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54	TITLE OF INVENTION
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Building and parking system

57	ABSTRACT (NOT MORE THAN 150 WORDS)
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The sheet(s) containing the abstract is/are attached.

If no classification is furnished, Form P.9 should accompany this form.
The figure of the drawing to which the abstract refers is attached.

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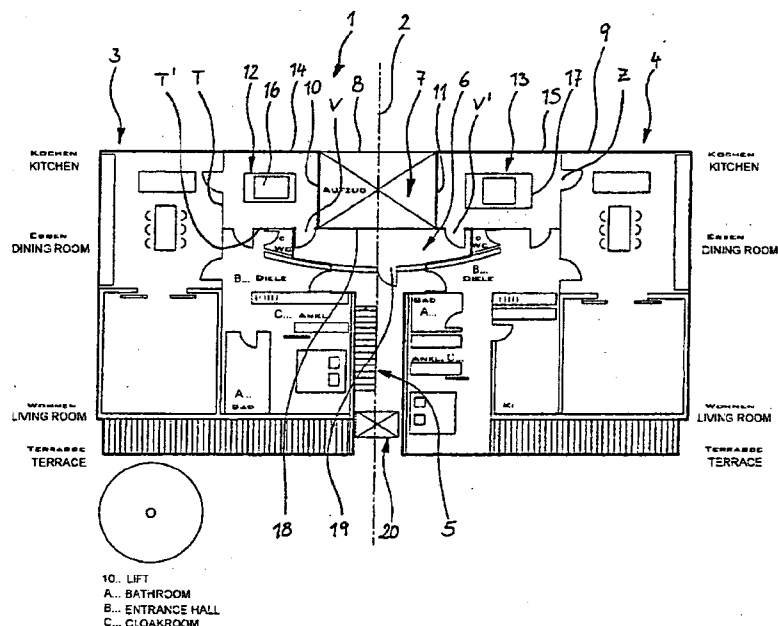
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[Fortsetzung auf der nächsten Seite]

(54) Title: BUILDING AND PARKING SYSTEM

(54) Bezeichnung: GEBÄUDE UND PARKSYSTEM



(57) Abstract: The invention relates to a building (1) with several levels, several utilisable units (3, 4) accessible only with right of access and a vertical conveyor (7) with which vehicles (16, 17) are transported to parking places (12, 13). The utilisable units (3, 4) and the parking space associated (12, 13) therewith are arranged respectively on a common level and parking places are integrated in the utilisable units (3, 4). The invention also relates to a parking system for said building

[Fortsetzung auf der nächsten Seite]

A building and parking system

The invention relates to a building with several levels, comprising several utilizable units accessible only with right of access and a vertical conveyor by means of which vehicles are transported to parking places, with the utilizable units and the parking places associated with the same each being arranged on a common level.

A multi-level building typically comprises traffic areas and units for private or commercial use. Traffic areas are substantially used for reaching a plurality of utilizable units by persons or vehicles and are publicly or freely accessible at least for the purpose of utilizing the connected utilizable units. Utilizable units which are publicly accessible are substantially vertically acting conveyor devices with discontinuous operation such as passenger or freight elevators.

Utilizable units are used for example for housing, office or business purposes and should generally not be accessible to users of other utilizable units (especially where private apartments are concerned), but only with authorization. The authorization for access to a utilizable unit is usually granted by means of a key that fits a locking system, e.g. through a magnetic, chip or transponder card, the entry of an access code or by means of release triggering by a person authorized for this (doorkeeper, porter).

The increasing problematic parking situation in particular close to residential and commercial areas in small and large cities has long been the subject of investigations and scientific studies with a large number of proposals for solutions. They have increasingly led to the development of buildings offering parking close to residences and workplaces, especially in buildings which – as described in claim 1 – offer parking places for vehicles in the same level on which the privately or commercially used utilizable units are located.

Such a building is known for example from DE OS 1 559 303. It concerns a so-called multi-level parking tower with a lifting platform configured in the form of a turntable with which the vehicles are displaceable in the vertical direction. The parking places extend in a radial manner over the circumference of the lifting platform, with a residential area being formed between the mutually adjacent double parking places, which residential

area has a triangular shape. On the one hand, the conveyor device in the known building which is provided in the form of the rotatable lifting platform is comparatively complex in its construction. On the other hand, the known building must be regarded as critical for reasons of fire protection as a result of the plurality of the vehicles housed per level (two per housing unit). Finally, there is an additional disadvantage in that the known building concerns a closed construction which is not suitable to retrofit parking places close to residential areas in existing buildings.

A further building of this kind is known from JP 4-176971 A. According to this specification, two vertical conveyors are placed in front of the façade of a building and a parking place is arranged between the same on each level. The parking places border on each level to a corridor extending along the façade and through which it is possible to reach the utilizable units and the staircase. It is proposed in JP 4-247168 A to arrange in front of the façade of a building a plurality of parking places along the façade, which parking places are accessed via running ways extending in front of said parking places. JP 2001-012097-A discloses a building of this kind which is equipped in the interior with a vertical elevator by means of which vehicles can be conveyed to parking levels in the building. In the embodiment according to this specification, a parking level comprises eight parking places which are associated with four utilizable units.

The use of parking places by motor vehicles in the ultimate vicinity of the utilizable units requires special security features for the users, on the one hand concerning the access authorization and on the other hand with respect to securing the entrances and exits for protecting children at play for example.

The invention is further based on the object of constructing a building which ensures the secure parking of vehicles and a secure passage to the utilizable unit. The construction is preferably to be simple, variable in its application and offer a visually appealing design and should also allow it to be retrofitted to existing buildings.

Based on the current state of the art, this object is achieved by the invention in such a way that the parking places are integrated in the utilizable units. In such a building, the parking places of publicly accessible utilizable units and traffic areas are separated by constructional measures, but direct access from a parking place to residential, office or business premises of the utilizable unit is enabled.

Users can reach a parked car securely and at a direct route from the rooms of the apartment or office or vice-versa, or use a parking place as a terrace or loggia. The parking place thus belongs directly to the private sphere of the respective utilizable unit and can be reached by the utilizable unit without having to use publicly accessible traffic areas (corridors, staircases, etc.), so that the risk of being attacked is clearly reduced as compared with conventional parking places (on the road or in underground garages). Moreover, the risk of a vehicle theft and vandalism of the vehicle is substantially lowered because the accessibility of the parking places for unauthorized persons is made much more difficult. In connection with level apartments, the impression of a one-family house with a garage "on the xth level" is thus obtained in connection with the flat.

In a preferred embodiment, at least one parking place on at least one level is delimited in a building in accordance with the invention at one of its longitudinal sides by a façade plane. Such an arrangement of parking places allows creating a wide connection between the parking place and the ambient environment, e.g. by cross sections that are permanently free or can be opened. This allows a substantially unobstructed discharge of smoke in the case of a fire of a vehicle parked in such a parking place and a comparatively favorable accessibility of the parking place for fire-fighting water jets of the fire brigade. In comparison with the parking place arrangement in the building as known from DE OS 1 559 303, the vertical surface of the parking place as integrated in the façade plane is double if a length-to-width ratio for such parking places of approximately 2:1 is assumed. Different advantageous embodiments for such a building in accordance with the invention are obtained when the vertical conveyor and the parking places are attached to a façade to the outside or are integrated in the same partially or completely.

In order to offer an appealing view for the viewer of the building in respect of the arrangement of the parking places in accordance with the invention, it is provided that a longitudinal side of a parking place which is delimited by the façade plane is at least partly transparent. Such a transparency can be achieved by means of glazing or alternatively also by means of a wire fabric or any other light-transparent façade elements.

is further especially advantageous when the conveyor device forms a part of the façade plane with at least one vertical bordering surface. Such an arrangement of the conveyor device allows on the one hand the retrofitting of existing buildings with parking places close to residential or business areas and an associated conveyor device for the vehicles. The integration of the conveyor device in the façade or its at least partial arrangement in front of the façade further allows an arrangement of the parking places close to the façade in a simple manner, such that one longitudinal side of the parking places is delimited by a façade plane. This, on the other hand, leads to the previously explained advantages whereby the traffic areas on the individual levels are minimized.

An especially advantageous embodiment of the building in accordance with the invention is that two parking places arranged on one level are arranged on opposite sides of the conveyor device. This leads to an especially advantageous successive arrangement parallel to the façade of a parking place, an interposed conveyor device as well as a further parking place. Such an arrangement also forms an especially striking design feature of a façade from an artistic-architectural viewpoint, especially when the conveyor device and/or the parking places as well as the vehicles parked thereon can also be recognized by viewers of the building from the outside as such. Moreover, the required space for housing and transporting the vehicles is very small. In particular, steering movements during the entrance into and exit from the parking place can be avoided entirely.

In a further development of the invention it is proposed that two parking places which are arranged on opposite sides of the conveyor device are mutually connected through a gate area which comprises lockable connecting doors to the parking places and a lockable passage to the staircase area. The conveyor device and the two parking places arranged on opposite sides thus belong to a kind of outside region of the building and can therefore be connected with the ambient environment through large ventilation cross sections. The actual interior space of the building only begins after the lockable connecting doors, i.e. with the gate area. It is sufficient when merely one such staircase area is present because the same can be reached via the gate area by at least two parking places. Moreover, there is thus (as seen from the parking place) a second escape route which does not lead through the utilizable unit itself but through the gate area to the staircase area. It is also ensured that pedestrians who use the staircase area with a separate passenger elevator preferably arranged therein need not access

the area of the conveyor device as used by the vehicles and the parking places.

Especially in the winter months or in the case of inclement weather it is thus avoided that dirt from the area of the conveyor device and the parking places is carried directly into areas with a residential, office, business or similar use.

An especially favorable connection of the conveying device to the traffic areas enclosing the building is obtained when the conveyor device is connected on an entrance and exit level (which is usually the ground floor level) at two mutually opposite sides to a traffic area. This allows entering the conveyor device in a forward manner, to park the car on a parking place of a random level and, after the return of the vehicle to the entrance and exit level, to leave the conveyor in a forward manner again, but this time on the opposite side of the conveyor device. A rearwardly directed shunting of the vehicle which is especially undesirable in the region of pavements or in the case of restricted space or limited visibility is thus entirely avoided.

It is further provided according to the invention that differently large parking places are arranged on opposite sides of the conveyor device, which parking places are associated with differently large areas with a residential, office, business or similar use. A small-size apartment or a flat can thus be assigned a parking place for a small two-seat car, whereas a larger apartment which is also suitable for families for example has a respectively large parking place which is also suitable for housing a middle-class vehicle or van.

It is further especially advantageous that a separating wall between a parking place and an associated area with residential, office, business or other use is glazed at least in part in order to thus allow visual contact between the parking place and the associated residential or office area.

In an especially preferable embodiment of a building in accordance with the invention a vehicle can be conveyed by means of a floor conveyor device from the vertical conveyor to a parking place. The vehicle "drives" in the interior of the building without its own drive, so that the emissions unavoidable in the operation of combustion engines will not occur. The requirements placed on the ventilating and aerating equipment of the building are reduced on the one hand and the convenience increases on the other hand. The disturbance by noise by starting engines is reduced significantly, so that it is

possible to substantially omit the use of noise-insulating materials and constructional elements. The difficult driving and steering skills demanded by the driver of the vehicle in entering or leaving the parking places are reduced, as frequently occur in the very narrow parking garages according to the state of the art.

Preferably, the building has a booking device by means of which the uses of the vertical conveyor as performed with access authorization can be debited to an account associated with said access authorization. The operation of a vertical conveyor for motor vehicles entails considerably higher costs than the operation of the known passenger elevators, so that an at least partial individual billing of the actual utilization processes with the respective users would be appropriate.

The vertical conveyor and the parking places for a building in accordance with the invention are preferably prefabricated as modules which each comprise a shaft module and optionally a parking place module arranged to the side of the same.

The invention finally comprises a parking system for a building with several levels and several utilizable units which are only accessible with access authorization, which parking system comprises a vertical conveyor and the parking places for the vehicles which are assignable to the utilizable units. The parking places can be integrated in the utilizable units and a vehicle can be conveyed by means of the vertical conveyor to a parking place assigned to the same only with access authorization with respect to a utilizable unit.

Such a functional unit is especially suitable to realize parking places in already existing buildings, which parking places are positioned in front of the existing façade and are each associated to a residential, office, business or similar area with similar use. As a result of the special alignment of the parking places, the fire protection regulations can be fulfilled in a reliable fashion and existing development concepts can substantially be maintained. As a result of the attached construction of the functional unit, it will immediately be recognized as such from the outside, thus leading to possibilities for positioning the vehicles in a potential advertising manner on the parking places retrofitted in accordance with the invention or during the transport in a glazed conveyor device for example.

The invention is now explained in closer detail by reference to an embodiment shown in the drawings, wherein:

Fig. 1 shows the layout of a first level with two residential units;

Fig. 1a shows an alternative layout with two residential units;

Fig. 2 shows a layout of second level with two office units;

Fig. 3 shows a layout of a ground level with the connection of a conveyor device to the traffic areas;

Fig. 4 shows an alternative layout design in the ground floor;

Fig. 5 shows a perspective front view of the building;

Fig. 6 shows a schematic representation of the control system;

Fig. 7 shows schematic representation of driving into the vertical conveyor, and

Fig. 8 shows a schematic representation of driving out of the vertical conveyor.

Fig. 1 shows a schematic layout of a multi-storey building 1 which to the right and left of an imaginary axis 2 comprises a first smaller residential unit 3 with a floor area of approximately 105 square meters and a larger residential unit 4 with a floor area of approximately 120 square meters. A staircase area 5, a gate area 6 and a vertical conveyor 7 for conveying motor vehicles in the vertical direction are arranged successively on the axis 2. The vertical conveyor 7 which extends from the ground level or even basement level up to the top level forms a part of a façade plane 9 together with a vertical bordering surface 8, which façade plane extends in a straight line along the associated side of the building 1. The vertical conveyor 7 comprises a rectangular cross section whose length and width exceeds the length and width dimensions of conventional motor vehicles by a certain amount. A parking place 12, 13 is each adjacent to the opposite face sides 10 and 11 of the cross section of the vertical conveyor 7, with the longitudinal axes of said parking places extending parallel to the

façade plane 9. The parking places 12, 13 are therefore each delimited at their longitudinal sides 14, 15 by the façade plane 9. A two-seat small vehicle 16 is schematically shown on the parking place 12 with the smaller floor area, which parking place is associated with residential unit 3, whereas the parking place 13 which is arranged on the other side of the vertical conveyor 7 and is associated with the residential unit 4 is occupied by a middle-class motor vehicle 17 which is shown in a schematic manner. Both residential units 3 and 4 can each be accessed via an access Z, e.g. in the form of a glass door, directly from the associated parking places 12, 13. The separating walls T and T' between the parking places 12, 13 and the residential units 3, 4 are designed in full or in part in glass in order to allow visual contact from the residential units 3, 4 to the vehicles 16, 17 situated on the parking places 12, 13, which may be desired where historical or luxury vehicles are concerned.

One longitudinal side 18 of the cross section of the vertical conveyor 7 which is averted from the façade plane 9 is adjacent to the gate area 6 whose length exceeds that of the cross section of the vertical conveyor 7, so that there is a connection between the two parking places 12 and 13 for persons insofar as there is an authorization for opening the respective connecting doors V, V' between the parking places 12, 13 and the gate area 6. A passageway 19 produces a connection between the gate area 6 and the staircase area 5 which is associated similarly to the two residential units 3 and 4. A passenger elevator 20 is arranged adjacent to the opposite façade at the end of the staircase area 5 averted from the gate area 6 and the vertical conveyor 7. The access from the vertical conveyor 7 to one of the parking places 12, 13 as well as the actuation of the respective connecting doors V, V' between the parking places 12, 13 and the gate area 6 and the access to the associated residential unit 3, 4 is only possible by means of the chip card associated to the respective residential unit. The access from the parking places 12, 13 to the respectively associated residential unit 3, 4 is not secured with such measures however. The parking places 12, 13 are thus integrated in the respectively associated residential unit 3, 4 and form with the same a uniform, private utilizable unit. It is thus possible for example after a shopping trip with the vehicle 16, 17 to access the own, enclosed parking place 12, 13 by using the chip card in order to unload the vehicle 16, 17 in a protected and undisturbed manner.

Fig. 1a shows a layout as an alternative to fig. 1 in which there is no gate area. There are two accesses Z which each connect the parking places 12, 13 with the entrance hall or the kitchen of the residential units 3, 4.

Fig. 2 shows a layout of the same building 1 as shown in fig. 1 on another level on which the two parking places 12, 13 are each associated with a larger and a comparatively smaller office unit 21 and 22. The connection between the gate area 6 and the staircase area 5 is unchanged relative to the layout according to fig. 1.

Fig. 3 shows a layout on the ground floor level. The cross section of the vertical conveyor 7 is connected at both face sides 10 and 11 each to a traffic area 23 which concerns an entrance and a traffic area 24 which concerns an exit. The two traffic areas 23 and 24 jointly form an oval halved in the longitudinal direction together with the cross-sectional surface of the vertical conveyor 7, which oval falls back behind the façade plane 9 into the interior of the building 1 (but only in the region of the ground level). The traffic surface 24 is crossed by an access surface 25 which is indicated by parallel cross lines and leads to a staircase area.

Fig. 4 shows an alternative variant where the access 25 and the traffic surface 24 forming the exit do not cross each other, which is why the likelihood of an accident is thus further minimized. The separation of the traffic areas 23 and 24 for the vehicles and traffic area 25 for the pedestrians causes in total a slightly larger need for traffic surfaces with simultaneously slightly restricted available space for the access for persons and the exit for cars from building 1.

It is understood that the entrance and exit directions into and from the vertical conveyor 7 can be exchanged. If desired, each of the traffic surfaces 23 can be used both as an entrance as well as an exit. In all cases the advantage is maintained that, apart from getting and leaving a parking space in a reverse direction on the respective level, there is no rearwardly required shunting when entering or leaving the building 1, especially in regions where there is pedestrian traffic.

Fig. 5 shows a perspective front view of the building 1 whose façade plane 9 is formed in the indicated section by the vertical bordering surface 8 of the vertical conveyor 7 and, connected at the face side to the vertical conveyor 7, by the longitudinal sides of the two

Parking places 12, 13 which are directly adjacent to the vertical conveyor 7. Since the lateral bordering surfaces of the parking places 12 and 13 which are integrated in the façade plane 9 are left completely open (apart from the filigree banisters not shown in fig. 5), an interesting view is obtained for the viewer of the building 1 which allows recognizing all vehicles 16, 17 which are housed on all levels on the parking places 12 and 13. If the vertical conveyor 7 is glazed for example, the transported vehicle can also be recognized from the outside. At times at which the parking places 12 or 13 are not engaged with vehicles 16 or 17, the parking places 12 or 13 can be used as loggias for example.

For cost reasons the opposite arrangement of two parking places 12 and 13 is favorable, because two parking places 12, 13 can be realized per level and vertical conveyor 7, which parking places are both arranged directly adjacent to the façade plane 9 and can therefore be realized under a fire-protection aspect without any major problems. The required space is especially low.

Fig. 5 finally shows that on the ground level the traffic areas 23 and 24 used as entrance and exit reach in a semi-oval manner into the regions behind the façade plane 9. In this way it is possible to drive in a forward manner into the vertical conveyor 7 on the ground floor level and also to leave the building 1 in a forward manner when leaving the same. An access area 25 crosses the traffic area 24 and leads to a staircase arranged behind the vertical conveyor 7.

Fig. 6 schematically shows the problem concerning security and access authorization for the use and control of the vertical conveyor 110. It is provided that only the respective owner/tenant of a utilizable unit can access his or her parking place with the vertical conveyor 110. Another parking place can only be accessed with a respective authorization.

Fig. 6 thus schematically shows a control system 90 which comprises the respective level sensors 91, 91a through 94, 94a. They respond exclusively to a respective portable transmitter or transponder 95 with the level code. This system is only exemplary for other encodable recognition and control systems, e.g. with insert cards, keys or phonetic signal recognition devices.

The control system 90 consists of a computer-memory-printer unit in which the use times of the actual respective level drives are stored in order to determine the respective energy costs of the respective user. It can be provided that the vertical conveyor 110, after the unloading on a level above the ground floor, automatically returns to the ground floor after the expiration of a predetermined time.

All parking places can be equipped with respective fume ventilating and fire extinguishing systems (not shown in closer detail). For the purpose of preventing any blinding of the neighbors, the parking places can be provided with light screens. For the purpose of reducing the noise emission values, all visible surfaces of the parking places are lined with noise-absorbing materials.

In order to reduce the sound emissions to the highest possible extent and in order to increase the comfort and security for the users, the module consisting of opposite parking places and the vertical conveyor 110 and associated with one level is equipped with an automatic vehicle floor conveyor device 120 acting in the horizontal direction whose function is shown schematically in figs. 7 and 8. Such a floor conveyor device 120 is known from car washing systems. A three-member floor conveyor device 120 is provided for the module. In fig. 7a the vehicle 43 stands in front of the vertical conveyor 110. The left front and rear wheel is situated between two guide rails 70, 71. A mechanically driven roller 72 pushes the vehicle 43 at the rear wheel partly in the vertical conveyor 110. As soon as the vehicle 43 has reached this position (fig. 7b), a further mechanically driven roller 73 (fig. 7c) of the vertical conveyor 110 pushes the vehicle 43 at the front wheel forward to the position as shown in fig. 7d, so that after reaching this position the elevator doors will close automatically and the vehicle 43 can be moved vertically.

After the completion of the vertical transport, the vehicle doors will open and a roller 74 of the vertical conveyor 110 pushes the vehicle 43 to the position as shown in fig. 8b, so that thereafter the roller 75 (fig. 8c) conveys the vehicle to the parking position as shown in fig. 8d. The displacement process is repeated in reverse order when leaving the parking position.

Claims:

1. A building (1) with several levels, comprising several utilizable units (3, 4) accessible only with right of access and a vertical conveyor (7, 110) by means of which vehicles (16, 17, 43) are transported to parking places (12, 13), with the utilizable units (3, 4) and the parking places (12, 13) associated with the same each being arranged on a common level, characterized in that parking places (12, 13) are integrated in utilizable units (3, 4).
2. A building as claimed in the preceding claim, characterized in that at least one parking place (12, 13) on at least one level is delimited at one of its longitudinal sides (14, 15) by a façade plane (9).
3. A building as claimed in the preceding claim, characterized in that a longitudinal side (14, 15) of the parking place (12, 13) which is delimited by the façade plane (9) is at least partly transparent.
4. A building as claimed in the preceding claim, characterized in that a longitudinal side (14, 15) of the parking place (12, 13) which is delimited by the façade plane (9) is at least partly glazed.
5. A building as claimed in one of the preceding claims, characterized in that the vertical conveyor (7) forms a part of the façade plane with at least one vertical bordering surface (8).
6. A building as claimed in one of the preceding claims, characterized in that two parking places (12, 13) arranged on a level are arranged on mutually opposite sides of the vertical conveyor (7).
7. A building as claimed in the preceding claim, characterized in that two parking places (12, 13) arranged on opposite sides of the vertical conveyor (7) are mutually connected via a gate area (6) which comprises lockable connecting doors (V, V') to the parking places (12, 13) and a lockable passageway (19) to a

staircase area (5).

8. A building as claimed in one of the preceding claims, characterized in that the vertical conveyor (7) is connected on an entrance and exit plane at two mutually opposite sides (10, 11) to a traffic area (23) each.
9. A building as claimed in one of the preceding claims, characterized in that differently large parking places (12, 13) are arranged on mutually opposite sides of the vertical conveyor (7), which parking places are assigned to differently large utilizable areas (3, 4).
10. A building as claimed in one of the preceding claims, characterized in that a separating wall (T, T') between a parking place (12, 13) and an associated utilizable area (3, 4) is at least partly glazed.
11. A building as claimed in one of the preceding claims, characterized in that a vehicle (43) can be conveyed by means of a floor conveyor device (110) from the vertical conveyor (7) to a parking place (12, 13).
12. A building as claimed in one of the preceding claims, characterized by a booking device by means of which the uses of the vertical conveyor (7) as performed with access authorization can be debited to an account associated with said access authorization.
13. A building as claimed in one of the preceding claims, characterized in that vehicles (16, 17, 43) are conveyed by means of a vertical conveyor (7) in a shaft which is composed of stacked shaft modules on which parking places modules are arranged on the side.
14. A parking system for a building (1) with several levels and several utilizable units (3, 4) only accessible with access authorization, which system comprises a vertical conveyor (7) and parking places (12, 13) for vehicles (16, 17, 43) which can be associated to the utilizable units (3, 4), characterized in that the parking places (12, 13) can be integrated in the utilizable units (3, 4) and a vehicle (16, 17, 43) can be conveyed to a parking place (12, 13) associated with a utilizable

unit (3, 4) by means of the vertical conveyor (7) only with access authorization with respect to said utilizable unit (3, 4).

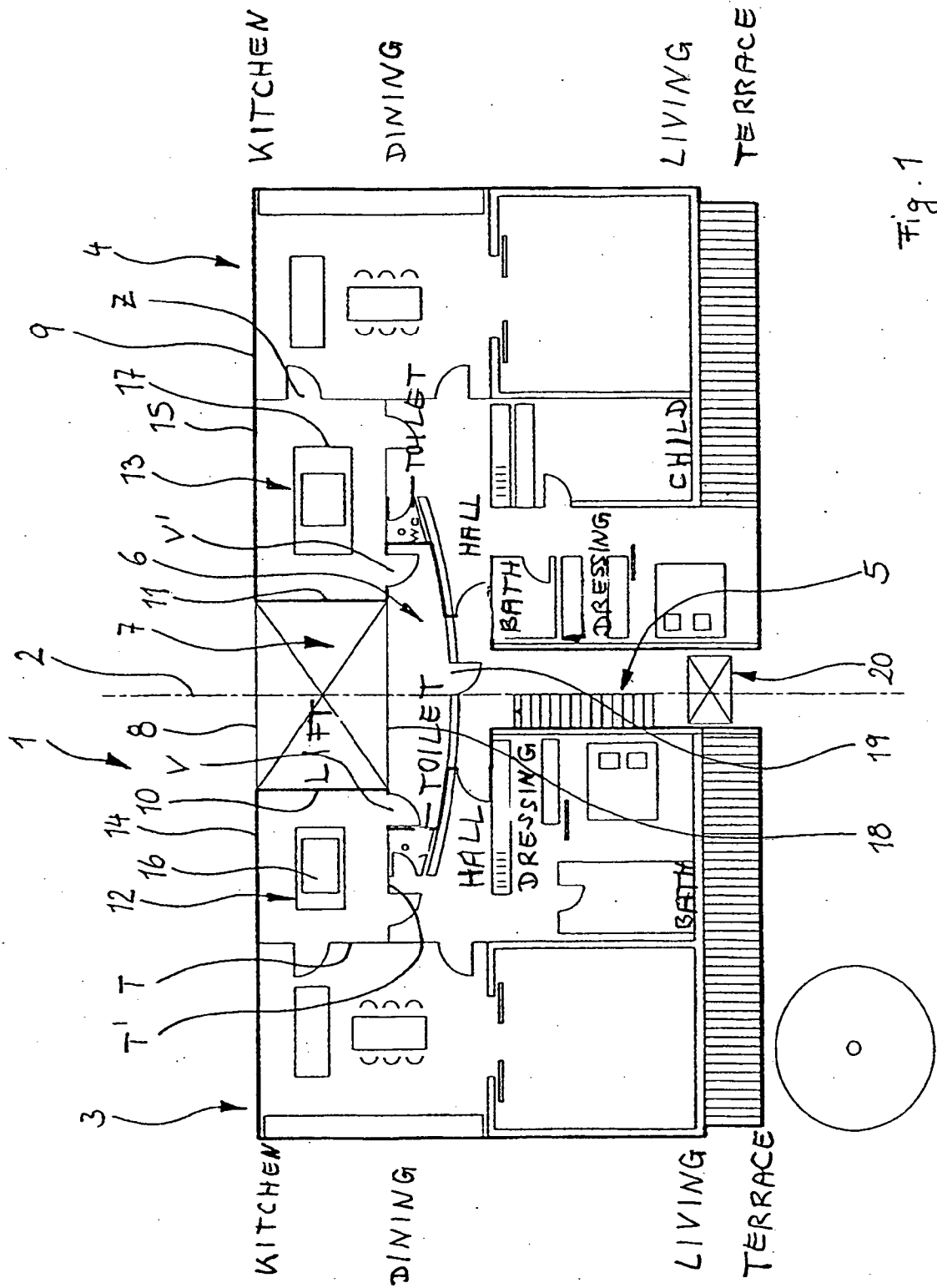


Fig. 1

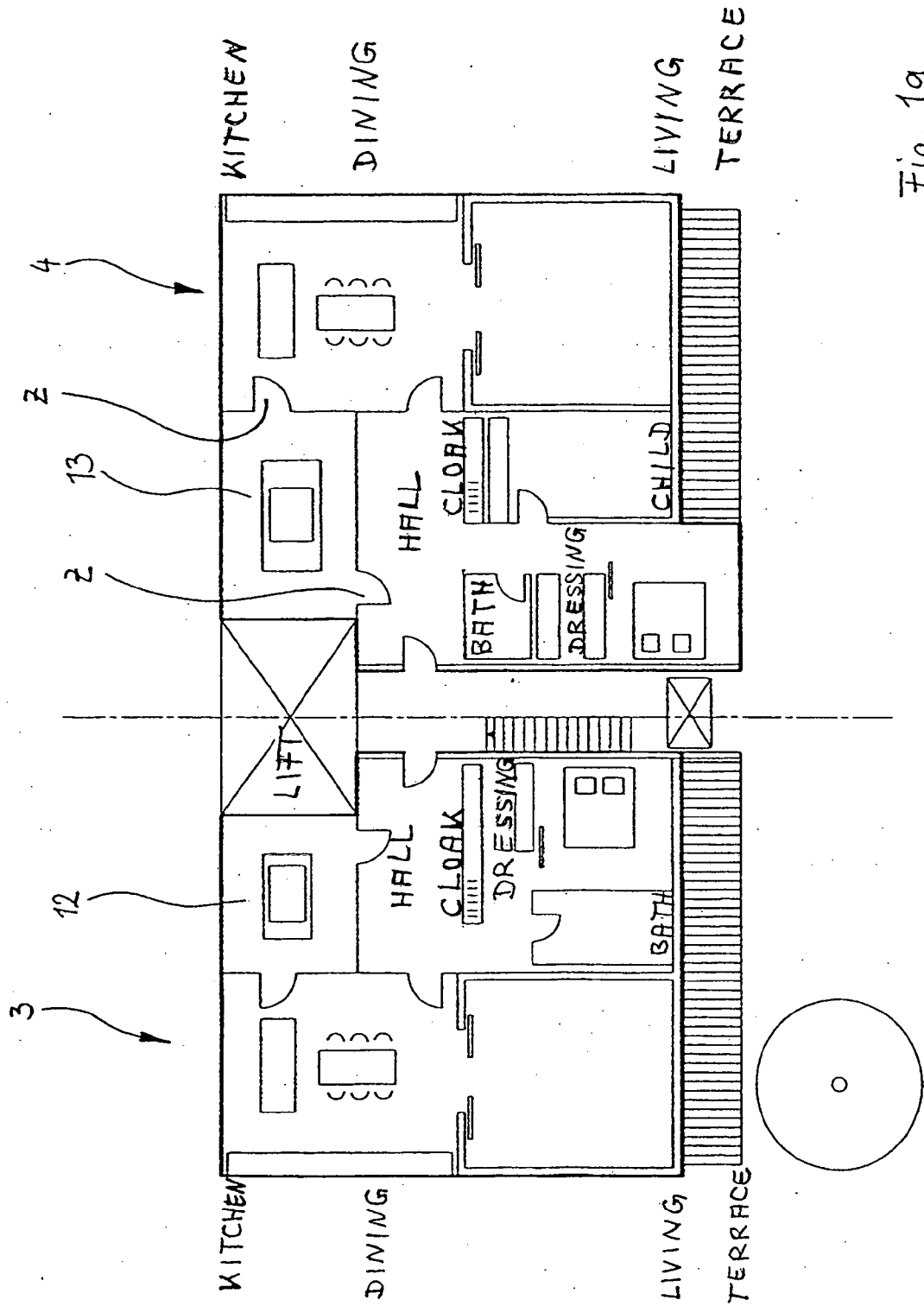


Fig. 1a

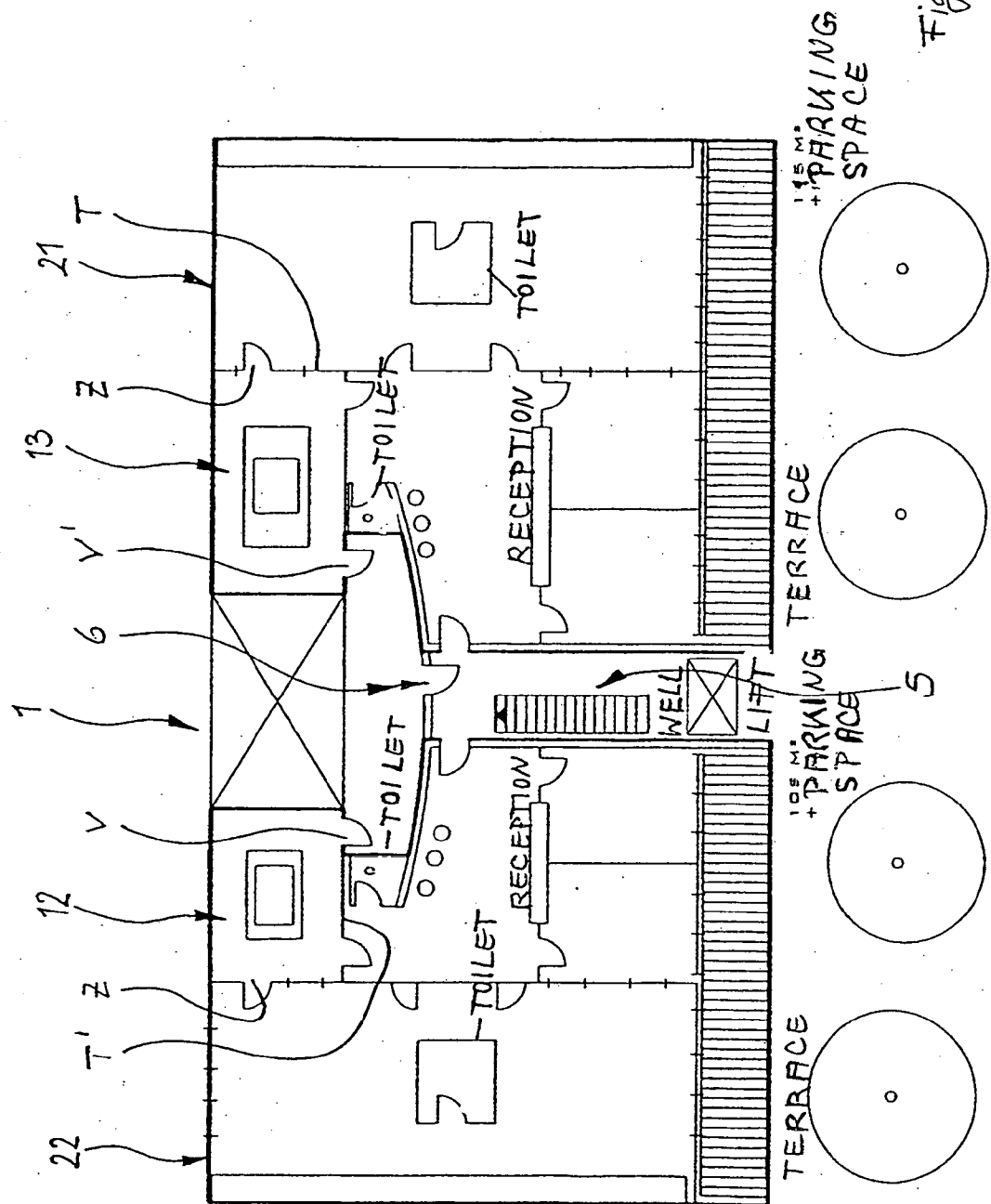


Fig. 2

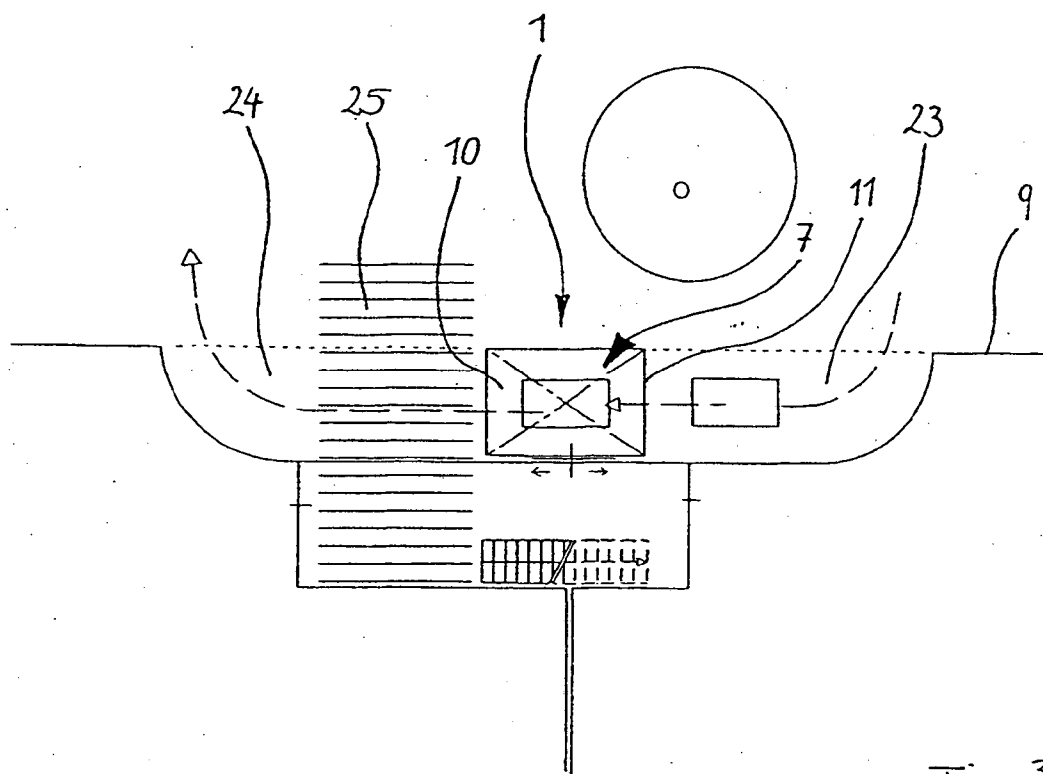


Fig. 3

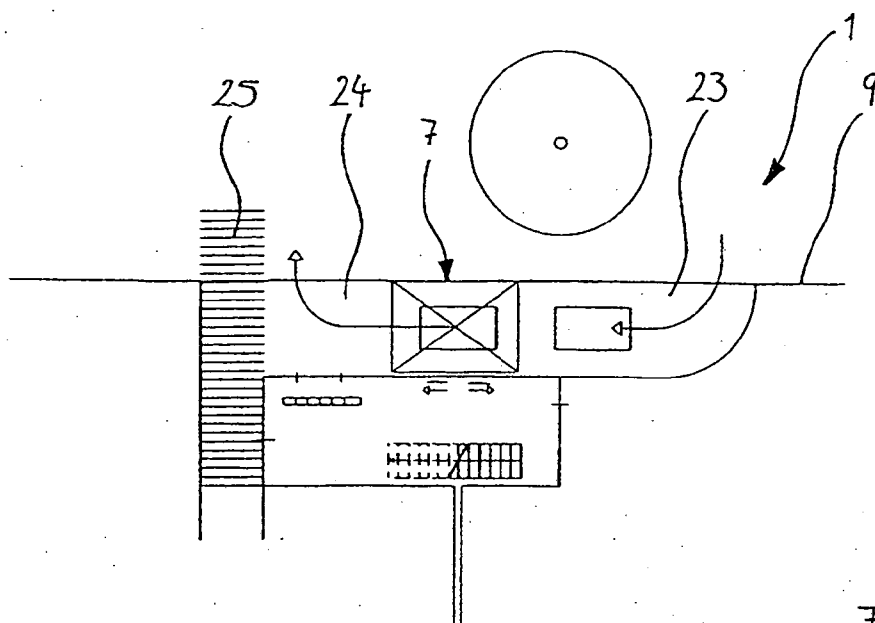


Fig. 4

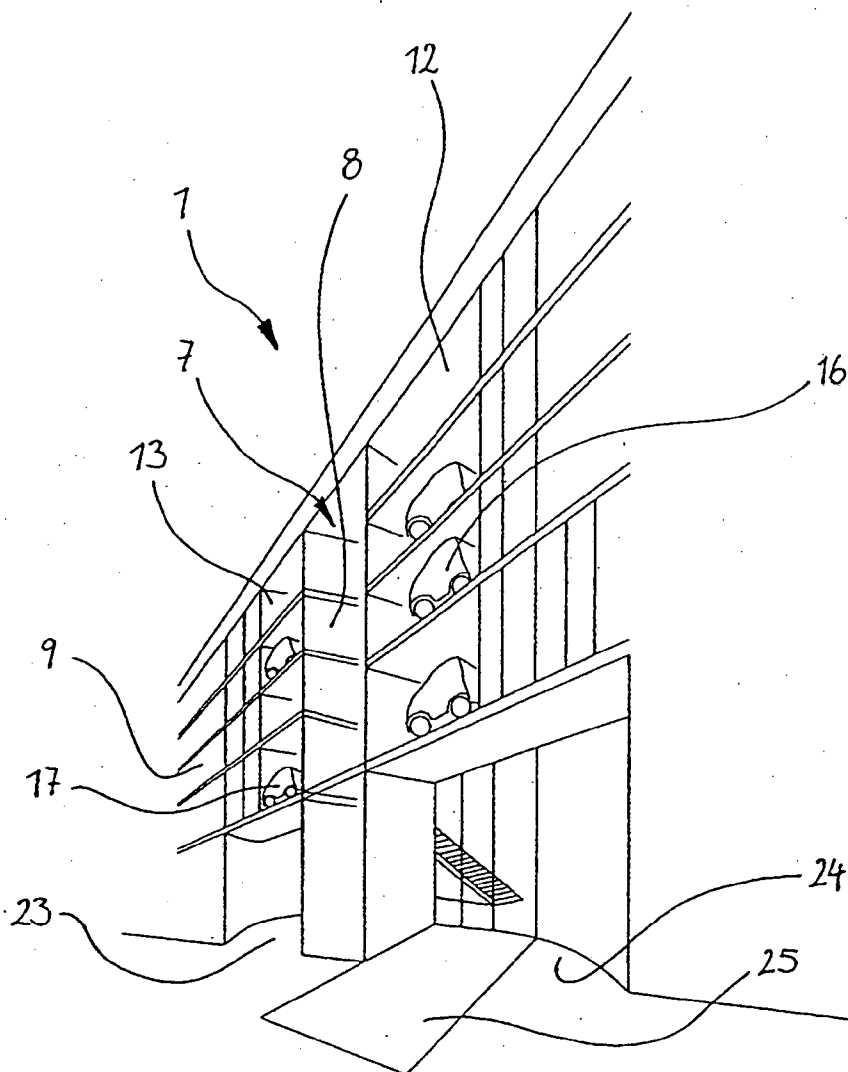


Fig. 5

Fig. 6

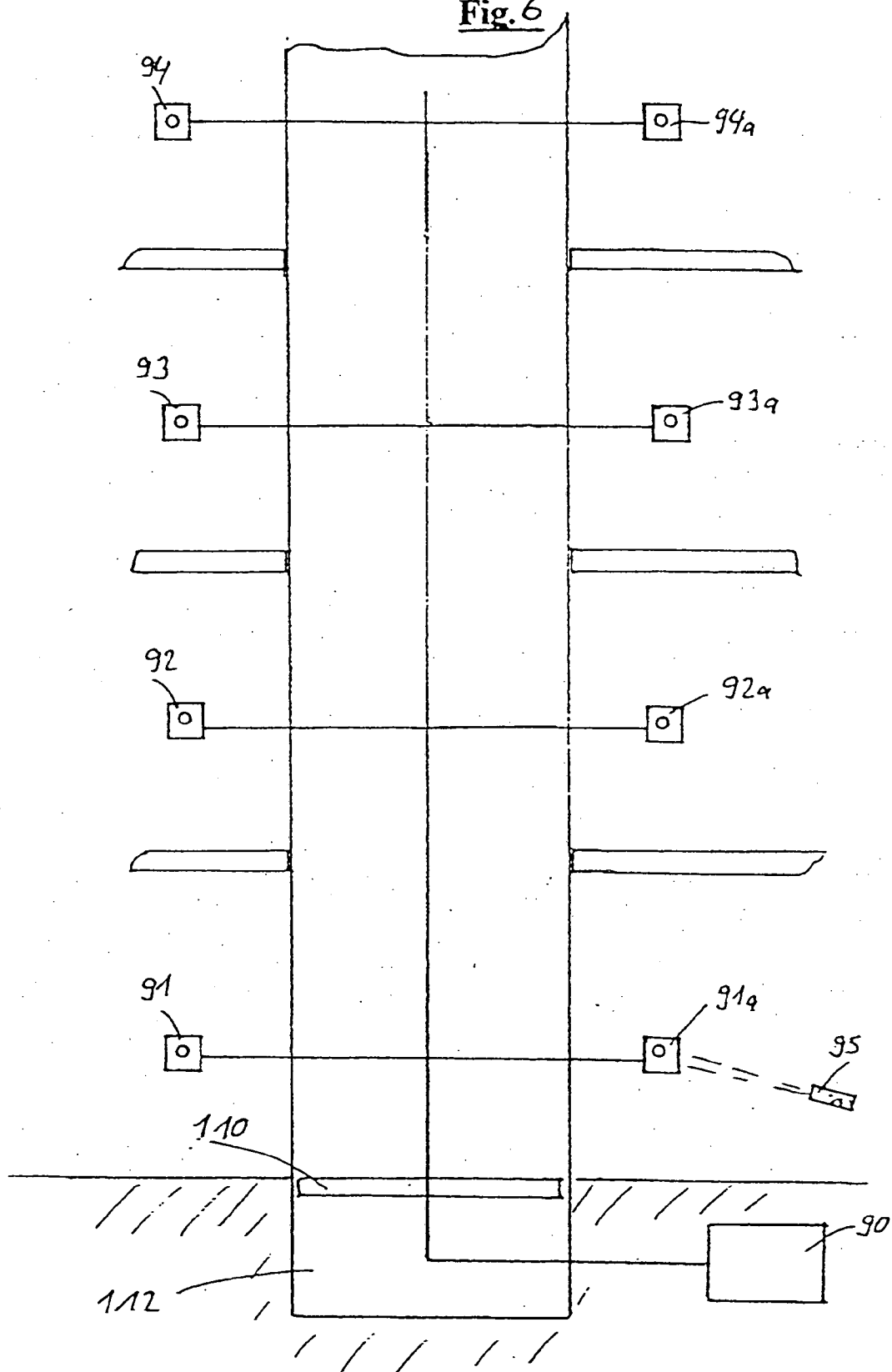


Fig. 7

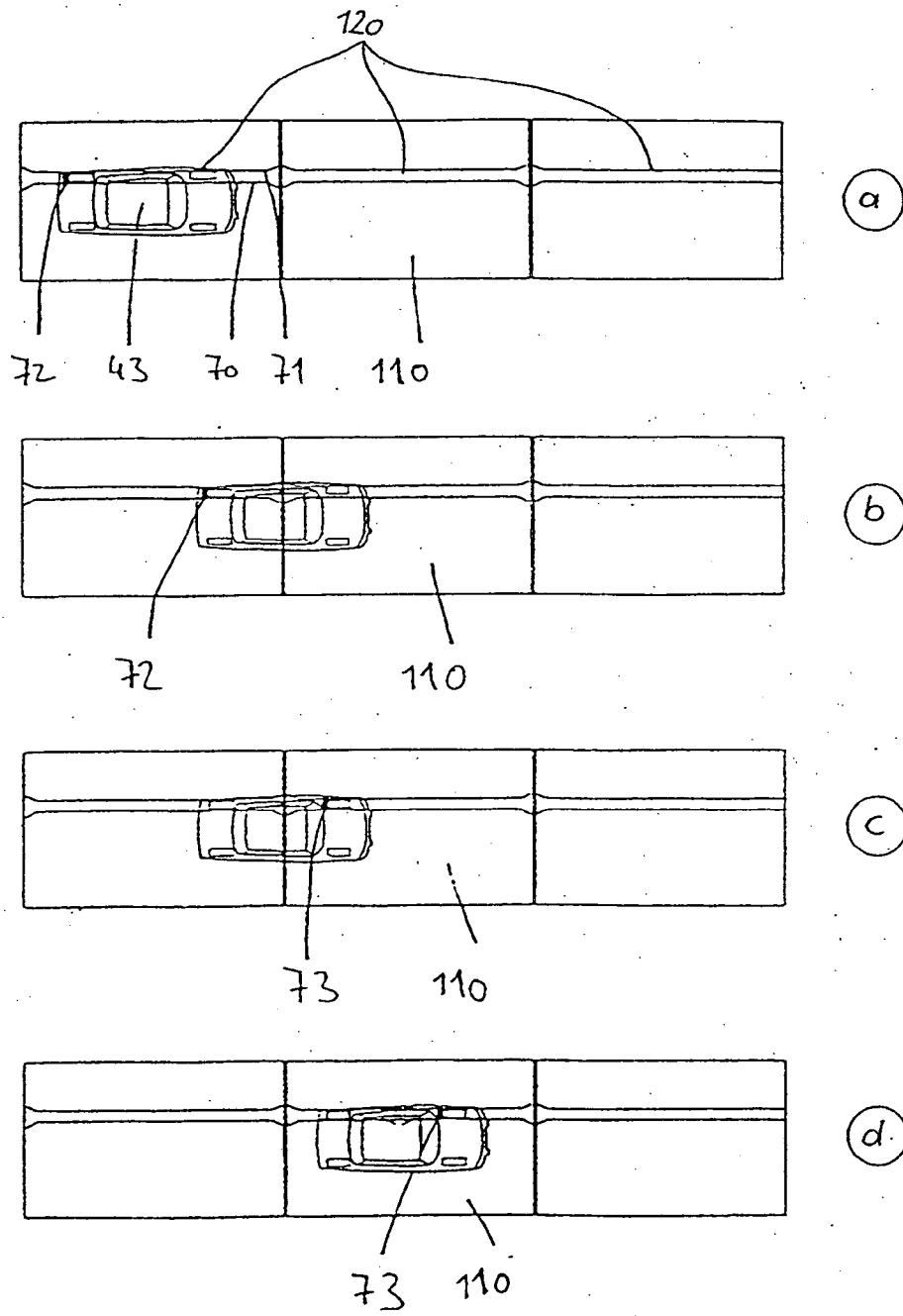


Fig. 8

