

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number:

0 225 419
A1

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: **85850393.1**(51) Int. Cl.4: **E04H 1/00**(22) Date of filing: **09.12.85**

(43) Date of publication of application:
16.06.87 Bulletin 87/25

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

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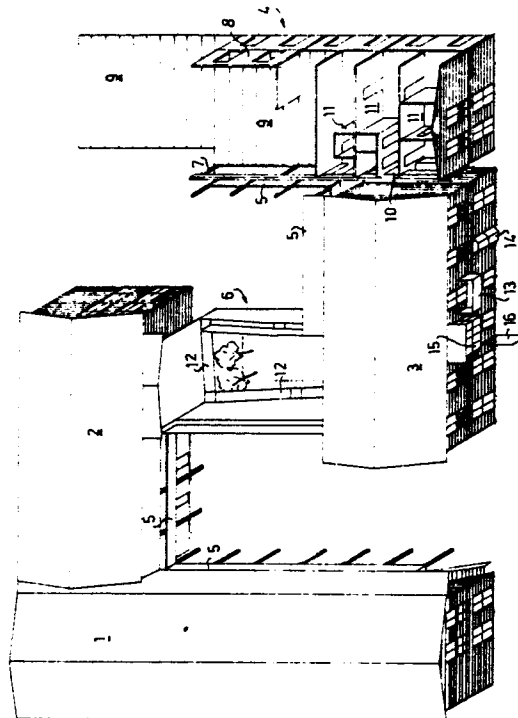
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(54) **A building.**

(57) The object of the present invention is to provide a novel type of building which can be readily adapted at low cost to changing functional requirements of the building and which is so planned that handicapped people in particular are able to reside safely and comfortably therein.

A building constructed in accordance with the invention comprises free-span floor structures (9) supported by load-bearing supports, such as pillars - (7), wall sections (8) or the like, extending freely between these supports, and further comprises exterior and/or interior wall-elements (10,11) which are held between respective floor structures. The building is mainly characterized in that at least some of the wall elements can be replaced and/or re-positioned, in order to afford flexibility with regard to the various rooms or enclosed areas of the building, and in that arranged in the vicinity of the floor-forming floor structures are horizontal walk surfaces, optionally in the form of access balconies (5). These walk surfaces or balconies are, in turn, connected to a system of ramps (12) extending between the different floor levels. In addition, the service lines extending to and from the rooms and like areas of the building, such as electric cables, water pipes and waste pipes and the like, are drawn to respective exterior walls of the building, or to a location adja-

cent thereto, in a manner such as to provide external access to the surface lines, preferably from the horizontal walk surfaces (5).



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A building

A characteristic feature of thriving communities, such as towns, cities, and like compactly settled areas resides in their constant growth and development. Of course, the development of communities is not solely restricted to the creation of new sub-urbs, but also involves the rebuilding and, at times, the demolition of existing buildings, which, due to changing circumstances, no longer suit the purpose for which they were originally built.

Improvements to the functionability of a community and/or its individual buildings solely by rebuilding or replacing outdated structures can no longer be considered a rational approach, nor yet economically viable in the long term. With this in mind, the present invention is based on the concept of planning new buildings in a manner which will enable them to be modified and altered to suit changing requirements when the time for alteration arises, thereby eliminating the need to demolish existing buildings and to rebuild to specification, and avoiding the heavy costs involved therewith. Since the aims and purposes of a thriving community change with time, it is feasible to suppose that the individual units and buildings, in the area can also be modified to accommodate the needs prevailing at that point in time. Building planning which permits modifications to be carried out readily on existing buildings would render the present day methods of demolition and rebuilding unnecessary, and would greatly reduce the cost and relative chaos which the present-day restructuring of large built-up areas often involves. A standard ruling when planning modern communities is that there is room for future development. It is therefore feasible to suppose that similar concepts can be adopted when planning individual building structures within the community, such as dwellings. It might even be expected that communities involved in the erection of new buildings should even today require building contractors to show how such buildings could be modified at reasonable cost at a later date, to suit the changing circumstances of the occupants or to provide an alternative use.

A modern apartment block, for example, is expected to last from 50-60 years. Consequently, a block of apartments erected today is expected to house families, many of which are still to be born, until the middle of the next century. Generally, present day apartments are "type" designed, i.e. built to accommodate given family sizes, e.g. "families of four", "a single person", etc., since more profit is obtained when the number of "type-design" apartments is rationalized and kept low.

Obviously, when planning the construction of apartment blocks in domestic areas, the present day architect or planning authority has little basis on which to decide which type of apartments shall have priority, with a view of ensuring that the buildings will satisfy the housing needs of 60 years hence. Although the planning authority of a particular community is aware of the housing needs of the various types of family living at present in the community, it has little knowledge of how these families would wish to be housed if they were given the freedom of choice. It is not surprising then that such planning authorities, whether in the public or private sector, should find it difficult if not impossible, to ascertain the housing requirements and needs of families in the year 2030-40. In addition to difficulties of this nature, the demands for additional buildings, better housing facilities, and the modification of existing buildings are often only met in times of good economy, when sufficient funds are available. These and similar factors place an unreasonable demand on the foresight of long-term planning authorities and like bodies.

Present day authorities are also aware of the need to plan and build dwelling and work-places which are more fitting to the requirements of the people to be accommodated therein than present day buildings, for example, such work-places as - schools, office-blocks, factories, and dwellings for handicapped people etc.

Consequently, an object of the invention is to provide an arrangement in building structures which will eliminate a major part of the aforesaid difficulties without requiring comprehensive modifications of outdated buildings or the replacement of such buildings when wishing to meet changing circumstances. Accordingly, the present invention relates to a novel type of building which can be readily modified at low cost to satisfy changing functions, and which is also designed to meet the needs and requirements of handicapped people.

In its broadest aspect the invention has as its starting point a known building structure incorporating floor structures which are supported by load-bearing supports, such as pillars, wall-elements and like components, and further incorporating outer and/or inner wall-elements which extend freely between said supports, and which are erected between adjacent floor structures, the invention being mainly characterized in that at least some of the wall-elements are exchangeable and/or capable of being repositioned, to afford flexibility in respect of room space; in that arranged in the proximity of respective floor structures are horizontal walk surfaces which join with a system of ramps extending

between mutually adjacent floor levels; and in that service lines, such as electric cables, water pipes, waste pipes and the like, are extended to the outer walls or to locations adjacent thereto in a manner to be readily accessible from without. Such a construction reduces the number of problems involved when deciding on building policy, while at the same time enabling changes in previously decided designs and lay-outs to be readily implemented.

In the case of wide buildings, the horizontal walk surfaces can be arranged centrally in the transverse direction of the building and at a suitable distance apart in the longitudinal direction thereof. Alternatively, the ramps connecting the various floor levels can lead directly to corresponding positions in the transverse and vertical directions of the building.

It will be understood that when planning and constructing buildings of the type proposed, it is possible to change a previously decided lay-out or design with regard, for example, to the types of apartments to be included and the floor area thereof, without incurring heavy costs and without needing to carry-out comprehensive reconstruction work. In addition hereto, the rooms provided in such a building can be readily adapted to meet changing space requirements or to suit changes in function. The building can also be readily adapted, either totally or in part, to meet future standards with regard to furnishings, fittings, etc.. The ramps connecting adjoining horizontal walk surfaces in a building constructed in accordance with the invention also satisfy the requirement of dwellings in which handicapped persons, such as partially sighted, partially immobilized persons for example, can live comfortably and in safety. The use of ramps obviates the need for staircases, elevators etc., which are considered troublesome to a greater or lesser extent by some old and infirm people; the use of elevators in apartment buildings can cause particular problems, especially when the elevators break-down or are placed out of commission for inspection purposes. It will be seen herefrom that the object of the invention has been fulfilled.

In summary, the present invention provides a novel building which may be given any desired number of floors and which comprises a basic building structure which can be completed with the use of suitable standardized concrete building elements. As beforementioned, a building of this type can be used over a long period of time without requiring comprehensive restructuring work, and can be readily modified to suit various different purposes. For example, one and the same building can be readily altered for such widely different usages as varying types of living accommodation - (families, sheltered homes for the aged, youth accommodation, with or without service functions),

office facilities, schools, childrens play-schools, medicare centres and like localities. Each floor level of the building affords maximum flexibility with regard to the division and allocation of the space available and with regard to the general planning of the floors, such as to satisfy widely varying needs and quality demands. It is also possible to simply "dismantle" a building constructed in accordance with the invention and re-construct it on another site in a different guise or form.

A building constructed in accordance with the invention also affords good possibilities of achieving optimal running economy, since the inherent elasticity of the building with regard to room size and space in general, together with its flexibility with regard to the manner in which the various levels or floors are planned, enables electricity, heat, water, etc. to be drawn to individual apartments and rooms and paid for separately by respective tenants, and also greatly facilitates the disposal of domestic waste, all of which is meaningful and of real worth to the tenants involved.

A building constructed in accordance with the present invention also enables the instigation of a novel conception of management and administration in which a tenant may be given the right, preferably contractually, to modify or alter the living space rented by the tenant, or any other form of rented space.

In one particularly advantageous embodiment of a building constructed in accordance with the invention, the service lines are accessible from outside the building. This greatly facilitates all inspection work and maintenance work required to be carried out, and also enables the service lines to be readily shifted and re-drawn in conjunction with modifications to the various rooms in the building.

In order to construct initially a building which can be readily modified and altered in accordance with the invention to fulfil a number of differing functions and purposes, the respective floor structures are preferably dimensioned to support purpose-built rooms of prescribed load-bearing capacity. The structural floor height should also be dimensioned for purpose-built rooms of prescribed ceiling heights, for the same reasons.

A particularly versatile building coupled with optimal disposition ability of the various floor levels can be achieved when the span of the free-span floor structures corresponds to the depth of the building.

It will be understood from the foregoing that a building constructed in accordance with the invention may comprise mutually different types of modularized building elements or units. This enables

such a building to be erected more readily and more cheaply than would otherwise be the case, despite all the advantages afforded by such a building.

For example, the free-span floor structures may include concrete elements which have been cast in vertical moulds thereby avoiding plastic deformation to a large extent.

Building costs can be reduced still further, by pre-preparing the ultimately outwardly facing surfaces of the free-span floor structures to prescribed floor standards, prior to installation.

When erecting buildings according to the invention in smaller or larger groups, the ramps and/or the horizontal walk surfaces may be made common to a plurality of building structures. This does not only make construction less expensive but also provides the architect with the valuable possibility of varying the appearance of such groups of buildings.

The ramps and/or the horizontal walk surfaces may either be enclosed or open, depending largely on prevailing climatic conditions.

Advantages from a practical aspect and from the aspect of appearance can be achieved when the ramps extend within a space which is separate from an associated building or buildings, for example an extended conservatory designed as a winter garden or the like in which the ramps either extend along the walls thereof, while leaving a central free-space in the building, or are arranged centrally of the building so as to leave the spaces around the walls free. A ramp-enclosure of this kind affords scope for the inclusion of tasteful and practical arrangements, plants etc., interdispersed with childrens play areas and lounge areas, surrounded by flowers, plants etc. Ramps and adjoining horizontal walk surfaces can also be arranged in a space which is not common solely to one building but which also connects with several adjacent buildings, for example in the form of a covered atrium between four adjacent building structures.

If desired, at least one of the ramps of a building constructed in accordance with the invention can incorporate a so-called moving side-walk.

In order to facilitate the replacement or repositioning of different wall elements, resilient seals are conveniently fitted between the edge surfaces of said elements and the building surfaces against which said edge surfaces are intended to bear. It will readily be seen that the presence of such seals will assist greatly in those modifications and changes made in the building requiring the repositioning or replacement of wall elements, since the seals are able to compensate for deviations in measurement tolerances and for any irregularities which might be present. Such changes in room planning are also greatly facilitated when respec-

tive building elements incorporate permanently located adjustment devices, by means of which floor-structure elements and wall elements can be adjusted relative to one another, in order to obtain perfectly flush joints.

The invention will now be described in more detail with reference to an embodiment of a building constructed in accordance with the invention and illustrated in the accompanying drawing, the single figure of which is a slightly schematic, explicit view of a building complex according to the invention seen obliquely from above.

The illustrated building complex comprises four elongated basic building structures or blocks 1-4 in the form of a balcony-access apartment block comprising two stories or floors, these building structures being arranged in pairs to present an "L"-configuration, and being mutually connected partly by horizontal walk surfaces or access balconies 5, common to all building structures, and partly by a further, centrally located building structure 6, which constitutes an area common to the remaining building structures 1-4. Although the illustrated central building structure 6 can fulfil a number of purposes, it is assumed that the central building structure of the illustrated embodiment primarily serves as the main entrance to the building complex and affords the requisite internal vertical connection between the various floor levels of said complex and the horizontal walk surfaces between the various apartments, offices or the like located on one and the same floor level but in different pairs of buildings 1,2 and 3,4 of said building complex.

The illustrated building complex can be readily adapted at low costs to changing functional demands, and is so designed that handicapped people, and especially disabled people, are able to live and move in ease and comfort. To this end, as illustrated by the building structure 4 under construction and shown to the right of the figure, the different building structures are each constructed from known load-bearing pillars 7 and wall-sections 8 which support free-span floor structures 9 therebetween. Known exterior and/or interior wall elements 10,11 are mounted between respective adjacent floor structures 9.

In order to realize the aforementioned objects of the present invention, and advantages afforded thereby, it is essential that at least some of the wall elements 8,10,11 of the building complex can be readily replaced and/or repositioned, to provide the requisite flexibility of the various rooms and like areas. It is also essential that the horizontal walk surfaces forming the access balconies 5 are arranged in connection with firstly the floor structures 9 forming the respective floors of the building, and secondly with a system of ramps 12 extending between the various floor-structure levels and lo-

cated within the central, common-use building structure 6, these ramps together with the access balconies 5 being common to all building structures 1-4, 6 forming part of the building complex. It is also an essential feature of the invention that all service lines, such as electric supply cables, water pipes and waste pipes etc., leading to and from the buildings are drawn to the outer walls or to locations adjacent thereto in a manner which provides ready access to the service lines from without. A particular advantage is afforded when these service lines are incorporated in exterior walls accessible from the balconies 5.

In the illustrated embodiment, the ramps 12 extend in a separate space or area provided within the central building 6 and are thus fully enclosed, whereas the horizontal walk surfaces or balconies 5 are solely covered by a roof structure. It will be understood, however, that both ramps and access balconies may be either fully open or fully enclosed, according to choice, and may also conceivably be placed in a common atrium-like area in the centre of a building, or at least the ramps may be placed in a space separate from the actual building itself, although this space must, of course, be connected with the horizontal walk surfaces or balconies served by the ramps.

The ramp system 12 incorporated in the central building 6 of the illustrated building complex is assumed to be fitted with large glass wall-sections, so that the area providing access to the ramp system may be planned as a winter garden, with the possibility of providing play areas and recreation areas for the tenants. In addition to the ramp area being used in this way, some or all of the balconies 5 may be extended so as to also include recreation areas or common areas of some kind or another.

When a building constructed in accordance with the invention is provided with a basement level accessible to the tenants or occupants of the building, the basement is also preferably connected to the ramp system 12, in order to fulfil the object of the invention.

The requirement placed on the foundations of a building constructed in accordance with the invention are no more than those required of conventional buildings. However, in order to achieve the flexibility sought for with regard to the future use to which such a building may be put, the floor structures 9 thereof should be dimensioned in a manner which enables them to support purpose-built rooms having prescribed load-bearing capacities. With regard to flexibility, the structural room height should be dimensioned to provide purpose-built rooms having prescribed ceiling heights.

In the illustrated embodiment, the free-span floor structures 9 have a span which corresponds to the depth of the building, which as beforementioned provides for rational construction coupled with optimal possibilities with respect to the disposition of the various floors. From the aspect of rationalization, it is also expedient to use module-type building elements, and then, inter alia, floor-structure elements in the form of concrete units cast in vertical moulds and provided with an ultimately upwardly facing surface which satisfies prevailing floor standards from the time of manufacture.

In order to facilitate the replacement and repositioning of the various wall elements in the building, sealing means (not shown) are conveniently placed between the edge-surfaces of respective wall elements and those building surfaces against which said edge-surfaces are intended to lie.

The exchangeable and/or movable elements in the floor structures and walls of the building are also preferably provided with built-in permanent adjustment devices (not shown) effective to permit positional adjustment of said elements in order to obtain perfectly flush joins.

All or some of the exterior walls of the building may, to advantage have load-bearing wall elements having a structural room height and length which are adapted to suit a particular purpose. Prior to being erected in the building, these wall elements are conveniently thermally insulated on the outwardly facing surfaces and provided with simple attachment means which enable suitable facing elements to be readily attached thereto and removed therefrom, thereby enabling the facade of the building to be changed at relatively low costs. Certain load-bearing exterior-wall elements are also suitably provided with ducting through which the aforesaid service lines can be drawn.

Each flat, office or like accommodation space in a building constructed in accordance with the invention may be supplied individually with electricity, cold water and a waste-disposal service. The collective part of these services is suitably placed so as to be accessible from outside the building. This enables each flat or other locality to prepare its own hot water, to be responsible for its own heating and ventilation, including the evacuation of stale air, the intake of fresh air and the recovery of heat. This renders the individual supply of electricity and water and the payment for such services more meaningful to the tenants concerned.

As shown by the drawing, a building constructed in accordance with the invention may also be provided with individual balconies 13, bay windows 14, conservatories 15, and garden dividers 16, ca-

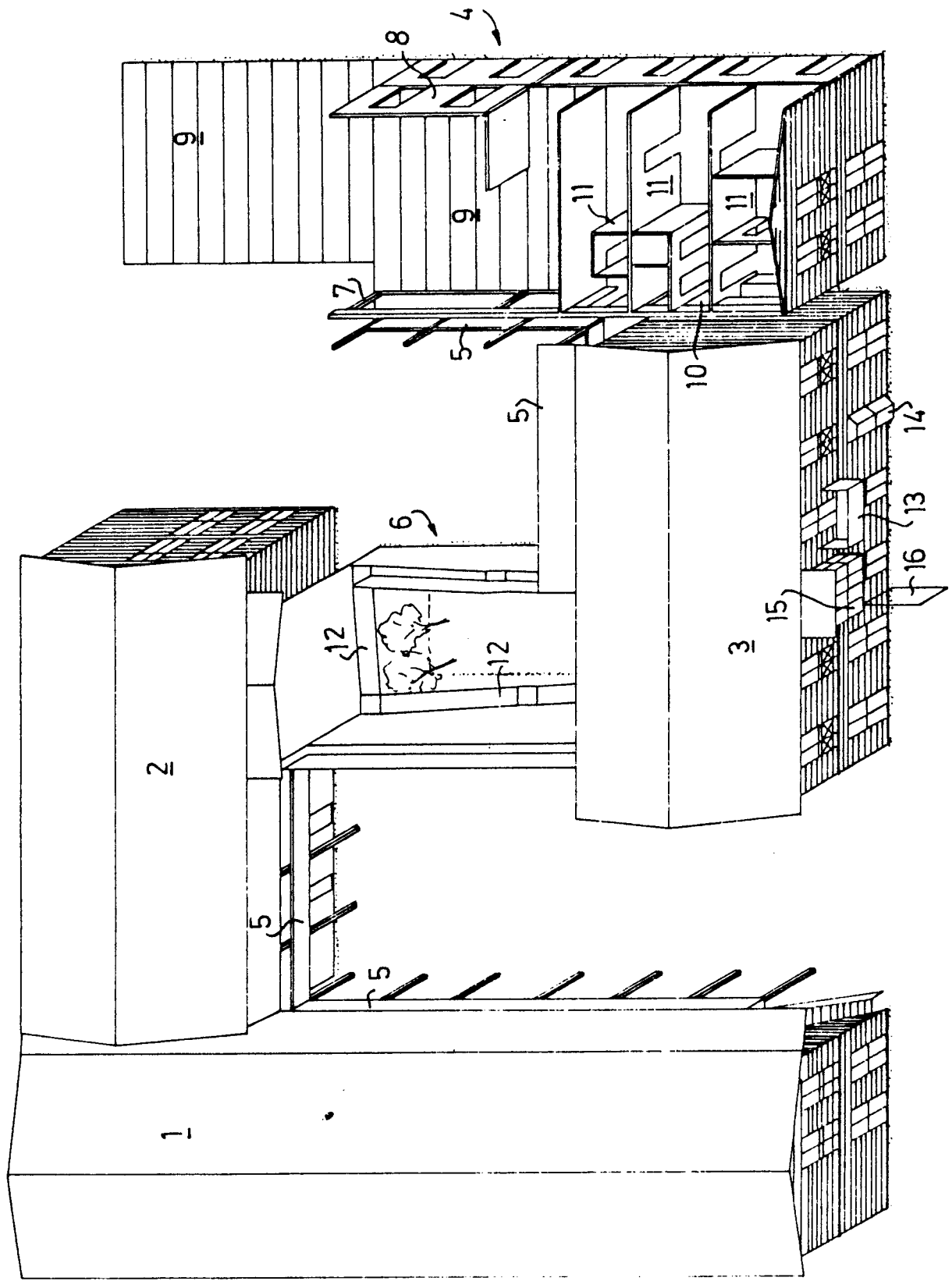
pable of being erected, taken-down or dismantled or moved, thereby affording further possibilities of adapting the building during the various phases of its use.

When tenants move out and new tenants move in, or when renovating or clearing the building, all interior walls and all fittings can be replaced without requiring work to be carried out on the basic structure of the building. For example, the size of the apartments can be varied and the apartments re-planned, by converting room-dividing walls into apartment dividing walls.

In the illustrated embodiment the building complex constitutes a block of apartments. It will be understood, however, that the building may also constitute a block of offices, an industrial hotel, a school, a play-centre or creche, or like localities, all within the scope of the invention. Thus, the invention is not restricted to the described and illustrated embodiment, and modifications can be made within the scope of the following claims.

Claims

1. A building comprising floor structures (9) which are carried on load-bearing supports, such as pillars (7), wall sections (8) or the like and which extend freely between said supports, and further comprising exterior and/or internal wall elements - (10,11) mounted between the floor structures, characterized in that at least some of the wall elements can be placed and/or re-positioned in order to provide flexibility with respect to the various rooms or enclosed areas in the building; in that arranged in the proximity of respective floor structures are horizontal walk surfaces (5) which join with a system of ramps (12) extending between the different floor-structure levels; and in that service lines, such as electric cables, water pipes, waste pipes and the like, extending into and out of said rooms and enclosed areas, are placed in or adjacent exterior walls in a manner to be accessible from without.
2. A building according to Claim 1, characterized in that the service lines are accessible from the horizontal walk surfaces (5).
3. A building according to Claim 1 or Claim 2, characterized in that the floor-forming floor structures (9) are dimensioned to support purpose-built rooms having a prescribed load-bearing capacity.
4. A building according to Claims 1, 2 or 3, characterized in that its structural room height permits the construction of purpose-built rooms having a prescribed ceiling height.
5. A building according to any of the preceding Claims, characterized in that the span of the free-span floor structures (9) corresponds to the depth of the building.
6. A building according to any of the preceding claims, characterized in that the upper surfaces of respective free-span floor structures (9) are formed to prevailing floor standards.
7. A building according to any of the preceding claims, characterized in that the free-span floor structures (9) comprise concrete elements which have been cast in vertical moulds.
8. A building according to any of the preceding claims, characterized in that ramps (12) and/or horizontal walk surfaces (5) are common to a plurality of building structures (1-4,6).
9. A building according to any of the preceding claims, characterized in that ramps or horizontal surfaces are enclosed.
10. A building according to any of Claims 1-8, characterized in that ramps and/or horizontal walk surfaces are open.
11. A building according to any of the preceding claims, characterized in that the ramps extend within a space or area separate from the building.
12. A building according to any of the preceding claims, characterized in that ramps and horizontal walk surfaces extend in a common space or area.
13. A building according to any of the preceding claims, characterized in that at least some of the horizontal walk surfaces include recreation areas, common rooms or areas, and the like.
14. A building according to any of the preceding claims, characterized in that at least some of the horizontal walk surfaces have the form of access balconies (5).
15. A building according to any of the preceding claims, characterized in that at least some of the horizontal walk surfaces serve as entry corridors to the various areas of a respective floor plan.
16. A building according to any of the preceding claims, characterized in that resilient seals are provided between the edge surfaces of the exchangeable and/or re-positionable wall-elements and those building surfaces against which said edge-surfaces are intended to lie.
17. A building according to any of the preceding claims, characterized in that arranged in the replaceable and/or re-positionable elements are permanent adjustment devices by means of which the floor-structure elements in particular, but also the wall elements can be adjusted positionally in relation to one another, in order to provide flush joints.





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.4)
Y	DD-A- 82 819 (BACH) * figures 2, 3, 18-26; column 3, lines 11-43; claims 2-4, 12, 13 *	1,2	E 04 H 1/00
A		16,17	
Y	--- E. NEUFERT "Bau-Entwurfslehre", 30th edition, 1979 Friedr. Vieweg & Sohn, Braunschweig/Wiesbaden * pages 249, 306 *	1,2	
Y	--- idem * page 306, figure 4 *	5	
A	idem	8-15	TECHNICAL FIELDS SEARCHED (Int. Cl.4)
Y	--- FRICK/KNÖLL/NEUMANN "Baukonstruktionslehre Teil 1", 28th edition, 1983 B.G. Teubner, Stuttgart * pages 209, 210, section 5.8.4 *	1	E 04 H 1/00 E 04 H 14/00
Y	idem * page 249, section 7.2.2.2 *	5	
A	idem	16,17	
-/-			
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 26-06-1986	Examiner BOUSQUET K.C.E.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	



DOCUMENTS CONSIDERED TO BE RELEVANT			Page 2
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	DEUTSCHES ARCHITEKTENBLATT, vol. 13, 1st June 1981, pages 915-918, Stuttgart; W. MEYER-BOHE "Leichte Trennwandsysteme" * whole article *	1, 16, 17	
A	--- FROMMHOLD/HASENJÄGER "Wohnungsbau Normen", 17th edition, 1984, pages 6-11, 183-190, Werner-Verlag GmbH, Düsseldorf * page 11 *	6	
A	idem * pages 189, 190, sections 8.1, 8.2 *	1	
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The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 26-06-1986	Examiner BOUSQUET K.C.E.
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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			