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(54) **BUILDING ACCESSIBLE FOR PERSONS**

(75) Inventor: **Gerardus Stephanus Hofman**, Maasdijk (NL)

(73) Assignee: **G.S. HOFMAN HOLDING B.V.**, Maasdijk (NL)

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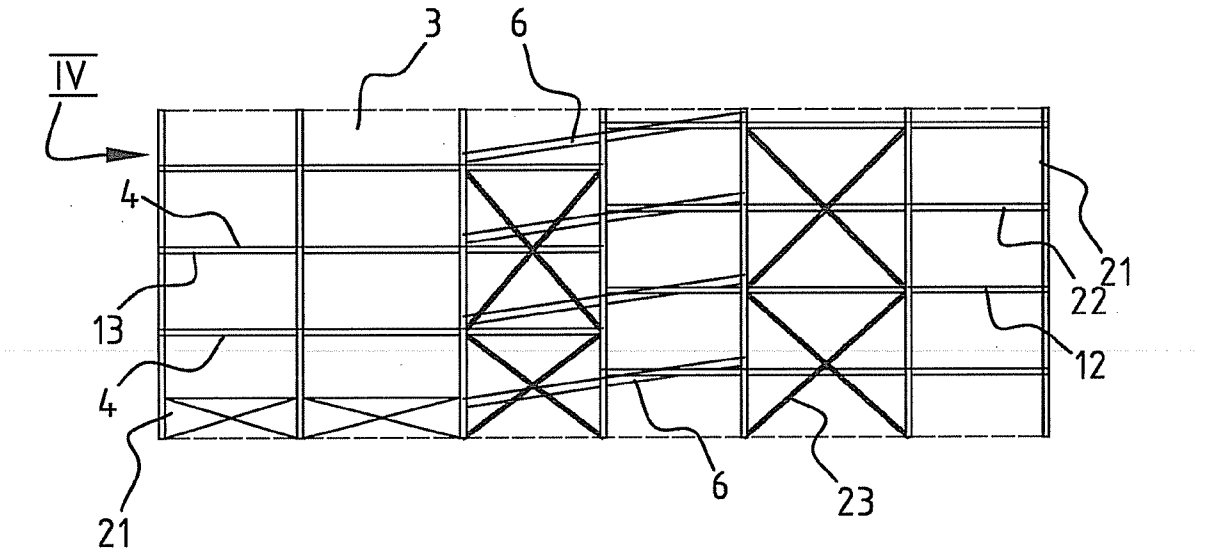
(57) **ABSTRACT**

Building accessible for persons, in particular a garage, comprising a load bearing structure, wherein at least a part of a facade of said building is formed by a textile, wherein at least 30% of the total surface area of the facade is open to air. Preferably the textile has a coarseness such that at least 30% of the total surface of said textile is open to air.



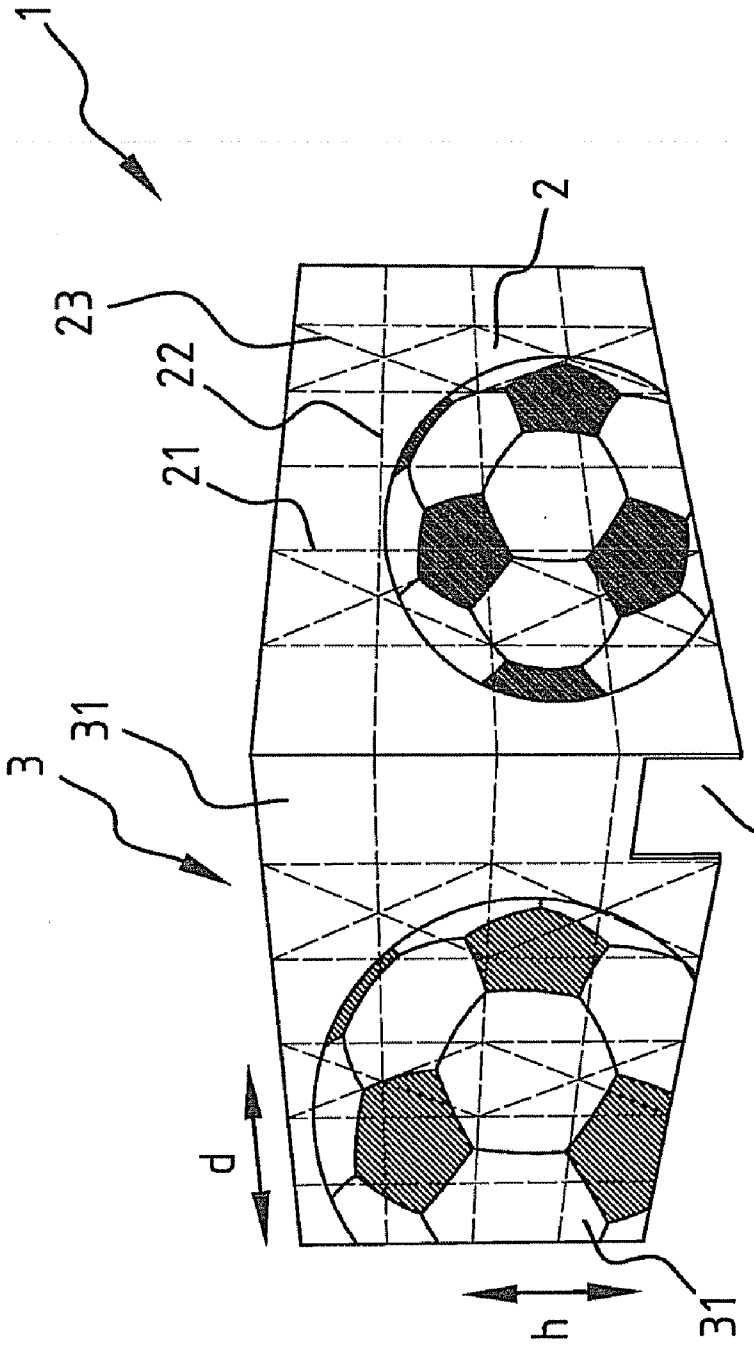


FIG. 1

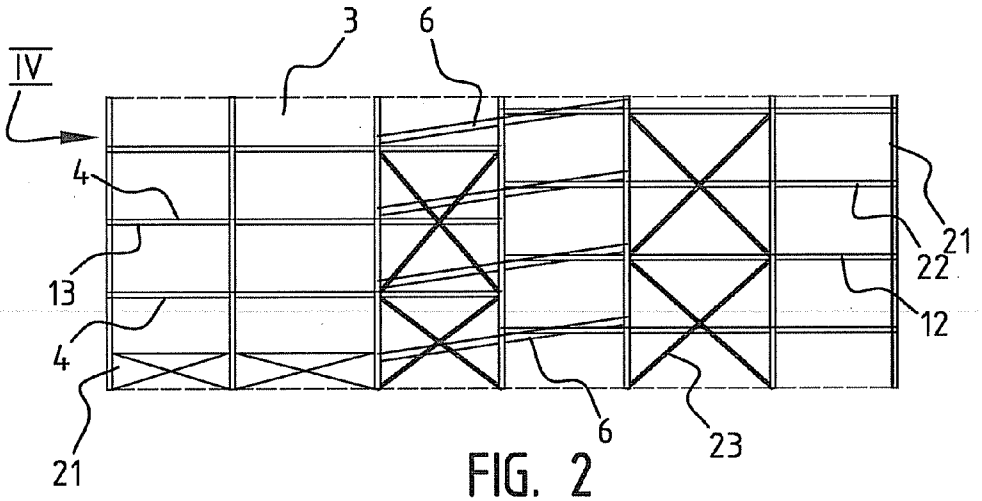

IV
3
6
4
13
4
21
21
22
12
6
23

FIG. 2

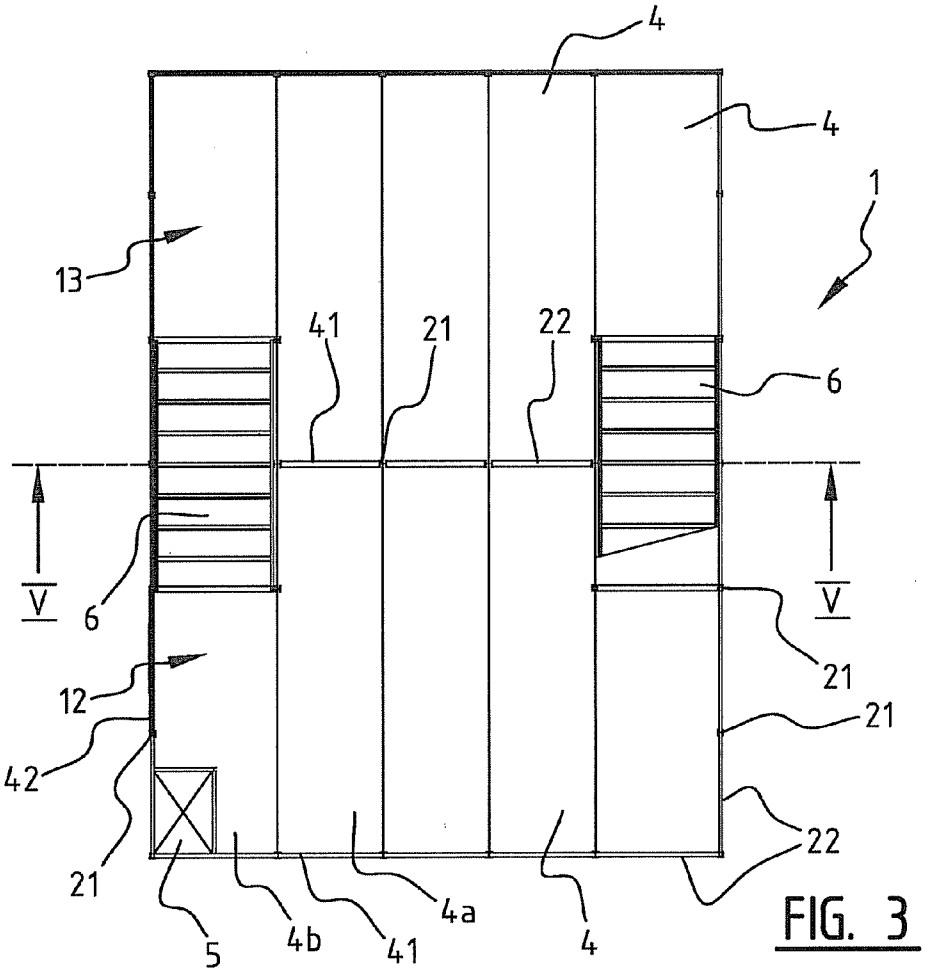

4
4
1
13
41
21
22
6
V
V
6
21
12
21
42
21
22
5
4b
41
4a
4

FIG. 3

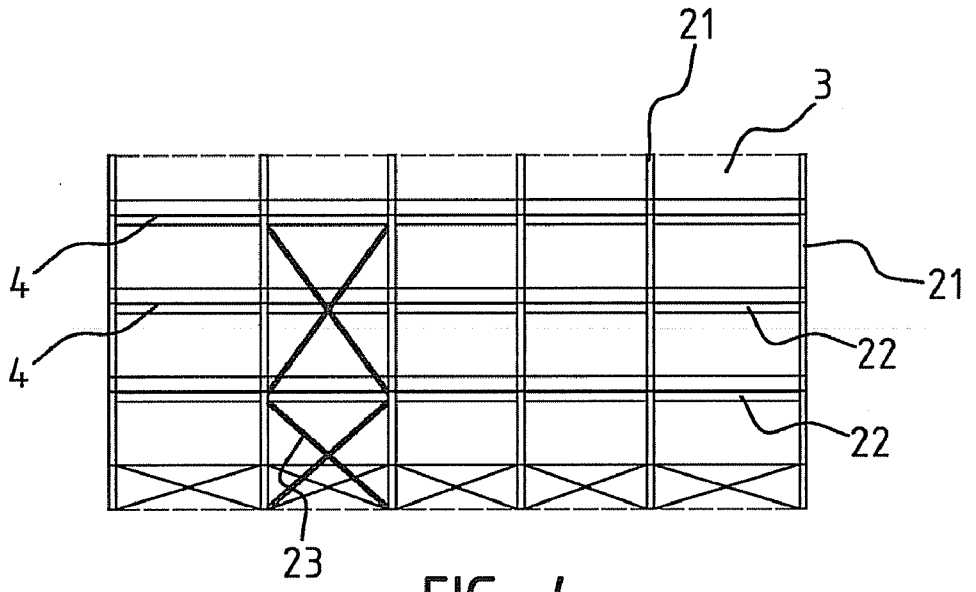


FIG. 4

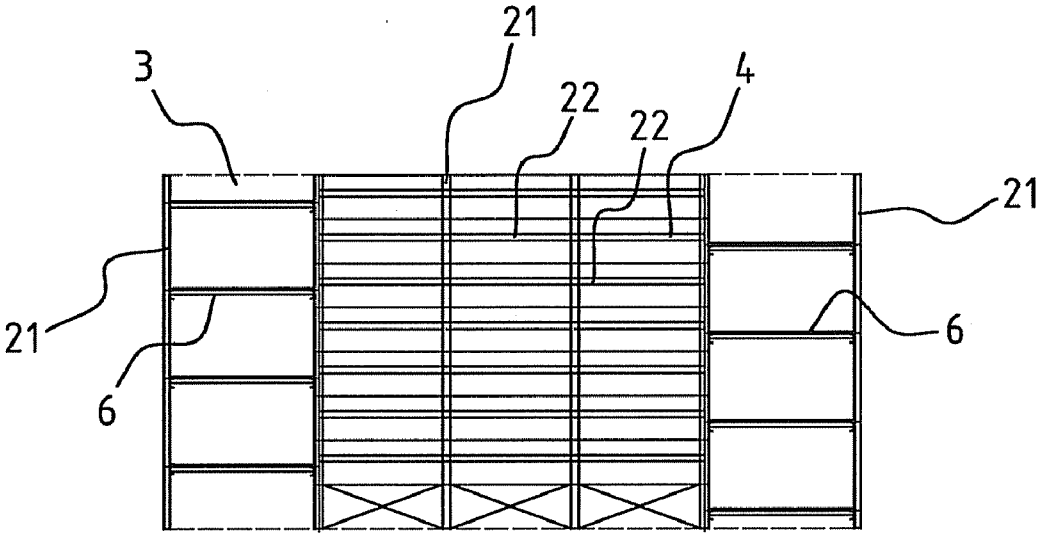


FIG. 5

BUILDING ACCESSIBLE FOR PERSONS

[0001] The present invention relates to a building accessible for persons, in particular a garage, comprising a load bearing structure and a facade.

[0002] Buildings, such as for instance houses, high-rise flats or garages, can be build by first providing a body as a load bearing structure for said building. In order to provide a building of solid build, said load bearing structure is usually manufactured from concrete.

[0003] To finish the building, the inner structure of said building, for instance in the form of rooms, stairways, elevators etc, and the outer structure, for instance in the form of roofing and a facade, can be applied to said load bearing structure.

[0004] Manufacturing such a building may be costly and time consuming.

[0005] It is therefore a goal of the present invention, amongst other goals, to provide an improved building which can be manufactured more efficiently.

[0006] The above goal is met by the present invention, amongst other goals, by a building as defined in the appended claim **1**.

[0007] Specifically, the above goal, amongst other goals, is met by the present invention by a building accessible for persons comprising a load bearing structure, wherein at least a part of a facade of said building is formed by a textile. Using a textile as a facade, instead of for instance glass or concrete slabs, reduces the weight of said facade. This allows the use of a lighter load bearing structure. The textile can be applied to an outside of a load bearing structure efficiently, for instance by tensioning said textile with suitable connecting means known in the art. The means for connecting the textile are adapted to the load on said textile, for instance due to the wind. The load bearing structure may hereto be provided with a framing for connecting the textile.

[0008] It should be noted that with a facade, an outer wall of a building is meant. When a facade is formed by a textile, the textile extends between an inner space of said building and the open air and is adjacent to both. The facade formed by said textile is thereby a non-load bearing facade. This improves the resistance of said building against for instance earthquakes and explosions. The textile according to the invention is preferably arranged as a permanent facade, in contrast to for instance shielding a broken window using plastic.

[0009] Preferably substantially the whole facade is formed by a textile. This further reduces the load bearing impact of the facade on the load bearing structure and further increases the efficiency of the building process of the building according to the invention. The facade may be formed by a single sheet of textile. However, it is preferred to provide a plurality of adjacent sheets. This is more efficient to apply to the load bearing structure, or a frame provided thereto. Preferably the sheets extend vertically, i.e. the height of the sheets is larger than the width with respect to the building, facilitating the application of said sheets. It is however also possible to apply the sheets in a horizontal orientation.

[0010] According to a preferred embodiment of the building according to the invention, the textile is manufactured from a material chosen from the group of natural or artificial fibres or a combination thereof. Preferably the textile comprises polyester. The textile is preferably weather proof and resistant to wear. More preferably, the textile has fire resistant properties.

[0011] According to a further preferred embodiment, the facade comprises a plurality of layers of textile. This improves the isolation properties. The layers may extend adjacently. It is however also possible to provide a space between the layers for further improving the isolation properties. Between said layers, isolation material may be provided.

[0012] According to a further preferred embodiment of the building according to the invention, the textile is provided with a print. By applying a textile with a print to a building, the appearance of said building can be efficiently determined. It may even be possible to removable apply a textile to a building as a facade. This allows the appearance of the building to be changed efficiently by applying another textile as a facade.

[0013] The textile may be non-permeable to air preventing air flow between the open air and an inner space of said building. This increases the insulating properties of the facade. However, according to a preferred embodiment the textile is permeable to air, providing exchange of air between the inner space of said building and the open air. It may also be possible to use a sufficient coarse textile to provide an at least partially transparent facade.

[0014] When the textile is used as a facade of a building such as for instance an office or a house, the textile is preferably sufficiently fine to prevent precipitation, i.e. rain, hail or snow, from entering the inner space of said building.

[0015] According to a further preferred embodiment of the building according to the invention, said building is a parking garage, wherein at least 20%, preferably at least 30%, of the total surface area of the facade is open to air. This ensures in a sufficient refreshment of air in said garage and ensures fire safety for the garage. It may be possible to provide only a part of the facade with an air impermeable textile and leave at least 20%, preferably at least 30%, of the facade open.

[0016] However, the textile preferably has a coarseness such that at least 20%, preferably at least 30%, of the total surface of said textile is open to air. On a given surface of said textile, at most 70% of this area is formed by the fibres of the textile. The at least 30% remaining surface area is formed by the meshes between said fibres. This allows substantially the whole facade of a garage to be provided with a textile according to the invention. This results in a garage that appears to be provided with a totally closed facade, while air is still allowed to pass through said facade. The textile further protects parked cars from precipitation.

[0017] It should be noted that the facade being open for 30% is based on a fire safety regulation. It may be possible that different countries have different regulations concerning fire safety of parking garages in terms of facades being open to air. The invention is therefore not limited to the above mentioned ranges in case regulations require a different permeability. According to the invention, a textile is provided which is sufficiently coarse allowing enough air to pass to meet the regulations for fire safety in parking garages.

[0018] It will be appreciated that a facade in the form of a textile can be applied to said load bearing structure efficiently. Further, by forming a facade of a garage from textile, the load bearing structure of said garage can be manufactured lighter compared to garages provided with steel, concrete or glass facades.

[0019] Therefore, according to a further preferred embodiment of the building according to the invention, the load bearing structure of the building comprises structural steel framing. This improves the efficiency of the building process. In particular parking garages usually comprise load bearing structures manufactured from concrete. Although the load bearing structure may be assembled from pre-cast elements, forming said load bearing structure from concrete is a labour intensive work, whereas a load bearing structure from structural steel framing can be formed relatively efficient. Structural steel framing furthermore allows the design of a parking garage to be adapted efficiently. It even allows—in a preferred embodiment of the present invention—the members of the framing to be reused after disassembly.

[0020] It should be noted that with structural steel framing a framework of steel members is meant, wherein the steel members are provided with a specific shape or cross section and certain standards of chemical composition and strength. In particular, structural steel members, such as I-beams, have high second moments of area, providing a high stiffness in respect to their cross-sectional area.

[0021] Preferably at least the stands of said load bearing structure are formed by structural steel framing. The vertical members or columns are at least formed of structural steel members. In particular, no concrete columns are provided. This results in a compact and light composition.

[0022] A further preferred embodiment of the building according to the invention comprises at least one floor, wherein said floor is formed by at least one profiled concrete slab. Using a profiled concrete plate, large areas of the building can be spanned. In particular in a parking garage this is advantageously, since providing columns for supporting the floors decreases the efficiency of the parking space. Profiled concrete slabs further have relative small heights and weight with respect to their stiffness. Preferably said profiled concrete plate comprises a hollow core slab. Hollow core slabs have a high stiffness, allowing spanning of large areas in the building.

[0023] Preferably a slab has a length of approximately 16 meters. This allows accommodating two cars in length with a driving passage provided there between. Other lengths are however possible. For instance, when cars are parked under an angle on a floor, the spanned space can be reduced.

[0024] According to a further preferred embodiment of the building according to the invention, the load bearing structure is arranged to support said slab at the short edges of said slab and/or at the perimeter of said floor. Preferably a floor is formed by a plurality of slabs provided in a row. Preferably, the floor is then only supported at its perimeter, i.e. the edges of a floor. All the slabs in the row are thereby supported at their short edges, whereas the outer slabs can further be supported along long edges. The space below said floor is thereby free of columns, which is in particular advantageously in parking garages.

[0025] It may however also be possible that a floor is formed by for instance two rows of slabs. The load bearing structure is then arranged to support the slabs at their short edges, wherein the load bearing structure forms columns beneath said floor. This however still results in a floor with relative few columns compared to garages known in the art due to the large areas spanned by the slabs.

[0026] A slab is usually formed as a rectangular body with a height. The height of said slab is usually smaller than the dimensions of the sides of said rectangular. Further, one side, the long edge, is usually longer than the other side, the short edge. Supporting the slabs only at the short sides allows larger areas to be spanned.

[0027] It will further be appreciated that by using profiled concrete slabs or plates, no additional support beams, i.e. structural steel members extending horizontally, are needed extending under said floors for support. This reduces the height needed for manufacturing a floor.

[0028] Although it is advantageously to provide a parking garage according to the invention with a facade formed by a textile, it may however be possible to provide the garage with different types of facades or even without a facade.

[0029] The invention further relates to the use of a textile as a facade for a building according to the invention. Using a textile for forming a facade is efficient and reduces the weight of the building, allowing a lighter load bearing structure to be used. According to a preferred embodiment, the textile is used as a facade for a parking garage. This allows substantially the whole facade of a garage to be covered, while still providing sufficient air circulation inside said garage.

[0030] The invention furthermore relates to a method for manufacturing a building according to the invention, comprising providing a load bearing structure and providing a textile as facade.

[0031] The present invention is further illustrated by the following Figures, which show a preferred embodiment of the device according to the invention, and are not intended to limit the scope of the invention in any way, wherein:

[0032] FIG. **1** schematically shows a parking garage according to the invention in perspective;

[0033] FIG. **2** schematically shows the garage in side view;

[0034] FIG. **3** schematically shows two floors in top view;

[0035] FIG. **4** schematically shows a front view of the garage, and;

[0036] FIG. **5** schematically shows a cross-section along line V-V in FIG. **3**.

[0037] In FIG. **1** a parking garage **1** according to the invention is shown. The parking garage **1** is provided with a load bearing structure in the form of structural steel framing **2**. The structure comprises columns **21**, beams **22** and ties **23** to provide a solid framework.

[0038] To enclose the structural steel framing, a facade in the form of textile **3** is provided. The facade is formed by sheets of textile **31** having a height h and a width d. The edges of the sheets **31** are provided with holes for connecting said sheets to framing **2**. Other suitable connecting means can however be provided. The textile **3** is in this example provided with a print in the form of a ball. Adjacent sheets **31** hereby form said image. The entrance **11** of the parking garage **1** is kept open and can be provided with a barrier or a gate.

[0039] The textile **3** has a coarseness allowing air circulation in said garage. In this example 30% of the surface of said textile is open for air. This provides good ventilation properties to the garage, while still providing sufficient protection to parked cars from for instance rain.

[0040] The garage **1** is shown in more detail in FIGS. **2-5**. The garage comprises eight floors, wherein the floors are provided staggered. Between the floors ramps **6** are provided allowing cars to move between floors.

[0041] As can be seen in FIG. **3**, a single floor **12**, as also indicated in FIG. **2**, is formed by a row of five hollow core slabs **4**. The slabs **4** provided in the middle, indicated with **4***a*, have a length of 16 meter. The edges of the floor **12** are supported by beams **22** and columns **21**. For slabs **4***a* provided

in the middle of a floor, only the short edges indicated with **41** are supported. For the outer slabs **4***b* of a floor, also the long edge **42** along the edge of the floor **12** is supported. The inner area of a floor is therefore not supported, providing a column free parking area beneath said floor.

[0042] Although also floor **13** is visible in FIG. **3**, this floor actually extends higher than floor **12**, wherein ramp **6** can be used to get from floor **12** to floor **13**. However, as an example, it may be possible to form a floor from two rows of slabs. In this case, floor **12** and **13** then form a single floor. The shorts edges **41** of the slabs are then supported along the centre, indicated with V, of said floor by columns **21** and beams **22**.

[0043] Since the floors are however provided staggered, the middle section as shown in FIG. **5** comprises twice as much beams **21** to support the slabs **4** as the end section as shown in FIG. **4**.

[0044] It will be appreciated that the design of the garage **1** as shown can be adapted easily. It is for instance possible to provide extra slabs in the rows forming the floors, thereby increasing the parking capacity. The design can also be efficiently modified to include more floors. And as mentioned above, it may even be possible to form a floor using two rows of slabs, thereby further increasing the parking capacity.

[0045] The parking garage can then be efficiently finished by providing a textile **3** around the framework **2**. The textile **3** provides an appealing appearance, while still providing sufficient air circulating in the garage **1**.

[0046] The present invention is not limited to the embodiment shown, but extends also to other embodiments falling within the scope of the appended claims. For instance, it is possible to provide a carrousel instead of the ramps to allow the cars to move between the floors. The framing structure is then adapted accordingly.

1. A building accessible for persons, comprising a load bearing structure, wherein at least a part of a facade of said building is formed by a textile, wherein at least 30% of the total surface area of the facade is open to air and wherein the load bearing structure of the building includes structural steel framing.

2. The building according to claim **1**, wherein substantially the whole facade is formed by the textile.

3. The building according to claim **1**, wherein the textile is manufactured from a material chosen from the group of natural or artificial fibres or a combination thereof.

4. The building according to claim **1**, wherein the textile is provided with a print.

5. The building according to claim **1**, wherein the textile has a coarseness such that at least 30% of the total surface of said textile is open to air.

6. The building according to claim **1**, wherein at least stands of said load bearing structure are formed by structural steel framing.

7. The building according to claim **1**, further including at least one floor, wherein said floor is formed by at least one profiled concrete slab.

8. The building according to claim **7**, wherein said profiled concrete plate comprises a hollow core slab.

9. The building according to claim **7**, wherein the load bearing structure is arranged to support said slab at the perimeter of said floor.

10. A method of using textile as a facade for a garage, according to comprising:

providing a load bearing structure, wherein at least a part of a facade of said building is formed by a textile, wherein at least 30% of the total surface area of the facade is open to air and wherein the load bearing structure of the building includes structural steel framing.

11. A method for manufacturing a garage, comprising providing a load bearing structure and providing a textile as facade, wherein the load bearing structure of the building comprises structural steel framing and wherein at least 30% of the total surface area of the facade is open to air.

12. The building according to claim **1**, wherein said building is a parking garage.

13. The building according to claim **2**, wherein the textile is manufactured from a material chosen from the group of natural or artificial fibres or a combination thereof.

14. The building according to claim **2**, wherein the textile is provided with a print.

15. The building according to claim **2**, wherein the textile has a coarseness such that at least 30% of the total surface of said textile is open to air.

16. The building according to claim **2**, wherein at least the stands of said load bearing structure are formed by structural steel framing.

17. The building according to claim **2**, further including at least one floor, wherein said floor is formed by at least one profiled concrete slab.

18. The building according to claim **17**, wherein said profiled concrete plate comprises a hollow core slab.

19. The building according to claim **17**, wherein the load bearing structure is arranged to support said slab at the perimeter of said floor.

* * * * *