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(72) Inventor: **Walsh, Oliver**  
**St. Albans Herts AL 1 1RT (GB)**

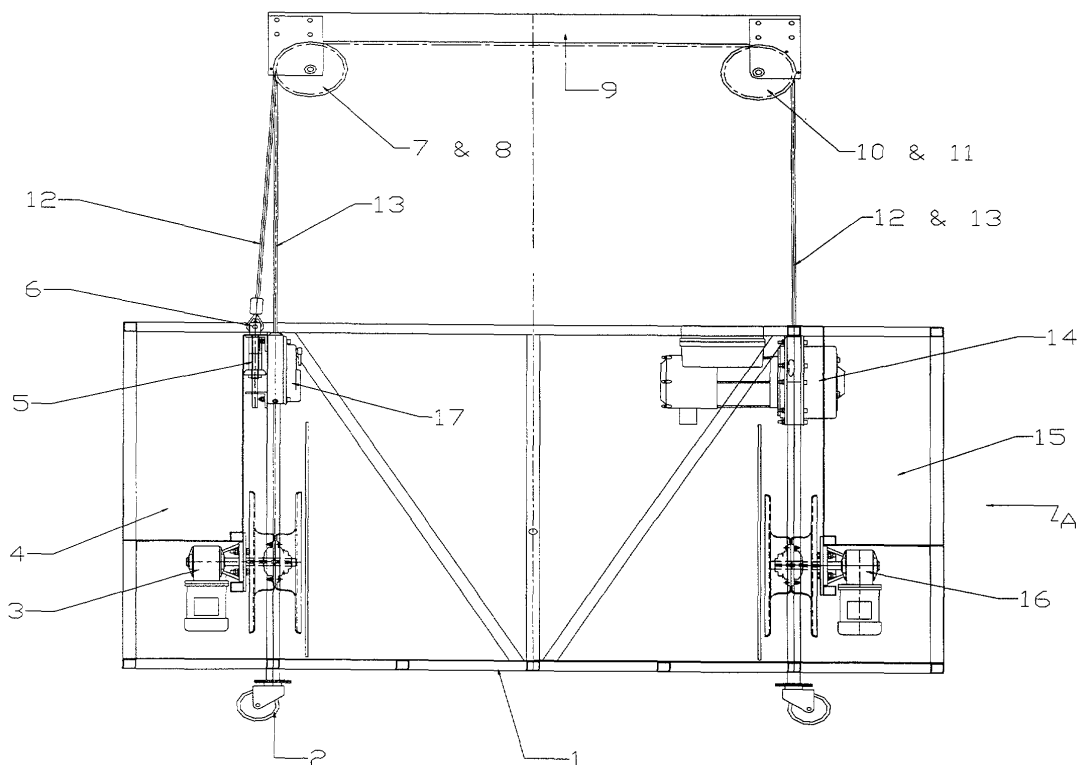
(74) Representative: **Luys, Marie-José et al**  
**Gevers & Vander Haeghen NV,**  
**Intellectual Property House,**  
**Business Airport Park,**  
**Holidaystraat 5**  
**1831 Diegem (BE)**

(71) Applicant: **Sky Man International**  
**2850 Boom (BE)**

(54) **Device for working at high locations**

(57) Device for working at high locations comprising a gondola (1) which is suspended from a carrier (9). The carrier comprises at least two primary pulleys (8, 11) which are mounted on spaced apart locations on the carrier (9). The gondola (1) is suspended on a single primary wire (12) which is fixed on a first transverse side

of the gondola (1) and runs over the primary pulleys (8, 11) to a traction hoist (14) on a second transverse side opposite the first transverse side of the gondola (1). The gondola (1) further comprises a single drive motor for driving the single traction hoist (14) and raising or lowering the gondola (1) with respect to the carrier (9).



**Fig. 1**

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## Description

**[0001]** The present invention relates to a device for working at a high location according to the preamble of the first claim.

**[0002]** Such a device is for example known from DE-A-197 14 848. The device known from DE-A-197 14 848 comprises a platform or gondola on which workers can be supported. The gondola is suspended by means of wires from a carrier, which is for example mounted on a roof of a building. The gondola is suspended on two pairs of wires, namely two primary wires which are provided to carry the gondola and two safety wires which have the secondary function of securing the gondola in case of breakage of one of the primary wires. On either side of the gondola, one primary wire and one safety wire is provided, so the two primary wires are spaced apart from each other and also the two safety wires are spaced apart from each other. Each of the primary and safety wires is fixed to the carrier on the roof. In order to move the gondola up and down, the gondola is provided with an elevator device, which is located at the top side of the gondola. This elevator device comprises a series of pulleys, by means of which the two primary wires are brought together and are lead over two adjacent traction hoists, which are driven by one and the same drive motor.

**[0003]** The device known from DE-A-197 14 848 however has the disadvantage that, although the two traction hoists are driven by only one drive motor and as such the cost of one drive motor is saved, the device is still expensive.

**[0004]** It is an aim of the present invention to provide a device for working at high locations of which the cost can be reduced.

**[0005]** This aim is achieved according to the invention with a device showing the technical characteristics of the characterising part of the first claim.

**[0006]** The device for working at high locations according to the invention comprises a gondola which is suspended from a carrier which has at least two primary pulleys on spaced apart locations. The gondola is suspended on a single primary wire. This primary wire is fixed on a first transverse side of the gondola and runs over the primary pulleys of the carrier to a traction hoist on a second transverse side opposite the first transverse side of the gondola. The gondola further comprises a single drive motor for driving the single traction hoist. Due to the suspension of the gondola in this way, only one traction hoist and one drive motor is needed for enabling the raising or lowering of the gondola with respect to the carrier. As a result, the cost of one drive motor as well as the cost of one traction hoist, which would both act on a second primary wire, is avoided.

**[0007]** Furthermore, there is no need for an expensive anti-tilt control device for controlling the speed of two drive motors with respect to each other and as such stabilising the gondola horizontally. With the device of the

invention, the horizontal stability during raising and lowering of the gondola is achieved by suspending the gondola from the pulleys on the carrier. An excess length of primary wire on one side of the gondola will result in a rotation of the pulleys until the length of the primary wire on both sides is substantially equal.

**[0008]** Furthermore, by leaving out one traction hoist and one drive motor, the weight of the device according to the invention can be reduced.

**[0009]** Preferably, the device of the invention is provided with a safety wire to prevent a drop of the gondola in case of breakage of the primary wire. To this end, the carrier of the device of the invention further comprises at least two secondary pulleys on spaced apart locations and the gondola is suspended on a single safety wire. This safety wire is fixed to the second transverse side of the gondola and runs over the secondary pulleys to a safety brake on the first side of the gondola. With respect to the prior art device described above, this safety suspension of the gondola has the advantage that only one safety break is needed instead of two, since there is only one safety wire in the device of the invention. This can further reduce the cost of the device of the invention.

**[0010]** The device according to the invention preferably comprises two motorised wire reelers, one on the second side of the gondola for reeling the primary wire and the other on the first side of the gondola for reeling the safety wire. Because of the suspension of the gondola on only one primary wire and only one safety wire, only two reelers are needed, whereas in the prior art four reelers are needed for reeling two primary and two safety wires. This again shows that the device of the invention may be of lower cost and of lower weight with respect to the prior art.

**[0011]** Preferably, the primary wire is fixed to the first transverse side of the gondola by means of an overload/underload unit, which is provided to cut the power to the traction hoist in case too much weight is placed on the gondola. This enhances the safety of the device of the invention.

**[0012]** The invention will be further elucidated by means of the following description and the appended figures.

**[0013]** Figures 1 and 2 respectively show a front view and a side view of a preferred embodiment of the device of the invention. Figure 1 is a view on arrow B of figure 2; figure 2 is a view on arrow A of figure 1.

**[0014]** The device for working at high locations shown in figures 1 and 2 comprises a gondola 1 which is suspended from a carrier 9 by means of a single primary wire 12 and a single safety wire 13. The carrier comprises a suspension beam 9, on which two primary pulleys 8, 11 are mounted on spaced apart locations. The primary wire 12 is fixed on an anchor point 6 on a first transverse side of the gondola and runs over the primary pulleys 8, 11 of the carrier 9 to a traction hoist 14 on a second transverse side opposite the first transverse side of

the gondola 1.

**[0015]** The traction hoist 14 is driven by a single drive motor, which is operable by means of a control unit (not shown). By means of this control unit, a person on the gondola 1 can operate the traction hoist 14 to raise or lower the gondola 1. The traction hoist is further provided with a primary brake (not shown), which can be operated by the person on the gondola for descending in case of power failure.

**[0016]** In the anchor point 6, the primary wire 12 is connected to the gondola by means of an overload/underload unit 5. This unit 5 is provided to cut the power to the traction hoist 14 in case too much weight is put on the gondola 1.

**[0017]** The carrier 9 further comprises two secondary pulleys 7, 10, which are mounted on spaced apart locations on the suspension beam 9, adjacent the primary pulleys 8, 11. The gondola is suspended from these secondary pulleys 7, 10 on a single safety wire 13. This safety wire 13 is fixed on an anchor point 18 on the second transverse side of the gondola 1 and runs over the secondary pulleys 7, 10 to a safety brake 17 on the first side of the gondola.

**[0018]** The safety brake 17 functions to halt the descent of the gondola 1 in the event of an overspeed situation, which may for example result from a breakage of the primary wire 12. As the safety wire 13 passes through the safety brake 17, it senses the descent speed by means of a spring-loaded centrifugal system (not shown). In the event that the safety wire 13 passes through the safety brake 17 at a too high speed, i.e. a speed which exceeds a predetermined value, the brake will activate and lock onto the safety wire 13, thereby halting the descent of the gondola 1. The safety brake 17 is furthermore fitted with a manually operable trip and reset lever (not shown), by means of which the brake can be manually activated in case of other emergency situations than the overspeed situation. Optionally, the safety brake 17 may be equipped with an incorporated microswitch which cuts off power to the traction hoist 14 in the event of overspeed or manual operation of the safety brake 17.

**[0019]** The distance between the primary pulleys 8, 11 is substantially equal to that between the secondary pulleys 7, 10, and is furthermore substantially equal to the distance between the anchor point 6 of the primary wire 12 on the first transverse side and the anchor point 18 of the safety wire 13 on the second transverse side of the gondola 1. In this way, the suspension bridges substantially the whole width of the gondola 1. However, the distance between the primary pulleys 8, 11 and may also be different from the distance between the secondary pulleys 7, 10 and both distances may also differ from the distance between the anchor points 6 and 18.

**[0020]** On the gondola 1 of figures 1 and 2, a pair of motorised wire reelers 3, 16 is mounted. The wire reeler 3 on the first transverse side is mounted below the safety brake 17 and is provided for reeling the safety wire 13.

The wire reeler 16 is mounted on the second transverse below the traction hoist 14 and is provided for reeling the primary wire 13.

**[0021]** On both transverse sides of the gondola 1 of figures 1 and 2, a storage bin 4, 15 is provided, for example for storing electric cables which provide electric power to the traction hoist 14 and the wire reelers 3, 16.

**[0022]** On the bottom side of the gondola 1 of figures 1 and 2, wheels 2 are mounted, by means of which the gondola 1 is easily movable on for example a roof for moving it from a storage position to a position in which it may be suspended from the roof.

**[0023]** The carrier 9 may be of any type known to the person skilled in the art, such as for example a movable roof cart with storage capability for storing the gondola 1 on the roof of a building, a rail system on which the pulleys are mounted on movable crabs, or other.

**[0024]** The device of figures 1 and 2 functions as follows. In normal working situations, the worker on the gondola can raise or lower the gondola 1 by operating the control unit of the traction hoist 14. For example in case of raising the platform, the traction hoist 14 pulls in the primary wire 12, the excess of which is automatically rolled onto the motorised wire reeler 16 below the traction hoist 14. During the raising, the gondola 1 remains substantially horizontal by the suspension on the primary pulleys 8, 11, which rotate and as such ensure that the length of primary wire 12 which is pulled in by the traction hoist 14 is substantially evenly removed on both transverse sides of the gondola 1. In other words, the pulling speed of the traction hoist 14 is substantially equal to twice the raising speed of the gondola 1. The excess of safety wire 13 which is created during the raising of the gondola 1 is automatically rolled onto the motorised wire reeler 3 below the safety brake 17. By the suspension of the safety wire 13 on the secondary pulleys 7, 10, the length of safety wire which is rolled onto the wire reeler 3 is substantially evenly removed on both sides, in a similar way as the primary wire.

**[0025]** In case too much weight is placed on the gondola 1, the overload/underload unit 5 cuts the power to the traction hoist 14 and halts the descent or ascent of the gondola 1. The worker can then lower the gondola 1 towards the ground by operating the primary brake (not shown), which is provided on the traction hoist 14. The gondola 1 then descends at a controlled speed.

**[0026]** In case of breakage of the primary wire 12, the gondola 1 will start descending at a high speed and, due to the suspension on the secondary pulleys, the safety wire 13 will run through the safety brake 17 at twice the descending speed of the gondola 1. When the speed at which the safety wire 13 runs through the safety brake 17 exceeds a predetermined value, the safety brake 17 will be activated and locked onto the safety wire 13, thereby halting the descent of the gondola 1.

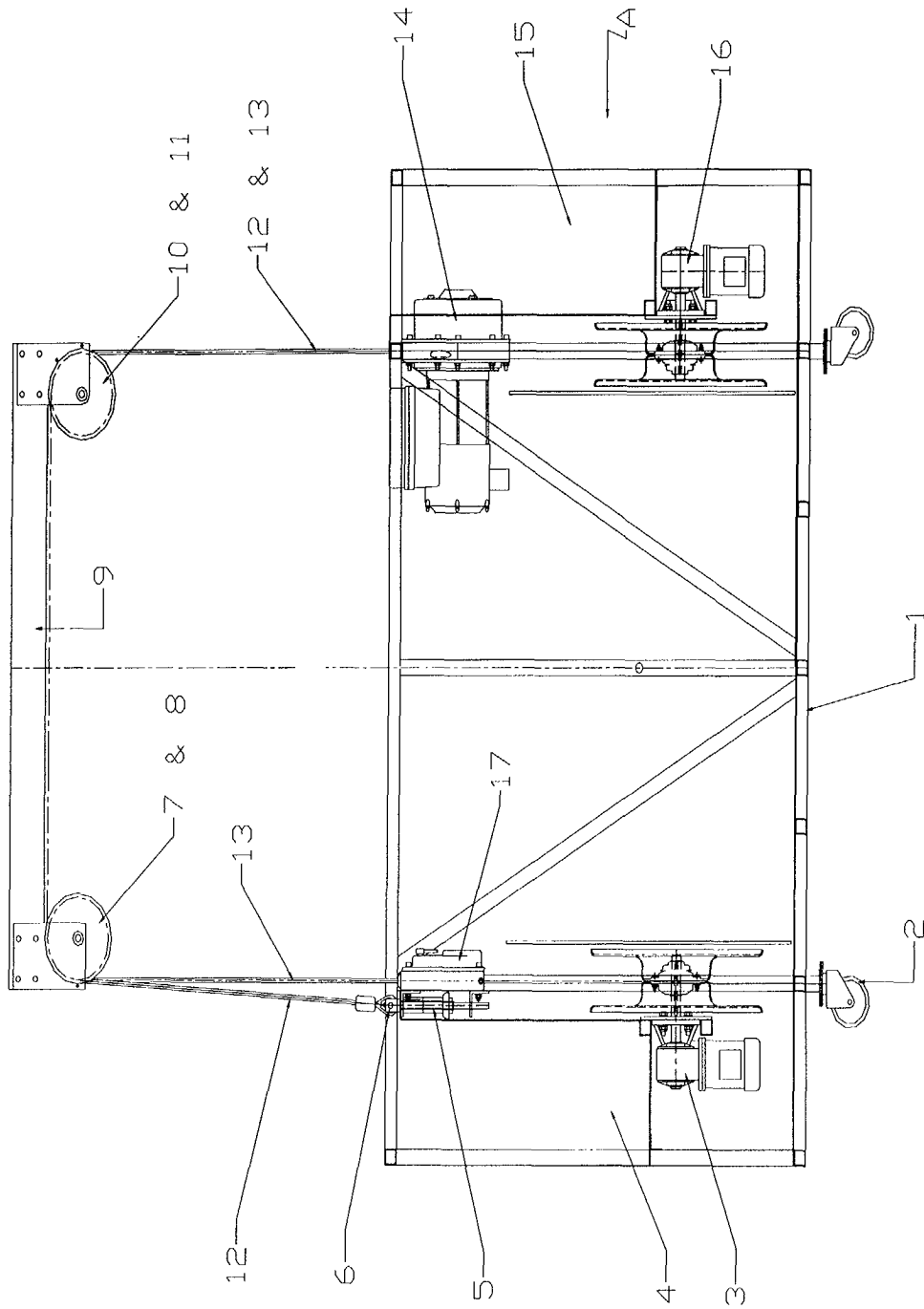
## Claims

1. Device for working at high locations comprising a gondola (1) which is suspended from a carrier (9),  
**characterised in that** the carrier comprises at least  
two primary pulleys (8, 11) which are mounted on  
spaced apart locations on the carrier (9), and **in that**  
the gondola (1) is suspended on a single primary  
wire (12) which is fixed on a first transverse side of  
the gondola (1) and runs over the primary pulleys  
(8, 11) to a traction hoist (14) on a second trans-  
verse side opposite the first transverse side of the  
gondola (1), the gondola (1) further comprising a  
single drive motor for driving the single traction hoist  
(14) and raising or lowering the gondola (1) with re-  
spect to the carrier (9).
  
2. Device for working at high locations according to  
claim 1, **characterised in that** the carrier (9) further  
comprises at least two secondary pulleys (7, 10)  
which are mounted on spaced apart locations on  
the carrier (9), and **in that** the gondola (1) is sus-  
pended on a single safety wire (13) which is fixed  
to the second transverse side of the gondola (1) and  
runs over the secondary pulleys (7, 10) to a safety  
brake (17) on the first transverse side of the gondola  
(1).
  
3. Device for working at high locations according to  
claim 2, **characterised in that** the gondola (1) is  
provided with two motorised wire reelers (3, 16),  
one (16) on the second side of the gondola for reel-  
ing the primary wire (12) and the other (3) on the  
first side of the gondola for reeling the safety wire  
(13).
  
4. Device for working at high locations according to  
any one of the claims 1-3, **characterised in that**  
the primary wire (12) is fixed to the first transverse  
side of the gondola by means of an overload/under-  
load unit (5).

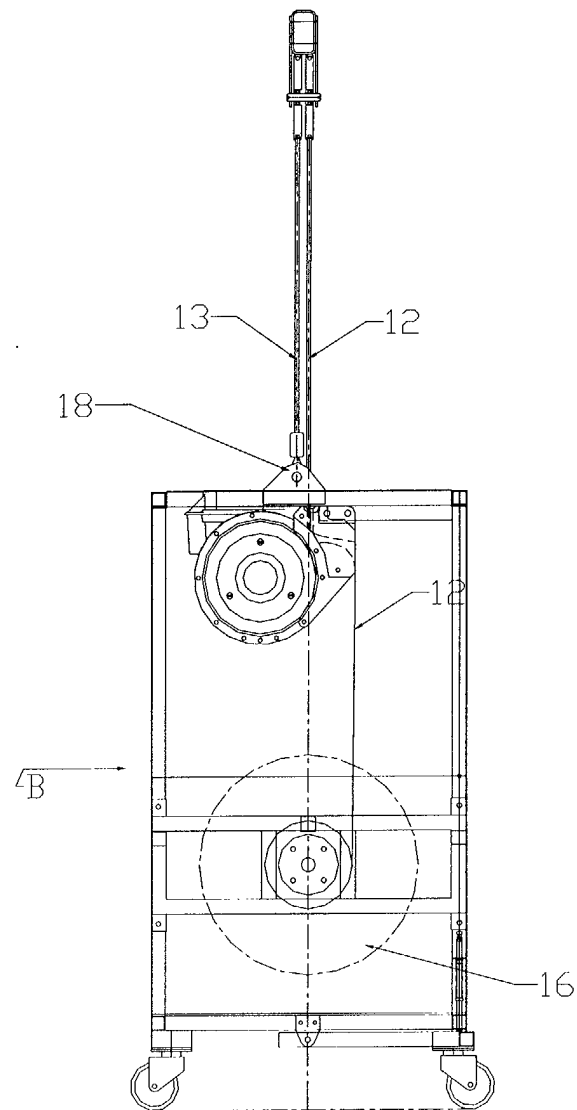
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**Fig. 1**



**Fig. 2**



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# EUROPEAN SEARCH REPORT

Application Number  
EP 02 44 7174

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	US 4 650 035 A (EUBANKS FURNEY M) 17 March 1987 (1987-03-17) * the whole document *	1	E04G3/00
A	FR 1 489 234 A (POMAGALSKI JEAN) 21 July 1967 (1967-07-21) * the whole document *	1	
A	US 1 368 668 A (VON DEEST WILLIAM) 15 February 1921 (1921-02-15) * the whole document *	1	
D,A	DE 197 14 848 A (RINIO JOHANNES) 29 January 1998 (1998-01-29)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E04G
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 25 November 2002	Examiner Festor, E
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 T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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

EP 02 44 7174

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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25-11-2002

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4650035	A	17-03-1987	US 4630710 A	23-12-1986
FR 1489234	A	21-07-1967	NONE	
US 1368668	A	15-02-1921	NONE	
DE 19714848	A	29-01-1998	DE 19714848 A1	29-01-1998