Title: TWO-WHEELED MOTOR-VEHICLE PARTICULARLY FOR CITY USE

Abstract: Described herein as a two-wheel motor vehicle, particularly for urban use, comprising a driving cell (7) defined in part by a liftable cover (8) provided with means for hooked connection to the frame of the windshield of the vehicle. Said hooking means include strut-type tensioning means that can be operated by means of a control lever for tensioning the top part of the cell in such a way that it forms, with the bottom part, a single rigid, reticular, load-bearing structure, for protection of the driver and possible passenger.
— before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
"Two-wheeled motor-vehicle particularly for city use"

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TEXT OF DESCRIPTION

The present invention relates to two-wheel motor vehicles, particularly for urban use.

The urban-traffic problem and its repercussions is basically due to the "non-saturation" of private means of transport, typically automobiles which are capable of carrying a number of people but which, instead, are more often than not exploited only for a minimal portion of their transporting capacity. The need is therefore felt for an individual means of transport which approaches as far as possible the degree of serviceability and comfort afforded by automobiles. Motorcycles, scooters, mopeds and the like are unable to meet these needs satisfactorily since they are inconvenient to use for a wide range of users, both because they are unable to ensure an adequate degree of comfort, above all in the winter season, and because they are unable to guarantee a high degree of protection and safety for the user.

The purpose of the present invention is therefore to provide a two-wheel vehicle that constitutes a sort of "downgrading" of an automobile, whilst preserving all the advantages in terms of comfort and safety, rather than an "upgrading" of a motorcycle. In fact, there have already been proposed in the past sophisticated versions of motorcycles, which include a top "canopy" for protecting the driver, but which continue to present the drawbacks of the motorcycles referred to previously, without achieving the degree of comfort and safety that are, instead, typical of a motor car.

With a view to achieving the above purpose, the subject of the present invention is a two-wheel motor
vehicle, particularly for urban use, comprising:
- a load-bearing structure;
- a front steering wheel and a rear wheel mounted with the aid of respective suspension systems on the load-bearing structure;
- an electric motor or an internal-combustion engine mounted on the load-bearing structure and connected to the rear wheel by means of a transmission system; and
- a cell for the driver and possibly for a passenger, which forms an integral part of the load-bearing structure and which includes at least one seat, as well as a top part that can be lifted up to enable the driver and possible passenger to get in and out;
in which the top liftable part of the cell includes a top cover and two side protections;
in which said liftable part of the cell has a rear portion mounted articulated on the load-bearing structure about an axis which is transverse to the longitudinal vertical plane of the vehicle and is set basically at the height of the driver’s head;
in which said side protections include handles for gripping by the driver in order to facilitate displacement of the mobile part of the cell;
in which said mobile part of the cell is recalled towards the raised position by elastic means, for instance one or two gas-operated springs set on respective sides of the cell;
in which the top cover of the cell is provided at the front with hooking means for connection to the frame of the vehicle windscreen; and
in which said hooking means include strut-type tensioning means that can be operated by means of a control lever for tensioning the top part of the cell in such a way that it forms, together with the bottom
part of the cell, a single rigid, reticular, load-bearing structure for protection of the driver and possible passenger.

Thanks to the above-mentioned characteristics, the cell of the vehicle according to the invention, once positioned in its closed and tensioned condition, guarantees complete protection of the driver. The vehicle thus constituted comes to resemble a sort of automobile divided into half longitudinally, with just two wheels and a passenger compartment that is altogether similar to that of a motor car. Consequently, on the one hand, a high safety for the driver is achieved, whilst, on the other, a degree of comfort similar to that afforded by an automobile is ensured.

The vehicle according to the invention may be provided with a series of additional meliorative characteristics. For instance, it may be equipped with a safety chest harness connected to a safety-belt system which is automatically applied to the bust of the driver following upon the manoeuvre of closing the liftable cover in a way similar to a passive safety-belt system for use in automobiles.

The protection afforded by the compartment consisting of the cell renders the use of protective helmets for the driver and/or the possible passenger unnecessary, with a consequent further improvement in comfort.

The fixed rear structure of the cell can be exploited to obtain a cabinet-like compartment accessible from outside, which may, for example, be used as a carrier or for containing an overcoat, umbrella or other items.

The vehicle according to the invention can also be equipped with a safety-belt system with a chest-harness
branch possibly provided with an air bag.

As has already been said, the tensioning of the top part of the cell, once the latter has been positioned in its closed condition, is obtained by operating a control lever. It is also possible for two separate control levers to be provided, associated to the gripping handles with which the side protections of the mobile part of the cell are equipped. In this way, once the driver has taken hold of the handles and has pulled the top part of the cell towards its lowered, closed, position, he can operate the control levers (for example, with a mechanism similar to that of the parking brake lever of an automobile) in order to tension the structure.

It is moreover possible to provide a heating system for heating the compartment defined by the cell of the vehicle according to the invention. In a preferred solution, a system for heating the seat is provided, as is also a system of the leg-guard type consisting of an waterproof cover arranged between the floor of the compartment and the chest harness of the passive safety-belt system, which is able to cover the driver’s legs. When the cell is open, the leg-guard is raised and does not constitute a hindrance for the driver when he mounts or dismounts. When the cell is closed, the leg-guard rests against the driver’s legs. Two radiators connected to the engine-cooling circuit are arranged on the floor; when required, these radiators supply heat for warming the driver’s legs, which are already protected by the leg-guard.

As has been clarified previously, the vehicle according to the invention can also be equipped with an electric motor. In this case, the carrier mentioned above can be used as a battery holder.

Finally, a further important characteristic of the
invention lies in the fact that the load-bearing structure is provided, at the bottom, with two side carriages which can be raised; for example, each of these carriages may have a structure similar to that of a roller blade. The said carriages are able to provide stability for the vehicle when the latter is stationary or is travelling at a very low speed. The movement of the two side carriages can be controlled, for example, by an electric motor or by a transmission with a pedal control that can be operated by the driver. When the driver decides to stop the vehicle, he just has to control lowering of the two side carriages, which thus rest on the ground and bestow stability on the vehicle. In this way, it is possible to carry out all the manoeuvres of opening the cell and dismounting and mounting the vehicle in conditions of absolute stability and safety. In this condition, the vehicle thus rests on four points (i.e., the two wheels and the two side carriages), but can even so be easily displaced for small adjustments during a parking manoeuvre. When starting on a journey, once the manoeuvres for getting onto the vehicle have been carried out, raising of the side carriages can be controlled directly by the driver, or else can be controlled automatically, for example when a minimum number of revolutions of the wheels has been reached.

Thanks to all the characteristics referred to above, the vehicle according to the invention proves ideal for urban and suburban transport and may be used by a wide range of users. In fact, on the one hand, it guarantees the advantages of lightness, manageability, and reduced overall dimensions, which are ideal for city traffic, but at the same time also guarantees features of comfort and safety comparable to those of an automobile.
Further characteristics and advantages of the present invention will emerge from the ensuing description, with reference to the attached drawings, provided purely by way of non-limiting example, in which:

- Figure 1 is a perspective view of an example of embodiment of the vehicle according to the invention; and

- Figure 2 is a view, at an enlarged scale, of a detail of the vehicle, with the cell partially open so as to show the tensioning means according to the invention.

In Figure 1, the reference number 1 designates as a whole a vehicle according to the invention, comprising a load-bearing structure 2, a front steering wheel 3, a rear motor-driven wheel 4, and a cell 5 delimited at the front by a windscreen 6 rigidly connected to the structure of the vehicle, and at the top by a cover 7 which extends towards the rear as far as the top of a backrest 8 rigidly connected to the structure of the vehicle. The top cover 7 is connected to the backrest 8 in an articulated way about a transverse horizontal axis 9 located roughly at the height of the driver's head when the driver occupies the seat of the vehicle. The cover 7 is therefore displaceable between the lowered, closed, position, as illustrated in the figure, and a raised position rotated upwards about the axis 9, in which it enables easy access of the driver to the seat, designated by the reference number 10. The need to raise the cover 7 to enable access to the seat results from the fact that the cell further includes two side protections 11 which, in the example illustrated, consist of two uprights projecting downwards starting from the front end of the cover 7, the said uprights guaranteeing the safety of the driver.
in the event of the vehicle turning over. The two uprights 11 are provided with two handles 12, which can be gripped by the driver once he has occupied the seat 10 so that he can lower the uprights 11 towards the operative position illustrated in Figure 1. Also associated to the handles 12 are operating levers 13, which can consist, for example, of a mechanism similar to that of a parking brake lever of an automobile, which enables activation of the system for tensioning the structure. As illustrated above, in fact, the top cover of the cell is provided at the front with hooking means for connection to the frame of the vehicle windshield. The said hooking means include, on each side, a strut 14 (see Figure 2), which is received in a corresponding seat made in the frame of the windshield of the vehicle and which can be pushed in such a way as to project further from the top cover 7 so as to tension the structure of the cell consisting of the ensemble of the windshield and the raisable cover, in order to create a single rigid, reticular, load-bearing structure for protecting the driver and the possible passenger.

The annexed drawings do not illustrate all the remaining characteristics of the vehicle according to the invention as described above, such as, for example, the safety belts for the driver and the retractable carriages which ensure stability of the vehicle when it is standing still or travelling at low speeds. The constructional details of these elements may, on the other hand, be understood perfectly well by any person skilled in the branch in the light of the description of said elements which is provided in the first part of the present description.

Of course, without prejudice to the principle of the invention, the details of construction and the
embodiments may vary widely with respect to what is described and illustrated herein purely by way of example, without thereby departing from the scope of the present invention.

In a variant, the upper part of the cell can be removed completely in order to enable use as a normal motorbike in the summer season.
CLAIMS

1. A two-wheel motor vehicle, particularly for urban use, comprising:
   - a load-bearing structure;
   - a front steering wheel and a rear wheel mounted with the aid of respective suspension systems on the load-bearing structure;
   - an electric motor or an internal-combustion engine mounted on the load-bearing structure and connected to the rear wheel by means of a transmission system; and
   - a cell for the driver and possibly for a passenger, which forms an integral part of the load-bearing structure and which includes at least one seat, as well as a top part that can be lifted up to enable the driver and possible passenger to get in and out;
     in which the top liftable part of the cell includes a top cover and two side protections;
     in which said liftable part of the cell has a rear portion mounted articulated on the load-bearing structure about an axis which is transverse to the longitudinal vertical plane of the vehicle and is set basically at the height of the driver's head;
     in which said side protections include handles for gripping by the driver in order to facilitate displacement of the mobile part of the cell;
     in which said mobile part of the cell is recalled towards the raised position by elastic means, for instance one or two gas-operated springs set on respective sides of the cell;
     in which the top cover of the cell is provided at the front with hooking means for connection to the frame of the vehicle windscreen; and
     in which said hooking means include strut-type tensioning means that can be operated by means of a control lever for tensioning the top part of the cell.
in such a way that it forms, together with the bottom part of the cell, a single rigid, reticular, load-bearing structure for protection of the driver and possible passenger.

2. The vehicle according to Claim 1, characterized in that it is equipped with a safety chest harness connected to a safety-belt system, which is applied automatically to the bust of the driver following upon the manoeuvre of closing the raisable cover.

3. The vehicle according to Claim 1, characterized in that the fixed rear structure of the cell includes a cabinet-like compartment accessible from outside, usable as a carrier.

4. The vehicle according to Claim 1, characterized in that it is equipped with a safety-belt system with a chest-harness branch provided with air bag.

5. The vehicle according to Claim 1, characterized in that the aforesaid tensioning means are controlled by two operating levers (13) associated to two handles (12) for gripping the side structures (11) of the cell.

6. The vehicle according to Claim 1, characterized in that it comprises a system for heating the passenger compartment, including a system for heating the seat and a leg-guard system consisting of an impermeable cover arranged between the floor of the compartment and a safety chest harness of the safety-belt system, capable of covering the driver's legs, the said leg-guard system being raised when the cell is opened so as not to constitute a hindrance when the driver mounts or dismounts.

7. The vehicle according to Claim 2, in which the motor is an electric motor, characterized in that the carrier is used as a battery holder.

8. The vehicle according to Claim 1, characterized in that the bearing structure is provided at the bottom
with two raisable side carriages.

9. The vehicle according to Claim 8, characterized in that each of said carriages has a structure similar to that of a roller-blade.

10. The vehicle according to Claim 8, characterized in that the movement of the two side carriages is controlled by an electric motor or by a foot-controlled transmission that can be operated by the driver.

The foregoing substantially as described and illustrated and for the purposes herein specified.
## INTERNATIONAL SEARCH REPORT

### A. CLASSIFICATION OF SUBJECT MATTER

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

### B. FIELDS SEARCHED

**Minimum documentation searched** (classification system followed by classification symbols)

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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 practical, search terms used)**

EPO-Internal

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

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* Further documents are listed in the continuation of box C.

** Patent family members are listed in annex.**

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**Date of the actual completion of the international search:**

8 November 2001

**Date of mailing of the international search report:**

16/11/2001

Name and mailing address of the ISA

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