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

(11) EP 0 854 257 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
22.07.1998 Bulletin 1998/30

(51) Int. Cl.[6]: **E04H 6/06**

(21) Application number: **98100129.0**

(22) Date of filing: **07.01.1998**

(84) Designated Contracting States:
AT BE CH 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: **20.01.1997 IT VR970002**

(71) Applicant: **Donà, Albino**
37060 Gazzo Veronese (VR) (IT)

(72) Inventor: **Donà, Albino**
37060 Gazzo Veronese (VR) (IT)

(74) Representative: **Savi, Alberto**
c/o CON LOR SPA,
Corso Porta Nuova, 3
37122 Verona (IT)

(54) Vertically movable modular structure for obtaining auxiliary stalls and being insertable in space to be obtained under the floor of a motor car stall, garage or the like

(57) A vertically movable prefabricated modular structure (3) is proposed to obtain auxiliary stalls. This structure (3) is insertable in space to be obtained under the floor of a motor car stall, garage or the like. It permits to utilize the room under the floor of a garage or motor car stall through a system of vertical movement. A new, efficient stall or "subroom" is thus obtained where it is possible to park a second motor car or it may be used to store whatever material.

In general, the present structure (1) is formed by a fixed parallelepiped-shaped metal or plastic or concrete container (2) in which a movable structure (3) is installed.

The movable structure (3) can go up and down in the fixed container (2) like an elevator.

The movable structure (3) comprises two loading platforms (4, 5) that are arranged one above the other. Therefore, two motor cars can be parked vertically.

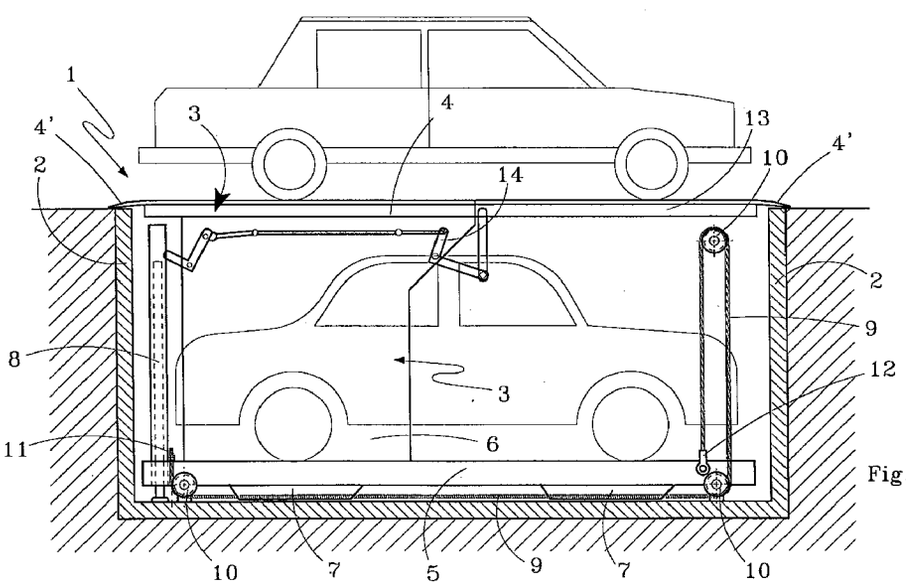

Fig. 1

EP 0 854 257 A1

Description

The present invention proposes a vertically movable structure for obtaining auxiliary stalls. This structure is insertable in seats to be obtained under the floor of a motor car stall, garage or the like, there being the possibility for this structure to vertically slide.

In particular, the present invention proposes that the said auxiliary stalls be prepared at the factory by mounting prefabricated kits. Such kits are carried out according to some main versions and dimensions and form autonomous units to be directly installed in the place of utilization.

As it is known, a limited availability of motor car stalls both in apartment buildings and single houses is one of the most frequent problems since a person often owns more than a car while a flat is in general coupled with an only motor car stall.

In such situations that, as it is known, are getting more and more numerous, an owner of a second or third car is compelled to let his or her vehicle parked in an unguarded place such as a road, otherwise the owner of the car has to look for another motor car stall. However, there are many practical difficulties in finding another car stall and in addition, there are often expenses to be incurred for an utilization of this stall.

One can try to overcome the above described economical-practical inconveniences by exploiting the owned garage or motor car stall. It is necessary to exploit the space of the garage or stall in order to park as much cars as possibile. However, in this case there are further problems due to a reduced space for storing cumbersome objects.

In fact, as it is known, a garage or stall is often used to store cumbersome objects. In addition, there is a problem of movability.

The aim of the present invention is the elimination or at least a reduction of the above described inconveniences by proposing a vertically movable structure that permits to get auxiliary stalls and is insertable in seats to be obtained under the floor of a motor car stall, garage or the like, such a structure permitting to utilize the space under the floor of a garage or motor car stall through a system of vertical movement, a new efficient stall or "sub-room" being thus obtained where it is possible to park a second motor car, the above-described economical-practical disadvantages being thus overcome.

Another advantage of the present invention is the possibility of obtaining new rooms through very simple, unexpensive interventions that can be utilized by a large number of persons. For these reasons, a rapid diffusion of the present structure is to be expected, also on a large scale.

Moreover, as mentioned above, the present invention proposes that the auxiliary stalls be carried out according to systems of prefabrication. In fact, these stalls are realized in the factory by assembling prefabricated kits which are carried out according to some main versions and dimensions and form autonomous units which can be directly installed in the place of utilization.

All the above aims and advantages are reached according to the present invention by means of a vertically movable structure which permits to obtain auxiliary stalls, this structure being insertable in seats to be obtained under the floor of a motor car stall, garage or the like, characterized by the fact of comprising a substantially parallelepiped-shaped container which is insertable in an excavation showing a corresponding shape, a structure which can slide vertically in the container and comprises two loading platforms, that is a lower platform and an upper platform, such platforms being arranged one above the other and being connected through side plates; the said movable structure can slide along suitable rails of the said container through hydraulic or mechanical hoisting systems or through combined systems.

Further features and details of the present invention will appear from the following specification describing the preferred embodiment as an example non-restrictive of the invention on the base of the accompanying drawing in which:

- Figure 1 shows a schematic sectional side view of a movable structure according to the present invention in a lowered position;

- Figure 2 shows a schematic view of the same in a lifted position.

With reference to the drawing, number 1 denotes a movable structure according to the present invention on the whole.

This movable structure forms an auxiliary motor car stall, otherwise it can be used like a cellar for a domestic use.

The structure is inserted under the floor of a private or public garage for a single motor car.

The structure 1 can be realized in several sizes in order to house any type or model of car. It can be inserted in a seat obtained in the already existing garage or in a new building, otherwise it can be buried in an outer space such as a courtyard or square.

The structure 1 comprises a parallelepiped-shaped fixed container 2, formed by a metal or plastic or concrete structure. In practice, the container 2 is like a box without a cover. A movable structure, indicated on the whole with number 3, is installed in the inner room of the fixed container 2. The movable structure 3 can go up and down to the fixed container 2 like an elevator or goods-lift.

The movable structure 3 is made of metal and comprises two loading platforms 4 and 5 which have width and length dimensions somewhat longer than the motor cars to be supported and somewhat shorter than the fixed container 2 in which the structure 3 is inserted.

The upper loading platform 4 is connected with the lower loading platform 5 through two vertical uprights 6 and 6' which permit both platforms to be moved together. As it can be seen in Fig. 1, the side uprights 6, 6' occupy only parts of both side surfaces between both platforms and about a half of the upper platform is projecting so as to facilitate the driver when getting in or out of a vehicle parked on the lower platform. The lower platform 5 is provided in the lower part with feet 7 which rest on the base of the container 2 and act as stroke ends.

The lower platform 5 is self-supporting while the upper platform 4 is supporting only when it rests on the upper border of the container and/or the borders of the seat obtained under the floor. This situation occurs when the movable structure is in the lowered position.

The movable platform may accomplish upward and downward motions in the container on sliding along suitable vertical rails which are arranged at the four angles of the fixed container. The corners of the platforms are equipped with antifriction skates, made for instance of teflon or other suitable material.

The platforms are, therefore, able to slide along the rails.

The platforms can slide vertically in the fixed container by means of an oleodynamic or hydraulic system or by means of a mechanical transmission or by using a combined hydraulic-mechanic system.

The utilization of an oleodynamic or hydraulic moving system involves the presence of an oleodynamic central cylinder or four side cylinders, arranged at the four angles of the container, respectively. The four side cylinders are operated by a central hydraulic distributing station and provoke the upward and downward motions.

A mechanical movement of the movable structure involves the utilization of an electric motor reducer which moves two or more synchronized shafts. Such shafts are equipped with their own gears acting on fixed racks and permit a lifting or a lowering of the structure itself.

According to a combined system, which is the one represented in Figures 1 and 2, two vertical hydraulic cylinders 8 are used to support one of the two short sides of the lower platform while the opposite short side is interested by a transmission of cables 9 which are arranged between wheels 10 which are fixed in the inner part of the container 2.

In this case, one of both ends of each cable 9 is fixed at a point 11 near a coupling point where the cylinder 8 is coupled with the lower platform while the opposite end is fixed, after suitable transmissions, to the sided of the opposite part of the platform by means of hooks 12.

Getting into and out of a car, which is parked on the lower plane, is facilitated for the driver since the upper platform 4 is provided with a movable element or door 13 which remains normally lifted when the platform is in the high position and closes automatically horizontally when the structure has reached the lower point of support on the base plane of the container 2.

The movement of the movable door 13 may be caused by a linkage indicated with number 14 or by another more suitable system, both electromechanic and hydraulic.

Alternatively, the upper platform can be disengaged from the movable structure and can be connected with the structure itself through a hinging system or a sliding system or a winding system or any other more suitable system.

Now, we shall briefly describe an example of installation of a structure according to the present invention.

The utilization of modern masonry sawing machines makes the cutting of concrete floors easy and unexpensive, without damaging the structures.

It is necessary to do four cuts to delimit a rectangle that must be somewhat larger than the stall. Then, the floor is removed and it is possible to begin the excavation.

The auxiliary stall for a second motor car is inserted and installed in the seat obtained under the floor of a garage or the like. This auxiliary stall is self-contained and needs only of electric energy for feeding a hydraulic or mechanical distributing station.

The movable structure is moved upwards and downwards in the fixed container and can be brought to the highest position by actuating an electric control in order that the lower platform can be aligned with the edge of the floor of the garage. Once such a position has been reached, the motor car can be inserted on the lower platform, as it appears from Fig. 2.

When the driver has got out of the motor car, a second electric command is imparted to control the downward motion of the structure in the fixed container. When the structure touches the floor of the container, that is the feet 7 touch the floor of the container, the upper platform becomes in its turn a supporting platform since its borders 4' rest on the edges of the container and/or on the contour of the garage floor.

When the structure is lowered, the movable element or door 13 is at the same time closed through a system of levers which provoke an automatic motion of the same.

At this stage, the floor of the garage remains completely closed and is structurally able to support the weight of a second vehicle, as it can be seen in Fig. 1.

As mentioned above, the described structure is to be carried out according to some standard sizes in order that vehicles of any size may be parked in the lower stall.

The inner lower room may be used, of course, for other purposes. For instance, the lower room may be utilized like a cellar for storing objects. Otherwise, this room may be used for any other suitable purpose.

Finally, as mentioned above, the auxiliary stalls are prepared at the factory by mounting prefabricated kits. Such kits are carried out according to some main ver-

sions and dimensions and form autonomous units to be directly installed in the place of utilization.

The present vertically movable structure for obtaining auxiliary stalls has been described and represented according to a preferential embodiment, however it is possible to carry out some variants, technically equivalent to the described mechanical parts and components. Accordingly, such variants are to be considered as included in the scope of protection of the present invention.

Claims

1. A vertically movable structure for obtaining auxiliary stalls and being insertable in seats to be obtained under the floor of a motor car stall, garage or the like, characterized by the fact of comprising a substantially parallelepiped-shaped container (2) which is insertable in a corresponding excavation and in which container a movable structure (3) may slide vertically, which structure comprises two loading platforms (4, 5) that are arranged one above the other and are connected through side plates (6) or the like; the said movable structure (3) can slide along suitable rails of the said container through hydraulic or mechanical lifting systems or through combined systems.

2. A vertically movable structure as claimed in the preceding claims, characterized by the fact that the said movable structure (3), made of a metal material, comprises two loading platforms, that is an upper platform (4) and a lower platform (5), which platforms have width and length dimensions somewhat longer than the motor cars to be supported and somewhat shorter than the fixed container (2) in which the structure is inserted.

3. A vertically movable structure as claimed in the foregoing claims, characterized by the the fact that the said movable structure (3) can accomplish upward and downward motions inside the container (2) on sliding in suitable vertical rails which are arranged at the four angles of the fixed container and in which the corners of both platforms slide, such platform corners being equipped with antifriction skates made, for instance, of teflon or other suitable material.

4. A vertically movable structure as claimed in the foregoing claims, characterized by the fact that the said movable structure (3) can slide vertically in the fixed container by means of an oleodynamic or hydraulic system or by means of a mechanical transmission or by using a combined hydraulic-mechanical system.

5. A vertically movable structure as claimed in the preceding claims, characterized by the fact that the upper platform (4) of the said movable structure (3) is provided with a movable element or door (13) which remains normally lifted when the platform is in the high position and closes automatically horizontally when the structure reaches the lower point of support on the base plane of the container.

6. A vertically movable structure as claimed in the preceding claims, characterized by the fact that the movement of the said movable structure is permitted by vertical hydraulic cylinders (8) which support one of the two short sides of the lower platform (5) while the opposite short side is interested by a transmission of cables (9) which are arranged between wheels (10) which are fixed in the inner part of the container.

7. A vertically movable structure as claimed in the foregoing claims, characterized by the fact that in this case, one of both ends of each cable (9) is fixed at a point (11) near a coupling point where the cylinder is coupled with the lower platform while the opposite end is fixed, after the suitable transmission , to the sides of the opposite part of the platform by means of hooks (12).

8. A vertically movable structure as claimed in the foregoing claims, characterized by the fact that the structure is a prefabricated structure, that is it is prepared at the factory by mounting a prefabricated kit, the kit being carried out according to some main versions and dimensions and forms an autonomous unit to be directly installed in the place of utilization.

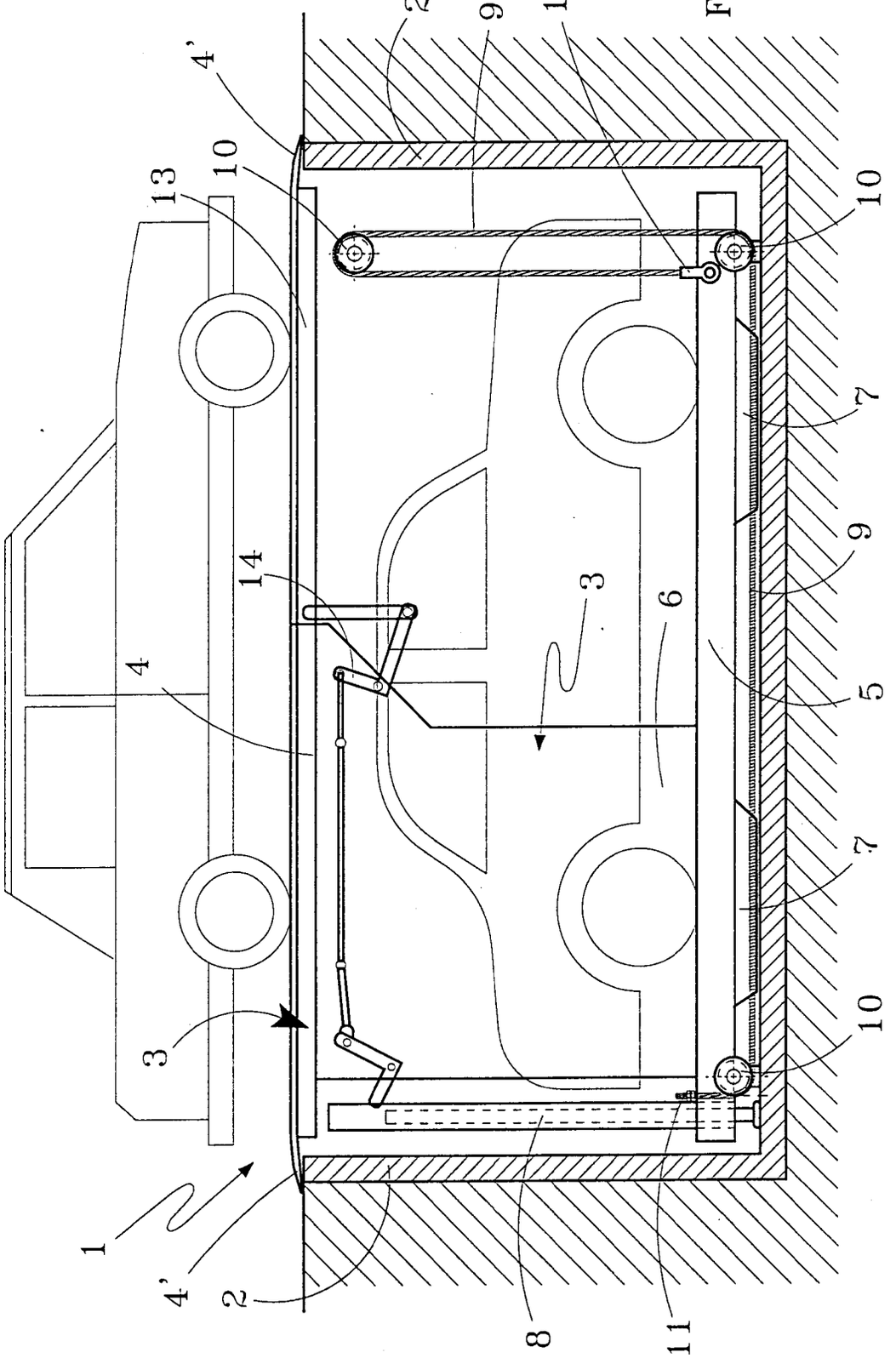

Fig. 1

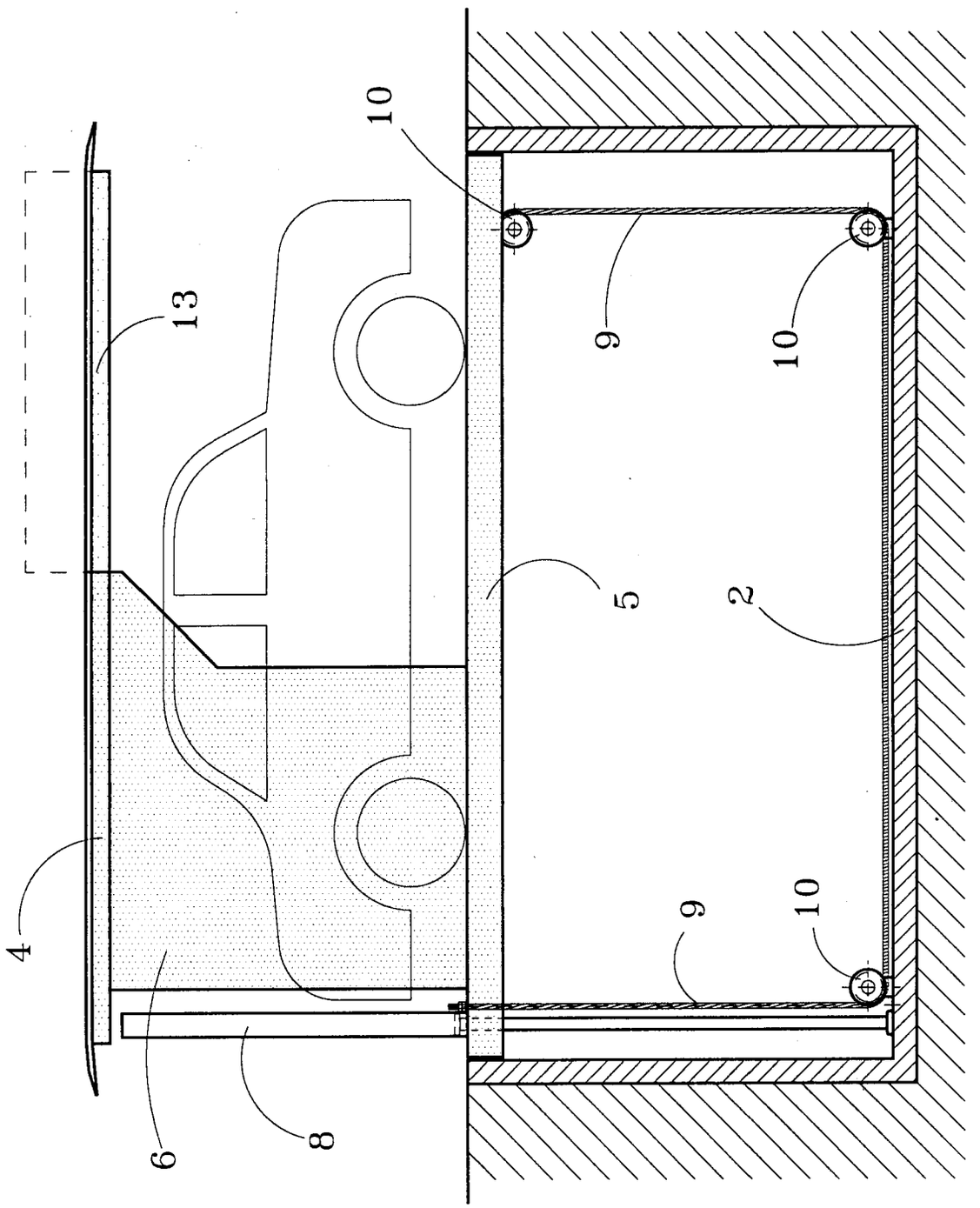

Fig. 2

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 10 0129

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.6)
Y A	DE 19 17 197 A (KALTENBACH) * page 13, line 1 - line 16 * * page 14, line 18 - page 15, line 20 * * page 16, line 17 - line 20; figures 1,2,5,6 *	1,2,4,8 5	E04H6/06
Y A	FR 1 068 480 A (PILLOT) * page 1, right-hand column, line 13 - page 2, left-hand column, line 10 * * page 3, left-hand column, line 56 - right-hand column, line 24; figures 1-4,7-9 *	1,2,4,8 3	
A	BE 492 020 A (TIPS) * the whole document *	1-3	
A	DE 22 51 858 B (MONTAN-HYDRAULIK GMBH & CO KG) * column 3, line 2 - column 4, line 20; figures *	1,2	
A	GB 2 051 004 A (DOUBLE PARKING LTD) * page 2, line 27 - line 47; figures *	3	TECHNICAL FIELDS SEARCHED (Int.Cl.6) E04H
A	DE 23 54 227 A (WESTERN TRADING CO) * the whole document *	5	
A	FR 2 709 510 A (CHALAIN OCTAVE ;PLET DANIEL; PLET EMILIE; PLET ETIENNE; BURNY BENJ)		
A	GB 2 000 488 A (KLAUS K)		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	9 April 1998	Porwoll, H

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

EPO FORM 1503 03.82 (P04C01)