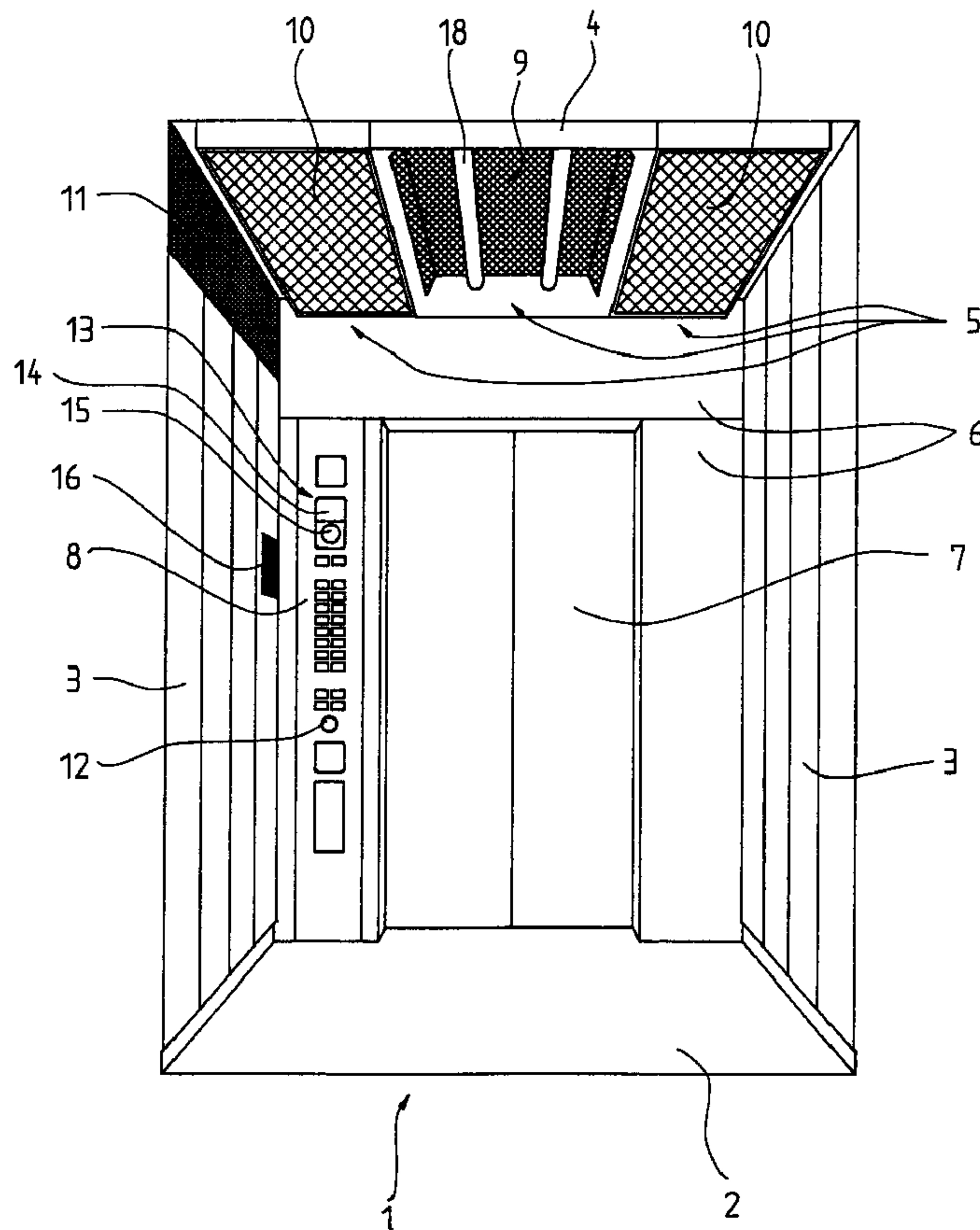




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(54) Titre : ECLAIRAGE DE SECOURS DANS DES CABINES D'ASCENSEUR CONTENANT DES MATIERES PHOSPHORESCENTES
 (54) Title: EMERGENCY LIGHTING IN ELEVATOR CARS WITH PHOSPHORESCENT MATERIALS



(57) Abrégé/Abstract:

The interior of an elevator car is equipped with phosphorescent components which serve as emergency lighting in the case of power failure, and for giving the alarm it contains relevant operating elements which have phosphorescent coatings or are made of materials with phosphorescent additives.

Abstract

The interior of an elevator car is equipped with phosphorescent components which serve as emergency lighting in the case of power failure, and for giving the alarm it contains relevant operating elements which have phosphorescent coatings or are made of materials with phosphorescent additives.

10 (Fig. 1)

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**Emergency Lighting in Elevator Cars
5 with Phosphorescent Materials**

Description

The present invention relates to a device to assure
10 adequate emergency lighting, as well as sufficient
visibility of alarm operating elements and instruction
plates, in cars of passenger and freight elevators in case
of power failure. Emergency lighting is necessary because,
when there is a power failure, the elevator car can come
15 to rest in a position where the passengers cannot leave it
and remain trapped until the arrival of specialist
assistance.

Most national and international elevator standards (as for
20 example EN-81) require elevator installations to have
emergency car lighting which switches on automatically if
power failure occurs and which, being powered by a
battery, guarantees a minimal level of lighting in the car
for at least 1 hour.

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US 3,808,499 describes a battery-powered emergency supply
unit for emergency lighting systems in elevator cars with
functions according to the invention such as charge
voltage monitoring, charge level monitoring, charging rate
30 control, power failure simulation, etc. Such, or similar,

emergency lighting systems are nowadays built into practically all elevator cars.

Emergency lighting systems of the type described have a number of disadvantages. To keep their costs and installed weight low, their capacity is usually designed for the prescribed minimum power rating of 1 watt which must be delivered for a period of one hour. The resulting intensity of illumination is adequate to enable operation of certain devices such as an alarm button or intercom, but is often insufficient to prevent feelings of panic in passengers who are so disposed. Reading during the time of waiting until the elevator is released is practically impossible. In a fully occupied car, spreading of the light from the light source, which is usually in the form of a point, is usually hindered by passengers. Moreover, it can never be entirely ruled out that the emergency lighting device does not function when there is a power failure, especially since the emergency lamp can be relatively easily put out of action by vandals. In such a situation the passenger can neither read the relevant instruction plates, nor discern the alarm button or an intercom. Further disadvantages are that the status of these systems must be periodically checked, and that the batteries contained in them must be disposed of in a costly manner.

The subject of the present invention is an emergency lighting device for elevator cars which fulfils the requirements specified in the regulations and does not have the disadvantages mentioned.

According to the invention, this is achieved by affixing in the interior of such elevator cars in suitable positions phosphorescent materials in a suitable manner and in sufficient quantity. These are activated during operation of the elevator by the normal car lighting and, should this fail, the energy they have absorbed is emitted again in the form of visible light. This emission takes place in such a manner that the desired lighting effect is maintained for a period of more than an hour. An emergency lighting device according to the invention contains phosphorescent components with large area in the form of plastic foil parts, foils, or coats of paint (acrylic emulsion), which contain phosphorescent pigments as, for example, inorganic polycrystalline zinc sulfide.

By comparison with the prior art mentioned, this type of emergency lighting has considerable advantages.

Firstly, the phosphorescent sources of light with large surface achieve a much more even illumination of the elevator car than the usual 1-watt emergency lighting lamps in the form of a point. As already mentioned, this is especially the case when the car is fully occupied with passengers. Secondly, with modern fluorescent materials the rate of diminution of the light intensity is such that even after 3 hours enough light is emitted to prevent the occurrence of feelings of panic resulting from darkness. A third advantage is that emergency lighting of this type is extremely unsusceptible to faults, because it functions without wearing and does not depend on an emergency power

supply. The phosphorescent materials which are used permit a practically unlimited number of activation and emission cycles. No periodic check such as is required for emergency lighting with lamp and emergency power supply is required for this system. A further significant aspect is that a system of this type with phosphorescent components can be less easily put out of action by vandals than the emergency lighting lamps which are usually used.

There is separate inventive content in the phosphorescing construction of parts such as emergency instruction plate, alarm button, and intercom. The advantage of such a construction is that these components are still legible or discernible even after several hours of power failure when the emission of light from the large surface of phosphorescent components serving as emergency lighting is no longer sufficient for this purpose.

Accordingly, in one aspect the invention resides in an elevator car comprising a lighting installation for normal operation and an emergency lighting, wherein an interior of the elevator car has in suitable positions at least one of phosphorescent surfaces and phosphorescent components having a total area selected to provide for a limited period of time, a preselected minimum luminous intensity selected to provide said emergency lighting to said interior.

In another aspect, the present invention resides in an elevator car comprising a lighting installation for normal operation and an emergency lighting, wherein an interior of the elevator car has in suitable positions at least one of phosphorescent surfaces and phosphorescent components having a total area selected to provide for a limited period of time, a preselected minimum luminous intensity sufficient

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for substantially illuminating a whole of the elevator car interior to provide said emergency lighting to said interior.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is described in more detail below by reference to a drawing.

Figure 1 shows the interior of a passenger elevator car according to the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Figure 1 shows the interior of a passenger elevator car (1)

according to the invention viewed from the rear wall (not visible) toward the car entrance. An elevator car consists essentially of a rigid car floor (2), two side walls (3), a rear wall, a car roof (4) with integral lighting (5), a car front (6) with automatic car doors (7) and an operating and display panel (8). In Fig. 1 the following phosphorescent components with large surface which form part of the emergency lighting can be seen: the reflectors (9) belonging to the lighting device (5) integrated into the car roof and the lamp covers (10) which are described in more detail in the description of Fig. 2, as well as a lighting surface (11) at the upper edge of the left-hand car wall, which consists of either a self-adhesive phosphorescent PVC foil or of a coat of emulsion paint containing a phosphorescent pigment. Also shown in Fig. 1, and built into the operating and display panel (8), are the alarm button (12) and the intercom (13) with microphone (14) and activating button (15), all of which are marked with phosphorescent coatings in such a manner that after a power failure they are still discernible for several hours. The instruction plate (16) for breakdowns either has phosphorescent characters on a usual plate, or usual characters on a phosphorescent plate, and in case of power failure can therefore still be read after several hours.

Fig. 2 shows in detail the lighting device (5) integrated in the car roof. Fastened to the car roof with bolts (17) is a reflector (9) which also serves as mounting for the fluorescent tubes (18). This reflector is coated with a coat of emulsion paint which contains phosphorescent pigments. Below the fluorescent tubes and held by the reflector (9) with snap connectors (19) are lamp covers (10) which are made of a transparent plastic material which also contains phosphorescent pigments. These lamp covers (10) can be constructed as decorative elements with a wide range of different shapes, for instance as a closed diffuser

(10.1) or as a grille (10.2). With the arrangement described here of the phosphorescent elements immediately adjacent to the fluorescent tubes, their phosphorescent pigments are optimally activated which is extremely important for prolonged luminescence in case of power failure.

It goes without saying that the present list of possible constructions of the phosphorescent components, as well as the positions in which they are affixed and the ways in which they are fastened, is not definitive.

We claim:

1. An elevator car comprising a lighting installation for normal operation and an emergency lighting, wherein an interior of the elevator car has in suitable positions at least one of phosphorescent surfaces and phosphorescent components having a total area selected to provide for a limited period of time, a preselected minimum luminous intensity sufficient for substantially illuminating a whole of the elevator car interior to provide said emergency lighting to said interior.
2. The elevator car according to Claim 1 containing one or more alarm devices characterized in that operating elements serving to give the alarm are coated with phosphorescent materials or consist of materials which contain phosphorescent additives.
3. The elevator car according to Claim 1 characterized in that instruction plates important in the case of a breakdown have either phosphorescent characters on a usual plate or have usual characters on a phosphorescent plate.
4. The elevator car according to Claim 1 characterized in that the phosphorescent surfaces consist of self-adhesive plastic foils containing phosphorescent pigments.
5. The elevator car according to Claim 1 characterized in that the phosphorescent surfaces have a coat of paint which contains phosphorescent pigments.

6. The elevator car according to Claim 1 characterized in that the lighting installation comprises a fluorescent tube, and a reflector disposed above the fluorescent tube which consists of phosphorescent plastic foils or has a coat of paint which contains phosphorescent pigments.

7. The elevator car according to Claim 1 characterized in that the lighting installation comprises a fluorescent tube, and a light grille or a transparent cover disposed below the fluorescent tube which is made of material, or has a coat of paint, which contains phosphorescent pigments.

Fig. 1

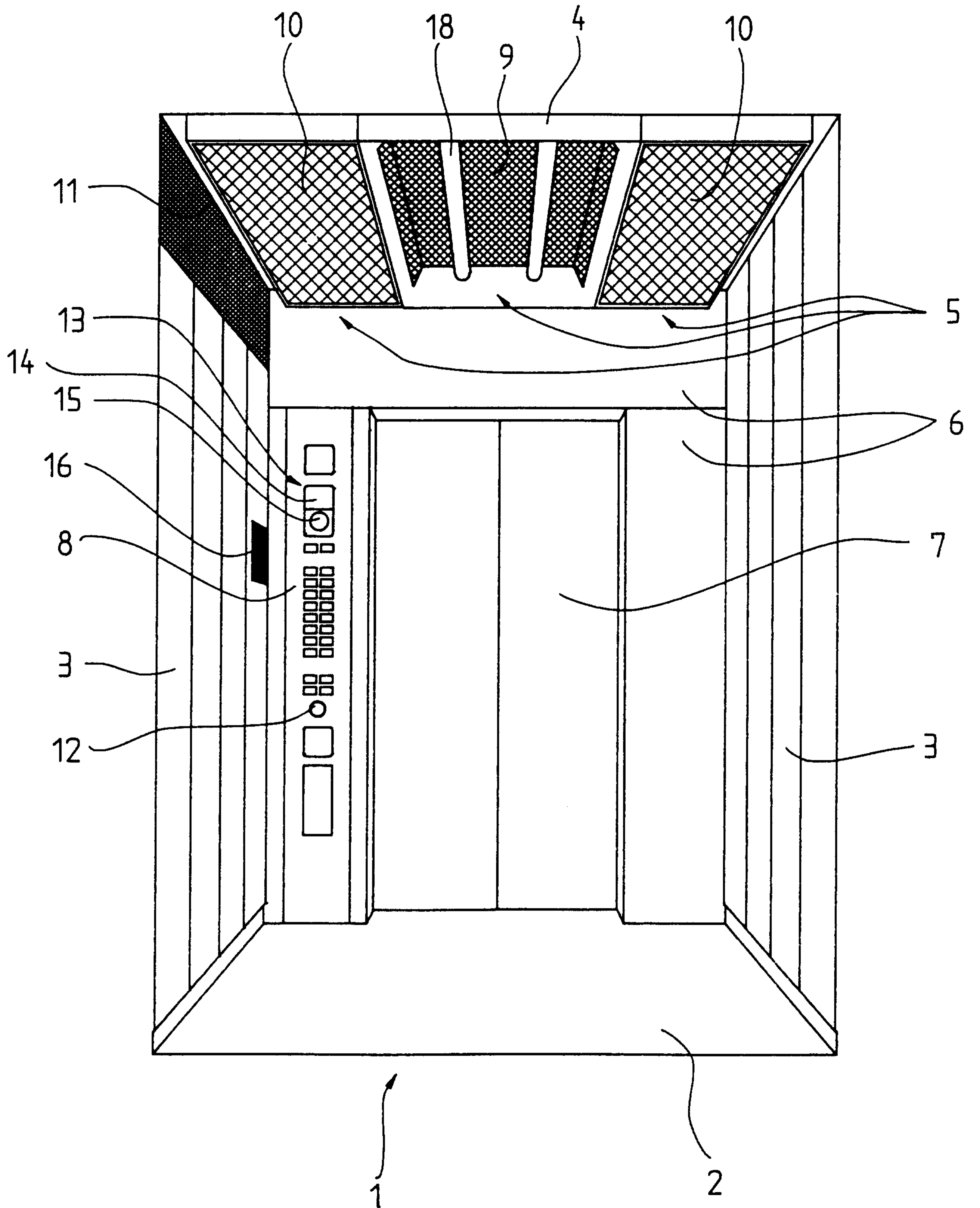


Fig. 2

