

Description

[0001] The present invention relates to a multi-purpose motor vehicle that is specifically equipped in order to provide the best support in the activities for re-establishment of safe and practicable road conditions, after car accidents, especially when the accidents are localized in town, where the disturbances arising from large traffic jams, and few available highways, make the quick run of vehicles of emergency, towards the site of accident, something very difficult.

In fact, it is a very important strategic aim to provide a quick operative intervention so that disturbances due to changed flow of traffic (stopped traffic, decreased size of the carriageway, flooding of polluting liquids, etc.) are minimized. These disturbances cause direct social costs, like the waste of time, use of additional fuel, pollution, degradation of mechanical gears, risks of new accidents involving the incoming vehicles, etc., and further, the use of time of Police officers responsible for signalling the event and managing the traffic during the return to normal and safe traffic conditions.

The multi-purpose vehicle of the present invention can reach quickly the site of an accident and it is able, using some special devices installed on it, to support the re-establishment of safe traffic conditions and to prevent, in small accidents, any damage to the environment. This is possible because it supports the cleaning of road platform and the aspiration of functional polluting liquids (lubricating oils, fuels, cooling liquids, etc.) eventually lost by vehicles involved in the accident. Further, the road platform is subject to a treatment under specific products, so that it is avoided any slippery surface, and the solid debris related to typical car equipments (broken glasses, parts made of plastic, metals, remaining parts of structures, etc.) are removed.

Instead, the interventions of cleaning the road platform in larger accidents are supported by different multi-purpose vehicles, more exactly the *multi-purpose vans* and the *multi-purpose top trucks*, as described in their technical aspects in a previous European patent EP 09007776 filed by the same undersigned applicant. Another *multi-purpose wagon* has entered in the group of the above special vehicles, and this wagon is able to support the usual mechanical interventions and either the re-establishment of safe traffic conditions after car accidents.

Indeed, these vehicles can support the interventions, addressed to re-establish safe traffic conditions and to prevent any damage to the environment, on most of the road accidents, because they are equipped with special devices providing a jet of water solution and other devices having a high aspiration power, further containing specific products able to remove any slippery condition of surfaces, like the *ecological surfactant* and the *molecular chain destroyer*, these special devices can further collect and contain a big quantity of solid debris lost by vehicles involved in the accidents; and the above emergency ve-

hicles can reach very quickly the site of accidents.

It is here remarked how these vehicles, equipped with a suction system and a pressure water gun, both working with electric power supply, require the installation on board of a 7-8 Kw electric energy generator, having a relevant weight and size. During the design of the *multi-purpose motor vehicle*, these technical problems have been subject of a specific study, and the final choice has been to avoid devices requiring electric power supply, or requiring compressed air supply, that have as a consequence a short operative autonomy. Both the above solutions have resulted to be not compatible with this type of vehicles, especially with reference to typical weight of an electric generator and its big size.

[0002] Therefore, the main objective of the present invention is to avoid all the above said drawbacks, and to obtain a technical system that is autonomous, and can work for a long time depending only on the quantity of the available fuel.

Further particular and specific features of the multi-purpose motor vehicle - having two or three, symmetric or asymmetric wheels, powered by a combustion, electric, or hybrid engine - are the following:

- design of the previous suction and pressure water jet systems, so that they are integrated and optimized, they are efficient and take as less space as possible, so that they can be carried and used in a very comfortable way; the pressure water jet system can be either used as a fire extinguisher, because the used products stop the combustion in a very quick and efficient way, due to a bio-chemical isolation process of the fuel in respect of the air oxygen (oxidizing agent);
- emergency signalling, to be placed at a specific distance from the obstacle on the road, so that it alerts the incoming drivers and protects the workers involved in the *cleaning* operations of the road platform, consisting of:
 - a LED panel including two icons, the first alerting a generic danger, according to Art. 39 of the Italian law (Road Code), and Art. 103 of the executive Regulation law, the second imaging the symbol of two colliding cars, according to Art. 39 of the Italian law (Road Code), and Art. 83 of the executive Regulation law;
 - a mechanical arm moving vertically and slowly, on which a red flag is installed;
 - an additional acoustic alarm device, activated by a proximity sensor, for a time of 10 seconds, when a vehicle is approaching the area;
 - four visual signalling devices, having a yellow blinking light, to be placed on ground, in order to signal the obstacle on the road, in case of night intervention or low visibility conditions;
 - an additional visual signalling device, having a yellow blinking light installed on the multi-pur-

pose motor vehicle, otherwise having a blue blinking light, in case it is recognized as a fire extinguishing vehicle by the Italian Ministry of Transportation and Facilities, Department of Terrestrial Transportations;

- apparatus including computing means and means for a real time communication with an operative Headquarter, said apparatus embedding functions of:
 - driving the operator to the exact site of accident, according to the quickest route;
 - immediate recognition of the risk factor of the event, according to detection of R.I.N. codes (Risk Identification Number) and O.N.U. codes (related to the identification of the product);
 - communication to the operative Headquarter of the need for a special intervention by skilled operators available on the territory, especially in case of accidents involving products, materials or substances that are dangerous, infective and/or toxic;
 - transmission to the operative Headquarter of digital images related to the accident, so that workers of the same Headquarter can understand exactly the situation and can take the proper decisions;
 - reporting the completed activities of intervention, with storage of the technical and photographic documents related to the accident;
 - communication to the operative Headquarter of the current geographic position of the motor vehicle, so that it can be visually represented on each terminal or on a main screen, and can give a constantly updated reference of the operative situation in a specific national area;
- special lighting apparatus to be used in the operative area;
- printer, so that a copy of the filled form, according to the called "transparent project", can be released including all data related to the road accident;
- medical emergency material, like i.e.: medical emergency box; first aid medicines; defibrillator (all the operators are skilled because they have followed courses of first medical aid, and use of defibrillator, at qualified medical Institutions); a small oxygen cylinder for asthmatic people; thermic cover; a bottle of water, etc.;
- special equipment of the multi-purpose motor vehicle, including boxes obtained from the modified shape of the structure, in order to achieve a quantity of space close to the volume of a typical passenger, said boxes being partitioned and prepared as respective housings of portable devices or containers of debris having specific size (in fact the vehicle is used by a single operator); the distributions of

weights and boxes have been designed so that the center of mass of the entire vehicle results to be as low as possible, and the operator works in comfortable and safe driving conditions; furthermore, during the intervention, the operator works in safe conditions in respect to the other incoming vehicles.

[0003] Therefore, it is specific subject of the present invention a multi-purpose motor vehicle for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, said motor vehicle being equipped by:

- three tanks, made of any type of material and having any shape and size: the first containing clean water, at least 10 litres of capacity; the second containing water mixed to a special washing liquid (ecological surfactant) and a special treatment liquid for the road platform (so called molecular chain destroyer, to be sprayed on oil and related oil products), at least 10 litres of capacity either; the third containing emulsion obtained by washing the road platform, at least 10 litres of capacity either;
- a high-pressure water gun, including a rain jet adjustment, providing a jet of the above said solution on the road platform, where polluting functional liquids (lubricating oils, fuels, cooling substances, etc.) have been eventually lost;
- a suction system suitable to remove, from the road platform, the above resulting emulsion, obtained from polluting materials mixed to the washing/treatment solution; furthermore, solid and not biodegradable debris are removed/aspirated, these debris being related to the typical car equipments (broken glasses, parts made of plastic, metals, remaining parts of structures, etc.);
- tanks containing the resulting emulsion and the removed solid remaining parts, to be temporary stocked at the site of the company that made the intervention, before to be definitely delivered to special and authorized plants, where they are processed and finished according to specific operative procedures in respect to the existing environmental laws,

characterized in that:

- the power supply, necessary to make the multi-purpose motor vehicle working properly, can be directly provided by the engine and/or any other point of energy transmission in the kinematic chain; the extracted energy can be therefore used as a power supply for mechanical, electrical or hydraulic devices.

The present invention will now be described for illustrative but not limitative purposes, according to its preferred embodiments, with particular reference to figures of the enclosed drawings, wherein:

figure 1 is a lateral view of a multi-purpose motor vehicle, as a vehicle of support to activities for re-establishment of safe and practicable road conditions, after car accidents;

figure 2 is a front view of the same motor vehicle of figure 1;

figure 3 is a rear view of the same motor vehicle of figure 1;

figure 4 is a rear view of the same motor vehicle of figure 1, including devices, in a closed position, suitable to signal an accident;

figure 5 is a rear view of the same motor vehicle of figure 1, including devices, in an open position, suitable to signal an accident;

figure 6 is a perspective view of a *tablet PC*, available in the same motor vehicle of figure 1, that provides a real time communication of an operator with an operative Headquarter;

figure 7 is a view of a block diagram that represents an electric circuit working as a power supply of a high-pressure water gun device, and a device for fast aspiration of liquids, both installed on motor vehicle of figure 1.

[0004] It is here underlined that, in the following, only some of the many conceivable embodiments of the present invention will be described, and that they are just some particular examples that do not introduce any limitations, having the possibility to describe many other embodiments based on the disclosed technical solutions of the present invention.

In figures 1-3 it is illustrated, according to respective lateral, front and rear views, an example of a motor vehicle 100, that represents a machine supporting the activities of re-establishment of safe and practicable road conditions, through "cleaning" parts of the road platform involved in a car accident. "Cleaning" means aspiration and collection of liquids and other polluting materials, eventually lost by vehicles, like i.e. lubricating oils, fuels, parts of vehicles and other types of debris. In particular cases, the intervention can involve the treatment of dangerous goods, hazard substances, and industrial wastes transported on the same vehicles involved in the accident. In these situations, the intervention will be managed by companies of specialists having all the certificates and skills required by law, usually operative partners of the intervention network.

In fact, motor vehicle 100 is part of a national intervention network that includes different type of vehicles, like, i.e. the *multi-purpose vans*, the *multi-purpose top trucks*, and the *multi-purpose wagons*, chosen according to the type and extension of the accident.

This network is coordinated by an operative Headquarter that receives all the intervention calls coming from all around the national territory. The requests are received directly, through an Italian toll free phone number "800.014.014", that is active 24 hours per day, 365 days per year. When a telephone call arrives, related to an

accident, a worker of the Headquarter calls the local operator and ask him to go urgently on site, and to start as soon as possible the activities of re-establishment of normal road conditions, through cleaning of the road platform.

During the travel, the same operator has some computing means available on his motor vehicle 100, like i.e. the *tablet PC* of figure 6, connected to the operative Headquarter through the national mobile telephone network, or the satellite or wireless telecommunication networks. As an alternative, the computing means can be represented by *personal computers*, PDAs, or mobile phones of the latest generation, able to send/receive digital photos and digital videoclips.

The *tablet PC* 600 has a special navigation system, installed inside, connected to a data base containing detailed maps with indications of the best way to reach any destination in the shortest possible time. When the operator arrives on site of accident, he has the first duty of recognizing exactly the nature of materials and eventual chemical substances to be treated and/or removed, so that he can implement the proper recovering methods in cooperation with personnel of the Headquarter.

In order to reach this goal, the operator uses the same *tablet PC* 600, available in said motor vehicle 100, connected to a data base containing:

- list of dangerous goods, with reference to their chemical-physical features and their proper handling procedures, in respect of possible events of leakage, fire, or environmental dispersion (R.I.N. code - Risk Identification Number, former Kemler, and O.N.U. code related to the identification of the product);

The same data base is available to the operative Headquarter and further comprises information about:

- position, on national territory, of industrial structures able to operate and handling dangerous transported goods, in order to prevent further relevant disasters;
- list of plants, associated to class of environmental risk, so that it is possible to find, as soon as possible, at any place on the national territory, the closest to the place of accident, the same plants being able to provide production, treatment or storage of that specific dangerous materials, for which the intervention has been requested.

The communication between local operator and operative Headquarter can be integrated with audio/video clips, e-mails, digital photos, etc., everything transmitted in real time, using the same *tablet PC* 600 available on motor vehicle 100.

With reference to figure 7, the multi-purpose motor vehicle 100 comprises as basic elements:

- tanks 101 containing: clean water; water mixed to a special washing liquid (*ecological surfactant*) and a

special treatment liquid for the road platform (so called *molecular chain destroyer*, to be sprayed on oil and related oil products) 803; emulsion obtained by collection of the washing/treatment liquids and the polluting oil materials;

- a high-pressure water gun, including a rain jet adjustment, 802 providing a jet of the above said solution on the road platform, where polluting functional liquids (lubricating oils, fuels, cooling substances, etc.) have been eventually lost by vehicles as a consequence of car accidents or breakdown;
- a suction system 804 suitable to remove, from the road platform, the above resulting emulsion 806, obtained from polluting materials mixed to the washing/treatment solution 803; furthermore, solid and not biodegradable debris are removed/aspirated, these debris being related to the typical car equipments (broken glasses, parts made of plastic, metals, remaining parts of the structures, etc.) 805;
- tanks 107 containing the resulting emulsion 806 and the removed solid remaining parts, to be temporary stocked at the site of the company that made the intervention, before to be definitely delivered to special and authorized plants, where they are processed and finished according to specific operative procedures in respect to the existing environmental laws.

One time that the connection pipes are installed, connecting the terminal devices of the hydraulic circuit to respective independent tanks, 101, 107, placed on vehicle 100, the operator 816 can start the operations of cleaning the road platform and related parts invaded by polluting liquids and/or other not biodegradable materials. As a priority, the same operator 816 will remove immediately, using the suction system 804, most of the existing polluting liquids lost by vehicles in the accident, then he will wash the road platform using a solution of water and specific products 803 (ecological surfactant and molecular chain destroyer). This solution is sprayed using a high-pressure water gun, including a rain jet adjustment, 802, so that the polluting material is removed from the platform, avoiding any slippery condition, and it is activated a degradation process of hydrocarbons provided by natural bacteria.

Finally, the resulting emulsion 806 is aspirated and collected in the proper container 807, and then temporary stocked at the site of the company that made the intervention, before to be definitely delivered to special and authorized plants, where they are processed and properly finished.

The power supply, necessary to make the multi-purpose motor vehicle 100 working properly, can be directly provided by the engine and/or any other point of energy transmission in the kinematic chain; the extracted energy can be therefore used as a power supply for mechanical, electrical or hydraulic devices.

In such a way, the motor vehicle 100 results to be completely autonomous, from an energetic point of view, and

can directly supply said high-pressure water gun 802 and said system of fast suction of liquids 804, without any need of an external electric generator.

One time that operations of cleaning of road platform and related parts are completed, the operator must update the information, using the same *tablet PC* 600 available on the motor vehicle 100, in order to put in the data base:

- intervention form, with reference to arrival time on site, and departing time from site; description of the activities related to intervention;
- digital photos of the accident area.

In case it is required, instead, the clearance of the territory, because some big dispersions have occurred, or some dangerous or toxic materials have been lost in the environment, situations as described in the Italian law 334/1999 (Seveso), the Headquarter further contacts the most qualified companies in the country, usually operative partners of the organization.

At the end of the operations, the data base is updated with the following information:

- intervention form related to involved persons in the accident and activities provided by operators;
- accident report, realized by Police officers, with reference to activities performed in order to return practicable road conditions, to manage the emergency of people and vehicles, and to collect the usual identity and measurement data;
- for relevant accidents, some special reports prepared by experts with reference to general situation and activities provided by operators;
- digital photos of the accident area.

As previously explained, after the cleaning procedures, the emulsion contained in tank 107 of motor vehicle 100 is temporary stocked at the site of the company that made the intervention, before to be definitely delivered to special and authorized plants, where they are processed and properly finished.

Another innovative feature of the motor vehicle 100, as illustrated in figures 4-5, is that it includes a specific system, alerting the incoming drivers about the dangerous traffic conditions. This system is composed of: a lighting panel 501; a red flag 502 that is moved vertically; four visual signalling devices with a yellow blinking light, to be placed on ground, in order to signal the obstacle on the road, in case of night intervention or low visibility conditions; an additional visual signalling device, having a yellow blinking light, or having a blue blinking light, according to the type of authorization obtained; and an acoustic signalling device.

On the LED panel 501, or on an alternative *liquid crystals display* (LCD) panel, two icons are displayed: the first alerting a generic danger, and the second imaging the symbol of two colliding cars. This panel, or screen, 501, is placed on the rear side of said motor vehicle 100, in

front of the incoming traffic, so that it can be seen by incoming drivers, and it can be opened or closed on itself, on command, using gears activated by a small electric engine. In the open position, the icons are well visible even in front of the sun light, and in the closed position, the panel 501 is perfectly aligned to the profile of the motor vehicle 100, and takes a small quantity of space. The red flag, or so called *moviere*, 502, is placed on the left side of the motor vehicle 100, and it is moved in a vertical direction using an electric engine. When the flag 502 is moved up and down, it has a strong power to attract the attention of the incoming drivers. Instead, when it is closed, it is either perfectly aligned to the profile of the motor vehicle 100, and takes a small quantity of space. The acoustic signalling device is connected to a proximity sensor, and it is able to detect the approaching of a vehicle that is potentially dangerous for all the persons staying in the area of the accident: the operators responsible of returning to safe traffic conditions, the Police officers, the workers of mechanical emergency, and the same people of vehicles that have been involved in the accident. When a new vehicle is arriving, the system is automatically activated and generates an acoustic alarm signal, that is diffused around by loudspeakers installed on the same motor vehicle 100. According to different embodiments, the alarm signal can be diffused by a pocket device and/or earphones, so that the persons can be alerted immediately about the danger and have the time to run to a safe place.

In order to support any possible emergency and assistance to people involved in car accidents, or natural disasters, the motor vehicle 100 further includes a set of boxes and housings, particularly suitable to contain medical emergency material, like i.e.: medical emergency box; first aid medicines; *defibrillator*, a small oxygen cylinder for asthmatic people; thermic cover; a bottle of water, etc.;

[0005] Therefore, the above examples show that the present invention achieves all the proposed objectives. In particular, it permits to obtain a multi-purpose motor vehicle supporting the activities addressed to re-establish safe and practicable road conditions, through cleaning of the area involved in car accidents, by aspiration of the functional liquids lost by vehicles, and collection of the solid debris related to the same involved vehicles.

The same invention includes an internal system for generation and transmission of energy, necessary as a power supply for a high-pressure water gun device and a fast aspiration of liquids device, so that it is avoided to carry an external electric generator, with its drawbacks concerning additional weight and size.

Furthermore, above said high pressure water jet device and fast liquids aspiration device are integrated and designed in such a way that they result to be efficient and at the same time they take a small amount of space, so that they can be transported and used in a very comfortable way.

Again, according to the invention, the equipment of the

motor vehicle includes a system signalling dangerous situations, i.e. due to the activities of operator and to vehicles that are stopped in the center of the road; this system protects everybody who is travelling through the area, and the persons involved in the operations of returning to safe traffic conditions.

Furthermore, the equipment of the motor vehicle includes computing means and means for a real time communication with an operative Headquarter, said means embedding functions of:

- driving the operator to the exact site of accident, according to the quickest route;
- immediate recognition of the risk factor of the event, according to detection of R.I.N. codes (Risk Identification Number) and O.N.U. codes (related to the identification of the product);
- communication to the operative Headquarter of the need for a special intervention by skilled operators available on the territory, especially in case of accidents involving products, materials or substances that are dangerous, infective and/or toxic;
- transmission to the operative Headquarter of digital images related to the accident, so that workers of the same Headquarter can understand exactly the situation and can take the proper decisions;
- reporting the completed activities of intervention, with storage of the technical and photographic documents related to the accident;
- communication to the operative Headquarter of the current geographic position of the motor vehicle, so that it can be visually represented on each terminal or on a main screen, and can give a constantly updated reference of the operative situation in a specific national area.

The present invention has been described for illustrative but not limitative purposes, according to its preferred embodiments, but it is clear that modifications and/or changes can be introduced by those skilled in the art without departing from the relevant scope, as defined in the enclosed claims.

Claims

1. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, said motor vehicle being equipped by:

- tanks (101) containing: clean water; water mixed to a special washing liquid (*ecological surfactant*) and a special treatment liquid for the road platform (so called *molecular chain destroyer*, to be sprayed on oil and related oil products) (803); emulsion obtained by collection of the washing/treatment liquids and the polluting

oil materials;

- a high-pressure water gun, including a rain jet adjustment, (802), providing a jet of the above said solution on the road platform, where polluting functional liquids (lubricating oils, fuels, cooling substances, etc.) have been eventually lost by vehicles as a consequence of car accidents or breakdown;

- a suction system (804) suitable to remove, from the road platform, the above resulting emulsion (806), obtained from polluting materials mixed to the washing/treatment solution (803); furthermore, solid and not biodegradable debris are removed/aspirated, these debris being related to typical car equipments (broken glasses, parts made of plastic, metals, remaining parts of structures, etc.) (805);

- tanks (107) containing the resulting emulsion (806) and the removed solid remaining parts, to be temporary stocked at the site of the company that made the intervention, before to be definitely delivered to special and authorized plants, where they are processed and finished according to specific operative procedures in respect to the existing environmental laws,

characterized in that:

- the power supply, necessary to make the multi-purpose motor vehicle (100) working properly, can be directly provided by the engine and/or any other point of energy transmission in the kinematic chain; the extracted energy can be therefore used as a power supply for mechanical, electrical or hydraulic devices.

2. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, according to previous claim 1, **characterized in that:**

- said polluting functional liquids, eventually lost by vehicles involved in the accidents, and said debris, related to typical equipments of the same vehicles, are considered material to be treated according to the Italian law D. Lgs. 152/2006 and its variations and integrations.

3. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, according to one or more of previous claims, **characterized in that:**

- said special washing liquid (803) is composed of: water, *ecological surfactant*, *molecular chain destroyer*, and/or additional substances; and it

is contained, in its final composition, inside said tanks (101), so that the complexity and size of the whole system is minimized, in respect to a situation where different tanks are installed, one for the water, and others for the above said other products.

4. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, according to one or more of previous claims, **characterized in that:**

- said high-pressure water gun, including a rain jet adjustment, (802), and said suction system (804), are supplied by electric energy directly coming from the above system converting mechanical energy in electric energy (808).

5. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, according to one or more of previous claims, **characterized in that** further comprising:

- computing means and means for a real time communication (600), with an operative Head-quarter, said means embedding a function of *satellite navigator*, where a geographic map is represented with indicated the current position of the motor vehicle (100) and the position of the site of the accident; and driving the operator to the exact site of the accident, following the quickest route.

6. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, according to one or more of previous claims, **characterized in that** further comprising:

- computing means and means for a real time communication (600), with an operative Head-quarter, said means embedding a function of immediate recognition of the risk factor of the event, according to detection of R.I.N. codes (Risk Identification Number) and O.N.U. codes (related to the identification of the product), and with access to a data base including the list of known dangerous goods, with reference to their chemical-physical features and the proper procedures of their treatment, with a further list of industrial plants able to provide treatment of that specific dangerous materials, with their location on the national territory.

7. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after

car accidents, through cleaning of the road platform, according to one or more of previous claims, **characterized in that** further comprising:

- computing means and means for a real time communication (600), with an operative Head-quarter, said means embedding a function of reporting, through access to a data base, the completed activities of intervention, with storage of the technical and photographic documents related to the accident. 5 10
- 8. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, according to one or more of previous claims from 5 to 7, **characterized in that:** 15
 - said computing and communication means (600) are represented by one or more mobile phones of the latest generation, connected through the mobile telephone network, or the satellite or wireless telecommunication networks, said phones being able to send/receive text messages, audio/video clips, e-mails and digital photos. 20 25
- 9. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, according to one or more of previous claims from 5 to 7, **characterized in that:** 30
 - said computing and communication means (600) are represented by one or more personal computers, tablet PCs, or PDAs, connected to the internet, through the mobile telephone network, or the satellite or wireless telecommunication networks, said computers being able to send/receive multimedia content, through FTP, web server, and electronic mail. 35 40
- 10. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, according to one or more of previous claims, **characterized in that** further comprising emergency signalling means, composed of: 45
 - a LED panel, or on an alternative *liquid crystals display* (LCD) panel, (501), where two icons are displayed: the first alerting a generic danger, and the second imaging the symbol of two colliding cars; this panel, or screen, (501), is placed on the rear side of said motor vehicle (100), in front of the incoming traffic, so that it can be seen by incoming drivers, and it can be opened or closed on itself, on command, using gears activated by 50 55

a small electric engine; in the open position, the icons are well visible even in front of the sun light, and in the closed position, the panel (501) is perfectly aligned to the profile of the motor vehicle (100), and takes a small quantity of space;

- a red flag, or so called *moviere*, (502), placed on the left side of the motor vehicle (100), that is moved in a vertical direction using an electric engine; when the flag (502) is moved up and down, it has a strong power to attract the attention of the incoming drivers; instead, when it is closed, it is either perfectly aligned to the profile of the motor vehicle (100), and takes a small quantity of space.

11. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, according to previous claim 10, **characterized in that:**

- said gears and devices, activated by respective electric engines, and related command circuits, and control logic, are power supplied by electric energy coming directly from said system of conversion of mechanical energy in electric energy (808).

12. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, according to one or more of previous claims, **characterized in that** further comprising an acoustic signalling device connected to a proximity sensor, said device is able to detect the approaching of a vehicle that is potentially dangerous for all the persons staying in the area of the accident: the operators responsible of returning to safe traffic conditions; the Police officers; the workers of mechanical emergency; and the same people of the vehicles that have been involved in the accident. When a new vehicle is arriving, the system is automatically activated and generates an acoustic alarm signal, that is diffused around by loudspeakers installed on the same motor vehicle (100); otherwise, the alarm signal can be diffused by a pocket device and/or earphones, so that the persons can be alerted immediately about the danger and have the time to run to a safe place.

13. Multi-purpose motor vehicle (100) for re-establishment of safe and practicable road conditions, after car accidents, through cleaning of the road platform, according to one or more of previous claims, **characterized in that** further comprising:

- a special equipment, including boxes obtained from the modified shape of the structure so that

the center of mass of the entire vehicle results to be as low as possible, and the operator works in comfortable and safe driving conditions; furthermore, during the intervention, the operator works in safe conditions in respect to the other incoming vehicles; 5

- a set of boxes and housings, particularly suitable to contain medical emergency material, available to support any possible emergency and assistance to people involved in car accidents, or natural disasters, like i.e.: medical emergency box; first aid medicines; *defibrillator*, a small oxygen cylinder for asthmatic people; thermic cover; a bottle of water, etc. 10

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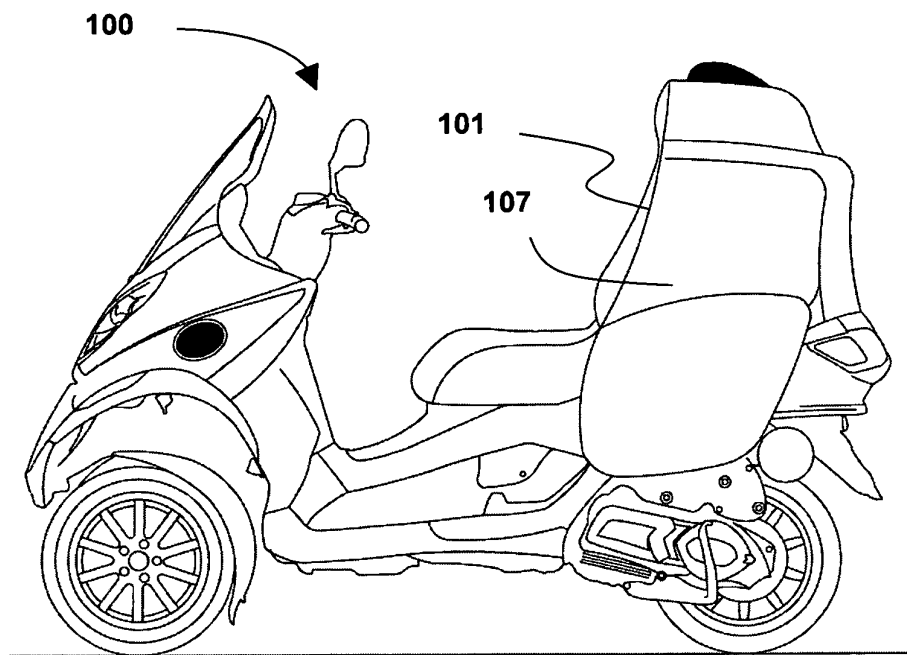


Fig. 1

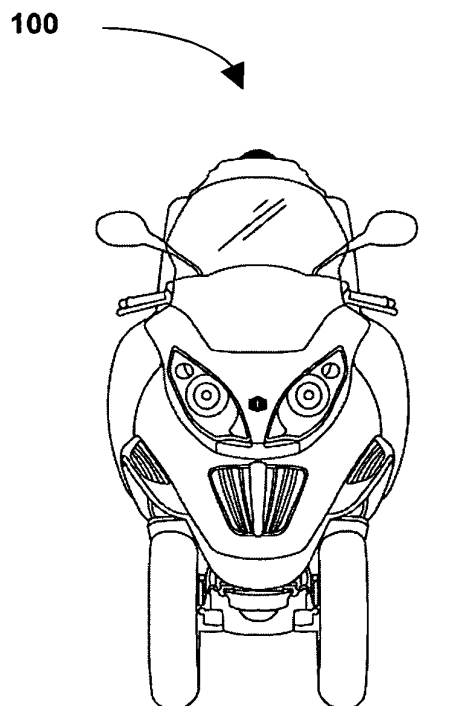


Fig. 2

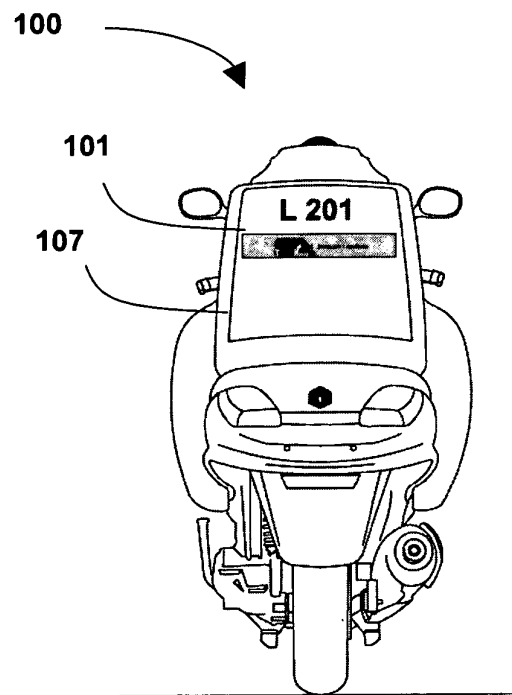


Fig. 3

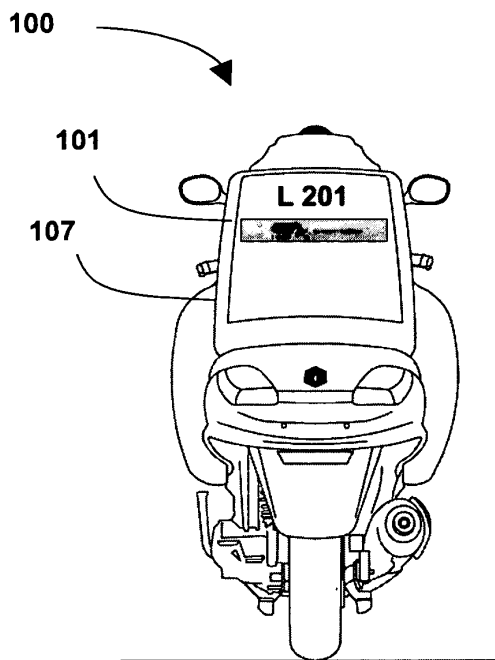


Fig. 4

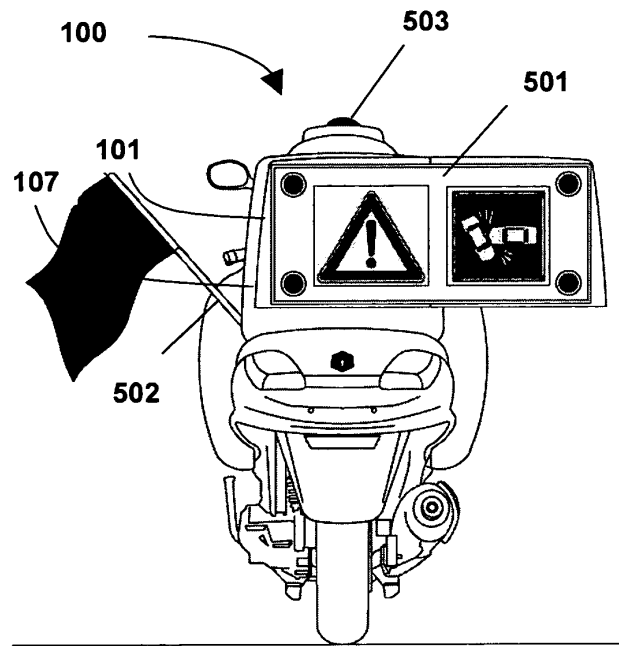


Fig. 5

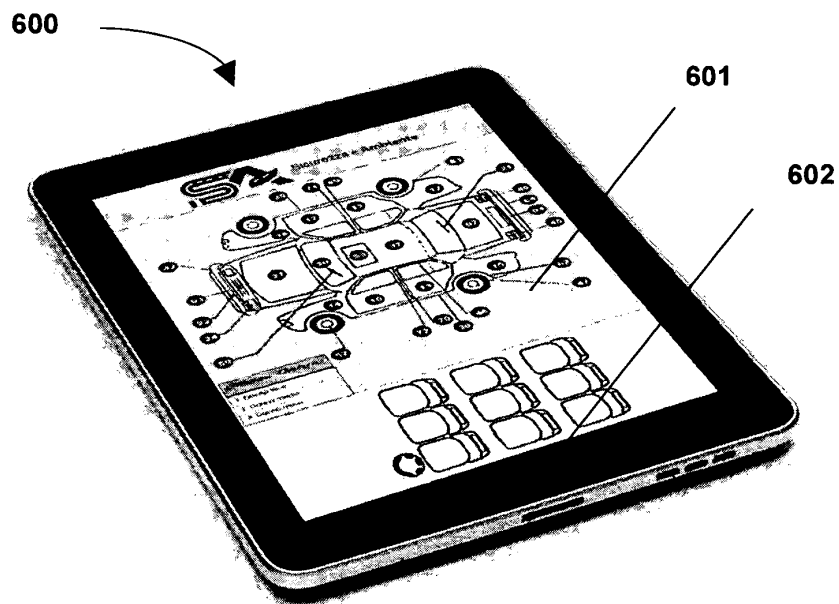


Fig. 6

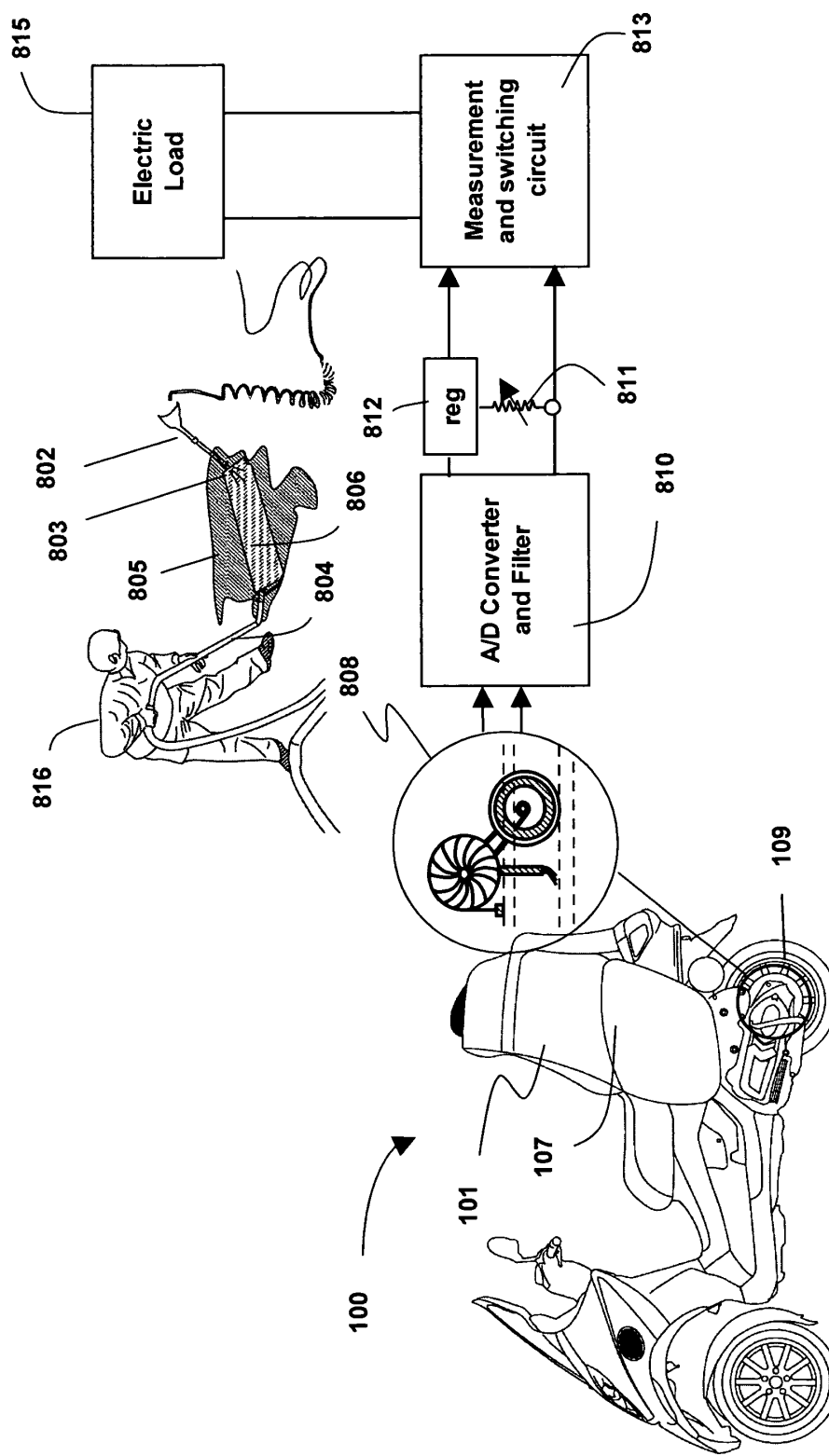


Fig. 7

**PARTIAL EUROPEAN SEARCH REPORT**

Application Number

under Rule 62a and/or 63 of the European Patent Convention.
This report shall be considered, for the purposes of
subsequent proceedings, as the European search report

EP 10 42 5290

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 6 381 801 B1 (CLEMONS SR WILLIAM E [US]) 7 May 2002 (2002-05-07) * column 2, line 64 - column 3, line 35 * * column 4, line 46 - column 5, line 21 * * column 5, line 41 - column 6, line 24 * -----	1,3,4	INV. B08B3/02 E01H1/00 E01H1/10
X	EP 0 162 769 A1 (TROTTOIRNET SA [FR]) 27 November 1985 (1985-11-27) * page 2, line 25 - page 6, line 24 * -----	1,3,4	
X	US 2007/169797 A1 (CROCKER JAMES P [US]) 26 July 2007 (2007-07-26) * paragraphs [0009] - [0011], [0026] - [0031] * -----	1,3,4	
Y	DE 43 35 117 A1 (DIETRICH THOMAS [DE]; DIETRICH MICHAEL [DE]; DIETRICH UWE [DE]) 20 April 1995 (1995-04-20)	1	
A	* column 1, line 33 - column 2, line 32 * * column 3, lines 18-37 * -----	3	
Y	FR 2 823 775 A1 (CARRE GALOPIN [FR]) 25 October 2002 (2002-10-25) * page 1, line 1 - page 5, line 22 * -----	1	TECHNICAL FIELDS SEARCHED (IPC)
			B08B E01H
INCOMPLETE SEARCH			
The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out. Claims searched completely : Claims searched incompletely : Claims not searched : Reason for the limitation of the search: see sheet C			
Place of search		Date of completion of the search	Examiner
Munich		24 February 2011	Militzer, Ernest
CATEGORY OF CITED DOCUMENTS		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	
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			



**INCOMPLETE SEARCH
SHEET C**

Application Number
EP 10 42 5290

Claim(s) completely searchable:
1, 3-13

Claim(s) not searched:
2

Reason for the limitation of the search:

Claim 2 is not clear (Article 84 EPC) because it does not contain constructional limiting features of the multi-purpose motor vehicle but only features relating to the pollutants. The multi-purpose motor vehicle cannot be defined by the pollutants lost by vehicles involved in accidents. Moreover, the reference in the claim to the "Italian law 152/2006 and its variations and integrations" is unclear because it does not give to the reader a clear indication which technical feature (if there are any) in the law and its variations and integrations should be considered (Article 84 EPC).



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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-4 (see additional sheet)

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-4

A multi-purpose motor vehicle comprising tanks containing the cleaning mediums, a high-pressure water gun, a suction system and tanks containing the resulting emulsion and removed solid parts wherein the power supply is directly provided by the engine of the motor vehicle and/or any point of the energy transmission in the kinematic chain.

2. claims: 5(completely); 8, 9(partially)

A multi-purpose motor vehicle comprising tanks containing the cleaning mediums, a high-pressure water gun, a suction system and tanks containing the resulting emulsion and removed solid parts wherein the power supply is directly provided by the engine of the motor vehicle and/or any point of the energy transmission in the kinematic chain and further comprising computing means embedding a function of satellite navigator.

3. claims: 6(completely); 8, 9(partially)

A multi-purpose motor vehicle comprising tanks containing the cleaning mediums, a high-pressure water gun, a suction system and tanks containing the resulting emulsion and removed solid parts wherein the power supply is directly provided by the engine of the motor vehicle and/or any point of the energy transmission in the kinematic chain and further comprising computing means embedding a function of immediate recognition of the risk factor of the event.

4. claims: 7(completely); 8, 9(partially)

A multi-purpose motor vehicle comprising tanks containing the cleaning mediums, a high-pressure water gun, a suction system and tanks containing the resulting emulsion and removed solid parts wherein the power supply is directly provided by the engine of the motor vehicle and/or any point of the energy transmission in the kinematic chain and further comprising computing means embedding a function of reporting the activities of the intervention.

5. claims: 10, 11

A multi-purpose motor vehicle comprising tanks containing the cleaning mediums, a high-pressure water gun, a suction system and tanks containing the resulting emulsion and



LACK OF UNITY OF INVENTION **SHEET B**

Application Number

EP 10 42 5290

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

removed solid parts wherein the power supply is directly provided by the engine of the motor vehicle and/or any point of the energy transmission in the kinematic chain and further comprising emergency signalling means.

6. claim: 12

A multi-purpose motor vehicle comprising tanks containing the cleaning mediums, a high-pressure water gun, a suction system and tanks containing the resulting emulsion and removed solid parts wherein the power supply is directly provided by the engine of the motor vehicle and/or any point of the energy transmission in the kinematic chain and further comprising detection means to detect a potentially dangerous approaching vehicle.

7. claim: 13

A multi-purpose motor vehicle comprising tanks containing the cleaning mediums, a high-pressure water gun, a suction system and tanks containing the resulting emulsion and removed solid parts wherein the power supply is directly provided by the engine of the motor vehicle and/or any point of the energy transmission in the kinematic chain and further comprising medical emergency material.

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

EP 10 42 5290

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

24-02-2011

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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EP 0162769	A1	27-11-1985	AU 563062 B2	25-06-1987
			AU 4229085 A	14-11-1985
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US 2007169797	A1	26-07-2007	WO 2007087622 A2	02-08-2007
DE 4335117	A1	20-04-1995	NONE	
FR 2823775	A1	25-10-2002	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 09007776 A [0001]