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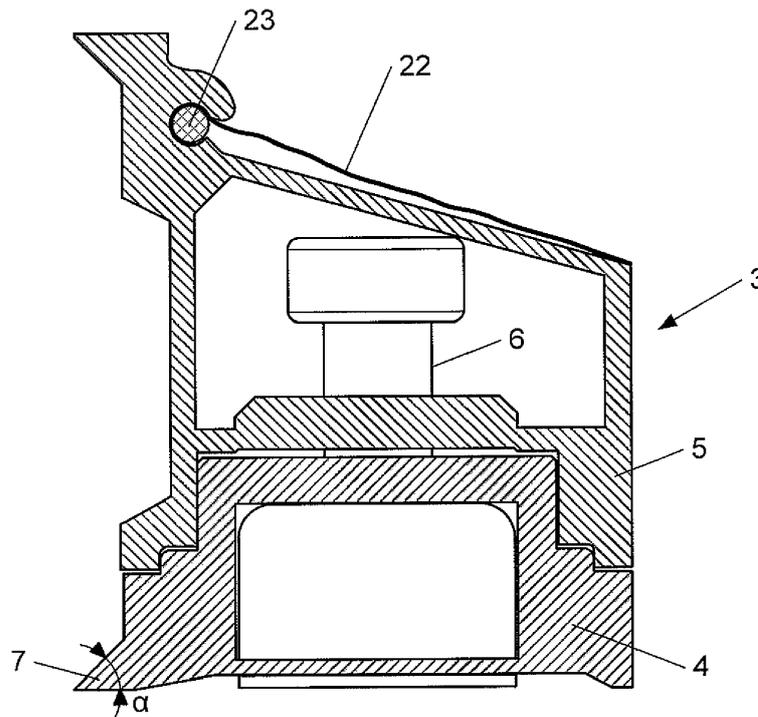
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(54) **Formwork beam**

(57) A formwork beam for a formwork table, comprising a base element and a put on piece which is to be attached to the base element in a detachable manner, wherein the base element is provided with a foot member in order to rest upon the formwork table, which foot member comprises an oblique flank which descends from a

longitudinal side of the put on piece, which formwork beam is produced from extruded aluminium with the foot member, and wherein openings which give access to a hollow space formed in put on piece are formed in an upper side of the put on piece, which openings are covered by a movable flap.



**Fig. 2**

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## Description

**[0001]** The invention relates to a formwork beam for a formwork table, which formwork beam comprises a base element and a put on piece which is to be attached to the base element in a detachable manner, the base element being provided with a foot member in order to rest upon the formwork table, which foot member comprises an oblique flank which descends from a longitudinal side of the put on piece, which formwork beam is produced from extruded aluminium with the foot member, and openings which give access to a hollow space formed in the put on piece being formed in an upper side of the put on piece.

**[0002]** A formwork beam of this type is known from US 2007/0051867 and is used in the construction industry for the production of concrete slabs which are used as walls or ceilings for the construction of buildings. The formwork beams are mounted on a formwork table so as thereby to form a bowl into which concrete can be poured. In order to produce slabs of different thickness, the formwork beam comprises a base element which is fixed on the formwork table and on which where necessary a put on piece of the desired height is placed. The known formwork beam is produced from extruded aluminium since the latter is well able to withstand concrete. The base elements are screwed tightly to the formwork table by means of bolts which are introduced into the interior of the hollow space by way of the openings. These openings are covered by means of caps before concrete is poured in.

**[0003]** A drawback of the known formwork beam is that the openings are covered by means of caps. Not only do these caps get lost relatively quickly, but they also constitute an obstacle when the freshly poured concrete is wiped off. In fact, since the caps always protrude slightly above the upper surface of the put on piece, the caps will constantly be knocked when the freshly poured concrete is wiped off. As a result, the caps can then become dislodged themselves and concrete can penetrate into the hollow space and, in addition, can make access for the fastening of the base element extremely difficult. The object of the invention is to provide a formwork beam where the openings in the formwork beam can be sealed off without the sealing off thereof forming an when the freshly poured concrete is wiped off, and where the possibility of concrete penetrating into the hollow space is significantly reduced.

**[0004]** To this end, a formwork beam according to the invention has the feature that the openings are covered by a movable flap. On account of its flexible nature, the movable flap does not form an when the freshly poured concrete is wiped off. Since the flap forms a whole unit it will cover the openings as a whole unit, as a result of which the possibility of concrete flowing through the openings is significantly reduced.

**[0005]** A first preferred embodiment of a formwork beam according to the invention is characterised in that

a fastening means for fastening the flap in a rotatable manner is applied below an upper edge of the put on piece. Applying the fastening means below the upper edge of the put on piece ensures that the flap will extend below the upper edge of the put on piece and will thus not form an when the concrete is wiped off.

**[0006]** A second preferred embodiment of a formwork beam according to the invention is characterised in that the external longitudinal sides of the base element have a first stepped profile and the internal longitudinal side of the put on piece has a second stepped profile which adjoins the first stepped profile. The presence of these two stepped profiles affords the advantage that the base element and the put on piece can be attached to each other in a rapid, simple and reliable manner.

**[0007]** A third preferred embodiment of a formwork beam according to the invention is characterised in that an external longitudinal side of the put on piece comprises a recess which extends over at least part of the length of the put on piece. The presence of this recess makes it possible for the concrete slab - which is to be produced - to have formed in it a tooth which can play a part in the assembly of the slabs.

**[0008]** The invention will now be described in greater detail with reference to the drawing, which illustrates a preferred embodiment of a formwork beam according to the invention. In the drawing

Fig. 1 shows a formwork panel;

Fig. 2 is a cross-section through a formwork beam in the mounted state according to the invention, and

Fig. 3 is a cross-section through a formwork beam in the dismantled state.

**[0009]** In the drawing the same or an analogous element is designated with the same reference number.

**[0010]** The formwork table 1 reproduced in Fig. 1 comprises a panel sheet 2 which is bounded by a plurality of formwork beams so as thereby to form a bowl into which concrete can be poured. Once the concrete is poured into the structure it can set and, in this way, a concrete slab is produced which can be used in construction for the production of walls or floors. The formwork beam is available in various heights so that concrete slabs of different thickness can be produced. The formwork beams are mounted on the panel sheet in a detachable manner in order to be able to use the same panel sheet for different dimensions of a concrete slab.

**[0011]** Fig. 2 is a cross-section through a formwork beam according to the invention along the line II-II' (Fig. 1). The formwork beam comprises a base element 4 and a put on piece 5 which is to be attached to the base element in a detachable manner. In order to connect the put on piece to the base element and to the sheet of the formwork table, use is made of fastening elements 6. In the embodiment illustrated, the fastening element 6 is formed by a magnet, preferably a magnet to be activated electrically, but it will be clear that other fastening ele-

ments can be used such as nuts and bolts.

**[0012]** The base element is additionally provided with a foot member 7 which rests on the sheet of the formwork table. That foot member forms an inclined angle  $\alpha$  which from the table sheet descends from the longitudinal side of the put on piece in order to form an oblique edge on the concrete slab.

**[0013]** The formwork beam according to the invention is produced from extruded aluminium, in particular an aluminium of an alloy in accordance with the Belgian Standard EN-AW-6060 or 6063. In this case both the base element with the foot member thereof and the put on piece are produced by aluminium extrusion. Aluminium extrusion affords the advantage that the foot member is produced at the same time as the rest of the base element, as a result of which it is no longer necessary to work with separate foot members as is the case with formwork beams which have been produced from stainless steel. In addition, aluminium with an alloy in accordance with the Standard EN-AW-6060 (publication 06/2001) affords the advantage that it is highly resistant to the aggressive nature of concrete. It is preferable for the formwork beam also to be provided on its outside with a coating of lacquer, in order to protect the formwork beam still further from the aggressive nature of concrete.

**[0014]** As reproduced in Fig. 3, the base element 4 has a first stepped profile on its external longitudinal sides 8 and 9. The put on piece 5 has on its internal longitudinal sides 10 and 11 a second stepped profile which adjoins the first stepped profile. By means of these two stepped profiles the put on piece is accurately joined to the base element when it is placed thereon. The stepped profiles preferably each have a step with a rounded edge 12 and 13 which allows some limited play during the assembly of the two elements one upon the other.

**[0015]** On an external longitudinal side 14 the put on piece 5 preferably comprises a recess which extends over at least part of the length of the put on piece. As a result, it is possible to impart a toothed profile to a concrete slab to be obtained, which facilitates the assembly thereof when used for building purposes.

**[0016]** An upper edge of the put on piece preferably has a tothing 15 which extends over the length of the put on piece. The tothing preferably has an oblique profile which has an angle  $\beta = 45^\circ$  and extends towards an upper edge of the profile. This tothing makes it possible to form an oblique edge on the concrete slab just like the foot member.

**[0017]** The base element 4 has in its interior a series of hollow spaces 16 which provide space for part of the fastening element. The hollow space is provided each time with a first opening 17 and a second opening 18 which give access to an underside and an upper side respectively of the base element, as a result of which the fastening element can make contact with the panel sheet on the one hand and is accessible at its top and can be inserted into the hollow space on the other hand.

**[0018]** In addition, the put on piece is provided with

hollow spaces 19 with openings 20 and 21 on the top side and underside so that the fastening elements can be and are accessible through it. The hollow space 19 in the put on piece preferably has a larger volume than the hollow space 16 in the base element, in order to make access to the fastening elements easier. In order to cover these hollow spaces 19 in the put on piece a flap 22 is attached which is mounted in a hinged manner in an eye 23 of put on piece, in such a way that the flap can tilt away and the fastening elements are accessible. The flaps protect the hollow spaces and prevent concrete from flowing into the hollow spaces when it is poured. The flap preferably comprises a strip with a thickening of material which is secured in the eye 23.

**[0019]** The flap 22 is preferably produced from a flexible material, such as PVC or rubber, in order to be sufficiently strong and to withstand concrete which could drop onto the flap during the production of a concrete slab. The flap extends over the entire opening 21 in order to protect it properly. The use of a flexible material has the advantage that the concrete does not readily adhere to it and that, when the flap is swung away, concrete which might have dropped onto it simply becomes loose and can be removed.

**[0020]** The eye 23 is attached below an upper edge of the put on piece 5 in order to ensure that the flap extends under the upper edge of the put on piece. In this way, the flap does not form an when the freshly poured concrete is wiped off. During this wiping a scraper (not shown in the drawing) is indeed used which wipes the poured concrete from the upper face and moves over the upper edge of the put on piece 5.

**[0021]** In order to use the formwork beam a user will first attach the base element 4 to the table sheet. Then the fastening element 6 is pushed through the openings 18 and 17. After that, the put on piece 5 of the desired height is attached. Finally, the fastening element is activated in order to fasten the formwork beam to the table sheet. When magnetic fastening elements are used, the magnets are activated. When bolts are used, the latter are screwed tight with a spanner which is introduced through the opening 21 in the put on piece.

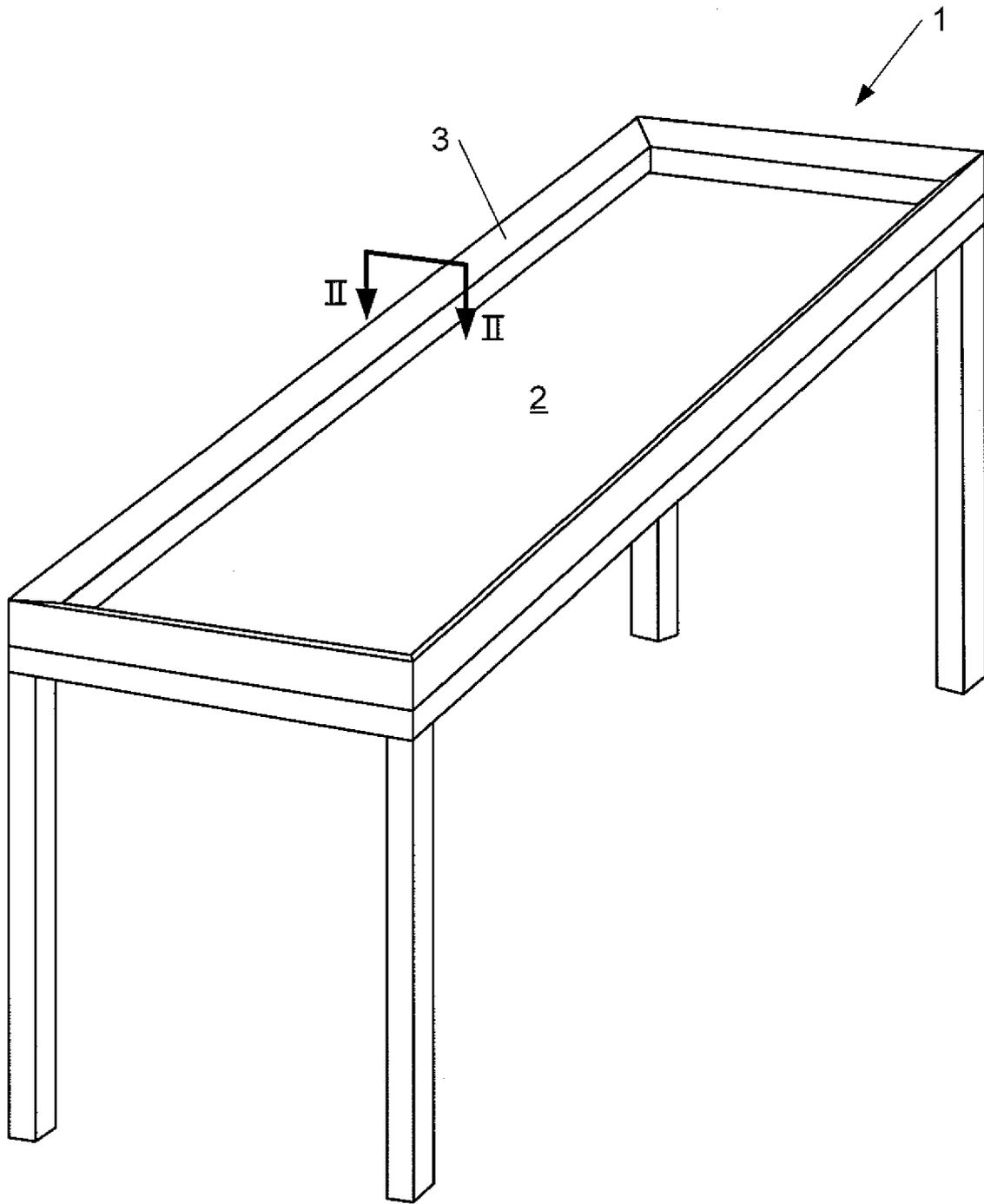
**[0022]** After the formwork beam has been secured to the panel sheet the flap is laid on the put on piece so as thereby to cover the hollow space and the opening. In the event that some concrete now reaches the flap during the casting of the concrete, the flap prevents this concrete from penetrating into the hollow space and from becoming firmly attached to the fastening elements so that it then becomes difficult to remove. After the pouring of the concrete it is sufficient for the flap to be raised and tilted away in order to remove the concrete which might have dropped onto it.

## Claims

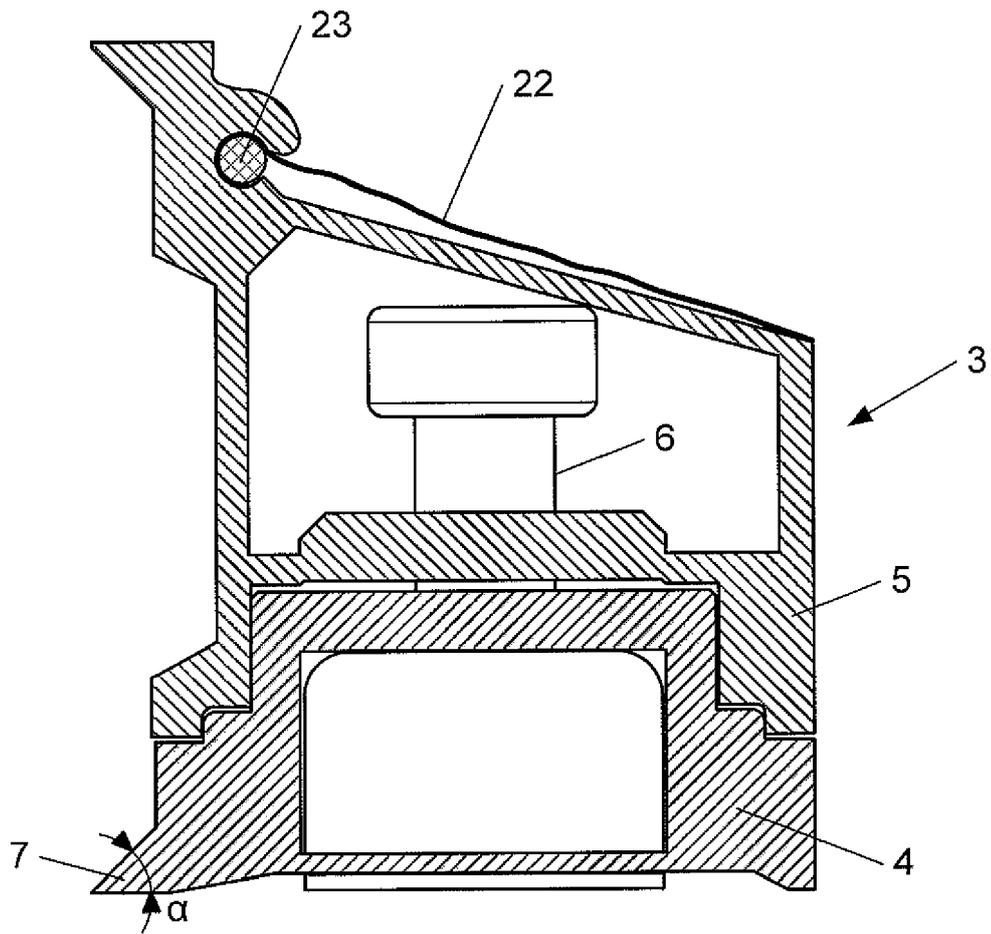
1. A formwork beam for a formwork table, comprising

a base element and a put on piece which is to be attached to the base element in a detachable manner, wherein the base element is provided with a foot member in order to rest upon the formwork table, which foot member comprises an oblique flank which descends from a longitudinal side of the put on piece, which formwork beam is produced from extruded aluminium with the foot member, and wherein openings which give access to a hollow space formed in the put on piece are formed in an upper side of the put on piece, **characterised in that** the openings are covered by a movable flap.

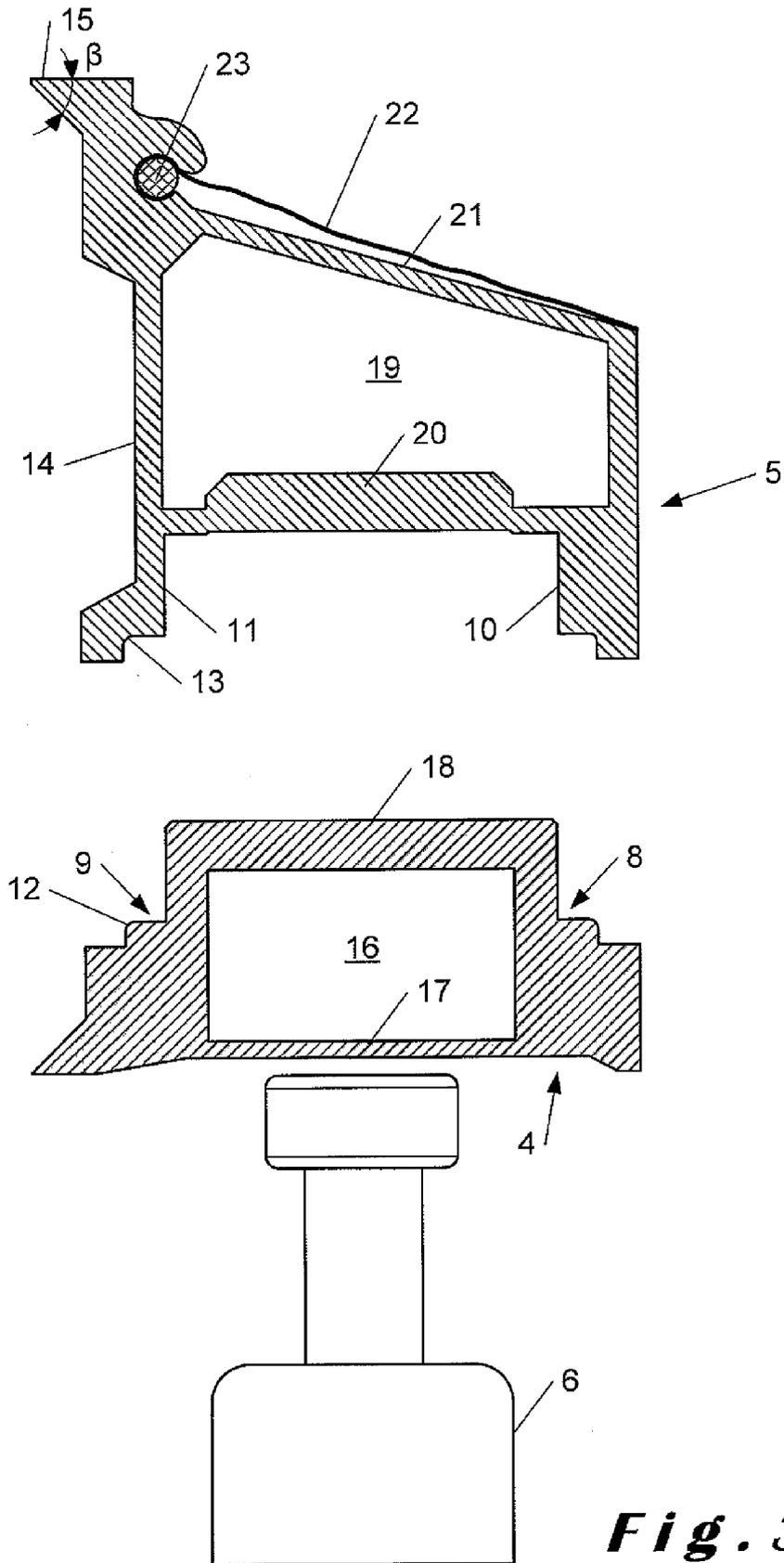
2. A formwork beam according to claim 1, **characterised in that** a fastening means for fastening the flap in a rotatable manner is applied below an upper edge of the put on piece.
3. A formwork beam according to claim 2, **characterised in that** the fastening means is formed by an eye applied below the upper edge of the put on piece.
4. A formwork beam according to any one of claims 1 to 3, **characterised in that** the external longitudinal sides of the base element have a first stepped profile and the internal longitudinal side of the put on piece has a second stepped profile which adjoins the first stepped profile.
5. A formwork beam according to any one of claims 1 to 4, **characterised in that** an external longitudinal side of the put on piece comprises a recess which extends over at least part of the length of the put on piece.
6. A formwork beam according to any one of claims 1 to 5, **characterised in that** an upper edge of the put on piece has a tothing which extends over the length of the put on piece.



***Fig. 1***



**Fig. 2**



**Fig. 3**



EUROPEAN SEARCH REPORT

Application Number  
EP 14 16 2973

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Place of search		Date of completion of the search	Examiner
The Hague		10 June 2014	Orij, Jack
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