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(71) Applicant: **Torres Mesa, Wuiljes Ibrahim**
51069 Köln (DE)

(72) Inventor: **Torres Mesa, Wuiljes Ibrahim**
51069 Köln (DE)

(74) Representative: **González López-Menchero, Álvaro Luis**
Protectia Patentes y Marcas, S.L.
C/ Almagro, 3 2º izda.
28010 Madrid (ES)

(54) **CONSTRUCTION SYSTEM USING PLASTIC BLOCKS**

(57) The present invention relates to a construction system using plastic blocks that comprises plastic rectangular prismatic blocks as individual construction units with lateral coupling means and other vertical coupling means at both the lower and upper part thereof, wherein each of the blocks has at least one vertical through cavity where both the lateral coupling means (2) and the vertical coupling means (8) serve to join the adjacent blocks to each other in a stable and aligned manner. There may be two lateral coupling means that are on opposite or perpendicular sides, or there may be three, one of which is perpendicular to the other two that are arranged opposite each other.

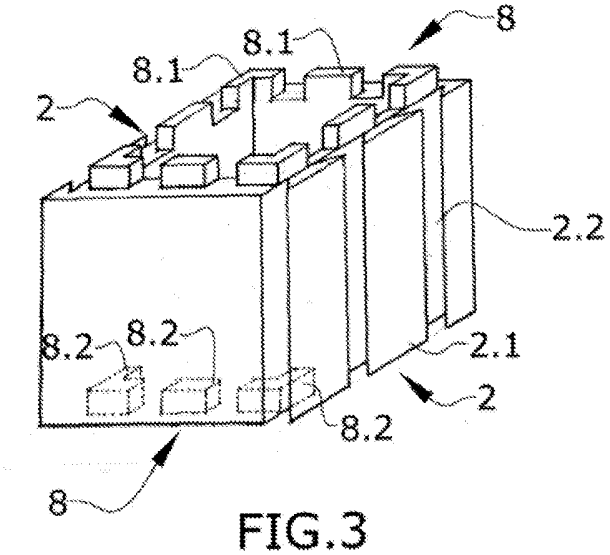

FIG.3

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Description

OBJECT OF THE INVENTION

[0001] The object of the present invention, as per the title of the invention, is a construction system using plastic blocks, which are manufactured from plastics intended for recycling.

[0002] The present invention is characterised by the special design and configuration of each and every one of the parts that make up the construction system so that, on the one hand, the reuse of plastic on a large scale is achieved, and on the other hand, a construction system that allows to join blocks both horizontally and vertically without the need to use any additional material to join the blocks of the construction system is achieved.

[0003] Therefore, the present invention falls within the field of construction and more precisely among the blocks used as individual construction units.

BACKGROUND OF THE INVENTION

[0004] Many construction methods are known to date with blocks made of different materials such as; concrete blocks; terracotta; prefabricated houses; wooden houses etc.

[0005] All of them use natural resources for the production thereof such as land, stone and wood, thus unfortunately destroying mountains and forests, as well as the pollution of the environment by the waste from the production of said construction systems.

[0006] All of this causes a loss of natural resources in addition to environmental pollution. Furthermore, as a result of the current way of life, the problem of plastic and polymer waste keeps increasing.

[0007] Taking into account that there is a worldwide housing shortage in many low-income countries, or even in developed countries in which not everyone can afford a decent house, a solution has been sought that jointly solves the following problems:

- environmental effects derived from the use of natural resources
- plastic and polymer waste management
- the housing shortage in developing countries and high costs in developed countries.

[0008] Therefore, the present invention seeks to jointly solve all the problems mentioned by developing a construction system using plastic blocks such as the one described below and which is included in its essential nature in the first claim.

DESCRIPTION OF THE INVENTION

[0009] The object of the present invention is a construction system using plastic blocks that comprises plastic rectangular prismatic blocks as individual construction units with lateral coupling means and other vertical coupling means at both the lower and upper part thereof, wherein each of the blocks has at least one vertical through cavity where both the lateral coupling means (2) and the vertical coupling means (8) serve to join the adjacent blocks to each other in a stable and aligned manner.

[0010] The lateral coupling means can be arranged on opposite sides which allows to join the blocks in an aligned manner forming walls, facades or partitions, they may also be on perpendicular sides in which case they serve to form corners. There may also be lateral coupling means in three different parts of the blocks, on two opposite sides and on one side transversally oriented to the coupling means of the two transversal sides and positioned at an intermediate point of the coupling means of the opposite lateral sides so that they serve to form intermediate separation partitions.

[0011] The blocks have at least one vertical through cavity so that, aligned with other through cavities of the blocks immediately above and below, they form a continuous cavity in which a reinforced concrete beam can be housed or formed in situ by introducing a steel frame and then filled with concrete.

[0012] The through cavities of the blocks also serve as channels for different installations, such as electricity, water, communications, heating, etc.

[0013] The cavities that are freed from any of the aforementioned uses can be filled with thermal insulating material to ensure thermal stability inside the built home.

[0014] The advantages of this system are that a home can be built in less time than usual; the final weight of the construction is reduced; it is an earthquake-resistant construction by using plastic blocks; moreover, it does not allow moisture to pass through; offers 100 year lifespan; the material itself is resistant to high and low temperatures in addition to being insulating, so it forms energy-efficient buildings.

[0015] Except when indicated otherwise, all of the technical and scientific elements used in this specification have the meaning commonly understood by a person with average skill in the art to which this invention belongs. When this invention is put into practice, methods and materials may be used that are similar or equivalent to the ones described in the specification.

[0016] Throughout the description and the claims, the word "comprises" and its variants are not intended to exclude other technical features, additions, components or steps. For those skilled in the art, other objects, advantages and features of the invention will be deduced from both the description and the practical use of the invention.

DESCRIPTION OF THE FIGURES

[0017] As a complement to the description provided herein, and for the purpose of helping to make the features of the invention more readily understandable, in accordance with a preferred practical exemplary embod-

iment thereof, said description is accompanied by a set of drawings which, by way of illustration and not limitation, represent the following.

Figure 1 depicts a perspective representation of the construction system where some details of the blocks can be seen.

Figure 2 shows a perspective view of the manner in which a dividing partition is formed.

Figure 3 shows a perspective view of a block where the lateral and vertical coupling means can be seen.

Figure 4 shows a block with three vertical cavities.

Figure 5 shows a block with three vertical cavities to form a corner of the construction.

Figure 6 shows a block with the lateral coupling means with transversal orientation and used to form a corner.

Figure 7 shows a block with two cavities to be able to erect a dividing or intermediate partition.

Figure 8 shows a block with three cavities to be able to erect a dividing or intermediate partition.

Figure 9 shows a block with three cavities to also be able to raise an intermediate partition in an alternative embodiment.

Figure 10 shows a height reduction given to a block on two of its opposite sides in order to allow, for example, a beam and different facilities to pass through, such as electricity, water, heating communications, among others.

PREFERRED EMBODIMENT OF THE INVENTION

[0018] In light of the figures, a preferred embodiment of the proposed invention is described below.

[0019] In Figure 1, we can see part of a construction made with the system object of the invention in which plastic blocks (1) are used as individual construction units, wherein the blocks (1) have lateral coupling means (2). which are complementary to each other, and also have several through cavities (3).

[0020] When the blocks (1) are arranged coupled on top of each other, the vertical cavities (3) that the blocks (1) have are aligned with each other, so that a concrete or steel beam (4) can be housed or formed inside or a steel frame (5) can be accommodated and then concrete can be spread.

[0021] Figure 2 shows how to proceed to form intermediate or dividing partitions (7), for which blocks (1) are used that have a third lateral coupling means (6) orienting the two opposite lateral coupling means (2) transversely.

[0022] Figure 3 shows the lateral coupling means (2) in addition to the vertical coupling means (8).

[0023] The lateral coupling means (2) of each block are complementary to each other, and in a possible embodiment they may comprise a series of projections (2.1) and recesses (2.2) that are dovetail-shaped in the embodiment shown.

[0024] Moreover, the vertical coupling means (8) are arranged on both the upper side and the lower side and may comprise projections (8.1), as well as recesses (8.2) having a complementary configuration.

[0025] Both the lateral coupling means (2) and the vertical coupling means (8) ensure a union and attachment between elements so that they remain together in a stable and perfectly aligned manner.

[0026] Figure 4 shows a block of three vertical through cavities in which the lateral coupling means are in an opposite arrangement, so that they are used to form aligned walls, while Figure 5 shows a corner block (9) with three through cavities in which the coupling means (2) are arranged with a transversal orientation with respect to each other so that they allow the formation of a corner of a construction.

[0027] Figure 6 shows a second corner block (10) having two through cavities (3) in which, as in Figure 5, the lateral coupling means (2) are transversely oriented between the same and serve to form the corner of a construction.

[0028] Building blocks are shown in Figures 7 and 8, the one in Figure 7 is a first dividing block (11) having two through cavities (3) that serves to form intermediate or dividing partitions, while the one in Figure 8 is a dividing block (12) having three through cavities (3). Both blocks (10) and (11) serve to form dividing or intermediate partitions by having a third lateral coupling means (6) transversely oriented to the other lateral coupling means (2) which are opposite each other.

[0029] Figure 9 shows a third dividing block (13) that serves to form dividing walls and that has a third lateral coupling means (6) arranged perpendicular to the lateral coupling means (2) which are opposite each other.

[0030] Finally, Figure 10 shows a recessed block (14) showing a recess (14) on two of its opposite sides that can serve to house a horizontal beam, as well as different installations, such as electricity, water, communications, heating, etc.

[0031] Having thus adequately described the nature of the present invention, as well as how to put it into practice, it must be noted that, within its essential nature, the invention may be carried out according to other embodiments differing in detail from that set out by way of example, which the protection sought would equally cover, provided that the fundamental principle thereof is not altered, changed or modified.

Claims

1. A construction system using plastic blocks **characterised in that** it comprises plastic rectangular prismatic blocks (1) as individual construction units with lateral coupling means (2) and other vertical coupling means (8) at both the lower and upper part thereof, wherein each of the blocks has at least one vertical through cavity (3) where both the lateral coupling means (2) and the vertical coupling means (8) serve to join the adjacent blocks to each other in a stable and aligned manner.

2. The construction system using plastic blocks according to claim 1 **characterised in that** there are two lateral coupling means (2) that are arranged on opposite sides, which allows to join the blocks in an aligned manner forming walls, facades or partitions.

3. The construction system using plastic blocks according to claim 1 **characterised in that** there are two lateral coupling means (2) that are arranged on perpendicular sides in which case they serve to form corners.

4. The construction system using plastic blocks according to claim 1 **characterised in that** there are three lateral coupling means, two of them on opposite sides and the third coupling means on one side transversely oriented to the coupling means of the two transversal sides and positioned at an intermediate point of the coupling means of the opposite lateral sides so that they serve to form intermediate separation partitions.

5. The construction system using plastic blocks according to any of the preceding claims **characterised in that** the lateral coupling means (2) of each block are complementary to each other and comprise a series of projections (2.1) and recesses (2.2) that are dovetail-shaped in the embodiment shown.

6. The construction system using plastic blocks according to any of the preceding claims, **characterised in that** the vertical coupling means (8) are arranged both on the upper side and on the lower side and comprise projections (8.1), as well as recesses (8.2) having a complementary configuration.

Amended claims under Art. 19.1 PCT

1. A construction system using plastic blocks that comprises plastic rectangular prismatic blocks (1) as individual construction units with lateral coupling means (2) and other vertical coupling means (8) at both the lower and upper part thereof, wherein each of the blocks has at least one vertical through cavity (3) where both the lateral coupling means (2) and the vertical coupling means (8) serve to join the adjacent blocks to each other in a stable and aligned manner, **characterised in that** the lateral coupling means are some of the following alternatives:

   - there are two lateral coupling means (2) that are arranged on opposite sides
   - there are two lateral coupling means (2) that are arranged on perpendicular sides in which case they serve to form corners.
   - there are three lateral coupling means, two of them on opposite sides and the third coupling means on one side transversely oriented to the coupling means of the two transversal sides and positioned at an intermediate point of the coupling means of the opposite lateral sides so that they serve to form intermediate separation partitions.

   wherein
   the lateral coupling means (2) of each block are complementary to each other and comprise a series of projections (2.1) and recesses (2.2) that are dovetail-shaped.

2. The construction system using plastic blocks according to claim 1 **characterised in that** the vertical coupling means (8) are arranged on both the upper side and the lower side and comprise projections (8.1), as well as recesses (8.2) having a complementary configuration.

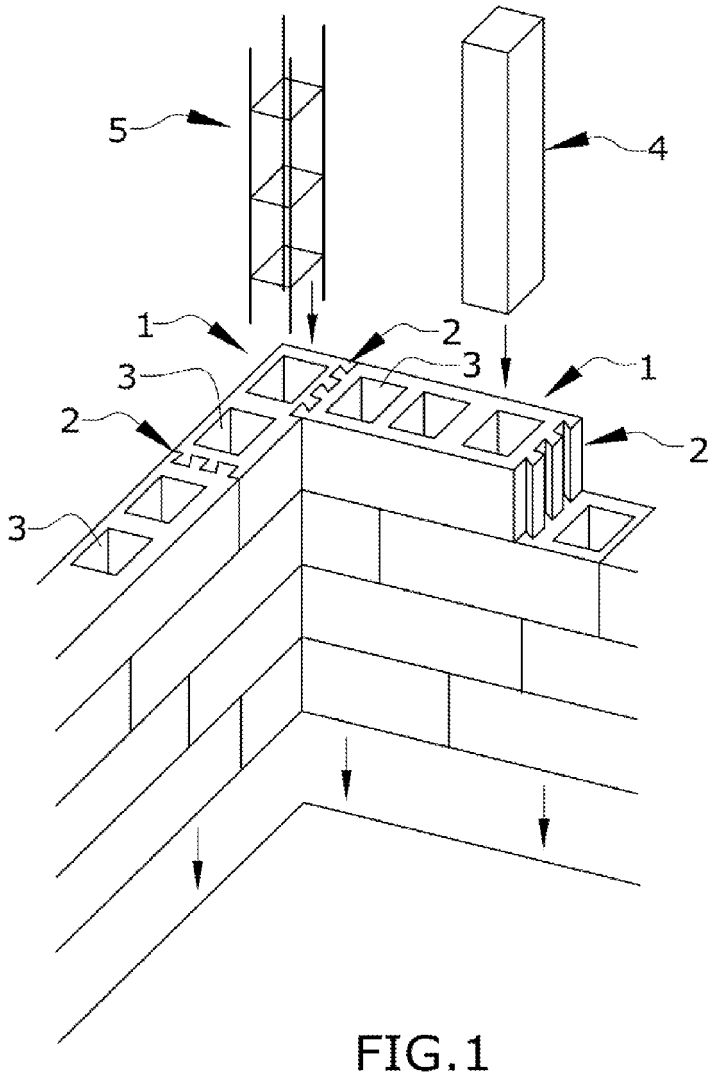

FIG.1

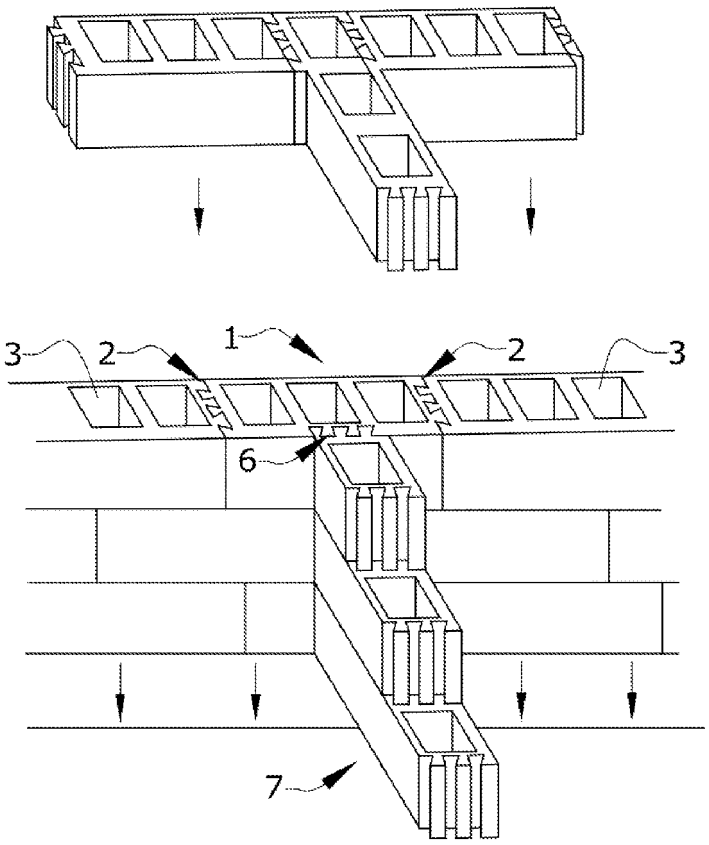

FIG.2

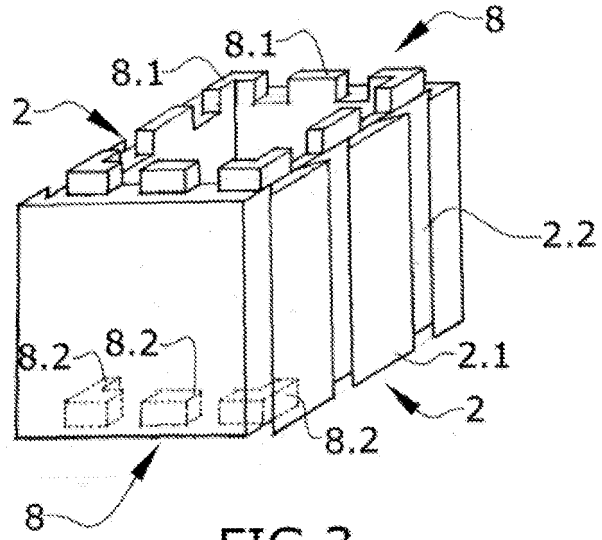

FIG.3

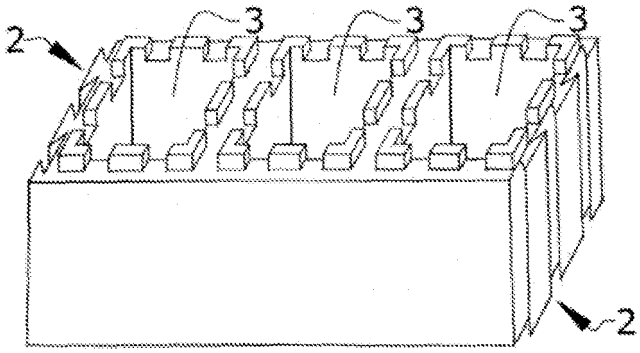

FIG.4

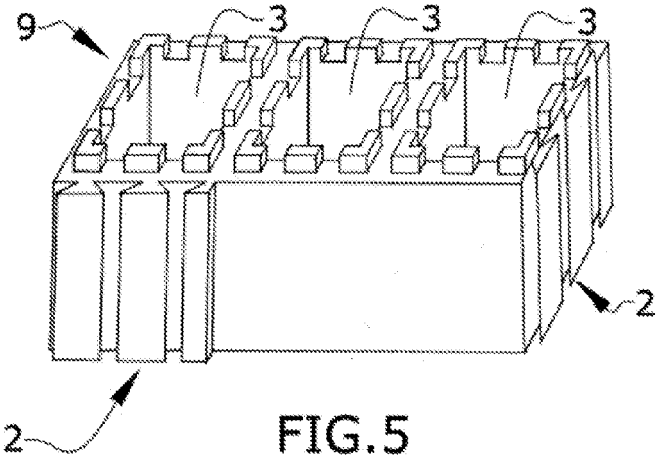

FIG.5

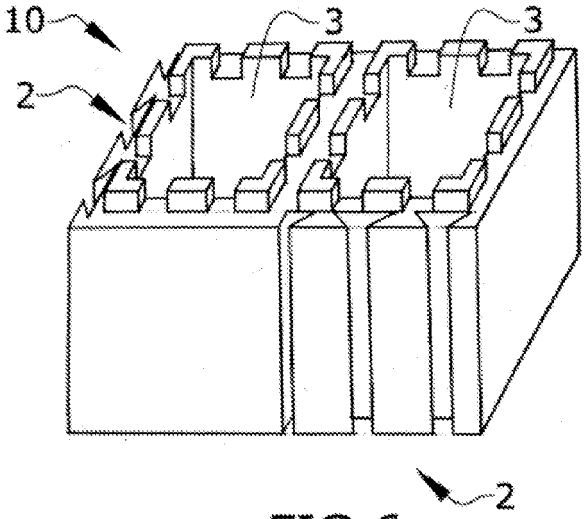

FIG.6

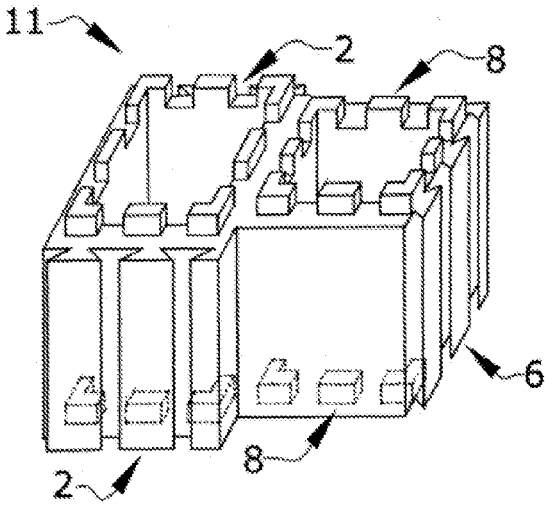

FIG.7

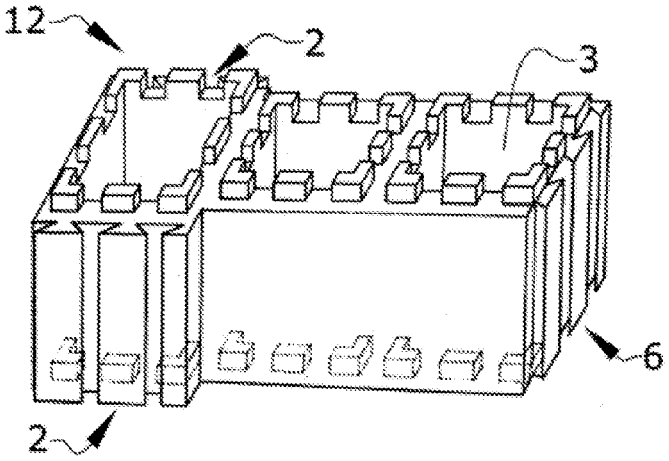

FIG.8

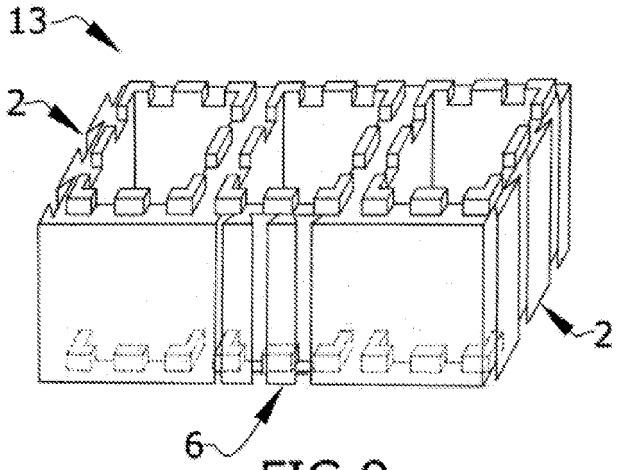

FIG.9

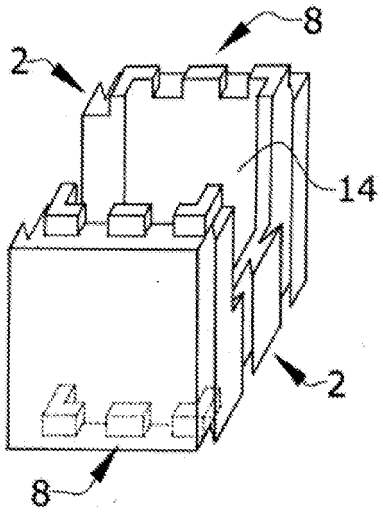

FIG.10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2021/070417

A. CLASSIFICATION OF SUBJECT MATTER

E04B2/46 (2006.01)
E04C1/00 (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, INVENES

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0166249 A2 (INTERBLOCK PARTNERS LTD) 02/01/1986, abstract; page 1, lines 6 - 19; page 2, line 22 - page 3, line 19; page 5, line 1 - page 8, line 34; figures.	1-6
X	WO 2016205922 A1 (DEVITO CIRO) 29/12/2016, Paragraphs [0002 - 0011]; paragraphs [0019 - 0029]; paragraph [0052]; paragraphs [00103 - 00123]; paragraphs [00154 - 00156]; figures.	1-6
X	GB 2500331 A (PHI DESIGN LTD) 18/09/2013, Page 10, line 12 - page 12, line 6; figures.	1-6
A	CN 107060071 A (DUAN ZHIXIANG) 18/08/2017, Abstract from DataBase EPODOC. Retrieved of EPOQUE; figures.	1-6

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
03/02/2022	**(04/02/2022)**
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04	Authorized officer R. Peñaranda Sanzo Telephone No. 91 3493051

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2021/070417

C (continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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A	US 3782049 A (SACHS M) 01/01/1974, Column 2, line 29 - column 3, line 13; figures.	1-6

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Information on patent family members

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