(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 693 035 A1

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 158(3) EPC

(43) Date of publication:
23.08.2006 Bulletin 2006/34

(21) Application number: **04721552.0**

(22) Date of filing: **18.03.2004**

(51) Int Cl.:
A61G 1/02 *(2006.01)* ***A61G 1/06*** *(2006.01)*
A61G 7/08 *(2006.01)*

(86) International application number:
PCT/ES2004/000129

(87) International publication number:
WO 2005/051277 (09.06.2005 Gazette 2005/23)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO SE SI SK TR

(30) Priority: **25.11.2003 ES 200302766**

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(54) SELF-PROPELLED STRETCHER SUPPORT SUITABLE FOR USE IN THE MEDICAL FIELD

(57) The invention relates to a self-propelled-type stretcher support which is designed to perform two functions, namely:

(i) to support and hold a patient stretcher as well as the different medical instruments or devices required to attend to said patient; and

(ii) to enable an external operator to move the assembly easily, conveniently and safely with little physical effort.

The inventive stretcher support comprises a support frame having four wheels connected thereto, i.e. two front wheels which can rotate in relation to a respective vertical axis, and two rear wheels which are driven by an electric motor. In addition, the rear part of the stretcher support comprises two handles which are connected to a handlebar-shaped structure and which are equipped with means for connecting/disconnecting the motor power supply and for controlling the speed of same using a suitable electronic circuit.

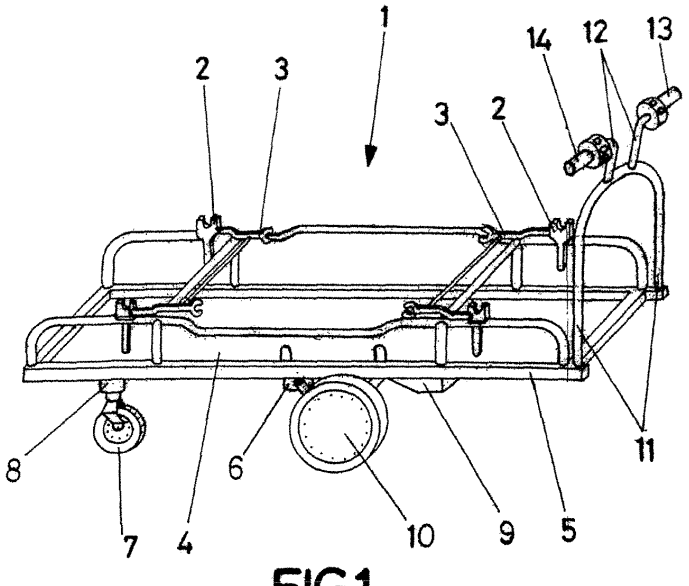

FIG.1

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Description

Subject of the invention

[0001] The present invention relates to a system known as a "self-propelled stretcher support suitable for use in the medical field", for use in ambulances (hereinafter called PAM, for short), which has novel essential characteristics and significant advantages over known means used for similar purposes in the state of the art.

[0002] More specifically, the invention proposes the development of a self-propelled movable device and of an associated set of anchorings, such that it can be fixed to the floor of the ambulance, while the latter is moving.

[0003] The purpose of the PAM is two-fold: on the one hand, it serves as support and fastening both for the patient-carrying stretcher and for the various medical instruments and devices; on the other hand, it enables the entire assembly consisting of the patient, stretcher and devices to be moved by an external operator with safety and convenience and with little physical effort.

[0004] The mobility of the PAM is based on the fact that it is equipped with four wheels and a propulsion device consisting of an electric motor coupled to a reducer/differential mechanism and powered by integral batteries. Said motor may be actuated as desired, both in terms of progress (forward or backward) and in terms of speed (faster or slower) by means of conventional electrical switching elements.

[0005] Lastly, the associated set of anchorings enables the PAM to remain stationary, in position, while the ambulance is moving.

[0006] The field of application of the present invention is that of the industry dedicated to the manufacture of auxiliary equipment for medical purposes, particularly devices and means designed for equipping ambulances and the like, although its use in intra-hospital environments is not ruled out.

Background and summary of the invention

[0007] The practical need to transport sick persons requiring technical/health attention en route or to provide transportation between different parts of large hospitals is generally known.

[0008] The ambulances that perform this type of service are equipped with a series of apparatuses and devices - normally located on the sides and ceiling of the vehicle - that provide a variety of functions for the patient, such as monitoring vital signs, defibrillation, assisted breathing with or without the supply of oxygen, aspiration, intravenous or intraarterial infusion of medicinal products, etc.

[0009] Furthermore, the state of the art in terms of the transportation of patients in ambulances generally consists in fixing a frame serving as support base for anchoring the patient's stretcher to the floor of the vehicle, and, at the same time, it enables the patient to be placed at a height and an angle suitable for treatment. Normally, this frame occupies a central position in the medical area of the ambulance and cannot accommodate devices other than the actual stretcher it supports. Furthermore, the maneuver of inserting the stretcher in the frame and coupling it to it is not accident-free and the possibility of injury as a consequence of equipment failure, inexperience or the frequent physical effort required of health personnel cannot be ruled out. In other cases, special stretchers are used, which, although they do not require the installation of a frame fixed to the ambulance floor, do not dispense with the effort needed to manually pull them inside the ambulance, nor do they have the capacity to carry medical devices.

[0010] Said arrangement of elements implies the need to extend cables and a variety of pipes between the devices and the patient which impedes the movement of the medical personnel around the latter in a passenger compartment that is already, in itself, small and that is usually traveling at significant speed. In addition, removal of the patient from the ambulance when the latter arrives at its destination in many cases requires temporary interruption of the treatment or the need to manually transport the devices that were, until then, placed in their housings, provided they are able to function autonomously, which is not the case on every occasion.

[0011] The present invention has proposed, as basic objective, the development of a system not only capable of supporting the patient's stretcher, but also of carrying the greater part of the equipment required to provide intensive care in an orderly and continuous manner, to mobilize the entire assembly conveniently and without effort and, finally, to allow a more ergonomic and functional design of the interior of the ambulance's care compartment.

[0012] The principle element of the PAM consists of a frame of rectangular form and cross section, consisting of a plurality of elements (metal profile sections and support plate) that give it the required rigidity and strength, and it incorporates a motor set, a controlling electronic device, preferably a solid-state electronic device, and power-supply batteries. This frame is displaced on four wheels, the rear two of which are moved by said motor set. The casing of the latter is mounted, at its two ends, on individual support arms, each one of which is fixed via its opposite end to an elastic suspension element in turn secured to the frame. The other two wheels are located in the front part, having rotary supports and an elastomer casing for absorbing small impacts owing to the unevenness of the ground.

[0013] Above the support plate of the frame and connected in an integral manner to the longitudinal profile sections of the latter, there are elements that provide support for a stretcher and that leave, between the latter and the support plate, an empty inner space designed to contain the various medical apparatuses and to allow easy access thereto. The design of the elements supporting the stretcher means that the latter is able to pivot

on any of its ends - so that tilting of the patient with respect to the horizontal plane is correct for those pathologies that so require - and also can vary its height from the floor, thereby facilitating the health personnel's work and transfer of the patient from the PAM to a hospital bed, or vice versa.

[0014] The smooth, convenient steering of the PAM/patient combination is achieved by means of a handle or handlebar-shaped structure consisting of a tubular part with a riser, to which electrical switching means that control the speed of the motor are secured and which consist, preferably, of "motorcycle handlebar-type" devices, owing to their easy and intuitive operation.

[0015] In accordance with a preferred embodiment, the propulsion unit provided for actuating the entire assembly consists of a DC electric motor coupled to a reducer and differential gear, all within the same casing. In this way, the movable unit is propelled at a low displacement speed which, according to the preferred embodiment, is in the range of 3 to 5 km/h, and makes it possible to turn it, even in very small spaces.

[0016] Lastly, the set of anchorings is composed of two parts, permanently secured to the floor of the vehicle and arranged longitudinally thereon. One of them consists of a mechanism provided with a safety bolt that automatically grabs a steel pivot secured to the lower part of the PAM. The other is a guide stop that helps center and immobilize the unit in the ambulance compartment. This set of anchorings prevents any displacement of the PAM longitudinally, laterally or vertically while the vehicle is in motion.

Brief description of the drawings

[0017] These and other characteristics and advantages of the invention will become more clearly apparent on the basis of the following detailed description of a preferred embodiment that is given solely by way of illustrative nonlimiting example, with reference to the accompanying drawing, in which:

> Figure 1 shows a perspective view of the self-propelled stretcher support device suitable for use in the medical field (PAM) constructed in accordance with the invention.

Brief description of a preferred embodiment

[0018] With reference to the figure of the drawings, it may be seen that the self-propelled stretcher support suitable for use in the medical field (PAM) of the invention, in running order, i.e. ready for a stretcher to be coupled to it at any time, having been given, overall, reference numeral 1.

[0019] The device has in its upper part, the forked parts 2 that serve for accommodating and anchoring the transverse reinforcement bars of the stretcher. The tilting forks 3 allow any of said bars to be held in a higher position with respect to another, thereby enabling the stretcher to be tilted at a certain angle of predetermined amplitude. Likewise, the device-carrying plate or tray 4 serving as shared support base for the medical instruments (not shown) can also be seen.

[0020] The lower part of the frame is formed by a rectangular structure 5 obtained from a plurality of profile sections of different materials, shapes and cross sections, on which are mounted the elastic suspension elements 6 of the drive assembly, and also two front wheels 7, each of which is mounted on a respective, freely rotating vertical axis. The forks securing the latter incorporate an elastomer casing 8 designed to reduce or to damp the small impacts and vibrations that may be transmitted to the frame during movement. Also the casing 9 of the drive unit is linked to the elastic suspension elements 6 by means of support arms (not visible in the figure), while the rear wheels 10, of greater diameter than the front wheels, are mounted on the ends of the motor/reducer/differential unit.

[0021] In addition, from the upper part of a tubular arch 11 connected to the rear part of the frame 5 emerge two parallel tubular elements 12, which, after a short vertical run, then have another horizontally extending portion, these portions being capable of use as handles by the user, and on which are mounted means 13, 14 that are used for connection/disconnection of the electrical power supply controlling the speed of the motor, and which preferably consist of "motorcycle-twistgrip type" elements. Use of this switching and control device has been chosen for its operating characteristics which are accessible for any user and because they enable such operations to be carried out rapidly, reliably and intuitively.

[0022] In the above description, the self-propelled stretcher support suitable for use in the medical field (PAM) assembly has been described in connection with ambulances, as a function of the various characteristic parts of which they are made, from a generalized standpoint.

[0023] As will be understood, with the entire assembly as described in the aforesaid, a genuinely functional and complete unit is provided for care of and attention to a patient during the latter's transfer in an ambulance, making available to health personnel the means they need in order to provide medical attention from a general standpoint, under optimum conditions, without this attention having to be interrupted under any circumstances.

[0024] It is not considered necessary to extend the content of this description for an expert in the field to be able to comprehend its scope and the advantages deriving from the invention or to develop and implement the subject matter thereof.

[0025] However, it should be understood that the invention has been described in accordance with a preferred embodiment thereof and therefore may be modified without this constituting any alteration to the basic design of said invention, such modifications possibly relating, in particular, to the shape, size and/or to the ma-

terials of manufacture of the entire assembly.

Claims

1. A self-propelled stretcher support suitable for use in the medical field, designed for transferring a patient while the latter receives ongoing attention and care, **characterized in that** it consists of a structure (5) formed by a plurality of profile sections of different materials, shapes and cross sections, which are connected together, which, in addition to serving as the support base for a stretcher, make it possible for an interior space to be configured in order to accommodate medical instruments and devices on a lower tray (4), and for moving the entire assembly, to which end it has four wheels (7, 10) two of which, preferably the front wheels (7), are mounted on supports that can rotate with respect to their respective vertical axis, and the other two (10), of greater diameter than the previous ones, are connected to a drive means that drives them in order to displace the entire assembly at a speed between preset limits.

2. The self-propelled stretcher support suitable for use in the medical field as claimed in claim 1, **characterized in that** the drive means preferably consists of a DC electric motor coupled to a reducer/differential mechanism, with a wheel (10) incorporated on each of the latter's axles, said motor being powered by electric batteries and controlled by a solid-state electronic device.

3. The self-propelled stretcher support suitable for use in the medical field as claimed in claim 1 or 2, **characterized in that** it has a handlebar-shaped structure (12) serving as a handle for correct maneuvering and steering of the entire assembly, and **in that** there is a handle (13, 14) mounted on both the left and on the right, with means for connection/disconnection of the power to the motor and for controlling the speed thereof.

4. The self-propelled stretcher support suitable for use in the medical field as claimed in any one of the preceding claims, **characterized in that**, optionally, it is possible to incorporate a circuit for distribution of electrical power from an external source, designed to supply power to the medical devices that might be installed on said structure.

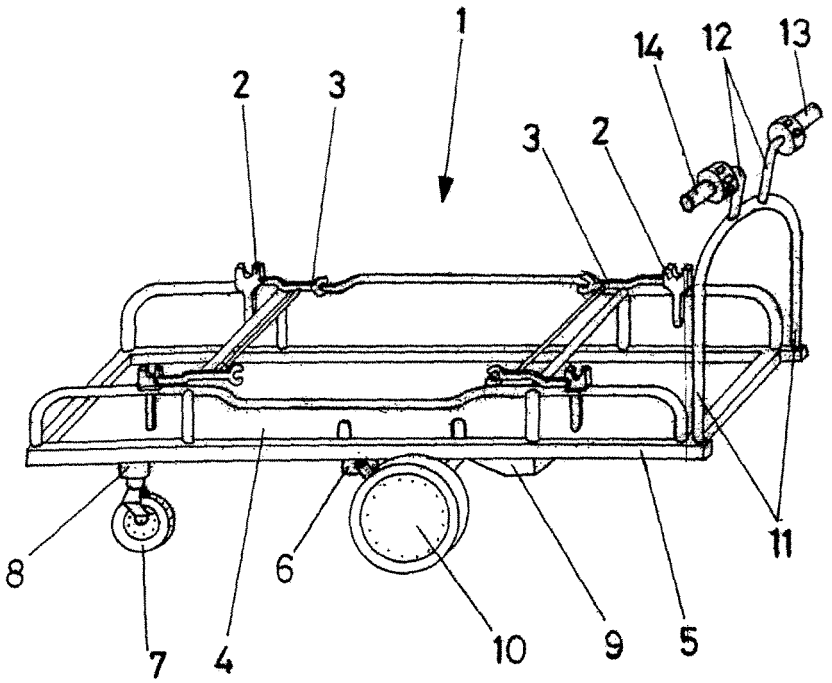

FIG.1

INTERNATIONAL SEARCH REPORT	International application No. PCT/ ES 2004/000129

A. CLASSIFICATION OF SUBJECT MATTER

IPC [7] A61G1/02, A61G1/06, A61G7/08

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 [7] A61G+

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

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

CIBEPAT,EPODOC,WPI,PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	SE309087 B (STILLE WERNER AB.) 10.03.1969; **the whole document.**	1-3

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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
01 July 2004 (01/07/04)	**09 July 2004 (09/07/04)**
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INTERNATIONAL SEARCH REPORT
Information on patent family members

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Form PCT/ISA/210 (patent family annex) (July 1992)