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

(11) EP 1 035 067 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
13.09.2000 Bulletin 2000/37

(51) Int. Cl.[7]: **B66C 23/20**

(21) Application number: **00200863.9**

(22) Date of filing: **10.03.2000**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **10.03.1999 NL 1011511**

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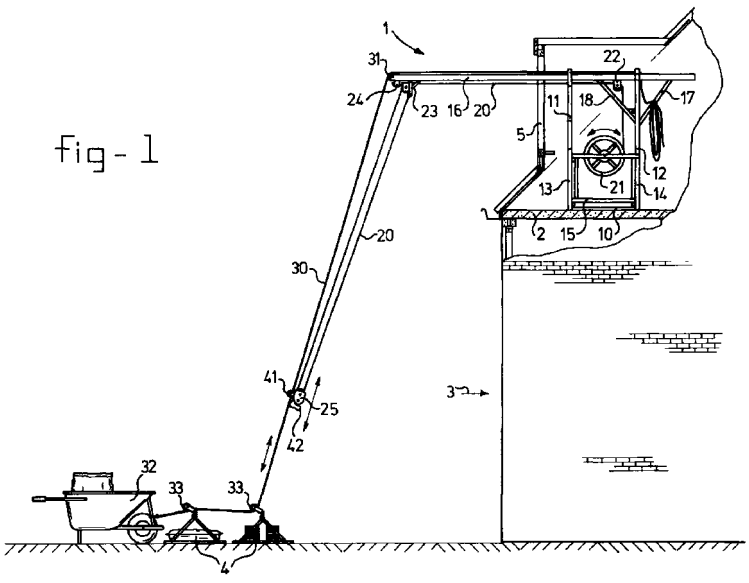
(54) Hoisting apparatus

(57) The invention relates to a method for hoisting a load (4) from a first position to a second position, in which method

- the load (4) is placed at a first position,
- a guide (30) is arranged from the second position, via the load (4), to a fixed point at the first position,
- hoisting means (20,25) are moved towards the load (4) via the guide (30),
- the load (4) is coupled to the hoisting means (20,25),
- the load (4) is hoisted up to the second position with the aid of the hoisting means (20,25).

The present invention also relates to a device for carrying out this method.

fig-1



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Description

[0001] The invention relates to a method for hoisting a load (4) from a first position to a second position.

[0002] It is known in the prior art to use a hoisting device to hoist loads from a first position to a second position. If a relatively simple device is used, a user has to couple a load to the hoisting device at the first position, then has to move to the second position and, from this second position, hoist up the load with the aid of the hoisting device. It is also possible for the coupling of the load and the hoisting of the load to be carried out by different people. It is also possible to utilize a relatively complex hoisting device, with the aid of which a load can be coupled from the second position with the aid of the hoisting device itself.

[0003] For numerous applications, it constitutes a drawback if two users have to operate a hoisting means together. Moreover, for numerous applications it is a drawback if a relatively expensive hoisting device is used. One example of an application of this nature is the use of a hoisting device in the building trade. By way of example, in order for a tiler to tile the wall of a bathroom, he has to take a relatively large number of heavy loads out of a means of a transports, such as a car or lorry, up into a house. This load may, in some cases, have to be carried up three or four storeys. The profit margins with which a tiler usually works do not allow the labouring work (carrying the material upstairs) to be carried out by two people. Moreover, the margins are too low to enable expensive, relatively complex hoisting devices to be used at the workplace.

[0004] The object of the present invention is to provide a method and a device with which, in a relatively simple manner and at low cost, a single user can hoist loads up from a first position to a second position.

[0005] This object is achieved by the fact that the present invention provides a method in which

- the load is placed at a first position,
- a guide is arranged from the second position, via the load, to a fixed point at the first position,
- hoisting means are moved towards the load via the guide,
- the load is coupled to the hoisting means,
- the load is hoisted up to the second position with the aid of the hoisting means.

[0006] As a result of a guide being arranged between the first position and the load, it is possible for a user to utilize the guide for the purpose of coupling hoisting means. Consequently, the user does not have to descend from the second position to the first position in order to couple the hoisting means.

[0007] The method according to the present invention is improved by the fact that, at the second position, the load is uncoupled from the guide and from the hoisting means.

[0008] It is also improved by the fact that two or more loads are placed at the first position and the loads are connected in series to the guide.

[0009] These measures ensure that a user can uncouple the loads from the hoisting means and the guide at the second position without having to leave the second position. The hoisting means can then be brought into position for coupling and hoisting a second load which, at the first position, was positioned in series with the first load which has just been hoisted. Depending on the particular use, a large number of loads can be made ready, can be connected with the aid of the guide and can then be hoisted up.

[0010] In addition, the present invention provides a device for carrying out the method according to the invention. This device comprises a hoisting device for hoisting a load, comprising a hoisting cable provided with hook means for engaging on the load.

[0011] The hoisting device according to the present invention is characterized in that the hoisting device is provided with a guide which, in use, extends substantially between the hoisting device and the load, the hook means comprising follower means, with the aid of which the hook means are movably coupled to the guide.

[0012] In this case, it is advantageous for the guide to be designed as a second or guide cable.

[0013] These measures ensure that, while a user is located at a position to which the loads are to be hoisted, such as for example an upper storey of a house, he can use the hoisting device according to the invention to move a hoisting cable towards a load by passing this hoisting cable along a guide towards the load with the aid of hook means which are mounted thereon and coupling it to the load. To couple the load, therefore, the user himself does not have to descend to the loads. By designing the guide as a guide cable, it can easily be guided from a hoisting device towards the loads, and during transportation it can be stored in compact and therefore user-friendly form.

[0014] Furthermore, it is possible, according to the present invention, for the hoisting device to comprise a frame, in which case tackle means, such as a winch, are arranged on the frame for the purpose of actuating the hoisting cable.

[0015] In this case, it is possible for locking means to be arranged on the frame for the purpose of locking the guide cable to the frame.

[0016] Moreover, it is possible for the hoisting device to comprise a hoisting arm which is attached to the frame, which hoisting arm is provided with guide means for guiding the hoisting cable and the guide cable along the hoisting arm.

[0017] These measures ensure that, from the hoisting device, the guide cable can be guided via the hoisting arm towards the loads. The presence and specific position of the hoisting arm make it possible to circumnavigate obstacles such as, for example, a gutter, a balcony or other obstacles. The guide cable can be locked

to the frame, so that a secure connection between the loads and the hoisting device is ensured at all times. In use, the hoisting cable may moreover be actuated with the aid of the winch, so that the load imposed on the user himself is minimized.

[0018] Furthermore, according to the invention it is possible for the guide means for the hoisting cable to comprise a pulley which is movably attached to the hoisting arm.

[0019] In this case, it is possible for locking means to be arranged at the end of the hoisting arm for the purpose of locking the movable pulley in place.

[0020] The effect of these measures is that the position to which the load is hoisted by the hoisting means can be adjusted since the pulley is movably attached to the hoisting arm. For example, a load can be hoisted into a position in which the pulley is locked substantially at the end of the hoisting arm. Then, the pulley can be displaced towards the user as a result of the pulley being shifted along the hoisting arm. In this way, it is possible to prevent a user having to reach out or stretch in order to release a load from the end of the hoisting arm, which would require the user to raise a load in what may be an awkward position. The mobility of the pulley means that the ultimate position of the load can be determined by the user. For example, the pulley can be moved along the hoisting arm with the aid of a drive, for example in the form of a rope or cord.

[0021] It is possible for the hoisting device according to the present invention to be of modular design. This means that the hoisting device itself comprises parts which are releasably connected to one another. The advantage of this measure is that the hoisting device can be moved in pieces. By way of example, the user can carry the hoisting device to its position of use in two or three runs. Consequently, the burden on the user is restricted further. To keep the weight of the hoisting device as low as possible, the hoisting device may, for example, be made from aluminium or another suitable lightweight construction material.

[0022] It should be understood that the hoisting device according to the invention is particularly suitable for hoisting relatively light loads, for example with a maximum weight of 50 kg. Currently, the statutory maximum weight which can be hoisted per person is 25 kg. The device can also be set to this maximum. This means that the hoisting device can be of relatively lightweight design. To further limit the weight of the hoisting device, it is possible to design the hoisting device in such a manner that, in the hoisting position, the user himself serves as ballast.

[0023] For this method of hoisting a load, it is desirable for the device to contain a counterweight. By using the bodyweight of the user, it is possible for the device itself to be of relatively lightweight design.

[0024] The present invention always refers to a guide cable and a hoisting cable. It should be understood that it is also possible to use any cord, line, rope or chain made from a suitable material for these cables.

[0025] The present invention will be explained with reference to the appended drawings, in which:

Figure 1 shows an overview of a possible embodiment of the present invention.
Figure 2 shows a perspective view of the hoisting apparatus shown in Figure 1.
Figure 3 shows a detailed view of the end of the hoisting arm of the hoisting apparatus shown in Figures 1 and 2.
Figure 4 shows a detailed view of how a hoisting hook is coupled to a load.
Figure 5 shows a detailed view of how the hoisting hook is attached to a load during hoisting.
Figure 6 shows a plan view of how a guide pulley is attached to the load.
Figure 7 shows a further detail of the catch which is used to uncouple the load from the guide.

[0026] As will also emerge from the following description, the intention is for it to be possible for the hoisting apparatus 1 to be used to hoist up a number of loads without a user always having to couple the next load himself each time. Consequently, a user does not have to keep running up and down stairs, for example. This means that the carrying work for the user is minimized using the device according to the invention. The hoisting apparatus itself is taken to the place of use by the user himself using his own strength. For this reason, it is advantageous if the hoisting apparatus itself is of relatively lightweight design in the first place. This means that the load on a user when carrying up the hoisting device is as low as possible. Secondly, it is advantageous if the hoisting device comprises separate modules which together, in assembled form, form the hoisting device according to the invention. The shape of these modules themselves must be such that they can easily be handled by a user. Figure 1 shows the hoisting apparatus in the mounted position. It is clear that the hoisting apparatus may also be of fold-up design.

[0027] Figure 1 shows an overview of the use of the hoisting apparatus 1 according to the present invention. The hoisting apparatus 1 is positioned on a floor 2 on, for example, the first storey of a house 3. Figure 1 shows the situation in which loads 4 have to be moved into the house 3 through a window 5 with the aid of the hoisting device 1.

[0028] The hoisting apparatus 1 comprises a baseplate 10, to the front side of which a support fork 11 is attached. The support fork 11 comprises two bearing rods which are coupled together at their ends by means of a locking piece 11a. The coupling piece ensures that, in use, the hoisting arm cannot come out of the support fork. A possible form of the support fork can be seen in particular from Figure 2. A hoisting arm 16 is placed on the top end of the support fork 11. A bearing rod 12 is attached to this hoisting arm 16 and is mounted in or on

a side gate part 15. With the aid of the support fork 11 and the bearing rod 12, the hoisting arm 16 is secured substantially in the horizontal position. To reinforce the entire structure, the hoisting arm 16 and a bearing rod 12 are also connected to one another with the aid of two support elements 17, 18. The support fork 11 forms part of or is arranged releasably in a front gate part 13. The bearing rod 12 forms part of or is releasably attached to a rear gate part 14. The gate parts 13 and 14 are connected to one another by two side gate parts 15.

[0029] Two cables extend from the hoisting apparatus towards 1 the loads 4. The first cable is a hoisting cable 20. This hoisting cable 20 is unwound from or rolled up onto a cable drum 21 which is attached, for example, to a side part 15. From the cable drum 21, the hoisting cable 20 runs via a first pulley 22, which is attached to the hoisting arm 16, via a second pulley 23, which can be displaced along the hoisting arm. The way in which the second pulley 23 is attached to the hoisting arm 16 can be seen in particular from Figure 3. This second pulley 23 can be secured in place in the vicinity of the end of the hoisting arm 16 with the aid of a lock 24. From the second pulley 23, the hoisting cable 20 extends towards a hook block 25. The structure of this hook block 25 and the way in which it operates can be seen in particular from Figures 4 and 5. Next to the first hoisting cable 20, a second cable, which has the function of a guide cable 30, runs from the hoisting arm 16. This guide cable 30 can be fixed to the hoisting arm 16 or the bearing rod 12. From the attachment, the guide cable 30 runs, via one or more guides on the top side of the hoisting arm 16, towards pulley 31 at the end of the hoisting arm. From this pulley 31, the guide cable 30 runs towards the loads 4. The free end of the guide cable 30 is attached to an anchor. In Figure 1, this anchor is formed by a wheelbarrow 32 containing ballast. It will be clear that another form of anchor, such as for example a tree, a towing hook of a car or any other heavy or stationary element can be used as an anchor. In Figure 1, it can be seen that the guide cable 30 is guided along pulleys 33 which are attached to the loads 4.

[0030] From the above, it is clear that the hoisting arm 16, with the bearing rod 12 and the hoisting means, such as the cable drum 21, attached to it together form a module. This module contains all the moving compartments of the hoisting apparatus 1. In use, in particular this module will be transported and stored with all due care and attention.

[0031] The use of the hoisting tool 1 according to the present invention is as follows. A user, for example a tiler, needs to move a large number of loads (tiles and cement) from a car to a room located at a higher level at a workplace, for example a bathroom. The first option is for the user to carry the loads up one by one. However, carrying the loads represents a heavy physical burden. The carrying seriously limits the number of square metres which a tiler can cover per day. In the contracting sector, and in particular in the subcontracting sector, work is carried out at very competitive prices. This means that it is highly uneconomical for, for example, a plurality of people to carry the loads up. The use of hoisting apparatuses containing an electrically driven motor is often also impossible. Firstly, apparatuses of this nature are relatively expensive. This makes the margins on the work to be carried out too low. Secondly, work such as tiling is often carried out when there is no power to the area to be constructed. For example, in the case of house alterations, the power is often switched off. Therefore, it is advantageous if the hoisting apparatus can be operated by the user himself by means of his own physical strength.

[0032] After the hoisting apparatus 1 has been erected as shown in Figure 1, the guide cable 30 is lowered from the end of the hoisting arm 16. The hook block 25 is coupled to this guide cable via a pulley 41 (see in particular Figures 3, 4 and 5). The anchor 32 and the various loads 4 are positioned one behind the other. Then, the end of the guide wire is guided along the pulleys 33 of the successive loads 4. Next, the end of the guide cable is coupled to the anchor 32. A user can then walk up to the hoisting apparatus 1. To use the hoisting apparatus, the user takes his place on the baseplate 10 of the hoisting apparatus 1. The user then manually tensions the guide cable 30. This means that the guide cable 30 is substantially taut between the pulley 31 at the end of the hoisting crane 16 and the pulley 33 on the load 4 which is positioned closest to the hoisting apparatus 1. Then, with the aid of the cable drum 21, the user lowers the hoisting cable 20, to which the hook block 25 is attached, towards the first load 4. Once it has reached the bottom, the hook block 25 will be automatically coupled securely to the first load 4 with the aid of a hook 42 mounted thereon (see in particular Figures 4 and 5). Without having to move from his station, the user can then pull the hoisting cable, with the hook block 25 attached to it and therefore also the load 4, upwards by turning the cable drum 21. The load 4 is moved towards the block 23 with the aid of the hoisting cable 20. This block is movably attached to the hoisting arm 16. When the load 4 has substantially reached the block 23, the lock 24, with the aid of which the block 23 is fixed to the hoisting arm, can be released, so that the block 23 can move towards the user, who is standing on the baseplate 10. Since the block 23 is movably secured to the hoisting arm 16, the load which has been raised up in the meantime can be moved towards the user. This means that the user does not have to lean out of the window in order to grip the load in an awkward position, but rather the load can move towards the user. This means that the user does not have to leave his position on the baseplate 10 throughout an entire hoisting cycle. The user can therefore act as a "ballast" himself while the load is being hoisted. This means that consequently the hoisting apparatus 1 can be of relatively lightweight design without the stability of a hoisting operation being

endangered.

[0033] The block 23 can be moved along the hoisting arm 16 in various ways. For example, it is possible for a user to determine the position of the block 23 with the aid of a second handle and a drive cord. It is also possible for the block 23 to slide along the hoisting arm 16 without further drive means being present. After all, beyond the lock 24 at the end of the hoisting arm 16, the load will automatically move towards the user under the influence of the force of gravity if the lock 24 is released when a load is attached to the hook block 25. It is also possible for a user to determine the position of the block 23 on the hoisting arm 16 with the aid of a stick. This stick could also be used to release the lock 24 of the block 23.

[0034] The load is prevented from falling freely with respect to the hoisting arm 4 by the fact that the block 23 is kept in check, via the pulley 41 of the hook block 25, by the guide cable 30.

[0035] When a load has reached the user, he can release it from the guide cable and from the hoisting cable by uncoupling the hoisting hook 42 and the attachment of the guide wire 30 over the pulleys 33 (see also Figures 6 and 7). Consequently, the load has arrived at the top and can be placed next to the hoisting apparatus 1 by the user. Without the user having to leave his position on the baseplate 10, he can allow the hoisting hook 25 to move downwards again via the guide cable 30 after the block 23 has reached the lock. Once it has arrived at the bottom, the hook 42 of the hook block 25 will again be automatically coupled to the next load. The hoisting cycle can then be repeated. It should also be noted that during the hoisting operation it is possible for the guide wire to be made tauter or slacker if this is required for the hoisting operation.

[0036] In the manner described above, it is possible for a user to move a plurality of loads 4 up with the aid of the cable drum 21 without the user having to run up and down in order to couple each load. Due to the design of the hook block 25 and the presence of the guide wire 30, successive loads will always be coupled automatically.

[0037] Figure 2 shows a perspective view of the hoisting apparatus 1 shown in Figure 1. It can be seen from Figure 2 that the hoisting arm 16 is always at a slight angle with respect to the baseplate 10. The fact that the hoisting arm 16 is at angle to the baseplate 10 ensures that the load on the hoisting tool is distributed centrally. Moreover, the position of the load is improved with respect to the hoisting station. For example, if there is a projection, such as a porch or a balcony, beneath the hoisting apparatus, the obliquely positioned hoisting arm 16 enables an obstacle of this nature to be avoided relatively easily. Perhaps superfluously, it is pointed out that the underside of the bearing rod 12, after it has been fitted in the side gate part 15, is secured with the aid of a securing pin 27. By contrast, the support fork 11 is attached to the front side 13 via two limbs. Figure 2 clearly shows the modular design of the hoisting apparatus 1. The various components, such as the support fork 11, the hoisting module together with the bearing rod 12 and the front side 13, the rear side 14, the side walls 15 and the baseplate 10 can be pushed together as separate components. To prevent the components from becoming detached during use, the components may, for example, be held securely together with the aid of securing pins 27. In particular the attachment of the rear side 14 to the baseplate 10 and the bearing rod 12 to the gate side part 15 must be carried out carefully, since a tensile load will be exerted on this attachment when a load is hanging from the hook block 25. Figure 2 also shows the locking of the guide cable 30. This cable 30 can be attached to the bearing rod 12, for example with the aid of two arms which have a resilient action with respect to one another and are provided, on the sides which face towards one another, with toothing. A clamping connection of this nature is known, inter alia, from sailing. In Figure 2, an arrow indicates that cable drum 21 can rotate in two directions. Particularly when a load is attached to the hook block 25, it is important to ensure that the cable drum cannot just rotate back. Therefore, a non-return pawl (not shown) is provided. To make the hoisting arm easier to handle when the hoisting apparatus 1 is being transported in parts, an attachment eyelet 28 is attached to the bearing rod 12, to which eyelet the cable drum 21 can be fixed when the components are being transported or stored. The presence of this attachment eyelet 28 prevents the cables from becoming tangled during transport, as a result of the cable drum being incorrectly positioned on the bearing rod 12. Figure 2 shows the situation in which the baseplate 10 is surrounded on four sides by a fence structure in the form of a gate. It will be clear that other designs, in which the baseplate is freely accessible from at least one of the four sides can be used appropriately.

[0038] The way in which the slidable block 23 is attached can be seen clearly in particular from Figure 3. In Figure 3, only the end of the hoisting arm 16 is shown. A catch 24 is arranged at the end of this hoisting arm 16. This catch can be used to define the position of the displaceable block 23 at the end of the hoisting arm. It is possible to release the lock from the user's position on the loading platform 10 (not shown) by means of a stick. It can also be seen in Figure 3 that the hoisting cable 20 extends, from the block 23, via a first reeved arrangement, towards the hook block 25 and, via a second reeved arrangement, runs back towards a stationary attachment 50. This double reeved arrangement halves the load on the cable drum 21. This also means that the force which is required to operate the cable drum is halved.

[0039] It has already been stated above that, when the hoisting apparatus 1 according to the invention is used, the hook block 25 automatically clicks onto a load which has been prepared when the hoisting cable 20 is paid out, so that the hook block 25 can be moved into

the vicinity of the load. The way in which this mechanism operates can be seen in particular from Figures 4 and 5. Figure 4 shows the situation in which the hook block 25 has been moved downwards as a result of the hoisting cable 20 being paid out. When the cable is being paid out, the pulley 41 which is attached to the hook block 25 is guided over the guide wire 30. The distance from the pulley 41 to the hook block 25 is thus clearly defined. Due to the weight of the hook block 25, the hook 42 attached to the hook block will be pushed open by the top side of the bracket 52 which forms part of the load 4. The correct positioning of this hook 42 with respect to the bracket 52 is achieved, inter alia, by the distance of the pulley 33 from the bracket 52. When the hook block 25 has moved so far downwards that the top end of the bracket 52 is entirely accommodated inside the hook 42, the block 24 can be hoisted up again. This situation is shown in Figure 5. Due to the spring force of the movable lip 43 of the hook 42, the hook will automatically close tightly at the moment at which force is exerted on the hoisting cable 20. Via the connection of the hook 42 to the bracket 52, the load 4 is carried with the hook block. If the hook should fail to make contact with the bracket 52, the user will detect that the hook block 25 can be moved upwards too easily. The user may make a second attempt to couple the hook 42 to the bracket 52 and then still move the load 4 upwards.

[0040] When the load 4 has reached the user, the load must of course be easily releasable from both the hook 52 and the guide cable 30. To achieve this, it is possible to select a design which is shown in Figure 6. Figure 6 shows the case in which the hook 42 (the hook block 25 is not shown) has not yet made contact with the bracket 52. The pulley 33 is attached to the bracket 52 with the aid of a strip 53. The guide wire 30 which runs along the pulley 33 is in this case shown in cross section. A movable lip 54 is mounted in the strip 53. By opening this lip 54, the guide cable 30 can be removed from the pulley and the bracket 52 can be released from the guide cable 30. A possible embodiment of the lip is shown in Figure 7.

[0041] The present invention has referred to the use of a hoisting cable 20. It should be understood that a rope, a cord made, for example, from plastic or any other suitable material may also be used. A similar statement applies to the guide cable 30. By way of example, a rope or a cord may also be used as the guide cable.

[0042] Moreover, the figures show one possible embodiment of the hoisting apparatus 1. Numerous other embodiments are possible without departing from the scope of protection of the present invention, which is described in the appended claims.

Claims

1. Method for hoisting a load (4) from a first position to a second position, characterized in that
   - the load (4) is placed at a first position,
   - a guide (30) is arranged from the second position, via the load (4), to a fixed point at the first position,
   - hoisting means (20, 25) are moved towards the load (4) via the guide (30),
   - the load (4) is coupled to the hoisting means (20, 25),
   - the load (4) is hoisted up to the second position with the aid of the hoisting means (20, 25).

2. Method according to Claim 1, characterized in that, at the second position, the load (4) is uncoupled from the guide (30) and from the hoisting means (20, 25).

3. Method according to Claim 1 or 2, characterized in that two or more loads (4) are placed at the first position and the loads (4) are connected in series to the guide (30).

4. Hoisting device (1) for hoisting a load (4), comprising a hoisting cable (20), provided with hook means for engaging on the load (4), characterized in that the hoisting device (1) is provided with a guide (30) which, in use, extends substantially between the hoisting device (1) and the load (4), the hook means (25) comprising follower means (41), with the aid of which the hook means (25) are movably coupled to the guide (30).

5. Hoisting device (1) according to Claim 4, characterized in that the guide is designed as a second or guide cable (30).

6. Hoisting device (1) according to Claim 4 or 5, characterized in that the hoisting device (1) comprises a frame, in which case tackle means, such as a winch (21), are arranged on the frame for the purpose of actuating the hoisting cable (20).

7. Hoisting device (1) according to Claim 5 or 6, characterized in that locking means (29) are arranged on the frame for the purpose of locking the guide cable (30) to the frame.

8. Hoisting device (1) according to Claims 5-7, characterized in that the hoisting device (1) comprises a hoisting arm (16) which is attached to the frame, which hoisting arm (16) is provided with guide means for guiding the hoisting cable (20) and the guide cable (30) along the hoisting arm (16).

9. Hoisting device (1) according to Claim 8, characterized in that the guide means for the hoisting cable (20) comprise a pulley (23) which is movably attached to the hoisting arm (16).

10. Hoisting device (1) according to Claim 9, characterized in that locking means (24) for locking the movable pulley (23) in place are arranged at the end of the hoisting arm (16).

11. Hoisting device (1) according to one of the preceding claims, characterized in that the hook means (25) comprise a pulley, the hoisting cable (20) extending, via a first reeved arrangement, from the hoisting arm (16) to the hook means (25) and, via a second reeved arrangement, from the hook means (25) to the hoisting arm (16).

12. Hoisting device (1) according to one of the preceding claims, characterized in that the frame of the hoisting device is of modular design.

13. Hoisting device according to one of the preceding claims, characterized in that the frame is made from aluminium.

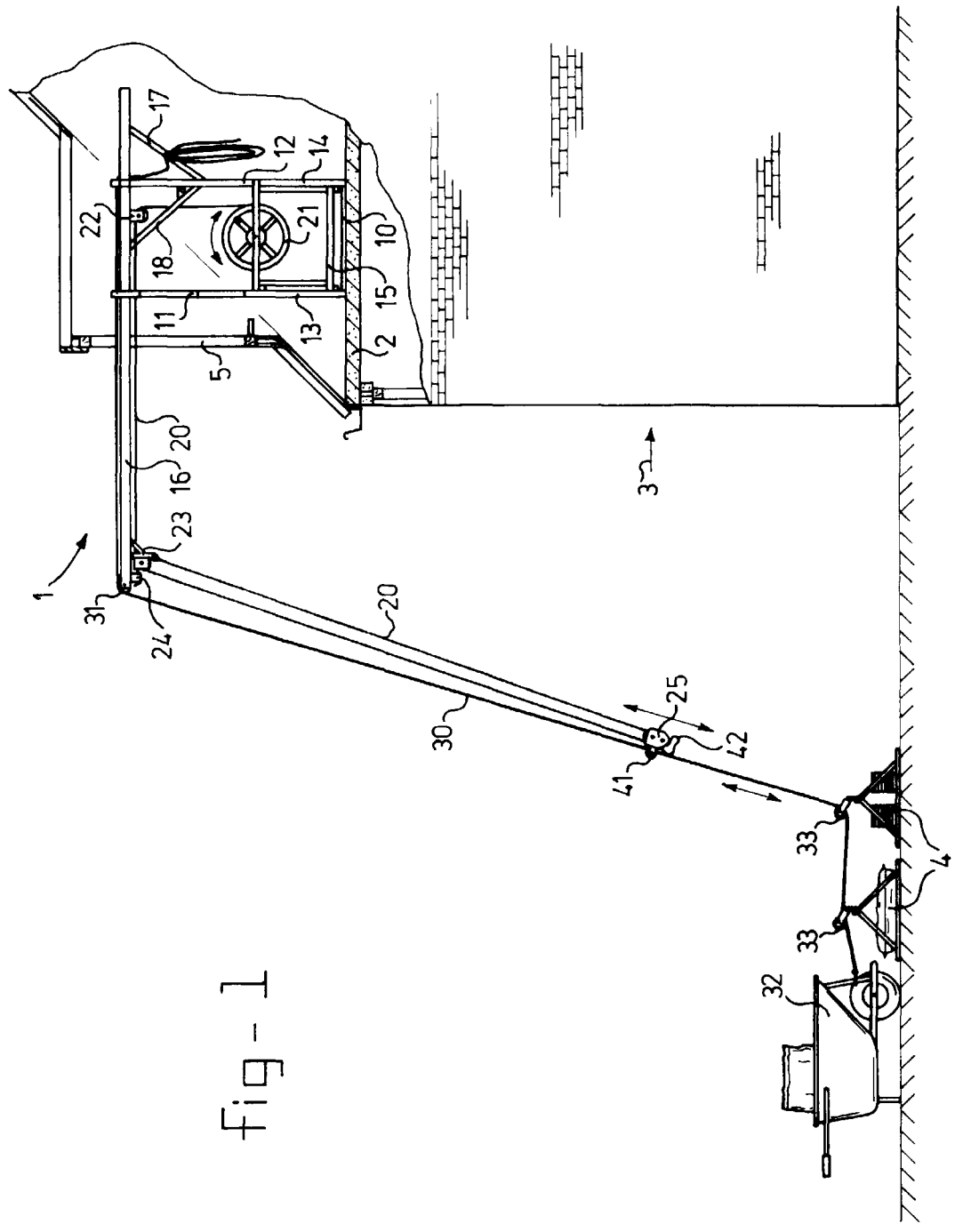


fig-1

fig - 2

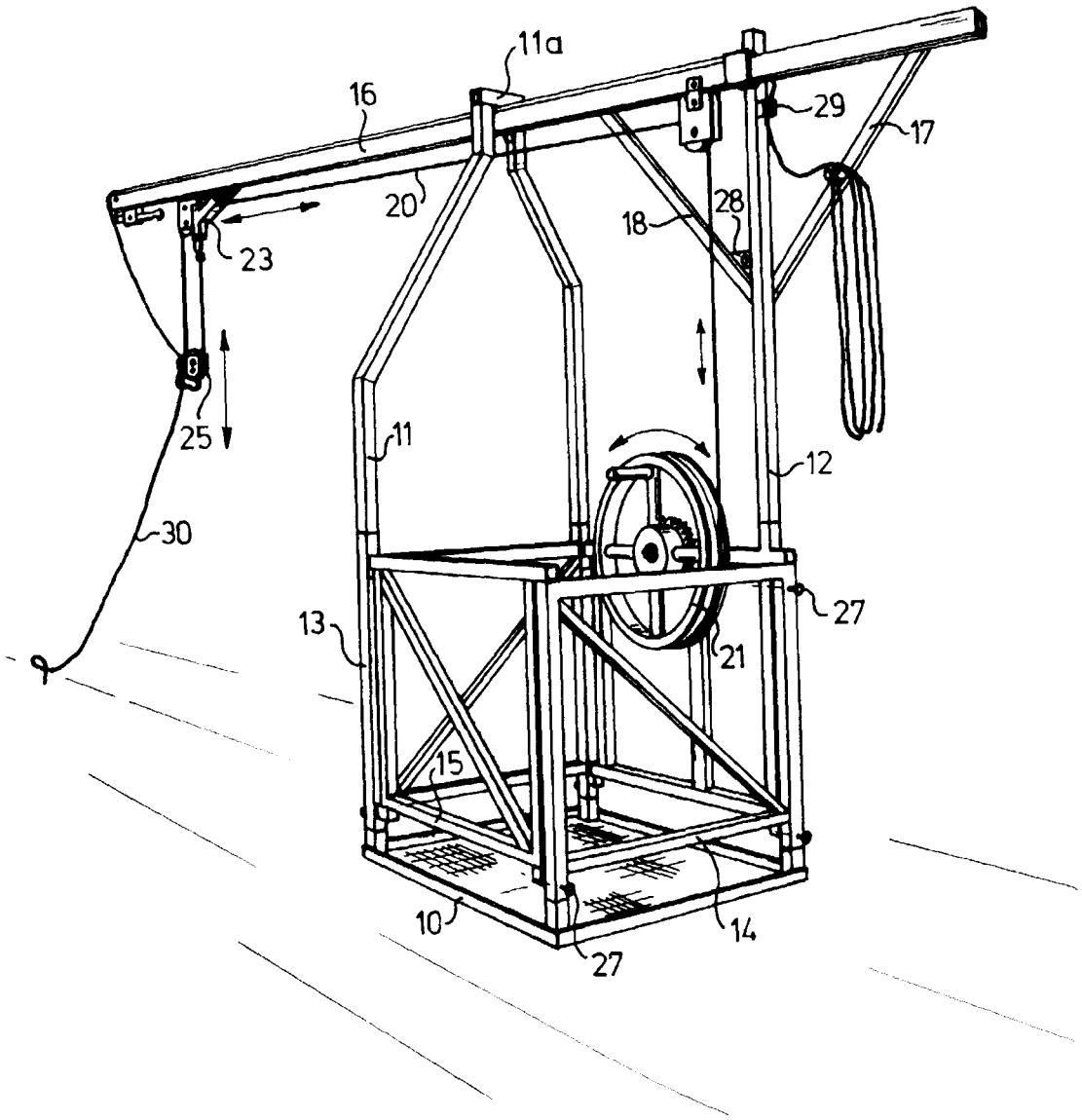


fig - 3

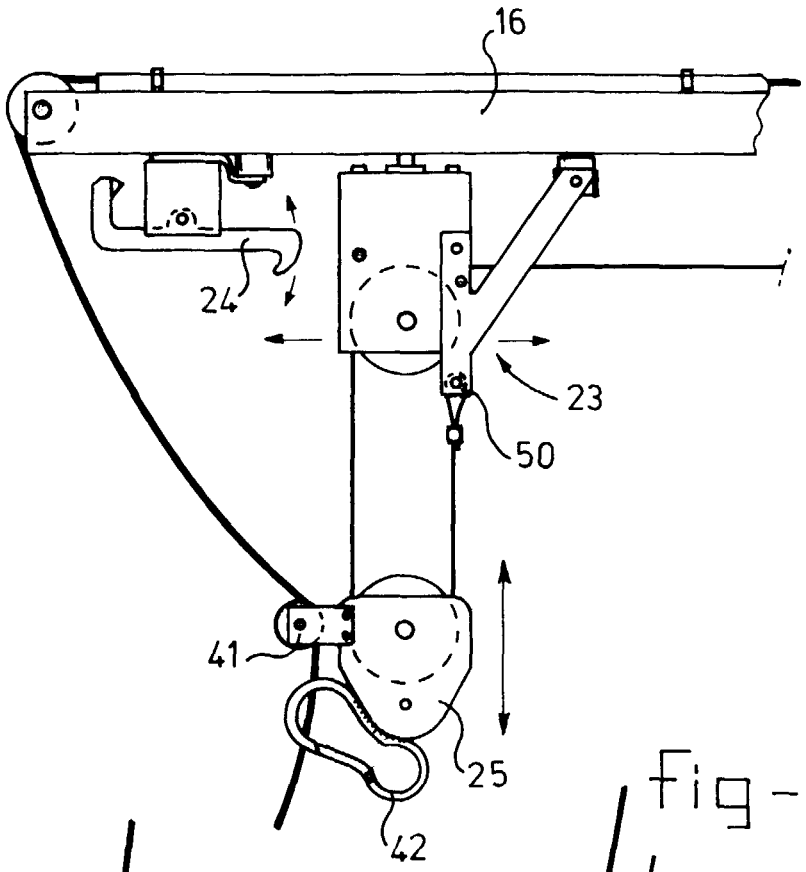


fig - 4

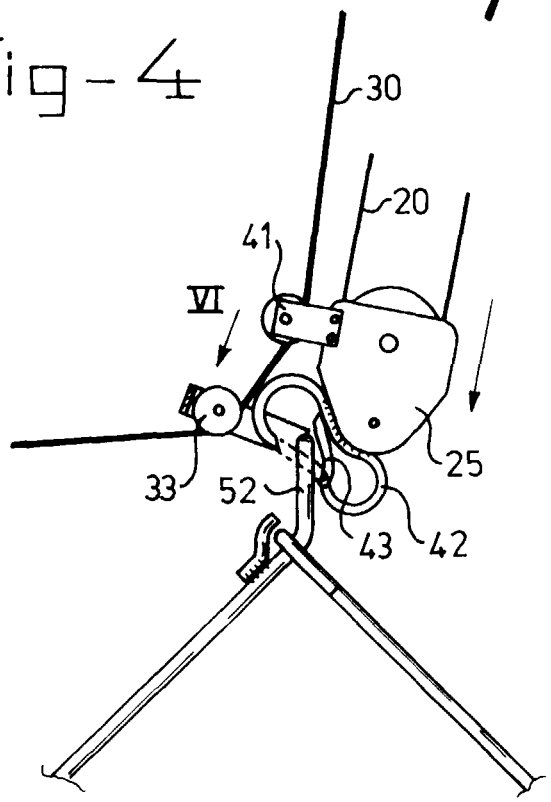


fig - 5

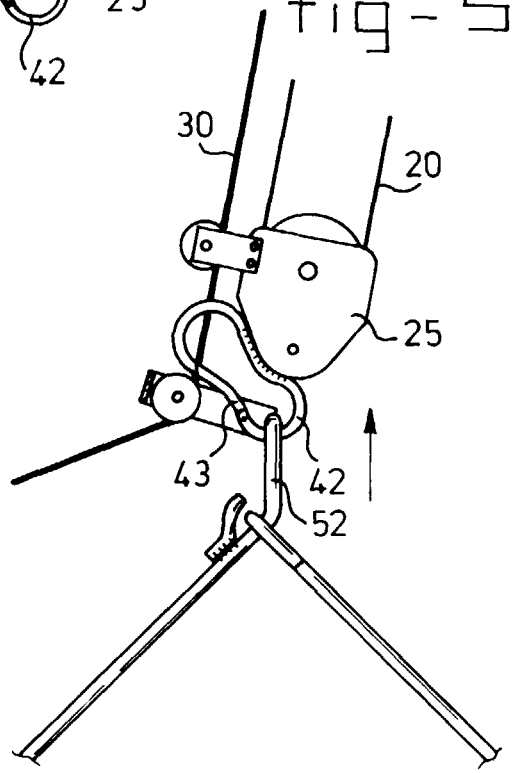


Fig - 6

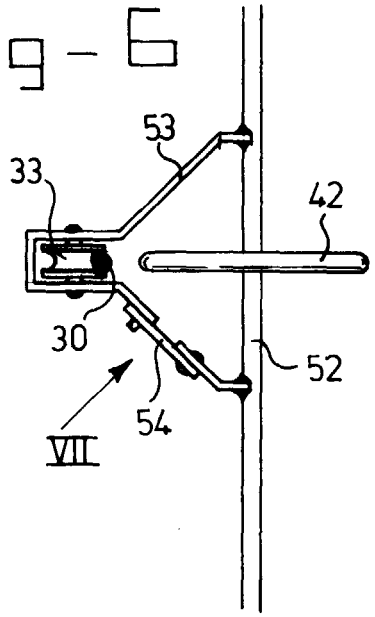
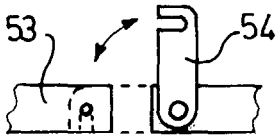


Fig - 7



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EUROPEAN SEARCH REPORT

Application Number
EP 00 20 0863

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Place of search	Date of completion of the search	Examiner
THE HAGUE	16 June 2000	Vollering, J

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