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(71) Applicant: **Resiplac, s.a.**
30400 Caravaca de la Cruz (Murcia) (ES)

(72) Inventor: **CAMPOS TORRALBA, Pedro**
30400 CARAVACA DE LA CRUZ (Murcia) (ES)

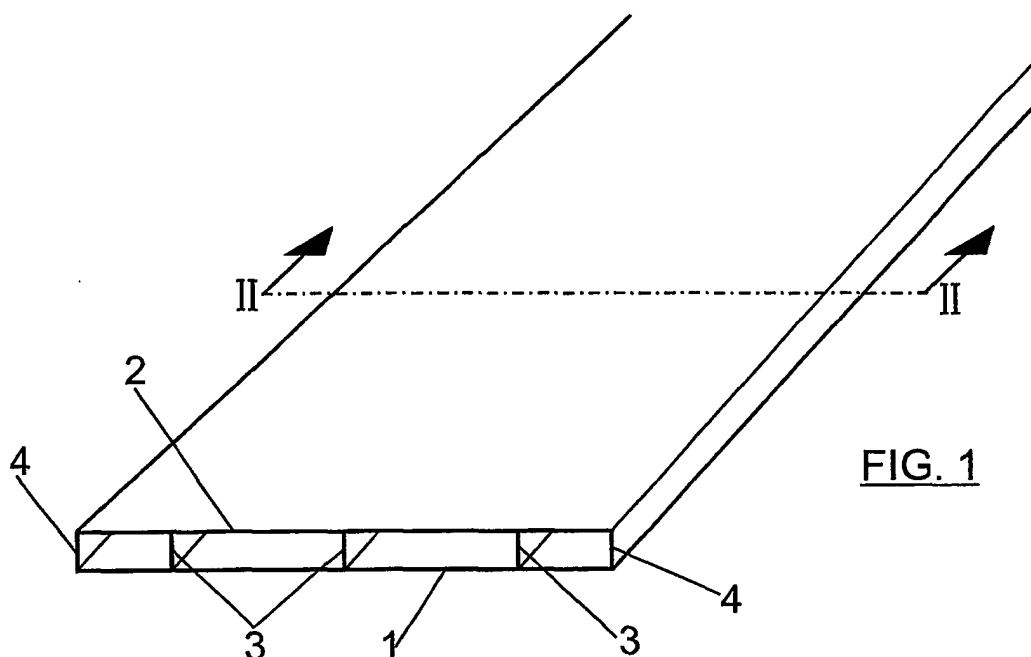
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(74) Representative: **Carvajal y Urquijo, Isabel et al**
Clarke, Modet & Co.,
C/ Goya No. 11
28001 Madrid (ES)

(54) **PANEL USED TO PRODUCE FORMWORK**

(57) A panel for the formation of formworks, made up of two identical plates of plastic material (1-2), parallel and close, which are joined together by means of intermediate partitions (3) of the same material, parallel

to one another and perpendicular to said plates, which run between two of the opposite edges thereof, forming a tubular structure of rectangular section, of a great length with regard to its height.



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Description

[0001] The present invention refers to a panel for the formation of formworks, for example formworks for concrete slabs, which due to its nature and constitution allows the reuse thereof a large number of times without the need for special maintenance care.

[0002] Formworks for concrete slabs and the like are generally built based on wooden boards, which easily deteriorate and deform, which prevents or makes difficult their reuse.

[0003] While the use of metal panels allows their reuse, it is limited by its high cost and further has the drawback of their high weight.

[0004] By Utility Model 200102268 of the same applicant, a panel for formworks is known which is constituted of a plate of plastic material of small thickness and preferably rectangular contour having at one of its surfaces a series of reinforcing partitions of a small height, running perpendicularly between two of the opposite edges.

[0005] The constitution set forth allows providing panels for formworks which are strong, due to the reinforcement partitions of the plate of plastic material, and which are easily reusable a large number of times due to the material of which they are constituted.

[0006] However, the constitution set forth allows the use of the panels on only one surface, since the reinforcing partitions run on the opposite surface.

[0007] The object of the present invention is to achieve a panel for the formation of formworks which can be used indistinctively on both surfaces, which has a great strength and long lasting, allowing its reuse a large number of times.

[0008] According to the present invention, the panel is made up of two identical plates of plastic material, parallel and close, joined together by means of intermediate partitions parallel and perpendicular to said plates, forming a tubular structure of rectangular section, of a great length with respect to its height.

[0009] The intermediate partitions will run between two of the opposite edges of the plates, preferably in the longitudinal direction, between the transverse edges.

[0010] The end partitions will preferably coincide with the longitudinal edges of the plates, such that a rectangular tubular section of a small height and great length is formed, crossed by other intermediate partitions.

[0011] Both the plates and the partitions forming the panel of the invention will be constituted based on glass fiber-reinforced resins. Furthermore, the gaps delimited between the plates and the partitions can be filled with expanded polyurethane, all of which allows obtaining panels of great strength and rigidity.

[0012] The panel of the invention can have one of the surfaces smooth and the opposite one with a series of very thin ribs, parallel to one another, and which have the same longitudinal direction as the inner reinforcing nerves of the panel, forming a type of grooving on that

face of the panel.

[0013] The number of partitions running between the two plates will depend on the desired rigidity or strength.

[0014] The inclusion of expanded polyurethane in the gaps of the panel allows obtaining a sandwich-like assembly which provides not only a compact and secure structure, but also an excellent cushion for cushioning falls or blows.

[0015] Furthermore, the panel of the invention can have coupled in its end sections removable caps increasing the solidity of the plates in their end sections and preventing the entry of concrete. These caps include a body of an outer contour equal to the inner contour of the tubular structure, such that it can be introduced therein, said body being finished from its outer surface in a peripheral rib or flap which is of a contour equal to the outer contour of the tubular structure and which functions as a stop for the support against the edge of the wall of said structure, limiting its penetration therein.

[0016] According to a preferred embodiment, the body of the cap has, from its inner surface, transverse channels coinciding in number, size and position with the partitions of the tubular structure. With this constitution, the body penetrating in the profile of the panel envelops the partitions, thus achieving a perfect fixing of the cap to the panel.

[0017] As has been set forth, the panel will be made up by means of the combination of rigid, semi-rigid and flexible resins, accompanied by glass fiber reinforcement of different types, all of which added with the corresponding fillers and additives.

[0018] Among the additives, an inner mold release agent can be included which allows form releasing without needing to use any external additive, by way of a form releasing agent. Additives can also be included in order to protect the product, such as anti-shrinkage agents, solar filters and anti-deformation agents, etc.

[0019] The panel can either be filled with foaming products in order to increase its rigidity and strength with a minimum weight, or filled with solid and compact materials. The foaming products can be accompanied with fillers in order to improve the characteristics of the product, and the foams can further be of a rigid, semi-rigid or flexible nature, depending on the applications of the panel, the latter even being able to be completely hollow, with no filler whatsoever.

[0020] Solid and compact fillers may be indicated when the panel has an application other than the one set forth.

[0021] The cap closing the end sections of the panel will preferably be of the same material as said panel, i. e. of plastic material, although it can also be of a metallic nature, wood, etc., at any rate depending on the use which is made of said panel. When the panel is intended for forming recoverable formworks, the cap will preferably be of a plastic nature and will function so as to prevent the entry of concrete inside and to protect the panel

from possible blows in its fall.

[0022] The caps can also be fixed to the panel by means of gluing, melting, by means of screws, etc.

[0023] A more detailed description of the panel of the invention is made below with the aid of the attached drawings, wherein a non-limiting embodiment example is shown.

[0024] In the drawings:

Figure 1 shows a partial perspective view of a panel constituted according to the invention.

Figure 2 shows a cross sectional view of the panel, taken along the II-II section line of Figure 1, at a greater scale.

Figure 3 shows a view similar to Figure 1, showing a panel with cap.

Figure 4 shows a longitudinal sectional view of the panel according to the IV-IV section line of Figure 3.

[0025] As can be seen in the drawings, the panel of the invention is made up of two plates of plastic material, referenced with numbers 1 and 2, identical and parallel, for example of a rectangular contour, which are connected by means of intermediate partitions 3, the ends of which, which are referenced with number 4, coincide with two of the opposite edges of the plates.

[0026] In the example depicted in the drawings, the intermediate partitions 3 and the end partitions 4 run in a longitudinal direction, being perpendicular to plates 1 and 2 and to the transverse edges thereof.

[0027] The panel of the invention thus has a tubular structure, of rectangular section, of a great length with regard to its height, which is subdivided by means of partitions 3 and 4 into longitudinal passages 5, which can be filled with a foam, for example of expanded polyurethane. The end sections of the plate can further be closed by means of caps preventing the entry of concrete, sand, water, etc.

[0028] One of the surfaces of the panel of the invention will be at least of a smooth nature, the opposite one being able to be rough, thus providing surfaces of a different nature for different applications or purposes.

[0029] In the embodiment of Figures 3 and 4, the end sections of the panel 1 have coupled thereto a cap 6, which includes a body 7 penetrating into the tubular structure of the panel 1, this body being finished off, from the outer upper surface, in a peripheral flap 8 resting against the edge of the walls 2 and 4, acting as a stop so as to limit its penetration in the panel.

[0030] From the inner surface, the body 7 will be provided with transverse channels 9 coinciding in number, position and size with those of the longitudinal partitions 3.

[0031] With the constitution set forth, the cap 6 can be easily assembled and disassembled from the panel 1.

[0032] In the assembled position, the panel 1 is closed at its end sections, thus preventing concrete from being

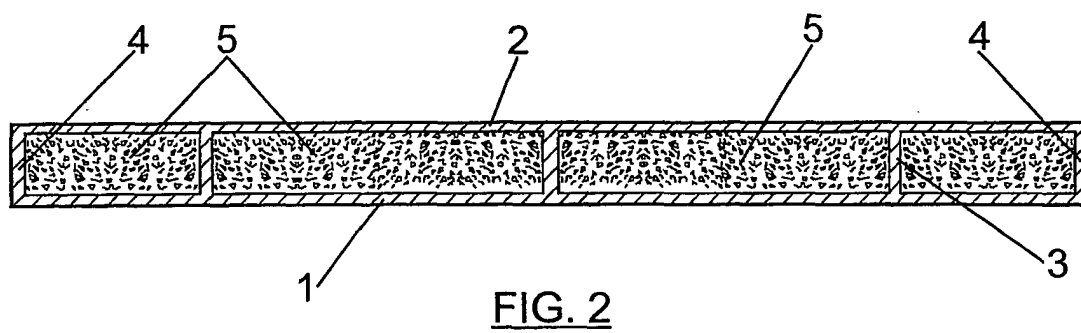
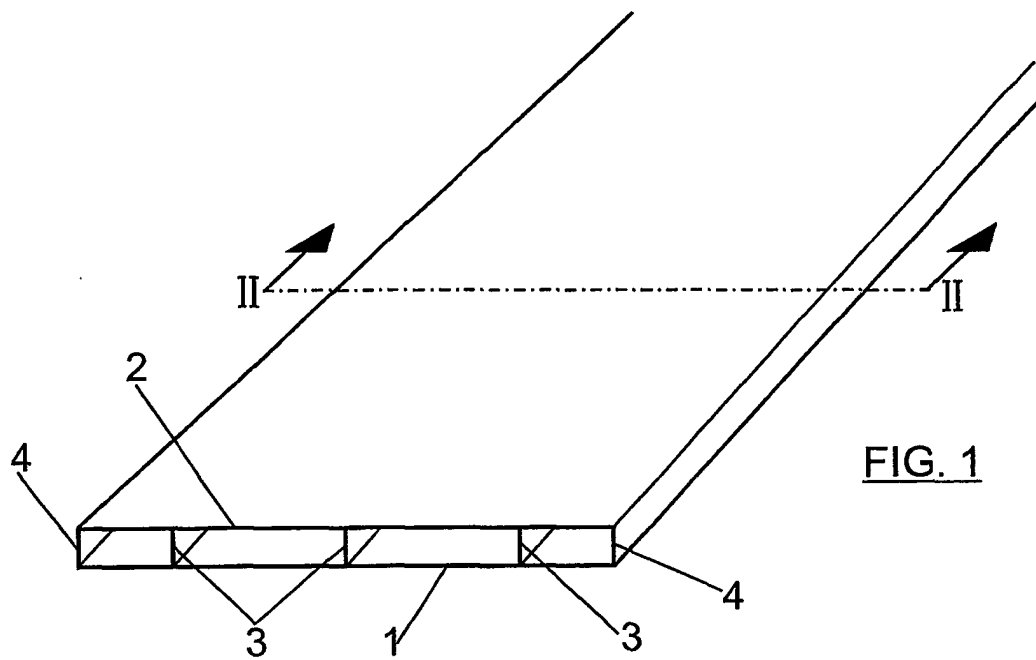
able to enter during the concreting phase of the concrete slabs.

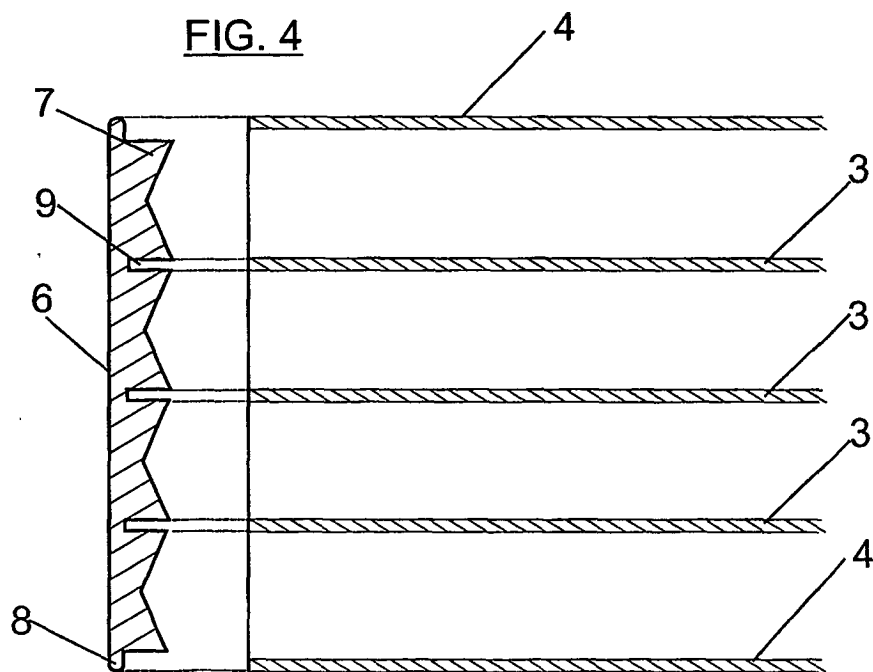
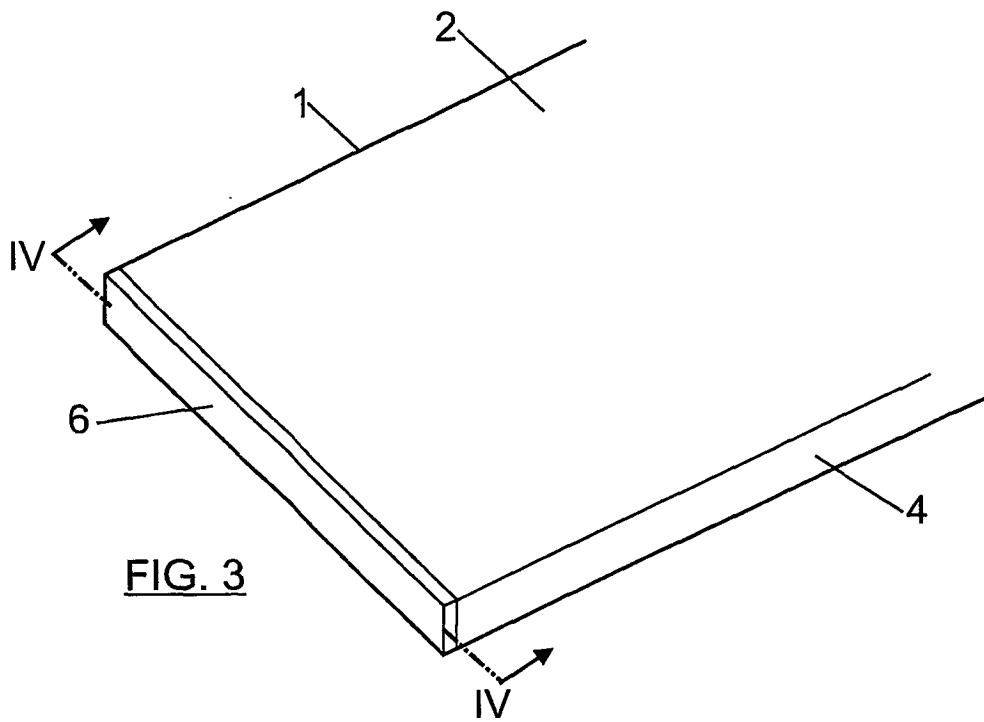
[0033] The cap 6 can have a different configuration, for example to reduce the volume of the inner body 7, eliminating the portions limited between consecutive channels 9, at least in some of the portions.

[0034] The cap can also consist of a simple layer which is joined to the edge of the tubular profile by means of gluing, welding, etc.

Claims

1. A panel for the formation of formworks, **characterized in that** it is made up of two identical plates (1-2) of plastic material, parallel and close, which are joined together by means of intermediate partitions (3) of the same material, parallel to one another and perpendicular to said plates, which run between two of the opposite edges thereof, forming a tubular structure of rectangular section, of a great length with regard to its height.
2. A panel according to claim 1, **characterized in that** the intermediate partitions (3) run in the longitudinal direction between the transverse edges of the plates.
3. A panel according to claim 2, **characterized in that** the end partitions (4) coincide with the longitudinal edges of the plates.
4. A panel according to the previous claims, **characterized in that** the plates and partitions are constituted using glass fiber-reinforced resins.
5. A panel according to the previous claims, **characterized in that** the gaps (5) demarcated between the two plates and the partitions are filled with expanded polyurethane.
6. A panel according to claim 1, **characterized in that** the end sections have coupled thereto removable caps (6), which comprise a body (7) of outer contour equal to the inner contour of the tubular structure, which is insertable in said tubular structure, the body of which is finished off from its outer surface in a peripheral rib or flap (8) of contour equal to the outer contour of the tubular structure, functioning as a stop for the support against the edge of the wall of said structure.
7. A panel according to claim 6, **characterized in that** said body has, from its inner surface, transverse channels (9) coinciding in number, sizes and positions with those of the partitions of the tubular structure.





INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER		
IPC 7 E04G 9/05, 9/10		
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)		
IPC 7 E04G		
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)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	GB 1420614 A (VEBA CHEMIE A.G.) 07.01.1976, the whole document.	1-3 4-5
Y	ES 1034596 U (ENCOFRADOS DEL POLIESTER S.L.) 16.01.1997, column 3, lines 16-30.	4,5
PX	PATENT ABSTRACTS OF JAPAN, Vol. 2002 n° 11 (06.11.2002) & JP 2002206338 A (KANA FLEX CO. K.K.) 26.07.2002.	1,6,7
X A	ES 1035133 U (LÓPEZ) 16.03.1997, the whole document.	1-3 5
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents: "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) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "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 "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 "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 such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT
 Information on patent family members

 International Application No
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