cage electrical system is arranged at a lateral boundary of the cage roof, the apparatus space used for accommodation of the cage electrical system advantageously occupies less than 1/3 of the cage width. Due to this arrangement, the rest of the cage roof area has a sufficient standing area in order to be able to offer a

sufficiently large, unified work area for the service specialist.

In the following figures of Fig. 1 to Fig. 3 a possible embodiment of the invention is described by way of example.

Fig. 1 shows an arrangement, by way of example, of a lift installation,

Fig. 2 shows a perspective view of the cage roof with laterally arranged apparatus space and

Fig. 3 shows a detail view of a cage roof with laterally arranged, closed apparatus space and mounted further cage electrical system.

A lift installation 1 consists, as illustrated in Fig. 1 by way of example, of a lift cage 3 which is arranged in a lift shaft 2 to be movable along a substantially vertical axis. The lift cage serves primarily for the movement of persons and/or goods. The lift cage 3 consists of cage floor 4, side walls 5a, 5b, front wall containing a cage entrance 6, back wall and cage roof 7. The access to the lift cage 3 is made possible via at least one cage entrance 6 and via floor entrances 12. If the lift cage 3 has more than one cage entrance 6, a main cage entrance 6a is defined. The lift cage 3 is, in the illustrated example, connected with a counterweight by means of support means and moved by means of a drive. The arrangement of the drive is not critical for this invention and the lift cage can, in addition, be executed in the form of an automotive vehicle.

The cage roof 7 closes the lift cage 3, as shown in Figs. 2 and 3, at the top. The cage roof 7 can be walked on for the purpose of maintenance. In the illustrated example the cage roof has a height h of 7 to 12 centimetres (cm). The lateral boundaries of the cage roof 7 are formed by cage roof edges 7sh, 7sl, 7sr and 7sv. The cage roof 7 is closed towards the passenger space. This side serves for reception of ceiling design elements according to the selection of the customer. The cover, which is usually closed downwardly, upwardly forms, together with the cage roof edges 7sh, 7sl, 7sr and 7sv a pan which has the height h of the cage cover. This pan forms a cage roof space which corresponds with the product of height h, width b times depth t (h x b x t). This cage roof space is divided up into part spaces. An apparatus space 7a is, according to the invention, arranged along a cage roof edge 7sh, 7sl, 7sr or 7sv or along an outer boundary of the cage roof 7. The apparatus

space 7a can in that case, depending on the mode of construction of the cage roof 7, be selectably arranged along a rear cage roof edge 7sh, along a front cage roof edge 7sv or along a lateral cage roof edge 7sl, 7sr. Parts of the cage electrical system 8 required for operation of the cage are arranged in the apparatus space 7a. The cage electrical system 8 contains, for example, apparatus and installations such as cage computer 8c, which ensures the data communication from the cage to the lift control, door computer 8a, which checks the safety status of the door, communications elements 8d, which, for example, serve for alarm transmission, terminals and cable plug positions, as well as stowage space for excess lengths of cables or energy supply units, etc. Similarly, control elements 8b which serve for control of the lift in the service operation are arranged in the apparatus space 7a in correspondence with requirements.

The disposition of the apparatus space 7a for arrangement of the cage electrical system along an outer boundary of the cage roof allows an economic construction of the cage electrical system 8, since own boxes do not have to be used. The rest of the cage roof space can advantageously be used for stiffening the cage roof or for accommodation of cage lighting, etc. The arrangement of the cage electrical system (8) in the apparatus space (7a) allows an optimum and economic manufacture of the entire cage roof 7 at the factory. It can be wired and checked there as a unit. Mounting at the construction site is thereby optimised and the susceptibility to error due to erroneous wiring is reduced.

In an advantageous embodiment the apparatus space 7a used for arrangement of parts of the cage electrical system 8 is arranged along a lateral boundary 7sl, 7sr of the cage roof, wherein this lateral boundary 7sl, 7sr extends at right angles to the boundary associated with the main cage entrance 6a. The apparatus space 7a, which from the viewing direction of the main entrance 6a to the cage 3 or to the cage roof is arranged to the left of 7sl or to the right of 7sr along a lateral boundary line of the cage roof, for reception of the cage electrical system 8 fulfils the criterion of easy accessibility. Walking on the cage roof 7 is possible without obstruction and risk of accident is reduced.

In an example, the apparatus space 7a used for arrangement of parts of the cage electrical system 8 occupies less than 1/3 of the cage roof area. A sufficiently large residual area of the cage roof 7 therefore remains available to provide a required work standing surface for the service engineer. In the example shown in Fig. 2 the apparatus space 7a for installation of the cage electrical system 8 extends substantially over the

entire depth t of the cage and requires, in width, approximately 1/4 of the cage width or approximately 100 mm to 300 mm. These dimensions offer sufficient space for arrangement of the cage electrical system 8 and at the same time enable an optimum construction, which is appropriate to strength, of the cage roof 7.

The apparatus space 7a receiving the cage electrical system 8 can be covered by a cover 9. The cover 9 is advantageously fixedly connected with the cage roof 7 by means of a joint along one side. The cover 9 can be opened by means of a pivot motion, as shown in Fig. 2. The cage electrical system 8 is thereby protected in the closed state of the cover 9c and is easily and safely accessible in the opened state 90 for the purpose of maintenance. Moreover, the cover 9 forms a direct protection of the cage electrical system 8 during transport of the cage roof 7 from the factory to the construction site. Other forms of opening such as, for example, a slidable cover 9 or a removable cover 9 are equally possible according to the choice of the manufacturer.

The closed position of the cover (9) is advantageously monitored electrically. The monitoring prevents release of the lift installation 1 for normal operation as long as the cover 9 is not disposed in the closed setting. The safety for maintenance specialists is thereby additionally increased. In the case of need the cover 9 can be locked in the closed setting 9c. This prevents improper access to the cage electrical system 8 and thus precludes, inter alia, vandalism and damage.

The cover 9 is advantageously constructed to be able to be walked on. It has the stiffness necessary for this purpose and in the case of need is executed with a slip-proof structure, such as, for example, a grooved plate as defined in the standard DIN 59220. The service specialist can use the surface formed by the roof as an additional standing surface. It is constructed to be slip-resistant and tread-safe. In addition, the cover 9 in the closed state is advantageously arranged in one plane with respect to the rest of the cage roof. The service specialist thereby has, when the lid 9 is closed, the entire cage roof area 7 available as a work platform and he or she can carry out the service operations, which are required in the shaft, safely and in a convenient standing position. Since the closed lid does not form a step to the rest of the cage roof the risk of an accident as a consequence of tripping is reduced.

In Fig. 3 it is apparent that the rest of the cage plan area is used for arrangement of an

emergency escape 10. The illustrated arrangement of an emergency escape 10 allows safe evacuation of passengers, who are trapped in the lift cage, by way of the cage roof 7. Such an emergency escape is desired in specific cases by, for example, the lift standard EN-81.

As apparent in Figs. 2 and 3, the cover 9 used for covering the cage electrical system (8) has a cut-out 9a which enables access to control elements 8b or other elements, which are required for the service operation, without the cover 9 having to be opened. A service of the lift installation, in particular inspection of the shaft space, can thereby be carried out quickly. Dangerous states are avoided, since the current-conducting parts of the cage electrical system 8 remain covered. This arrangement of the control elements 8b in the apparatus space 7a similarly allows an optimum and economic manufacture of the entire cage roof 7 at the factory. It can be largely wired and checked there as a unit. Mounting at the construction site is thereby optimised and the susceptibility to error by erroneous wiring is reduced.

A further cage electrical system 11, which due to function or for operational reasons is mounted outside the apparatus space 7a, is arranged along a cage roof edge 7sh, 7sl, 7sr, 7sv. The further cage electrical system 11 contains, for example, parts which serve for the direct control or drive 11b of a cage door and/or lighting elements 11a which serve for illumination of the service region for the service specialist and/or monitoring elements 11c which in the case of presence of persons on the cage roof interrupt normal operation of the lift installation. This arrangement possibility is particularly advantageous, since the apparatus can be arranged in a suitable position in correspondence with its function and the arrangement along a cage roof edge has an insignificant influence on the standing area for the service personnel. As an ideal mounting installation use is made of the cage boundary 7sv defined by a door drive 13. Above all, the further cage electrical system 11b serving for drive of the door is thus arranged appropriately to function in the vicinity of its use location.

With knowledge of the present invention the expert can change as desired the set magnitudes and arrangements. For example, the expert can make multiple subdivision of the cage roof space, the expert can provide further part regions with a cover in correspondence with purpose or the apparatus space can, in the case of the lateral arrangement, extend only over a part region of the cage depth.

Patent Claims

1. A lift installation (1) with a lift cage (3), which is movable in a lift shaft (2) and substantially consists of a cage floor (4), side walls (5a, 5b), at least one cage entrance (6) and a cage roof (7), wherein the cage roof (7) has an apparatus space (7a), which is integrated in the cage roof and which is used for arrangement of parts of the cage electrical system (8), characterised in that the apparatus space (7a) is arranged along an outer boundary of the cage roof or along a cage roof edge (7sh, 7sl, 7sr, 7sv).

2. Lift installation according to claim 1, characterised in that the apparatus space (7a) is arranged along a lateral boundary of the cage roof (7sl, 7sr), wherein this lateral boundary extends at right angles to the boundary associated with the main cage entrance (6a).

3. Lift installation according to any one of the preceding claims, characterised in that the apparatus space (7a) occupies less than 1/3 of the cage roof area.

4. Lift installation according to any one of the preceding claims, characterised in that the apparatus space (7a) is covered by a cover (9) which is openable by means of pivoting or sliding or is removable.

5. Lift installation according to one of claims 4 and 5, characterised in that the cover (9) used for covering the cage electrical system (8) forms in closed state (9c) a planar surface with the adjoining cage roof area and/or that the cover (9) is constructed to be able to be walked on.

6. Lift installation according to claim 4, characterised in that the cover (9) used for covering the cage electrical system (8) has a cut-out (9a) enabling access to control elements (8b) or other elements, which are required for service operation, without the cover (9) having to be opened.

7. Lift installation according to any one of the preceding claims, characterised in that a further cage electrical system (11), which is to be mounted outside the apparatus space (7) due to function or for operational reasons, is arranged along a cage roof edge (7sh, 7sl, 7sr, 7sv).

8. Lift installation according to any one of the preceding claims, characterised in that the cage electronic system (8) in particular comprises parts which enable data exchange (8c) between cage and lift control and/or comprises parts which check the safety status of the door (8d) and/or comprises parts serving for alarm communication (8a) and/or comprises control elements (8) serving for service operation of the lift installation (1) and/or can receive excess lengths of cable.

9. Lift installation according to any one of the preceding claims, characterised in that the control elements (8b) comprise parts or control elements which serve for control of the lift (1) in service operation and/or enable switching over from normal to service operation and/or enable connection of service tools.

10. Lift installation according to any one of the preceding claims, characterised in that the further cage electrical system (11) comprises parts serving for direct control (11b) or drive of a cage door and/or comprises lighting elements (11a) serving for illuminating the service region for the service specialist and/or comprise monitoring elements (11c) which in the case of presence of persons on the cage roof interrupt normal operation of the lift.

11. A method of mounting a lift installation (1), with a lift cage (3) which is movable in a lift shaft (2) and which substantially consists of a cage floor (4), side walls (5a, 5b), at least one cage entrance (6) and a cage roof (7), wherein the cage roof has an apparatus space (7a) which is integrated in a cage roof and is used for arrangement of parts of the cage electrical system (8), characterised in that parts of the cage electrical system (8) are arranged in an apparatus space (7a) which is arranged along an outer boundary of the cage roof or along a cage roof edge (7sh, 7sl, 7sr, 7sv).

Abstract

The cage electrical system (8), such as cage computer, terminals, communication apparatus, etc., required at the cage (3) is integrated in an apparatus space (7a) integrated in the cage roof (7). The apparatus space (7a) is arranged along a cage roof edge (7s). The constructional height (h) required for stiffening the cage roof (7) is appropriately utilised. The cage electrical system (8) is accessible by means of a pivotable cover (9) for the purpose of service. At the same time the cover (9) in closed state forms a standing surface which can be used for servicing the shaft.

[Fig. 2]

Claims amended
Received at the International Bureau on August 20, 2004 (20.08.05)
Initial claims 1 and 11 replaced by amended claims 1 and 11 (2 pages

Patent Claims

1. A lift installation (1) with a lift cage (3), which is movable in a lift shaft (2) and substantially consists of a cage floor (4), side walls (5a, 5b), at least one cage entrance (6) and a cage roof (7), wherein the cage roof (7) has an apparatus space (7a), which is integrated in the cage roof and which is used for arrangement of parts of the cage electrical system (8), characterised in that the apparatus space (7a) occupies a part region of the cage roof (7), which is arranged along an outer boundary of the cage roof or along a cage roof edge (7sh, 7sl, 7sr, 7sv).

2. Lift installation according to claim 1, characterised in that the apparatus space (7a) is arranged along a lateral boundary of the cage roof (7sl, 7sr), wherein this lateral boundary extends at right angles to the boundary associated with the main cage entrance (6a).

3. Lift installation according to any one of the preceding claims, characterised in that the apparatus space (7a) occupies less than 1/3 of the cage roof area.

4. Lift installation according to any one of the preceding claims, characterised in that the apparatus space (7a) is covered by a cover (9) which is openable by means of pivoting or sliding or is removable.

Claims amended
Received at the International Bureau on August 20, 2004 (20.08.05)
Initial claims 1 and 11 replaced by amended claims 1 and 11 (2 pages

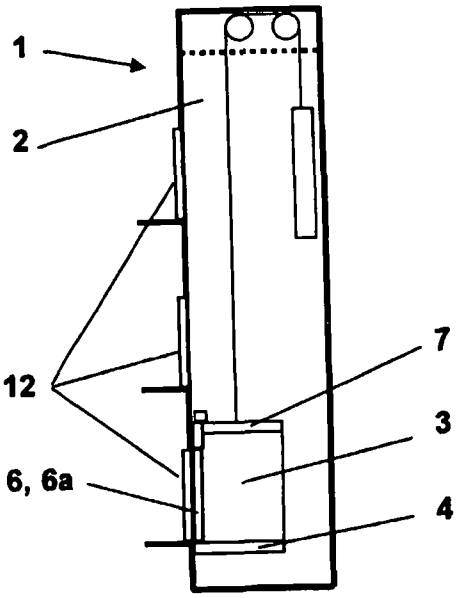
9. Lift installation according to any one of the preceding claims, characterised in that the control elements (8b) comprise parts or control elements which serve for control of the lift (1) in service operation and/or enable switching over from normal to service operation and/or enable connection of service tools.

10. Lift installation according to any one of the preceding claims, characterised in that the further cage electrical system (11) comprises parts serving for direct control (11b) or drive of a cage door and/or comprises lighting elements (11a) serving for illuminating the service region for the service specialist and/or comprise monitoring elements (11c) which in the case of presence of persons on the cage roof interrupt normal operation of the lift.

11. A method of mounting a lift installation (1), with a lift cage (3) which is movable in a lift shaft (2) and which substantially consists of a cage floor (4), side walls (5a, 5b), at least one cage entrance (6) and a cage roof (7), wherein the cage roof has an apparatus space (7a) which is integrated in a cage roof and is used for arrangement of parts of the cage electrical system (8), characterised in that parts of the cage electrical system (8) are arranged in an apparatus space (7a) which is arranged in a part region of the cage roof (7), along an outer boundary of the cage roof or along a cage roof edge (7sh, 7sl, 7sr, 7sv).

Figuren

Fig. 1



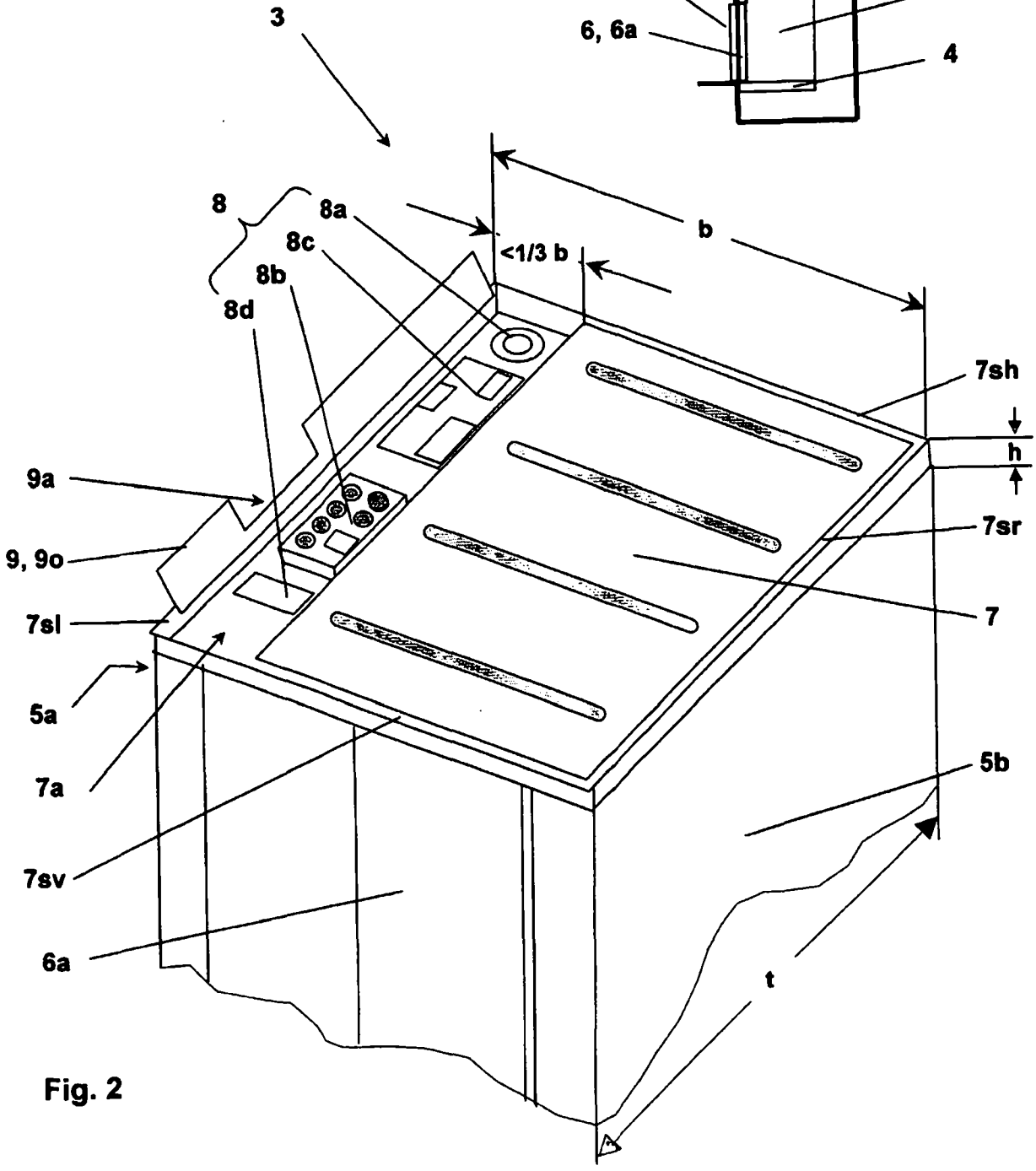


Fig. 2

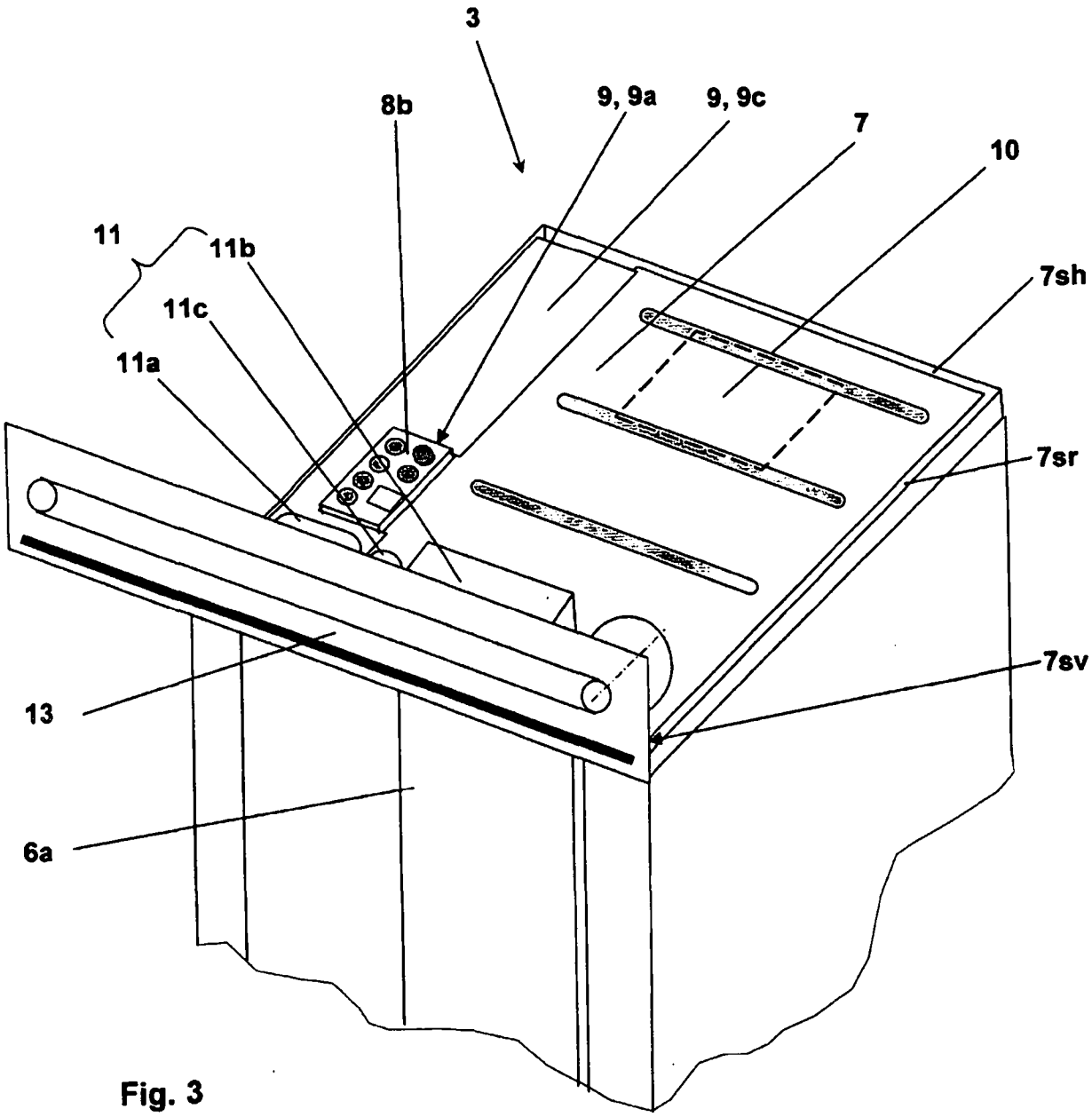


Fig. 3