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(54) Bagger shovel for making slits for reinforced concrete walls

(57) A crane shovel (1) for building reinforced concrete cutoff walls and similar, having a self-propelled undercarriage (2) particularly suitable for moving over rough ground; a movable superstructure (3) mounted on the self-propelled undercarriage (2) to revolve about a vertical axis of rotation (A); a boom (4) projecting from the movable superstructure (3) in a substantially horizontal direction; and a grab bucket (5), for reinforced concrete cutoff walls, suspended from the free end (4a) of the boom (4) by means of one or more supporting cables (6).

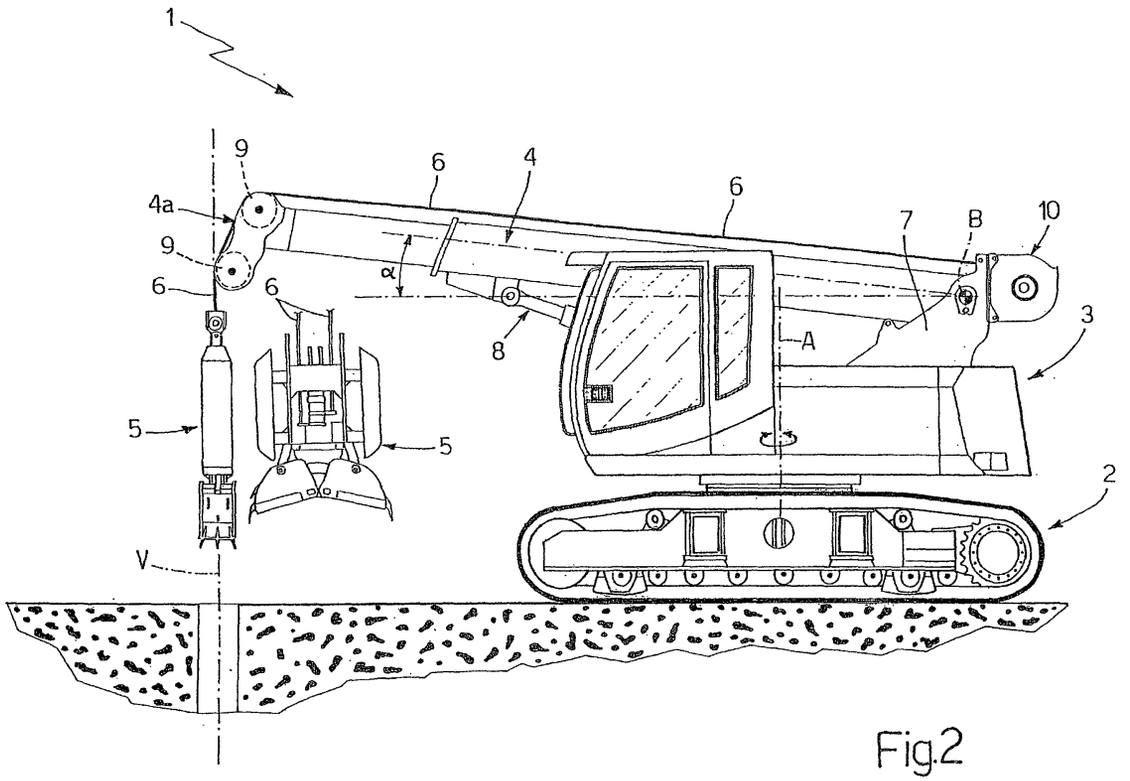


Fig.2

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Description

[0001] The present invention relates to a crane shovel for building reinforced concrete cutoff walls and similar.

[0002] As is known, in the building industry, reinforced concrete cutoff walls and similar are often used in the construction of certain types of underground structures, such as garages, stores, cellars, tanks, etc.

[0003] The construction of reinforced concrete cutoff walls requires a special type of crane shovel capable of digging trenches of constant width and depth, depending on the type of cutoff wall being built.

[0004] With reference to Figure 1, known crane shovels for building reinforced concrete cutoff walls comprise : a self-propelled track-mounted undercarriage I for moving over any type of ground; a movable superstructure II mounted on self-propelled undercarriage I and revolving about a vertical axis; a boom III projecting substantially vertically from movable superstructure II; and a special grab bucket IV, for reinforced concrete cutoff walls, fixed to the top end of boom III by one or more supporting cables V looped about a number of transmission pulleys VI at the top end of boom III.

[0005] Supporting cables V are wound and unwound by a number of winches on movable superstructure II, so as to move grab bucket IV, on command, along the vertical line through the top end of boom III.

[0006] Known crane shovels have the major drawback of being extremely bulky and therefore of limited application, so that builders are often forced to adopt alternative solutions to reinforced concrete cutoff walls, with a considerable increase in building costs. Known crane shovels, in fact cannot be used inside buildings or on small building sites with not enough room to maneuver.

[0007] It is an object of the present invention to provide a crane shovel for building reinforced concrete cutoff walls and similar, with an entirely new structure, and which is compact enough to operate easily in confined spaces and inside existing buildings.

[0008] According to the present invention, there is provided a crane shovel for building reinforced concrete cutoff walls and similar, comprising a self-propelled undercarriage; a movable superstructure mounted for rotation on the self-propelled undercarriage; a boom projecting from said movable superstructure; and a grab bucket, for reinforced concrete cutoff walls, suspended from said boom by means of at least one supporting cable; the crane shovel being characterized in that said boom projects from said movable superstructure in a substantially horizontal direction.

[0009] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 2 shows a side view of a crane shovel for building reinforced concrete cutoff walls and similar, in accordance with the teachings of the present invention;

Figure 3 shows a rear view of the Figure 2 crane shovel;

Figure 4 shows a view in perspective of a detail of the crane shovel in Figures 1 and 2.

[0010] Number 1 in Figures 2 and 3 indicates as a whole a crane shovel specially designed for building reinforced concrete cutoff walls and similar in highly confined spaces.

[0011] Crane shovel 1 comprises: a self-propelled undercarriage 2, specially designed for moving over rough ground, and preferably, though not necessarily, mounted on tracks; a movable superstructure 3 mounted in known manner on self-propelled undercarriage 2 to revolve about a vertical axis of rotation A; a boom 4 projecting from movable superstructure 3 in a substantially horizontal direction; and a grab bucket 5, for reinforced concrete cutoff walls, suspended from the free end 4a of boom 4 by means of one or more supporting cables 6.

[0012] More specifically, boom 4 is hinged at the other end to a supporting bracket 7 projecting from the top of the body of movable superstructure 3, and is maintained in a substantially horizontal position by a hydraulic piston 8 having a first end hinged to boom 4, and a second end hinged to the body of movable superstructure 3.

[0013] More specifically, and with reference to Figure 2, boom 4 is hinged to supporting bracket 7 so as to rotate about a horizontal axis of rotation B; while hydraulic piston 8, projecting from movable superstructure 3, supports boom 4 centrally and is adjustable in axial length to adjust, on command, the tilt angle α of boom 4 with respect to its horizontal operating position.

[0014] At free end 4a, boom 4 has one or more transmission pulleys 9, about which cable/s 6 supporting grab bucket 5 for reinforced concrete cutoff walls is/are wound.

[0015] It should be pointed out that, in the example shown, boom 4 is a telescopic type, i.e. is defined by a number of sections (two in the example shown) connected to each other telescopically by one or more hydraulic actuators (not shown) for adjusting the overall axial length of boom 4 in known manner.

[0016] In addition to hydraulic piston 8, movable superstructure 3 also comprises an orienting device (not shown) for rotating movable superstructure 3, with respect to self-propelled undercarriage 2, about axis of rotation A; and at least one winch 10 for winding and unwinding, on command, cable/s 6 supporting grab bucket 5 for reinforced concrete cutoff walls, so as to move grab bucket 5 along the vertical line V through the free end 4a of boom 4, and also open and close the bucket.

[0017] In the example shown, winch/es 10 is/are fixed to and project from supporting bracket 7 at the point at which boom 4 is hinged to supporting bracket 7.

[0018] It should be pointed out that, in the example shown, crane shovel 1 is equipped with a known grab bucket 5 for reinforced concrete cutoff walls, which re-

quires two independent supporting cables 6 for moving grab bucket 5 along vertical line V and for opening and closing the bucket. Movable superstructure 3 is therefore equipped with at least two independent winches 10, each for winding and unwinding a respective supporting cable 6 on command.

[0019] With reference to Figures 3 and 4, crane shovel 1 preferably, though not necessarily, also comprises two lateral running boards 11 located on opposite sides of movable superstructure 3, and each of which is capable of supporting the weight of at least one person, is fixed to the body of movable superstructure 3, and can be removed easily and quickly, when necessary, to reduce the overall width of movable superstructure 3.

[0020] It should be pointed out that, in the example shown, each lateral running board 11 is defined by a preferably, though not necessarily, parallelepiped-shaped box, which may be used to advantage as a tool box.

[0021] In the example shown, each lateral running board 11 is defined by a parallelepiped-shaped box 12 fixed in easily removable manner by a long side wall to the body of movable superstructure 3; and by a top cover plate 13 hinged by a long lateral edge 13a to the lateral wall of box 12.

[0022] Top plate 13 defines the lid of box 12, and is movable between a closed position (Figure 3) closing the top opening of box 12, and an open position (Figure 4) exposing the top opening of and permitting access to the inside of box 12.

[0023] It should be pointed out that, in the closed position, top plate 13 defines the tread surface of lateral running board 11.

[0024] Operation of crane shovel 1 is easily deducible from the foregoing description with no further explanation required.

[0025] The advantages of crane shovel 1 for reinforced concrete cutoff walls as described and illustrated herein are obvious: the horizontal-arm structure greatly reduces the overall height of the machine, thus enabling it to operate in confined spaces and, in particular, inside existing buildings.

[0026] The drastic reduction in the overall height of the machine also eliminates the need for extensive ground supporting elements, so that smaller self-propelled undercarriages 2 and movable superstructure 3 can be used, thus reducing the production cost of the machine.

[0027] Clearly, changes may be made to the crane shovel 1 for reinforced concrete cutoff walls as described and illustrated herein without, however, departing from the scope of the present invention.

[0028] In particular, self-propelled undercarriage 2 may be equipped with removable track skids to reduce the overall size of the undercarriage during transport.

Claims

1. A crane shovel (1) for building reinforced concrete cutoff walls and similar, comprising a self-propelled undercarriage (2); a movable superstructure (3) mounted for rotation on the self-propelled undercarriage (2) ; a boom (4) projecting from said movable superstructure (3); and a grab bucket (5), for reinforced concrete cutoff walls, suspended from said boom (4) by means of at least one supporting cable (6); the crane shovel (1) being **characterized in that** said boom (4) projects from said movable superstructure (3) in a substantially horizontal direction.

2. A crane shovel as claimed in Claim 1, **characterized in that** said boom (4) is telescopic.

3. A crane shovel as claimed in Claim 1 or 2, **characterized in that** said boom (4) is hinged at one end to the movable superstructure (3), and is maintained in a substantially horizontal position by supporting means (8) on said movable superstructure (3).

4. A crane shovel as claimed in Claim 3, **characterized in that** said supporting means (8) adjust, on command, the tilt angle (α) of the boom (4) with respect to a horizontal operating position of the boom.

5. A crane shovel as claimed in Claim 3 or 4, **characterized in that** said supporting means (8) comprise a hydraulic piston (8) having a first end hinged to the boom (4), and a second end hinged to the body of the movable superstructure (3).

6. A crane shovel as claimed in any one of the foregoing Claims, **characterized in that** said movable superstructure (3) has a supporting bracket (7) projecting from the top of the superstructure body; said boom (4) being fixed to said supporting bracket (7).

7. A crane shovel as claimed in any one of the foregoing Claims, **characterized by** also comprising at least one winch (10) for winding and unwinding, on command, said at least one supporting cable (6) to control the vertical movements and opening and closing of the grab bucket (5).

8. A crane shovel as claimed in any one of the foregoing Claims, **characterized by** comprising at least one lateral running board (11) fixed in easily removable manner to the body of the movable superstructure (3).

9. A crane shovel as claimed in Claim 8, **characterized in that** said lateral running board (11) is defined by a box which may advantageously be used as a tool box.

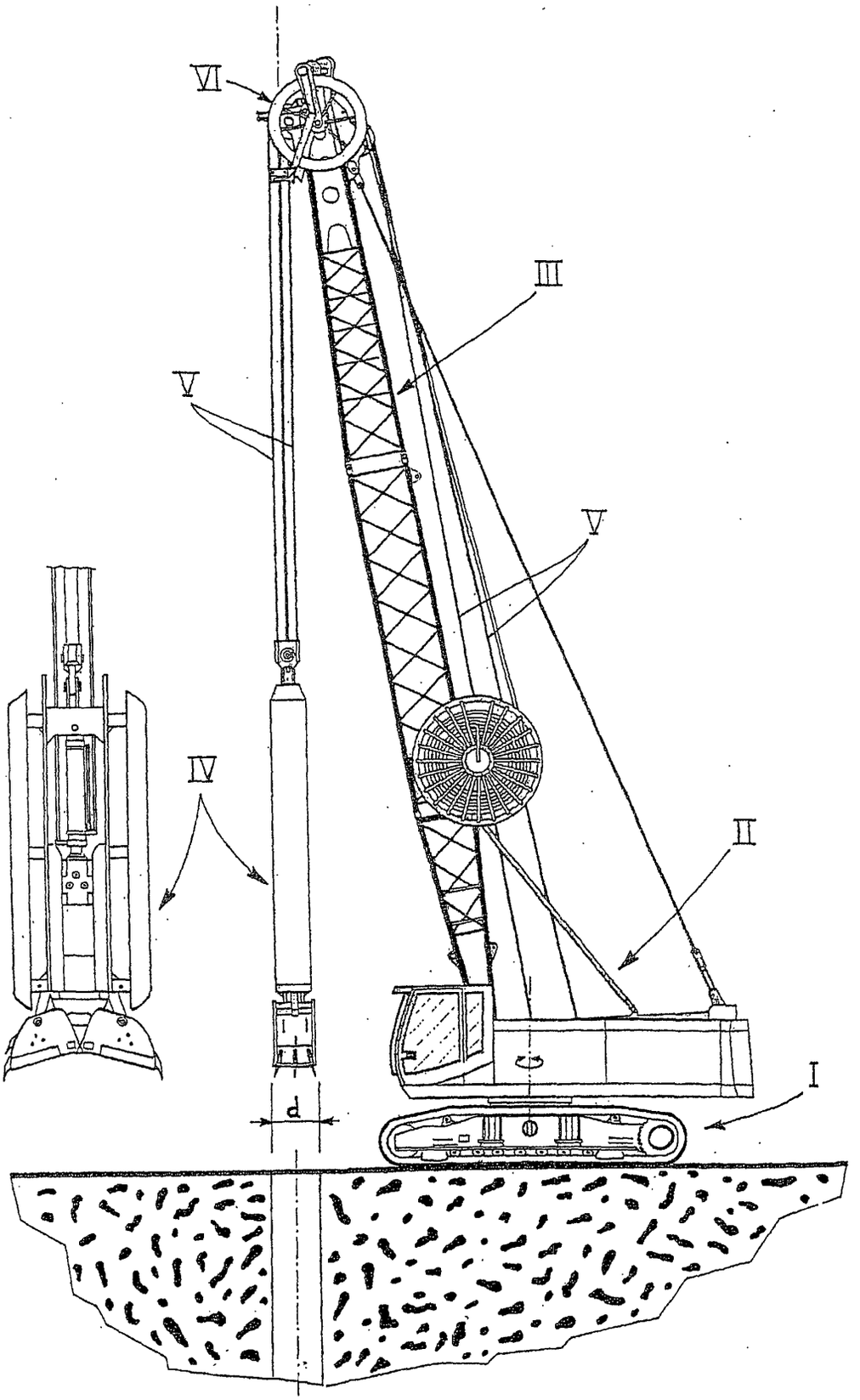


Fig.1

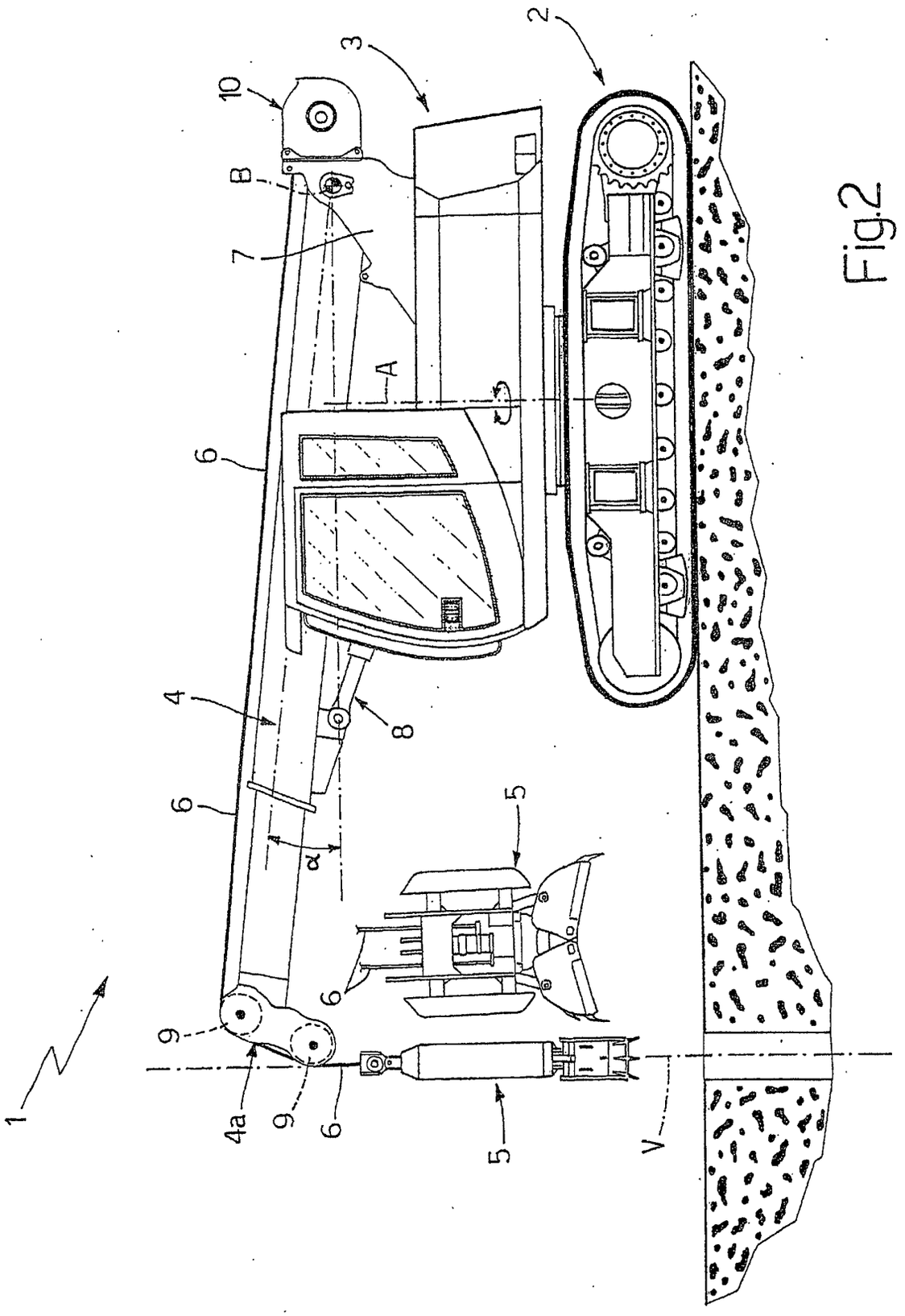


Fig.2

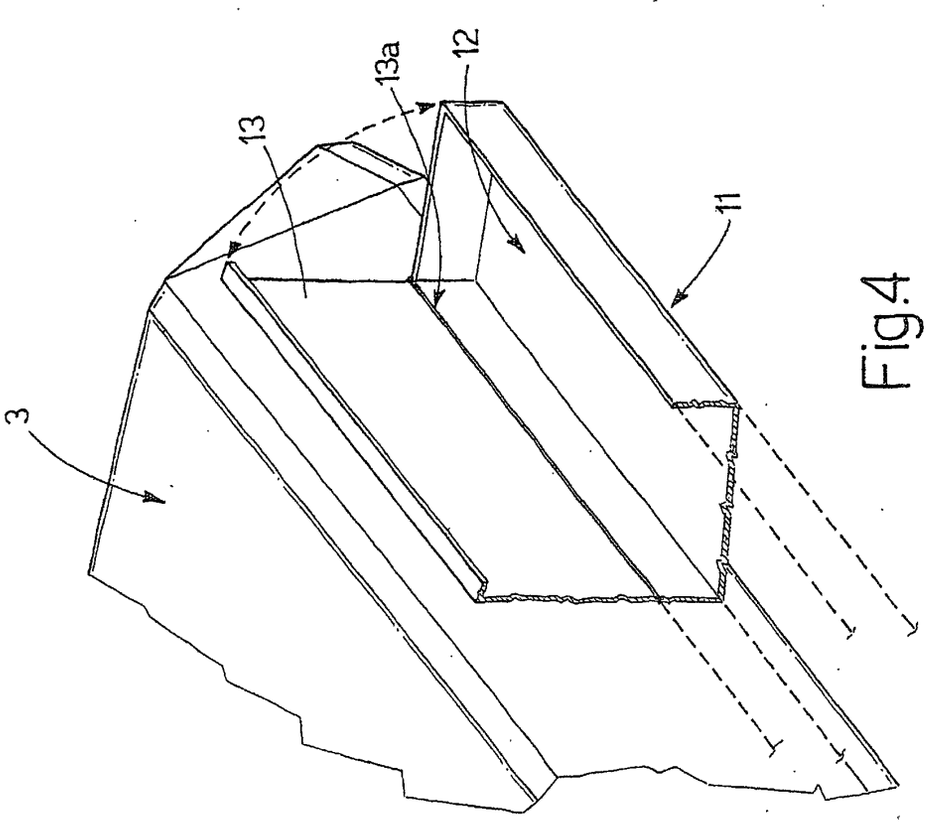


Fig.4

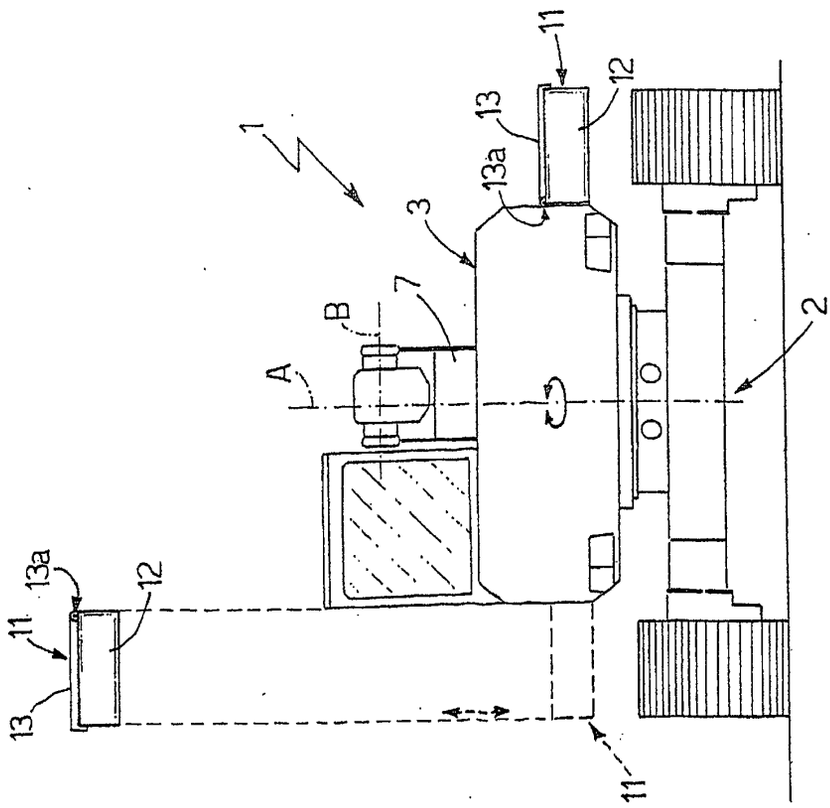


Fig.3