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Mass transit passenger vehicle and method for displaying images on such a vehicle

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The mass transit passenger vehicle (2) according to the invention comprises a body (4) provided with at least one lateral opening (42-46) for passengers to enter/exit as well as windows (12-20) positioned over the length of the vehicle, except at the lateral opening. The vehicle is equipped, on at least one side, with moving display panels (102, 104) positioned above the windows (12-20).

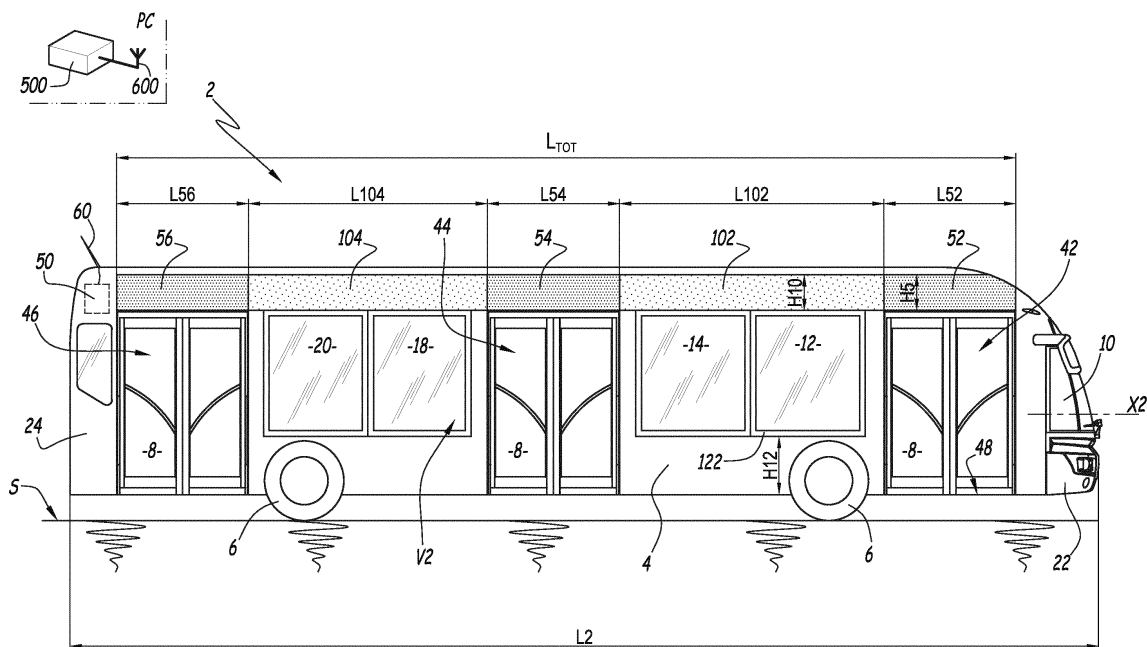


Fig.1

Description

[0001] The invention relates to a mass transit passenger vehicle as used in the context of the public transportation system. Such a vehicle may be a bus, tram, trolley coach or equivalent means.

[0002] It is known to equip a bus with advertising display panels positioned below the fixed windows of the bus, on those left and right sides. Such panels, on which paper advertising panels are fixed, are relatively difficult to see when the bus is in traffic and traveling in a traffic lane, while other vehicles are present in the adjacent traffic lanes. When the bus is stopped at a passenger pick-up/drop-off station, said passengers conceal the advertising panels if they are located on the sides of the lateral openings through which they enter or leave the bus. Furthermore, in order for these advertising panels to have a sufficient height to be visible from a distance, the lower edge of the windows of the bus must be situated at a relatively significant height with respect to its floor. This limits the natural light in the passenger compartment of the bus.

[0003] It is also known to at least temporarily cover a bus with a trim, for example on the occasion of a sporting event or for a promotional campaign. In that case, the entire outer surface of the bus is covered, including its windows, which are partially concealed, thereby making the passenger compartment of the bus darker. Furthermore, a complete trim of the bus is static, i.e., it only makes it possible to show a stationary image or group of images.

[0004] The invention aims more particularly to resolve these drawbacks by proposing a new mass transit passenger vehicle that makes it possible to display messages dynamically, whether those messages are informative or promotional, particularly effectively.

[0005] To that end, the invention relates to a mass transit passenger vehicle, said vehicle comprising a body provided with at least one lateral opening for passengers to enter/exit as well as windows positioned over the length of the vehicle, except at the lateral opening. According to the invention, this vehicle is equipped, on at least one side, with moving display panels positioned above the windows.

[0006] Owing to the invention, the moving display panels make it possible to broadcast a promotional or informational message that changes over time. This message may be a film or a sequence of animated images. Since the display panels are positioned above the windows, they are visible from far away, even when the sides of the bus are hidden by people or vehicles located nearby. Furthermore, these panels do not limit the driver's visibility behind and on the sides of the bus.

[0007] Since the windows are not covered by the display panels, which are located above said windows, the panels do not limit the lighting inside the bus. Inasmuch as promotional or informational display screens are provided on the sides of the bus, above the windows, the

operator of the bus system, which generally seeks to have an advertising medium, does not need an advertising panel in the lower portion of the windows. It is therefore possible for the lower edge of the windows to be lower relative to the known buses, which increases the glass surface and the inside lighting of the passenger compartment.

[0008] According to advantageous but optional aspects of the invention, such a vehicle may incorporate one or more of the following features, considered in any technically allowable combination:

- The ratio between the total length of the display panels and any displays positioned above the lateral opening, measured parallel to a front/back direction of the vehicle, on the one hand, and the total length of the vehicle, on the other hand, is comprised between 0.75 and 1, preferably between 0.85 and 0.95.
- The total length of the display panels, measured parallel to a front/back direction of the bus, is greater than 10 m.
- The display panels are of the light-emitting diode (LED) type.
- The panels are capable of displaying images coming from a video signal.
- The ratio between the height of the display panel measured vertically on the one hand, and the length of that panel measured parallel to a front/back direction of the bus on the other hand, is comprised between 0.04 and 0.15, preferably between 0.05 and 0.13.
- The elevation of the lower edge of a window, above which a moving display panel is positioned, relative to the floor of the vehicle is comprised between 540 and 580 mm.
- The vehicle is equipped with moving display panels on both of its sides, above all of its windows.
- The vehicle is equipped with at least one display positioned above the lateral opening. In that case, it is possible to provide that the moving display panels and displays are juxtaposed in a front/back direction of the vehicle. It is further possible to provide that the moving display panels and the display have the same height.
- The moving display panels also extend above the opening.
- The vehicle comprises at least one onboard electronic unit for controlling at least one moving display panel. Advantageously, wireless connection means are provided between the onboard electronic unit and a central unit capable of controlling the onboard electronic units on several vehicles.

[0009] The invention also relates to a display method that can be implemented with the vehicle as mentioned above and, more specifically, a method that comprises at least the following steps:

- a) determining whether the vehicle is stopped or moving;
- b) displaying a first series of images when the vehicle is stopped;
- c) displaying a second series of images when the vehicle is moving.

[0010] The invention will be better understood and other advantages thereof will appear more clearly in light of the following ascription of one embodiment of a vehicle and a display method according to its principle, provided solely as an example and done in reference to the appended drawings, in which:

- figure 1 is a right side view of a bus according to the invention, and
- figure 2 is a left side view of the bus of figure 1.

[0011] The bus 2 shown in figure 1 extends longitudinally along an axis X2 that corresponds to a front/back direction, along which the bus progresses as it moves. A driver's area (not shown) is provided at the front end 22 of the bus 2. The rear end of the bus is denoted 24. The bus comprises a body 4 that rests by wheels 6 on the surface of the ground S and that defines the inner volume V2 of the bus 2, i.e., its passenger compartment.

[0012] The bus 2 is equipped with three double doors 8 distributed over its length, on its right side shown in figure 1. In practice, in light of the direction of travel of buses in continental Europe, the doors are provided only on the right side. Alternatively, if the bus is to be used in a country where driving is done on the left, the doors may be provided on only the left side.

[0013] The doors 8 are provided at three openings 42, 44 and 46 respectively formed in the body 4 to provide access to the volume V2, at the front, in the middle or intermediate area, and at the rear of the bus 2, respectively.

[0014] In front of the front door 8 positioned in the front opening 42, the bus 2 is equipped with a windshield 10. Between the front and intermediate doors 8, positioned in the openings 42 and 44, the bus 2 is equipped, on the right side, with fixed lateral windows 12 and 14. Between the intermediate and rear doors 8, positioned in the openings 44 and 46, the bus is equipped, also on the right side, with fixed windows 18 and 20.

[0015] On the left side, the bus is equipped with several fixed windows 32, 34, 36, 38, 40 and 42, which follow one another, from front to back, along the axis X2, as well as a door 42 for accessing the driver's area, positioned at the front end 22.

[0016] Above the front door 8, there is a display 52, for example of the pivoting pixel type, which makes it possible to communicate information regarding the line served by the bus 2, its final destination or some of the stations served. Two displays 54 and 56, of the same type as the display 52, are respectively positioned above the openings 44 and 46 of the intermediate and rear doors

8. These displays 52 to 56 are sometimes called "vane displays".

[0017] According to the invention, a moving display panel 102 is positioned in the upper part of the body 4 on its right side, above the windows 12 and 14, between the displays 52 and 54 along the axis X2. Likewise, a display panel 104 is positioned above the windows 18 and 20 between the displays 54 and 56, along the axis X2.

[0018] On the left side, a display panel 202 is inserted in the upper part of the body 4, above the windows 32 to 36 and partially above the door 42. Likewise, a display panel 204 is installed in the upper part of the body 4, above the windows 38 to 40.

[0019] Each of the panels 102, 104, 202 and 204 makes it possible to display an image that moves over time, for example coming from a video signal. In this sense, the panels 102, 104, 202 and 204 are moving display panels. The panels 102, 104, 202 and 204 all use the same technology. In practice, these are light-emitting diode (LED) panels.

[0020] L2 denotes the length of the bus 2 along the axis X2.

[0021] L102, L104, L202 and L204 denote the length of the panels 102, 104, 202 and 204 measured parallel to the axis X2.

[0022] L52, L54 and L56 also denote the lengths of the displays 52, 54 and 56 measured parallel to the axis X2.

[0023] On the right side, the total length L_{TOT} of the display means is equal to the sum of the lengths $L52 + L102 + L54 + L104 + L56$. On the left side, the total length L'_{TOT} of the display means is equal to the sum of the lengths L202 and L204 and a play J is chosen to be smaller than 100 mm, preferably smaller than 60 mm. A play of the same magnitude is used on the right side.

[0024] These lengths L_{TOT} and L'_{TOT} represent between 75 and 100% of the length L2, preferably between 85 and 95% of that length. In other words, a display band is made up of the elements 52, 102, 54, 104 and 56, on the right side, both above the openings 42, 44 and 46 and above the windows 12, 14, 18 and 20, whereas on the left side, a display band is made up of the panels 202 and 204 above the windows 32 to 40, and partially above the door 42.

[0025] H5 denotes the height of the panels 52, 54 and 56 measured in a vertical direction, the height of these different panels being the same. H10 denotes the height of the panels 102 and 104 also measured in a vertical direction, which is the same for both of those panels.

[0026] The heights H5 and H10 are equal, such that the displays 52, 54 and 56 and the display panels 102 and 104 form a band with a constant height, in the upper part of the body 4 and on the right side.

[0027] H20 denotes the height of the panels 202 and 204, which is the same for both panels. These two panels constitute a band with a constant height over the length of the bus 2, in the upper part of the left side of the body 4.

[0028] The ratios $H10/L102$, $H10/L104$, $H20/L202$ and $H20/L204$ are comprised between 0.04 and 0.15, pref-

erably between 0.05 and 0.13.

[0029] In practice, the heights H10 and H20 are comprised between 200 and 300 mm, which gives the moving display panels sufficient visibility for the images that they display to be readable from several meters away.

[0030] Also in practice, the lengths L104 and L102 are comprised between 2.50 m and 5 m.

[0031] Each moving display panel is equipped with connection sockets for connecting a cable conveying a video or similar signal. These sockets may be of the RJ45, HDMI, or equivalent type.

[0032] Since the bus 2 has no advertising panels in its lower part, below the fixed windows 12, 14, 18, 20 and 32 to 40, it is possible to lower the lower edge of those windows. The lower edge of the fixed window 12 is denoted 122. H12 denotes the elevation, i.e., the vertical height, of the edge 122 relative to the floor 48 of the bus 2. This height H12 is comprised between 540 and 580 mm. In practice, the lower edges of the fixed windows 12 and 14 are aligned, as are the lower edges of the fixed windows 18 and 20 and the lower edges of the fixed windows 32 to 40. They have a height relative to the floor of the same order of magnitude as the height H12.

[0033] Since this height H12 is substantially lower than that of the known buses, such that the outside of the bus is not cluttered by fixed advertising panels positioned below the windows, the windows have a larger surface area, which improves the natural light of the volume V2.

[0034] The bus 2 also comprises an electronic unit supported by the body 4 and which is connected to the displays 52 to 56 and to the display panels 102, 104, 202 and 204 by wired connections (not shown). Alternatively, the connection between the unit 50 and the display means may be wireless.

[0035] The unit 50 makes it possible to control each display 52 to 56 to display the line or stations served by the bus 2. The unit 50 also makes it possible to control the display panels 102, 104, 202 and 204 to broadcast advertising or informational messages when the bus travels through the town.

[0036] It is also possible to provide that, at least on the right side, when the bus reaches a passenger pick-up/drop-off station, the display panels 102 and 104 are converted so as also to display information relative to the line followed by the bus 2, for example the list of stations served. In other words, the display panels 102 and 104 display a first series of informative images when the vehicle is stopped, i.e., when the vehicle is at a passenger pickup/drop-off station, where that first series of images may pertain to the line served by the bus. In that case, out of a concern for harmonization, it is possible to provide that the displays 52 to 56 are done using the same technology as the panels 102, 104, 202 and 204.

[0037] When the bus is moving between two stations, including when it is stopped at a red light, the display panels 102 and 104 may display a second series of images containing other information, for example promotional information.

[0038] The unit 50 is connected to an antenna 60 provided on the bus 2 to communicate with a central processing unit 500 integrated into a control station PC and which in turn is equipped with an antenna 600 making it possible to create a wireless connection with the antenna 60.

[0039] It is thus possible to control the messages displayed on the moving display panels 102, 104, 202 and 204 remotely from the control station PC.

[0040] Thus, in case of national holiday or special event, it is possible to broadcast a same message on the moving display panels of different buses in a system. For example, in the case of buses traveling throughout a town where the soccer team is playing a home game, it is possible to display an encouraging message that team on all of the moving display panels 102, 104, 202 and 204 of the buses in the system.

[0041] Alternatively, the windows 12 to 20 and 32 to 40 are not fixed, but open, at least partially.

[0042] According to another alternative, all or some of the displays 52 to 56 may be omitted. In that case, the moving display panels 102 and 104 also extend above the openings 42, 44 and/or 46.

[0043] The invention has been shown in the case where both the right and left sides of the bus 2 are equipped with moving display panels 102, 104, 202 and 204. Alternatively, such moving display panels are provided on a single side of the bus 2. This is particularly the case when the law of the country where the bus runs forbids to show commercials on the side of the vehicles crossed by bus 2, that is to say, on the left in continental Europe.

[0044] The invention is applicable to other mass transit vehicles, in particular a tram, trolley or equivalent means.

[0045] The embodiments and alternatives described above may be combined with each other to create new embodiments.

Claims

1. A mass transit passenger vehicle (2), said vehicle comprising a body (4) provided with at least one lateral opening (42-46) for passengers to enter/exit as well as windows (12-20, 32-40) positioned over the length of the vehicle, except at the lateral opening, **characterized in that** the vehicle is equipped, on at least one side, with moving display panels (102, 104, 202, 204) positioned above the windows (12-20, 32-40).
2. The vehicle according to claim 1, **characterized in that** the ratio between the total length (L_{TOT} , L'_{TOT}) of the display panels (102, 104, 202, 204) and any displays (52-56) positioned above the lateral opening (42-46), measured parallel to a front/back direction (X2) of the vehicle, on the one hand, and the total length (L2) of the vehicle, on the other hand, is comprised between 0.75 and 1, preferably between

0.85 and 0.95.

3. The vehicle according to the preceding claim, **characterized in that** the total length (L_{TOT} , L'_{TOT}) of the moving display panels (102, 104, 202, 204) and displays (52-56), measured parallel to a front/back direction (X2) of the bus, is greater than 10 m. 5
4. The vehicle according to one of the preceding claims, **characterized in that** the display panels (102, 104, 202, 204) are of the light-emitting diode type. 10
5. The vehicle according to one of the preceding claims, **characterized in that** the moving display panels (102, 104, 202, 204) are capable of displaying images coming from a video signal. 15
6. The vehicle according to one of the preceding claims, **characterized in that** the ratio between the height (H_{10} , H_{20}) of the moving display panel measured vertically on the one hand, and the length (L_{102} , L_{104} , L_{202} , L_{204}) of that panel measured parallel to a front/back direction of the bus on the other hand, is comprised between 0.04 and 0.15, preferably between 0.05 and 0.13. 20 25
7. The vehicle according to one of the preceding claims, **characterized in that** the elevation (H_{12}) of the lower edge (12) of a window (12) relative to the floor (48) of the vehicle (2) is comprised between 540 and 580 mm. 30
8. The vehicle according to one of the preceding claims, **characterized in that** it is equipped with moving display panels (102, 104, 202, 204) on both of its sides, above all of its windows (12-20, 32-40). 35
9. The vehicle according to one of the preceding claims, **characterized in that** it is equipped with at least one display (52-56) positioned above the lateral opening (42-46). 40
10. The vehicle according to claim 9, **characterized in that** the moving display panels (102, 104) and displays (52-56) are juxtaposed in a front/back direction (X2) of the vehicle. 45
11. The vehicle according to claim 10, **characterized in that** the moving display panels (102, 104) and the display (52) have the same height (H_5 , H_{10}). 50
12. The vehicle according to one of claims 1 to 8, **characterized in that** the moving display panels (102, 104) also extend above the opening (42 - 46). 55
13. The vehicle according to one of the preceding claims, **characterized in that** it comprises at least one on-board electronic unit (50) for controlling at least one

moving display panel (102, 104, 202, 204).

14. The vehicle according to claim 13, **characterized in that** it comprises wireless connection means (60) between the onboard electronic unit (50) and a central unit (500) capable of controlling the onboard electronic units on several vehicles.
15. A method for displaying images on a moving display panel (102, 104, 202, 204) of a vehicle (2) according to any one of the preceding claims, **characterized in that** it comprises at least the following steps:
 - a) determining whether the vehicle (2) is stopped or moving;
 - b) displaying a first series of images when the vehicle is stopped;
 - c) displaying a second series of images when the vehicle is moving.

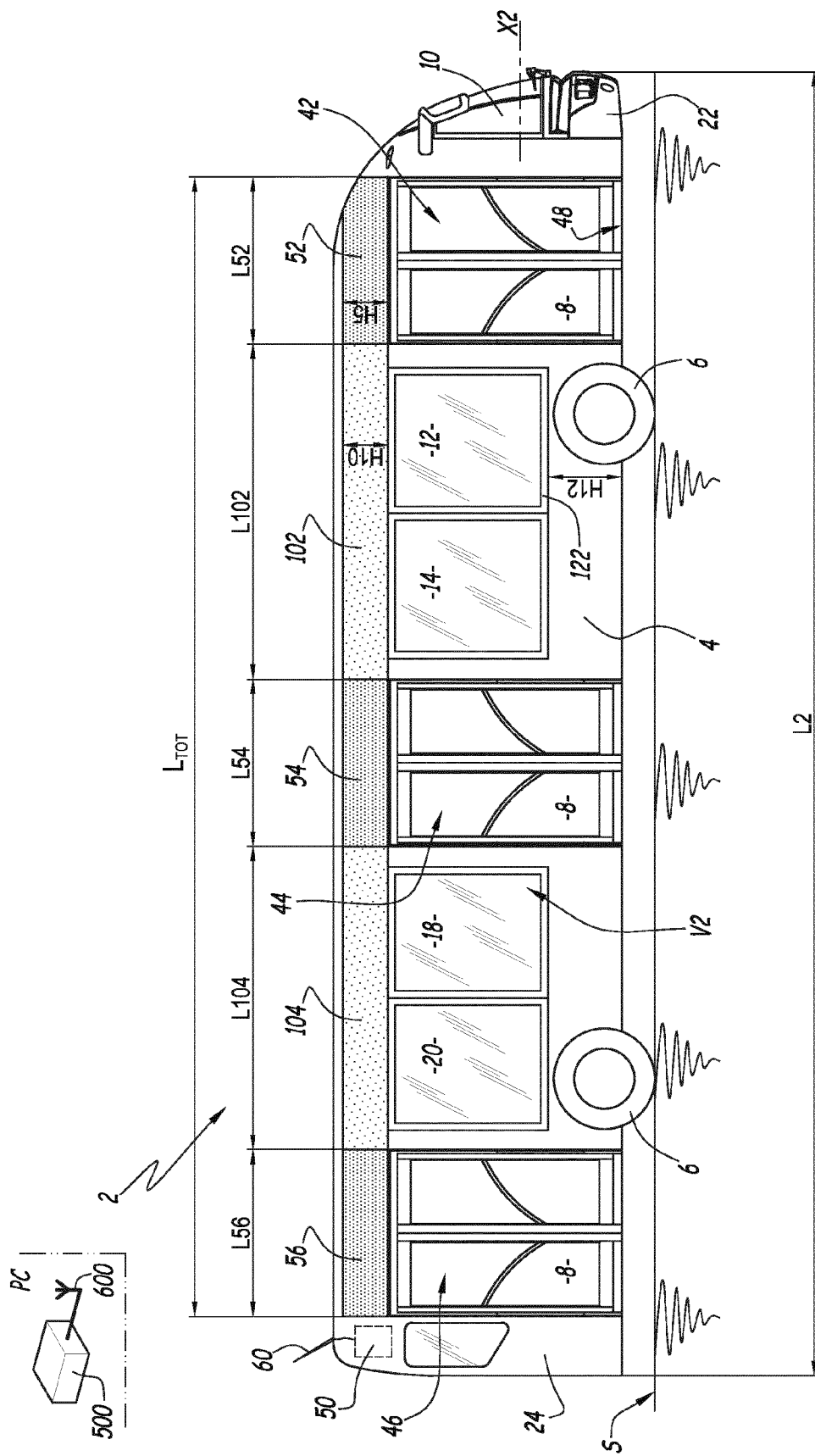


Fig.1

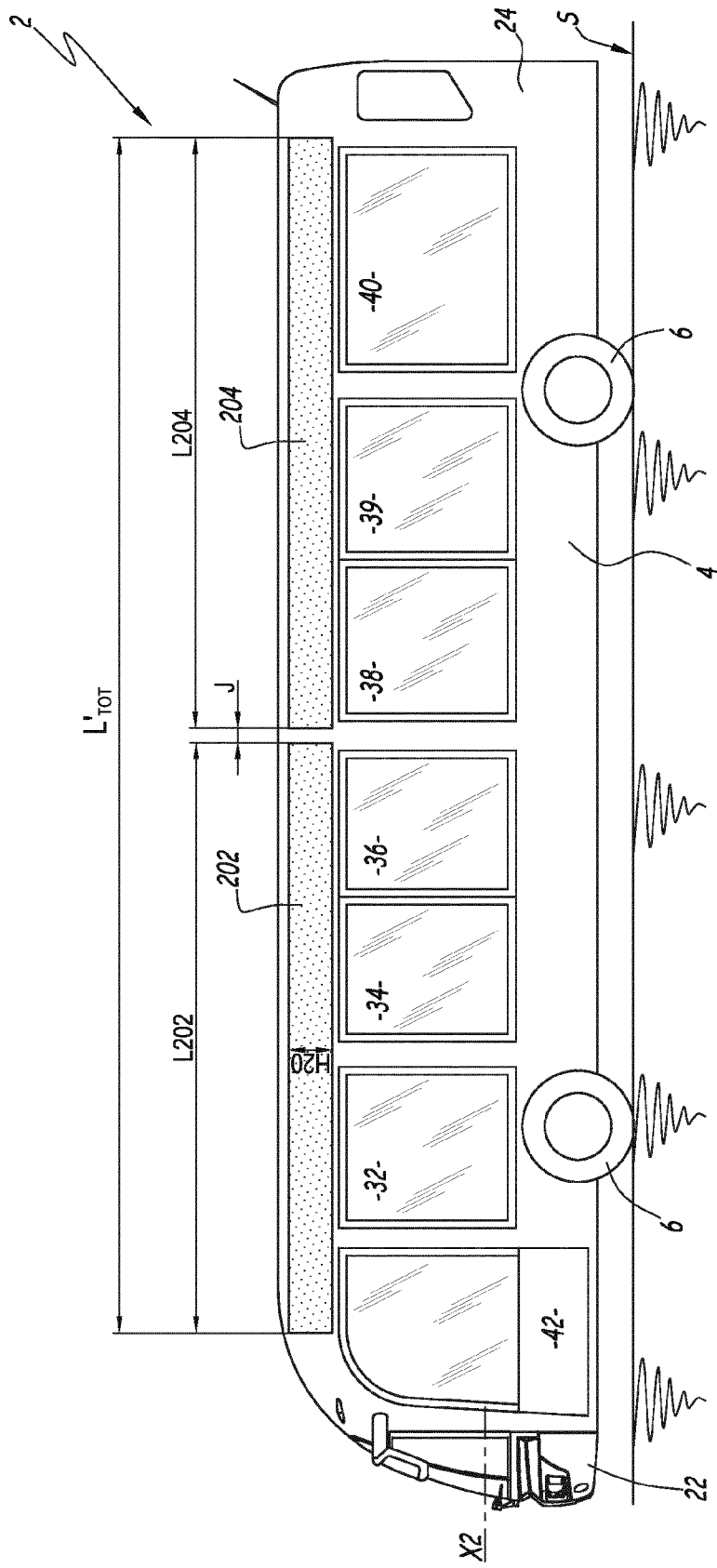


Fig.2



EUROPEAN SEARCH REPORT

Application Number
EP 13 18 8678

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		2 December 2013	Pantoja Conde, Ana
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82