



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 199 420 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
08.03.2006 Bulletin 2006/10

(51) Int Cl.:
E04B 5/48 ^(2006.01) **E04F 15/024** ^(2006.01)

(21) Application number: **01122852.5**

(22) Date of filing: **22.09.2001**

(54) **Modular element for the construction of ventilated and/or insulated floor**

Modulares Hohlraumbodenelement

Elément modulaire pour un faux plancher surélevé

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**

(30) Priority: **25.09.2000 IT PD000074**

(43) Date of publication of application:
24.04.2002 Bulletin 2002/17

(73) Proprietor: **GEOPLAST S.p.A.
35010 Grantorto (PD) (IT)**

(72) Inventor: **Pegoraro, Loris
35010 Grantorto (PD) (IT)**

(74) Representative: **Gustorf, Gerhard
Patentanwalt,
Bachstrasse 6 A
84036 Landshut (DE)**

(56) References cited:
EP-A- 0 803 618 US-A- 4 993 202

EP 1 199 420 B1

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The present invention concerns the sector of building construction and in particular it concerns prefabricated elements for the construction of ventilated and/or insulated cavities.

[0002] Non-retrievable prefabricated elements or formworks are known, which are used for the construction of ventilated cavities for raised floors.

[0003] These elements are generally available in the shape of a dome with four legs and are positioned side by side and connected in such a way as to form a continuous grid structure. The rod irons for reinforced concrete (resistance-welded netting or ribbed floor) are laid on this structure and then the concrete is cast. In this way a monolithic floor is obtained, which is ventilated in the lower part and whose ventilated cavity can be reached for laying pipes, ducts and cables.

[0004] The drawback of a floor constructed with these elements is represented by the fact that it is rather thick, fragile and does not resist to elevated pressures.

[0005] Modular elements as set forth in the preamble of the claim are known from EP-B 803 618. These modular elements are provided with specific connection means requesting a considerable space and being equipped with holes to attach each element to the ground by means of screws, nails or the like. This means that each element must first be fixed to the ground before it would be possible to attach a second one.

[0006] On the other hand, each one of the elements has a convex upper surface, which, according to claim 1, includes at least one supporting and reinforcing pillar element in an underlying position which may be central or excentric.

[0007] US-A 4 993 202 relates to a cavity floor that includes a profiled sheet material having a plurality of support feet which are formed by deep - drawing of the sheet. No modular elements are provided which would be adapted to be combined with each other.

[0008] The object of the present invention is new prefabricated modular element with reduced thickness, comprising a series of small domes and provided with a plurality of supports at the bottom.

[0009] The new modular element, thanks to its reduced thickness and to its structure comprising a plurality of domes, may be conveniently used in all the situations in which it is necessary to obtain a ventilated and/or insulated layer, when the total thickness of the floor must be reduced and/or the floor must bear high loads.

[0010] The upper surface of the new prefabricated elements is substantially plane and comprises a series of domes whose concave part is directed downwards.

[0011] Each common area among four domes, as far as the central part of the new element is concerned, or between two domes, as far as the sides of the new element are concerned, is arched until the point where it reaches the lower surface of the new modular element, in such a way as to form a series of intermediate feet or

supports distributed on the entire surface of the new modular element. Notwithstanding the reduced thickness, the structure formed by the various small domes allows the new element to resist to the great stresses that are exerted perpendicularly to it.

[0012] The various feet or supports present among the various domes of the new modular element allows all the weights applied to the upper side of the element to be discharged onto the support surface constituted by the feet or supports.

[0013] The edges of the various domes, along the sides of the new modular element, are bent to form a U, so that it is possible to match more modular elements by simply inserting the U-shaped edge of the side of a new modular element in the U-shaped edge of the side of the modular element that has already been laid.

[0014] The upper part of each dome of the new modular element is provided with parallel and/or radial projections.

[0015] The concrete reinforcement of the floor or upper wall can be comfortably laid on the various new modular elements, even between said projections. In fact, the upper part of the domes is partially plane, so that it is possible to make a smooth casting where the projections reach a constant, suitable height for a smooth casting.

[0016] Notwithstanding the reduced thickness, the new modular element makes it possible to ventilate properly the space created between the two floors or walls, thus avoiding the formation of condensate and humidity, and to obtain heat and sound insulation.

[0017] The upper part is flat, in such a way as to facilitate any smooth casting and the introduction of iron rods for reinforced concrete, aimed to obtain a linear cope with constant and definite thickness.

[0018] The following is a practical application among many of the invention in question, illustrated in the enclosed drawings, wherein:

Figures 1 and 2 are two views, a plan view and a side view, respectively, of the new modular element, in which it is possible to observe the various domes (1) comprising an upper plane surface (1.1), a curved perimetral surface (1.2) and support feet or bases (1.3) in common among the various domes and reaching the lower surface of the new modular element.

[0019] Along the sides of the new modular element the edges (1.4) of the various domes (1) are bent in the shape of a U, so that it is possible to match more modular elements by simply introducing the U-shaped edge (1.4) of the side of a new modular element in the U-shaped edge (1.4) of the side of the modular element that has already been laid.

Claims

1. Non-retrievable modular element for the construction of ventilated and/or insulated floors, which may be combined side by side with similar elements having the same dimension and shape to form a series of domes (1) the upper surface (1.1) of which verges into a lateral surface, which is arched downwards until reaching the lower surface of the element **characterized in that** said element comprises a surface shaped in such a way as to form a series of said domes positioned side by side, the upper surface (1.1) of each dome (1) being plane such that the common upper face of said series of domes (1) is also a plane, and **in that** the edges of the domes (1) along the lateral sides of said element are U-shaped edges (1.4) permitting the reciprocal fitting of each modular element with the adjacent one.
2. Non-retrievable modular element according to claim 1, wherein the common upper surface of said series of domes (1) is interrupted by perimetral surfaces (1.2) delimiting the upper surfaces (1.1) of the domes (1).
3. Non-retrievable modular element according to claim 2, wherein said perimetral surfaces (1.2) are curved and verge into arched lateral surfaces such that at the corners of each dome (1) support feet (1.3) are present.

Patentansprüche

1. Verlorenes, modulares Element für die Bildung belüfteter und/oder isolierter Fußböden, das Seite an Seite mit ebensolchen Elementen gleicher Dimension und Form kombinierbar ist, um eine Reihe von Kuppeln (1) zu bilden, deren obere Fläche (1.1) in eine seitliche Fläche übergeht, die nach unten gewölbt ist, bis sie die untere Fläche des Elementes erreicht, **dadurch gekennzeichnet, daß** das Element eine Fläche hat, die so geformt ist, daß sie eine Reihe von nebeneinander angeordneten Kuppeln bildet, wobei die obere Fläche (1.1) jeder Kuppel (1) eben ist, so daß die gemeinsame Oberfläche der Reihe der Kuppeln (1) ebenfalls eben ist, und daß die Kanten der Kuppeln (1) an der seitlichen Fläche des Elementes U-förmige Kanten (1.4) sind, die eine gegenseitige Befestigung jedes modularen Elementes mit dem benachbarten Element gestattet.
2. Verlorenes, modulares Element nach Anspruch 1, **dadurch gekennzeichnet, daß** die gemeinsame Oberfläche der Reihe der Kuppeln (1) durch umlaufende Flächen (1.2) unterbrochen ist, die die oberen Flächen (1.1) der Kuppeln (1) begrenzen.

3. Verlorenes, modulares Element nach Anspruch 2, **dadurch gekennzeichnet, daß** die umlaufenden Flächen (1.2) gewölbt sind und derart in die gewölbten seitlichen Flächen übergehen, daß an den Ecken jeder Kuppel (1) Stützfüße (1.3) ausgebildet sind.

Revendications

1. Élément modulaire perdu pour la construction de planchers ventilés et/ou isolés apte à être combinés côte à côte avec des éléments semblables ayant les mêmes dimension et forme pour former une série de dômes (1) dont la surface supérieure (1.1) se raccorde à une surface latérale s'incurvant vers le bas jusqu'à ce qu'elle atteigne la surface inférieure de l'élément, **caractérisé par le fait que** l'élément présente une surface formée de telle sorte qu'elle forme une série de dômes placés les uns à côté des autres, ladite surface supérieure (1.1) de chaque dôme étant plane de sorte que la surface commune de la série de dômes soit également plane, et **par le fait que** les bords des dômes se trouvant à la surface latérale des éléments forment des bords en U (1.4) qui permettent une fixation mutuelle de chaque élément modulaire avec l'élément voisin.
2. Élément modulaire perdu selon la revendication 1, **caractérisé par le fait que** la surface commune de la série de dômes (1) est interrompue par des surfaces (1.2) entourant le périmètre et délimitant la surface supérieure (1.1) des dômes (1).
3. Élément modulaire perdu selon la revendication 2, **caractérisé par le fait que** les surfaces (1.2) entourant le périmètre sont incurvées et se raccordent avec les surfaces latérales incurvées de sorte qu'aux coins de chaque dôme (1) des pieds de support (1.3) soient formés.

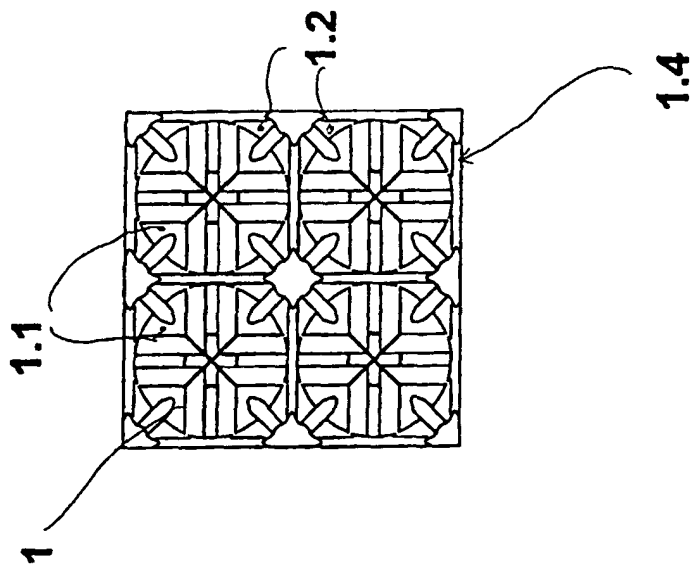


Fig. 1

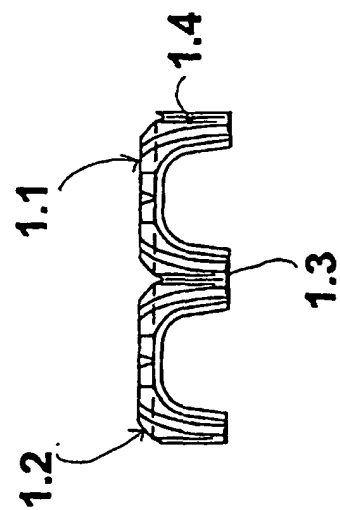
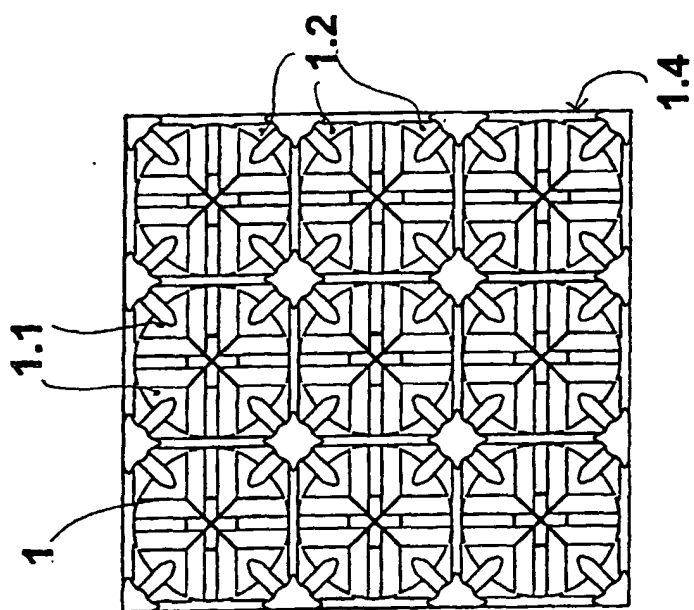


Fig. 2

