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No. ***1680***

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DESCRIPTION TO CERTIFICATE OF UTILITY MODEL REGISTRATION

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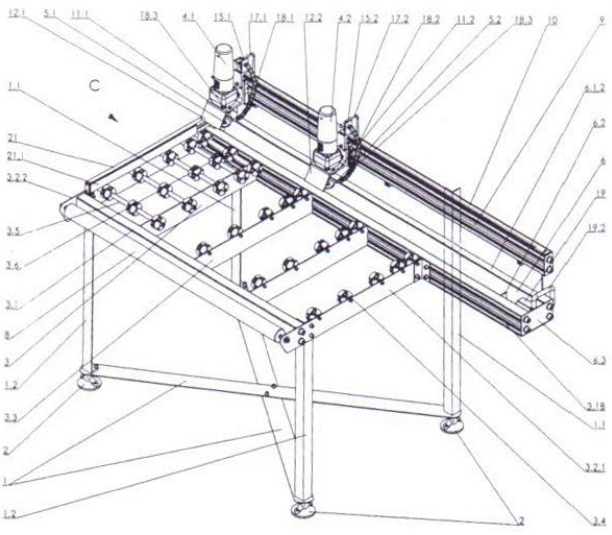
(54) SLOT MILLING MACHINE FOR FAÇADE PANELS

(57) The machine is applicable in the construction industry. The slot milled in the panel (P) is extremely precise due to opportunity to fine-tune the milling process in both horizontal and vertical direction. The closed circulation (recirculation) of the cooling water used to remove the particles of milled material enables the cooling water reuse and eliminates the need for constant water supply. The slot milling process in the panel (P) can be interrupted and started again due to the used method of milling. That reduces the quantity of milled material and improves the strength properties of the panel (P). The machine is provided with two vertical motors. If the size of the panel (P) is too big to allow its safe rotation



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without hitting something, the travelling stopper can be lifted and locked in place by a spring claw. This allows the panel's movement to the left, so it can be aligned symmetrically on the roller conveyor table.

1 Claim, 13 Figures

(54) SLOT MILLING MACHINE FOR FAÇADE PANELS

Field of Application

The slot milling machine for façade panels is intended for use in the construction industry.

Background

There is an existing slot milling machine for façade panels [1], which consists of a frame with adjustable legs. The frame is provided with a roller conveyor table on which is positioned the panel (P). The machine has a single vertical motor with horizontal cutting wheel mounted on its rotor. There is a tank mounted underneath the rolling conveyor table intended to collect the used cooling liquid, the cutting wheel abrasive particles and the chunks milled from the processed panel (P). The cooling system is connected to a source of cooling liquid, while the tank has a drain outlet to evacuate the used cooling liquid. Both ends of the rolling conveyor table are provided with stoppers.

The existing slot milling machine for façade panels is not very precise, as the processed panel is moved manually along the rolling conveyor table.

As the panel slot is shaped by use of a single cutting wheel, the operator cannot make series of slots placed at the same distance from each other over a series of panels of the same type and size. The machine can make a single continuous slot along the whole length of a single panel, which weakens the panel's strength.

The existing slot milling machine for façade panels constantly disposes the used cooling liquid. This leads to substantial waste of cooling liquid which needs additional devices to be collected and recycled.

Detailed Description of the Utility Model

The objective of the utility model was to propose a slot milling machine for façade panels with improved precision, capable of making more than one slot in a single panel and enabling recirculation of the cooling water.

The objective was achieved through construction of a slot milling machine for façade panels consisting of a frame with two longer rear legs and two shorter front legs. All legs are provided with adjustable pads. A roller conveyor table is mounted on top of the metal frame. The panel to be processed is placed on the roller conveyor table. The machine is provided with a vertical motor with a horizontal cutting wheel mounted on the rotor. A tank is mounted underneath the roller conveyor table to collect the cooling water as well as the abrasive particles from the cutting wheel. The tank is located under the cutting wheel along the whole length of the frame. It has two drain outlets provided with stopper plugs to evacuate the used cooling liquid. The left end of the roller conveyor table is provided with a stopper. According to the utility model, the roller conveyor table consists of two longitudinal bars (3.1), as well as shorter right-end bar and longer left-end bar. The rear longitudinal bar is a rail support and serves as a front wall of the tank. There are three crossbars located at even distances within the table frame. Each crossbar is provided with five multi-directional rollers. The opposite multi-directional rollers located between the left-end bar and the next crossbar to the right are connected with axles. There is a single multi-directional roller placed in the middle of each axle. An idle roller is located along the whole front length of the frame. The rear wall of the tank is fixed to the longer rear legs of the frame. The rail support is also fixed to the real legs of the frame. It has a ruler on top of it. There is a second vertical motor with a horizontal cutting wheel mounted on its rotor. Both motors are fixed to L-shaped supports provided with safety shields at their lower ends. There are second L-shaped supports, which are fixed to the vertical surfaces of the first L-shaped supports. The tops of the second L-shaped supports go above the ruler. Retailing bolts go through the second L-shape supports. There are plates fixed to the second L-shaped supports which hold hydraulic couplings. Flexible pipes are fixed to the one end of the hydraulic couplings. The other ends of the flexible pipes are connected to the respective branches of a feed hose leading to the pump. Flexible hoses are connected to the other end of the hydraulic couplings. The

nozzles of these hoses are pointed to the working surfaces of both cutting wheels. The tank has a vertical rim located at a distance from the right wall of the tank.

A submersible pump is located in the space between the rim and the wall. The suction end of the pump is located close to the tank bottom, next to the rim. At the left end of the machine, on the longer left-end bar, there is a vertical plate fixed to the longer leg. This plate holds a travelling stop piece with a plastic stopper mounted on the right vertical side of the stop piece. The length of the stopper corresponds to the width of the roller conveyor table. When lowered, the stopper's left side rests against the right surface of the longer bar. There are handles with fixing screws mounted on the horizontal profiles. There are indicators placed above the ruler. The vertical rail supports are mounted to the respective horizontal profiles, while the vertical guiding profiles are mounted into the respective channels of the vertical rail supports. The vertical guiding profiles are fixed to the L-shaped supports. Retaining screws are used for fixing of the components to the L-shaped supports. There are vertical scales fixed to the respective vertical rail supports. Independent indicator lines are indented on the respective L-shaped supports to lie against the scales. There is a spring claw, the axel of which is fixed to the plate on the longer left leg and the rail support. The spring claw serves for keeping the stopper in lifted position. When in lowered position, the stopper lays on five bushings.

Brief Description of the Drawings

The created utility model is illustrated on the figures as follows:

Figure 1: General view of the slot milling machine for façade panels;

Figure 2: Partial plan of the machine demonstrating the location of the rollers (3.4 and 3.6) and the stopper (7);

Figure 3: Isometric projection of the one of the two vertical motors with its mechanical interface;

Figure 4: Cross-sectional view (section A-A of Fig. 3) showing the rail support (9) and its assembly with the horizontal profile (23.1);

Figure 5: Cross-sectional view (section B-B of Fig. 3) showing the assembly of the flexible pipe (17.1) and the flexible hose (18.1);

Figure 6: Assembly drawing showing the vertical guiding profile (26.1) and the channel of the vertical rail support (25.1);

Figure 7: Assembly drawing of the vertical movement mechanism of any of the two vertical motors;

Figure 8: Left side view of the slot milling machine for façade panels showing milling of a slot in a panel (P).

Figure 9: Partial front view of the tank (6) showing the position of the rim (6.2) and of the submersible pump (19);

Figure 10: Diagram of the hydraulic circuit showing the cooling liquid circulation from the tank (6) to the milling zone;

Figure 11: Left side view of the machine (the left longer bar (3.2.2) is not shown) demonstrating the bushings (31) and the position of the stopper (21) in relation to them (the stopper is in horizontal position);

Figure 12: Left side view of the machine (the left longer bar (3.2.2) is not shown) demonstrating the bushings (31) and the position of the stopper (21) in relation to them (the claw (30) is in lifted position);

Figure 13: Left side view of the machine (the left longer bar (3.2.2) is not shown) demonstrating the bushings (31) and the position of the stopper (21) in relation to them (the stopper is in lifted position, locked by the claw (30));

Structure and Operating Principle of the Utility Model

The slot milling machine for façade panels consists of a frame (1) with two longer rear legs (1.1) and two shorter front legs (1.2) All legs (1.2) have adjustable pads (2). A roller conveyor table (3) is mounted on the frame (1). The panel to be processed (P) is positioned on the table (3). There is a vertically mounted motor (4.1) provided with horizontal cutting

wheel (5.1). A collecting tank (6) is placed underneath the table (3). It takes the whole length of the frame (1) and is located under the cutting wheel (5.1). The rolling conveyor table (3) consists of a frame formed by two long bars (3.1), a right-end shorter bar (3.2.1), and a left-end longer bar (3.2.2). There is a stopper at the left end of the roller conveyor table (3). The collecting tank (6) for the used cooling liquid and for the abrasive particles from the cutting wheel (5.1) is placed under the cutting wheel (5.1) along the whole length of the frame (1). It has two drain outlets (6.1) provided with stopper plugs (6.1.1) intended for evacuation of the used cooling liquid. The left end of the roller conveyor table (3) is provided with a stopper (7). The rolling conveyor table (3) consists of a frame formed by two long bars (3.1), a right-end shorter bar (3.2.1), and a left-end longer bar (3.2.2). The rear long bar (3.1B) has a rail structure and serves as a front wall of the tank (6). There are three crossbars (3.3) located at even distances inside the table frame. Each of the crossbars is provided with five multidirectional rollers (3.4). In between the left-end bar (3.1) and the next crossbar (3.3) located to the left of it, the opposite multi-directional rollers (3.4) are connected with axles (3.5) having another multi-directional roller (3.6). There is an idle roller (8) placed alongside the table frame. The rear longitudinal wall (6.1.2) of the tank (6) is fixed to the longer rear legs (1.1) of the frame (1). The upper part of the rear legs holds the rail support (9). A ruler (10) is located on top of the rail support. The machine is provided with second motor (4.2), which also has a horizontal cutting wheel (5.2) on its rotor. These two motors (4.1 and 4.2) are fixed on L-shaped supports (11.1 and 11.2) provided with safety shields (12.1 and 12.2) at the lower end. Second L-shaped supports (13.1 and 13.2) are fixed to the upper vertical end of the supports (11.1 and 11.2). The upper parts of these second L-shaped supports are located above the ruler (10). The retainer bolts (14.1 and 14.2) go through the supports. The second L-shaped supports (13.1 and 13.2) are provided with plates (15.1 and 15.2) holding hydraulic couplings (16.1 and 16.2). Flexible pipes (17.1 and 17.2) are fixed to the one end of the hydraulic couplings. The other ends of the pipes are connected to the respective branches of a feed hose (19.2), which leads to the pump (19). Flexible hoses (18.1 and 18.2) are connected to the other end of the hydraulic couplings (16.1 and 16.2). The nozzles (18.3) of these hoses are pointed to the working surfaces of the cutting wheels (5.1 and 5.2). The tank (6) has a vertical rim (6.2) located at a distance from the right wall of the tank (6.3). a submersible pump (19) is located in the space between the rim (6.2) and the wall (6.3). The suction end of the pump (19.1) is located close to the tank (6) bottom, next to the rim (6.2). To the left end of the machine, on the left-end longer bar (3.2.2) there is a vertical plate (20) fixed to the long leg (1.1). This plate (20) holds a travelling stop piece (21) with a plastic stopper (21.1) mounted on the right vertical side of the stop piece (21). The length of the stopper corresponds to the width of the roller conveyor table (3). When lowered, the stopper's (21) left side rests against the right surface of the longer bar (3.2.2). The handles (22.1 and 22.2) with their fixing screws (22.1.1 and 22.2.1) are mounted on the horizontal profiles (23.1 and 23.2). The respective indicators (24.1 and 24.2) are placed above the ruler (10). The vertical rail supports (25.1 and 25.2) are mounted to the respective horizontal profiles (23.1 and 23.2). The vertical guiding profiles (26.1 and 26.2) are mounted into the respective channels in the vertical rail supports (25.1 and 25.2). The vertical guiding profiles (26.1 and 26.2) are fixed to the L-shaped supports (11.1 and 11.2). The retaining screws (27.1 and 27.2) are used for fixing of the components to the L-shaped supports (11.1 and 11.2). There are separate scales (28.1 and 28.2) fixed to the respective vertical rail supports (25.1 and 25.2). Independent indicator lines (29.1 and 29.2) are indented on the respective L-shaped supports (11.1 and 11.2) to lie against the scales (28.1 and 28.2). There is a spring claw (30), the axel of which is fixed to the plate (20) on the long left leg (1.1) and the rail support (9). The spring claw (30) is located

on the stopper (21). Each of the axles (3.5) is provided with five bushings (31).

The slot milling machine for façade panels operates in the following way:

The frame (1 on Fig. 1) provides stability of the whole structure. It consists of two longer rear legs (1.1 on Fig. 1) and two shorter front legs (1.2 on Fig. 1). The legs (1.1 and 1.2) are provided with adjustable pads, which enable the slot milling machine's leveling and compensation of any floor irregularities.

The roller conveyor table (3 on Fig. 1) consist of a shorter right-end bar (3.2.1 on Fig. 1), longer left-end bar (3.2.2 on Fig. 1), crossbars (3.3 on Fig. 1) and two longitudinal bars (3.1 on Fig. 1). The long rear rail bar (3.1B on Fig. 1) serves as a front wall of the tank (6 on Fig. 1), while the rear wall of the tank (6.1.2 on Fig. 1) is fixed to the legs (1.1). The axles (3.5 on Fig. 1) are fixed to the longer left-end bar (3.2.2) and the crossbar (3.3) located to the right of the left-end bar. The axle holds the rollers (3.6). This enables the trouble-free movement of smaller size panels in the work zone.

Prior to starting of the slot milling machine for façade panels, it has to be adjusted for the size of the panels that are going to be processed. This also includes installation of appropriate horizontal cutting wheels (5.1 and 5.2 on Fig. 1 and Fig. 3) to the rotor of each of the vertical motors (4.1 and 4.2 on Fig 1 and Fig 3) depending on the properties of the materials of the panels to be milled.

The position of the slot to be milled in the panel is adjusted by aligning to the left vertical surface and the lower horizontal surface of the slot-milled panel (P).

The adjustment in relation to the left vertical surface of the panel (P) is made by horizontal movement of the L-shaped supports (11.1 and 11.2 on Fig. 1 and Fig.3) along the rail support (9) with the help of the horizontal profiles (23.1 and 23.2 on Fig. 6), which slide inside the channels of the rail support (9). The ruler's (10) scale starts from the stopper (21.1 on Fig. 1), which suggests that the left vertical surface of the panel (P) has to be positioned against the stopper (21.1). The indicators (24.1 and 24.2 on Fig. 3) and the ruler (10) are used to measure the position of the L-shaped supports (11.1 and 11.2) in relation to the left vertical surface of the panel by moving them along the rail support (9). Once the L-shaped supports (11.1 and 11.2) arrive at the desired position, they are fixed with the help of the handles (22.1 and 22.2) which are turned to their uppermost right position.

The adjustment to the lower horizontal surface of the panel (P) is made by vertical movement of the L-shaped supports (11.1 and 11.2 on Fig. 1 and Fig.3) along the rail supports (25.1 and 25.2 on Fig. 7). The L-shaped supports' (11.1 and 11.2) travelling along the rail supports (25.1 and 25.2) is made with the help of the guiding profiles (26.1 and 26.2 on Fig. 7), which slide inside the channels of the rail supports (25.1 and 25.2). Travelling is made in the following way: The retaining screws (27.1 and 27.2 on Fig. 6) are untightened by turning them to the left. This releases the guiding profiles (26.1 and 26.2). Thus, the L-shaped supports (11.1 and 11.2) are allowed to travel along the rail supports (25.1 and 25.2) by screwing the retaining bolts (14.1 and 14.2 on Fig. 6) in the second L-shaped supports (13.1 and 13.2). The L-shaped supports (11.1 and 11.2) are lifted up by screwing the retaining bolts (14.1 and 14.2) down. The L-shaped supports (11.1 and 11.2) are lowered in relation to the lower horizontal surface of the panel by screwing the retaining bolts (14.1 and 14.2) up. When the stopper (21) is lowered, it lies on five bushings (31).

The scales (28.1 and 28.2) are aligned with the lower horizontal surface of the panel when lying on top of the multi-directional rollers (3.4 and 3.6). The independent indicators (29.1 and 29.2) and the scales (28.1 and 28.2 on Fig. 7) allow for measuring the position of the L-shaped supports (11.1 and 11.2) in relation to the lower horizontal surface of the panel (P) during the L-shapes' travelling along the rail supports (25.1 and 25.2). Once the L-shaped supports (11.1 and 11.2) reach the desired position, they are fixed in place by tightening of the retaining screws (27.1 and 27.2) to their utmost right position.

Due to the precise adjustment in both the horizontal and vertical directions of travel, the slot milled in the panel is very precise.

The tank (6) has two compartments. One of them starts from the left-end bar (3.2.2) and ends at the left side of the vertical rim (6.2). The second one starts from the right side of the vertical rim (6.2) and ends at the right wall of the tank (6.3). When filling the tank (6) with water, measures should be taken so that the water level is high enough to allow overflowing through the vertical rim (6.2) and filling both tank compartments (See Fig. 1 and Fig. 9).

The panel to be processed (P) is placed on the roller conveyor table (3) so that its lower horizontal surface rests on the multi-directional rollers (3.6). If it is a large panel, it may also placed on the multi-directional rollers (3.4). In case of a large panel (P), the operator may use the idle roller (8 on Fig. 1) to facilitate the panel (P) sliding on the table. Once placed on the idle roller (8), the panel (P) is pushed ahead until it lies on the rollers (3.4 and 3.6).

Before connecting the vertical motors (4.1 and 4.2) to the power supply, make sure that their switches are in "OFF" position. If the vertical motors are not connected to the power supply, connect the motors.

Once the submersible pump (19 on Fig. 1) is connected to the power supply, it starts pumping water through the suction hose (19.1 on Fig 10) and the feed hose (19.2 on Fig. 10) to the flexible pipes (17.1 and 17.2 of Fig. 1 and Fig. 5). The hydraulic couplings (16.1 and 16.2 on Fig. 5) mounted on their respective plates (15.1 and 15.2 on Fig. 5) connect the flexible pipes (17.1 and 17.2 on Fig. 1 and Fig. 5) with the flexible hoses (18.1 and 18.2 on Fig. 1 and Fig. 10). The pumped up water goes through the flexible hoses (18.1 and 18.2) and through the nozzles (18 on Fig. 4) pours onto the cutting wheels (5.1 and 5.2) in the milling zone. The ON/OFF switches of the motors (4.1 and 4.2) are turned into "ON" position. The cutting wheels (5.1 and 5.2) start rotating until they reach the preset speed. The speed of the vertical motors (4.1 and 4.2) can be adjusted by use of their adjustment knobs to comply with the milling mode suitable for the type of material to be milled.

Due to the closed circulation (recirculation) of the cooling water used to evacuate the particles, there is no need for the cooling water to be disposed, or for constant supply of fresh water.

Before the start of the slot milling process, the integrity of the safety shields (12.1 and 12.2 on Fig. 1) has to be checked as the shields protect the milling zone from flying debris.

In order to make two slots in a selected vertical surface of the panel (P), the operator should do the following:

The panel (P) is manually positioned on the table and pressed against the stopper (21.1). Then the panel is moved manually towards the cutting wheels (5.1 and 5.2) down the roller conveyor table (3) by rolling the panel on the multi-directional rollers (3.4 and 3.6). When the selected vertical surface of the panel (P) reaches the cutting wheels (5.1 and 5.2), they will start milling simultaneously two slots into the surface. The slots depth will depend on the position of the stopper (7 on Fig. 8 and Fig. 2). Once the vertical surface of the panel (P) reaches the stopper (7), it is manually removed from the cutting wheels (5.1 and 5.2). The panel (P) has to remain pressed against the stopper (21.1) at times during the panel's (P) approaching to and removal from the cutting wheels (5.1 and 5.2).

If another couple of slots is to be made into the same panel (P), after being removed from the cutting wheels (5.1 and 5.2), the panel (P) has to be turned on the roller conveyor table (3). The multi-directional rollers (3.4 and 3.6) on which the panel is lying facilitate the rotation process. Care should be taken by the operator to avoid any possible collision between the cutting wheels (5.1 and 5.2) and the panel (P) during the panel rotation by removing the panel at a safe distance from the cutting wheels.

If the panel (P) size is so big that the panel cannot be removed at a safe distance, the travelling stopper can raised and fixed in lifted position by the claw (30 of Fig. 11, Fig. 12 and Fig. 13). This will allow the panel to be moved

to the left, so it can be placed symmetrically to the surface of the roller conveyor table (3). The panel so positioned can be rotated on the roller conveyor table (3). The panel (P) has to be orientated in such a way that the vertical surface to be slot-milled can face the cutting wheels (5.1 and 5.2).

If the travelling stopper (21) has been lifted, it can be lowered down to lay on the bushings (31 on Fig. 11, Fig. 12 and Fig.13). This is made by lifting up the claw (30) which releases the stopper (21). While lowering the stopper, it must be held by hand to avoid its bumping in the bushings.

The sequence of works needed to make any couple of slots is identical to the one described above.

The method of milling allows slots to be made exactly at the required places in the panel (P). This reduces the milled material and improves the strength properties of the panel (P). After the required number of slots is milled, the panel (P) is removed from the roller conveyor table (3).

The machine is readjusted, whenever the slots' position in relation to the left vertical surface and the lower horizontal surface of the panel (P) has to be changed.

The machine is stopped by switching the ON/OFF switches of motors (4.1 and 4.2) into "ÖFF" position. After that, the power supply of the motors (4.1 and 4.2) and of the submersible pump (19) has to be disconnected.

After the slot milling machine is switched off, the water in the tank (6) is drained through the drain outlets (6.1 on Fig 9) by turning the stopper plugs (6.1.1 on Fig 9). The tank is cleaned from the sediment formed on the tank bottom with appropriate brush and water jet.

Claims

1. The slot milling machine for façade panels consists of a frame (1) with two longer rear legs (1.1) and two shorter front legs (1.2). All legs (1.2) are provided with adjustable pads (2). There is a roller conveyor table (3) mounted on the frame (1). The panel to be processed (P) is positioned on the table (3). A vertical motor (4.1) is provided with a horizontal cutting wheel (5.1). There is a collecting tank (6) installed under the cutting wheel (5.1) along the whole length of the frame (1). A stopper (7) is mounted to the left end of the table (3). The roller conveyor table (3) consists of two longitudinal bars (3.1), a shorter right-end bar (3.2.1) and longer left-end bar (3.2.2) The long rear rail bar (3.1B) serves also as a front wall of the tank (6). There are three crossbars (3.3) in the table frame. Each of them is provided with five multi-directional rollers (3.4). The opposite multi-directional rollers (3.4) located between the left-end bar (3.1) and the first crossbar (3.3) to the right of it are connected with axles (3.5). In the middle of each axel there is a multi-directional roller (3.6). There is an idle roller (8) along the whole length of the frame. The rear longitudinal wall (6.1.2) of the tank (6) is fixed to the longer rear legs (1.1) of the frame (1). The rail support (9) is mounted to the frame extensions and has a ruler (10) on top of it. There is a second vertical motor (4.2) with a horizontal cutting wheel (5.2) mounted on its rotor. Both vertical motors (4.1 and 4.2) are fixed to the L-shaped supports (11.1 and 11.2) which are equipped with safety shields (12.1 and 12.2) at their lower ends. There are second L-shaped supports (13.1 and 13.2) to the vertical surfaces of the respective L-shaped supports (11.1 and 11.2). The upper parts of the second L-shaped supports (13.1 and 13.2) go above the ruler (10). There are retainer bolts (14.1 and 14.2) going through them. There are plates (15.1 and 15.2) fixed to the second L-shaped supports (13.1 and 13.2). They hold hydraulic couplings (16.1 and 16.2). Flexible pipes (17.1 and 17.2) are fixed to the one end of the hydraulic couplings. The other ends of the pipes are connected to the respective branches of a feed hose (19.2), which leads to the pump (19). Flexible hoses (18.1 and 18.2) are connected to the other end of the hydraulic couplings (16.1 and 16.2). The nozzles (18.3) of these hoses are pointed to the working surfaces of the cutting wheels (5.1 and 5.2). The tank (6) has a vertical rim (6.2) located at a distance from the right wall of the tank (6.3).

A submersible pump (19) is located in the space between the rim (6.2) and the wall (6.3). The suction end of the pump (19.1) is located close to the tank (6) bottom, next to the rim (6.2). The tank (6) has drain outlets (6.1) provided with stopper plugs (6.1.1). At the left end of the machine, on the longer left-end bar (3.2.2), there is a vertical plate (20) fixed to the long leg (1.1). This plate (20) holds a travelling stop piece (21) with a plastic stopper (21.1) mounted on the right vertical side of the stop piece (21). When lowered, the stopper's (21) left side rests against the right surface of the long bar (3.2.2). The handles (22.1 and 22.2) with their fixing screws (22.1.1 and 22.2.1) are mounted on the horizontal profiles (23.1 and 23.2). The respective indicators (24.1 and 24.2) are placed above the ruler (10). The vertical rail supports (25.1 and 25.2) are mounted to the respective horizontal profiles (23.1 and 23.2), while the vertical guiding profiles (26.1 and 26.2) are mounted into the respective channels of the vertical rail supports (25.1 and 25.2). The vertical guiding profiles (26.1 and 26.2) are fixed to the L-shaped supports (11.1 and 11.2). The retaining screws (27.1 and 27.2) are used for fixing of the components to the L-shaped supports (11.1 and 11.2). There are separate scales (28.1 and 28.2) fixed to the respective vertical rail supports (25.1 and 25.2). Independent indicator lines (29.1 and 29.2) are indented on the respective L-shaped supports (11.1 and 11.2) to lie against the scales (28.1 and 28.2). There is a spring claw (30), the axle of which is fixed to the plate (20) on the long left leg (1.1) and the rail support (9). The spring claw (30) is located on the stopper (21). Each of the axles (3.5) is provided with five bushings (31).

Supplements: 13 Figures

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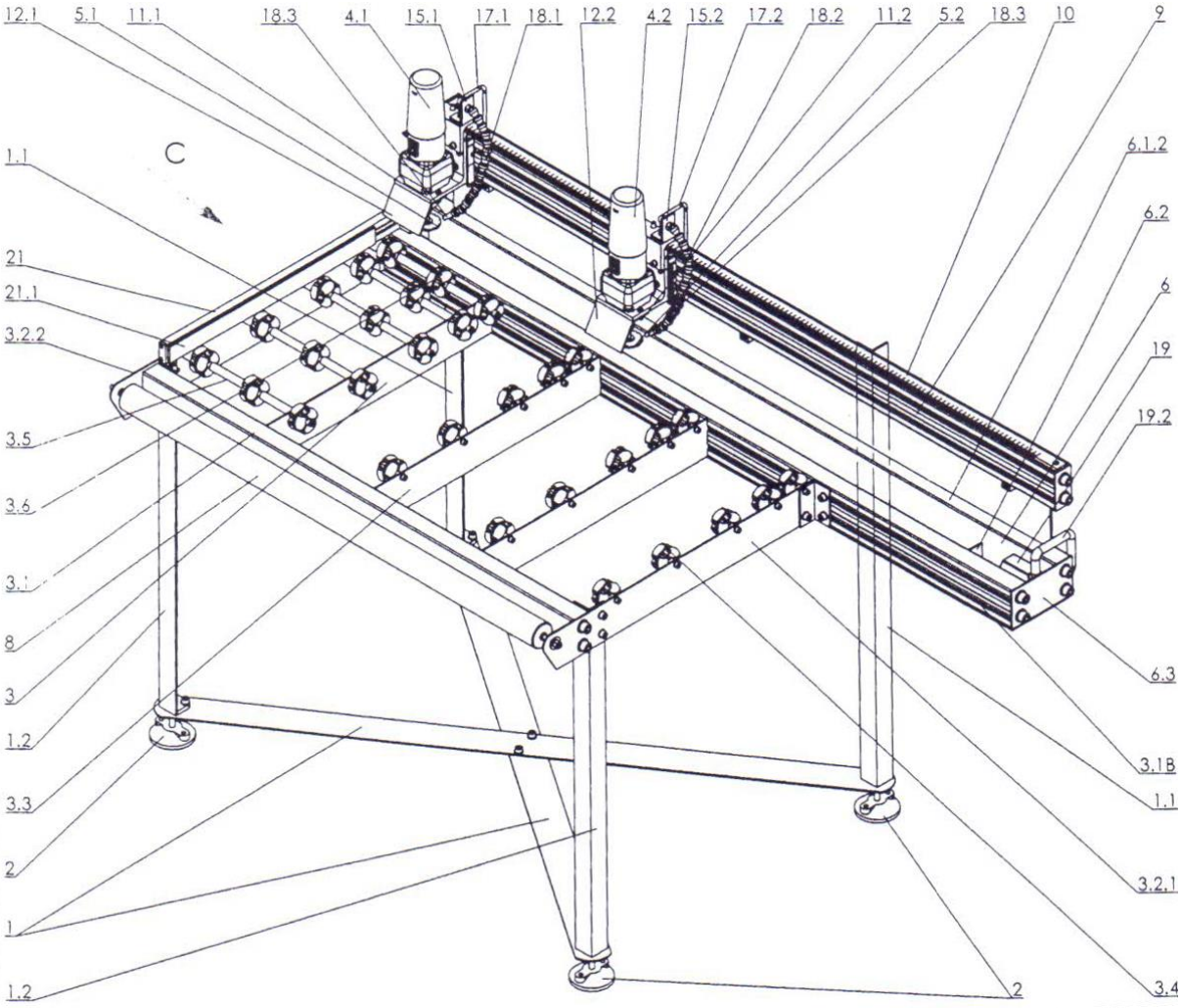
1. Internet brochure: http://www.main-cer.es/71116_en/Manual-Slotting-Machine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3.6
3.1
8
3
1.2
3.3
2
1
1.2
6.1.2
6.2
6
19
19.2
6.3
3.1B
1.1
3.2.1
2
3.4

Fig. 1

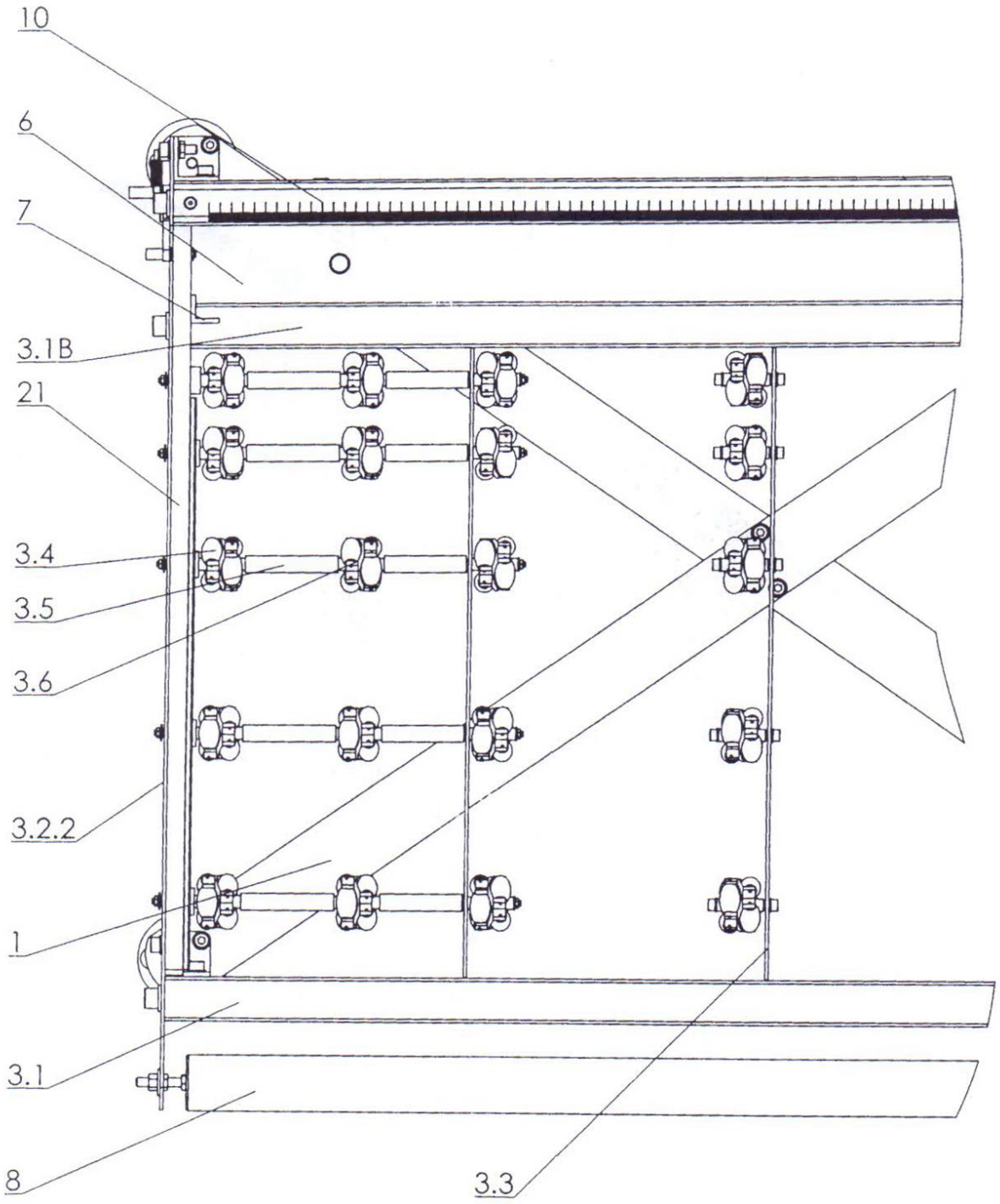


Fig. 2

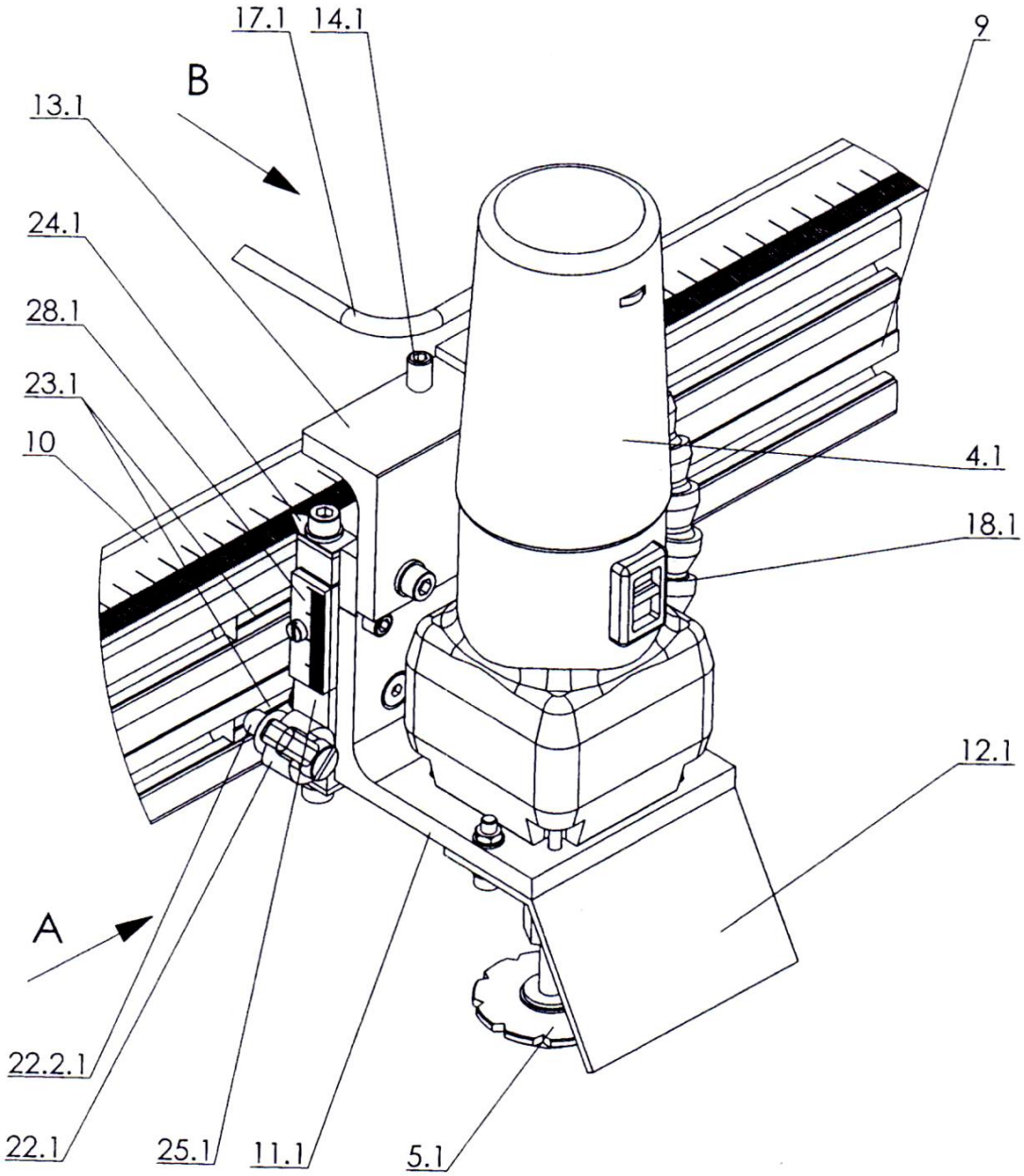
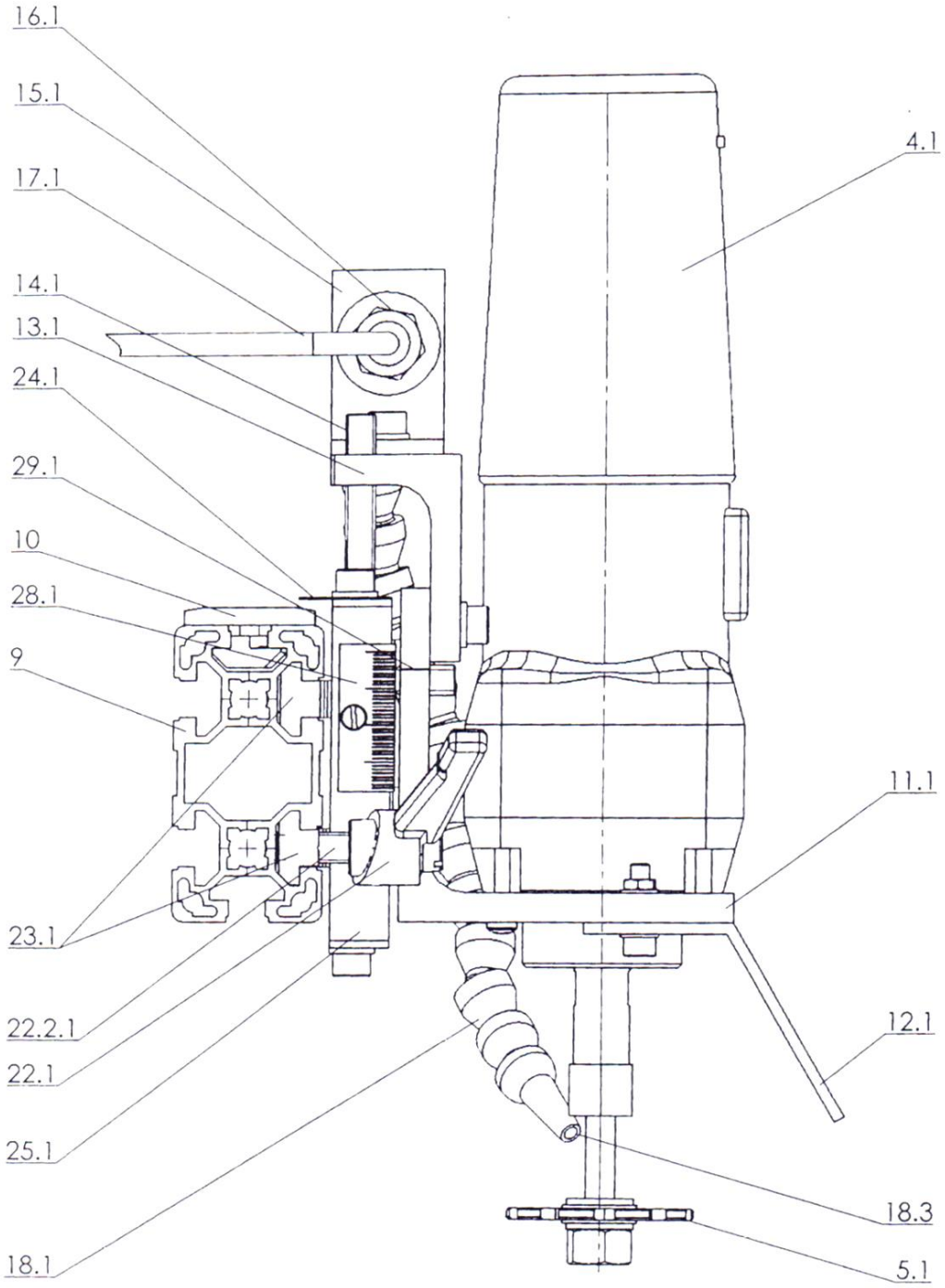


Fig. 3

A - A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17.1
14.1
13.1
24.1
29.1
10
28.1
9
23.1
22.2.1
22.1
25.1
18.1
4.1
11.1
12.1
18.3
5.1

Fig. 4

B - B

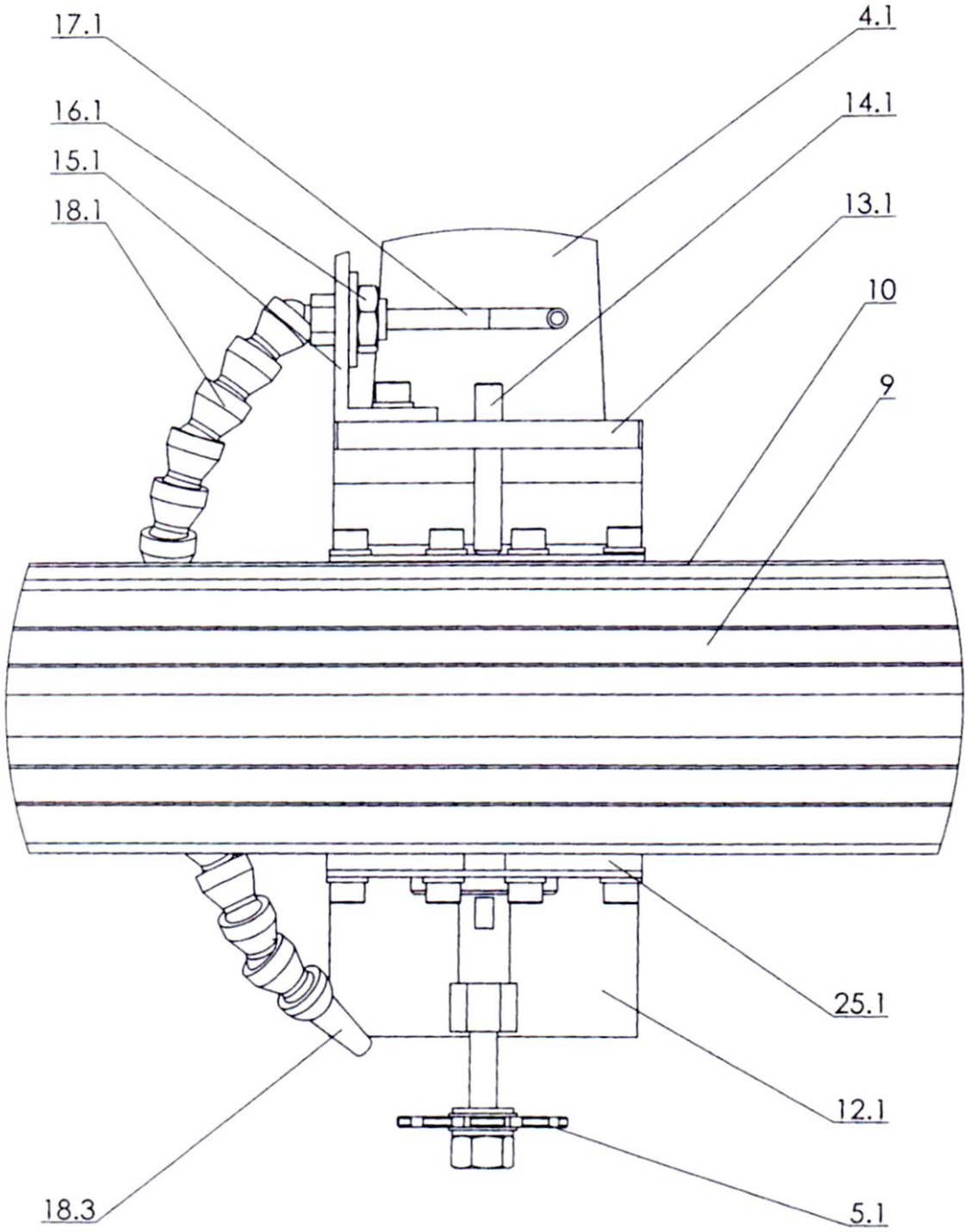
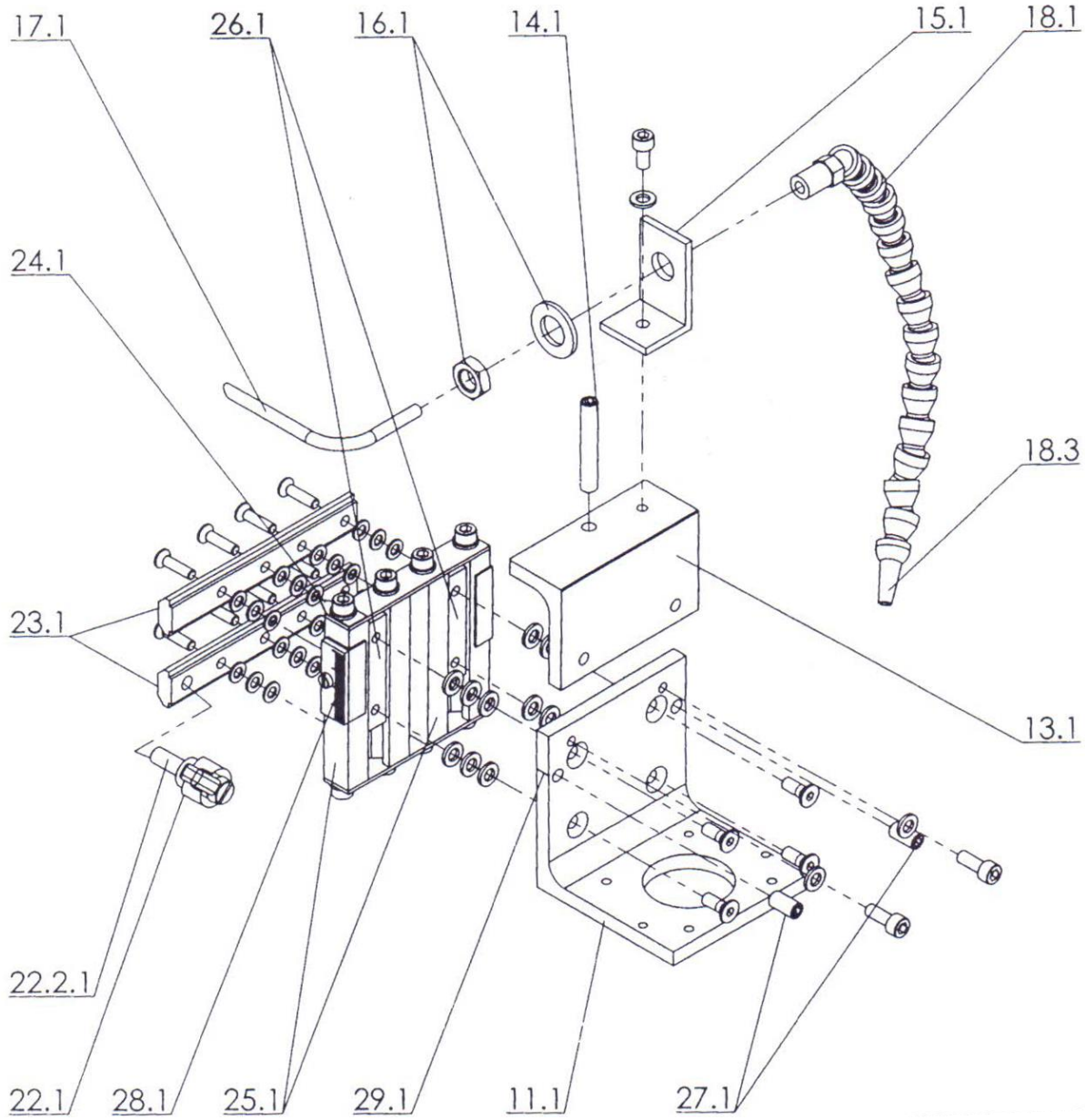


Fig. 5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26.1
16.1
14.1
15.1
18.1
24.1
18.3
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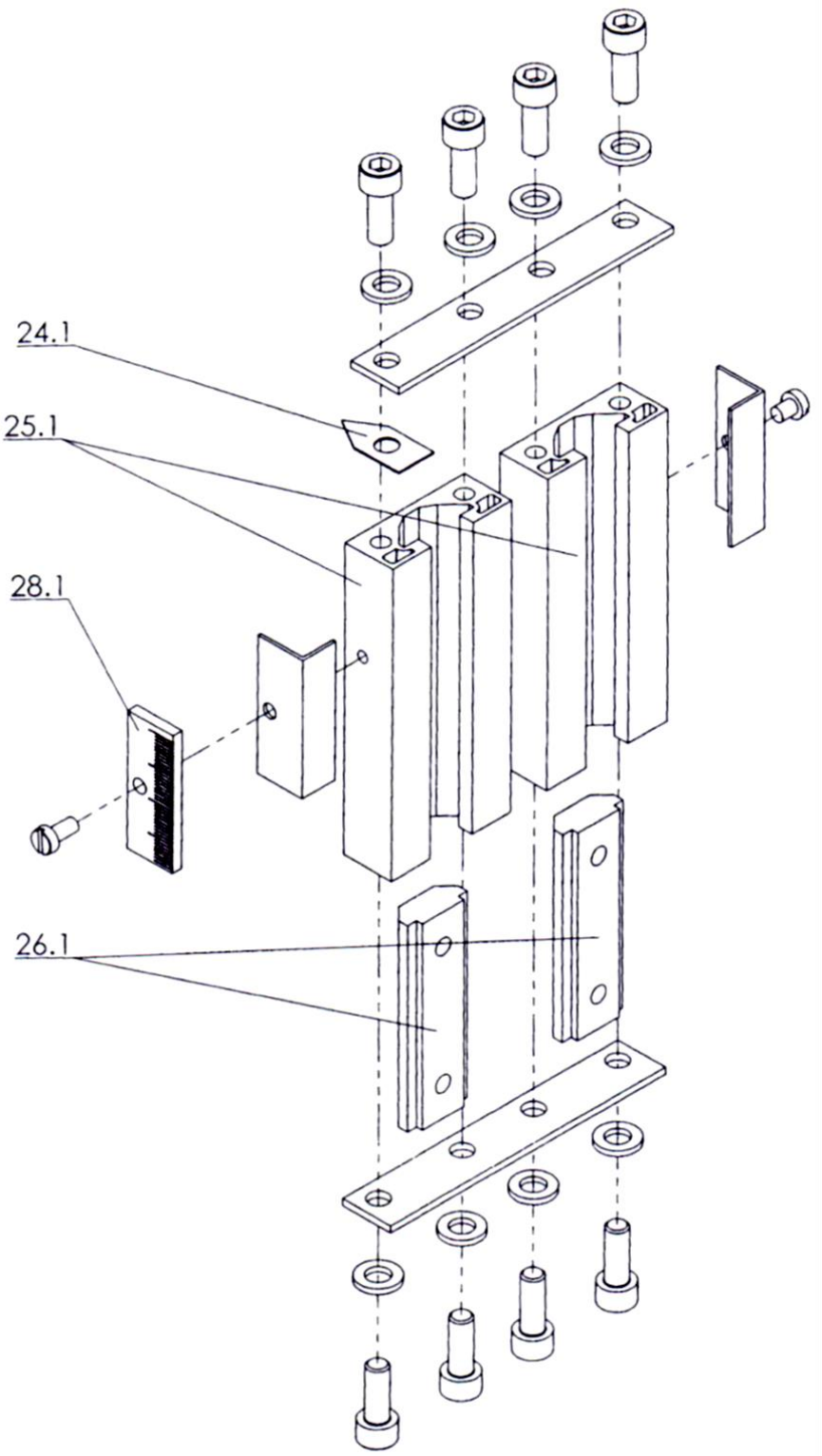
13.1
22.2.1
22.1
28.1
25.1
29.1
11.1
27.1

Fig. 6



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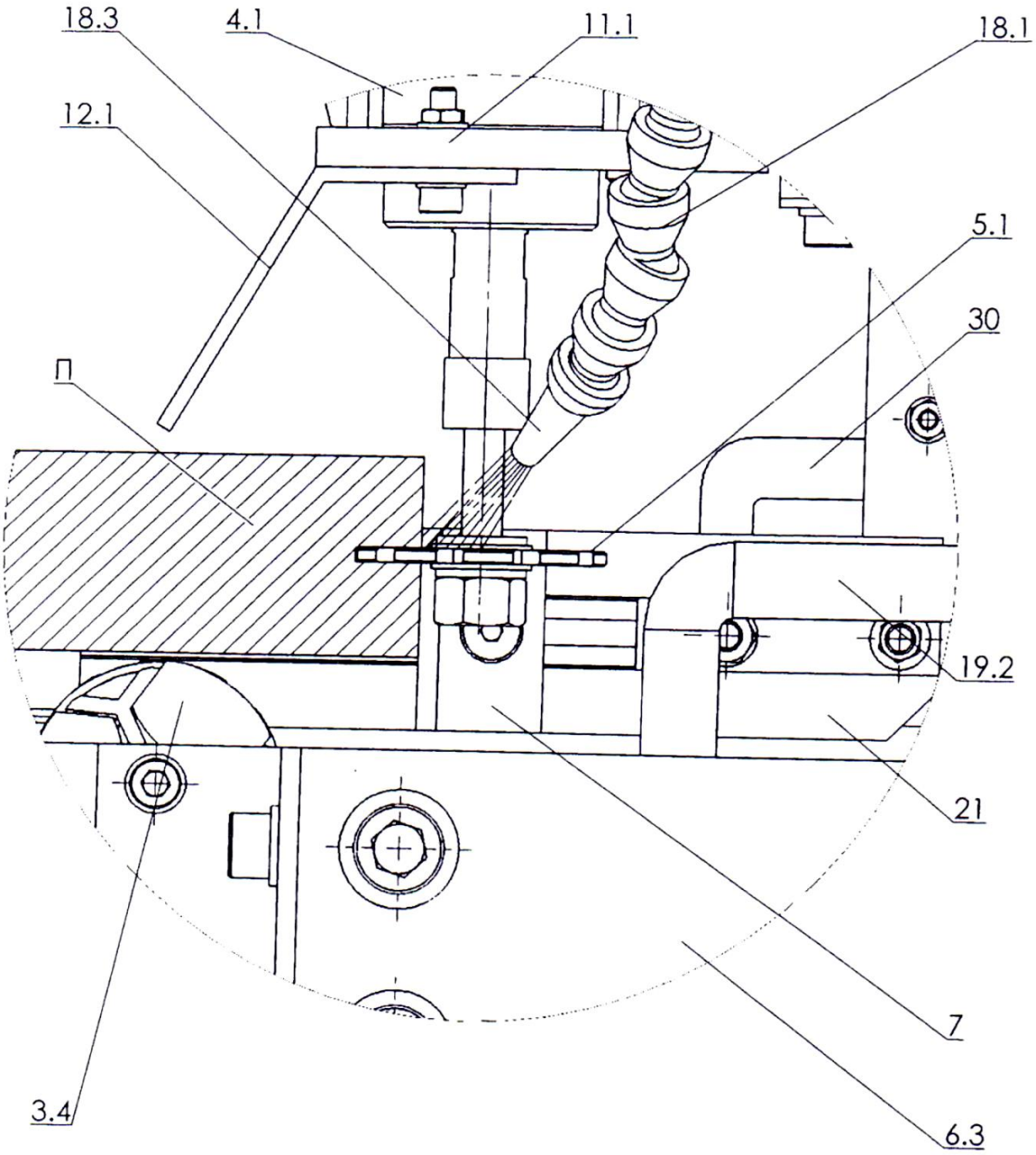

Fig. 8

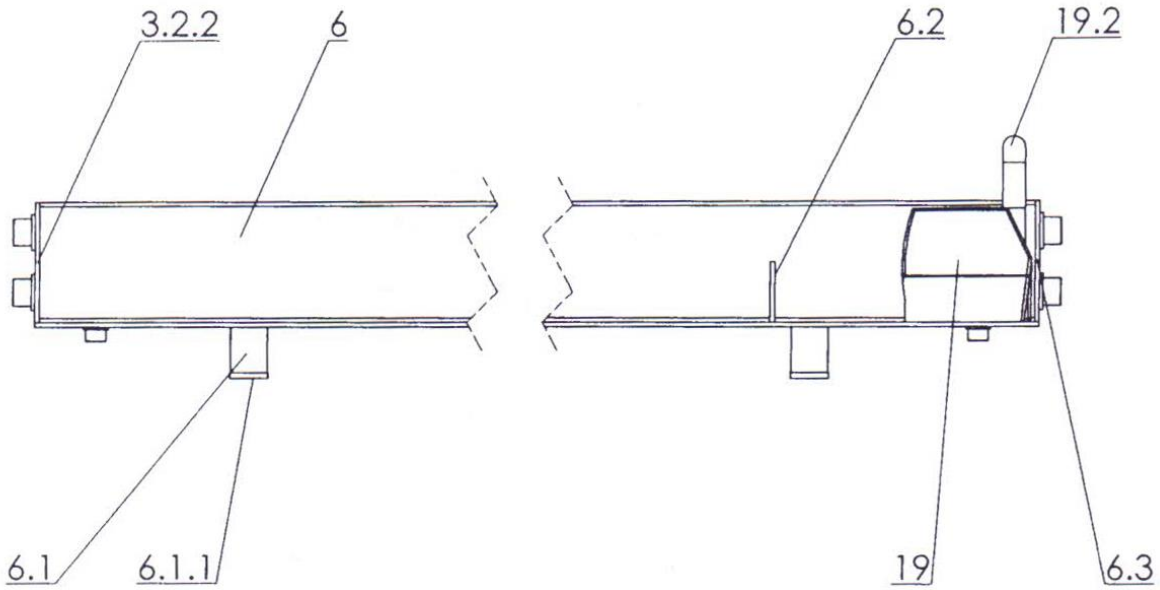

Fig. 9

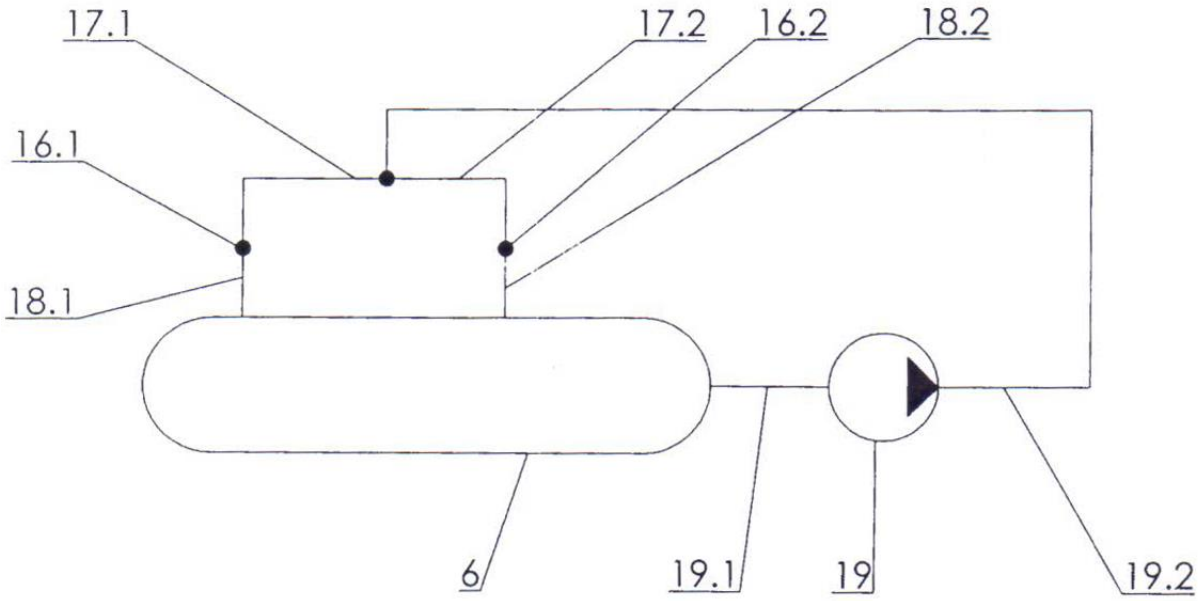

Fig. 10

C - C

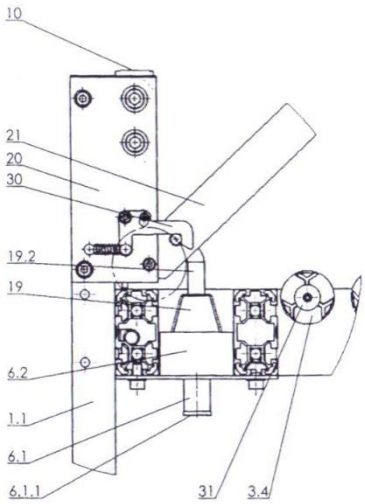

Fig. 11

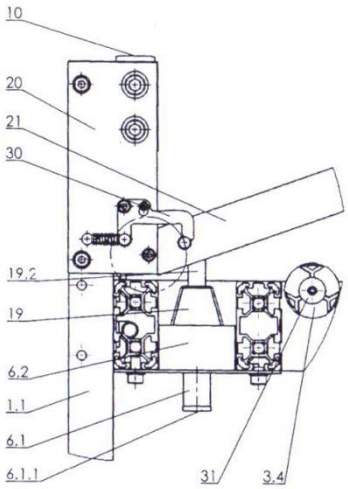

Fig. 12

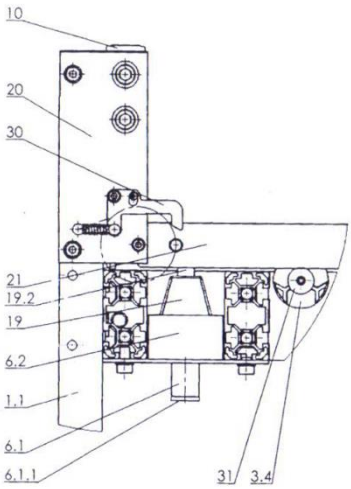

Fig. 13

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I, the undersigned **Kostadin Yordanov Kostadinov** hereby certify the accuracy of the translation made by me from **Bulgarian** language into **English** language of the document enclosed herein, namely: **Certificate of Utility Model Registration** No. **1680** dated **15 May 2013**

Translator: This translation contains **twenty** page(s).

(Kostadin Yordanov Kostadinov)