(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 187 458 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
05.07.2017 Bulletin 2017/27

(51) Int Cl.:
B68G 15/00 *(2006.01)*

(21) Application number: **15382668.0**

(22) Date of filing: **28.12.2015**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

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(54) DEVICE FOR SUPPORTING AND HANDLING OF AN OBJECT TO BE UPHOLSTERED

(57) The device comprises a vertical support (1), a first motor (6) arranged to move along guiding means (2) of the support structure (7), upon activation of a second motor (5). The device comprises a supporting structure (7) configured to support the object to be upholstered which is coupled to the first motor (6) through an arm (8) comprising a first end and a second end The arm (8) is coupled to a counterweight (9) through a first end and to the supporting structure (7) through a second end opposite to the first end. The arm (8) is coupled to an outer shaft of the first motor in an intermediate point of the arm (8) between the first end and the second end of the arm (8), such that the rotary movement of the outer shaft of the first motor (6) produces a rotation of the supporting structure (7) around the said outer axis of the first motor (6).

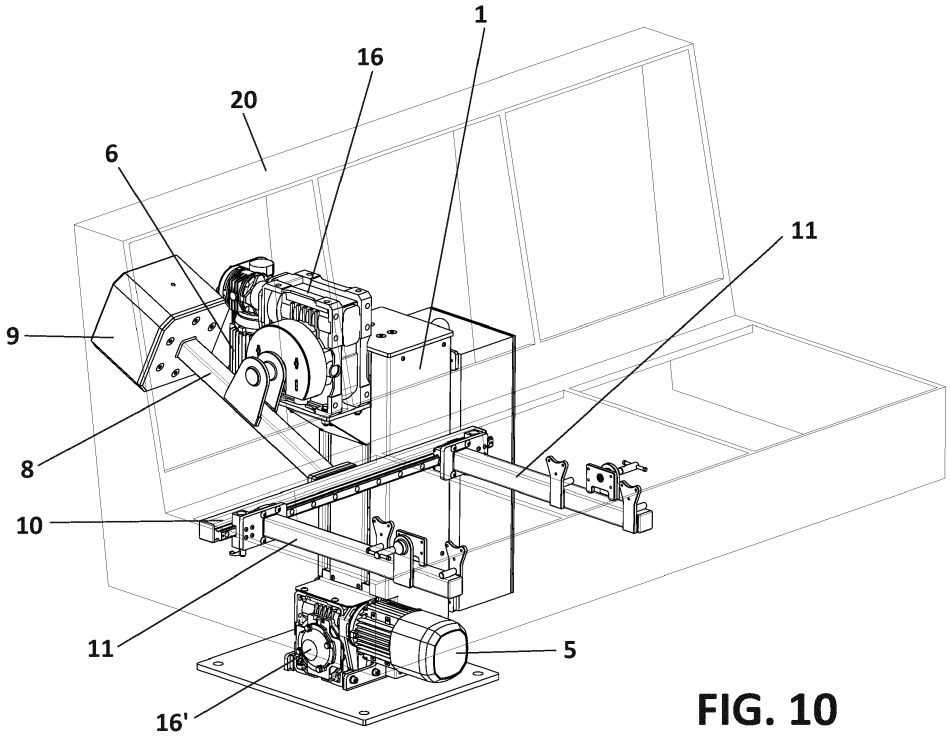

FIG. 10

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Description

TECHNICAL FIELD

[0001] The present invention relates to handling machines and especially to machines for supporting and handling of an object to be upholstered.

STATE OF THE ART

[0002] It is known in the art the use of devices or machines for supporing and handling of objects and in particular for handling an object to be upholstered. Those machines comprise a supporting structure for mounting the object and mechanical devices for the movement of the object in a vertical direction (elevation) and/or two tilting/rotation movements so that the object can be placed in the different positions necessary for the upholstery work. The supporting structure is moved manually by an operator or with the aid of pneumatic or hydraulic cylinders (EP-0855251-B1, US-3.860.228, US-3.977.622, US-4.221.368, US-4.767.109, US-7.111.373-B2, NL-9100001 and ES-2.277.558-B1). The problem when such devices are moved manually is that the operations for the change of position are not easy and comfortable. When the devices comprise pneumatic or hydraulic actuators the problem is that the range of possible positions is sometimes limited such that it is not possible to place the structure in an optimal position. Furthermore the working positions are fixed by the extension/retraction positions of the actuators (or by the automatic control of the actuators) so that the operator cannot change the predetermined working positions if needed for special operations or for his particulars conditions (for example the height of the operator).

[0003] A solution could be the use of motors instead of pneumatic or hydraulic actuators but the problem is that the motors must be of great size and weight for the handling of heavy objects such as a sofa to be upholstered. Furthermore, to get one vertical displacement and two rotations, two of the motors must be suspended what requires a very heavy and robust structure and a great power consumption. Another solution could be to place the three motors in the ground but that will require very complex transmissions to be used and probably a limited range of movements for the orientation of the object.

DESCRIPTION OF THE INVENTION

[0004] A first aspect of the invention relates to a device comprising:

- a vertical support or column comprising vertical guiding means,
- a first motor arranged to move in a vertical direction along said guiding means,
- an arm comprising a first end and a second end,
- a counterweight coupled to the first end of the arm,
- a supporting structure coupled to the second end of the arm, the supporting structure being configured to support the object to be upholstered.

[0005] According to the invention the arm is coupled to an outer shaft of the first motor in an intermediate point of the arm between the first end and the second end of the arm, such that the rotary movement of the outer shaft of the first motor produces a rotation of the arm and supporting structure around a first direction (preferably orthogonal to the vertical direction). The outer shaft of the first motor can be coupled directly to the arm or through coupling means.

[0006] The use of a counterweighed structure reduces the power and weight required for the first motor to rotate the object to be upholstered. In one embodiment the device comprises a second motor to move the first motor in the vertical direction.

[0007] In a preferred embodiment the first motor in mounted on a platform arranged to move along the vertical support, the platform comprising a slider to slide along the guiding means of the support. The platform comprises coupling means engaged to a vertically displaceable element (a chain, a screw) moved by transmission means activated by the second motor. The activation of the second motor moves vertically the displacement element which drags vertically the platform and consequently the first motor. The second motor is preferably placed on the ground.

[0008] In one embodiment the device further comprises a third motor mounted on the first end of the arm, with an outer axis coupled to the supporting structure such that the rotary movement of the outer shaft of the third motor produces a rotation of the structure around a second direction which is parallel to the arm. The outer shaft of the third motor can be coupled directly to the arm or through coupling means. The third motor can be used as the counterweight or at least as a part of it. That way the weight of the third motor is not an extra burden for the first motor. Preferably the second direction is orthogonal to the first direction.

[0009] The counterweight weights between 10% and 80% (and preferably between 20% and 50 %) of the weight of the object depending on the position of the intermediate point on the arm. The intermediate point of the arm can be placed with an offset between 10 and 30% of the center of the arm.

[0010] In a preferred embodiment the first motor, the second motor and/or the third motor are controlled manually, for example by means of a push button panel or a handheld control. The user can activate each of the motor at will, so as to arrive to a desired position (not at a predetermined position) or change a previous position of the object. The user can place the object at a desired height and with a desired orientation in two directions, one direction corresponding to a rotation around the first direction orthogonal to the vertical direction and around a second direction orthogonal to the first direction.

[0011] In a preferred embodiment the supporting structure comprises two adjustable struts for supporting the object. The supporting structure can comprise a main strut fixed to the arm and longitudinal sliding means. The adjustable struts can be mounted on said sliding means so that the struts can move longitudinally along the main strut to adjust its position to the size of the object to be upholstered.

[0012] The adjustable struts can comprise manual adjusting means for fixing the object to the supporting structure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] To complete the description and in order to provide for a better understanding of the invention, a set of drawings is provided. Said drawings form an integral part of the description and illustrate embodiments of the invention, which should not be interpreted as restricting the scope of the invention, but just as examples of how the invention can be carried out. The drawings comprise the following figures:

Figure 1 is a schematic perspective of a first embodiment of the device of the invention.

Figure 2 is a schematic perspective of the platform for the support of the first motor.

Figure 3 is a schematic perspective of the vertical support and the guiding means.

Figure 4 is a schematic perspective of the embodiment of figure 1 with the support structure rotated around a first direction.

Figure 5 is a schematic perspective of a second embodiment of the device of the invention.

Figure 6 is a schematic perspective, in explosion, of the embodiment of figure 5.

Figure 7 is a cross sectional view of the embodiment of figure 5.

Figure 8 is a cross sectional view of the embodiment of figure 5.

Figure 9 is a schematic perspective of the embodiment of figure 5 with the support structure rotated around a second direction.

Figure 10 is a schematic perspective of the embodiment of figure1 showing a sofa to be upholstered mounted on the device.

DESCRIPTION OF WAYS OF CARRYING OUT THE INVENTION

[0014] Figure 1 illustrates a first embodiment of the device of the invention. The device comprises a vertical support or column (1) comprising vertical guiding means (2) for the vertical movement of a platform (4) upon activation of a second motor (5) fixed to the ground. A first motor (6) is mounted upon the platform (4) such that the activation of the second motor (5) produces the up/down movement of the first motor (6) along the vertical column (1).

[0015] The device also comprises a support structure (7) for supporting the object to be upholstered. Figure 10 shows a sofa (20) to be upholstered mounted on the support structure (7) of the device of the invention. The support structure (7) is coupled to the first motor (6) through an arm (8) such that the up/down movement of the first motor (6) provokes a similar up/down movement of the support structure (7) and then of the object (i.e. a sofa) mounted on the support structure (7). The arm (8) comprises a first end and a second end. The arm (8) is coupled through the first end to a counterweight (9) and through the second end to the supporting structure (7). The arm is coupled to the outer shaft of the first motor (6) in an intermediate point of the arm (8) between the first end and the second end of the arm (8), such that the rotary movement of the outer shaft of the first motor (6) produces a rotation of the arm (8) and supporting structure (7) around a first direction orthogonal to the vertical direction. The outer shaft of the first motor (6) is coupled to the arm (4) through transmission means comprising a crown and pinion gear box or worm gear (16) and a first rotating shaft (17) fixed to the arm (8).

[0016] Figure 4 illustrates the device of the invention in a different position of the one illustrated in figure 1, upon a rotation of the supporting structure (7) around the first direction.

[0017] The supporting structure (7) comprises a main strut (10) fixed to the arm (8) and two adjustable struts (11) for supporting the object. The adjustable struts are mounted on sliding means (12) so that the adjustable struts (11) can move longitudinally along the main strut (10) to adjust its position to the size of the object to be upholstered.

[0018] The adjustable struts (11) comprise manual adjusting means (12) for fixing the object to the supporting structure (7).

[0019] As can be seen in figures 2 and 3 the platform (4) comprises a slider (13) which can slide along the guiding means (2) and fixing means to attach to a vertically displaceable chain (14). The chain (14) can rotate around two opposite gears (18) moved by transmission means comprising a crown and pinion gearbox or worm gear (16') activated by the second motor (5). When the second motor (5) moves the chain (14) up or down, the chain (14) drags the platform (4) up or down and the second motor (6) mounted on the platform (4). In another embodiment the chain (14) transmission can be substituted by a screw transmission with a nut attached to the platform (4) and a threaded shaft moved by the second motor (5).

[0020] Figures 5, 6, 7, 8 and 9 illustrate a second embodiment comprising a third motor (15) for the rotational movement of the support structure (7) around a second direction orthogonal to the first direction, such that the object can be oriented with three DOF: a vertical translation and two rotations. The third motor (15) is mounted on the first end of the arm (8), with its outer axis coupled

to the supporting structure (7) such that the rotary movement of the outer shaft of the third motor (15) produces a rotation of the structure (7) around an axis parallel to the arm (8). The third motor (15) is coupled to the structure (7) through transmission means comprising a crown and pinion gear box or worm gear (16") and a third rotating shaft (19) moved by the third motor (15). The third rotating shaft (19) runs inside the arm (8) and is fixed to the structure (7) such that the rotation of the third rotating shaft (19) produces the rotation of the structure (7) around a second direction orthogonal to the first direction.

[0021] In this text, the term "comprises" and its derivations (such as "comprising", etc.) should not be understood in an excluding sense, that is, these terms should not be interpreted as excluding the possibility that what is described and defined may include further elements, steps, etc.

[0022] On the other hand, the invention is obviously not limited to the specific embodiment(s) described herein, but also encompasses any variations that may be considered by any person skilled in the art (for example, as regards the choice of materials, dimensions, components, configuration, etc.), within the general scope of the invention as defined in the claims.

Claims

1. Device for supporting and handling of an object to be upholstered **characterized by** comprising:

   - a vertical support (1) comprising vertical guiding means (2),
   - a first motor (6) arranged to move in a vertical direction along said guiding means,
   - an arm (8) comprising a first end and a second end,
   - a counterweight (9) coupled to the first end of the arm,
   - a supporting structure (7) coupled to the second end of the arm (8), the

   supporting structure (7) being configured to support the object to be upholstered, the arm (8) being coupled to an outer shaft of the first motor (6) in an intermediate point of the arm (8) between the first end and the second end of the arm (8), such that the rotary movement of the outer shaft of the first motor (6) produces a rotation of the supporting structure (7) around a first direction.

2. Device as in claim 1 comprising a second motor (5) for moving the first motor in the vertical direction.

3. Device as in previous claims wherein the first motor (6) in mounted on a platform (4) arranged to move along the vertical support (1), the platform (4) comprising an slider (13) which can slide along the guiding means (2) and fixing means to attach to a vertically displaceable element (14) moved by the second motor (5).

4. Device as in previous claims wherein the second motor (5) is placed on the ground.

5. Device as in previous claims further comprising a third motor (15) mounted on the first end of the arm (8), with an outer axis coupled to the supporting structure (7) such that the rotary movement of the outer shaft of the third motor (15) produces a rotation of the supporting structure (7) around a second direction.

6. Device as in claim 5 wherein the second direction is orthogonal to the first direction.

7. Device as in previous claims wherein the third motor (15) is the counterweight (9).

8. Device as in previous claims wherein the counterweight (9) weights between 20% and 50% of the weight of the object.

9. Device as in previous claims wherein the intermediate point of the arm (8) is placed with an offset between 10 and 30% of the center of the arm (8).

10. Device as in previous claims wherein the first motor (6) is controlled manually.

11. Device as in previous claims wherein the second motor (5) is controlled manually.

12. Device as in previous claims wherein the third motor (15) is controlled manually.

13. Device as in previous claims wherein the supporting structure (7) comprises two adjustable struts (11) for supporting the object.

14. Device as in previous claims wherein the adjustable struts (11) comprise manual adjusting means (12) for fixing the object to the supporting structure (7).

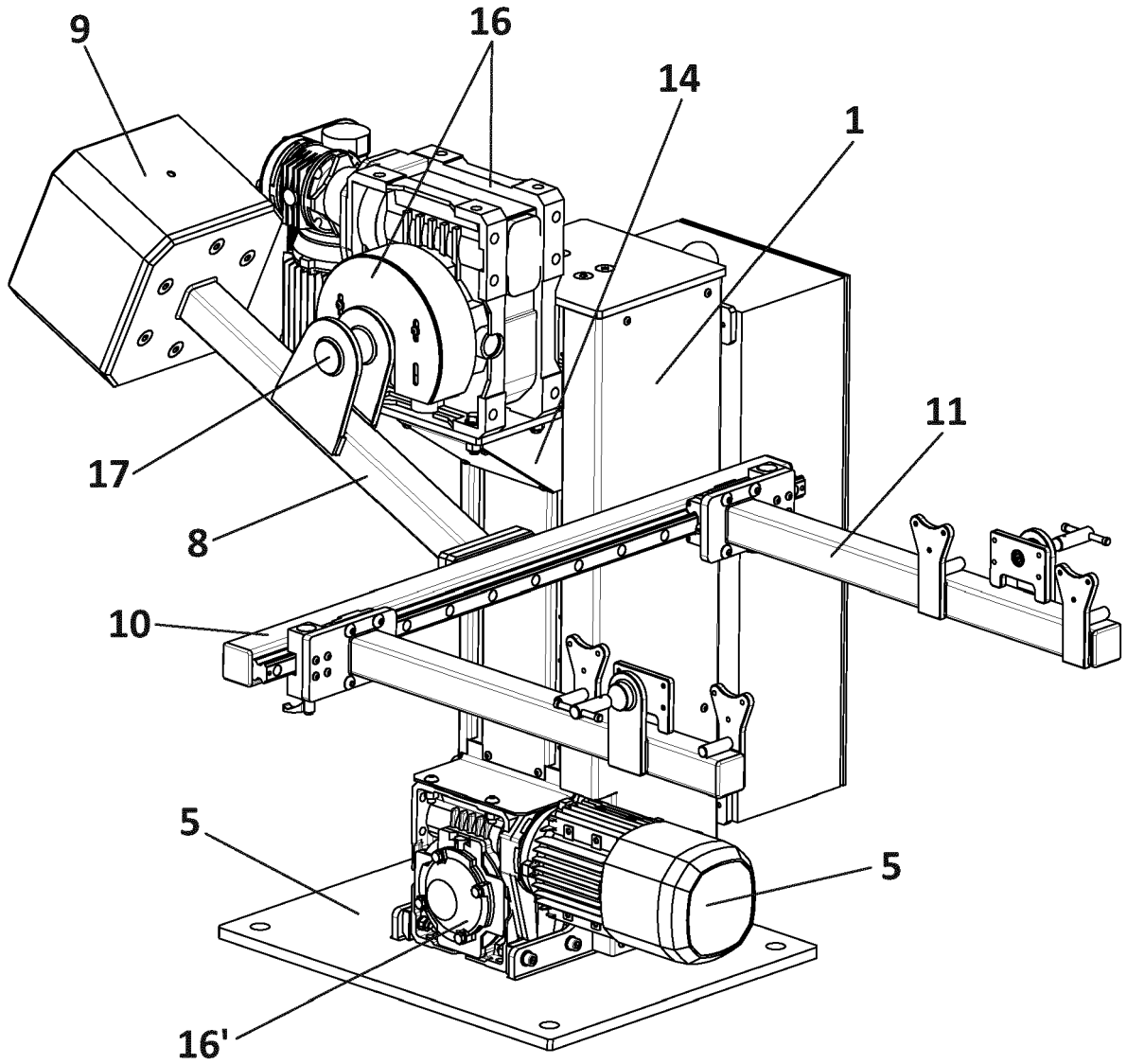

FIG. 1

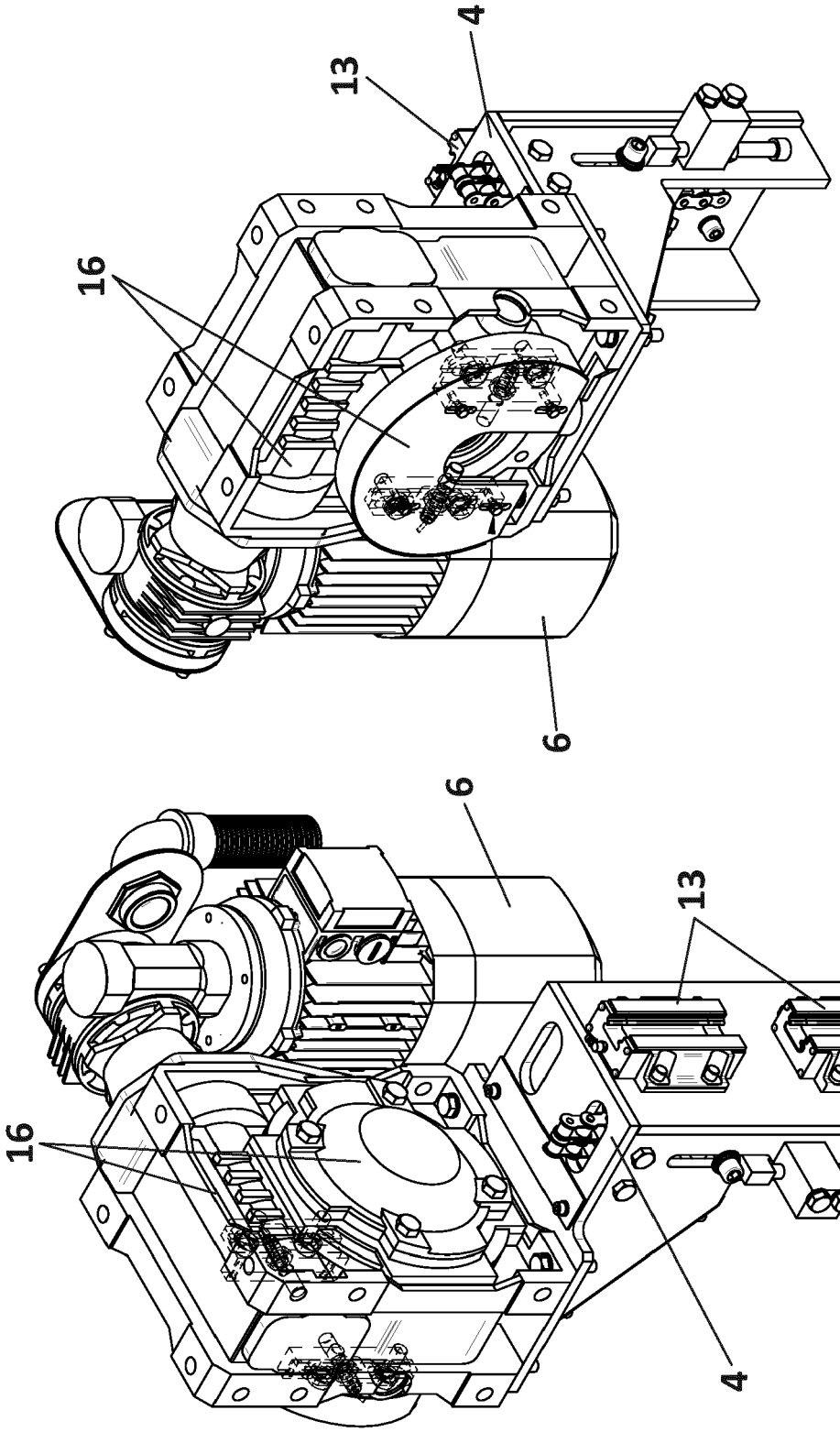

FIG. 2

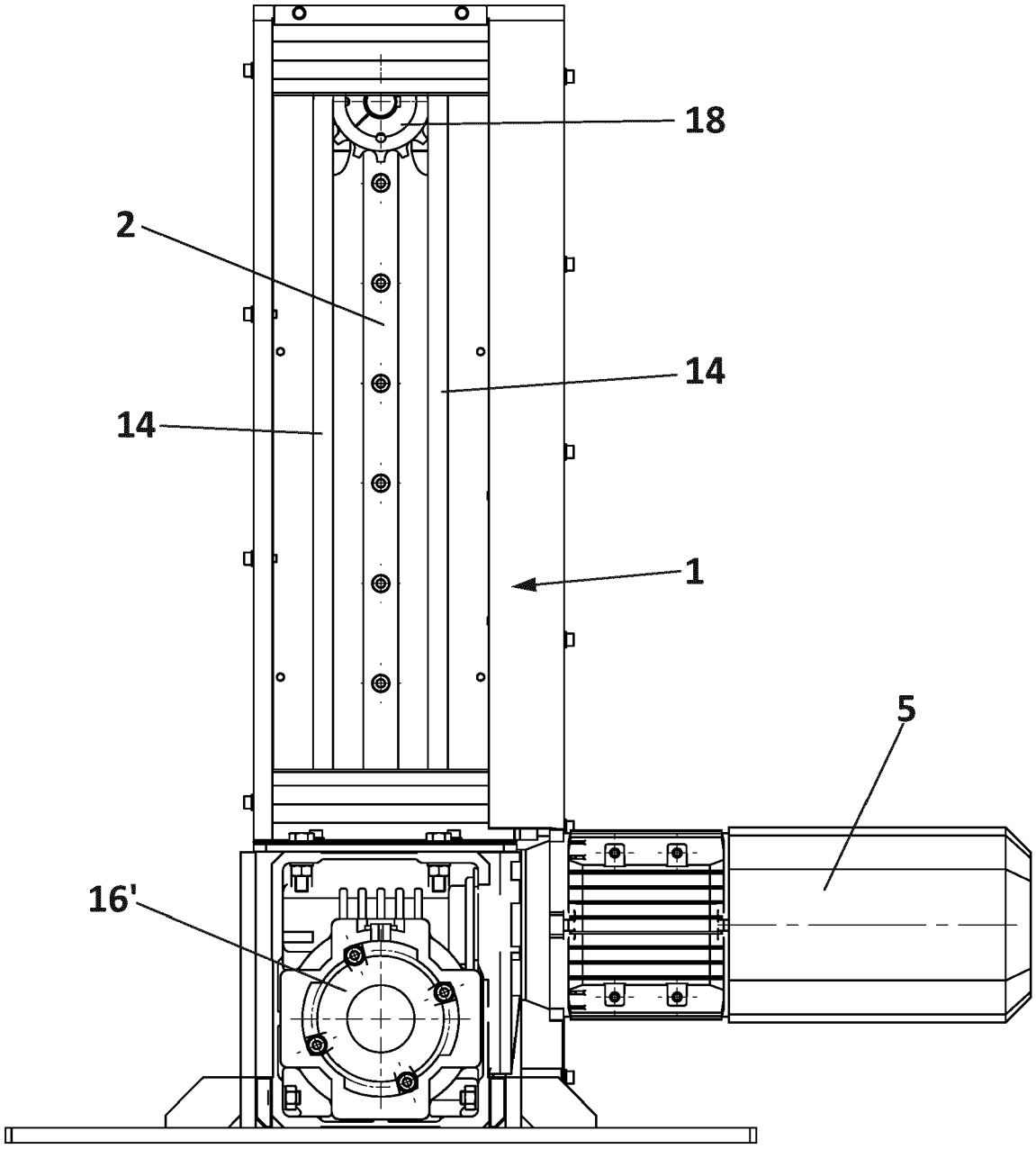

FIG. 3

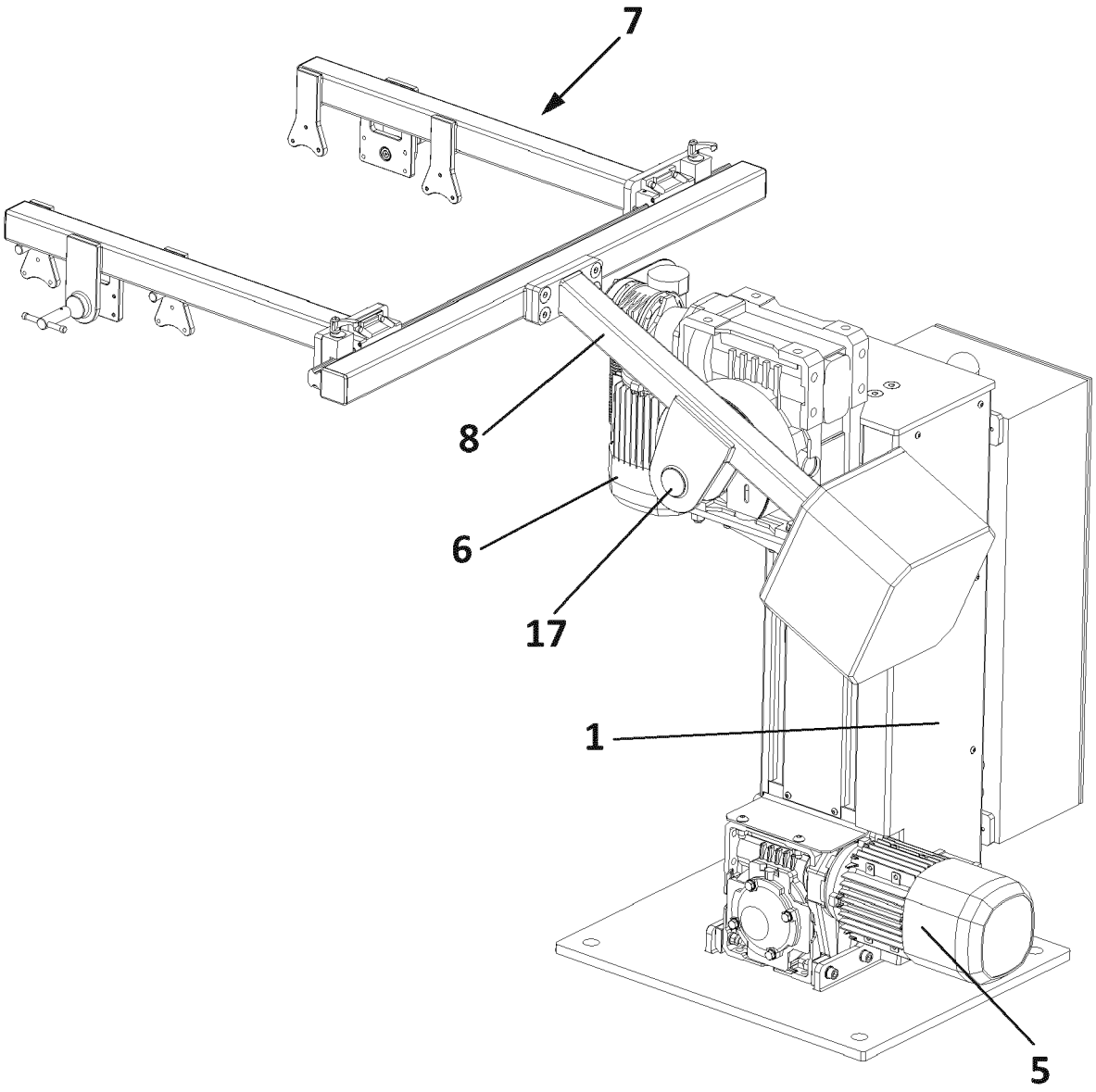

FIG. 4

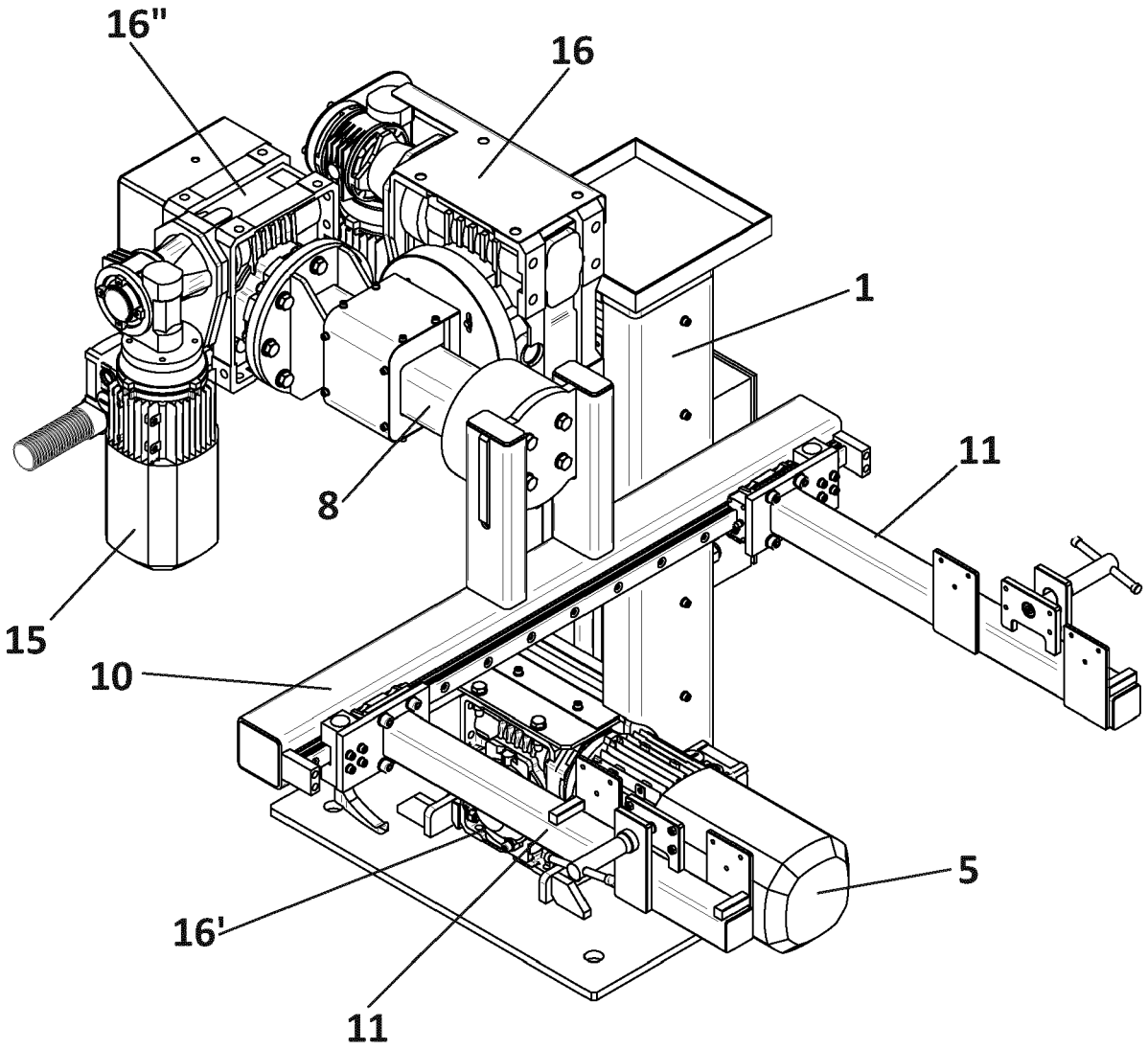

FIG. 5

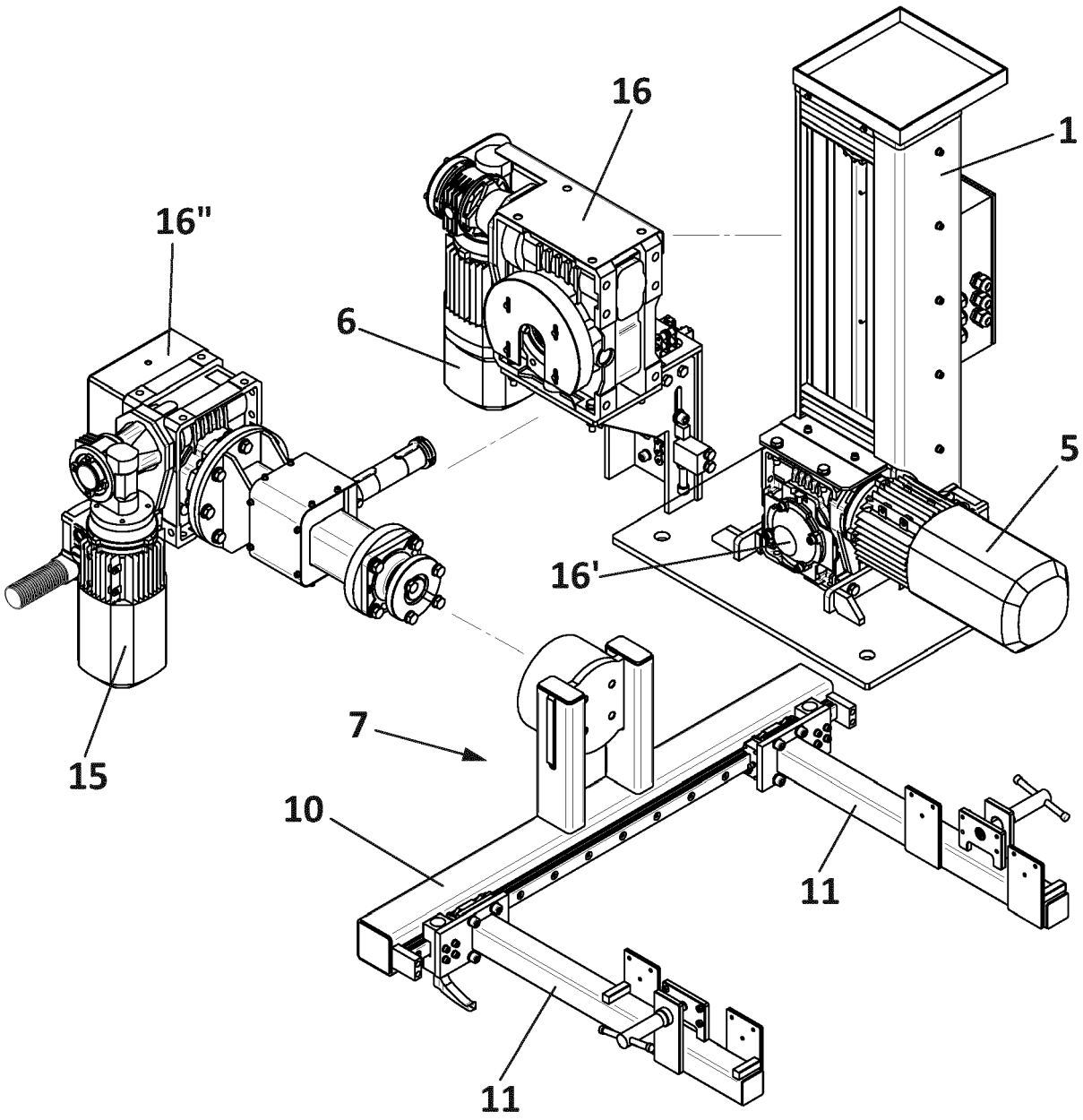

FIG. 6

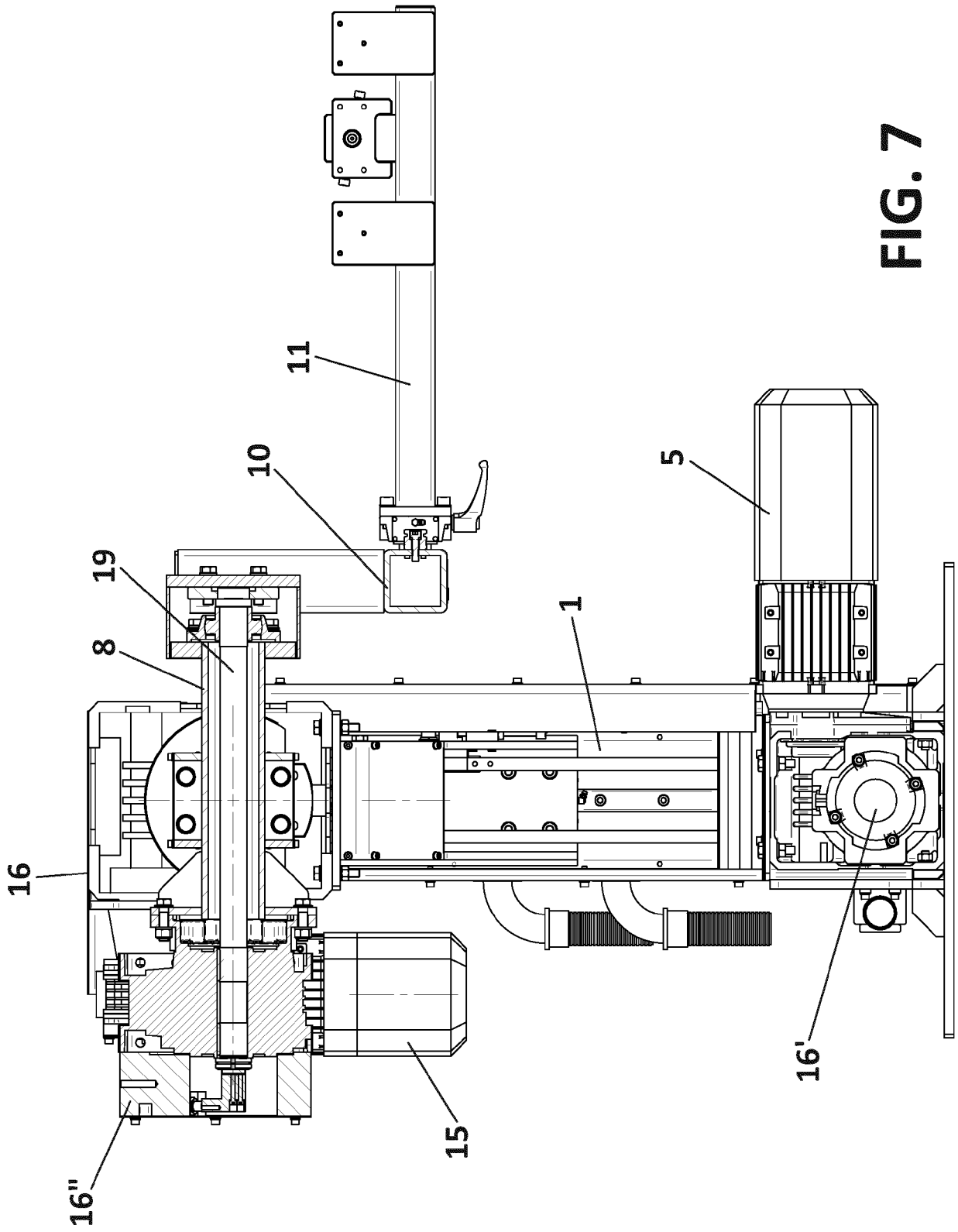

FIG. 7

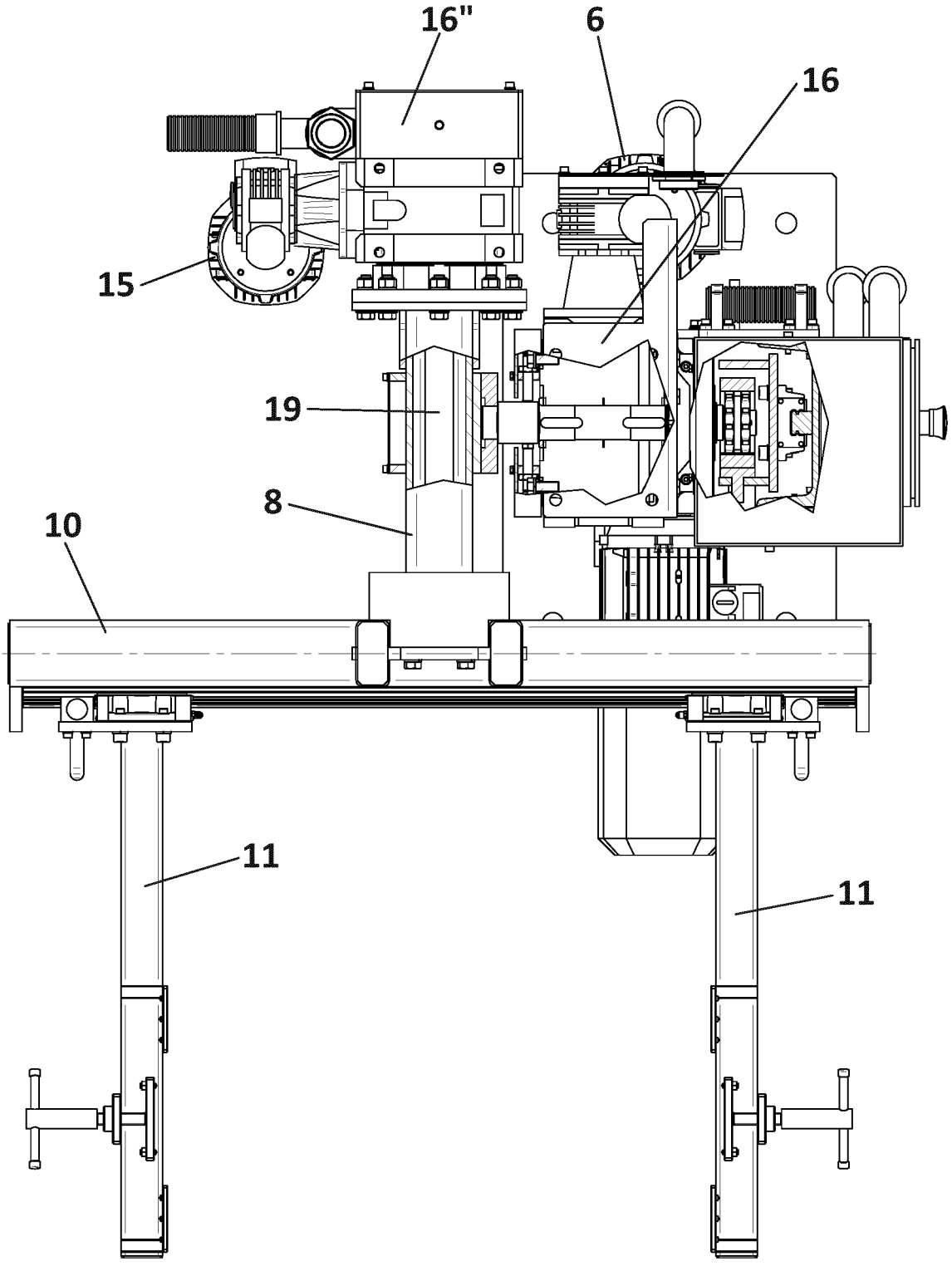

FIG. 8

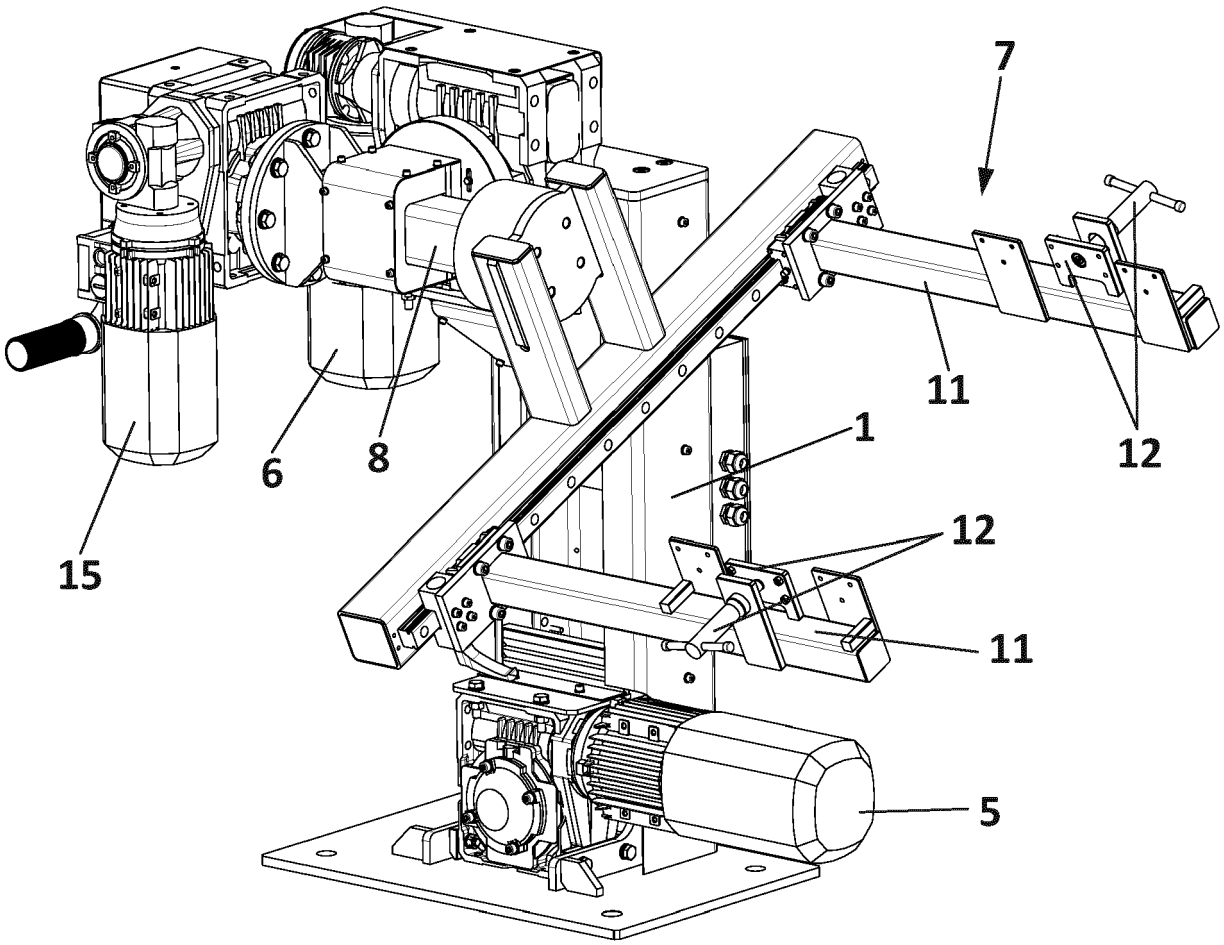

FIG. 9

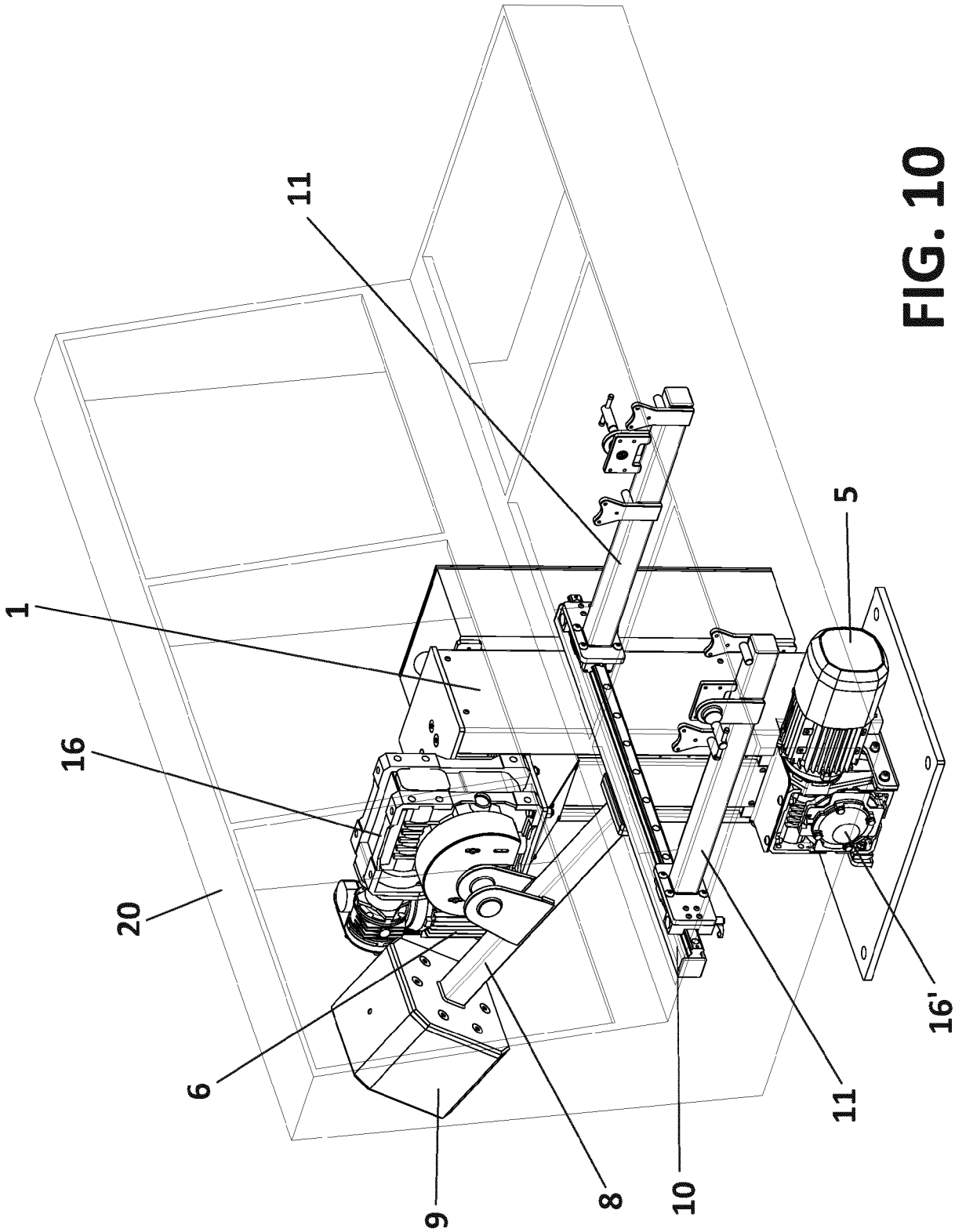

FIG. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 15 38 2668

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2 835 964 A (HENRY YARWOOD) 27 May 1958 (1958-05-27) * abstract; figures 1-3 * * column 1, lines 15-26 * * column 2, lines 3-17 *	1-4	INV. B68G15/00
X	EP 0 855 251 A1 (CABINET D ETUDES DARZACQ BRIOL) 29 July 1998 (1998-07-29) * abstract; figures 1,4-8 * * column 2, line 45 - column 3, line 13 *	1,2	
A	FR 2 956 653 A1 (SOLHYMECA SOLUTION HYGIENE MECANIQUE) 26 August 2011 (2011-08-26) * abstract; figure 1 *	1	
A	DE 29 32 854 A1 (JOHANSSON HANS ARNE VALENTIN) 12 February 1981 (1981-02-12) * figures 1-4 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

B68G
B25H
B23Q
B66F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 May 2016	Tempels, Marco

CATEGORY OF CITED DOCUMENTS

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REFERENCES CITED IN THE DESCRIPTION

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