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(54) **Device for blocking formworks**

(57) A device for blocking frame members (6,7) of formworks (8) comprises a main body (1) of elongated shape, a pair of clamps (2,3), of which one slidably mounted on said main body (1), and blocking means (4, 5) for blocking said pair of clamps (2,3) on said frame members (6,7), and is **characterised in that** said block-

ing means comprises a rack plate (4) integrally mounted on said main body (1), and an engagement member (5) for the lockable reversible engagement with said rack (4), slidably mounted on said at least one clamp (3) of said pair of clamps (2,3).

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Description

[0001] The invention refers to a device for blocking frame formworks for the casting of concrete materials and the like; more specifically, it refers to a bracket device for the alignment and the vertical and/or horizontal connection of two or more frame formworks.

[0002] To date, various types of devices for blocking formworks during their installation are already known, said devices typically providing a blocking member equipped with brackets apt to engage with respective engagement edges of the formworks. The arrangement is such that, once two or more frame formworks are side-by-side, a connecting edge is generated onto which a plurality of bracket devices can engage for the mutual blocking of the two side-by-side frames.

[0003] A type of bracket device as described above is provided in International Application W02005007997A1. Therein a bracket for frame formworks is described, said bracket having a main body onto which it is obtained a rack and a portion of the bracket. Onto the main body it is slidably mounted a second bracket portion, mounting a toothed wedge slidably arranged oblique to the bracket. The wedge is apt to engage with the rack in such a manner that, following a displacement of the wedge onto the rack, an axial displacement of the brackets is generated, creating a mutual moving away/nearing thereof.

[0004] However, such a type of device entails several drawbacks.

[0005] A first drawback lies in that the wedge has an overall length such that specific care is required in arranging the same during the assembling of two or more blocking devices on the same edge of the formwork, as a wedge when sliding must not obstruct the travel of another wedge of an adjacent blocking device.

[0006] Another drawback lies in that the sliding wedges are arranged slightly obliquely to the direction of development of the blocking device. This entails that during assembling of the devices on the formworks it is necessary to calculate beforehand the space for the operator's carrying out of the blocking step, a step usually carried out with a hammer or the like.

[0007] A further drawback lies in that the rack on the bracket body is obtained by moulding or the like of the entire body. This entails that the material of the body of the device be of a thickness predetermined and anyhow greater than that of a standard tubular member, with the related consequence of an increase in the overall weight of the blocking device. The same holds true for the sliding wedge that, by being of a length predetermined yet required in order to perform the bracket-blocking travel, has relevant dimensions and weights. In short, the whole device is heavy, bulky and less than handy.

[0008] Therefore, object of the present invention is to solve the drawbacks mentioned above by providing a device for blocking frame formworks for the casting of concrete materials and the like, which exhibits improved operation with respect to the blocking devices of the state

of the art.

[0009] Another object of the present invention is to provide a device for blocking frame formworks for the casting of concrete materials and the like, having weights and dimensions lower than similar devices of the state of the art.

[0010] A further object of the present invention is to provide a device for blocking frame formworks for the casting of concrete materials and the like, which be of simplified manufacture with respect to similar devices of the state of the art.

[0011] Hence, the present invention provides a device for blocking frame formworks for the casting of concrete materials and the like, substantially as defined in the appended claims.

[0012] Hereinafter there will be provided a detailed description of a preferred embodiment of the device for blocking frame formworks for the casting of concrete materials and the like according to the present invention, given by way of example and not for limitative purposes. Reference will be made to the annexed drawings, wherein:

Figure 1 illustrates in perspective, from the top and from one side, the device for blocking frame formworks of the present invention;

Figure 2 illustrates in a top plan the device for blocking frame formworks of the present invention, in an operative condition thereof;

Figures 3 and 4 illustrate in perspective, from the top and from one side, the device for blocking frame formworks of the present invention in two different conditions;

Figure 5 illustrates in front elevation the device for blocking frame formworks of the present invention; Figures 6 and 7 illustrate in perspective, from the top and from one side, the device for blocking frame formworks of the present invention in two different conditions;

Figure 8 illustrates in perspective, from the top and from one side, a component of the device for blocking frame formworks of the present invention; and

Figure 9 illustrates in a top elevation the device for blocking frame formworks of the present invention.

[0013] Referring now to Figure 1, the blocking device of the present invention is comprised of a first tubular body 1, having integrally mounted thereon a first clamp 2. The tubular body 1 is of square cross-section and serves as guide for a second clamp 3 slidably mounted thereon. Advantageously, the tubular body can alternatively be implemented also by means of a box-type member.

[0014] Moreover, in correspondence of one of its faces, the tubular body 1 has a moulded rack plate 4, made integral thereon by a spot welding step. It should be specified here that the rack 4 may be fixedly mounted on the tubular body also by removable blocking means, such

as screws, bolts or the like.

[0015] The clamp 3 slidably mounts it also a blocking wedge 5, which is apt to reversibly engage with the rack 4 added on the guide tube 1 (all better illustrated hereinafter).

[0016] Referring now to figure 2, therein it is illustrated the engagement of the clamps 2 and 3 with a respective pair of frame members 6 and 7 of a formwork 8. As it can be understood in the figure, the clamps 2 and 3, following the sliding on the tubular body 1, are apt to engage on complementary edges of respective formwork frames 6 and 7 and, furthermore, to mutually block said frames following the sliding of the blocking wedge 5.

[0017] Referring now specifically to Figures 3 and 4, therein the blocking device of the present invention is illustrated in the two limit conditions of full closure and opening. In said conditions, the clamps 2 and 3 perform a travel corresponding to the length of the rack 4. In particular, it can be noticed from Figure 4 how the sliding clamp 3 is apt to travel for a range greater than the length of the tubular body 1, though ensuring the lockable engagement with the rack 4 of the tubular body 1. Thus, there can be obtained a full opening of the clamps 2 and 3 with reduced external dimensions of the blocking device.

[0018] Referring now to Figure 5, therein it is illustrated the functional engagement of the blocking wedge 5 with the rack 4.

[0019] As it can be noticed in the Figure, the blocking wedge 5 has, on the face thereof engaging with the rack 4, an array of teeth 50 longitudinally extending along an axis Z1 that is tilted of an angle greater than 15°, and preferably of 19°, with respect to vertical axis Z of the tubular body 1 of the blocking device.

[0020] Moreover, the blocking wedge 5 is mounted on the clamp 3 slidably along an axis Z2 which is tilted of an angle greater than 20°, and preferably of 30°, with respect to vertical axis Z of the tubular body 1 of the blocking device.

[0021] Furthermore, the rack 4 has a plurality of teeth 40 having a longitudinal development along axis Z1, and therefore them also arranged in a condition tilted of 19° with respect to vertical axis Z of the tubular body 1 of the blocking device.

[0022] As it can be understood in the Figure, the mechanism for the lockable and reversible engagement of the clamps 2 and 3 results from the sliding of the vertical teeth 50 of the wedge 5 on the teeth 40 of the rack 4. In fact, the action of ascent and/or descent of the tilted wedge 5 causes the displacement, for a predetermined distance, of the movable clamp 3 on the axis X of the tubular body 1. In engagement with the frame members 6 and 7 of the formwork 8, such a predetermined displacement causes the mutual horizontal alignment of the same frame members 6 and 7 and their mutual blocking.

[0023] As it can be understood in Figures 6 and 7, the step of mutual nearing/moving away of the clamps 2 and 3 for the mutual blocking/unblocking thereof is made pos-

sible by the sliding of the wedge 5 in one sense or in the opposite sense (bottomwise or topwise in the Figures).

[0024] Referring now specifically to Figures 8 and 9, therein it is illustrated in detail a portion of the blocking device of the present invention. More precisely, the horizontal sliding of the clamp 3 is ensured by the guide function of the moulded rack 4 and two pairs of punched members 30 obtained on the movable clamp 3.

[0025] Likewise, the stop of the movable clamp 3 is made up by stopping members 41 obtained from the shearing and subsequent curving of the same onto the ends of the rack 4.

[0026] On the other hand, the abutment of the sliding wedge 5 serving also as a stop is guaranteed by respective plates 51 apt to support the loads transmitted during the step of blocking and unblocking the clamps 2 and 3.

[0027] Hence, the hereto-disclosed operation steps may be summed up as follows. The movable clamp 3 slides on the tubular body 1 by virtue of the engagement thereon of the punched members 30. During said sliding, the wedge 5, or better the teeth 50 thereof, engage the rack 4, resulting in a topwise or bottomwise displacement of the wedge itself.

[0028] Once the clamp 3 has moved to a desired operative distance with respect to the stationary clamp 2, the wedge 5 is riveted onto the rack 4 so as to block the movable clamp 3 in said position.

[0029] As it will be evident to those skilled in the art, the blocking device of the present invention entails several advantages. A first advantage lies in that the same has an operation remarkably improved with respect to the blocking devices of the state of the art.

[0030] Another advantage lies in that the arrangement and constitution of the members making up the device of the present invention attain weights and dimensions remarkably lower than those of similar devices of the state of the art.

[0031] A further advantage lies in that the device according to the present invention has a simplified manufacture with respect to similar devices of the state of the art.

[0032] The present invention has been hereto described with reference to preferred embodiments thereof. It is understood that other embodiments thereof might exist, in accordance with the protective scope of the claims hereinafter.

Claims

1. A device for blocking frame members (6,7) of formworks (8), comprising:

- a main body (1) of elongated shape, having a longitudinal axis (X) and a transversal axis (Z);
- a pair of clamps (2,3) for engagement with said frame members (6,7), of which at least one clamp (3) is slidably mounted on said main body

(1); and

- blocking means (4, 5) for blocking said pair of clamps (2,3) on said frame members (6,7),

characterised in that said blocking means comprises a rack plate (4) fixed with said main body (1) and an engagement member (5) reversibly blockable with said rack (4), associated with said at least one sliding clamp (3) of said pair of clamps (2,3).

2. The device for blocking frame members (6,7) of form-works (8) according to the preceding claim, wherein a clamp (2) of said pair of clamps is made fixed with said main body (1).
3. The device for blocking frame members (6,7) of form-works (8) according to claim 1 or 2, wherein said main body (1) is made by a tubular or box-type member.
4. The device for blocking frame members (6,7) of form-works (8) according to the preceding claim, wherein said tubular body (1) has a square cross-section.
5. The device for blocking frame members (6,7) of form-works (8) according to any one of the preceding claims, wherein said rack (4) is obtained by a moulding step on a plane member and is made fixed with said tubular body (1) in correspondence of a face thereof.
6. The device for blocking frame members (6,7) of form-works (8) according to the preceding claim, wherein said rack (4) is made fixed with said tubular body (1) by means of welding or the like.
7. The device for blocking frame members (6,7) of form-works (8) according to claim 5, wherein said rack (4) is made fixed with said tubular body (1) by reversible fixing means.
8. The device for blocking frame members (6,7) of form-works (8) according to any one of the preceding claims, wherein said member (5) for the reversible lockable engagement with said rack (4) is slidably mounted on said movable clamp (3).
9. The device for blocking frame members (6,7) of form-works (8) according to any one of the preceding claims, wherein said movable clamp (3) can perform a travel corresponding to the length of said rack (4).
10. The device for blocking frame members (6,7) of form-works (8) according to any one of the preceding claims, wherein said sliding clamp (3) is apt to travel for a travel greater than the length of the tubular body (1).

11. The device for blocking frame members (6,7) of form-works (8) according to any one of the preceding claims, wherein said blocking member (5) has, on a face thereof engaging with said rack (4), an array of teeth (50) longitudinally extending along an axis (Z1) that is tilted of an angle greater than 15°, and preferably of 19°, with respect to the transversal axis (Z) of said tubular body (1).

12. The device for blocking frame members (6,7) of form-works (8) according to any one of the preceding claims, wherein said blocking member (5) is mounted on said clamp (3) slidably along an axis (Z2) that is tilted of an angle greater than 20°, and preferably of 30°, with respect to the transversal axis (Z) of the tubular body (1).

13. The device for blocking frame members (6,7) of form-works (8) according to any one of the preceding claims, wherein said rack (4) has a plurality of teeth (40) having a longitudinal development coinciding with the direction of said axis (Z1) of said blocking member (5).

14. The device for blocking frame members (6,7) of form-works (8) according to any one of the preceding claims, wherein said sliding clamp (3) has guide means (30) apt to slidably engage on said moulded rack (4).

15. The device for blocking frame members (6,7) of form-works (8) according to the preceding claim, wherein said guide means is punched members (30) obtained on said sliding clamp (3).

16. The device for blocking frame members (6,7) of form-works (8) according to any one of the preceding claims, further comprising stopping means (41) for the stop of said sliding clamp (3).

17. The device for blocking frame members (6,7) of form-works (8) according to the preceding claim, wherein said stopping means for the stop of said sliding clamp (3) comprises stopping members (41) obtained on the ends of the rack (4).

18. The device for blocking frame members (6,7) of form-works (8) according to any one of the preceding claims, wherein said blocking member (5) comprises abutment and stop means (51).

19. The device for blocking frame members (6,7) of form-works (8) according to the preceding claim, wherein said abutment and stop means is a pair of plates (51) obtained in correspondence of the ends of said blocking member (5).

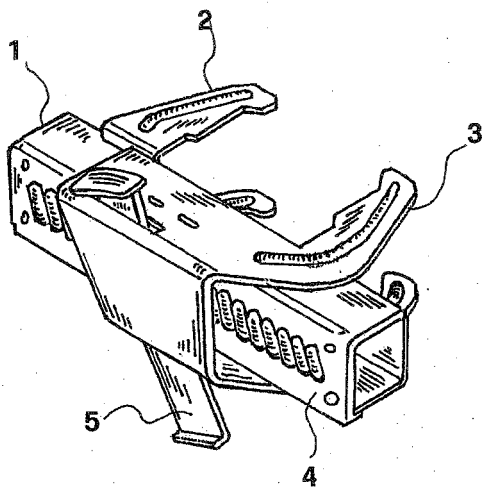


FIG.1

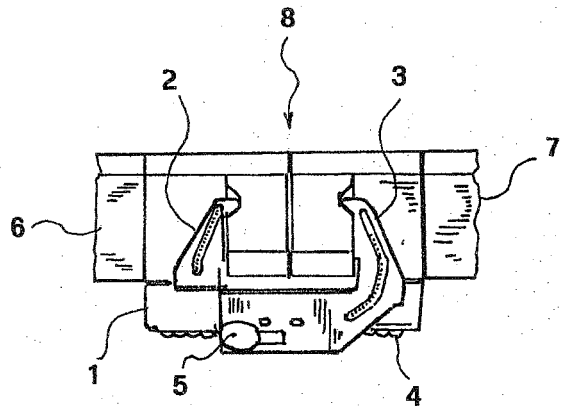


FIG.2

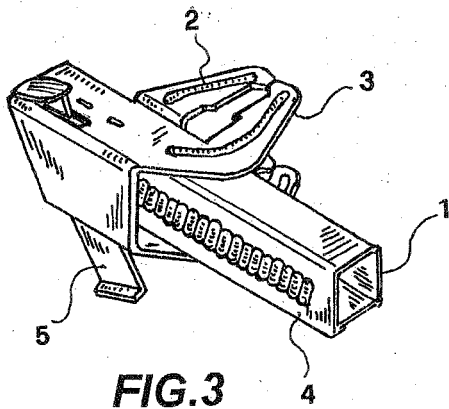


FIG.3

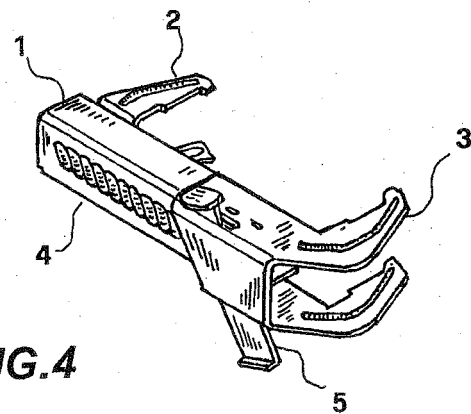


FIG.4

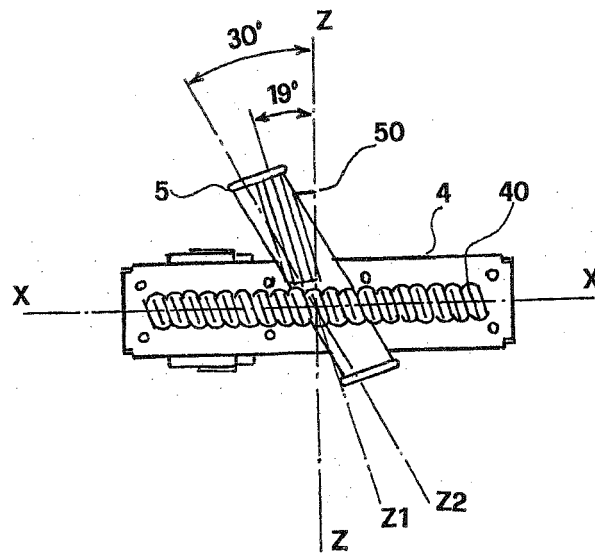


FIG. 5

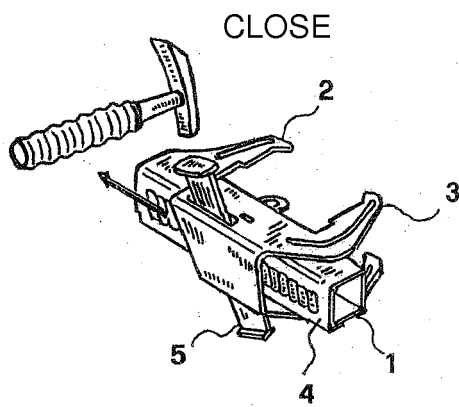


FIG. 6

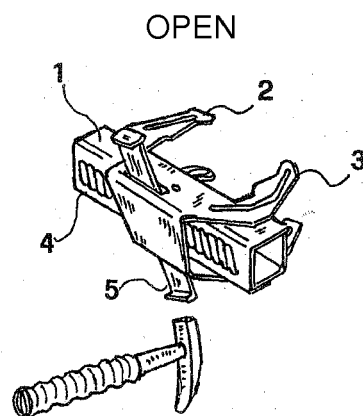


FIG. 7

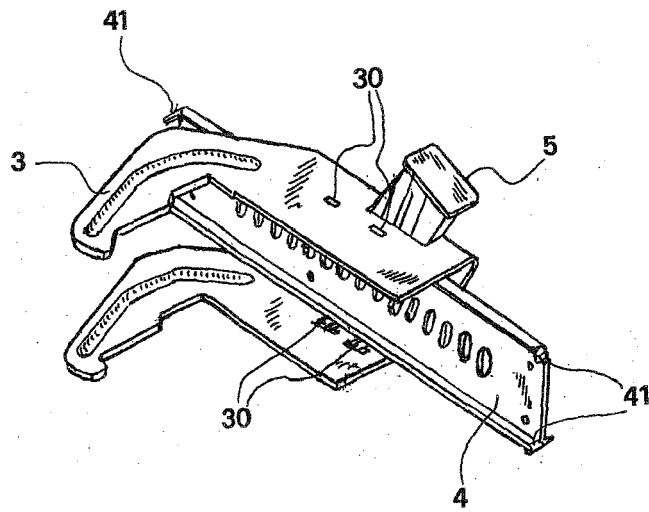


FIG. 8

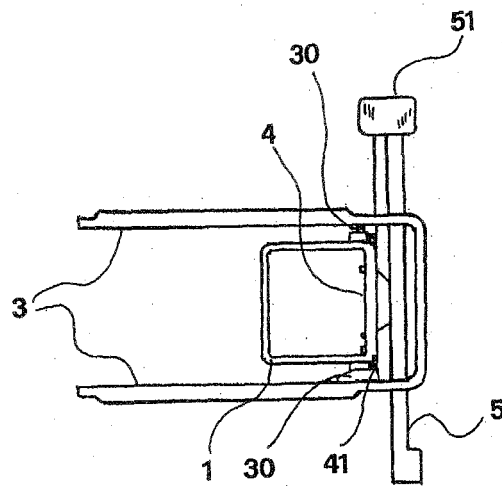


FIG. 9

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2005007997 A1 [0003]