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(54) **Title:** BRACKET FOR MOUNTING A HANDS-FREE ACCESS AND START ANTENNA AND FLOOR OF A VEHICLE SUPPORTING SAID BRACKET

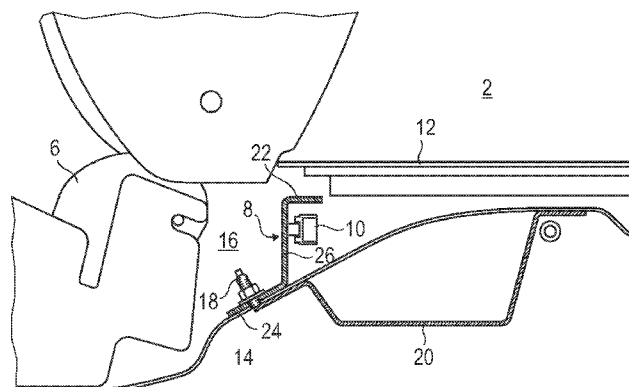


FIG 1

(57) **Abstract:** The invention is directed to a bracket for mounting a hands-free access and start antenna in a vehicle. The bracket (8) is an elongate member with at its upper portion a reversed L-shaped cross-section. The upper foot portion (22) and the leg portion (26) of the reverse L-shape form a cavity for receiving the antenna (10). The bracket (8) has also at its lower portion a L-shaped cross-section which is opposed to the L-shape of the upper portion. The foot portion of the L-shape is in flat contact with and fastened to the floor (14) of the vehicle at a location which is under the back rest (4) of a rear seat row of the vehicle. This location (16) is formed by a local deepening of the floor at a step like portion between the rear seat row area and the trunk area (2). This provides the double advantage of an easy access when assembling the vehicle and an optimal location for the quality of reception.

BRACKET FOR MOUNTING A HANDS-FREE ACCESS AND START ANTENNA AND FLOOR OF A VEHICLE SUPPORTING SAID BRACKET

The invention is directed to the mounting of an electronic component in a vehicle. More particularly, the invention is directed to the mounting of an antenna in a vehicle.

- 5 Even more particularly, the invention is directed to the mounting of a hands-free access and start system antenna in a vehicle. The invention is directed to a bracket for mounting said electronic component, to a floor equipped with said bracket and to a vehicle equipped with said floor and/or with said bracket.

- Conventionally, hands-free access and start entry systems have been proposed in
10 which the unlocking and locking of a lock mechanism which locks the doors of a vehicle, the luggage compartment door or the like is carried out without using a key. Additionally, this system allows the driver to open and start the vehicle without getting the key out. This access and start solution offers the driver greater freedom. Just placing the key in a pocket or bag is sufficient to open the door: the driver
15 simply pulls the handle to unlock the vehicle and the door opens. To start the vehicle or shut off the engine, the driver just presses the start button on the dashboard or presses the brake pedal. A simple stroke of the hand over a specific part of one of the door handles is enough to lock the vehicle. Practical, modern and secure, this is a user-friendly solution that is particularly helpful for drivers with their hands full.
20 Such a hands-free access and start entry system is equipped with an authentication device carried by the user. In addition, when a driver carrying an authorized identifier is insider the passenger compartment, such a system can also inhibit anti-starting devices, such as an electronic immobilizer, to enable starting of the vehicle's engine. The authentication device can emit an identification signal via antennas mounted
25 inside the vehicle to detect the identifier inside the vehicle. When the inside antennas are used for identification prior to engine starting, the identification signal emitted by the antennas must not propagate outside the vehicle to ensure that the immobilization system is inhibited only if an authorized driver is in the vehicle. To that end, the detection zones must not extend beyond the passenger compartment. The
30 antenna(s) must have a limited range and their positioning must be made accordingly.

Patent document FR 2 886 245 A1 discloses a device for retaining loads in the trunk of vehicle. The device is a crosspiece fastened to a floor pan of a rear trunk of a motor vehicle and including a rear face providing a local deformation which is oriented towards an interior of the crosspiece such that a space for housing a signal receiving antenna is arranged in a volume of the crosspiece. A cable connected to the antenna extends across the length of the crosspiece and transmits the information received by the antenna to a control unit which controls the opening of doors of the vehicle. The solution proposed in this document requires the presence of a bulky crosspiece for supporting the antenna, the crosspiece reducing to a certain extent the capacity and practicability of the trunk, especially when the back rest of the rear seat row is tilted for increasing the loading capacity. Additionally, the use of the crosspiece of this document has for consequence that the antenna is necessarily positioned in the trunk area so that the reception quality for signals emitted from the seating area of the vehicle can be reduced.

Patent document US 5,596,234 discloses a method for disposing in a vehicle an antenna of a keyless system (i.e. which is operated by pressing a corresponding button on a portable transmitter) in order to achieve an optimal reception quality. In order to achieve this goal, this document teaches to dispose the antenna so that a direction in which the efficiency of the antenna becomes a predetermined value or more and an opposing direction of a pair of conductors, among a plurality of conductors existing at the periphery of a region at which the antenna is disposed, whose opposing distance with the antenna there between is the smallest, substantially correspond. More specifically, this document teaches to place the antenna within a receiving unit, in an orthogonal direction with regard to the printed boards of the receiving unit, in the trunk area or under a seat. The technical measures disclosed in this document are interesting but require placing the antenna close to the receiving unit which is in principle rather bulky. The freedom of properly placing the antenna is therefore limited.

The invention has for objective to solve at least one of the above mentioned problems. More specifically the invention has for objective to propose a simple, cheap and practical solution for properly positioning an antenna, among others for a hands-free access and start entry system, inside a vehicle.

The invention has for object a bracket for supporting an electronic component like an antenna on the floor of a vehicle, the bracket having a longitudinal axis, and the bracket having a reversed L-shaped cross-section with a leg portion and an upper foot portion when the bracket is in position, and fastening means for the component on the leg portion and/or on the upper foot portion of the reversed L shape so that the component is protected from upward when fastened to the bracket.

Contrary to the reinforced construction of the bracket of the prior art FR 2 886 245 A1, the present invention has the advantage to provide a simpler construction which nevertheless protects in a satisfactory manner the component. Additionally, the reversed L-shape allows an easier access to the component.

Preferably, the cross-section of the bracket is generally constant along the whole longitudinal axis, thereby providing a free access to the component from both sides.

Preferably, at least the leg portion and/or the upper foot portion of the reversed L-shape of the cross-section is a single wall.

Preferably, the upper foot portion of the bracket is generally flat, more preferably generally planar.

According to a preferred embodiment of the invention, the bracket is a L-shaped bended metallic plate.

According to another preferred embodiment of the invention, the bracket has a S cross-section with a foot portion designed for coming into contact with and being fastened to the floor of the vehicle.

According to still another preferred embodiment of the invention, the fastening means comprise at least one hole or aperture through the leg portion of the reversed L-shape.

According to still another preferred embodiment of the invention, the bracket is designed such that its front shape is generally shaped like a funnel with its upper portion broader than its lower portion.

According to still another preferred embodiment of the invention, its length is less than 50 cm such that it does not cross over the width of a vehicle.

According to still another preferred embodiment of the invention, it comprises the electronic component.

According to still another preferred embodiment of the invention, the electronic component is an antenna, preferably a radio-wave antenna, more preferably an antenna of a hands-free access and start entry system.

The invention has also for object a floor of the rear part of a vehicle, comprising a bracket according to the invention and fastened to an area of the floor, the bracket supporting an electronic component like an antenna.

According to a preferred embodiment of the invention, the bracket is positioned at an area which corresponds to below the rear seat row of the vehicle.

According to another preferred embodiment of the invention, the bracket is positioned in an area which corresponds to below the back rest of the rear seat row.

According to still another preferred embodiment of the invention, the area of the floor to which the bracket is fastened is deepened locally so that the bracket does not protrude from the general surface of the floor.

According to still another preferred embodiment of the invention, the deepened area is formed in a step like section of the floor between the rear seat area and the trunk area.

The invention has also for object a vehicle comprising a floor according to the invention or a bracket according to the invention.

Other features and advantages of the present invention will be better understood with the description and the figures, wherein:

- figure 1 is a cross-sectional view of a lower portion of a rear seat of a vehicle, of the trunk and the corresponding floor portion supporting an antenna via a bracket in accordance with the invention ;
- figure 2 is a perspective view of the floor portion supporting the bracket of figure 1.

Figure 1 illustrates the trunk area 2 of a vehicle with a trunk, a rigid or semi rigid carpet 12 and a floor 14 forming to body of the vehicle. The vehicle is also provided

with a rear seat row comprising a back rest 4 and a seat 6. The floor 14 is generally flat under the seat 6 at a lower level and rises in direction of the trunk area 2 up to a higher level. The floor 14 in the trunk area 2 is reinforced by a transversal profile 20. More specifically, the floor rises progressively in the vertical direction starting from the rear end of the seat 6 until reaching a certain distance from the rear seat 6 in the trunk area 2. This curved and progressive shape of the floor 14 provides an empty space 16 directly behind the rear seat 6 and below the back rest 4 available for placing the antenna 10 of a hands-free access and start entry system. To that end, a bracket 8 is fixed to the floor 14 under the back rest in the empty space 16 and supports the antenna 10. The bracket is preferable made out of a steel plate. Its upper portion has a reverse L-shaped cross-section in order to form a protected location for the antenna 10. Indeed, the foot part 22 of the L-shape forms an upper cover which protects the antenna 10 from any external action coming from upward. The cavity formed by the reverse L-shape is oriented towards the trunk area 2 of the vehicle. This provides an easy access and mounting for the antenna and still a satisfactory protection. The lower portion of the bracket as also a L-shaped cross-section opposed to the L-shape of the upper portion. In other words, the global shape of the cross-section of the bracket corresponds approximately to a "S" where the upper loop 22 is generally horizontal and straight, the lower loop 24 is generally straight and parallel to the floor section to which it is fastened, and the central part 26 is generally straight and vertical.

The bracket is fastened to the floor via its lower portion 24 by means of screws and nuts. More specifically, two threaded rods 18 are welded to the floor and the lower portion 24 has two holes cooperating with the threaded rods.

The upper part 22 of the bracket is generally aligned with the floor 14 of the trunk, i.e. with the floor at its upper level in the trunk supporting the carpet 12.

As can be seen in figure 2, the empty space 16 where the bracket 8 and the antenna 10 are located corresponds in fact to a deepened area of the floor. Indeed, as mentioned above, the floor is at a lower level under the rear seat and rises up to a higher level in the trunk. To that end, the floor rises stepwise from the rear end of the rear seat. The space 16 for locating the antenna 10 is a deepened area of the step portion of the floor. The width of this deepened area is limited to the necessary

length of the bracket 8. The length of the bracket is limited to a length necessary for properly supporting the antenna 10. In practice, the length of the antenna is of a few centimeters or a few tens of centimeters and the bracket has a total length exceeding by a few centimeters the length of the antenna in order to provide enough
5 free space for the connector and to avoid any contact between the upper part of the bracket with the floor. In any case, the length of the bracket is a fraction of the width of the vehicle so that a deepened area of the step portion of floor suffices for positioning the antenna.

As can be seen also in figure 2, the lower mounting part 24 of the bracket 8 is
10 shorter in width than the upper part 22. The front shape of the bracket 8 is so that the length of the bracket narrows from the upper part 22 to the lower part 24. The maximal length at the upper portion is used for locating the antenna and the central part and lower part which have for essential role to fasten the antenna to the vehicle are reduced in length. A progressive deepened area in the floor for housing the
15 antenna is indeed easier to realize and provides a higher rigidity. In order to minimize the size of the deepened area, it is indeed appropriate to minimize the length of the lower fastening portion of the bracket.

As can also be seen in figure 2, the central portion 26 of the bracket 8 has holes or apertures 28 for fastening a mounting support of the antenna. When assembling the
20 vehicle, the harness portion for connecting the antenna and the corresponding connector can be fastened to the floor close to or in the deepened area 16 and the bracket 8 on which the antenna would be pre mounted can be placed in the deepened area 16 by engaging the holes in the lower fastening portion 24 with the threaded rods 18 and then by engaging nuts on the threaded rods. The connector of
25 the harness (not illustrated) can then be plugged into the corresponding connector of the antenna 10. The action of placing and fastening the bracket to the floor and the action of plugging in the connector of the harness onto the antenna can be made in the other order, i.e. first plugging in the connector and second placing and fastening the bracket with the antenna already connected to the harness.

30 The bracket 8 is preferably mounted transversally in order to reduce the longitudinal length of the deepened area 16.

The upper portion 22 of the bracket 8 can also be dimensioned and positioned such as to support at least partially the carpet 12 or any soft, rigid or semi rigid floor cover.

The bracket is preferably made of steel or any metallic material. Alternatively, it can be made of plastic or composite material.

- 5 The position of the antenna under the rear seat row and partially in the trunk area is particularly interesting because it provides many advantages. It provides an easy mounting when assembling the vehicle due to a better access and it provides an optimal location for receiving signals from different areas inside the vehicle. It provides also a location which is not directly accessible to the passengers or users of
10 the vehicle.

The bracket 8 and antenna 10 can be positioned at various locations transversally to the location illustrated in figure 1 and 2. Indeed, depending on the space necessary under the floor for different components like for example the tank, the exhaust pipe and different cables, the deepened area can be located at other places generally
15 under the rear seat.

Although embodiments of the invention have been described in relation with the antenna of a hands-free access and start entry system, it is to be understood that the invention is also applicable to any other type of antenna, receiver, sensor or any other electronic component and would still provide many of the advantages
20 mentioned above.

Claims

1. Bracket for supporting an electronic component (10) like an antenna on the floor of a vehicle, the bracket (8) having a longitudinal axis, and characterized in that
5 the bracket has a reversed L-shaped cross-section with a leg portion (26) and an upper foot portion (22) when the bracket is in position, and fastening means (28) on the leg portion (26) and/or on the upper foot portion (22) so that the component (10) is protected from upward when fastened to the bracket.
10
2. Bracket according to claim 1, characterized in that the bracket (8) is a L-shaped bended metallic plate.
3. Bracket according to any one of claims 1 and 2, characterized in that the
15 bracket (8) has a S cross-section with a foot portion (24) designed for coming into contact with and being fastened to the floor (14) of the vehicle.
4. Bracket according to any one of claims 1 to 3, characterized in that the fastening means comprise at least one hole or aperture (28) through the leg
20 portion (26) of the reversed L-shape.
5. Bracket according to any one of claims 1 to 4, characterized in that the bracket (8) is designed such that its front shape is generally shaped like a funnel with its upper portion (22) broader than its lower portion (24).
25
6. Bracket according to any one of claims 1 to 5, characterized in that its length is less than 50 cm such that it does not cross over the width of a vehicle.
7. Bracket according to any one of claims 1 to 6, characterized in that it
30 comprises the electronic component (10).
8. Bracket according to any one of claims 1 to 7, characterized in that the electronic component (10) is an antenna, preferably a radio-wave antenna, more preferably an antenna of a hands-free access and start entry system.

9. Floor of the rear part of a vehicle, characterized in that it comprises a bracket (8) according to any one of claims 1 to 8 fastened to an area of the floor (14), the bracket supporting an electronic component (10) like an antenna.

5

10. Floor of the rear part of a vehicle, according to claim 9, characterized in that the bracket (8) is positioned at an area which corresponds to below the rear seat row of the vehicle.

10

11. Floor of the rear part of a vehicle, according to claim 10, characterized in that the bracket is positioned an area which corresponds to below the back rest (4) of the rear seat row.

15

12. Floor of the rear part of a vehicle, according to any one of claims 9 to 11, characterized in that the area (16) of the floor (14) to which the bracket (8) is fastened is deepened locally so that the bracket does not protrude from the remaining surface of the floor.

20

13. Floor of the rear part of a vehicle, according to claim 12, characterized in that the deepened area (16) is formed in a step like section of the floor (14) between the rear seat row and the trunk area.

14. Vehicle characterized in that it comprises a floor (14) according to any one of claims 9 to 13 or a bracket (8) according to any one of claims 1 to 8.

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FIG 1

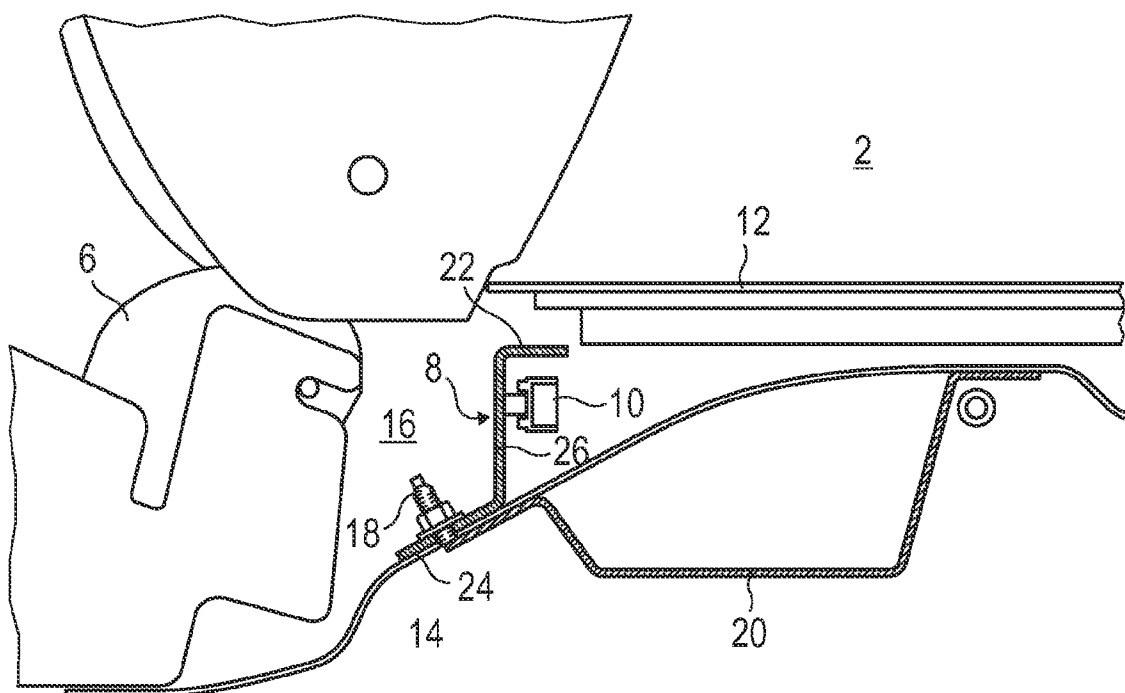
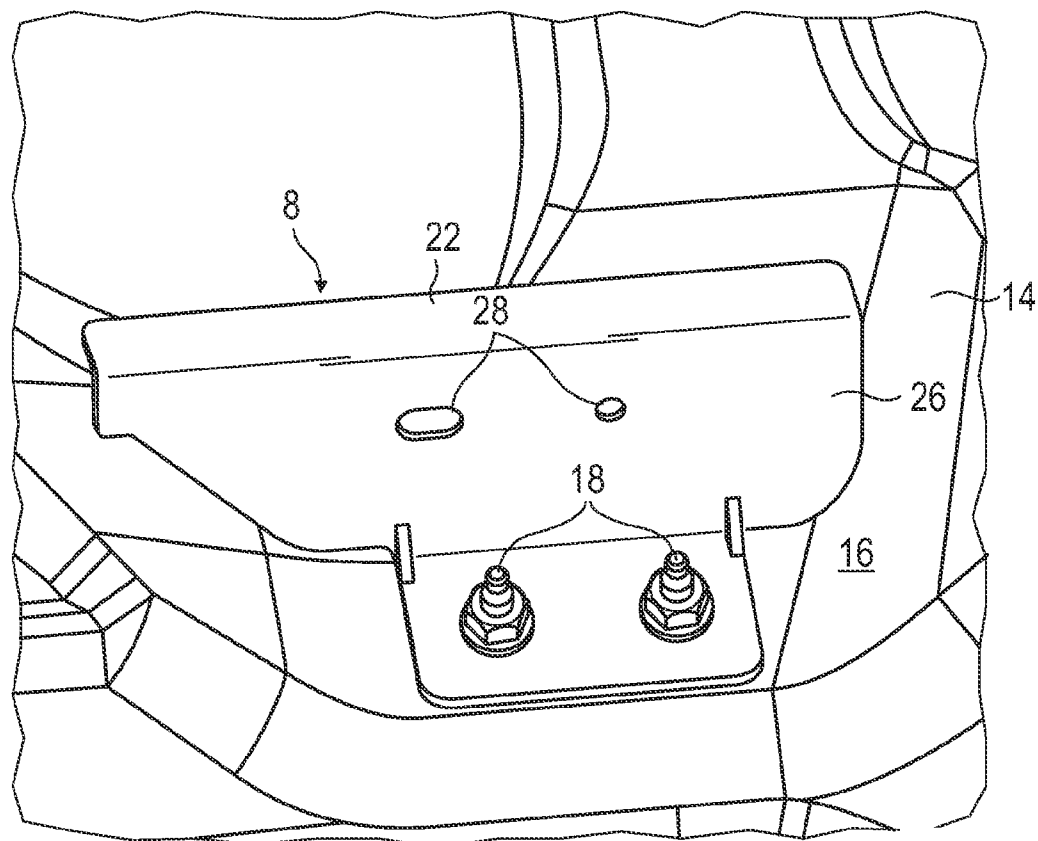


FIG 2



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC,WPI,PAJ,CNPAT

keyless,antenna,dispos+,mount+,arrang+,fix+,vehicle,car,automobile??,truck?,floor,bracket?,shape

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 20090153295 A1 (HAMADA) 18 Jun. 2009 (18.06.2009), embodiment 1 and figures 1,7	1-14
Y	FR 2886245 A1 (RENAULT SAS) 01 Dec. 2006 (01.12.2006), the embodiment shown in figures 1-4	1-14
A	CN 101547814 A (RENAULT TRUCKS CO LTD) 30 Sep. 2009 (30.09.2009), the whole document	1-14
A	US 5596234 A (Umeda et al.) 21 Jan. 1997 (21.01.1997), the whole document	1-14
A	US 4755823 A (Ohe et al.) 05 Jul. 1988 (05.07.1988), the whole document	1-14

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:	“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
“A” document defining the general state of the art which is not considered to be of particular relevance	“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
“E” earlier application or patent but published on or after the international filing date	“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
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“O” document referring to an oral disclosure, use, exhibition or other means	
“P” document published prior to the international filing date but later than the priority date claimed	

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Information on patent family members

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Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
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