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(54) Concrete floor structure

(57) A factory-made construction element for a system of joists (10), multiple construction elements being designed to be placed adjacent to each other on a framework. A layer of light clinker concrete (11) is provided between a first concrete layer (12) and a second concrete layer (16), and an elongate reinforcement member (13) extends in a longitudinal direction through the construction element between the concrete layers.

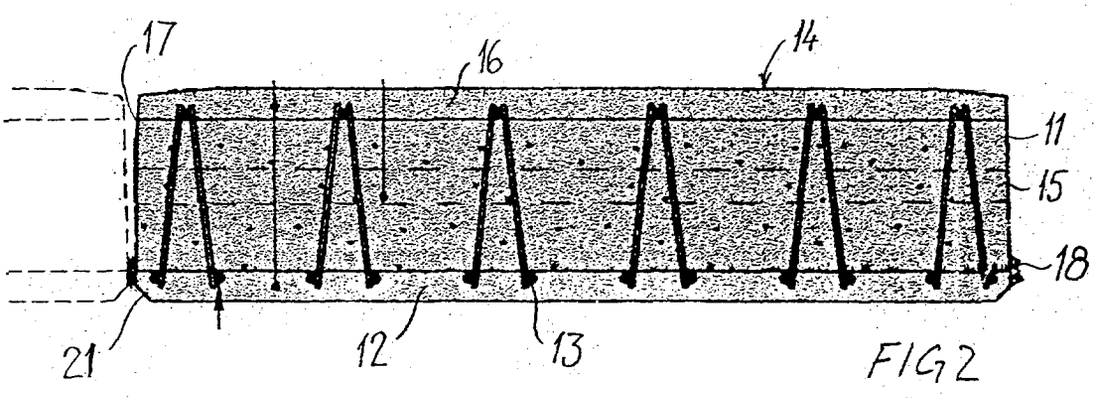

FIG 2

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Description

FIELD OF THE INVENTION

[0001] The invention concerns a factory-made construction element for a system of joists, whereby many construction elements are designed to be placed adjacent to each other on a framework.

STATE OF THE ART

[0002] Factory-made elements for a system of joists are used to a large degree by the construction industry. An important advantage is that their production can be rationalized in a factory and they can then be transported to a construction site to be assembled on a framework. Elements of this type for a system of joists can be made of reinforced concrete and thus attain high rigidity and strength. A disadvantage is the weight, which is high in a construction element of this kind, thus making transportation and assembly more difficult and expensive.

[0003] There are also construction elements for a system of joists made of light clinker concrete and similar materials, whereby a lower weight is achieved at the cost of lower strength. A further disadvantage with such elements is that an uneven outer structure can result, making further measures necessary at the construction site in order to achieve the desired surface evenness. Comprehensive installation of various piping and conduits is necessary after, or during, assembly of this type of elements for a system of joists and of other types of available systems of joists. The job of installation is difficult and often leads to accidents.

THE INVENTION IN SUMMARY

[0004] It is an objective of the invention to provide a construction element for systems of joists which combines high strength and low weight. This objective is achieved to the degree that the invention adheres to the special features indicated in Patent Claim 1.

[0005] Further advantages and special features of the invention are indicated in the following description, drawings, and dependent patent claims.

A BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The invention will now be described in more detail with the aid of examples of embodiments including reference to attached drawings on which

FIG 1 is a plane view from above of an embodiment of a construction element for a system of joists according to the invention,
FIG 2 is a cross-section from line II-II in FIG 1,
FIG 3 is a further cross-section of an embodiment of a construction element for a system of joists according to the invention,
FIG 4 is a sectional view at IV-IV at the short end in the embodiment according to FIG 1,
FIG 5 is a schematic plane view from above of a section of a construction element for a system of joists according to the invention,
FIG 6 is a schematic sectional view at VI-VI in FIG 5,
FIG 7 is a schematic sectional view at VII-VII in FIG 1 of a section of the construction element for a system of joists,
FIG 8 is a plane view of the section in FIG 7 and
FIG 9 which schematically shows longitudinal recesses at one end of an embodiment of a construction element for a system of joists according to the invention.

THE INVENTION

[0007] According to the embodiment of the invention shown in FIG 1, a construction element for a system of joists 10 is embodied as a longitudinal, parallelepiped block. Elements 10 are designed to be assembled adjacent to each other on a new or existing framework of steel, masonry, concrete, or wood. Together the construction elements 10 form a system of joists in a dwelling or in buildings for offices and stores. The construction element for a system of joists 10 is produced in a factory and then transported ready-made to a construction site for assembly. The upper side shown in FIG 1 is already prepared in the factory for covering with flooring, for example plastic and/or linoleum carpeting or wood, a laminated covering or similar. Upper side 14 can also be provided with an optional slanted surface for channeling moisture. Through the fact that upper surface 14 can already be prepared in the factory to have the required evenness and surface structure, the work of assembly at the construction site is considerably simplified.

[0008] FIG 2 is a cross section of a construction element for a system of joists 10 and shows that the construction element 10 consists of three layers. A central layer 11 consists of light clinker concrete or another material with similar weight and strength characteristics. The light clinker concrete layer 11 is sandwiched on two sides by a first lower concrete layer 12 and a second upper concrete layer 16. Other materials with concrete-like characteristics can also be used. The three layers together form a sandwich construction. The thickness of the different layers can vary with the current application and requirements for strength. In an advantageous embodiment the thickness of concrete layers 12 and 16 is 40 mm and the thickness of the light clinker concrete is 200 mm.

[0009] Reinforcement members 13 run in the longitudinal direction through the construction element for a system of joists 10, preferably in the form of welded reinforcement beams. An example of a reinforcement beam of this kind is FUNDIA SB with steel quality 500. Reinforcement member 13 extends in a vertical direc-

tion from lower concrete layer 12 through light clinker concrete layer 11 into upper concrete layer 16. The sandwich construction is made very strong by this means but maintains a low weight. Piping and conduits 15, extending through light clinker concrete layer 11 for water and/or drainage and particularly for ventilation channels, are already provided for in the factory. Piping and conduits 15 are combined in seams between two construction elements for a system of joists 10 with special connecting units, see FIG 5 and FIG 6. Corresponding connections are made with the ventilation channels. The running of piping, conduits, and ventilation channels can thus be accomplished in an environment which results in better conditions for good quality and less risk of on-the-job injuries.

[0010] The surfaces on construction elements 10 which are designed to face each other are provided with a putty compound bevel 17. Finishing of these putty compound bevels 17 is the only post-production processing which needs to be done after assembling of the construction elements for a system of joists 10. Further sealing between adjacent construction elements 10 is done with a sealing strip 18, for example in the form of an EPDM-rubber strip. FIG 3 and FIG 4 show an alternative embodiment of a construction element for a system of joists 10 with a larger beveled section 19. When delivered, lower surface 20 of construction elements 10 is finished completely as a surface for painting. No spackling or similar treatment is required on a lower surface 20 which has bevel 21 at the ends.

[0011] FIG 5 shows an end section of two construction elements for a system of joists 10 lying adjacent to each other. A floor drain 22 is placed in the left construction element 10. The floor drain can be ready-made at the factory. Piping and conduits 15 can also be ready-made at the factory by being poured into light clinker concrete layer 11 in the process of its fabrication. Openings 23 are made in the end sections of construction element for a system of joists 10 where the piping and conduits emerge. Coupling means 24 are installed in openings 23, which connect piping and conduits 15 in the two adjacent construction elements 10. A so-called JET-coupling is a suitable design of coupling means 24. The sectional view in FIG 6 shows coupling means 24 between the piping and conduits 15.

[0012] FIG 7 and FIG 8 show connection means 25, which connect and secure two construction elements for a system of joists 10 to each other. Connection means 25 are installed in further openings 26 and in the embodiment shown comprise flat bars with holes. Screw bushings are cast in light clinker concrete layer 11 so that screws 28 can be inserted through the holes in the bars and screwed tight.

[0013] According to the embodiment shown in FIG 9 the ends of construction elements for a system of joists 10 are provided with longitidunal recesses 29. Anchors to the framework or similar can be cast in recesses 29.

Claims

1. A factory-made construction element for a system of joists (10), multiple construction elements being designed to be placed adjacent to each other on a framework, ***characterized in***
that a layer of light clinker concrete (11) is provided between a first concrete layer (12) and a second concrete layer (16) and
that an elongate reinforcement member (13) extends in a longitudinal direction through said construction element between the concrete layers.

2. A construction element according to Claim 1, ***characterized in***
that an upper surface (14) in construction element (10) is produced to be plane in the factory and finished for application of floor covering.

3. A construction element according to Claim 1, ***characterized in***
that piping and conduits (15) for water and/or drainage are cast in light clinker concrete layer (11) in the factory.

4. A construction element according to Claim 2, ***characterized ins***
that space for floor drain (16) is provided in upper surface (14) of construction element (10).

5. A construction element according to Claim 1, ***characterized in***
that lateral surfaces of the construction element for a system of joists (10) are provided with a first set of openings (23) for running of pipes (15) and coupling means (24) between said pipes (15).

6. A construction element according to Claim 1, ***characterized in***
that lateral surfaces of said construction element for a system of joists (10) are provided with a second set of openings (26) for connection means (25) to secure said construction elements (10).

7. A construction element according to Claim 6, ***characterized in***
that said connection means (25) comprise a metal plate.

8. A construction element according to Claim 6, ***characterized in***
that said construction elements (10) for a system of joists are provided, at the location of the openings (26), with first cast machine members (27) for interaction with second machine members (28) holding said connection means (25).

9. A construction element according to Claim 8,

characterized in
that siad first machine member (27) comprises at least a screw bushing and
that said second machine member (28) comprises at least a screw.

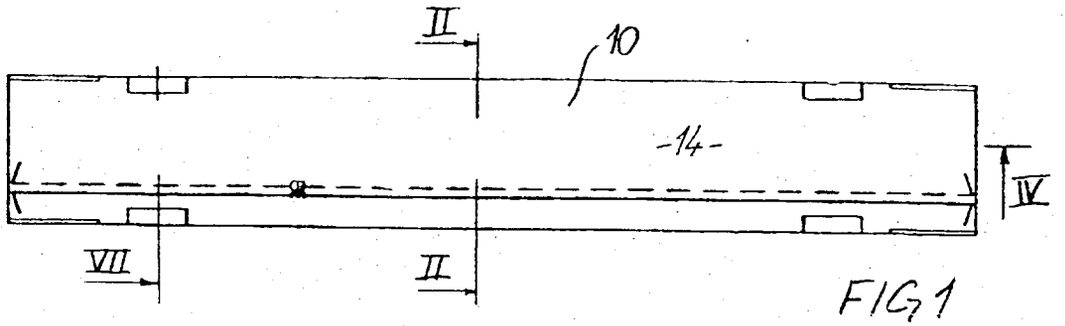

FIG 1

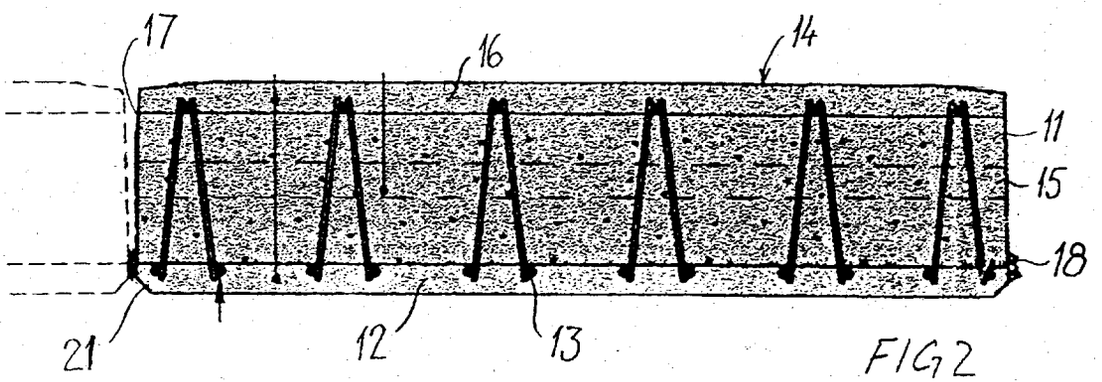

FIG 2

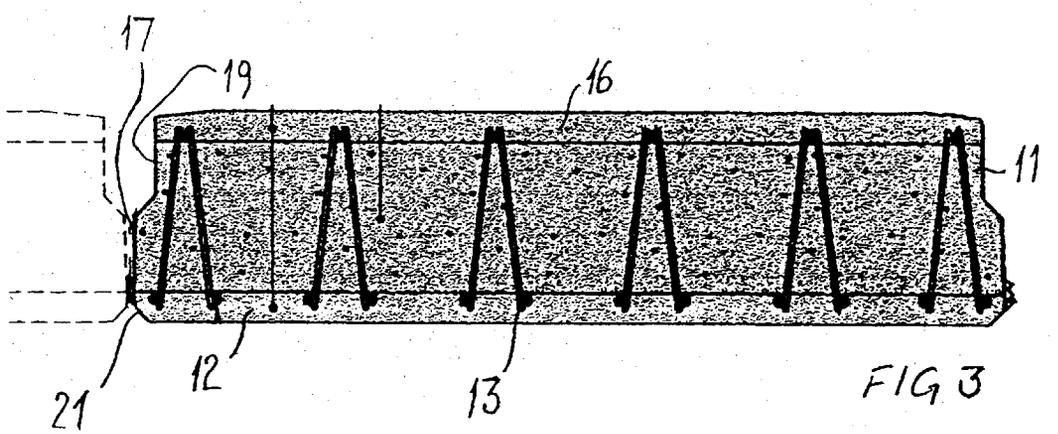

FIG 3

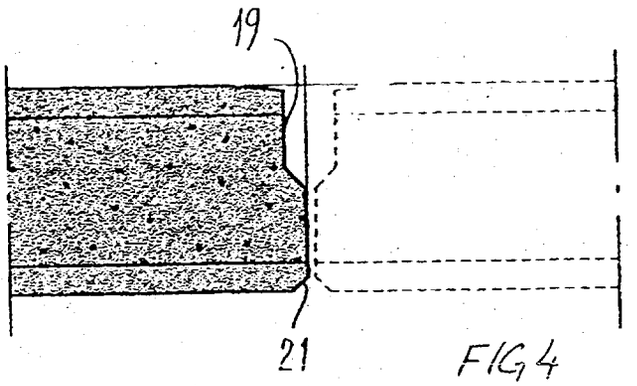

FIG 4

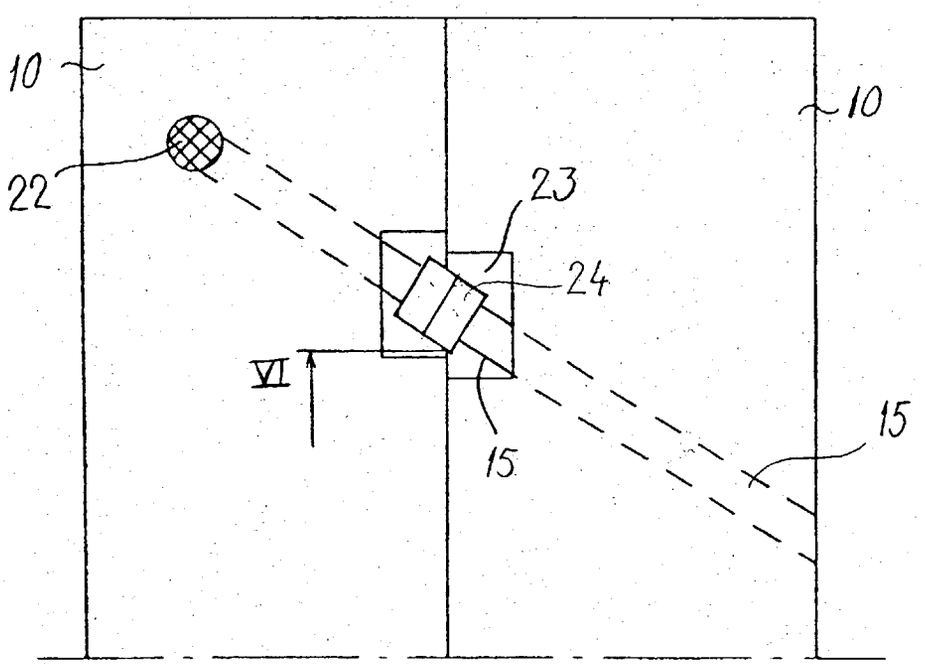

FIG 5

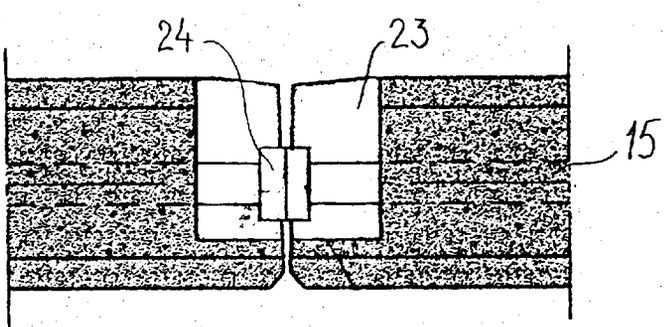

FIG 6

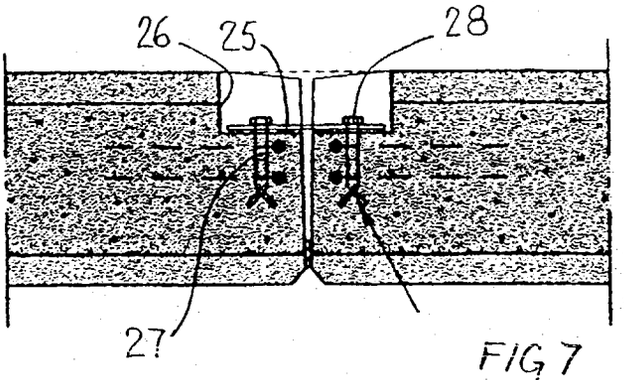

FIG 7

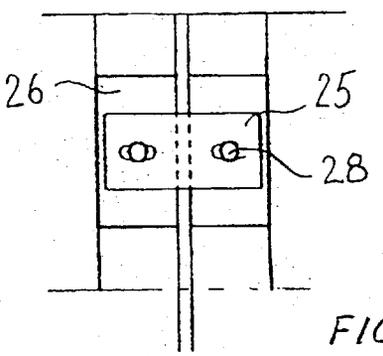

FIG 8

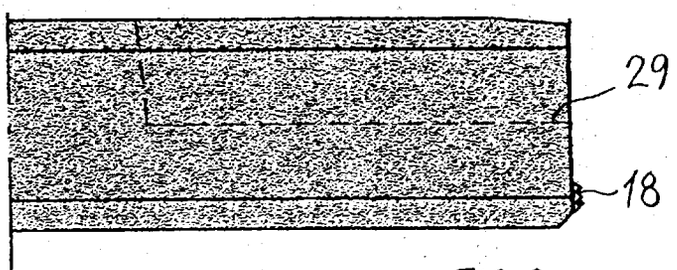

FIG 9