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(54) **METHOD FOR PRODUCTION OF CONCRETE DOUBLE-WALL PANELS**

(57) Method of production of concrete double-wall panels, wherein a layer of concrete (4) is poured into the bottom of a mould (1), covering a welded wire fabric (2) and the lower end portion of vertical structures (3) of rods; subsequently a second layer of concrete (10) is poured

into the upper part of the mould, over a plate (7) of insulating material arranged at a height on the vertical structures (3), said concrete covering a third welded wire fabric (9) fitted to the upper end portion of the vertical structures (3); after which the two layers of concrete (4) and (10) are left to cure simultaneously.

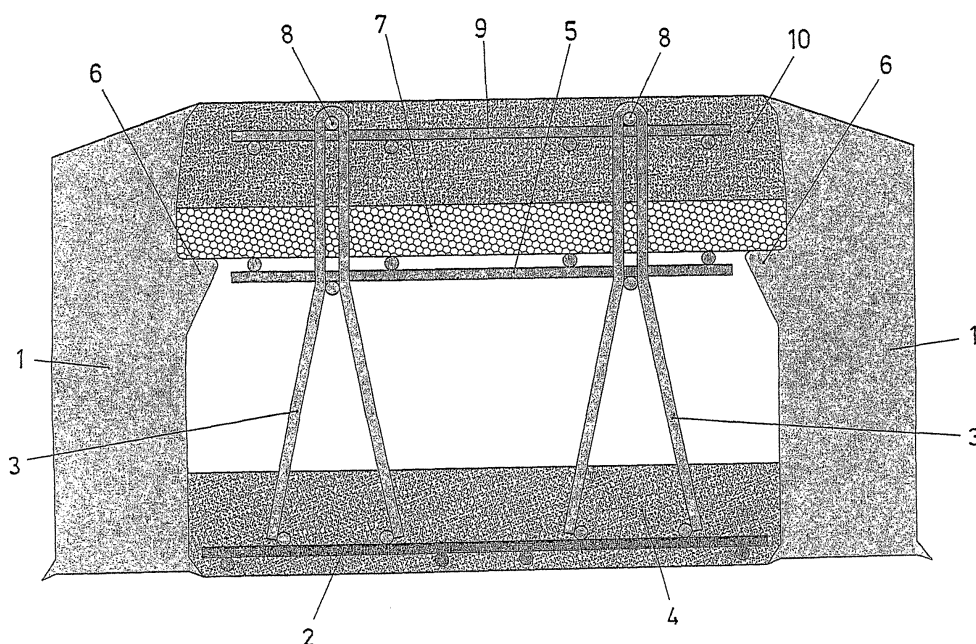


Fig.1

Description

Field of the Art

[0001] The present invention relates to the field of construction, proposing a method for production of prefabricated concrete double-wall panels, which allows making said panels with simultaneous curing of the two layers of concrete making up the panel and maintaining the position of the panel fixed during the entire production process.

State of the Art

[0002] The use of prefabricated concrete double-wall panels is known in the field of construction, which panels are used as vertical loading elements, being used for retaining walls, enclosures with a resistant function and similar applications.

[0003] Said concrete double-wall panels are formed with two parallel layers of concrete connected by means of metal reinforcements with a certain separation between them, such that the assembly thus formed is easy to install in the application works, wherein the intermediate chamber is filled with a pouring of concrete connecting the two plates of the prefabricated panel, determining a compact wall in the entire thickness which has high strength.

[0004] The production of these prefabricated double-wall panels is, however, slow and expensive, since one of the layers of concrete must first be made, incorporating connected thereto the metal reinforcements of the structure of the panel, and this assembly being formed must be left on standby until the concrete of the formed layer sets, to subsequently overturn the assembly being formed for the purpose of being able to make the second layer of concrete, which in turn must be left to set before being able to handle the panel.

[0005] The need to form first one of the layers of concrete and subsequently the other one, with a waiting time until the concrete of the first layer is cured before making the second layer, makes the production process for these panels very long, therefore the productive output is very low, and in addition the need of having to overturn the panel to form the second layer of concrete entails difficulties and considerable risks.

Object of the Invention

[0006] According to the invention, a method for production of the mentioned concrete double-wall panels is proposed, which is carried out according to implementation features which allow making the entire panel without intermediate waiting and in one and the same position, thus allowing a quick process and without the difficulties of overturning the panel in the production.

[0007] This method object of the invention consists of arranging in a mould for production of the panels a lower

welded wire fabric and connected thereto vertical structures of rods, a layer of concrete being poured into the bottom of the mould, covering the welded wire fabric and the lower ends of the vertical structures of rods, such that in this arrangement another welded wire fabric is placed at a height on the vertical structures of rods, on which welded wire fabric there is arranged a plate of insulating material, such as polystyrene, and then a third welded wire fabric is arranged in the upper part on the same vertical structures, a second layer of concrete being poured over the plate of insulating material, covering the upper welded wire and the ends of the vertical structures of rods.

[0008] In such conditions, the two layers of concrete making up the panel can be left to cure simultaneously, whereby the production process only requires the time of a curing and therefore the double-wall panel is obtained much more quickly than with the conventional method in which the curing operations of the two layers of concrete cannot be simultaneous.

[0009] With this method of the invention the panel is furthermore maintained in the same position during the entire production process, without the need of having to overturn it, since the first layer of concrete is deposited on the bottom of the mould and the second layer of concrete on the plate of insulating material which is supported on the vertical structures of rods, thus eliminating the difficulties and drawbacks of overturning the panel.

[0010] For the production of the double-wall panels according to this method of the invention, a mould is contemplated which is provided with a projection in the inner part of its side walls, determining seats on which the plate of insulating material is supported at its sides, whereby a closing is established between the mould and the plate of insulating material preventing the passage of the concrete of the upper layer between both of them, at the same time that the necessary strength of the plate of insulating material is achieved to support the concrete of said upper layer, without the welded wire fabric on which this plate of insulating material having to reach until the edge, wherein it could cause difficulties for placing the double-wall panel in its application assembly.

[0011] Therefore, the method of the invention has truly advantageous features, acquiring its own identity and a preferred character for the function of production of the concrete double-wall panels for which it is intended.

Description of the Drawings

[0012]

Figure 1 shows a sectional view of a double-wall panel inside the mould of production according to the method of the invention.

Figure 2 is a partial sectional view of the first phase of production of the double-wall panel according to the invention.

Figure 3 is a partial sectional view of an intermediate

phase of the production of the double-wall panel according to the invention.

Detailed Description of the Invention

[0013] The object of the invention relates to a method for production of concrete double-wall panels, with features allowing a quick process in conditions which are very easy to carry out.

[0014] The method of the invention consists of arranging, inside a mould (1) for forming the panel to be made, a welded wire fabric (2) on the bottom, and associated to said welded wire fabric vertical structures (3) of rods, a layer of concrete (4) being deposited, once this is so, said concrete covering the welded wire fabric (2) and the lower end portion of the vertical structures (3), as shown in Figure 2.

[0015] After the concrete of the mentioned layer (4) is deposited, a second welded wire fabric (5) is arranged at a height on the vertical structures (3), for which horizontal rods on which said second welded wire fabric (5) is supported are fitted to the vertical structures (3).

[0016] A plate (7) of insulating material, such as polystyrene or another similar material is then placed on the mentioned second welded wire fabric (5), which plate (7) is supported on the welded wire fabric (5), making the upper end portions of the vertical structures (3) pass through said plate (7), as shown in Figure 3.

[0017] In order to place the plate (7) on the welded wire fabric (5), said plate (7) can be provided with openings intended for the passage of the upper end portions of the vertical structures (3); but also, without this altering the concept, a plate (7) without openings can be used, making the upper end portions of the vertical structures (3) pass in a forced manner therethrough, breaking the material of said plate (7) by means of the forced insertion of the mentioned upper end portions of the vertical structures (3).

[0018] Other longitudinal rods (8), on which a third welded wire fabric (9) is secured, is subsequently fitted to the upper end portions of the vertical structures (3) by means of binding, welding or another form of securing.

[0019] Once so, another layer of concrete (10) is poured over the plate (7), said concrete covering the upper end portion of the vertical structures (3) together with the third welded wire fabric (9), and in this arrangement the concrete of the first layer (4) deposited in the lower part and the concrete of this second layer (10) deposited on the plate (7) are left to cure simultaneously, the formation of a concrete double-wall panel thus being obtained in the setting time of a single layer of concrete, since the curing of the two layers (4) and (10) making up the double-wall panel occurs simultaneously and without varying the position of the panel.

[0020] For the application of the proposed method for production, the use of a mould (1) with its side walls provided with a protrusion (6) in the inner face, such that said protrusion (6) determines in the mentioned walls a

seating step for supporting the plate (7) of insulating material, as observed in Figures 1 and 3, whereby the strength of said plate (7) for supporting the concrete of the upper layer (10) during the production of the double-wall panel is facilitated, and furthermore the welded wire fabric (5) can be slightly recessed with respect to the side edge of the double-wall panel which is formed, thus preventing it from being a hindrance for placing said double-wall panel for the application assembly in construction works.

[0021] The support of the plate (7) on these protrusions (6) of the walls of the mould (1) also determines a closing between both which effectively prevents the passage of the fluid concrete which is poured to form the layer (10) in the production of the double-wall panel.

Claims

1. A method for production of concrete double-wall panels, of the type comprising two parallel layers of concrete with a certain separation between them and connected by means of a structure of rods, **characterized in that** a welded wire fabric (2) is arranged on the bottom of the inside of a mould (1) and connected to such welded wire fabric there are vertical structures (3) of rods, a layer of concrete (4) being poured which covers the welded wire fabric (2) and the lower end portion of the vertical structures (3), after which a second welded wire fabric (5), on which a plate (7) of insulating material is placed, is secured on the vertical structures (3), whereas a third welded wire fabric (9) is secured at the upper ends of the vertical structures (3), a second layer of concrete (10) being poured over the plate (7) of insulating material, said concrete covering the upper ends of the vertical structures (3) together with the welded wire fabric (9), and in this arrangement the two layers of concrete (4) and (10) are left to cure simultaneously.
2. The method for production of concrete double-wall panels according to claim 1, **characterized in that** the supporting welded wire fabric (5) for the plate (7) of insulating material is secured on the vertical structures (3) at a height with respect to the lower layer of concrete (4).
3. The method for production of concrete double-wall panels according to claim 1, **characterized in that** longitudinal rods (8) are fitted on the upper ends of the vertical structures (3) by means of welding, binding or any other form of securing, with respect to which rods (8) the welded wire fabric (9) intended to be inside the upper layer of concrete (10) is secured.
4. The method for production of concrete double-wall panels according to claim 1, **characterized in that** the walls of the mould (1) which is used for production

have a projection (6) in the inner part, said projection (6) determining a seating step on which the plate (7) of insulating material is supported at its edges, beyond the supporting welded wire fabric (5).

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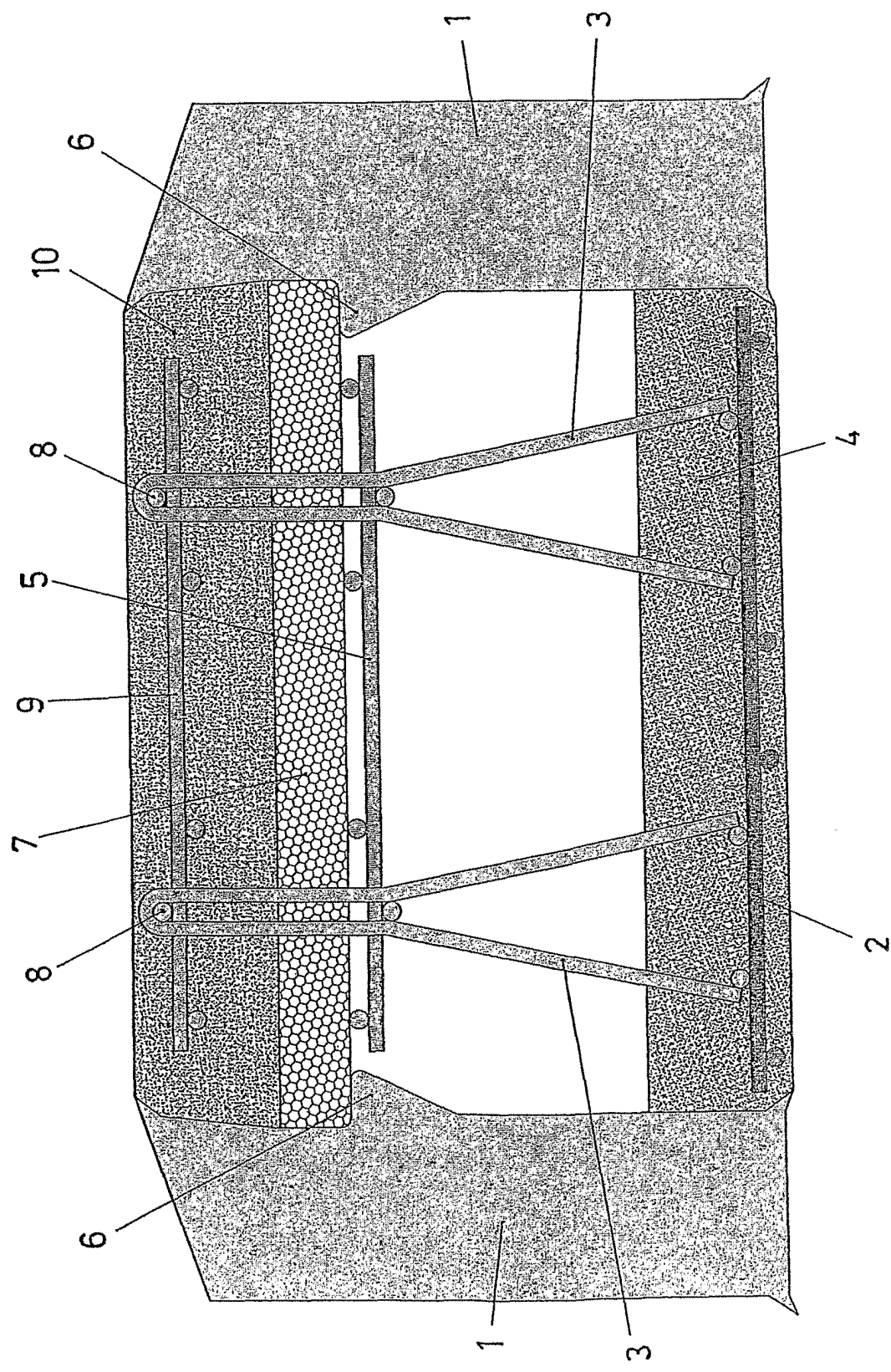


Fig.1

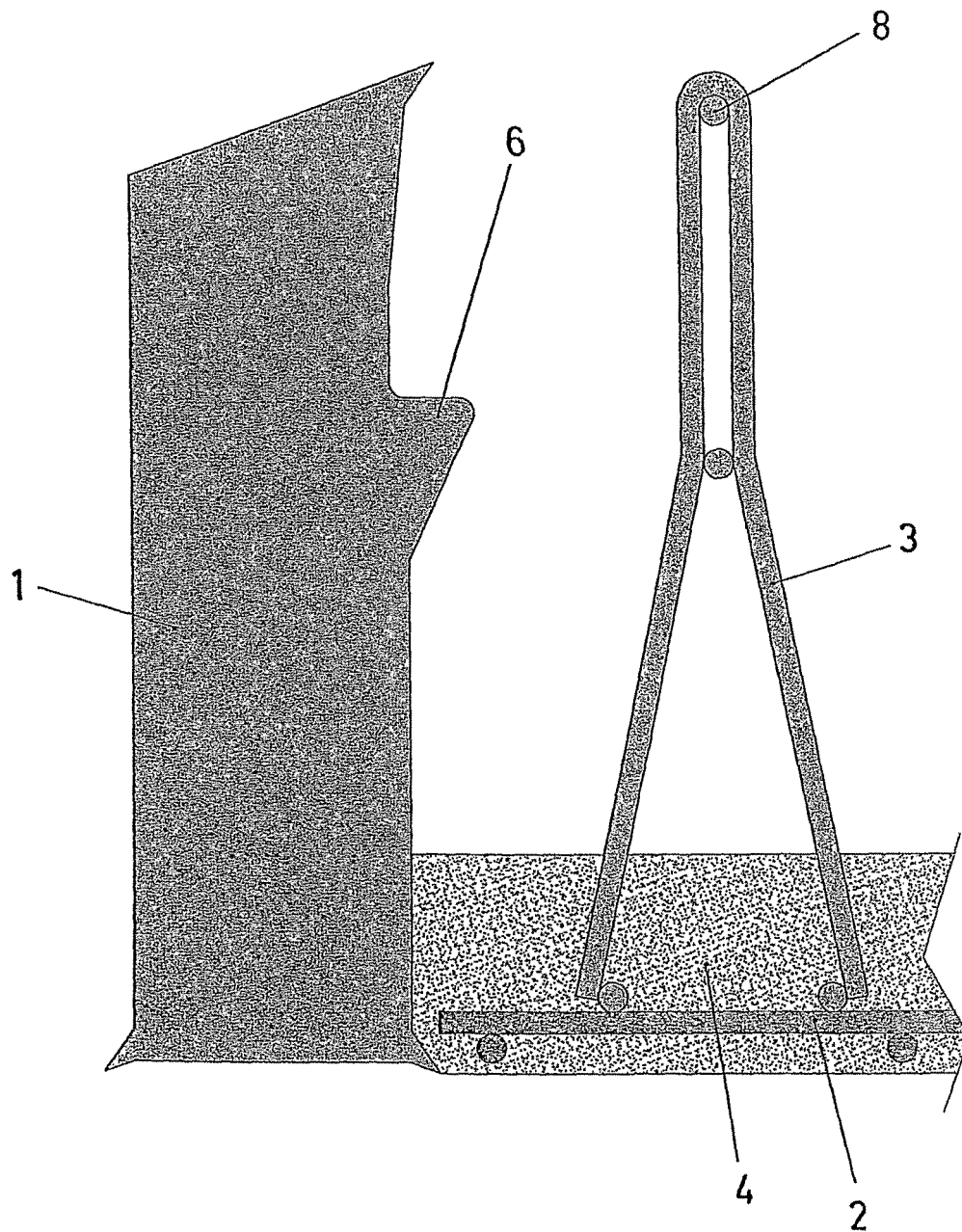


Fig. 2

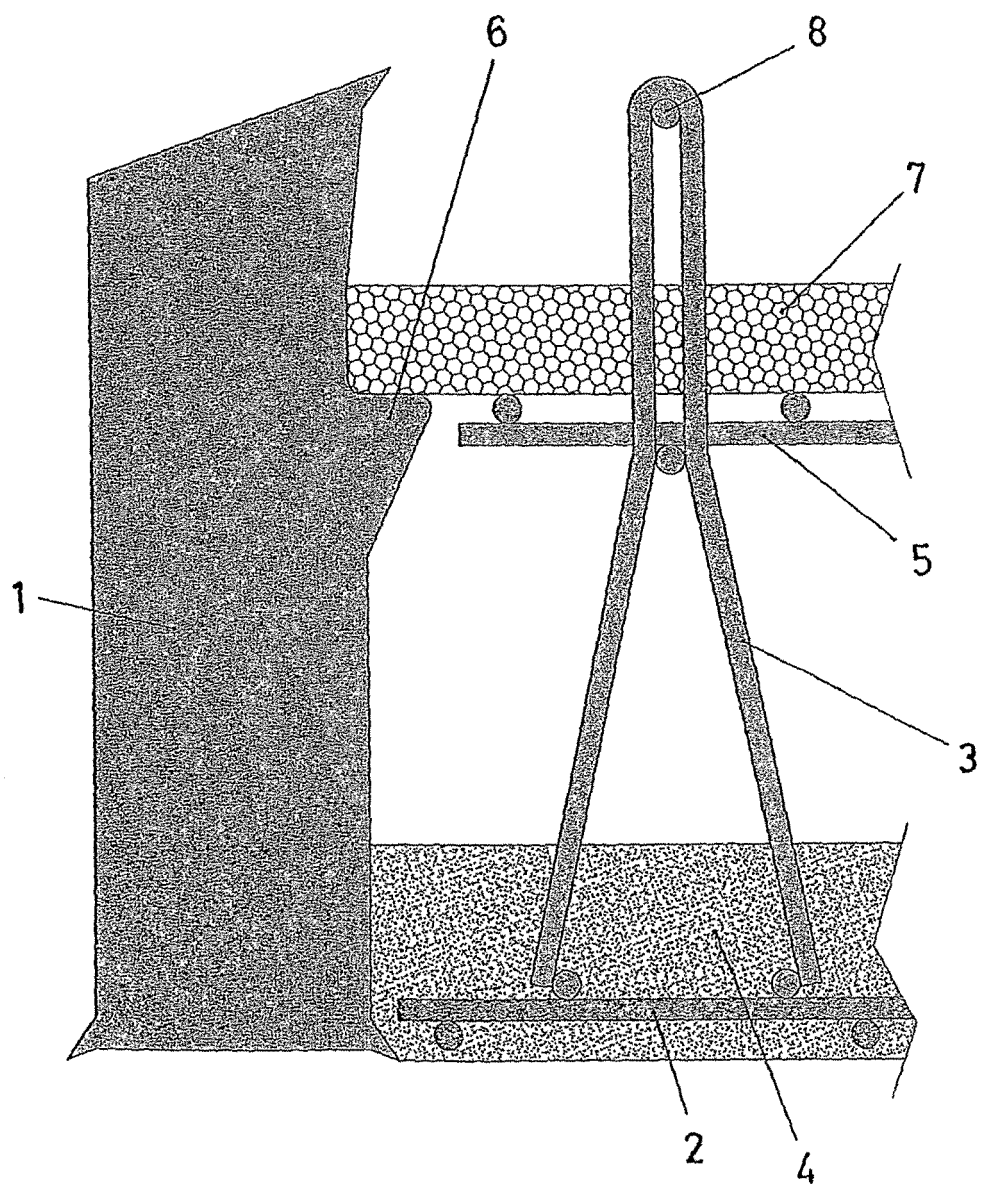


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES 2008/000399

A. CLASSIFICATION OF SUBJECT MATTER

see extra sheet

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)

B28B, E04C

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)

MISTRAL, EPODOC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE29812140U (WERNER) 10.12.1998 Abstract; figure 1	1-3
A	EP1482101A (MARKETING GMBH) 01.12.2004 Abstract; figure 2	1-3
A	EP0936320A (BETONBAUTEILE) 18.08.1999 Abstract; figure 2	1-3
A	DE2823748A (HOUBEN) 14.12.1978 Abstract; figures 1-4	1-3
A	FR2835272A (DIDIER) 01.08.2003 Pages 6-10; figures 1-2	1-3
A	FR2681357A (ACORA) 19.03.1993 Pages 6-8; figures 1-2	1-3
A	EP1010828A (BAUER) 21.06.2000 Abstract; figure 1	1-3

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance.		
"E" earlier document but published on or after the international filing date		
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"O" document referring to an oral disclosure use, exhibition, or other means	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents, such combination being obvious to a person skilled in the art
"P" document published prior to the international filing date but later than the priority date claimed		
	"&"	document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/ ES 2008/000399

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Form PCT/ISA/210 (patent family annex) (April 2007)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES 2008/000399

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