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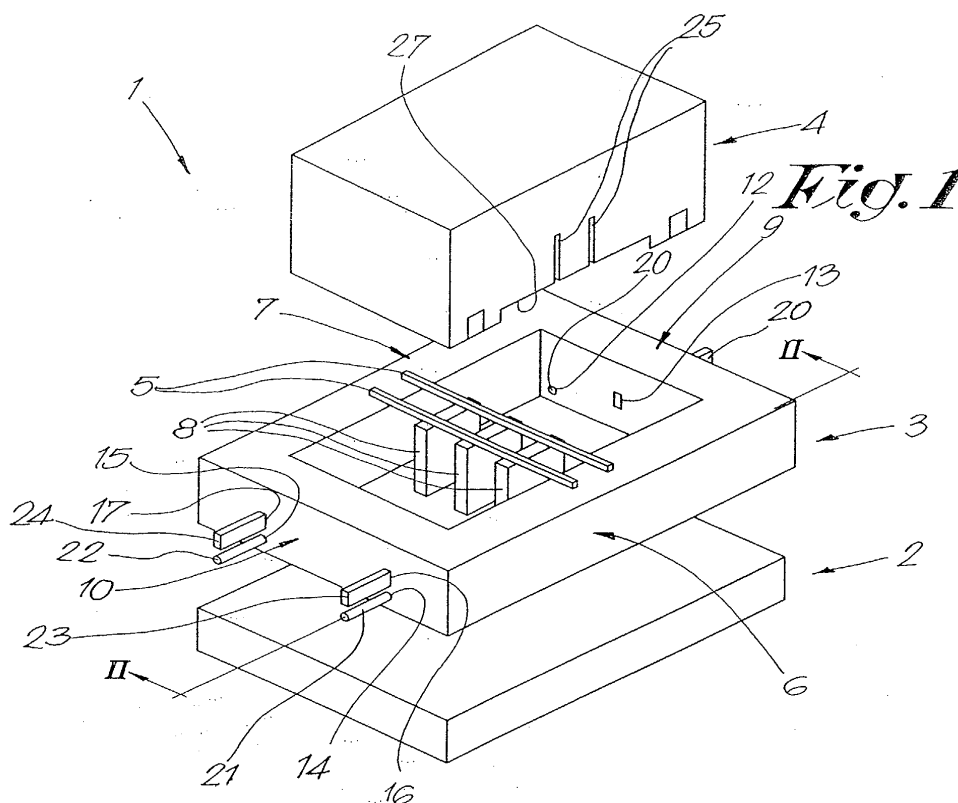
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(54) **Method for manufacturing products of reinforced concrete**

(57) Method for manufacturing products of reinforced concrete which consists in: placing a reinforcement (33) on a support (2); placing the support (2) against the lower wall of the mould (3); bringing the reinforcement (33) into contact with magnetic strips (30-31); moving the reinforcement (33) up; putting positioning bars (18-19, 21-22) in the mould (3) up to under

the reinforcement (33); detaching the reinforcement (33) from the magnetic strips (30-31); bringing positioning bars (20-23-24) in the mould (3) which position the reinforcement (33) horizontally; filling the mould (3); withdrawing the positioning bars (18-19, 21-22, 20-23-24); compressing the concrete (45); and vibrating the reinforced concrete product (32).



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Description

[0001] The present invention concerns a method for manufacturing products of reinforced concrete.

[0002] Such products of reinforced concrete can be made in all sorts of shapes and dimensions for any application whatsoever. An example of such an embodiment are concrete lids which can be applied for sealing cable trenches, drain ditches and the like and which are often found along railway beds, on bridges, etc.

[0003] It is known that such concrete products have been manufactured until now, before casting the concrete products, by providing fingers in the moulds concerned, which serve as a provisional support for the reinforcement of the concrete product.

[0004] In a first phase of the manufacturing according to this method, the above-mentioned fingers are manually provided in the moulds, after which the reinforcement is positioned on these fingers to subsequently fill the moulds with concrete.

[0005] After the moulds have been filled, the fingers are removed from the moulds, after which the concrete in the moulds is smoothed before turning over the moulds, in such a manner that the vibrated concrete products are placed on a support or a table.

[0006] According to this known method, the moulds are subjected to a vibrating treatment before or after the moulds are turned over.

[0007] Finally, the moulds are removed, such that the realized concrete products remain on the above-mentioned support or table.

[0008] A first disadvantage of the known method is that the fingers have to be provided manually, and later on have to be removed again manually.

[0009] Another disadvantage is that the moulds have to be turned over, such that not only an additional operation is required, but as a result of which a lot of production space is lost, since a first space has to be provided for to mould the concrete products, and a second, almost equally large space to take these concrete products out of their moulds.

[0010] The present method aims to provide a solution thereto.

[0011] To this end, the method concerns the manufacturing of products of reinforced concrete, whereby this method consists in: placing a reinforcement on a support; placing the support under a mould; placing the support against the lower wall of the mould; bringing the reinforcement into contact with magnetic strips; moving the reinforcement up; putting positioning bars in the mould up to under the reinforcement; detaching the reinforcement from the magnetic strips, such that the reinforcement ends up on the positioning bars; bringing positioning bars in the mould which position the reinforcement horizontally; filling the mould with concrete; withdrawing the positioning bars from the mould; compressing the concrete by means of a pressure element; and vibrating the reinforced concrete product.

[0012] As the device according to the invention consists among others of a support and a mould which can move in relation to each other, the step in which the mould has to be turned over can be omitted.

[0013] As the axial movement of the positioning bars can be easily done automatically, for example by equipping it with a hydraulic control, a lot of labour can be saved.

[0014] In order to better explain the characteristics of the invention, the following preferred embodiment of the method according to the invention for manufacturing products of reinforced concrete is described as an example only without being limitative in any way, with reference to the accompanying drawings, in which:

figure 1 schematically represents a view in perspective of a device according to the invention;
figure 2 represents a section according to line II-II in figure 1;

figures 3 to 11 represent sections similar to those in figure 2, but for successive steps of the method according to the invention;

figure 12 represents a section according to line XII-XII in figure 2;

figure 13 represents a section according to line XI-II-XIII in figure 7;

figures 14 and 15 represent sections according to the lines XIV-XIV, XV-XV respectively in figure 9;

figure 16 represents a concrete product in perspective according to arrow F16 in figure 11;

figure 17 represents a section according to line XVII-XVII in figure 16.

[0015] Figure 1 represents a device 1 which mainly consists of a support 2 in the shape of a plate, a mould 3 and a pressure element 4.

[0016] In this embodiment, two parallel carrying bars 5 are provided on the actual mould 3, fixed on two opposite side walls 6-7 of the mould 3, for example by means of welding.

[0017] Crosswise under these carrying bars 5 are in this case fixed three cores 8 which in this case have a height equal to the height of the side walls 6-7 and 9-10 of the mould 3.

[0018] In the opposite side walls 9-10 of the mould 3 are provided passages 11-12 and 13-14 respectively in the side wall 9 and 15-16 and 17 in the side wall 10, whereby positioning bars 18 to 24 respectively are provided in these passages 11 to 17.

[0019] The positioning bars 18 to 24 can be axially moved in the passages 11 to 17, whereby the positioning bars 18-19 and 21-22 are in this case made cylindrical, whereas the positioning bars 20-23-24 have a rectangular section.

[0020] The cylindrical positioning bars 18-19 and 21-22 are further provided at a level situated under the level of the positioning bars 20-23-24.

[0021] The actual pressure element 4 consists of a

thick plate, in which grooves 25 are provided in the bottom side, whose width is somewhat larger than the width of the carrying bars 5, whereas the depth of these grooves 25 is somewhat larger than the thickness of the mould 3.

[0022] In the bottom side of the pressure element 4 are further provided three grooves 26 whose width is somewhat larger than the width of the cores 8, whereas the depth of these grooves 26 is somewhat larger than the height of the cores 8.

[0023] The bottom side of the pressure element 4 in this case also comprises a recess 27 which extends over the entire width of the bottom side of the pressure element 4.

[0024] In the pressure element 4, at the bottom side, parallel to and on either side next to the recess 27, are provided two slits 28-29, in which are provided magnetic strips 30-31.

[0025] The device 1 is preferably equipped with means, not represented in the drawings, to vertically move the support 2 as well as the pressure element 4 in relation to the mould 3. These means can be of a mechanical, hydraulic or pneumatic nature.

[0026] Preferably, the device 1 will be completed with means which make it possible to subject the support 2, the mould 3 and the pressure element 4 to a vibrating treatment.

[0027] Also, the device is preferably equipped with means which make it possible to axially move the positioning bars 18 to 24 automatically through the passages 11 to 17 concerned.

[0028] Of course, it is necessary to provide a reinforcement 33 in order to manufacture a product 32 of reinforced concrete.

[0029] This reinforcement 33 is in this case formed of what are called reinforcing bars 34-41 which are welded onto each other. The spaces 42 to 44 between the reinforcing bars 34-41 are hereby larger than the cores 8.

[0030] The method for manufacturing products 32 of reinforced concrete, according to the invention, consists in placing a reinforcement 33 on the support 2.

[0031] This will preferably be done on a spot next to the mould 3, after which the support 2, together with the reinforcement 33 is placed under the mould 3.

[0032] Next, the support 2 is provided up against the lower wall of the mould 3 together with the reinforcement 33, whereby the cores 8 pass through the spaces 42 to 44 between the reinforcing bars 34 to 41 of the reinforcement 33.

[0033] A following step includes that the pressure element 4, between the side walls 6-7 and 9-10 and the carrying bars 5 and the cores 8, sink in the mould 3, until the magnetic strips 30-31 of the pressure element 4 reach up against the reinforcement 32, whereby this reinforcement 33 is drawn against the pressure element 4.

[0034] Next, the pressure element 4, together with the reinforcement 33, is moved over the level of the positioning bars 18-19 and 21-22, after which these posi-

tioning bars 18-19 and 21-22 are axially moved in the mould 3 through the passages 11-12, 14-15 respectively.

[0035] Simultaneously, the pressure element 4 moves further up together with the reinforcement 33, until the reinforcement 33 is being stopped by the carrying bars 5.

[0036] The pressure element 4 then withdraws entirely from the mould 3, and the reinforcement 33, which is detached from the magnetic strips 30-31 of the pressure element 4, consequently drops on the positioning bars 18-19 and 21-22, as a result of which the reinforcement 33 is automatically positioned in the height on a certain level.

[0037] According to the method of the invention, the next step consists in axially moving the positioning bars 20-23-24 through the passages 13-16-17 up against the reinforcement 33 and in thus horizontally positioning the reinforcement 33 in relation to the mould 3.

[0038] A following step according to the invention consists in filling the mould 3 with concrete 45, after which the pressure element 4 is moved down again and compresses the concrete 45 in the mould 3.

[0039] Next, the positioning bars 18 to 24 are withdrawn from the mould 3, after which the device 1 is subjected to a vibrating treatment.

[0040] Finally, the pressure element 4 is moved up again and the support 2, upon which the newly formed concrete product 32 rests, is moved down.

[0041] In a final step the support 2, upon which the newly formed concrete product 32 rests, is carried off.

[0042] A new support, with again a reinforcement upon it, is then positioned under the mould 3, after which the above-described cycle is repeated.

[0043] Although, in the above-described embodiment, use is made of permanent magnets, it is clear that also electromagnetic magnets can be applied.

[0044] Dropping the reinforcement 33 on the positioning bars 18-19 and 21-22 can in that case be done by interrupting the electric current.

[0045] The present invention is by no means limited to the above-described method given as an example and represented in the accompanying drawings; on the contrary, such a method can be realised according to different variants while still remaining within the scope of the invention.

Claims

1. Method for manufacturing products of reinforced concrete, **characterised in that** it consists in: placing a reinforcement (33) on a support (2); positioning the support (2) under a mould (3); placing the support (2) against the lower wall of the mould (3); bringing the reinforcement (33) into contact with magnetic strips (30-31); moving the reinforcement (33) up; putting positioning bars (18-19) and (21-22)

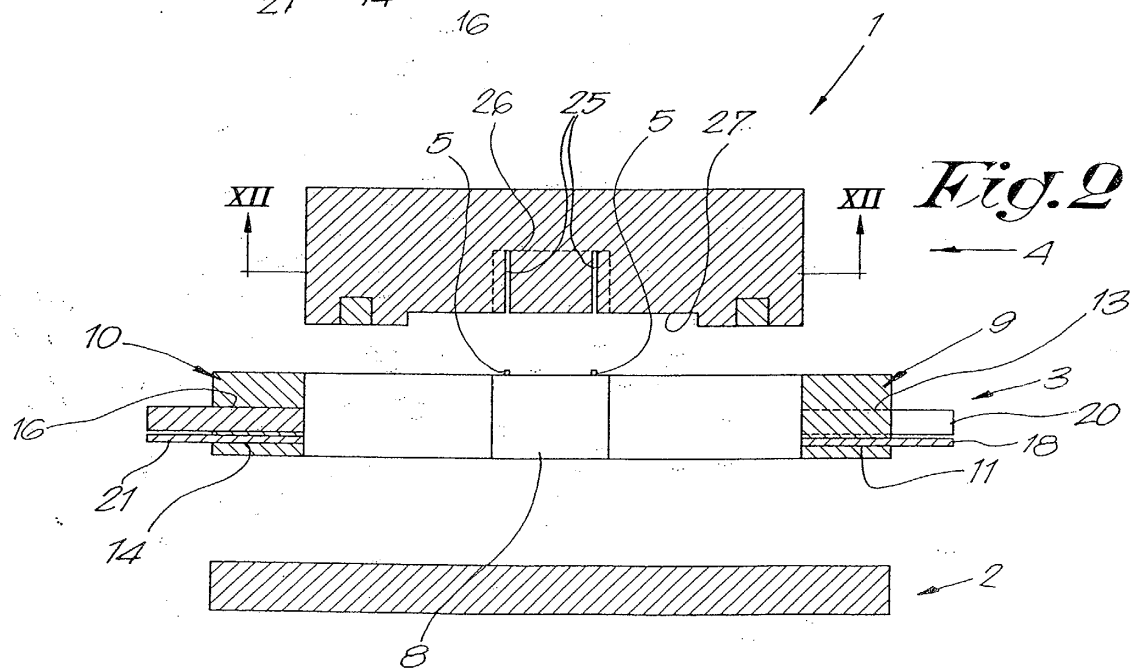
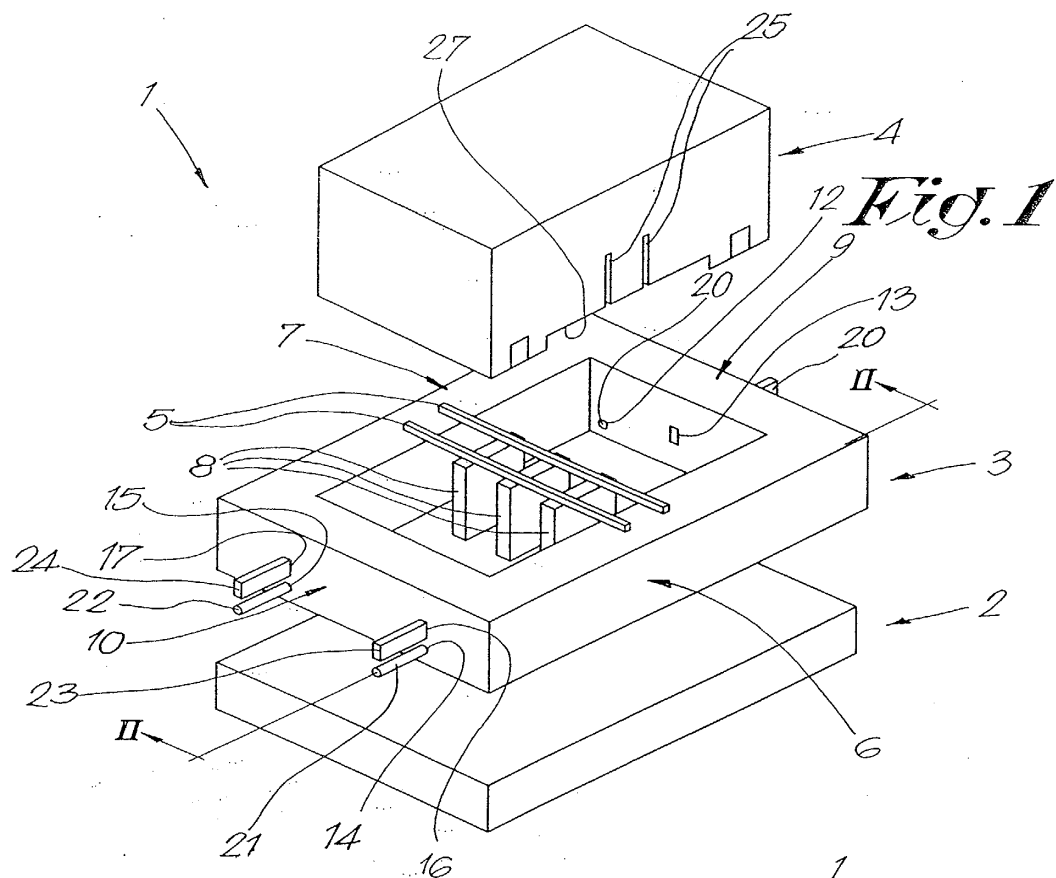
in the mould (3) up to under the reinforcement (33);
detaching the reinforcement (33) from the magnetic
strips (30-31), such that the reinforcement (33)
ends up on the positioning bars (18-19) and (21-22);
bringing positioning bars (20-23-24) in the mould (3) 5
which position the reinforcement (33) horizontally;
filling the mould (3) with concrete (45); withdrawing
the positioning bars (18-19) and (21-22) and
(20-23-24) from the mould (3); compressing the 10
concrete (45) by means of a pressure element (4);
and vibrating the reinforced concrete product (32).

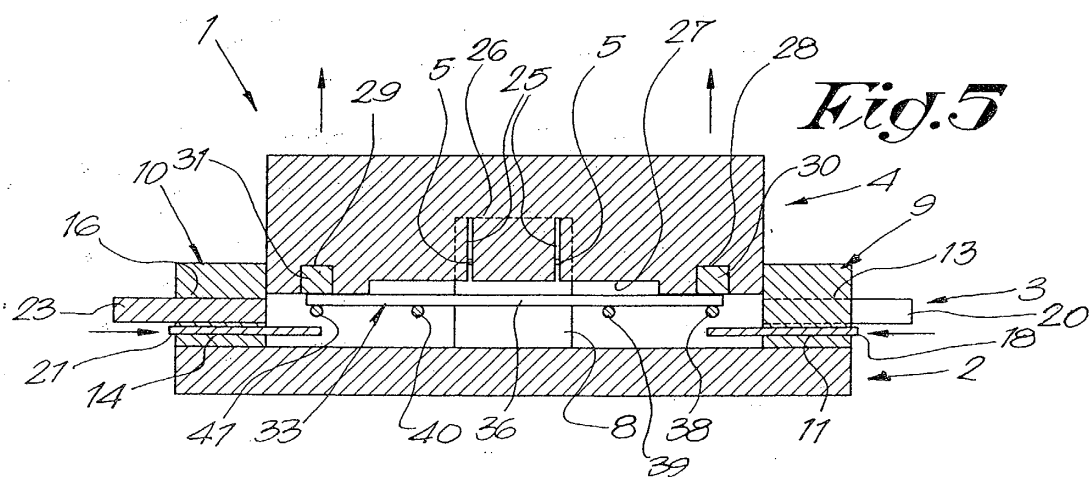
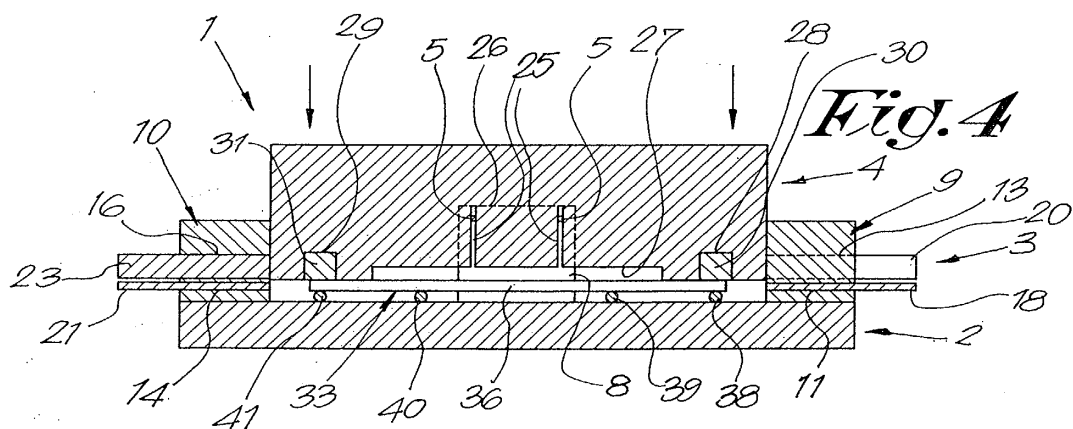
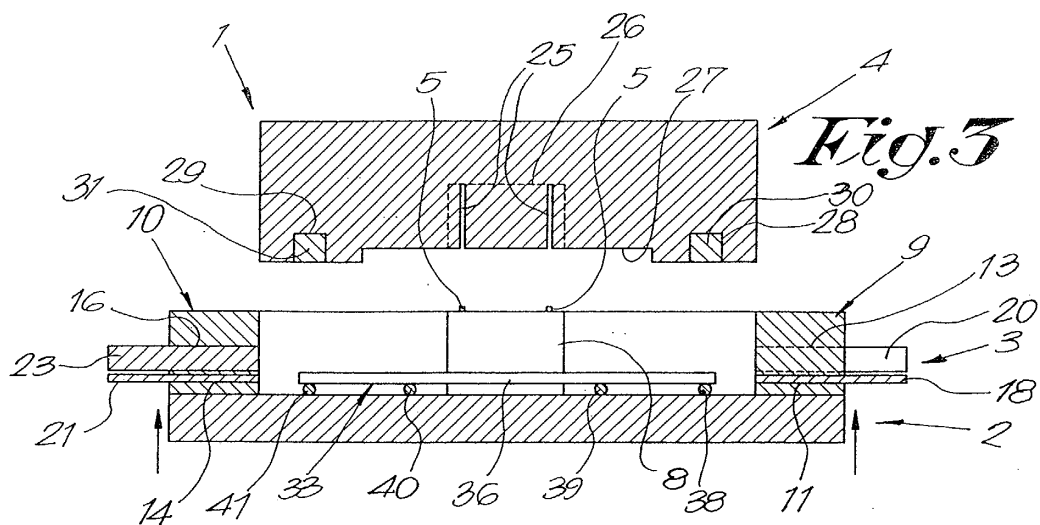
2. Method according to claim 1, **characterised in that**
the reinforcement (33) is placed on the support (2)
on a spot next to the mould (3). 15
3. Method according to claim 1, **characterised in that**
at least one carrying bar (5) is fixed on the mould (3).
4. Method according to claim 3, **characterised in that** 20
under the carrying bar (5) is fixed at least one core
(8).
5. Method according to claim 1, **characterised in that**
the magnetic strips (30-31) are formed of perma- 25
nent magnets.
6. Method according to any one of claims 1 and 3,
characterised in that the reinforcement (33) is de- 30
tached from the magnetic strips (30-31) by stopping
the reinforcement (33) against the carrying bar (5),
when the pressure element (4) is drawn out of the
mould (3).
7. Method according to claim 1, **characterised in that** 35
the magnetic strips (30-31) are formed of electro-
magnetic magnets.
8. Method according to claim 7, **characterised in that**
the reinforcement (33) is detached from the mag- 40
netic strips (33) by interrupting the electric current.

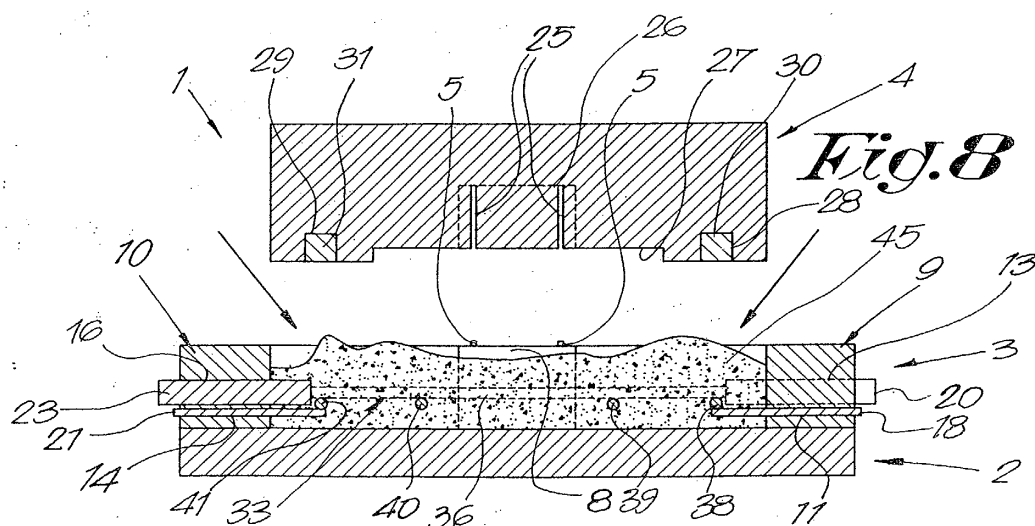
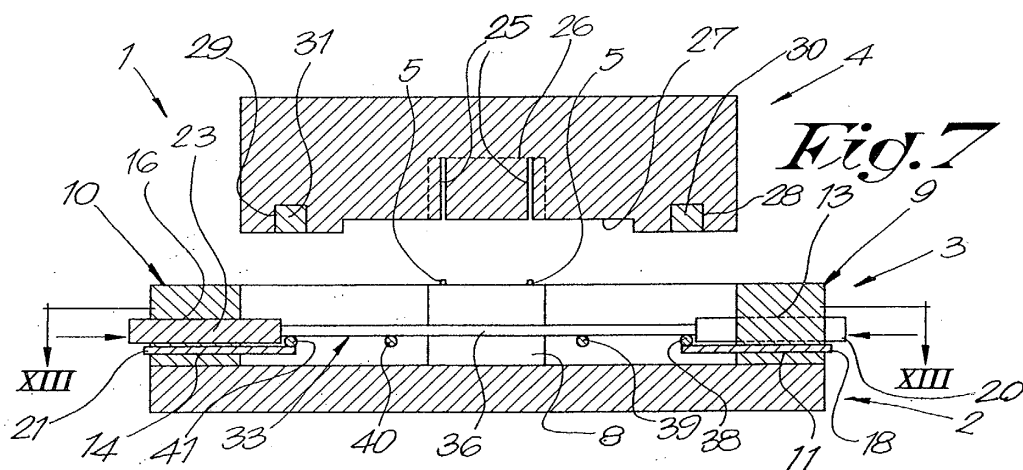
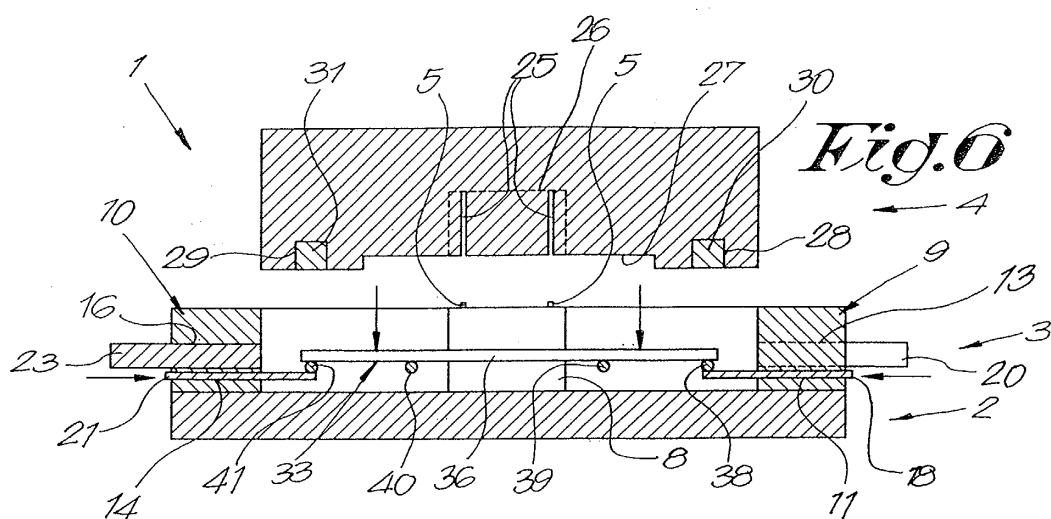
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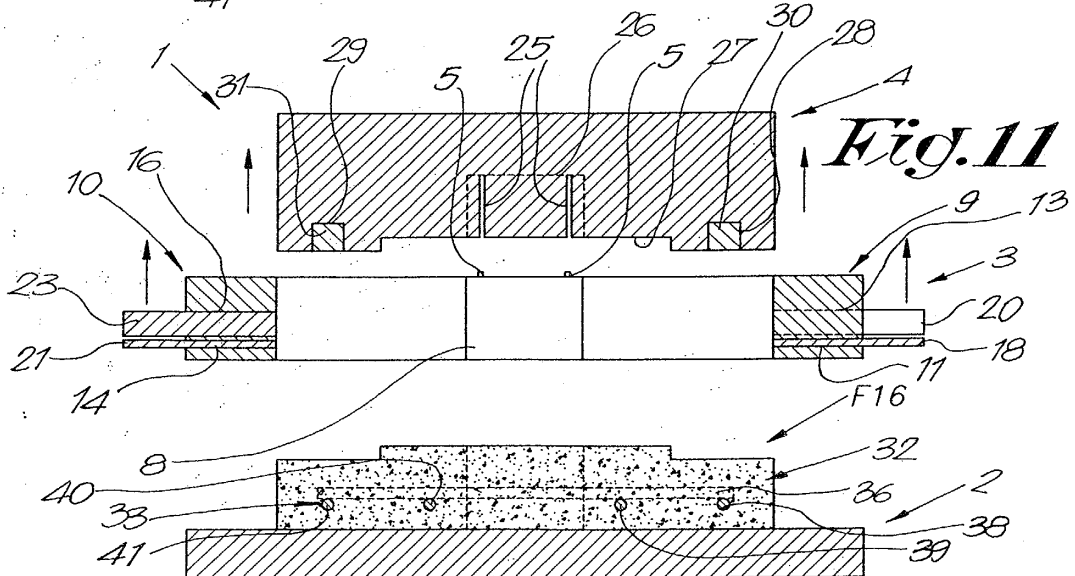
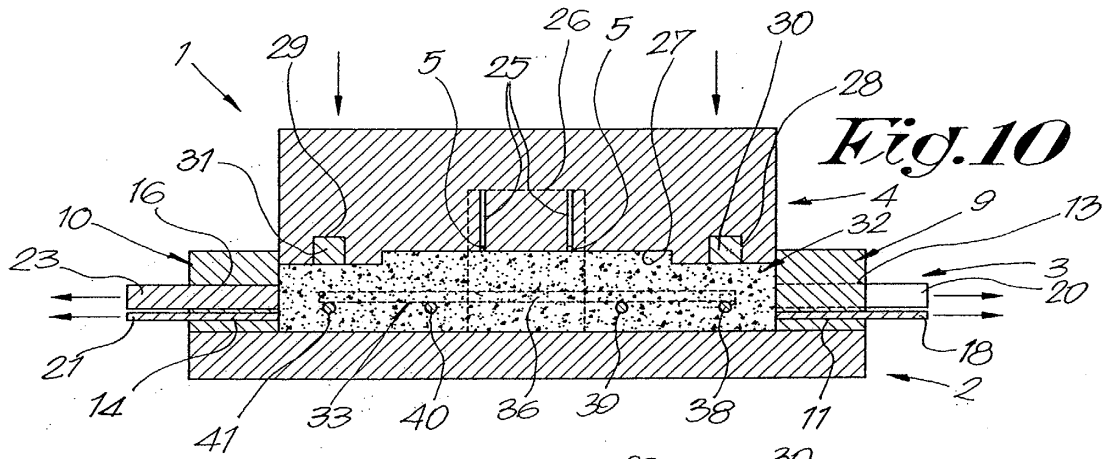
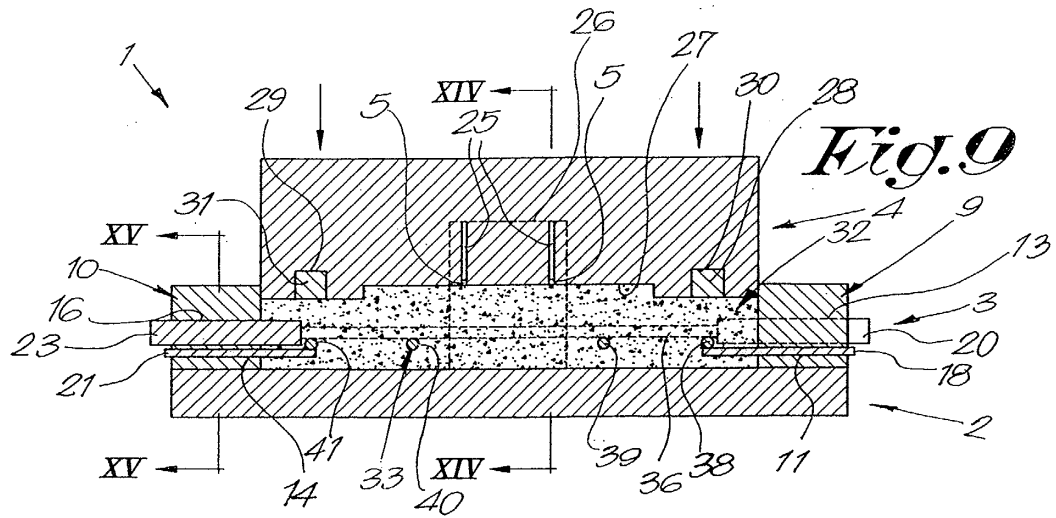
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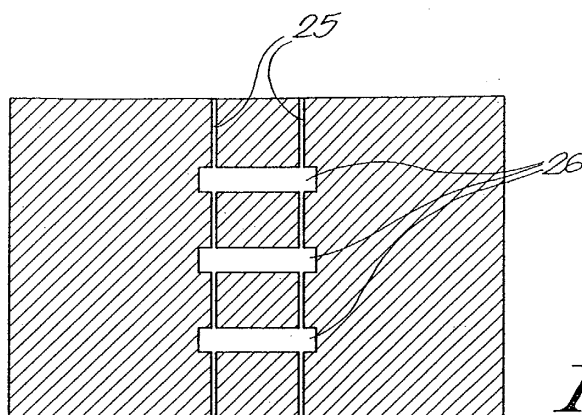


Fig. 12

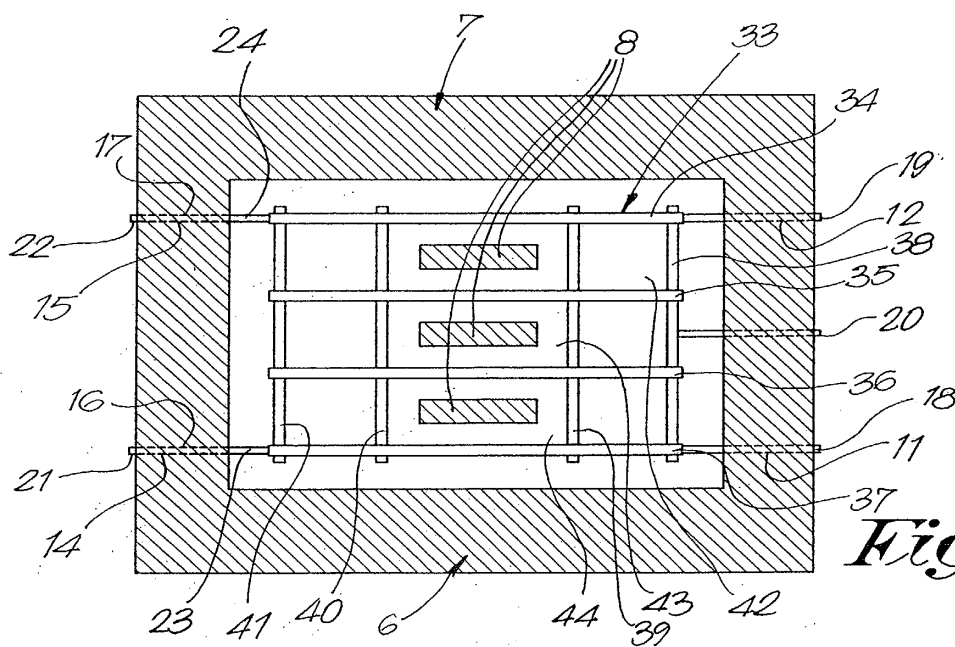


Fig. 13

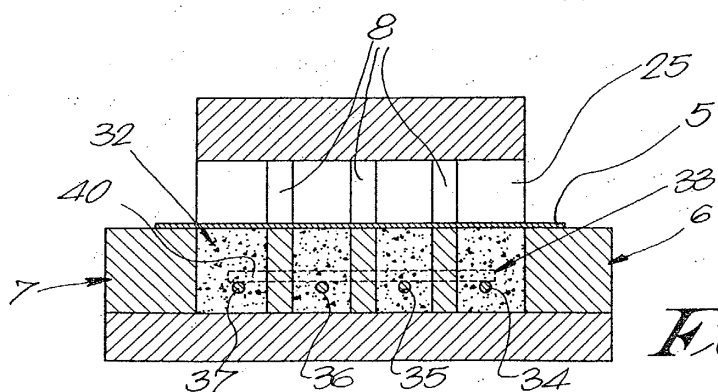
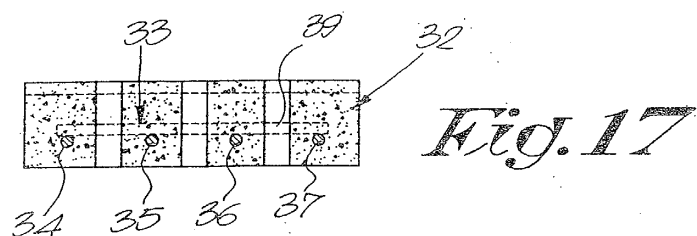
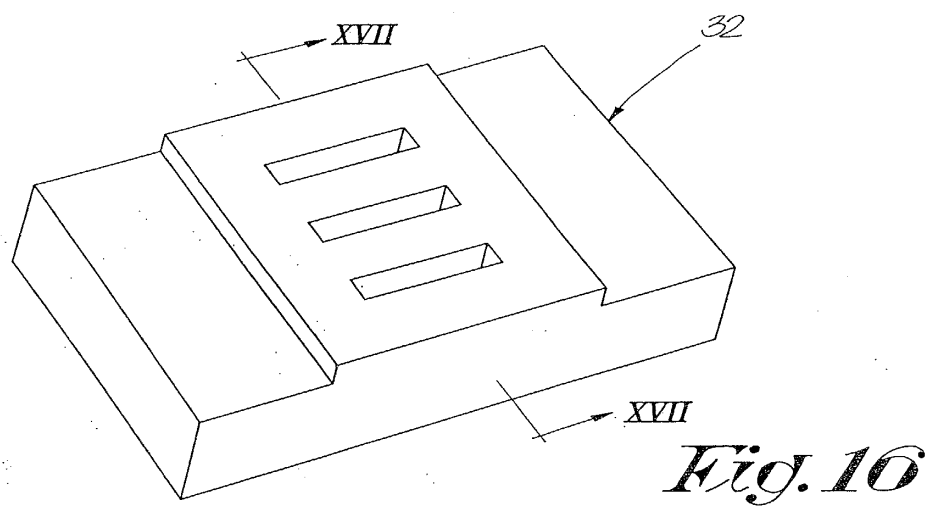
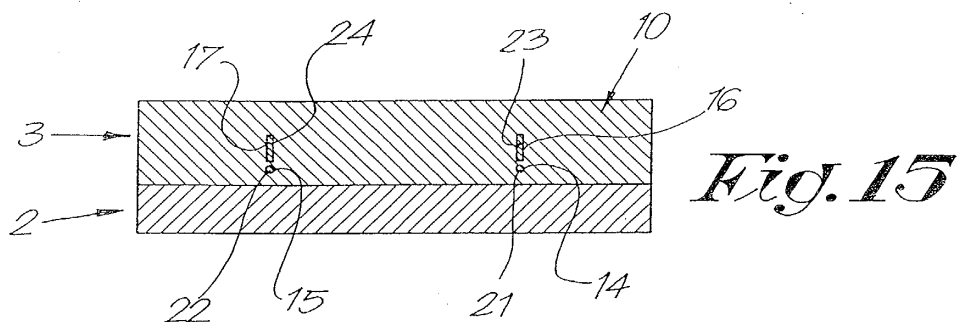


Fig. 14





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EUROPEAN SEARCH REPORT

Application Number
EP 04 07 6420

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B28B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 October 2004	Examiner Boone, J
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EP 04 07 6420

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19-10-2004

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