(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
6 November 2014 (06.11.2014)

WIPO | PCT

(10) International Publication Number
WO 2014/177154 A1

(51) International Patent Classification:
B62K 5/02 (2013.01) *B62K 5/05* (2013.01)
B62K 7/04 (2006.01)

(21) International Application Number:
PCT/DK2014/050114

(22) International Filing Date:
29 April 2014 (29.04.2014)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PA 2013 70235 30 April 2013 (30.04.2013) DK
PA 2014 70010 9 January 2014 (09.01.2014) DK

(71) Applicant: **TREFOR A/S** [DK/DK]; Kokbjerg 30, DK-6000 Kolding (DK).

(72) Inventors: **FRAHM, Søren Xerxes**; Rubinvej 16, DK-8700 Horsens (DK). **RIEDEL, Robert Byriel**; Sundvej 3, 1, DK-8700 Horsens (DK).

(74) Agent: **PATRADE A/S**; Fredens Torv 3A, DK-8000 Aarhus C (DK).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

(54) Title: CARGO SCOOTER

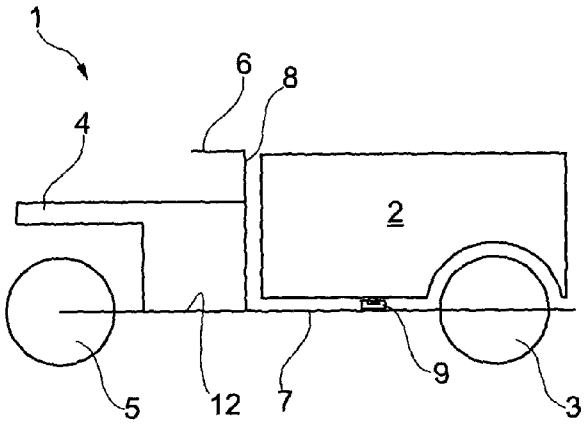

Fig. 3a

(57) Abstract: The present invention relates to a cargo scooter (1) comprising at least: two front wheels (3) and one rear wheel (5), steering means connected to at least one of said wheels, a chassis (7), where said cargo scooter (1) further comprises means for propulsion (11) of said cargo scooter (1) and means for carrying or supporting goods such as cargo. The cargo scooter (1) according to the invention is modularly built and comprises at least a base module (7), i.e. a chassis, and a cargo module (2), where said cargo scooter (1) further comprises means (9) for attachment and detachment of said cargo module (2) to and from said base module (7) on said cargo scooter (1). The cargo module (2) can e.g. comprise an open bed, a closed box, an open box, any OEM cargo unit and/or a people carrier module.

WO 2014/177154 A1

Cargo scooter

Field of the Invention

The present invention relates to a cargo scooter comprising at least: two front wheels and one rear wheel, steering means connected to at least one of said wheels, a chassis, where said cargo scooter further comprises means for propulsion of said cargo scooter and means for carrying or supporting goods such as cargo, where said cargo scooter is modularly built and comprises at least a self-supporting base module/a chassis.

Background of the Invention

It is well-known to have cargo scooters which primarily are used for urban transport of goods of any type. Often mail and small packages are delivered using such scooters. It is very typical that such cargo scooters are built and constructed with a specific fixed setup that will comprise a chassis with a load bed, a seat, some steering means and a propulsion unit. Propulsion is typically by using an internal combustion engine, a set of pedals or an electric motor that can be supported by a set of pedals.

Many types of such cargo scooters are constructed as a hybrid between small cars and bicycles and thus generally do not present much innovation or new thinking. Over the last decade or so it has however become more and more common to use electricity as power source as the battery technology has improved quite considerably.

Still the cargo scooters in the market remain rather conservative in their construction as they are constructed and built in a traditional manner having either an open load bed or a closed load bed – more or less as we know it from e.g. a van, a lorry, a truck etc.

It is also very common to arrange the load bed behind the driver as known from the above-mentioned types of vehicles. Although this is very much used, it still entails some disadvantages. One very important thing is that when performing a sudden braking, the goods/cargo on the load bed will still be pushed forward due to kinetic energy, and such a situation may very well cause problems or accidents to the driver.

In order to address the various needs for a cargo scooter, a cargo scooter will very often be used for multiple purposes no matter if it is more or less suitable for that specific purpose. As legal requirements for the working environment are becoming more and more restrictive it also becomes more and more difficult to perform the different jobs using a cargo scooter having e.g. an open or a closed load bed. Thus it becomes necessary to have more cargo scooters, where the scooters are differently built in order to address more specific needs and to be able to respect the legal requirements.

This is of course possible, but it is actually rather expensive to have more cargo scooters especially constructed and built for individual specific tasks. At the same time such cargo scooters that are built for specific purposes are typically not used on a daily full-time basis and thus they will also take up space when they are not in use.

The known cargo scooters are very inflexible and rather rigid in their construction and it is not easy or fast to reconfigure the known types of cargo scooters to a specific purpose different to the purpose for which the cargo scooter was originally built.

From DE 10 2011 111 497 A1 a traditional cargo scooter is known, where the propulsion unit can be changed within half an hour at a workshop. The load bed is however built into the chassis and can only be changed as a unit comprising the complete front end of the cargo scooter. This solution for a scooter is thus not very easy to reconfigure for specific purposes.

From CA 2 694 421 A1 a kind of modular built scooter is known, where a number of different modules such as e.g. a passenger seat, a shopping basket, or a pet cage, can be installed in order to fulfil specific needs. There is however a rather large drawback with this construction, namely that when reconfiguring the scooter, the whole scooter comes apart, as the structural parts that holds the various parts together needs to be uninstalled from their position.

The known solutions do thus not allow for an easy and quick reconfiguration of the scooter, such as changing the character of e.g. the load bed for a specific purpose during a working day. The known scooters can of course be reconfigured, but the process

is not possible for the user to carry out as a simple task – it is a time consuming job for a mechanic.

Object of the Invention

It is an object of the invention to provide a cargo scooter where the cargo scooter comprises a number of modules allowing different configurations of the cargo scooter in a simple and flexible manner. The object of the invention is further to provide a cargo scooter that can be configured to suit different users as well as different working environment and/or legal requirements.

Description of the Invention

As mentioned above and in the introduction to claim 1, the invention relates to a cargo scooter comprising at least: two front wheels and one rear wheel, steering means connected to at least one of said wheels, a chassis, where said cargo scooter further comprises means for propulsion of said cargo scooter and means for carrying or supporting goods such as cargo, where the cargo scooter is modularly built and comprises at least a self-supporting base module/a chassis.

The cargo scooter according to the invention comprises a cargo module, where said cargo scooter further comprises means at said base module/chassis for attachment and detachment of said cargo module to and from said self-supporting base module/chassis on said cargo scooter.

Said base module can comprise a full chassis or a part of a chassis, suspension, steering means, e.g. a handlebar, that is fixed or adjustable in height and/or angle, power supply, e.g. a battery pack arranged below the load bed or in another suitable space, electronics for controlling the cargo scooter, wheels, brakes, load bed, seating and propulsion units and devices. The base module does in principle comprise the essential parts of a cargo scooter with a basic frame ready for receiving a cargo module. The base module can however and as mentioned above comprise further modules that can be reconfigured in a workshop. The base module also called a chassis is self-supporting even without any cargo module installed thereon.

This allows for a simple reconfiguration of the cargo scooter, where the cargo module can e.g. comprise an open bed, a closed box, an open box, any OEM cargo unit and/or a people carrier module. The cargo unit can in other words be arranged to comprise in principle any possible configuration suitable for an all-round purpose or for a very specific purpose. As the cargo module can be attached and detached to the base module/chassis according to specific needs, it is very easy to alter the layout of the cargo scooter from one configuration to another configuration. Such a reconfiguration can be performed by the user of the cargo scooter and no workshop and/or skilled mechanic is needed.

By being able to change between two or more cargo modules it becomes possible to reconfigure the cargo scooter in a relatively short time to be optimised for another task. As an example, a cargo scooter can be equipped with a closed insulated cargo module comprising some kind of cooling equipment in order to keep the temperature inside a cargo module for transport and street sale of ice cream below e.g. -10 degrees Celsius. After said cooling cargo module has been used during the day, the cargo scooter can easily be reconfigured by changing the cargo module into another closed insulated cargo module comprising some kind of heating equipment or thermo equipment in order to keep the temperature inside a cargo module for transport and street sale of e.g. pizza or other types of food above e.g. 60 degrees Celsius. If a fleet of cargo scooters according to the invention is used for street sales, at least some of the cargo scooters can very easily be reconfigured according to the specific needs in the morning, midday, afternoon, evening and at night.

In an embodiment the cargo module can be configured with means for installation of an exchangeable heating unit and/or cooling unit. Such a unit can be installed inside the cargo module or outside and connected to the cargo module. The cargo module can also be constructed with e.g. two compartments, where one compartment is heated and another compartment is cooled. Alternatively the cargo module can comprise one heated or cooled compartment and one or more other compartments that are not heated or cooled.

A cargo scooter according to the invention may comprise a cargo module comprising at least a modular built sub-set of one or more panels, such as side panels, end panels, floor panels and/or cover panels, where said panels comprise means for attachment and detachment to said chassis, to said cargo module and/or to one or more other panels of said cargo module. The cargo module can thus be constituted by a number of sub modules, where e.g. the side panels can be changed or even removed in order to give the load bed another configuration for another purpose. The same possibility goes for the end panels, the cover panels, and the bottom and for other possible sub parts of a cargo module. Said sub parts of a cargo module may advantageously comprise suitable attachment and detachment means that will allow the parts to be installed and uninstalled in an easy manner and preferably without the use of tools.

In an embodiment of a cargo scooter according to the invention the cargo scooter may comprise a ramp module for accessing the cargo module, where said ramp module is arranged in mechanical connection with one of the following parts: the chassis, the cargo module. The ramp can be built into the chassis and used in connection with any cargo module installed at the chassis or it can be built into the cargo module in order to address the specific needs for a specific cargo module. Both solutions has advantages, such as that by building the ramp module into the chassis it will always be present no matter what type of cargo module is installed, and if the ramp module is built into the cargo module the ramp can be related even more to the specific needs and then not be a compromise that has to be usable for any kind of goods.

A preferred embodiment of a cargo scooter according to the invention comprises a ramp module arranged below, above or in the floor of the cargo module. Such a ramp may be arranged to slide in and out from a recess below or in the floor of the cargo module, but can also be arranged as one or more individual ramp parts that can be stored in a variety of places at a cargo scooter. By integrating the ramp module into the cargo module it becomes possible to design the ramp module for the specific needs that the cargo module is designed for. A further advantage is that the cargo scooter does not need to carry the load of the ramp module if it is configured with a cargo module that does not need a ramp e.g. a cargo module for street sale of ice cream.

In another embodiment of a cargo scooter according to the invention the ramp module can be arranged at the end of the cargo module and constitute at least part of an end panel, when not in use as a ramp. This allows for the ramp to have a second function such as being the end panel of a cargo module. The end panel/ramp may be foldable or extractable or in some manner adjustable in order to be able to fit both being an end panel and a ramp.

Such a ramp can be used to slide or drive goods to and from the load bed, and thus prevent the user from lifting heavy goods. This makes it possible to transport goods/items having a weight higher than the user is allowed to lift manually. In many countries personnel is only allowed to lift e.g. 15 kilogram manually due to legal requirements to the working environment, and any goods or items having a higher weight than allowed needs to be handled using lifting means. Until now goods having a weight above the allowed weight limit cannot be transported using small energy and environmental friendly cargo scooters as there is no possible way of handling the goods. Using a ramp system as mentioned above this becomes a possibility. In an embodiment of a cargo scooter the bottom or at least a part of the bottom of the cargo module may comprise a kind of trolley or lifting means, that can slide from the cargo module to the ground using the ramp, and which can then be used to handle heavy goods from the cargo module and all the way to the receiver of the goods. Further the ramp module might comprise actuator means that will allow for the ramp to be extracted and retracted from it position at the cargo scooter. Such actuator means might comprise electrical, pneumatic, hydraulic or any other type of actuator means.

The cargo scooter may comprise a single or a twin rear wheel. A twin wheel will be able to carry higher loads, and also more friction between the wheel and the ground will be present, which is appreciated for transfer of power during acceleration and braking. Also stability may be improved by having a twin rear wheel. Whether a single or a twin rear wheel configuration is used is in principle not interesting for the concept of a modularly built cargo scooter, but merely an option.

In an embodiment of a cargo scooter according to the invention, said modular cargo scooter comprises a driver module, said driver module comprising means for accommodating a driver, e.g. a seat unit or a driver support rail.

Said cargo scooter can further comprise means for attachment and detachment of said driver module to and from said base module on said cargo scooter.

The driver module may comprise various types of seats or support rails that allow the user to be either seated or standing during operation of the cargo scooter. The driver module may also comprise a running board for the driver's feet. Said running board may serve as a floor for the driver to be standing on, or as a floor for the driver to rest his feet upon when seated.

A cargo scooter according to the invention may comprise a driver module comprising running boards and a seat unit comprising a front end and a rear end, where said seat unit comprises adjusting means for adjusting the height of said seat unit. Adjusting of the height of the seat unit can be done easily according to the users preferences by a simple operation of a manual handle or electrical switch or by means of a stepless adjustment solution using friction.

A cargo scooter according to the invention can have a driver module comprising a seat, where said seat is arranged accessible from the rear end.

Further the invention also comprises a method of entering and/or leaving a cargo scooter as described above, where said method comprises that a user enters and/or leaves the cargo scooter/the driver module in a direction corresponding to the forward and backward driving direction of the cargo scooter.

The running boards can with advantage be arranged along the sides of the seat unit and by having a rather narrow seat unit, the user can enter the cargo scooter from behind simply by stepping up onto the running boards and lowering himself to rest at the seat unit. This possibility has a very important impact on the ergonomic use of the cargo scooter, as the user/driver does not need to twist his hips when entering the scooter. A

cargo scooter used to deliver mail and packages will during a normal working day be entered and left up to 400 times, and all the known types of scooters, has an entrance that demands the user to enter it from the side, which inevitable will cause the user to twist in the hips and knees. Over time this will possible cause a work related wear and damage at the hips and knees. Having a narrow seat and running boards the user can enter from the back by a simple one step up and then sit down without any twisting at all. Leaving the cargo scooter can likewise be done without having to twist in the hips or to swing one leg over a seat as is very common on the known types of scooters.

An alternative use of a cargo scooter according to the invention comprises that the user enters the cargo scooter from one of the sides or from behind and drives/operates the scooter standing at the running boards. This will especially save time if the next stop is within a short distance. Another alternative way of driving/operating a cargo scooter comprises that the user enters the scooter from one of the sides and uses the seat as a "sidesaddle" as known from horse riding. The mentioned alternative ways of using the cargo scooter, or more precisely the running boards and the seat, can in some circumstances save time and make the working environment around the cargo scooter more users friendly.

Another attractive feature of a cargo scooter according to the invention is that said cargo scooter comprises a support structure arranged in the area at the end of the cargo module, near the front end of the seat unit and below the steering means, where said support structure is arranged for supporting the legs and thighs of a user when operating the cargo scooter in curves. As the cargo scooter comprises two front wheels and a single or twin rear wheel it will not lean into the curves as a traditional two wheeled scooter, a motorcycle or a bicycle. The user/driver will however still be influenced by the centrifugal forces when driving the scooter through a curve and in order to support the driver during this, the cargo scooter comprises said structure, that allows the driver to support the legs/thighs and in this manner to be held comfortable in the seat during curves. The structure will preferably be some kind of plate structure or at least covered with some kind of plate material that might comprise elastic/soft parts at the area where the driver's legs will be in contact with said structure.

Further a driver module can comprise a side cover arranged at one or both sides of the driver module and/or at the rear end of the driver module/cargo scooter. Such side covers will protect the driver from other road users in case of road accidents. Even further such side covers can be arranged in such a manner that the driver of the cargo scooter only is allowed to step off or out of the driver module to e.g. the right-hand side, i.e. to the side away from the fellow road users. This will enhance the safety as the driver simply cannot step off the cargo scooter and into the traffic. Such side covers will of course also work very well as advertising space. Such side covers may have any suitable height e.g. 30 to 80 centimetres, or more or less, allowing the driver to move freely while operating the cargo scooter, and still to be protected against the fellow road users, the elements (e.g. rain and wind) and to be guided to only leave and enter the driver module via a specific opening in said side cover.

A cargo scooter can also be configured in a manner where said modular cargo scooter comprises a propulsion module, said propulsion module at least comprising means for electric power-assisted propulsion of said cargo scooter, where said propulsion module and said base module comprise means for attachment and detachment of said propulsion module to and from said base module on said cargo scooter.

The propulsion module may be a fully electrical and e.g. battery-supplied module, but it can also comprise a pedal arrangement to assist the electrical power supply. The pedals may be connected directly via mechanical means such as a chain, belt or shaft drive, but can also be connected electrically via a generator. Further the electric power can be supplied from fuel cells running on e.g. hydrogen or alternatively, the power can be generated in e.g. an internal combustion engine or in a multi-fuel engine. Further the power supply can be assisted by solar panels arranged in suitable areas on the cargo scooter. A suitable area could be on a cover module as will be mentioned below, or on a cargo module, or, in principle, anywhere else.

Also compressed air can be used as an energy source in a special compressed air engine, e.g. a turbine type engine, alone or as assisting energy source to electrical power, pedal power, or any other type of power/propulsion method.

As mentioned, a propulsion module can comprise means for attachment and detachment where said means are used in order to replace the propulsion module for service or repair. By performing a simple replacement of the propulsion module, the cargo scooter will be running within a very short time and the "old" propulsion module can be serviced at more suitable conditions and locations. This provides for a very short period of time where the cargo scooter is out of service during service or repair. The same benefits may apply to service and/or repair of other modules on the cargo scooter. The possibility of being able to attach and detach the propulsion module will of course have some obvious benefits as mentioned above when servicing the propulsion module, but also during manufacturing of the cargo scooter it is very advantageous that a specific module of a variety of different propulsion modules can be installed. This actually allows the manufacturer to have a standard base module that can be fitted with any module from a series of propulsion modules, giving a rather large flexibility. The same flexibility applies to the other modules already mentioned, and to the modules mentioned below.

A modular cargo scooter according to the invention and as described above may comprise a cover module, said cover module comprising at least one windscreen, a partial or a full roof structure, where said cover module and at least one of said base modules, cargo modules, driver modules and/or propulsion modules comprises means for attachment and detachment of said cover module to and from at least one other module. The cover module can be attached via means for attachment and detachment of other modules, e.g. a cargo module, but can also be attached via individual means in a fixed manner or in a detachable manner. The main purpose of the cover module is to protect the driver from rain, wind, sun or other influence from the elements in order to obtain a safe and comfortable use of the cargo scooter in almost any weather conditions. It is however still the main thought to provide a cargo scooter that allows the driver an ergonomic use during entrance and exit from the driver module.

In an embodiment of a cargo scooter according to the invention said means for attachment and detachment of any of said cargo-, driver-, propulsion- and/or cover module is manually and/or mechanically operated. Said means may comprise threaded bolts and nuts i.e. typically mechanical fastening means or any suitable kinds of mechanical quick

couplings that will allow for the respective parts to be either attached or detached without the use of tools such as spanners or the like, or at least without any extensive use of tools or spanners. In the simplest form of attachment and detachment means, said means can comprise flanges that are bolted together or alternatively fixed and/or held together by means of one or more non-threaded bolts arranged in apertures/holes in said flanges and e.g. secured by split pins. The more preferred and automated manually/mechanically operated means solution however comprises some kind of spring-biased coupling means that can be activated manually or mechanically during attachment, as e.g. one of the two parts may activate the attachment means when in the right position.

In yet another embodiment of a cargo scooter according to the invention said means for attachment and detachment of any of said cargo-, driver-, propulsion- and/or cover module is electronically or electrically operated. By operating the attachment and detachment means electronically/electrically there is no need to perform any operations in the coupling area. This will enhance the safety and also make it easier to perform an attachment and/or detachment of a module to another module or to the base module/chassis. Said means may comprise quick couplings that are operated by activating one or more actuators that will either release or secure said attachment and detachment means. Such operations may be carried out by activating said attachment and detachment means using any suitable type of electric switch arranged at e.g. a handlebar or in a more protected area. Further said means for activating the couplings can be connected to further control means on said cargo scooter in order to prevent undue operation. As an example said means can be blocked if one wheel is rotating, if the brakes are not on or if any other desirable situation is not positive or negative. This will prevent an undue release of e.g. a cargo module or any other module and thus ensure a more safe use of the modular cargo scooter.

In another embodiment of the cargo scooter according to the invention said cargo module and/or said base module comprises sensor means for sensing power level, temperature, movement and/or shocks to which the cargo scooter may be exposed. Such sensors can e.g. comprise temperature sensors for detecting conditions in a heated or cooled cargo module for transporting take-away food, in order to be able to document

the conditions to which the food was exposed during transport. In the same line of documentation also recording of the shocks and/or vibrations and/or accelerations to which the cargo scooter or at least the cargo module was exposed, might be preferred to document a certain quality of the transport carried out.

Other types of sensors could comprise weighing cells that will detect the overall weight of the cargo scooter and only allow the cargo scooter to drive when not overloaded. Also is very interesting to control the balance of the loads on a cargo scooter in order to ensure proper handling of the cargo scooter without compromising the safety of the driver and fellow road users. By installing weighing cells at e.g. the points where e.g. a cargo module is in contact with the chassis/base module, the balance can easily be determined, and if there is a difference of a certain value in relation to a threshold value, the cargo scooter can be disabled in order to not be driven until the balance fulfils specific criteria within the threshold values. This results in a very important safety factor for a load having e.g. an overload to the front, back or to the side which may cause the cargo scooter to be unstable which in turn will have a negative influence on the drivability and on the overall safety when using the cargo scooter. By controlling the distribution of the weight using weighing cells a larger safety margin can be ensured.

According to the invention said cargo scooter can comprise control means for controlling and operating the cargo scooter, where said control means comprises means for user identification. As a simple solution such identification means can be a key-operated ignition switch. Said control means may also comprise means for power management and for operating the cargo scooter, e.g. for managing acceleration and braking, for headlights and taillights and for turn signals. The cargo scooter may comprise brakes and/or locks that engage when removing e.g. a key from an ignition switch. Such brakes can be electrically activated and/or they can be spring-biased mechanical brakes acting on the wheels or somewhere on the transmission system. Further such locks/brakes may comprise means for locking the respective modules to each other and also for locking of e.g. a closed box cargo module to prevent theft of goods/cargo. In a preferred embodiment such locks and/or brakes can be operated as a single central unit, or the system can be constructed in order to e.g. brake in one sequence, and to perform a locking of e.g. a lid of a cargo module in another sequence. Also the above-

mentioned attachment and detachment means can be locked by activating/deactivating said identification means.

A cargo scooter according to the invention can comprise control means for controlling and operating the cargo scooter that comprises input means for electronically detecting an RFID tag or another type of electronic identification equipment. An RFID tag or similar electronic identification means (in the following text, the term "RFID tag" will be used as a general term for any electronic identifications means), can be used as a "key", for operating the cargo scooter, or it can be used together with a primary key or other type of identification means. The control means may be arranged in order to automatically activate e.g. a brake, a lock, or other features if the RFID tag is no longer within a certain distance from said input means and also to unlock the cargo scooter mechanically and/or electrically when the RFID tag is within a certain distance. This actually gives the benefit that the driver of the cargo scooter may leave the cargo scooter without thinking about locking and also enter the cargo scooter without unlocking any locks. Such a RFID tag or the like can be carried in a pocket, around the neck or in any other suitable place that is near enough to the receiving/transmitting part on the cargo scooter to detect its presence.

In a variant of a cargo scooter according to the invention said cargo scooter comprises one or more power connections between at least two of said modules. Such one or more power connections can be connected in one go as an integral part of a coupling system between the respective modules, or it can be connected in a separate process. The power connections can comprise connection between a power pack of batteries arranged under or in a cargo module. By arranging the power pack in a cargo module a fresh and fully charged pack can very quickly be changed onto the base module, and the primary tasks can be resumed. This way a cargo module can be self-supplying and a new load of e.g. ice cream can be made ready in a cargo module comprising cooling equipment and quickly changed onto a cargo scooter when the cargo scooter arrives at e.g. a store or warehouse. By arranging the power pack in the cargo module the condition of the goods/cargo can be held at a certain level due to the possibility to have e.g. a cooling, a heating or any other function activated, even if the cargo module is not installed at the base module of the cargo scooter. Said power pack of batteries can

constitute the power pack alone, or it can be a part of a divided power pack where another part can be installed at another place on the cargo scooter, preferably on the base module or at the propulsion module. By having more than one power pack/fuel source it becomes possible to use/drive the cargo scooter without any cargo module and also to prepare a cargo module as described above.

According to the invention the cargo scooter comprises a closure module, where said closure module comprises at least a brace or a lid, where said closure module and at least one of said base module, cargo module, driver module and/or propulsion module comprises means for attachment and detachment of said closure module to and from the cargo module. The closure module can be attached via means for attachment and detachment of other modules but can also be attached via individual means in a fixed manner or in a detachable manner. The main purpose of the closure module is to hold or fixate goods of uneven size in various manners in an open space by means of a brace or protected from the weather by means of a lid or even tempered in a cooling or freezing box.

In a variant of a cargo scooter according to the invention said closure module comprises opening means at least at one of the sides, front or rear of the cargo module. The opening means enables the closure module to be fully or partly opened depending on use and need. The opening means further enables a variety of possibilities in attachment depending on whether the user needs to access the cargo module from the sides, the front or the rear. If access was from the rear, the driver may then access the cargo module from the seat. If the access on the other hand was from the front end of the cargo module, anyone could gain access with or without opening the front end with a ramp.

In a further variant of a cargo scooter according to the invention said closure module comprises opening means within the closure module. This is an option to get a “lid in a lid” solution, where the closure module itself is the largest lid which for example have opening means enabling it to open to one of the sides of the cargo module, whereas a smaller lid may enable a smaller access opening to the cargo module from where an ice cream is taken out of the cargo module with freezer properties. The lid might be de-

signed to be transparent with or without sunscreen or just opaque. The options are many, and access from one or several sides even at the same time is possible.

In an embodiment of the invention the said modular cargo scooter comprises at least one sensor or button for opening/closing the closure module. This is an advantage when carrying goods with both arms/hands, so that there is no need to put the goods down on the ground to get the closure module opened. The sensor or button could be activated by foot, hand, knee or otherwise.

In another embodiment of the invention the said cargo module comprises at least one pull-out drawer. This makes it possible to keep goods separated from the rest of the cargo module at another temperature if needed. In case the cargo module was a freezer, the pull-out drawer could be used as a refrigerator or for goods where temperature not is an issue. The pull-out drawer may be pulled out to one side only or have the option to be accessed from both sides of the cargo module. Another option is two pull-out drawers, one accessible from each side.

In a further embodiment of the invention the said modular cargo scooter comprises means for locking/unlocking the closure module by remote control or distance sensor. When a postman, a courier, a delivery service or other user of a cargo scooter leaves the scooter unattended when delivering a parcel, pizza or other goods, it is of great importance that the cargo module is locked so that no one gains access to the rest of the content within the cargo module which might be of great value. By using a remote control or distance sensor the locking/unlocking operation is not a nuisance or even particularly annoying to use which ensures that the operator or driver actually uses the locking options.

In yet another embodiment of the invention the said modular cargo scooter comprises means for locking/unlocking the modular cargo scooter by remote control or distance sensor. For reasons previously mentioned regarding locking/unlocking of the closure module by remote control the same reasons appear for the cargo scooter itself. So when a postman, a courier, a delivery service or other user of a cargo scooter leaves the scooter unattended, it is not only of great importance that the cargo module is

locked so that no one gains access to the rest of the content within the cargo module, it is likewise or even more important to lock the cargo scooter itself. Again, by using a remote control or distance sensor the locking/unlocking operation is not a nuisance or even particularly annoying which ensures that the operator or driver actually uses the locking options.

Description of the Drawing

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Fig. 1	shows a cargo scooter as seen from the top.
Fig. 2	shows a cargo scooter as seen from the side.
Fig. 3a-3f	shows a cargo scooter comprising different cargo modules.
Fig. 4	shows a cargo scooter comprising a cargo module and a propulsion module.
Fig. 5	shows different propulsion modules.
Fig. 6	shows a cargo scooter comprising a cargo- and a propulsion module and a driver module.
Fig. 7	shows a height adjustable driver module.
Fig. 8	shows different driver modules.
Fig. 9	shows the thigh-support structure.
Fig. 10	shows access ways to the driver module.
Fig. 11a-11c	shows a cargo scooter comprising a cargo module and different cover modules.
Fig. 12a-12f	shows different side covers of the driver module.
Fig. 13a-13f	show a cargo scooter comprising a closure module with different variations of braces.
Fig. 14a-14d	show a cargo scooter comprising a closure module with different variations of lids.
Fig. 15a-15b	show different ways to open the cargo module.
Fig. 16a-16b	show various pull-out drawers
Fig. 17a-17b	show the process of lock/unlocking the cargo module and/or the cargo scooter

In the following text, the figures will be described one by one, and the different parts and positions seen in the figures will be numbered with the same numbers in the various figures. Not all parts and items indicated in a specific figure will necessarily be discussed together with that figure.

Item number list

1	cargo scooter
2	cargo module
3	front wheel
4	seat
5	rear wheel
6	handlebar
7	chassis/base module
8	steering column
9	attachment and detachment means
10	seat on people carrier cargo module
11	propulsion module
12	running board
13	internal motor
14	chain or belt drive
15	chain wheel
16	pedals
17	sprocket
18	driver module
19	support frame
20	suspension means
21	cover module
22	side cover
23	ramp
24	floor of cargo module
25	end panel
26	cover panel

27 heating unit
28 cooling unit
29 side panel
30 support structure
31 closure module
32 brace
33 lid
34 cover part
35 wing
36 sensor
37 button
38 pull-out drawer

Detailed Description of the Invention

Fig. 1 shows a cargo scooter 1 comprising a chassis/base module 7 as seen from the top. At the front end of the cargo scooter 1 two front wheels 3 are seen, and below the seat 4, a rear wheel 5 is seen. Between the seat 4 and the chassis/base module 7 a handlebar 6 is arranged allowing a driver to manoeuvre the cargo scooter 1.

This figure and the following figures show different variations of a cargo scooter 1 in a very simplified manner where there is no focus on the actual design/shape but merely the technical concepts is disclosed.

Fig. 2 shows the same cargo scooter 1 as seen in fig. 1 but here seen in a side view. Further details will be described below.

Fig. 3a to 3f shows a cargo scooter 1 comprising a cargo module 2 as seen from the side and in various configurations.

Generally it is seen that the cargo module 2 is installed on a chassis/base module 7, where also the wheels 3, 5 are installed as well as the seat 4 and steering column 8 comprising the handlebars 6. Underneath the cargo module 2 of fig. 3a, means 9 for attachment and detachment of the cargo module 2 to and from the base module 7 is

seen. A first part of said means 9 is installed at the cargo module 2, and a second part of said means 9 is installed at the base module/chassis 7. The means 9 is here seen as a single set of coupling means 9, but it is to be understood that there could for an example be arranged four sets or any other number of such attachment and detachment means 9 between two modules that are to be connected. Further said attachment and detachment means 9 can also comprise weighing cells as mentioned above for determining the weight of the load and also the balance of the load.

Fig. 3b shows a cargo module 2 comprising a ramp 23 that can be pulled from below the floor 24 of the cargo module, when in a horizontal position, as seen in dotted lines. As seen in fig. 3b' the ramp 23 can also be designed to constitute the end panel 25 or a part thereof, when not in use. The ramp 23 can thus be shorter or longer as seen here, and it may also comprise hinges or other means that will allow it to be folded or collapsed.

Fig. 3c shows an insulated cargo module 2 with a cover panel 26 suitable for storing and transporting cold goods such as e.g. food and/or ice.

Fig. 3d illustrates that a cargo module 2 may be arranged to accommodate either an exchangeable heating unit 27 or cooling unit 28. The unit can thus be installed to cover the specific needs for the cargo module 2. The cargo module could also accommodate seats for two or several people.

Fig. 3e shows a cargo module 2 with low side panels 29 that can either be individual side panels or a part of higher side panels as seen in fig. 3a and 3b. Such side panels 29 can be fixed to the floor 24, but can also be coupled in a detachable manner to the floor 24.

In fig. 3f a cover panel 26 is seen at the cargo module 2.

Fig. 4 shows a cargo scooter 1 comprising a cargo module 2, a base module 7 and a propulsion module 11. The cargo module 2 is attached to the base module 7 as is also seen in fig. 3a, and the propulsion module is also attached to the base module 7 via

attachment and detachment means 9. It is thus possible to replace the propulsion module 11 as well as the cargo module 2 by activating/deactivating the attachment and detachment means 9. The means 9 used between the base module 7 and the propulsion module 11 will typically comprise cables, hydraulic lines, electric wires or other connections, mechanical and/or electrical, for e.g. brakes, handling means or other parts that need some kind of connection to function. Such connections can be integrated into the attachment and detachment means 9, or not.

Fig. 5 shows different propulsion modules 11, namely a propulsion module 11' comprising a running board 12 for the driver's feet and a rear wheel 5 with an internal motor 13, a propulsion module 11'' comprising a chain or belt drive 14 driven by a motor 13 at the chain wheel 15, a propulsion module 11''' comprising a chain or belt drive 14 driven by pedals 16 and possibly a motor 13 at the chain wheel 15 and/or at the rear wheel 5, a propulsion module 11'''' comprising a chain or belt drive 14 driven by pedals 16, and a motor 13 between the chain wheel 15 and the sprocket 17. All four embodiments of propulsion modules 11 can be attached to a base module 7 as seen in fig. 2, 3 and in the following figures.

Fig. 6 shows a cargo scooter comprising a cargo module 2, a propulsion module 11 and a driver module 18. The driver module 18 mainly concerns how a driver of a cargo scooter 1 can be seated or standing while operating the cargo scooter 1. In the configuration in fig. 6 the seat is arranged as a part of a driver module 18 comprising attachment and detachment means 9 making it possible to attach and/or detach the driver module 18 to the propulsion module 11. It is however also possible to have the attachment and detachment means 9 arranged between the base module 7 and the driver module 18 or alternatively in connection with the attachment and detachment means 9 between the propulsion module 11 and the base module 7. This allows for a flexible and rather fast replacement of the driver module 18 as is also possible with the other modules 2, 7, 11 already mentioned.

Fig. 7 shows that the seat 4 can be adjusted in height, which preferably is done by activating – not seen – adjustment means arranged at the rear end of the seat 4. This allows the user to perform an easy adjustment before entering the cargo scooter 1, from

behind. The ergonomically benefits from entering the cargo scooter 2 from behind, is rather important as also described above.

Fig. 8 shows different driver modules 18, namely a regular seat 4 comprising rigid connection means between the driver module 18 and the propulsion module 11, a support frame 19 for a driver to lean against while driving the cargo scooter 1 in a standing position, a regular seat 4' comprising a suspension means 20 allowing the seat 4' to be more comfortable, and finally a running board 12 for the driver to rest his feet upon while seated or standing. The running board 12 also comprises suspension means 20. A running board 12 can easily be installed together with e.g. a seat 4 as seen in fig. 7 or any other driver module 18.

Fig. 9 shows a cargo scooter 1 seen from above where two arrows are pointed at a support structure 30 arranged at the end of the cargo module 2 and at the front end of the seat 4. This support structure 30 is arranged for supporting the legs and thighs of a user when operating the cargo scooter 1 in curves. As also mentioned above the cargo scooter comprises two front wheels and a single or twin rear wheel. It will thus not lean into the curves as a traditional two wheeled scooter, a motorcycle or a bicycle. The user/driver will however still be influenced by the centrifugal forces when driving the scooter through a curve and said support structure 30 allows the driver to support the legs/thighs against the support structure 30. The support structure 30 will preferably be some kind of plate structure or at least covered with some kind of plate material, that might comprise elastic/soft parts at the area where the driver's legs will be in contact with the support structure 30.

Fig. 10 shows different access ways to the driver module, illustrated by arrows. The cargo scooter 1 or more precisely the seat 4, can be entered from the sides and also, which is very important, from the rear end, in order to give the user a much more ergonomically path of movement. As such cargo scooters at a normal working day can be entered as many as up to 400 times, it is very important that it can be done easy and without overloading joints and muscles of the user.

Figs. 11a to 11c show a cargo scooter 1 comprising a cargo module 2 arranged on a base module 7 and further comprises different cover modules 21. In fig. 11a the cover module 21' is actually a windscreen which is attached to the base module 7 via the same attachment and detachment means 9 as used between the cargo module 2 and the base module 7. Fig. 11b shows a cover module 21'' comprising a windscreen and a roof that is partly covering the driver module 18, and fig. 11c shows a cover module 21''' comprising a windscreen, a roof and a back part more or less fully covering the driver module 18.

Figs. 12a-12f show different side covers 22 of the driver module 18. The side cover 22 fulfils a protective purpose and allows for advertising to be present in a rather large size.

In fig. 12a the side cover 22 comprises a side cover on the left-hand side of the cargo scooter 1 at the driver module 18.

In fig. 12b the side cover 22 comprises a side cover 22 on the left-hand side and in the full width of the rear end of the cargo scooter 1 at the driver module 18.

In fig. 12c the side cover 22 comprises a side cover 22 on the right-hand and left-hand sides and in the full width of the rear end of the cargo scooter 1 at the driver module 18. A side cover 22 as seen in fig. 9c may comprise a door that can be opened so a person can enter or leave the driver module 18.

In fig. 12d the side cover 22 comprises a side cover 22 on the right-hand and left-hand sides and with an opening at the rear end of the cargo scooter 1 at the driver module 18.

In fig. 12e the side cover 22 comprises a side cover 22 on the left-hand side which extends so as to cover approximately half of the width of the rear end of the cargo scooter 1 at the driver module 18.

In fig. 12f the side cover 22 comprises only a side cover 22 covering the full width of the rear end of the cargo scooter 1 at the driver module 18.

In figs. 12a to 12e, all the side covers are coupled to the end of the cargo module 2, but the side covers 22 might as well be arranged comprising attachment and detachment means 9 - allowing for attachment and detachment to the base module 7 or to the propulsion module 11.

Figures 13a to 13f show a cargo scooter 1 comprising a closure module 31 with different variations comprising braces 32.

In figure 13a and 13a' a cargo scooter 1 comprises a closure module 31 with two braces 32 covering the cargo module 2 by extending from one side of the cargo module 2 to the other side of the cargo module 2. In figure 13b and 13b' the closure module 31 with the two braces 32 is opened, and the braces 32 are pulled down the outside of the cargo module 2. The braces 32 could be connected to the cargo module 2 in a number of different ways like hinges, sliding rails or fixed devices in which the braces 32 are able to move or slide. The braces 32 can be used to fasten cargo which is too large to keep inside the cargo module 2 or the braces 32 can be used for extra cargo either when the braces 32 are resting on both sides of the cargo module or when then braces 32 are on the side of the cargo module 2. When the braces 32 are on the side of the cargo module 2, the braces 32 can be used for items which are longer than the size of the cargo module allows, like a ladder, broom, besom or other long items.

In figure 13c a cargo scooter 1 comprises a closure module 31 with one brace 32 in an opening position, where the brace 32 is open at the end panel 25, which alternatively could be at the rear cargo module end or the side panels 29. As can be seen from figure 13' where the brace 32 is in a closing position, the brace 32 is suitable for embracing the whole cargo module 2 and uneven goods within it. In figure 13c'' the brace 32 is closed, and the brace 32 has a cover part 34 in terms of a net stretched within the brace 32 to keep hold of the uneven goods within the cargo module 2. The cover part 34 could alternatively be a tarpaulin or a number of elastic strings or other flexible structure. The brace 32 could also by means of solid or flexible dividers be divided into

rooms of wanted sizes for example to keep special delivery into place and to keep the delivery sorted as well.

In figure 13d a cargo scooter 1 comprises a closure module 31 with one brace 32 which is foldable, so that it for example is possible to open the brace 32 at the end panel 25 of the cargo scooter 1 and remove goods from the cargo module 2. This could optionally be combined with a ramp at the end panel 25 for easier removal of goods.

In figure 13e a cargo scooter 1 comprises a closure module 31 with one brace 32, which is adjusted to a position at one end of the cargo module 2, which is different to a position at the other end of the cargo module 2. In figure 13f a cargo scooter 1 comprises a closure module 31 with one brace 32, which is adjusted to a position, which is parallel to but at different distance to the starting position and the top of the cargo module 2. The brace 32 can be fixed to and adjusted to the cargo module 2 in a number of different ways, like rods which are able to slide in pipes, guides or a sliding connection by means of rails.

Figures 14a to 14d show a cargo scooter 1 comprising a closure module 31 with different variations comprising lids 33.

In figure 14a a cargo scooter 1 comprises a closure module 31 with a lid 33, where the lid 33 and the content of the cargo module 2 is pulled up of the cargo module. It could be by means of compression springs, actuators or the like, which enables easy access from a number of sides to the content of the cargo module 2. Opposite the opening a closure operation is possible by pushing the lid 33 down or by using any means available in terms of electrically or mechanically driven actuators or motors.

In figure 14b a cargo scooter 1 comprises a closure module 31 with two lids 33. The closure module 31 is then able to be opened itself, and further when the closure module 31 is closed, it is then possible to gain access to the cargo module's 2 content by opening the lids 33. The lids 33 are shown in an embodiment where one lid 33 optionally could be opened and closed into another lid 33 displaced in the direction to/from the

end panel 25. Alternatively, one lid 33 could optionally be opened and closed into another lid 33 displaced in the direction to/from the side panel 29 of the cargo module 2. As can be seen in figure 14b' the closure module 31 with the lids 33 does not change the height of the cargo scooter 1 neither when the lids 33 are opened nor closed.

In figure 14c a cargo scooter 1 comprises a closure module 31 with a lid 33, and in figure 14c' it can be seen that the lid 33 can open towards one side panel 29 of the cargo module 2. It could alternatively be the other side panel 29 of the cargo module 2 or even the end panel 25 or the rear end of the cargo module 2. The lid 33 could be operated either manually or it could be operated by an actuator or pneumatic spring.
It is an option to have a smaller lid built in at the shown lid 33, such that it is not necessary to access the whole cargo module 2 if only a small parcel is needed from the cargo module 2. This option is not shown in the figure.

In figure 14d a cargo scooter 1 comprises a closure module 31 with a lid 33 with the form and function of bird wings, where the lid 33 opens around an axis which is preferably along the centre line of the cargo scooter's 2 longitudinal axis. In this preferred embodiment the two wings 35 are of the same size and can open individually or at the same time and away from the top of the cargo module 2 as shown in figure 14d'. In an alternative embodiment not shown, the wings 35 might open into the cargo module 2, that is in the opposite direction as shown in figure 14d'.

Figures 15a to 15b show different ways to open the cargo module 2.

In figure 15a a sensor 36 is placed at the front end of the cargo scooter 1 at the lower end of the end panel 25, where the sensor 36 by sensing a physical movement, by for example a foot, activates the automatic opening procedure of the closure module 31. In figure 15b a button 37 is placed at the front end of the cargo scooter 1 at the lower end of the end panel 25, where the button 37 by physical activation, by for example a foot, activates the automatic opening procedure of the closure module 31. Alternatively, the sensor 36 or the button 37 could be placed anywhere on the outside of the cargo scooter 1 as long as the sensor 36 is able to sense the movement, and as long as the

button 37 can be reached by man. Yet another option not shown, is the use of remote controlled activation means which could be carried by the driver, operator.

Figure 16a to 16b show various pull-out drawers 38.

In figure 16a a cargo scooter 1 comprises two pull-out drawers 38 one at each side of the cargo scooter's 1 cargo module 2 behind the front wheels 3. As can be seen in figure 16b the drawers 38 are positioned at the bottom of the cargo module 2. The drawers 38 can be pulled out separately or at the same time. Alternatively, the two pull-out drawers 38 could be just one big pull-out drawer 38, which could be pulled out to one side or the other of the cargo module 2. The drawers 38 can be opened manually or by means of a - not shown on the figure - sensor or a button.

Figure 17a to 17b show the process of locking/unlocking the cargo module 2 and/or the cargo scooter 1.

In figure 17a and 17b the locking/unlocking action is indicated by the locked/unlocked padlock. The means for locking/unlocking is preferably activated by the means of a remote control or distance sensor, open when the driver is less than for example 3 meters away from the cargo scooter 1 and applies to either the cargo module 2 or the cargo scooter 1 itself. However, it could obviously apply to both the cargo module 2 and the cargo scooter 1 and possibly at the same time. By locking the cargo module 2 it is also possible to lock the pull-out drawer(s) 38 at the same time. When locking/unlocking the cargo module 2, it is the closure module 31 which is locked/unlocked to the cargo module 2.

The invention is not limited to the above embodiments, which only serve the purpose of clarifying the preferred embodiments of the invention. It is thus clear that a skilled person after studying this specification will be able to make other embodiments of the invention which are not described in detail in this specification.

CLAIMS

1. A cargo scooter comprising at least: two front wheels and one rear wheel, steering means connected to at least one of said wheels, a chassis, where said cargo scooter further comprises means for propulsion of said cargo scooter and means for carrying or supporting goods such as cargo, where said cargo scooter is modularly built and comprises at least a self-supporting base module/a chassis, **characterised in**, that said cargo scooter further comprises a cargo module, and means at said base module/chassis for attachment and detachment of said cargo module to and from said self-supporting base module/chassis on said cargo scooter.

2. A cargo scooter according to claim 1, **characterised in** that said cargo module comprises at least a modular built sub-set of one or more panels, such as side panels, end panels, floor panels and/or cover panels, where said panels comprises means for attachment and detachment to said chassis, to said cargo module and/or to one or more other panels of said cargo module.

3. A cargo scooter according to any of the claims 1 and 2, **characterised in** that the cargo scooter comprises a ramp module for accessing the cargo module, where said ramp module is arranged in mechanical connection with one of the following parts: the chassis, the cargo module.

4. A cargo scooter according to claim 3, **characterised in** that said ramp module is arranged below, above or in the floor of the cargo module.

5. A cargo scooter according to claim 3, **characterised in** that said ramp module is arranged at the end of the cargo module and constitutes at least part of an end panel, when not in use as a ramp.

6. A cargo scooter according to any of the claims 1 to 5, **characterised in** that said modular cargo scooter comprises a driver module, said driver module comprising means for accommodating a driver e.g. a seat unit or a driver support rail.

7. A cargo scooter according to claim 6 **characterised in** that said driver module comprises running boards and a seat unit comprising a front end and a rear end, where said seat unit comprises adjusting means for adjusting the height of said seat unit.

8. A cargo scooter according to any of the claims 6 and 7 **characterised in** that said driver module comprises a seat, where said seat is arranged accessible from the rear end.

9. A cargo scooter according to any of the claims 1 to 8 **characterised in** that said cargo scooter comprises a support structure arranged in the area at the end of the cargo module, near the front end of the seat unit and below the steering means, where said support structure is arranged for supporting the legs and thighs of a user when operating the cargo scooter in curves.

10. A cargo scooter according to any of the claims 1 to 9 **characterised in** that said modular cargo scooter comprises a cover module, said cover module comprising at least one of a windscreen, a partial or a full roof structure, where said cover module and at least one of said base module, cargo module, driver module and/or propulsion module comprises means for attachment and detachment of said cover module to and from at least one other module.

11. A cargo scooter according to any of the claims 1 to 10 **characterised in** that said means for attachment and detachment of any of said cargo-, driver-, propulsion- and/or cover module is manually/mechanically operated.

12. A cargo scooter according to any of the claims 1 to 10 **characterised in** that said means for attachment and detachment of any of said cargo-, driver-, propulsion- and/or cover modules is electronically or electrically operated.

13. A cargo scooter according to any of the claims 1 to 12 **characterised in** that said cargo module and/or said base module comprises sensor means for sensing power level, temperature, movement and/or shocks to which the cargo scooter is exposed.

14. A cargo scooter according to any of the claims 1 to 13 **characterised in** that said cargo scooter comprises control means for controlling and operating the cargo scooter, where said control means comprises means for user identification.

15. A cargo scooter according to claim 14 **characterised in** that said control means for controlling and operating the cargo scooter comprises input means for electronically detecting an RFID tag or another type of electronic identification equipment.

16. A cargo scooter according to any of the claims 1 to 15 **characterised in** that said cargo scooter comprises one or more power connections between at least two of said modules.

17. A cargo scooter according to any of the claims 1 to 16 **characterised in** that said modular cargo scooter comprises a closure module, said closure module comprising at least a brace or a lid, where said closure module and at least one of said base module, cargo module, driver module and/or propulsion module comprises means for attachment and detachment of said closure module to and from the cargo module.

18. A cargo scooter according to claim 17 **characterised in** that said closure module comprises opening means at least at one of the sides, front or rear of the cargo module.

19. A cargo scooter according to any of the claims 17 to 18 **characterised in** that said closure module comprises opening means within the closure module.

20. A cargo scooter according to any of the claims 17 to 19 **characterised in** that said modular cargo scooter comprises at least a sensor or button for opening/closing the closure module.

21. A cargo scooter according to any of the claims 1 to 20 **characterised in** that said cargo module comprises at least one pull-out drawer.

22. A cargo scooter according to any of the claims 17 to 21 **characterised in** that said modular cargo scooter comprises means for locking/unlocking the closure module by remote control or distance sensor.

23. A cargo scooter according to any of the claims 1 to 22 characterised in that said modular cargo scooter comprises means for locking/unlocking the modular cargo scooter by remote control or distance sensor.

24. Method of entering and/or leaving a cargo scooter according to any of the claims 1 to 23 **characterised in** that said method comprises that a user enters and/or leaves the cargo scooter/the driver module in a direction corresponding to the forward and backward driving direction of the cargo scooter.

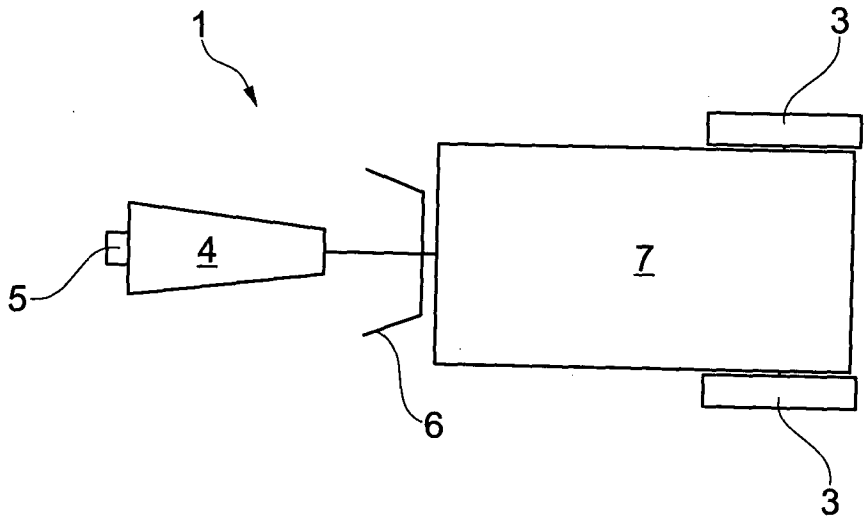

Fig. 1

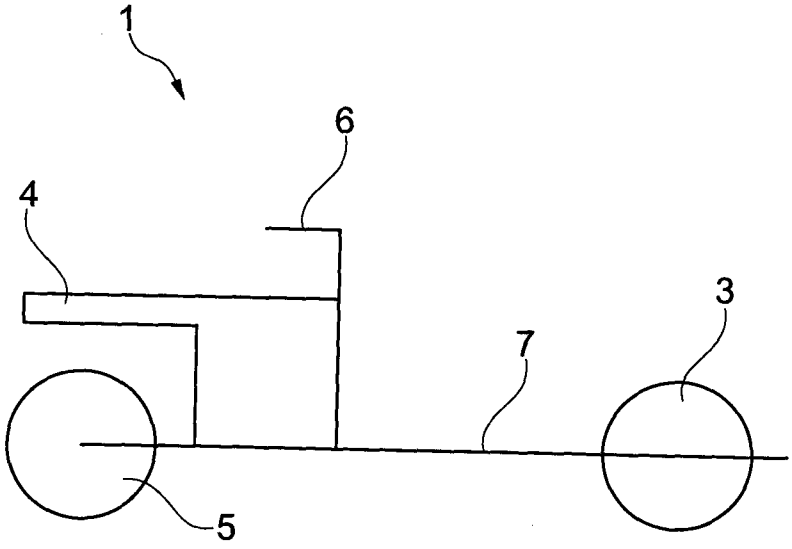

Fig. 2

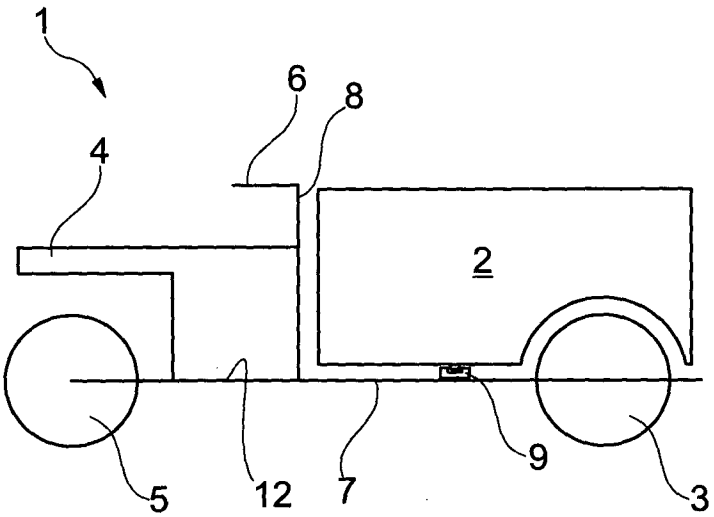

Fig. 3a

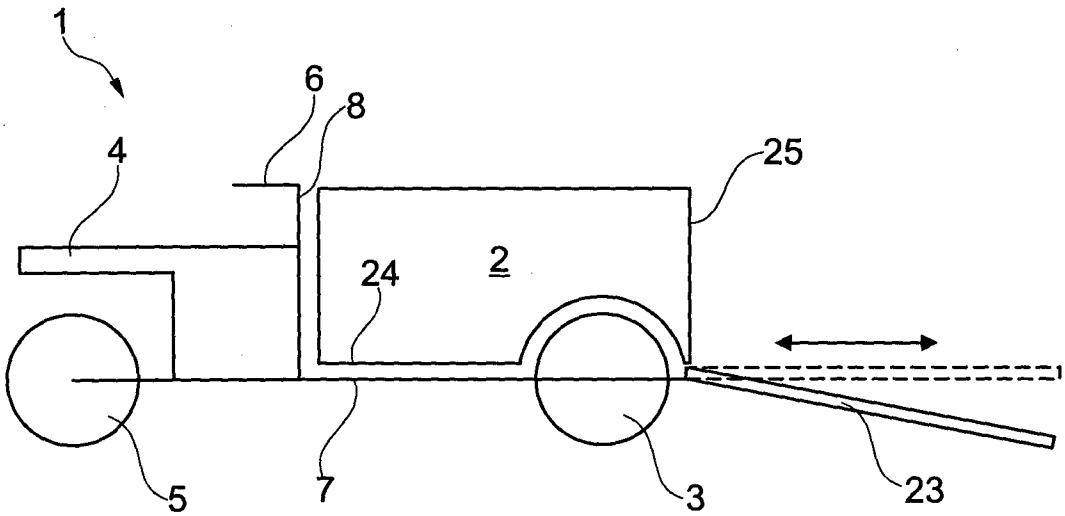

Fig. 3b

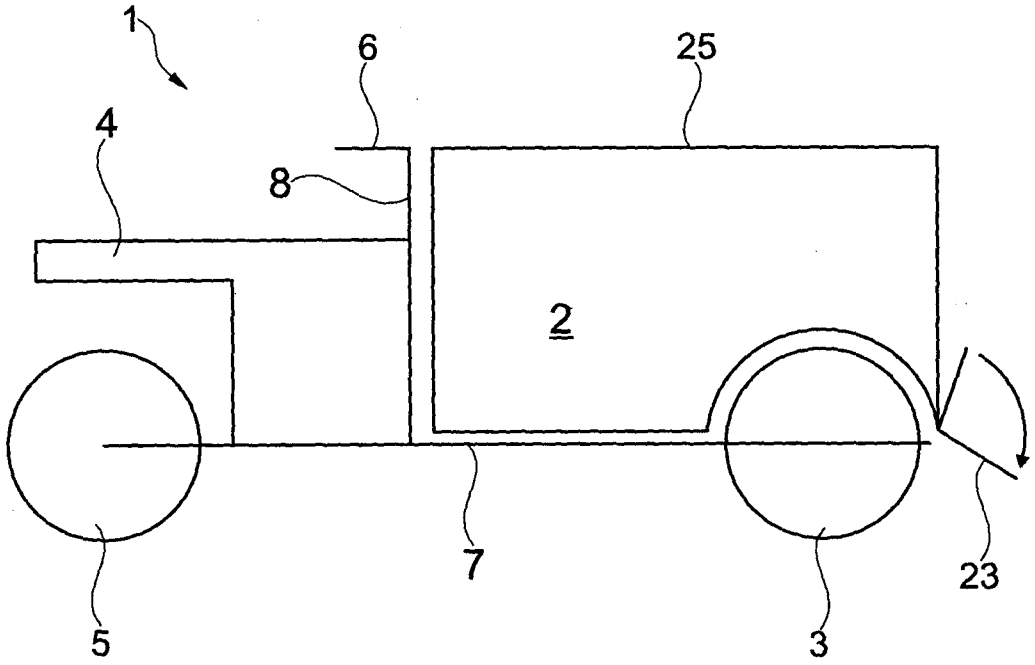

Fig. 3b'

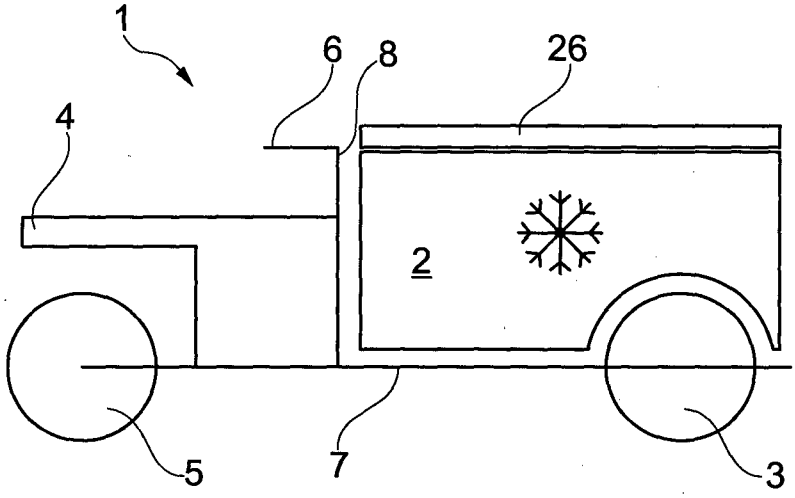

Fig. 3c

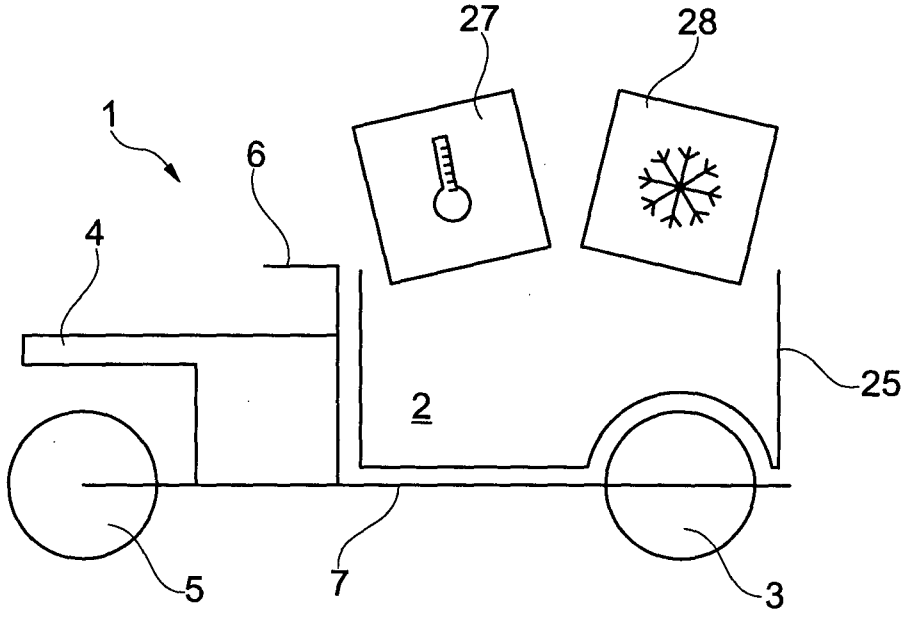

Fig. 3d

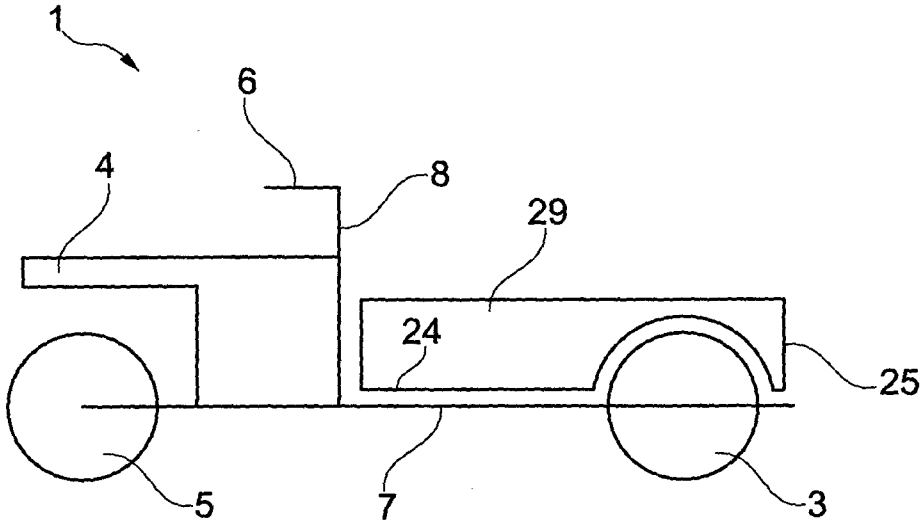

Fig. 3e

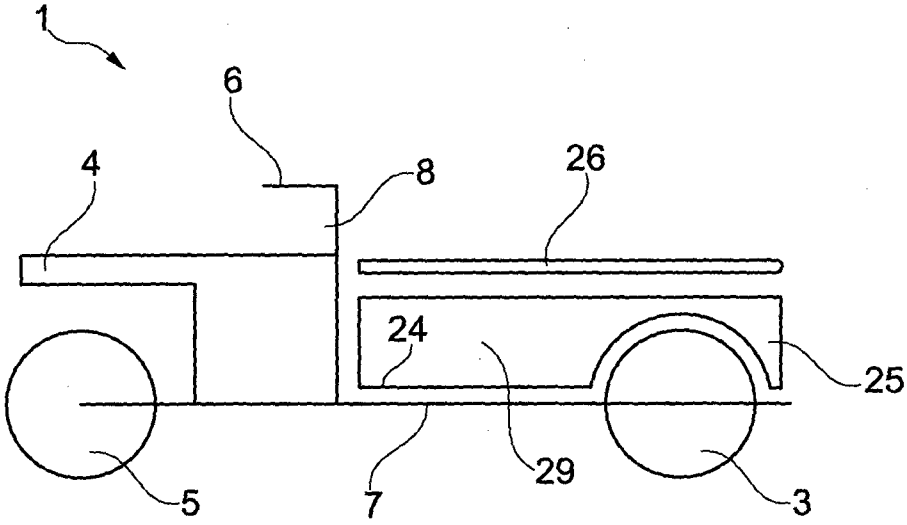

Fig. 3f

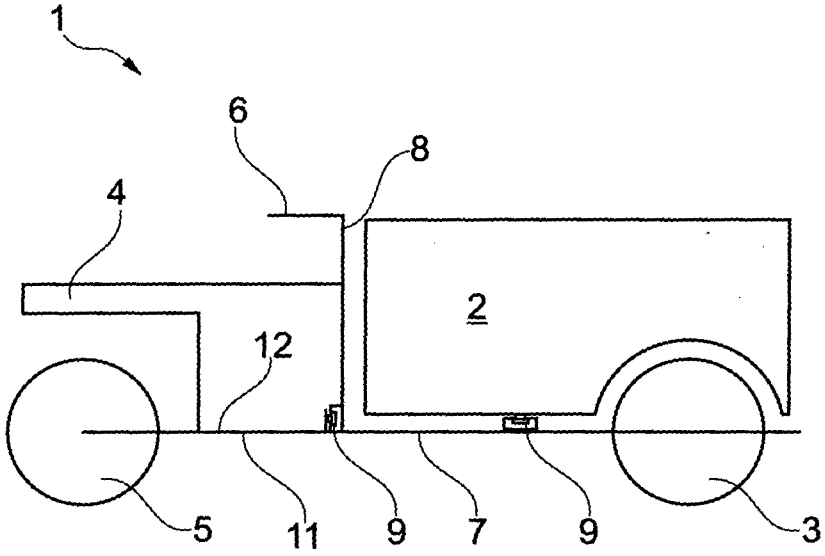
1
6
8
4
2
12
5
11
9
7
9
3

Fig. 4

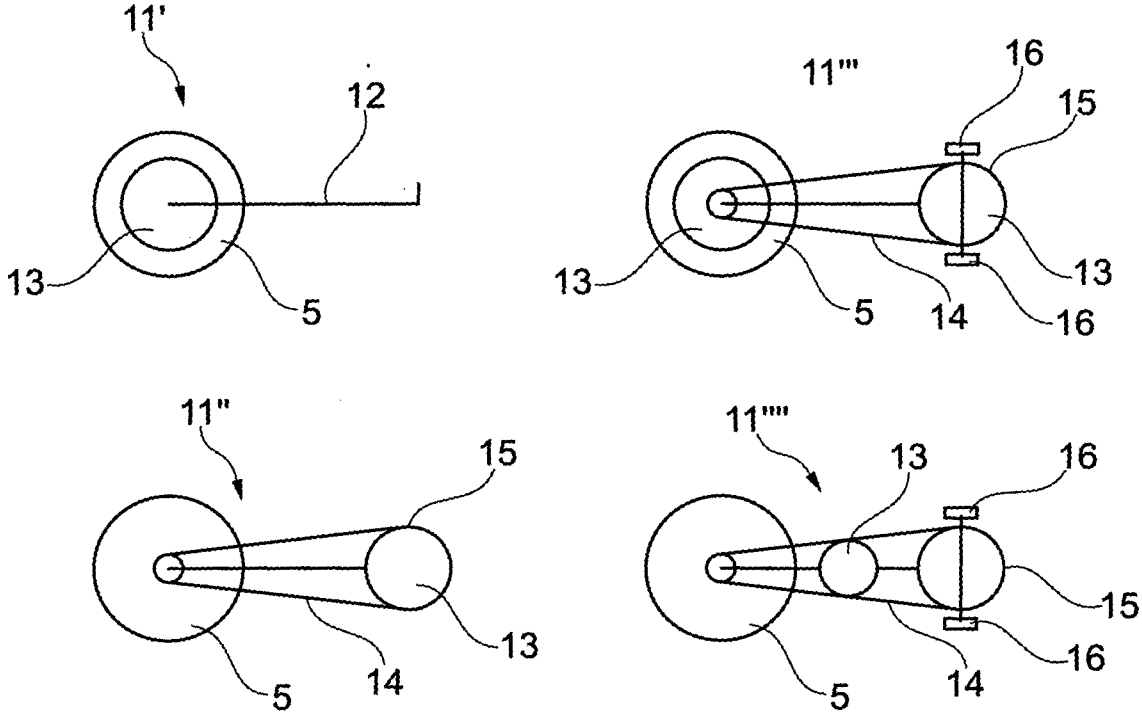
11'
12
13
5
11'''
16
15
13
5
14
16
11"
15
13
5
14
11''''
13
16
15
5
14
16

Fig. 5

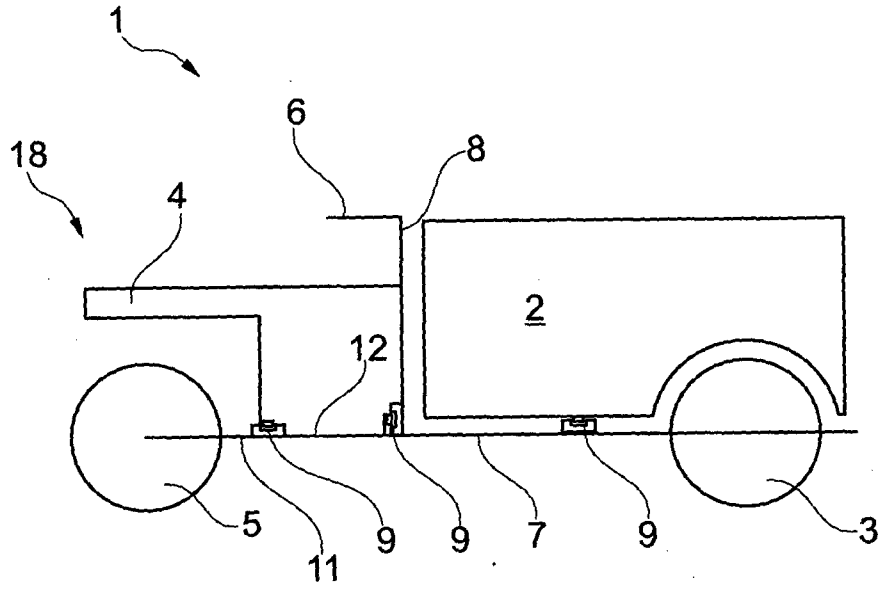

Fig. 6

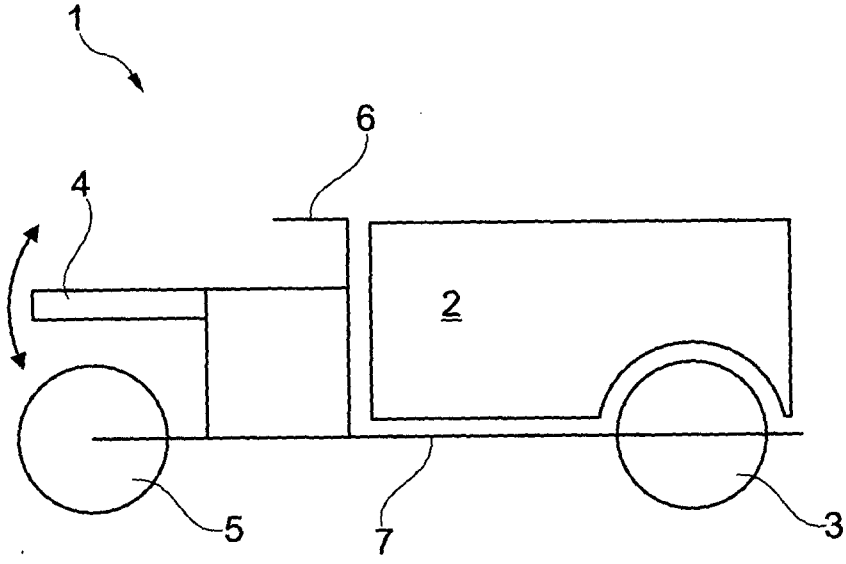

Fig. 7

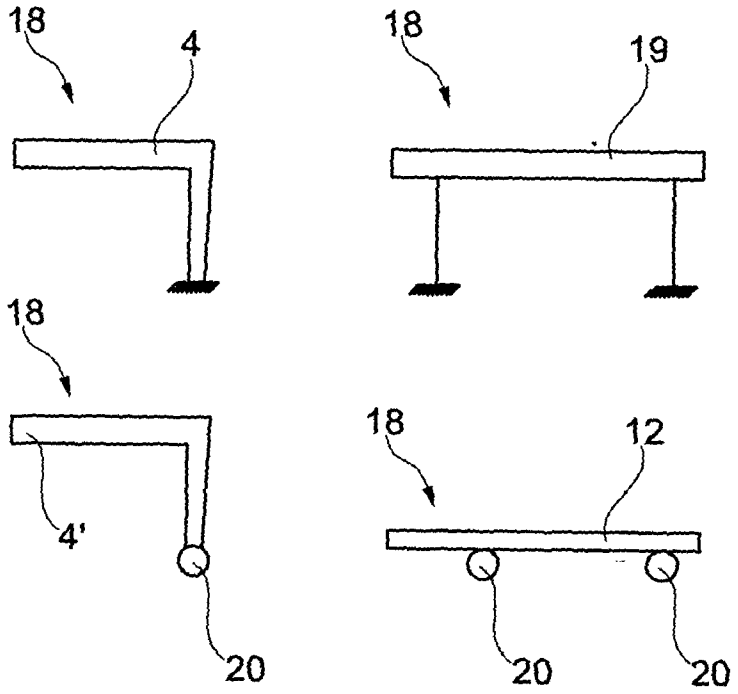

Fig. 8

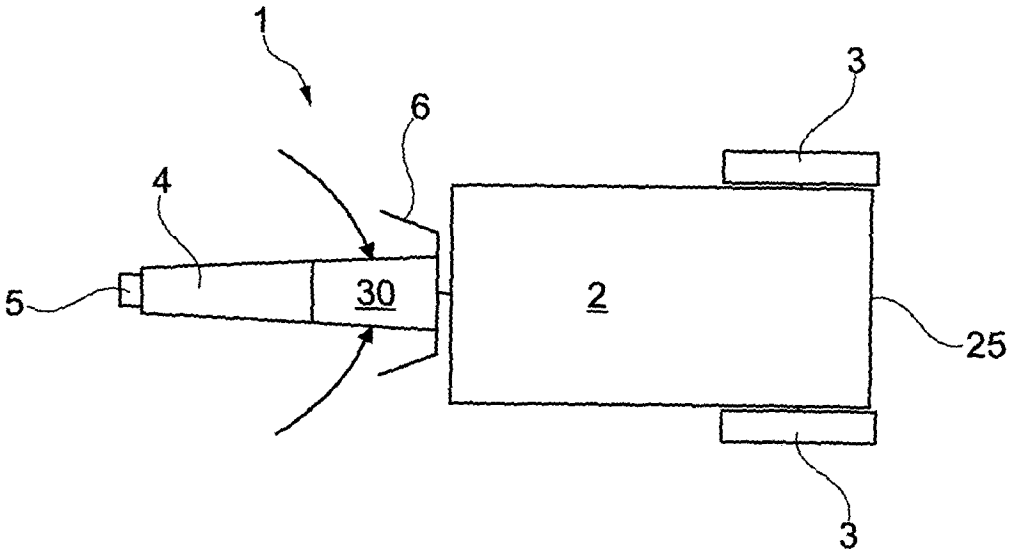

Fig. 9

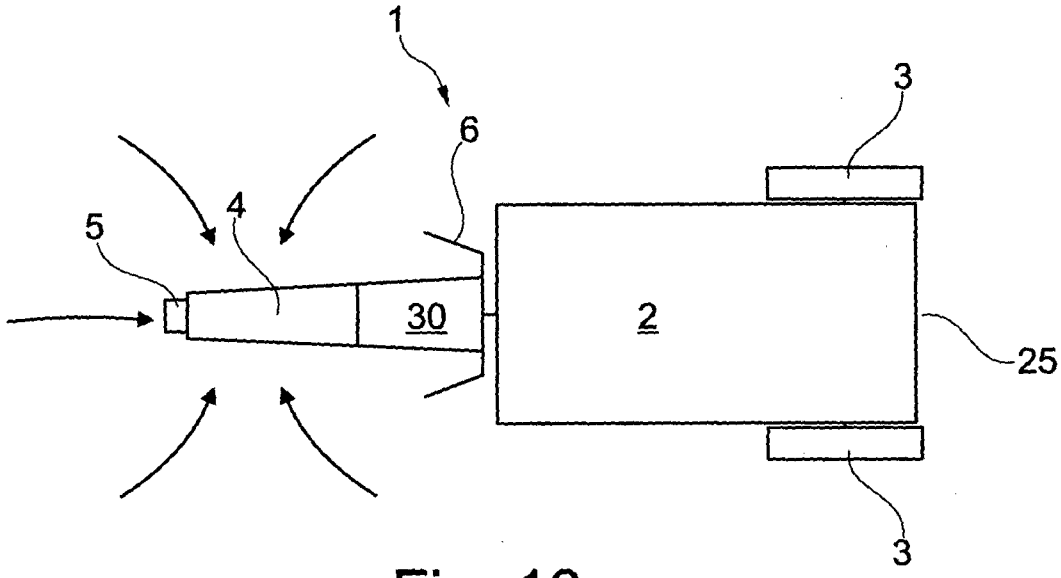

Fig. 10

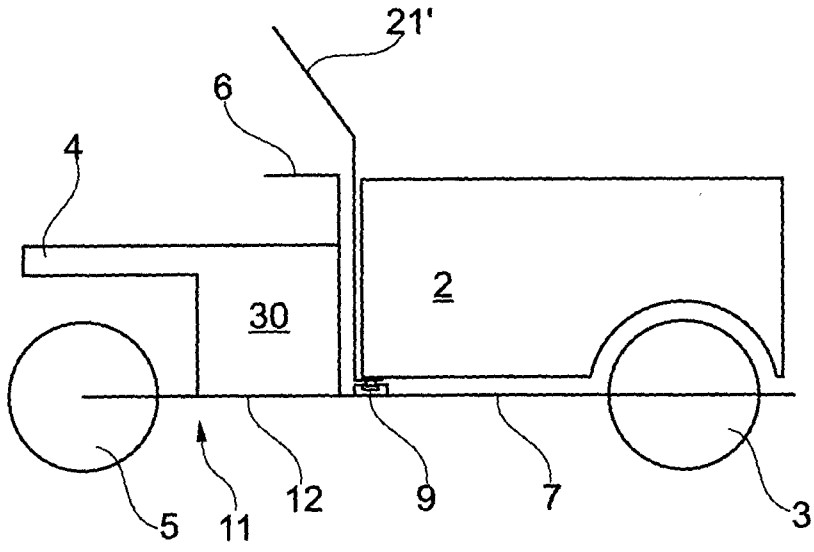

Fig. 11a

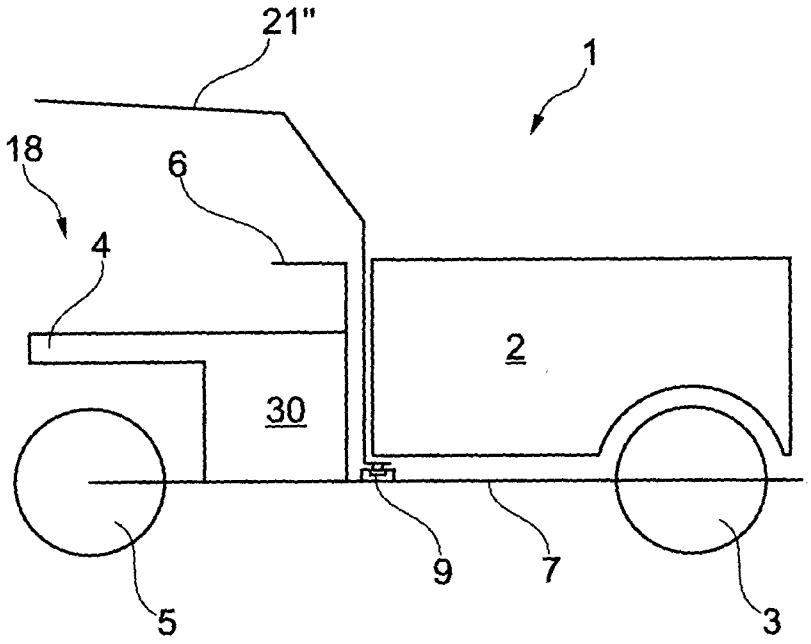

Fig. 11b

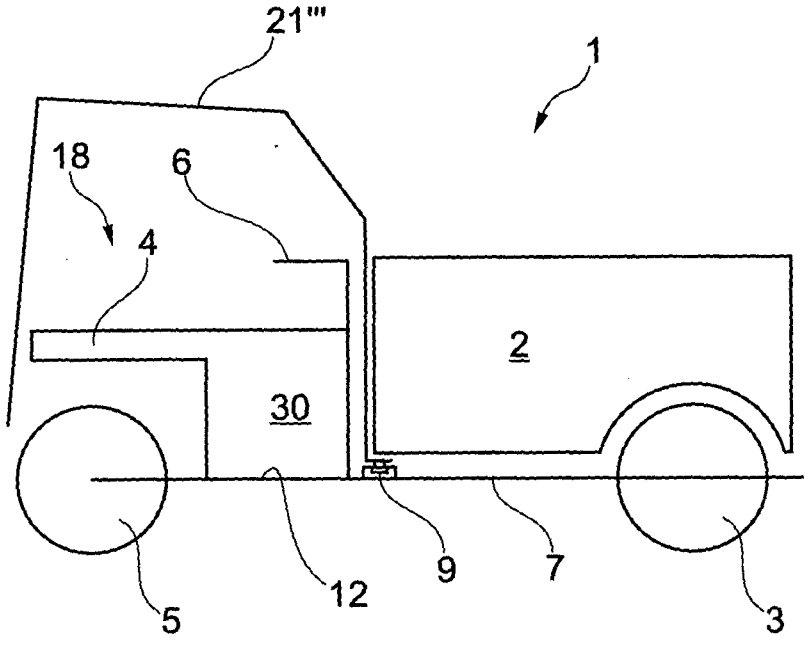

Fig. 11c

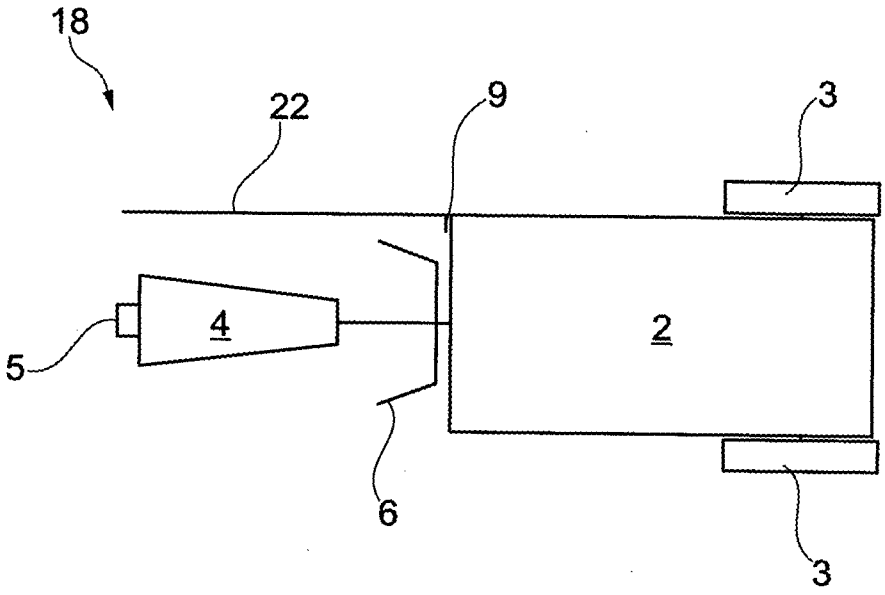

Fig. 12a

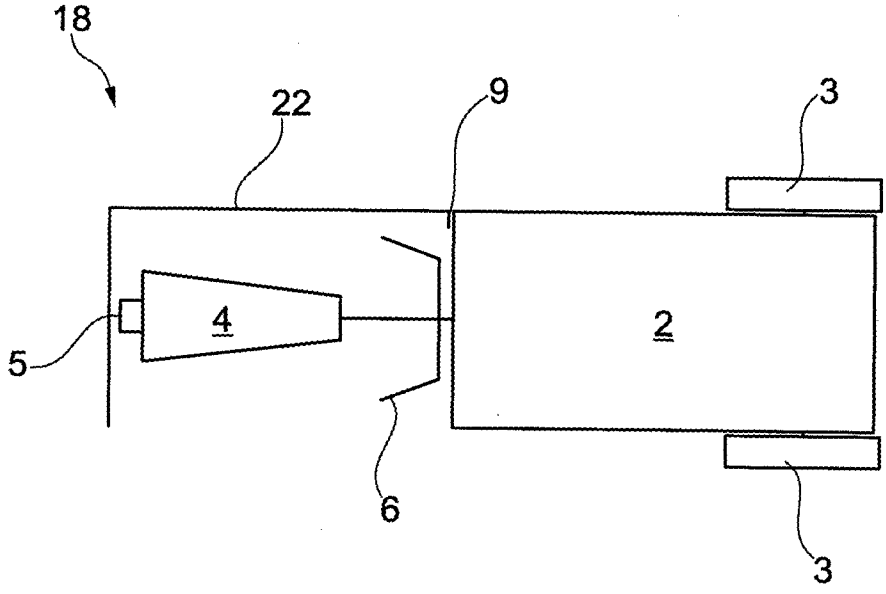

Fig. 12b

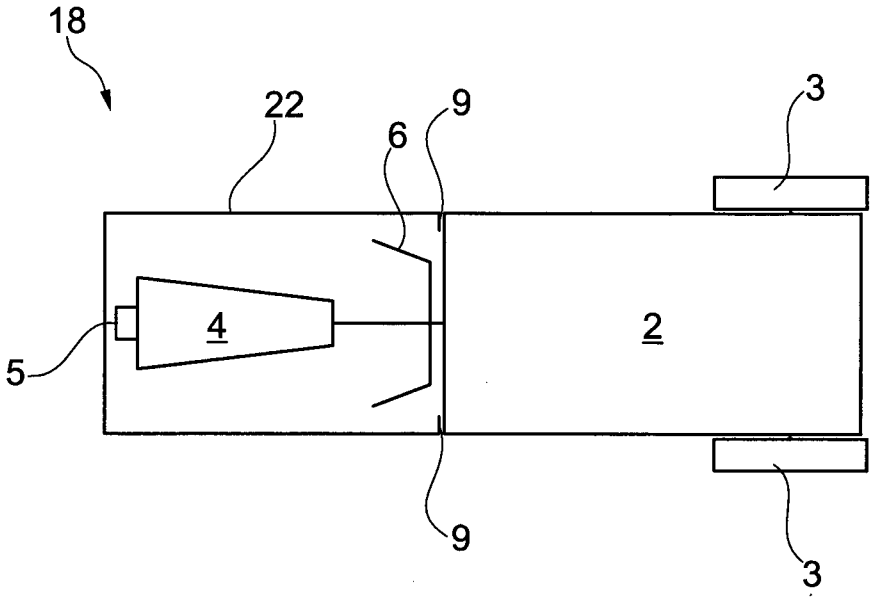

Fig. 12c

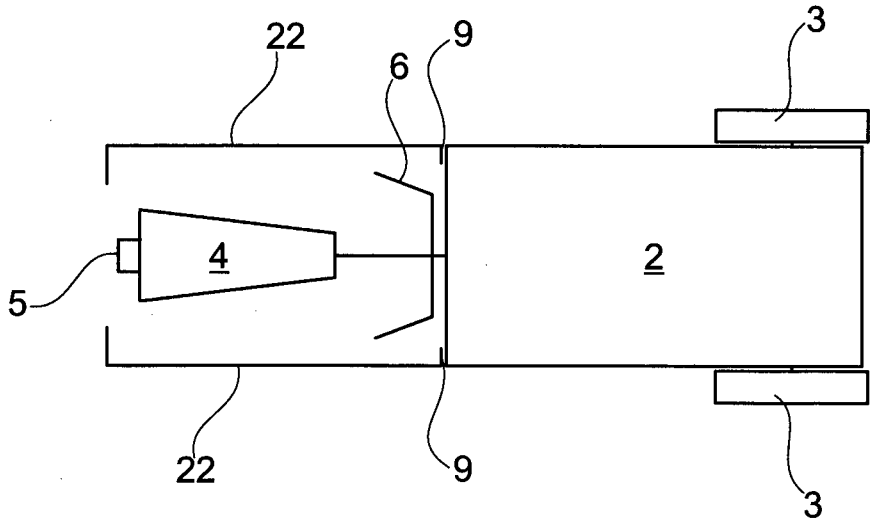

Fig. 12d

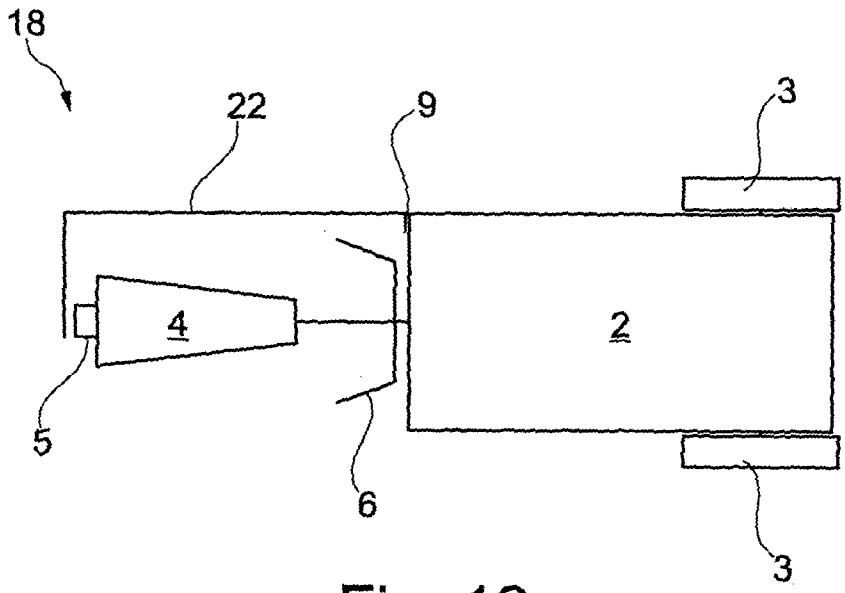

Fig. 12e

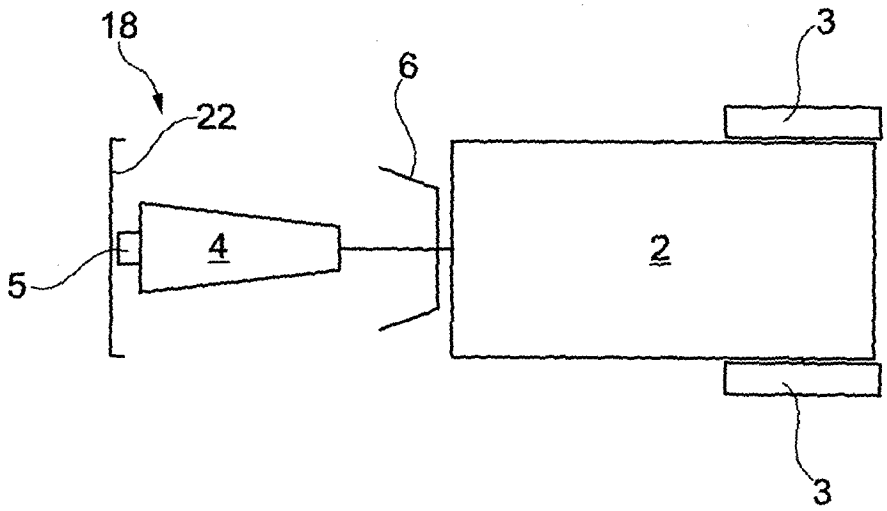

Fig. 12f

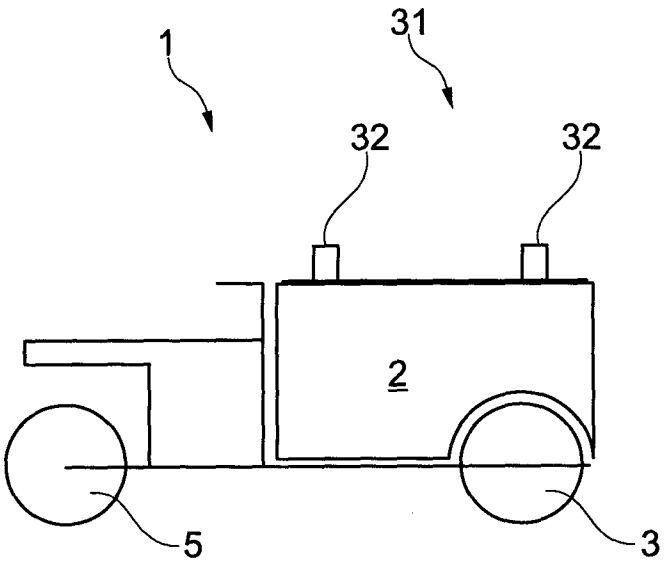

Fig. 13a

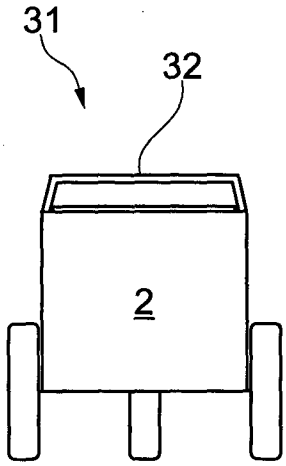

Fig. 13a'

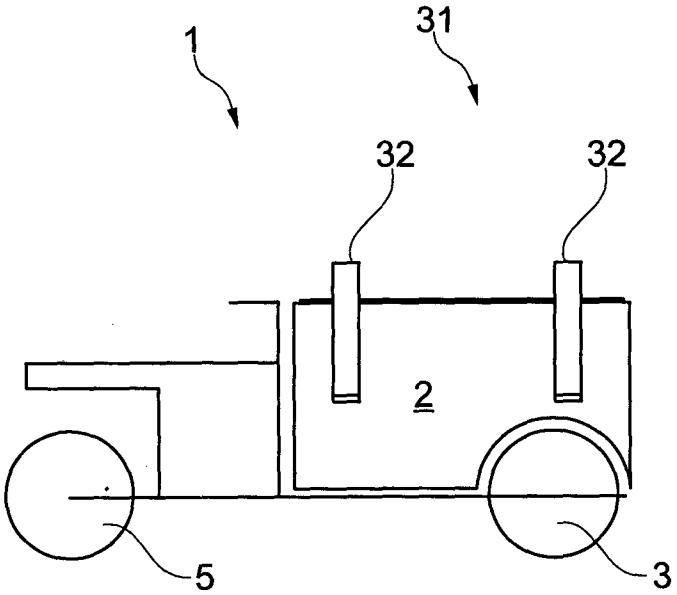

Fig. 13b

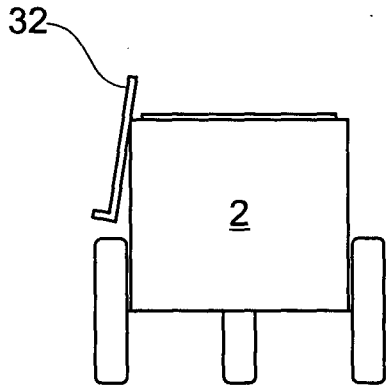

Fig. 13b'

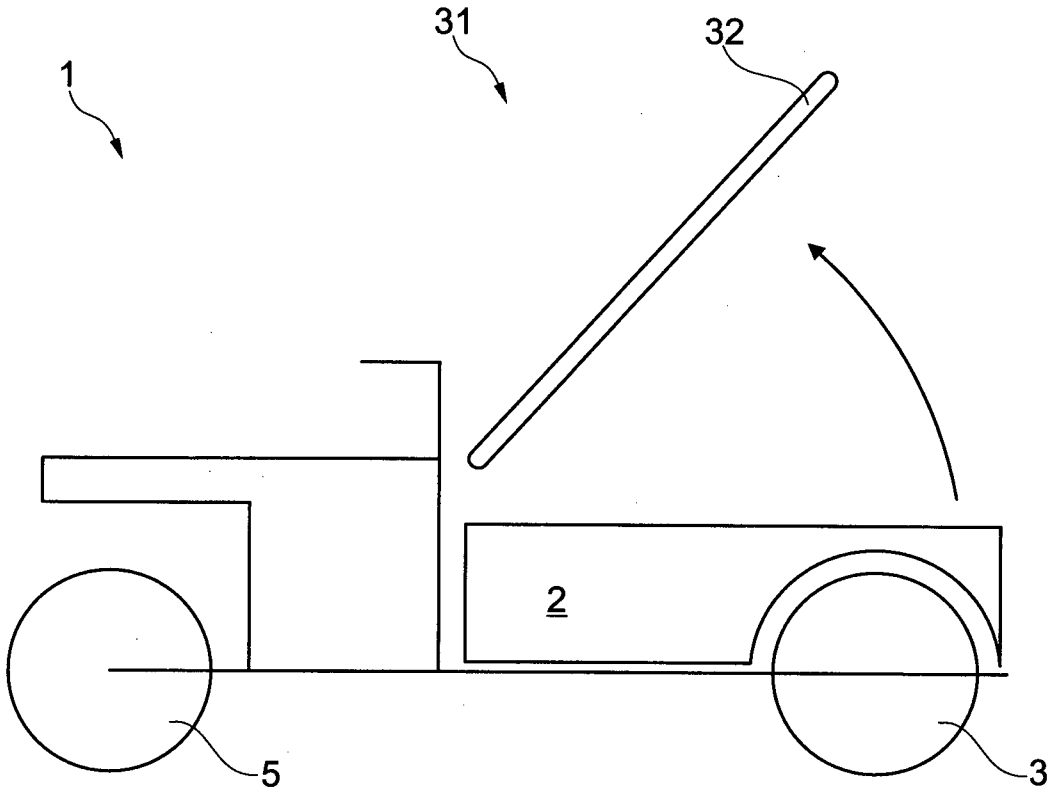

Fig. 13c

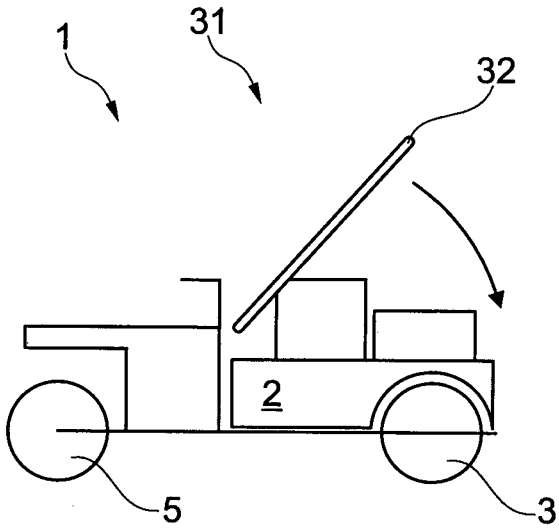

Fig. 13c'

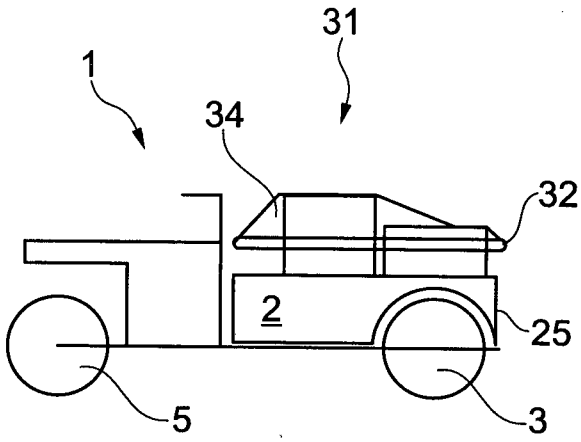

Fig. 13c"

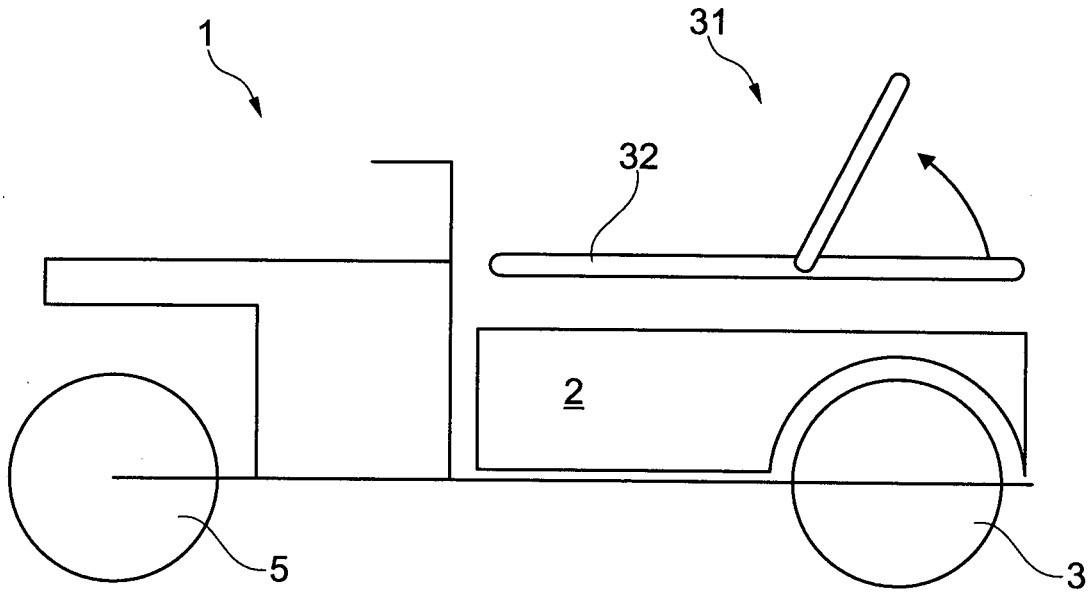

Fig. 13d

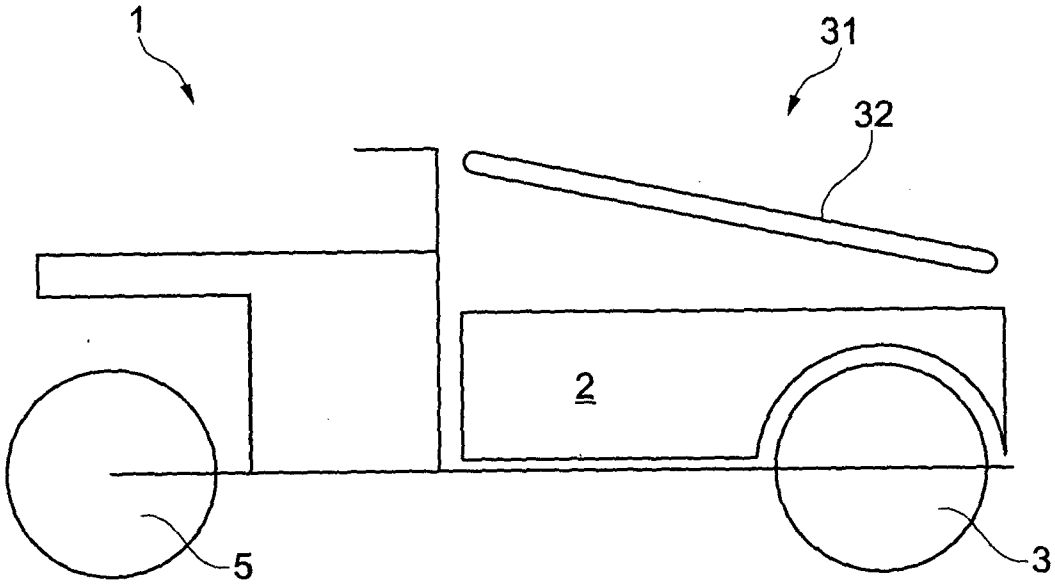

Fig. 13e

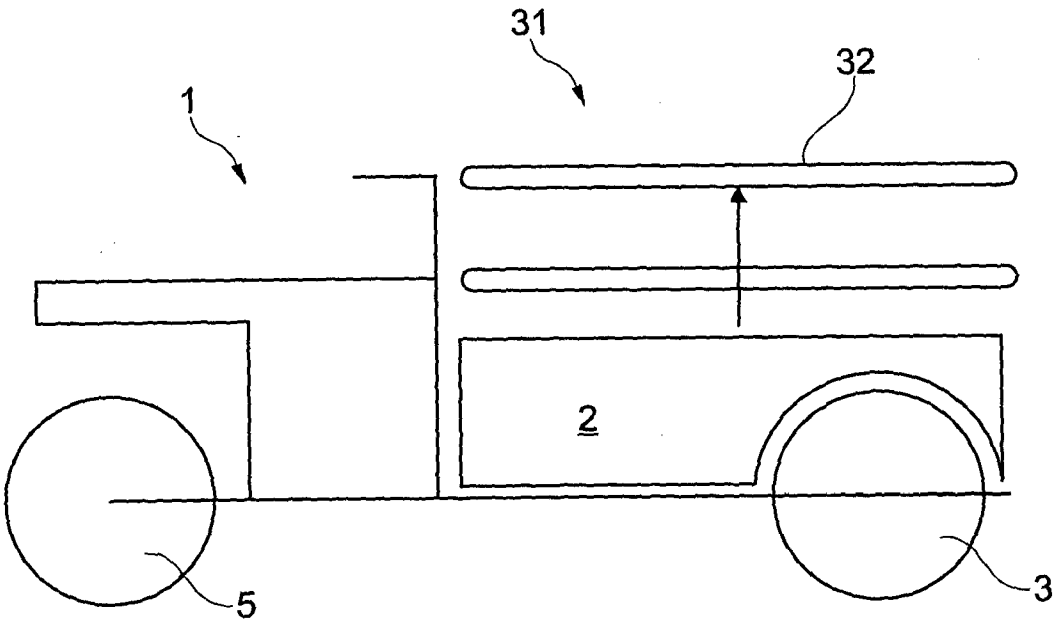

Fig. 13f

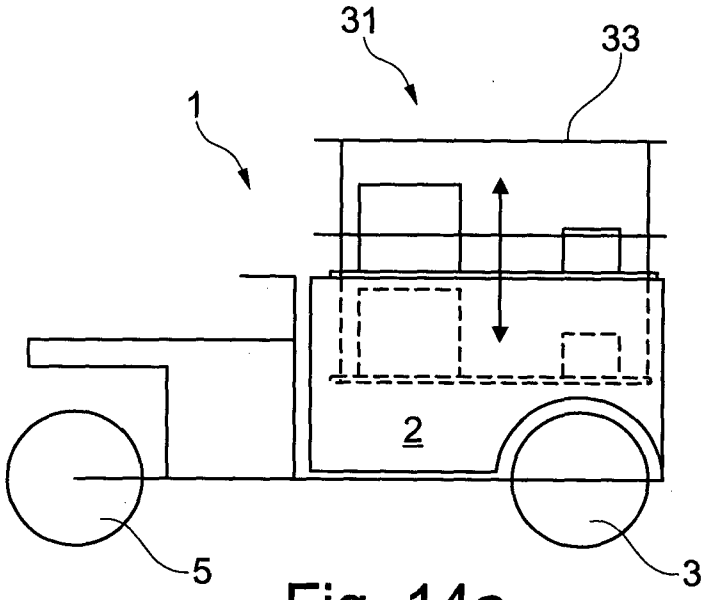

Fig. 14a

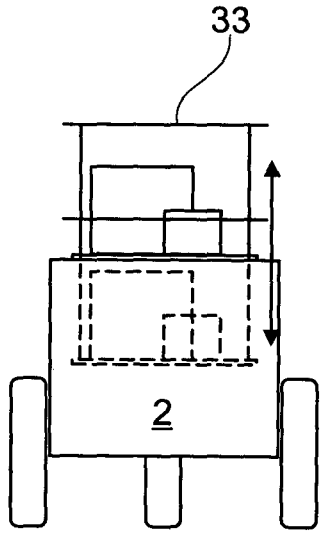

Fig. 14a'

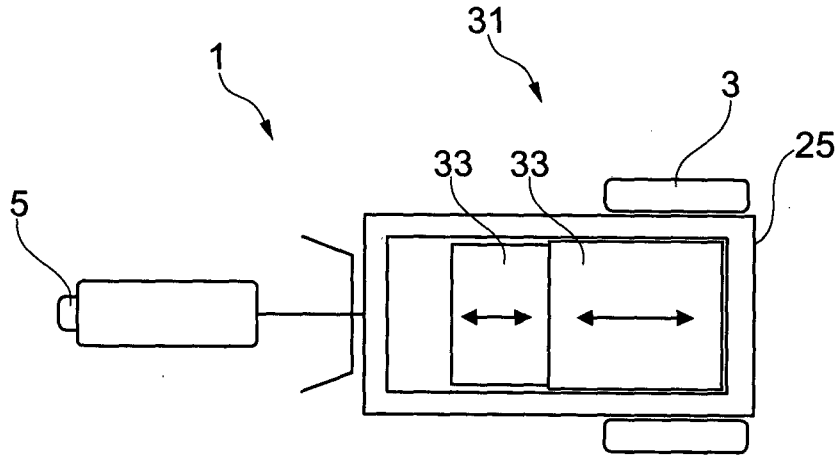

Fig. 14b

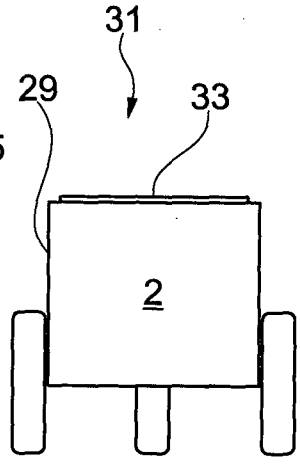

Fig. 14b'

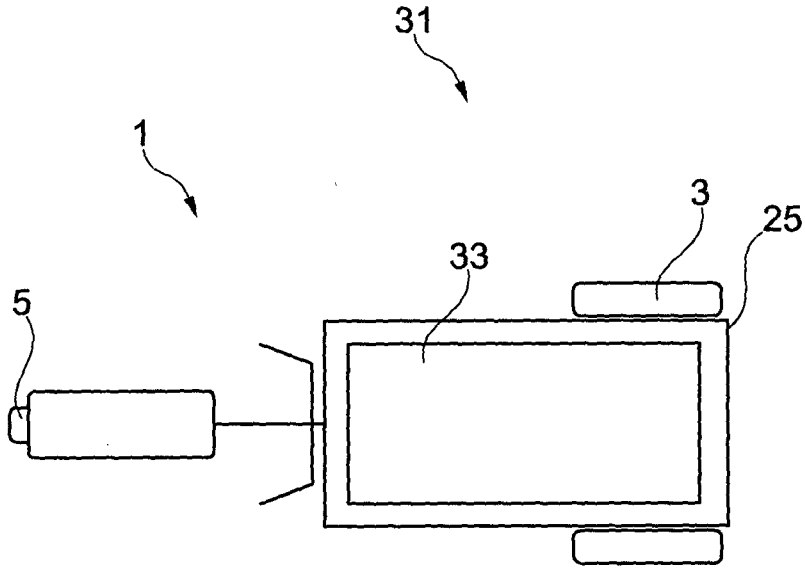

Fig. 14c

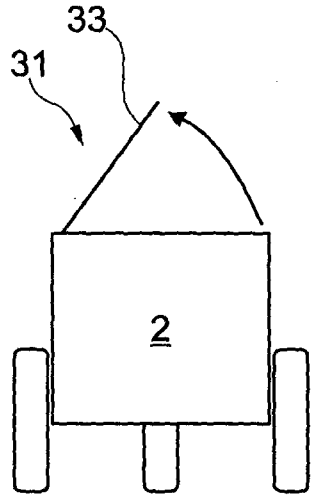

Fig. 14c'

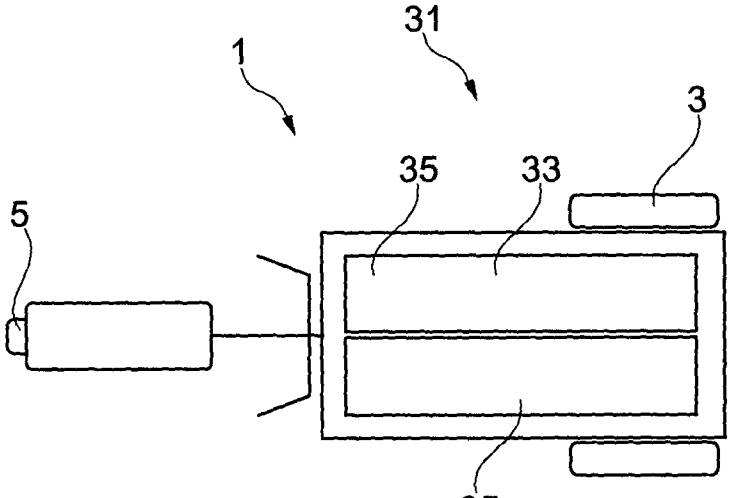

Fig. 14d

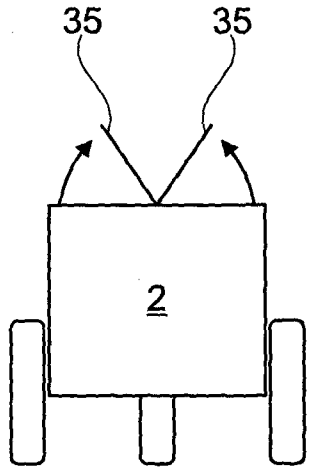

Fig. 14d'

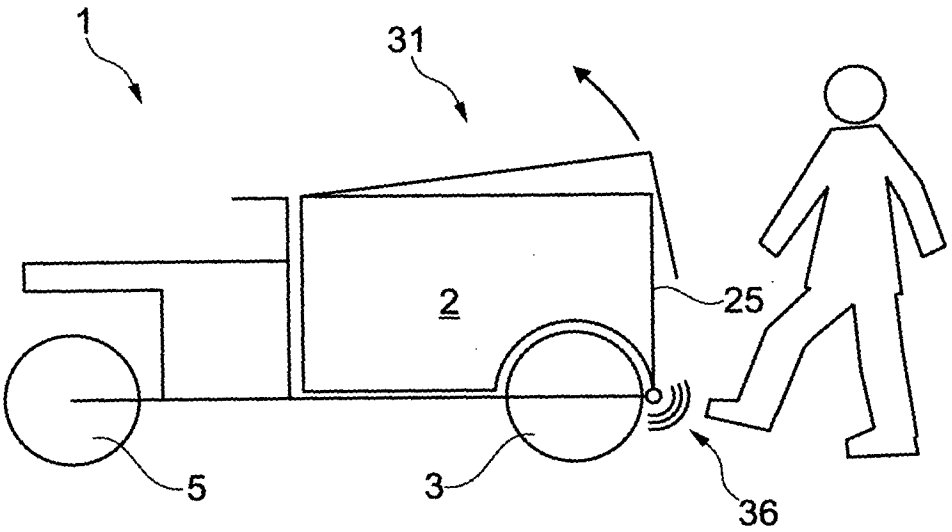

Fig. 15a

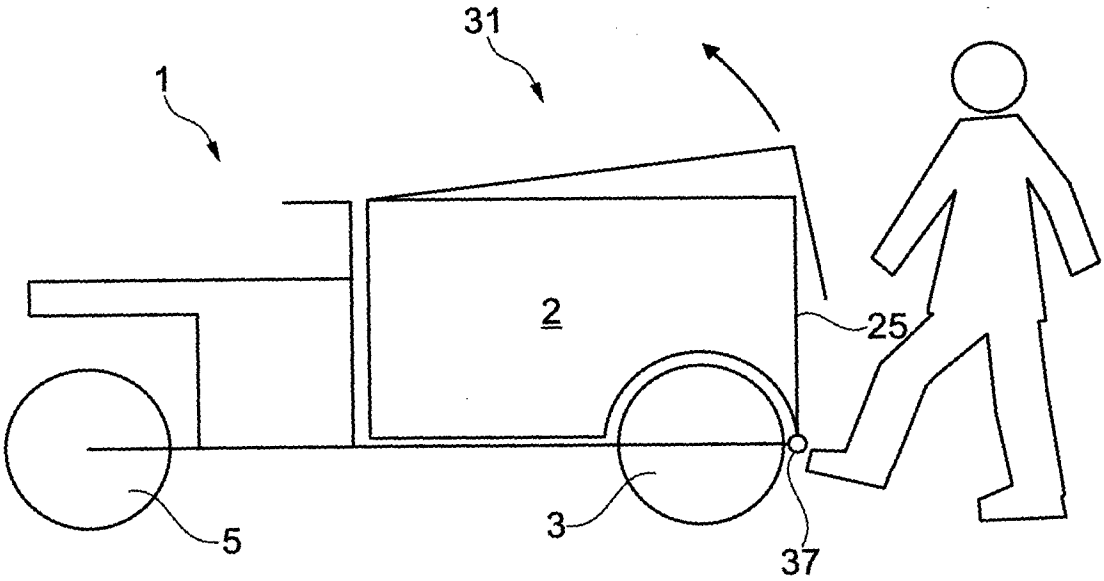

Fig. 15b

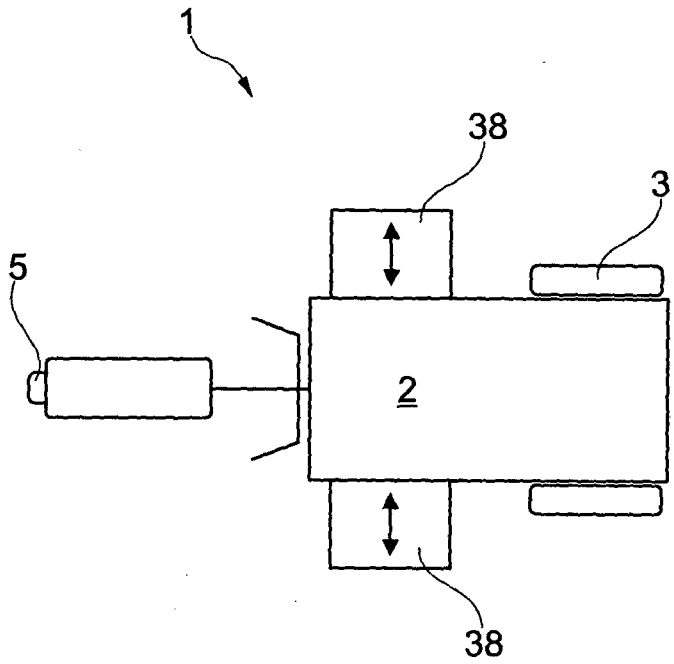

Fig. 16a

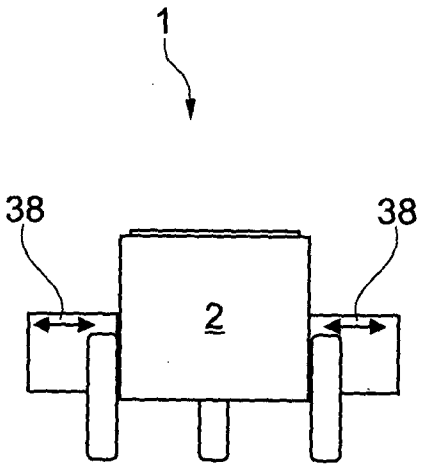

Fig. 16b

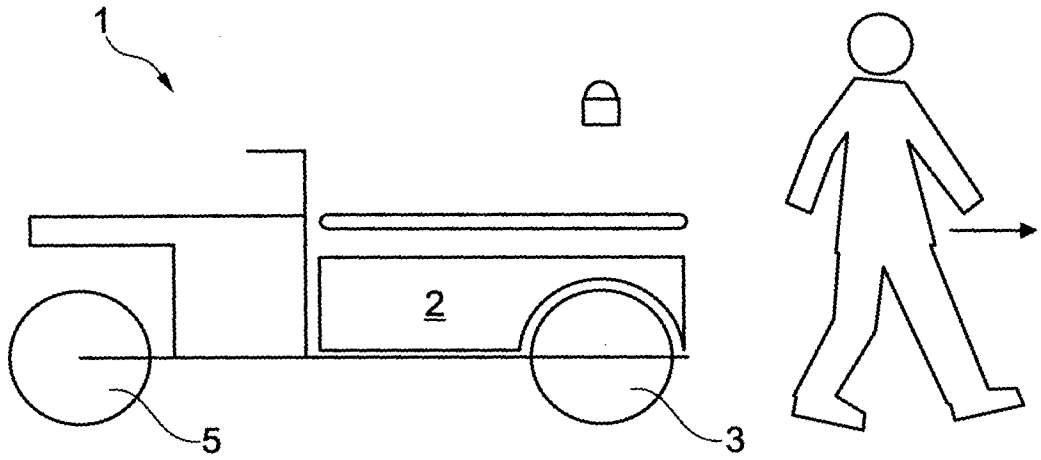

Fig. 17a

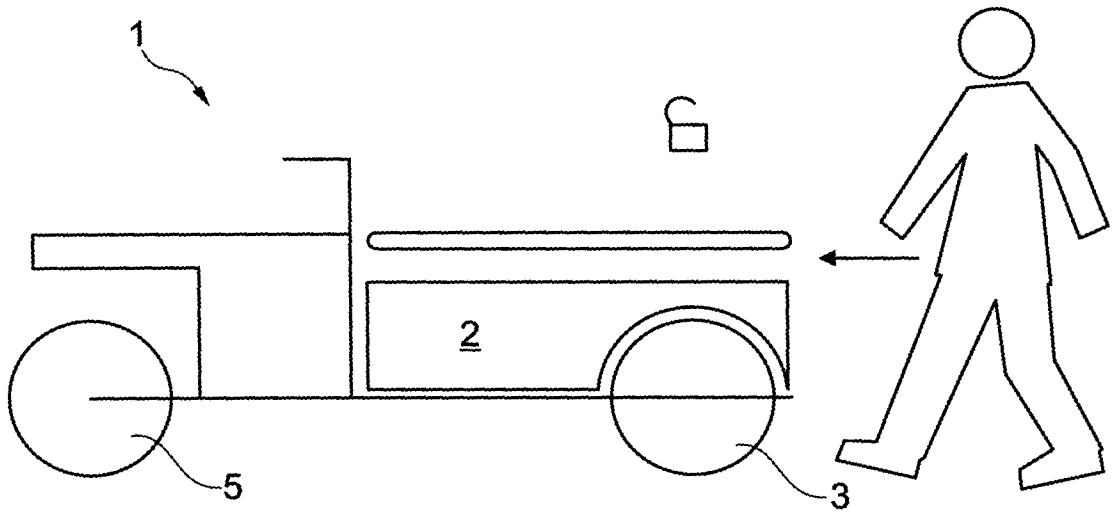

Fig. 17b

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK2014/050114

A. CLASSIFICATION OF SUBJECT MATTER
B62K 5/02 (2013.01), B62K 7/04 (2006.01), B62K 5/05 (2013.01)
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)
IPC & CPC: B62K

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

DK, NO, SE, FI: Classes as above.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPODOC, WPI, FULL TEXT: ENGLISH

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2012/141591 A1 (NOORENZ et al.) 2012.10.18 (See page 8 line 15 - page 11 line 4 and figure 1-13)	1-24
X	GB 302674 A (BOWDEN BRAKE COMPANY LTD) 1928.12.20 (See page 1 lines 57-69, page 2 lines 63-70, line 108 - page 3 line 5, page 3 lines 64 -72, lines 80-82, page 4 line 121 - page 5 line 54 and figures)	1-24
X A	US 2005/0168004 A1 (VANDEWINCKEL et al.) 2005.08.04 (See abstract, paragraph [0008] and figures)	1-2, 6, 11-12, 16, 23-24; 3-5, 7-10, 13-15, 17-22
X A	EP 0282519 A1 (LAVAULT CLAUDE) 1988.09.21 (See abstract and figures 4-26)	1,6-8, 11, 13, 23-24; 2-5, 9-10, 12, 14-22
X A	FR 2977229 A1 (BUISSON PASCAL) 2013.01.04 (See abstract, page 5 line 5 - page 6 line 32 and figures 1-9)	1, 6-7, 10-11; 2-5, 8-9, 12-24

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

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"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
"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
"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
"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
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
17/07/2014	21/07/2014
Name and mailing address of the ISA Nordic Patent Institute Helgeshøj Allé 81 DK - 2630 Taastrup, Denmark. Facsimile No. + 45 43 50 80 08	Authorized officer Tanja Häusermann-Güntzel Telephone No. +45 43 50 81 71

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK2014/050114

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 200432629 Y1 (In-Su Jeong) 2006.12.05	1, 6, 7, 10-11;
A	(See abstract and figure 1-4)	2-5, 8-9, 12-24
X	DE 19904962 A1 (SLANGEN MARIO) 2002.05.29	1, 10;
A	(See abstract and figures 144-159)	2-9, 11-24

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/DK2014/050114

Patent document cited in search report / Publication date	Patent family member(s) / Publication date
WO 2012141591 A1 2012.10.18	NL 2006612C C 2012.10.16
GB 302674 A 1928.12.20	NONE
US 2005/0168004 A1 2005.08.04	CA 2456948 A1 2005.07.30 CA 2456948 C 2012.09.04 MXPA 04001199 A 2005.08.03 US 7201453 B2 2007.04.10 US 2007216215 A1 2007.09.20 US 7399038 B2 2008.07.15
EP 0282519 A1 1988.09.21	FR 2603629 A1 1988.03.11 FR 2603629 B1 1992.01.17 WO 8801957 A1 1988.03.24 AU 7910487 A 1988.04.07 FR 2607163 A2 1988.05.27 FR 2607163 B2 1992.04.17 BR 8707457 A 1988.11.01 ES 2005656 A6 1989.03.16
FR 2977229 A1 2013.01.04	NONE
KR 200432629 Y1 2006.12.05	NONE
DE 19904962 A1 2002.05.29	NONE