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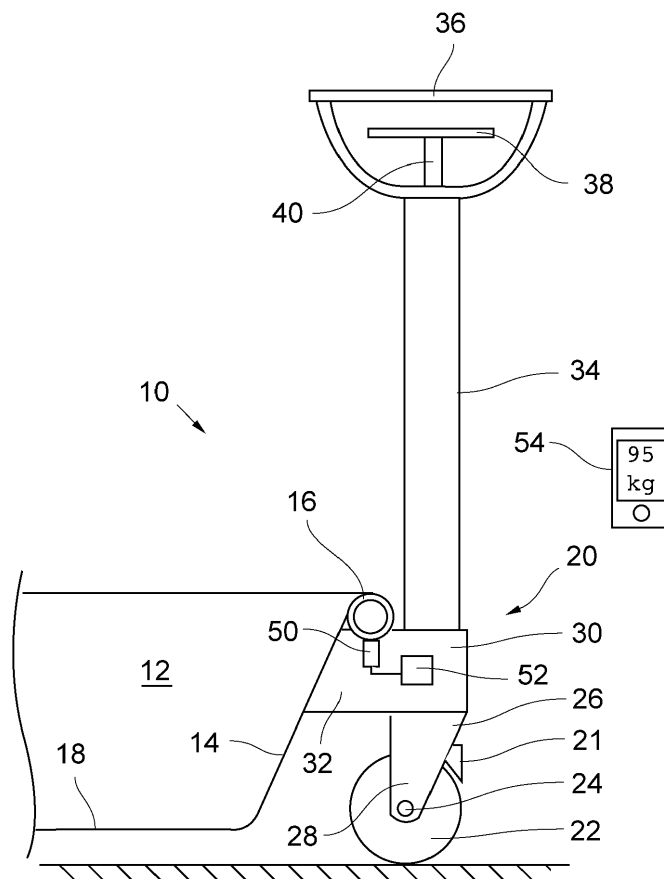
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(54) **BASKET STRETCHER WITH AUTOMATIC WEIGHTING SYSTEM**

(57) Basket stretcher weighting system (10), comprising a basket stretcher (10) with a stretcher body (12), at least one load sensor (50) provided to measure the

load of the stretcher body (12), and transmission means (52) to transmit an output of the load sensor (50) representing the measured load to a receiver (54).



Description

[0001] The present invention is related to a basket stretcher weighting system.

[0002] Basket stretchers represent an important part of the rescue equipment to be used for transporting injured or unconscious patients. The patient is placed within the stretcher body, which has a generally trough shape, and secured therein by a safety harness.

[0003] It takes several rescue crew members to lift and carry a basket stretcher with a patient of average weight over a long distance. If the patient has a body weight that lies above the average, this task becomes even more difficult. Carrying the weight of obese patients has become a severe problem in rescue situations. For such cases lifting devices have been developed to carry the basket stretcher. For example, such a lifting device is an aerial device, like a telescopic ladder of a fire fighting vehicle, comprising a telescopic arm or telescopic ladder part to which the basket stretcher can be attached. A control unit is provided to calculate the extension limits of the telescopic arm or ladder on the basis of data representing the load of the basket stretcher. Such a calculation can be performed with the required accuracy only if the load of the basket stretcher is known.

[0004] Another problem lies in the correct dosage of drugs to be dispensed to the patient by a physician or a paramedic at the rescue site according to the body weight to the patient. Usually this body weight must be estimated by the paramedic or physician, and this becomes even more difficult with increasing body weight.

[0005] For the reasons given above, it is often desired to have an information about the body weight of the patient within the basket stretcher. However, in the situations described above, there is no way to gain this information in a simple way.

[0006] It is therefore an object of the present invention to provide a basket stretcher weighting system to gather an information about the body weight of the patient lying therein in a fast, simple and effective way.

[0007] This object is achieved by a basket stretcher weighting system comprising the features of claim 1.

[0008] The basket stretcher weighting system according to the present invention comprises a basket stretcher with a stretcher body, at least one load sensor provided to measure the load of the stretcher body, and transmission means to transmit an output of the load sensor representing the measured load to a receiver. This output of the load sensor is the result of the load measurement and can be represented by an electric signal. This signal can be transmitted to a receiver, which can process this information, for example, by displaying the measured weight or by performing a calculation on the basis of the measured weight. It is noted that the load of the stretcher body which is measured by the at least one load sensor can be the total load as a sum of the weight of the stretcher body and the weight of its content, i. e. a patient lying therein.

[0009] According to a preferred embodiment of the present invention, the receiver is a display means to display the measured load. A person like a paramedic or a physician is able to interpret the displayed information and to use it, for example, for the dosage of a drug to be dispensed to the patient.

[0010] More preferably, the receiver is a mobile terminal.

[0011] According to another preferred embodiment of the present invention, the receiver is a control unit of a lifting device for lifting the basket stretcher.

[0012] More preferably, the lifting device is an aerial device comprising a telescopic arm to which the basket stretcher can be attached, and the control unit is provided to calculate operational limits of the telescopic arm on the basis of data representing the measured load. These operational limits can be the extension limits of the telescopic arm.

[0013] More preferably, the transmission means is a wireless transmission means.

[0014] According to another preferred embodiment of the present invention, the transmission means is a wire-bound transmission means.

[0015] According to another preferred embodiment of the present invention, the basket stretcher comprises a plurality of rollers supporting the stretcher body, wherein the at least one load sensor is integrated into one of the rollers.

[0016] According to another preferred embodiment, the basket stretcher weighting system comprises roller gears detachably attached at the stretcher body for supporting the stretcher body, wherein the at least one load sensor is integrated into one of the roller gears.

[0017] Preferably the roller gears are provided with manual handling means to bring the roller gear from an unloaded position into a loaded position in which the roller is loaded by the stretcher body.

[0018] More preferably, the manual handling means comprises a lever to push the respective roller gear into a loaded position supporting the stretcher body or its rim.

[0019] The invention is further related to an aerial device, comprising a telescopic arm, with a reception for carrying the basket stretcher and a control unit provided to calculate operational limits of the telescopic arm on the basis of data representing the load of the basket stretcher measured by a load sensor. These operational limits can be the extension limits of the telescopic arm.

[0020] These and other aspects of the present invention will be apparent from and elucidated with reference to embodiments of the present invention described in the following figures.

[0021] The only figure is a schematic partial view of an embodiment of a basket stretcher according to the present invention.

[0022] The figure shows a part of a basket stretcher 10, with a generally trough-shaped stretcher body 12 that is shown in section. It has an inclined right side wall 14 delimited at its upper end by a rim 16 with a generally

circular cross-section. The bottom 18 of the stretcher body 12 is mainly flat. Inside the stretcher body 12, a safety harness (not shown) for securing a patient lying therein is disposed.

[0023] At the right side of the basket stretcher 10, a roller gear 20 is attached that is provided with a roller 22 at its bottom. The roller 22 can rotate around a horizontal axis 24, which lies within a lower suspension part 26 encompassing the roller 22 from above with opposite vertical flanges 28. This suspension part 26 itself can be turned around a vertical axis so that the roller 22 can be positioned into any desired driving direction.

[0024] The suspension part 26 is rotatably mounted below an attachment part 30 with an attachment portion 32 engaging the rim 16 of the stretcher body 12 from below and abutting at the inclined side wall 14. In the position shown in the figure, the bottom 18 of the stretcher body 12 is positioned above the ground such that the load of the stretcher body 12 and its content (not shown) rests on the roller. With other words, in the position shown in the figure, the roller 22 is loaded by the weight of the stretcher body 12 and its contents. This position shall be noted as the loaded position in the following description.

[0025] The roller gear 20 shown in the figure is only one example of a plurality of roller gears 20 distributed along the rim 16 around the stretcher body 12. In particular the roller gears 20 are detachable from the stretcher body 12 and can be attached at laterally opposed positions at the stretcher body 12 individually.

[0026] As shown in the figure, each roller gear 20 further comprises a lever 34 extending vertically above the attachment part 30. At its top end, the lever 34 is equipped with a handle 36 for manually operating the lever. If the lever 34 is turned from the vertical position shown in the figure in the counterclockwise direction around the axis defined by the circular cross-section of the rim 16, the attachment portion 32 of the attachment part 30 is released from the side wall 14 of the stretcher body 12, and the basket stretcher 10 is lowered to the ground until its bottom 18 touches the ground. In this position the roller gear 20 can be released completely from the stretcher body 12. The position in which the bottom 18 of the stretcher body 12 is supported by the ground and not by the roller 22 shall be denoted as an unloaded position with respect to the roller 22.

[0027] For attaching the roller gear 20 to the stretcher body 12, the attachment part 30 is attached by its attachment portions 32 at the rim 16 of the stretcher body 12, and the lever 34 is turned in the clockwise direction until it reaches the vertical position shown in the figure, in which the attachment portion 32 touches the side wall 14 of the stretcher body 12 again. During this movement the roller 22 is increasingly loaded by the weight of the stretcher body 12 and its content.

[0028] The roller gear 20 further comprises a roller brake 21 to stop the roller 22 and to prevent accidental movements of the basket stretcher 10. This roller brake 21 can be operated by a brake handle 38 disposed within

a handle 36 for turning the lever 34. The brake handle 38 is a pulling handle that keeps a braking position if it is not operated, i. e. no upward pulling force acts on the brake handle 38. The brake handle 38 is connected to a brake at the bottom of the roller gear 20 within the support portion 26 by a vertical bar 40 extending through the lever 34. If the brake handle 38 is lifted manually, the brake 21 is released, and the roller 22 can run freely.

[0029] The roller gear 20 is further equipped with a load sensor 50 to measure the total load of the stretcher body 12 and its content. With a patient lying within the stretcher body 12, the load sensor is provided to measure the sum of the load of the stretcher body 12 and the load of the body weight of the patient. The load sensor 50 outputs an electric signal that represents the measured load. This output, i. e. the electric signal is supplied to a transmitter 52 for transmitting the output of the load sensor 50 to a receiver 54. In the present embodiment, the receiver is represented by a mobile terminal, for example, a mobile telephone unit in a wireless transmission. However, other embodiments of receivers 54 are possible. For example, the receiver 54 can be represented by a display to display the measured load in common weight units to be perceived by an operator. The display can also be attached at the roller gear 20, for example, at a top portion of the lever 34. Moreover, the transmission can also be a wire-bound transmission via a data cable between the transmitter 52 and the receiver 54.

[0030] According to still another embodiment, the receiver 54 is comprised within a control unit of a lifting device (not shown), for example, within a telescopic ladder of a fire fighting vehicle that is provided at its end with an attachment means to attach the basket stretcher 10. The control unit is provided for controlling this telescopic ladder as one example of an aerial device. With such aerial devices, it is of high importance to calculate operational limits of the telescopic arm depending on the load acting on the tip of the telescopic arm. These operational limits can be represented, for example, by the extension limits of the telescopic arm. This load is represented by the output of the load sensor 50 transmitted by the transmitter 52 to the receiver 54 representing the control unit as described above. Depending on these weight data, the control unit can calculate the extension limits of the telescopic arm. If certain load limits are exceeded, the control unit may indicate that it is impossible to carry the basket stretcher 10 because of an overload. It is also possible that the control unit indicates the precise extension limits, and to which extend the extension must be reduced to carry the present load. This is a valuable information for the operators to position the lifting device nearer to the basket stretcher 10.

[0031] In the present embodiment, the mobile terminal can also calculate the body weight of the patient by subtracting the known weight of the stretcher body 12 alone from the total load measured by the load sensor 50. The body indicated by the mobile terminal is an important information for dosing a drug to be dispensed to the pa-

tient. A paramedic or a physician at a rescue site can easily use this information displayed on her/his mobile terminal. The mobile terminal can store a computer program application to connect the mobile terminal automatically with the transmitter 52 so that the load information can be received by the receiver 54.

[0032] In the present embodiment, the load sensor 50 is placed directly under the rim 16 of the stretcher body 12, and the load sensor 50 and the transmitter 52 are received within the attachment part 30.

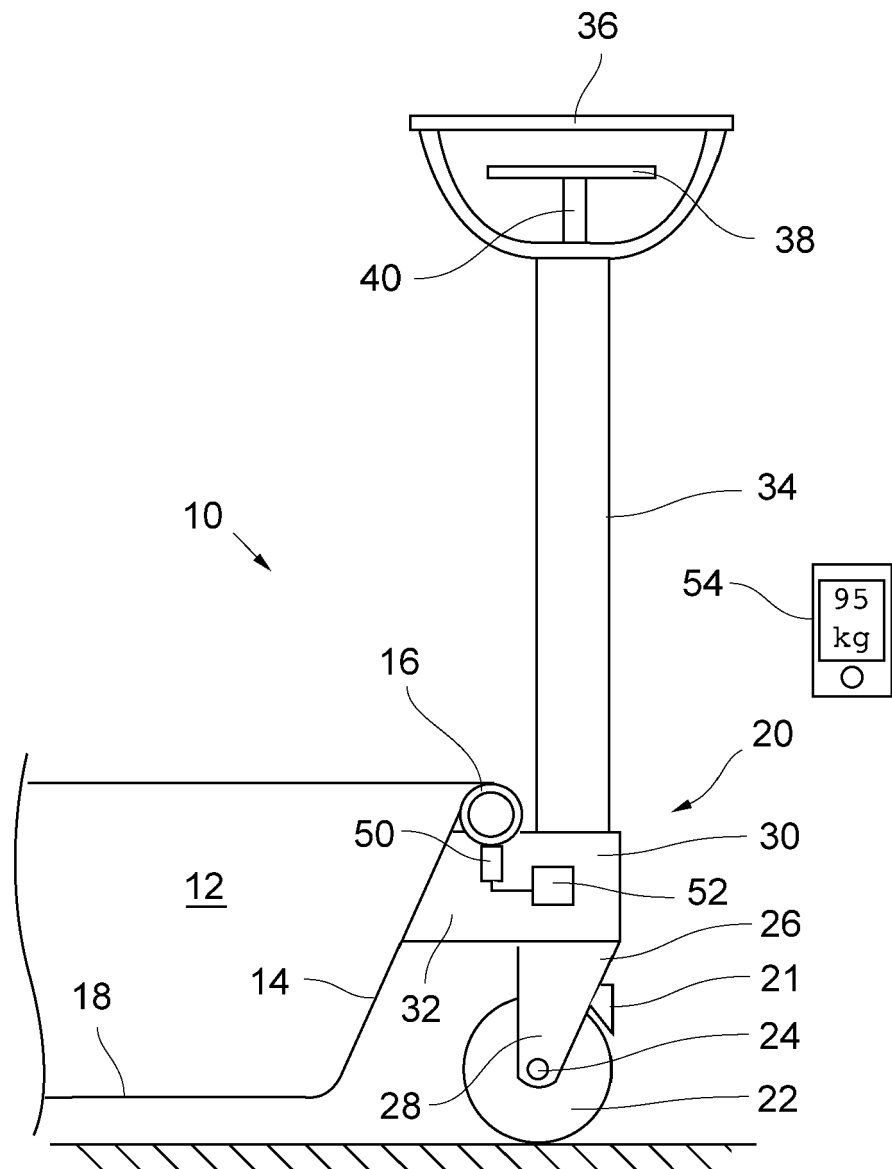
[0033] In case of a plurality of roller gears 20 attached at different positions of the rim 16, the loads determined by the load sensor 50 within the different roller gears 22 can be summarized to a total load that is transmitted to the receiver 54.

Claims

1. Basket stretcher weighting system (10), comprising a basket stretcher (10) with a stretcher body (12), at least one load sensor (50) provided to measure the load of the stretcher body (12), and transmission means (52) to transmit an output of the load sensor (50) representing the measured load to a receiver (54). 20
2. Basket stretcher weighting system according to claim 1, **characterized in that** the receiver (54) is a display means to display the measured load. 30
3. Basket stretcher weighting system according to claim 1, **characterized in that** the receiver (54) is a mobile terminal. 35
4. Basket stretcher weighting system according to claim 1, **characterized in that** the receiver (54) is a control unit of a lifting device for lifting the basket stretcher (10). 40
5. Basket stretcher weighting system according to claim 4, **characterized in that** the lifting device is an aerial device comprising a telescopic arm to which the basket stretcher (10) can be attached, and the control unit is provided to calculate operational limits of the telescopic arm on the basis of data representing the measured load. 45
6. Basket stretcher weighting system according to one of claims 1 to 5, **characterized in that** the transmission means is a wireless transmission means. 50
7. Basket stretcher weighting system according to one of claims 1 to 5, **characterized in that** the transmission means is a wire-bound transmission means. 55
8. Basket stretcher weighting system according to one of claims 1 to 7, **characterized in that** the basket

stretcher (10) comprises a plurality of rollers (22) supporting the stretcher body (12), wherein the at least one load sensor is integrated into one of the rollers (22).

9. Basket stretcher weighting system according to one of claims 1 to 7, **characterized by** roller gears (20) detachably attached at the stretcher body (12) for supporting the stretcher body (12), wherein the at least one load sensor is integrated into one of the roller gears (20).
10. Basket stretcher weighting system according to claim 9, **characterized in that** the roller gears (20) are provided with manual handling means to bring the roller gear from an unloaded position into a loaded position in which the roller (22) is loaded by the stretcher body.
11. Basket stretcher weighting system according to claim 10, **characterized in that** the manual handling means comprises a lever (34) to push the respective roller gear (20) into a loaded position supporting the stretcher body (12) or its rim (16).
12. Aerial device, comprising a telescopic arm, with a reception for carrying a basket stretcher, and a control unit provided to calculate operational limits of the telescopic arm on the basis of data representing the load of the basket stretcher measured by a load sensor.





EUROPEAN SEARCH REPORT

Application Number
EP 15 16 6851

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FR 2 679 331 A1 (MARCHAND BERNARD [FR]) 22 January 1993 (1993-01-22) * page 2, line 24 - line 36; figure 1 * -----	1,2,7	INV. A61G1/02 A61G1/048
X	US 4 482 783 A (LAIMINS ERIC [US]) 13 November 1984 (1984-11-13) * column 3, line 27 - line 67; figure 1 * -----	1,2,4,7	
			TECHNICAL FIELDS SEARCHED (IPC)
			A61G A62B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 12 October 2015	Examiner Sommer, Jean
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 16 6851

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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US 4482783	A	13-11-1984	NONE	

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EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82