

(19)



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(11)

EP 1 308 569 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

07.05.2003 Bulletin 2003/19

(51) Int Cl.7: **E04B 1/348**

(21) Application number: **02079520.9**

(22) Date of filing: **30.10.2002**

(84) Designated Contracting States:

**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SK TR**

Designated Extension States:

AL LT LV MK RO SI

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(30) Priority: **30.10.2001 NL 1019254**

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(54) House and method of constructing the same

(57) The invention relates to a house composed of building units, each of which is composed of a basic frame, fastened to which is at least one of a floor element, a ceiling element and a wall element, as well as means for fastening several building units to one another, and of which a bottom building unit comprises means

for resting on a foundation. This makes it possible to very quickly and simply assemble a house. The invention also relates to a method of constructing a house comprising the steps of at a first location fabricating building units, and at a second location connecting the same with each other. In this way it is possible to build a house on a building site in one day.

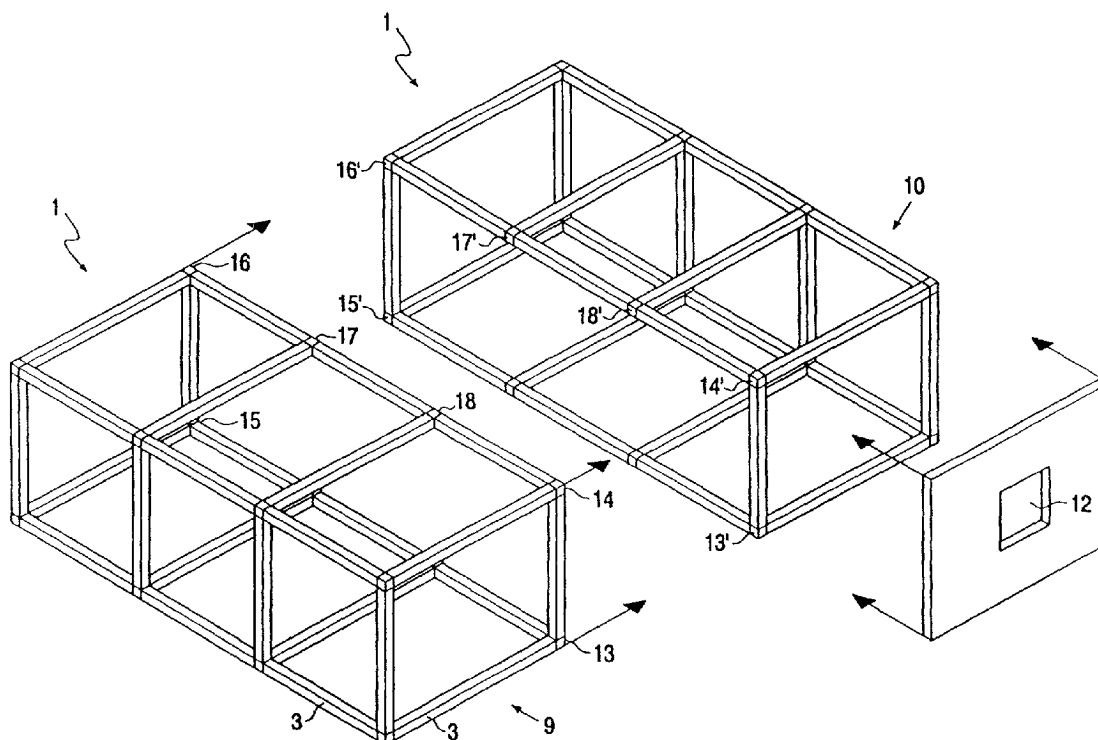


FIG. 2

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Description

[0001] The invention relates to a house composed of building units. The invention also relates to a method of constructing such a house with the aid of building units.

[0002] In general practice, houses are built in the same manner. In the first step a foundation is prepared on the site where the house is to be erected. Subsequently a floor is provided upon which the various walls are erected. On top of that a ceiling, respectively floor of an upper storey is provided, after which these steps of erecting walls and further ceilings, respectively storey floors, are repeated until finally a roof is put on. This known method of building houses has numerous disadvantages. One of the worst drawbacks is that work can only proceed if the weather conditions allow it. With precipitation and/or low temperatures it is generally not possible to build houses. Moreover, it is unhealthy to be outdoors for long periods in very high temperatures or very bright sunshine, especially with a view to the effect of harmful radiation on one's health. In particular the influences of the weather conditions make it in general very difficult to calculate the completion date of a house.

[0003] It is the object of the invention to provide an improved house, without the above-mentioned disadvantages. The object of the invention is in particular to provide a house that can be constructed very quickly and simply.

[0004] It is also an object of the invention to provide a method for the construction of a house. Preferably the method of building a house will be one that does not exhibit the above-mentioned drawbacks.

[0005] To achieve the above-mentioned objectives, the invention provides a house of the kind mentioned in the preamble and with which the building units are composed of a basic frame, fastened to which is at least one of a floor element, a ceiling element and a wall element, as well as means for connecting several building units to one another, of which a bottom building unit comprises means for resting on a foundation.

[0006] Such a house provides the solution for the above-mentioned drawbacks.

[0007] More particularly, with a house according to the invention it is possible to provide the various building units with the desired facilities such as electrical wiring, gas pipes, water pipes and heating pipes, as well as radiators. The building units may already be provided with windows and doors, as well as the partition walls desired in the final house, prior to fastening the building units to one another. In this way the building units can easily be transported to the location where the house is to be built, and can there be assembled on site.

[0008] According to a particular preferred embodiment the building units comprise a steel basic frame that connects at least corner points of the building units with each other. This provides a particularly solid and rigid construction of the various building units. The rigidity and strength of the units, and consequently of the

house, are derived from the basic frame. This means that the occupant is completely free in choosing the final layout of the units and thus of the house. In this case it is not the purpose of the partition walls to confer rigidity or strength on the house.

[0009] Particularly preferred is a building unit that has a substantially rectangular box shape. Such units can be fastened to one another very easily and can simply be transported by road to a desired location.

[0010] It is also particularly preferred for a house to have at least one building unit comprising a roof element. This makes it possible to build a house, which is already watertight immediately after its assembly. This allows the house according to the invention to be built even in the event of precipitation.

[0011] Further especially preferred is a house of which all the building units comprise at least one ceiling element. During the assembly of the house, the respective room defined by the building unit will stay dry even in the event of heavy precipitation.

[0012] The invention also provides a method of constructing a house. The method according to the invention comprises the steps of:

- at a first location fabricating building units, which are composed of a basic frame, fastened to which is at least one of a floor, wall or ceiling element, and
- at a second location connecting with each other at least two elements in order to obtain the house.

[0013] Thanks to this method, the various units can be fabricated at all times, for example, in a production hall, allowing work to go on continuously irrespective of the weather conditions. Moreover, the people building the house, will be protected from the elements. This greatly benefits the state of health. It is also an advantage because the completion date of the house can be calculated more accurately.

[0014] The building units can be fabricated in dimensions such that they are simply transportable by road.

[0015] According to a further preferred embodiment the method according to the invention comprises a step in which a foundation is provided at the second location before the building units are connected to one another on site.

[0016] A further preferred embodiment comprises the step in which at least two adjacent building units are connected to one another.

[0017] A further preferred embodiment still is a method comprising the step in which at least two building units on top of each other are connected to one another.

[0018] In order for the house to be ready for occupation immediately after the various building units have been assembled at the second location, the method preferably comprises the step in which at the first location the various building units are provided with water pipes, electric wiring, gas pipes, and heating pipes and radiators. A very simple method of building a house ac-

according to the invention is provided if the facilities are installed into the units in such a manner, that they will connect up after the units have been fastened together.

[0019] The method and the house according to the present invention make it possible to build a complete house with several storeys in one day. Especially if the foundation is already prepared, this manner allows a house to be constructed very safely and with ease.

[0020] According to the invention it is in particular possible to build a very energy-efficient house in conformity with the Soil Protection Decree. The energy performance coefficient (EP) of the house is maximally 1. The Rc of the house is at least 4. By applying suitable installation-technical measures, such as appropriate heating technology etc., which a person skilled in the art is able to determine quite easily, the EP may have a value of only 0.8. This means that the gas consumption of a detached house according to the invention, with three storeys and a volume of 650 m³, can be limited to less than 1000 m³ a year.

[0021] The invention will now be further elucidated with reference to a number of figures.

[0022] Fig. 1 shows a partially exploded view of a unit according to the invention.

[0023] Fig. 2 shows two units according to the invention that can be connected with one another.

[0024] As is shown in Fig. 1, a building unit 1 comprises a basic frame 2 consisting of steel elements, to wit horizontal elements 3 and vertical elements 4. The elements 3, 4 may be connected with one another by means of separate coupling elements (not shown), but may also be directly connected with one another by means of suitable coupling means. It is possible to embody all the elements 3, 4 identically, which provides a very simple and inexpensive system for constructing a basic frame 2.

[0025] Although the figures indicate that a basic frame serves as starting point to which subsequently wall panels 5, ceiling panels 6 and floor panels (not shown) are fastened, it is also possible to provide the separate wall, ceiling, and floor elements with a frame part each so that when fastening these elements to one another, the frame parts are coupled to one another. This provides a solid and rigid construction of units.

[0026] In the embodiment shown in Fig. 1, various frame parts 3, 4 are symmetrically connected with one another. However, as Figure 2 shows, it is also possible to omit a number of frame members, e.g. the frame members 7, 8, in Fig. 1. By coupling two building units 9, 10, as shown in Fig. 2, a very large living area is obtained without interfering frame members 7, 8.

[0027] As shown in Fig. 1, the building unit 1 may already comprise a wall element 5 in which a door opening 11 is provided. Fig. 2 shows the possibility of a wall element being provided with a window opening 12.

[0028] According to the invention, the corner points 13-16 may be connected with the respective corner points 13'-16'. The elements 9, 10 may optionally be

connected with one another in an additional manner by the fastening points 17 and 18 with 17' and 18' respectively. This provides a firm connection between the various building units. Analogously, various building units may be fastened on top of each other. If several building units are to be connected, it is preferred for this to be done via the basic frame.

[0029] According to a further embodiment, it is possible to provide expansion means between the various building units. This allows for some play in the final house. However, care must be taken to avoid any undesirable tensions developing in the other elements of the house.

[0030] The means for supporting the lower units of a house on a foundation are not shown in the drawing. These building elements will usually form a ground floor. However, it is also possible to have a lowered foundation upon which a basement building unit can be placed. Such a basement building unit preferably comprises enough solid basic frame elements on which to place a desired number of storeys.

[0031] Fig. 1 schematically shows that a ceiling element may comprise an opening 19 to provide, for example, a stair opening. In a similar manner feed-throughs for water pipes, gas and electricity pipes and the like may be provided.

[0032] The drawings show no partition walls. However, these may be provided according to choice anywhere in the various units. At a first location, for example in a factory, the building units may already be provided with lamps, doors, partition walls, toilet provisions?, etc. According to the invention, outer walls in combination with inner walls and optionally between these insulating materials, are also already provided in the factory. This makes it possible to build a complete house in one day. The only requisite is that a foundation is already present at the building site.

[0033] The invention encompasses numerous other embodiments, which have not all been described individually in the foregoing description. However, a person skilled in the art is quite capable of deriving these various embodiments from the specification of this invention.

[0034] Within the scope of the invention it is quite feasible to provide the house with a wooden basic frame instead of a steel basic frame. This may be a frame of, for example, laminated wood. The use of plastics, for example fibre-reinforced plastics, is also possible. A person skilled in the art is well able to determine the shape and dimensions units made from such materials may have, in order to confer on the house the necessary rigidity and strength.

[0035] Although the foregoing description is based on a detached house, it is also very well possible to build rows of staggered houses, or terraced houses using the system and method according to the invention. It is also possible to build simple apartment complexes according to the teachings of the invention. Moreover, already ex-

isting houses may be extended with extra storeys comprised of building units according to the invention. The possible applications of the invention also extend to holiday homes, student housing and the like.

[0036] The exterior walls of the house may be finished with wooden panels, but a finish of, for example, brickwork is also possible.

tric wiring, gas pipes, and heating pipes.

- 10.** A building unit according to one of the claims 1-4 to be used with a method according to one of the claims 5-9.

Claims

1. A house composed of building units, each of which is composed of a basic frame, fastened to which is at least one of a floor element, a ceiling element and a wall element, as well as means for connecting several building units to one another, of which a bottom building unit comprises means for resting on a foundation. 10
2. A house according to claim 1, wherein the building units comprise a steel basic frame that connects at least corner points of the building units with each other. 15
3. A house according to claim 1 or 2, wherein the building units have a substantially rectangular box shape. 20
4. A house according to claim 1-3, wherein at least one building unit comprises a roof element. 25
5. A method of constructing a house comprising the steps of: 30
 - at a first location fabricating building units, which are composed of a basic frame, fastened to which is at least one of a floor, wall or ceiling element, and 35
 - at a second location connecting with each other at least two elements in order to obtain the house. 40
6. A method according to claim 5, comprising a step in which a foundation is provided at the second location before the units are connected to one another. 45
7. A method according to claim 5 or 6, comprising a step in which at least two adjacent building units are connected to one another. 50
8. A method according to claim 5, 6 or 7, comprising a step in which at least two building units are connected on top of one another. 55
9. A method according to claim 5, also comprising the step in which at the first location the building units are provided with at least one of water pipes, elec-

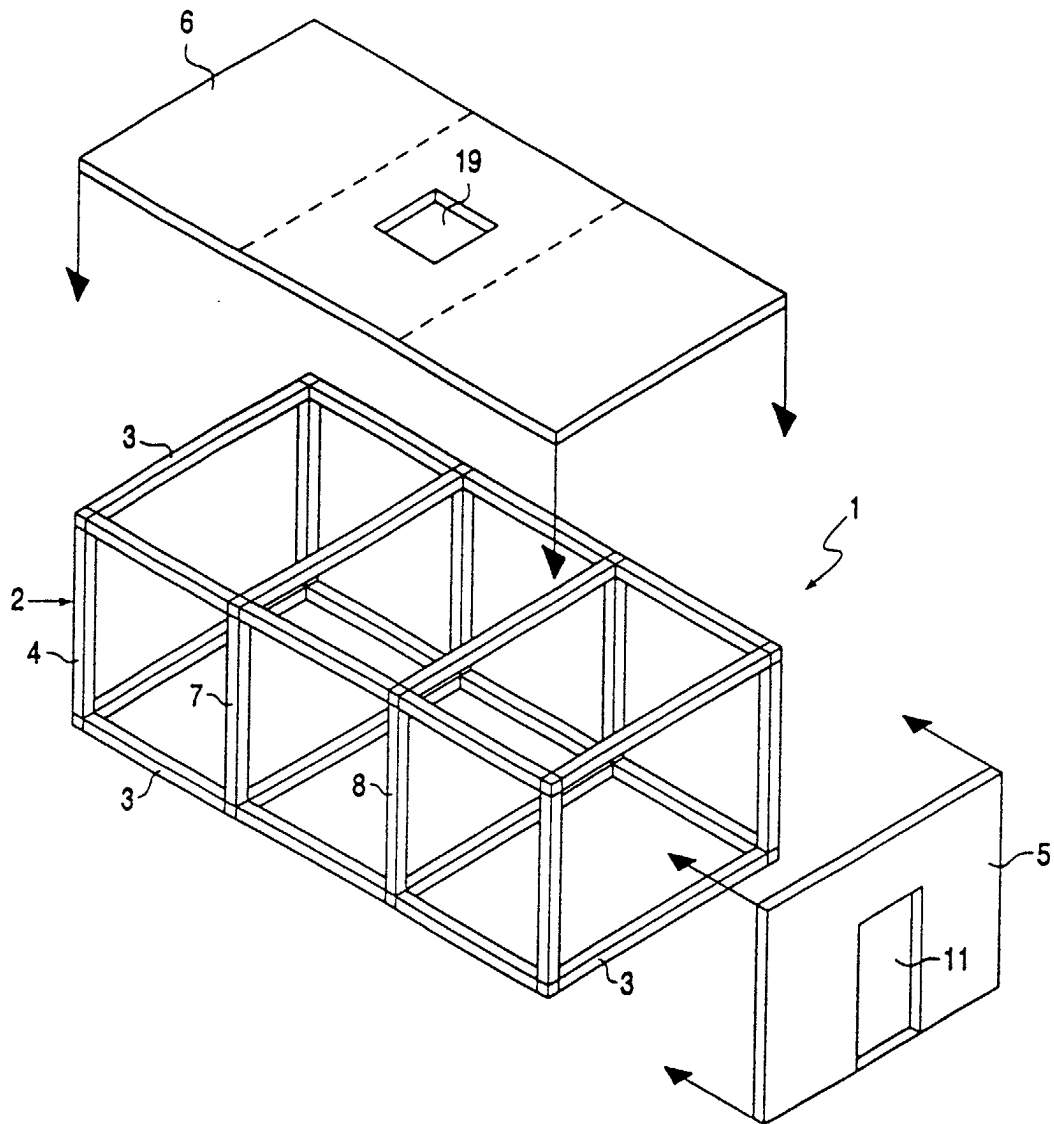


FIG. 1

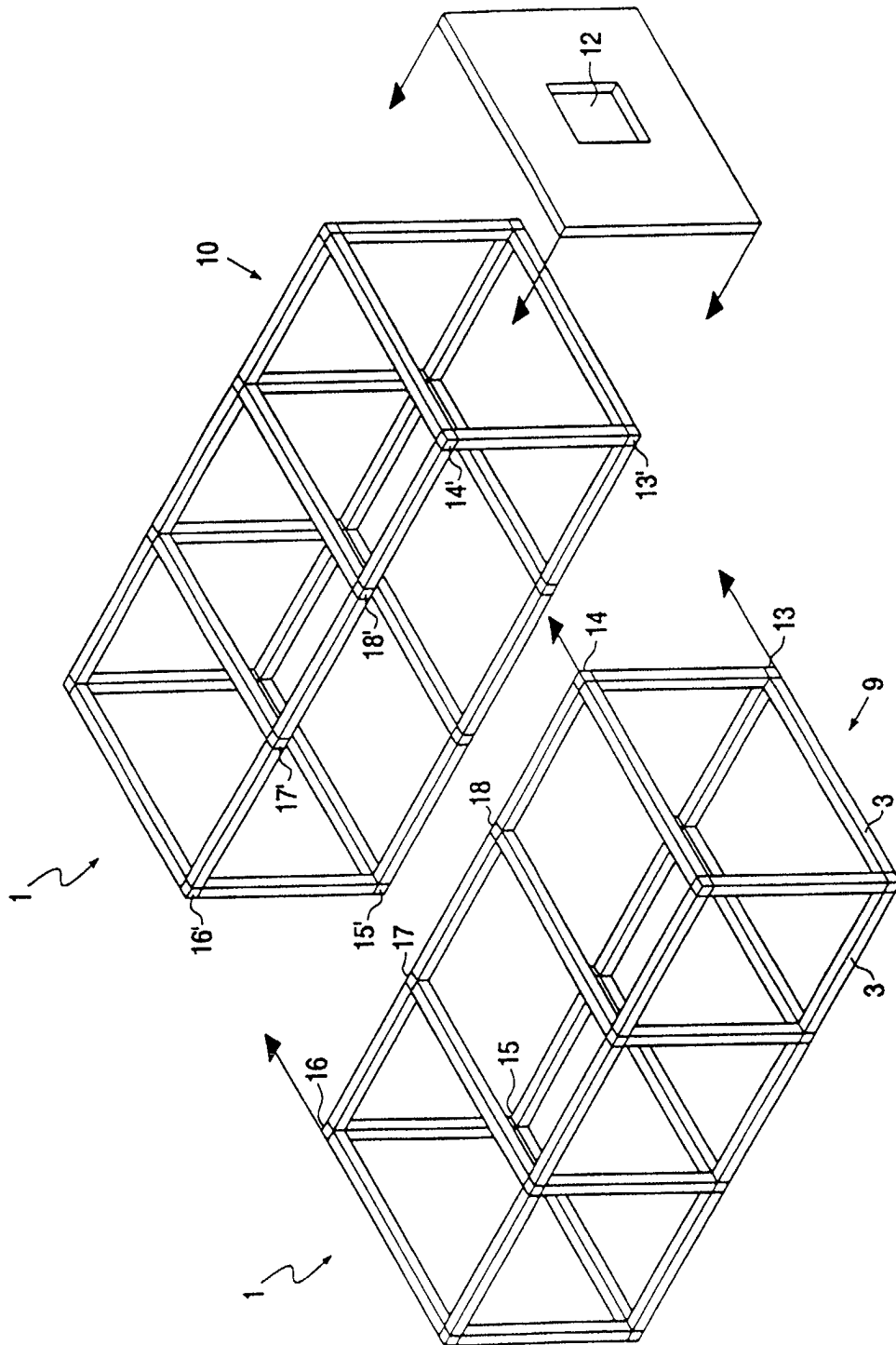


FIG. 2