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

(11) **EP 3 576 057 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
04.12.2019 Bulletin 2019/49

(51) Int Cl.:
G07F 13/10 *(2006.01)* ***G07F 13/06*** *(2006.01)*

(21) Application number: **19175202.1**

(22) Date of filing: **17.05.2019**

(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:
KH MA MD TN

(30) Priority: **01.06.2018 IT 201800005931**

(71) Applicant: **Bianchi Industry S.p.a.**
Frazione Zingonia (IT)

(72) Inventor: **ZAVATTI, Marco**
24040 CASTEL ROZZONE BG (IT)

(74) Representative: **Modiano, Micaela Nadia et al**
Modiano & Partners
Via Meravigli, 16
20123 Milano (IT)

(54) **HIGHLY VERSATILE DEVICE FOR THE TRANSLATION OF CUPS AND THE LIKE**

(57) A device for the translation of cups and the like (10), which comprises:
- a load-bearing structure (11) that supports one or more guides (12) along which a cup-holding assembly (20) can slide which is provided with at least one supporting opening (21) which is adapted to be engaged by a cup to be translated, and
- a drive assembly (50) which is configured to move the cup-holding assembly (20) along the guides (12) between a stroke start position and a stroke end position.

The cup-holding assembly (20) comprises at least two supporting elements (22), which between them define the supporting opening (21), are moveable with respect to each other in order to vary the breadth of the supporting opening (21), and are functionally connected to a mechanism that is configured to move the supporting elements (22) with respect to each other so as to vary in a controlled manner the breadth of the supporting opening (21).

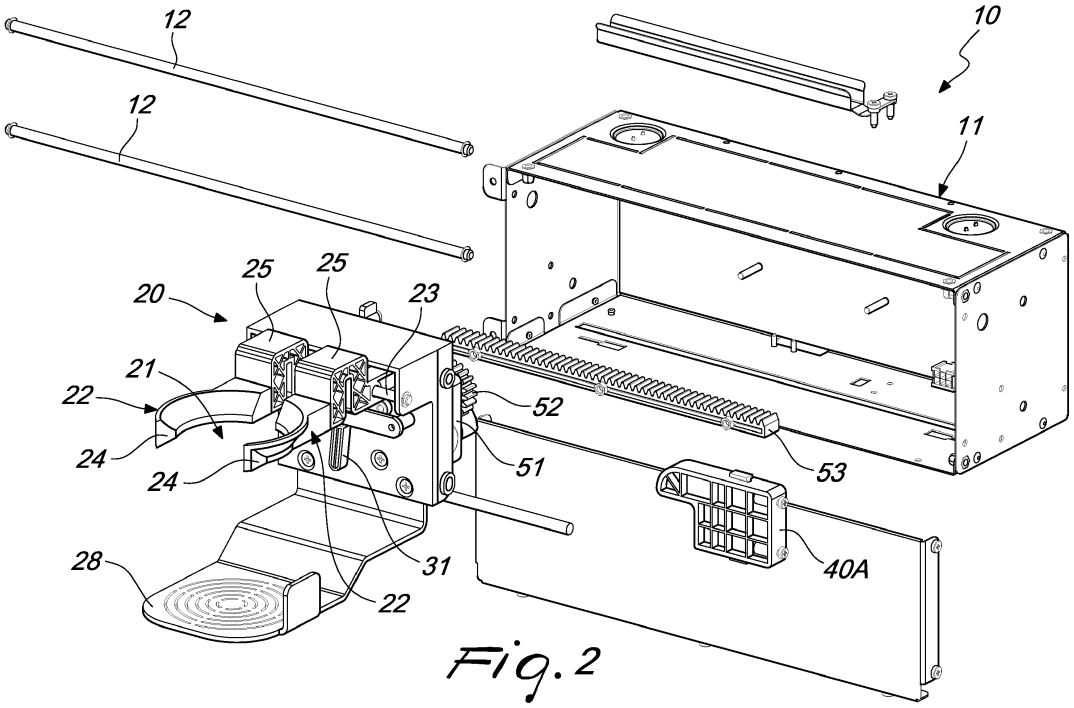

Fig. 2

EP 3 576 057 A1

Description

[0001] The present invention relates to a highly versatile device for the translation of cups and the like, particularly for the translation of cups or beakers in vending machines of food or beverages.

[0002] The present invention is therefore useful and practical particularly, but not exclusively, in the field of vending machines and of catering.

[0003] In more detail, the device according to the present invention can perform, for example, the function of transporting the cups or the like (beakers or bowls or ice-cream cones or any other container) from a dispensing station, in which the cup is dispensed for example by a device for dispensing cups, toward one or more other stations, such as for example one or more stations in which the food or the beverage is dispensed into the cup, and/or toward a pickup station where the user can retrieve the cup.

[0004] It should be noted that, for brevity, hereinafter in the description and in the accompanying claims, the term "cup" will be used to refer, completely generally and not in a limiting manner, to any container or recipient that is adapted to contain beverages and/or foods (such as for example beakers, cups, ice-cream cones, pots etc.)

[0005] Nowadays various translation devices are known which perform the function described above.

[0006] Generally, conventional devices for the translation of cups and the like comprise a fork, or other, equivalent element, which receives and supports the cup to be moved.

[0007] In more detail, the fork is provided with a supporting opening in which the dispensed cup is arranged (usually by making it fall from above from a device for dispensing cups) by snugly fitting into it.

[0008] The fork is moved, generally along the guides, by way of a drive-transmission system, so transporting the cup in a predetermined direction.

[0009] Commonly, the movement occurs along a straight direction or about an axis, in the manner of a carousel, and can entail one or more intermediate stations in which the fork is stopped for a suitable period of time.

[0010] Since the cup must fit snugly inside the supporting opening, it goes without saying that the fork, or any other supporting means, must be contoured precisely and uniquely as a function of the size of the cup to be moved.

[0011] In particular, for a correct operation, the supporting opening must be complementary to the cup to be moved: both too wide an opening and too narrow an opening would impede a correct positioning of the cup and would cause the fall or jamming thereof.

[0012] From this there follows a problem, which is that conventional devices for the translation of cups can operate with only a single size of cups.

[0013] Furthermore, even small and unforeseen variations of the diameter of the cups, for example after changing the cup supplier, risk causing problems of falling or jamming, since conventional devices generally cannot be adapted to such variations.

[0014] In any case, if it is desired to adapt a conventional device for the translation of cups to a different type of cup, it is necessary to carry out lengthy and costly invasive interventions, which entail substitution of the fork.

[0015] Therefore, conventional devices for the translation of cups cannot be used in vending machines that comprise multiple devices for dispensing cups of different dimensions (or in which there is a device for dispensing cups of various sizes).

[0016] The aim of the present invention is to solve the above mentioned technical problem and overcome the drawbacks and limitations of the known art by devising a device for the translation of cups and the like that can be used to translate different cups that have different sizes.

[0017] Within this aim, an object of the present invention is to provide a device for the translation of cups that can be reconfigured to translate cups of different sizes more rapidly, simply and economically than in the known art.

[0018] Another object of the invention is to provide a device for the translation of cups that can be reconfigured to translate a wider variety of cups than in the known art.

[0019] Another object of the invention is to provide a device for the translation of cups that can be used in vending machines that comprise multiple devices for dispensing cups of different dimensions or in which there is a device for dispensing cups of various sizes.

[0020] Another object of the invention is to provide a device for translating cups that is more reliable and less subject to jams when compared to the known art.

[0021] Another object of the invention consists in providing a device for translating cups that is easy to implement and economically competitive when compared to the known art.

[0022] This aim and these and other objects which will become better apparent hereinafter are achieved by a device for the translation of cups and the like which comprises:

- a load-bearing structure that supports one or more guides along which a cup-holding assembly can slide which is provided with at least one supporting opening which is adapted to be engaged by a cup to be translated, and
- a drive assembly which is configured to move said cup-holding assembly along said guides between a stroke start position and a stroke end position,

characterized in that said cup-holding assembly comprises at least two supporting elements, which between them define said supporting opening, are moveable with respect to each other in order to vary the breadth of said supporting opening, and are functionally connected to a

mechanism that is configured to move said supporting elements with respect to each other so as to vary in a controlled manner the breadth of said supporting opening.

[0023] Further characteristics and advantages of the invention will become better apparent from the detailed description of a preferred, but not exclusive, embodiment of a device for the translation of cups and the like, which is illustrated by way of non-limiting example with the aid of the accompanying drawings wherein:

Figure 1 is a perspective view of a possible embodiment of a device for the translation of cups, according to the invention;
Figure 2 is an exploded view of the device in Figure 1;
Figure 3 is an exploded view of the part of the device in Figure 1 corresponding to the cup-holding assembly;
Figure 4 is a side view of the part of the device in Figure 1 corresponding to the lever system;
Figures 5 and 6 are side views of part of the inside of the device in Figure 1 in two different configurations.

[0024] With reference to the figures, the device for the translation of cups and the like, generally designated by the reference numeral 10, comprises a load-bearing structure 11.

[0025] The load-bearing structure 11 can comprise a frame and/or a plurality of panels fastened to each other, and is preferably box-like in shape.

[0026] In the example shown, the load-bearing structure 11 comprises a box-like body in the shape of a parallelepiped, in which the walls are constituted by panels that are fastened to each other by way of removable fastening means (for example screws and bolts).

[0027] The load-bearing structure 11 supports one or more guides 12, preferably horizontal, along which a cup-holding assembly 20 can slide.

[0028] The term guide 12 means, very generally, any element that constrains the cup-holding assembly 20 to move along a preset trajectory, and it can be, for example, a rod, a track, a slot, an arm, etc.

[0029] In the preferred embodiment, the guides 12 are constituted by two straight bars that constrain the cup-holding assembly 20 along a straight horizontal path.

[0030] In other possible embodiments the guide or guides 12 take different forms, for example a curved shape that constrains the cup-holding assembly 20 along an arc-shaped path.

[0031] The cup-holding assembly 20 is provided with at least one supporting opening 21 which is adapted to be engaged by a cup to be translated.

[0032] In other words, the supporting opening 21 is the seat in which the cup to be moved is accommodated during the translation.

[0033] The device 10 further comprises a drive assembly 50 which is configured to move the cup-holding assembly 20 along the guides 12 between a stroke start position and a stroke end position.

[0034] Figures 5 and 6 show respectively the stroke start position and the stroke end position which, in the example shown, correspond to the two ends of the guides 12.

[0035] A possible embodiment of the drive assembly 50 is visible in particular in Figures 2 and 3 and comprises an actuator 51 (such as for example an electric motor) which guides the sliding of the cup-holding assembly 20 along the guides 12 by way of a gear 52 which is turned by the actuator 50 by way of a driving shaft 56 and which meshes on a rack 53. In the example shown, the rack 53 is rigidly coupled to the load-bearing structure 11, while the actuator 51 is, together with the gear 52, integral with the cup-holding assembly 20 and performs a translational motion with it.

[0036] In an alternative configuration (not shown), the actuator 51 is rigidly coupled, together with the gear 52, with the load-bearing structure 11, while the rack 53 is integral with the cup-holding assembly 20 and performs a translational motion with it.

[0037] In other possible embodiments (not shown), the drive assembly 50 comprises other conventional movement systems, such as for example an electric motor that moves the cup-holding assembly 20 by way of a mechanical transmission system using a chain or belt or gearwheels or by way of a piston.

[0038] According to the invention, the cup-holding assembly 20 comprises at least two supporting elements 22, which between them define the supporting opening 21.

[0039] Also according to the invention, such two supporting elements 22 are moveable with respect to each other (i.e. the position of at least one of them can be varied with respect to the position of the other one) in order to vary the breadth of the supporting opening 21.

[0040] In practice, the two supporting elements 22, by moving with respect to each other, for example moving away from each other or moving closer to each other or rotating or tilting, vary the shape and/or the size of the supporting opening 21, rendering it suitable to accommodate cups of different dimensions.

[0041] Preferably, the supporting elements 22 comprise two arms which can slide along a horizontal rod 23 so that they can be moved away from or toward each other in order to adjust the breadth of the supporting opening 21.

[0042] Even more preferably, each one of the two arms which can slide has one arc-shaped end so as to define a supporting opening that is complementary to a cylindrical or conical or frustum-shaped cup.

[0043] According to an optional and advantageous characteristic, at least one and preferably all the supporting elements 22 comprise a contoured distal portion 24, which contributes to define the supporting opening 21 and which can be removably coupled mechanically to a proximal portion 25 which is connected to the rest of the

cup-holding assembly 20, so as to be interchangeable.

[0044] In particular, in the preferred and illustrated embodiment, each one of the supporting elements 22 is constituted by a sliding arm that, in turn, comprises an arc-shaped distal portion 24, which contributes to define the supporting opening 21 and which can be removably coupled mechanically (by way of an insert 26) to a proximal portion 25 which is connected to the rest of the cup-holding assembly 20.

[0045] Note that the proximal portion 25 advantageously comprises a U-shaped portion, with a downward-directed concavity which is adapted to be engaged by the upper rim of one of the panels of the box-like body of the supporting structure 11.

[0046] According to the invention, the supporting elements 22 are functionally connected to a mechanism that is configured to move the supporting elements 22 with respect to each other so as to vary in a controlled manner the breadth of the supporting opening 21.

[0047] The mechanism referred to should be understood to be any kinematic transmission system through which it is possible to vary the mutual position of the supporting elements 22.

[0048] In some embodiments (not shown), such mechanism is actuated by an electronically-controlled adjustment actuator, so as to electronically adjust the breadth of the supporting opening 21, for example by sliding the supporting elements 22 along the horizontal rod 23, moving them away from or toward each other. In these embodiments, the adjustment actuator is accommodated in the cup-holding assembly 20 or in the load-bearing structure 11 and the mechanism comprises kinematic transmission elements through which the adjustment actuator guides the movement of the supporting elements 22.

[0049] In a simplified embodiment (not shown), the mechanism is manually actuated by an operator (for example through an adjustment knob), so as to manually adjust the breadth of the supporting opening 21.

[0050] In other embodiments, including the preferred and illustrated embodiment, the mechanism comprises a lever system 30 that in turn comprises an adjustment lever 31.

[0051] In more detail, the lever system 30 (visible in particular in Figures 3 and 4) is configured to modify the mutual position of the supporting elements 22 as a function of the position of the adjustment lever 31.

[0052] Note that the lever system 30 is integral with the cup-holding assembly 20 and performs a translational motion with it.

[0053] Furthermore, again in these embodiments, the device 10 comprises at least one abutment element 40A, 40B which is connected (preferably rigidly fastened) to the load-bearing structure 11 and is arranged so as to interact mechanically with the adjustment lever 31, modifying the position thereof and consequently modifying the breadth of the supporting opening 21, during at least one portion of the sliding of the cup-holding assembly 20 along the guides 12.

[0054] More precisely, the abutment elements 40A, 40B (which can comprise, for example, plates, blocks, posts, walls, shoulders etc.) are conveniently arranged along the path that the adjustment lever 31 describes as it moves integrally with the cup-holding assembly 20.

[0055] In this manner, during the movement of the cup-holding assembly 20, at a predetermined point on such path, the adjustment lever 31 comes into contact with an abutment element 40A, 40B and, by virtue of the indirect action of the drive assembly 50 that moves the cup-holding assembly 20, it is pushed in the opposite direction to the direction of motion (as can be seen in Figures 5 and 6) and therefore the lever system 30 induces the mutual displacement of the supporting elements 22, in so doing modifying the breadth of the supporting opening 21.

[0056] By positioning multiple abutment elements 40A, 40B along the movement path of the adjustment lever 31, it is possible to predetermine multiple variations of the breadth of the supporting opening 21, each one at a preset position of the cup-holding assembly 20.

[0057] As is evident, the positions in which the variations occur of the breadth of the supporting opening 21, as well as the extent of such variations, depends on the shape, on the dimensions and on the position of the abutment elements 40A, 40B.

[0058] By positioning adapted abutment elements 40A, 40B in suitable positions it is therefore possible to configure the device 10 to have one or more predetermined variations of breadth of the supporting opening 21, for example at a corresponding number of devices for dispensing cups.

[0059] For example, in the configurations shown in Figures 4 and 5, the device 10 comprises a first abutment element 40A and a second abutment element 40B, which are arranged respectively at the stroke start position and at the stroke end position, so that:

- when the cup-holding assembly 20 is in the stroke start position, the mechanical interaction between the adjustment lever 31 and the first abutment element 40A arranges, by way of the lever system 30, the supporting elements 22 in such a position as to define between them a supporting opening 21 which has a first predetermined breadth, and
- when the cup-holding assembly 20 is in the stroke end position, the mechanical interaction between the adjustment lever 31 and the second abutment element 40B arranges, again by way of the lever system 30, the supporting elements 22 in such a position as to define between them a supporting opening 21 which has a second predetermined breadth.

[0060] In other embodiments, not shown, the device 10 comprises at least one abutment element which is arranged in an intermediate position between the stroke start position and the stroke end position, so that the cup-holding assembly 20 can pass beyond it once the supporting opening 21 is adjusted.

[0061] It is to be noted that in the example shown the abutment elements 40A, 40B comprise pseudo-polygonal plates with rounded corner edges which form the abutment walls.

[0062] Furthermore, it should be noted that in Figures 5 and 6 the device 10 is shown in two different configurations, each one characterized by a different arrangement of the abutment elements 40A, 40B and more precisely in Figure 6 the abutment elements 40A, 40B are rotated through 180° with respect to Figure 5, so as to obtain different variations of the supporting opening 21.

[0063] Preferably, in order to make the change of configuration simpler, i.e. in order to vary the points where the variation occurs of the breadth of the supporting opening 21 and/or the extent of such variation, at least one abutment element 40A, 40B has an asymmetric contoured profile and can be coupled to the load-bearing structure 11 with different orientations and/or in different positions and/or rotatably with respect to the load-bearing structure 11, for example by being pivoted to the load-bearing structure 11 or by being connected to it by way of a rotating shaft so as to be able to rotate and/or selectively orientable.

[0064] Even more preferably, one or more of the abutment elements 40A, 40B are rotatable and/or selectively orientable automatically, by way of an electronically-controlled drive system.

[0065] The variation of the mutual position of the supporting elements 22 as a consequence of the mechanical interaction between the adjustment lever 31 and the at least one abutment element 40A, 40B is therefore variable as a function of the orientation and/or position of the abutment elements 40A, 40B.

[0066] Returning in more detail to the lever system 30, with particular reference to Figure 4, this comprises a plurality of kinematic transmission elements 32, 32' which mechanically connect the adjustment lever 31 to the supporting elements 22.

[0067] Advantageously, at least part of such kinematic transmission elements 32, 32' are removably connected to each other and/or to the adjustment lever 31 and/or to the supporting elements 22.

[0068] In this manner, the lever system 30 is configurable, by way of the replacement or the change of position of one or more of the kinematic transmission elements 32, 32', in a plurality of configurations, each one of which is characterized by a mutual movement of the supporting elements 22 that is different in terms of direction or breadth as a consequence of a same movement of the adjustment lever 31.

[0069] For example, in the embodiment shown, the kinematic transmission elements 32, 32' comprise a first linkage 32 pivoted with a first end to one supporting element 22 and with a second end to a point P1 of the adjustment lever 31 downstream of the fulcrum F of that lever 31 and a second linkage 32' pivoted with a first end to the other supporting element 22 and with a second end to a point P2 of the adjustment lever 31 upstream of the fulcrum F of that lever 31. Inverting the points of connection between the linkages 32, 32' and the adjustment lever (i.e. by pivoting the second end of the first linkage 32 at the point P2 and the second end of the second linkage at the point PI) inverts the direction of movement of the supporting elements 22 caused by the same movement of the adjustment lever 31.

[0070] Preferably, the lever system 30 also comprises one or more stroke limiting elements for controlling the positioning of the adjustment lever 31 and even more preferably also a coupling bar 35 which helps maintain the adjustment lever 31 and the kinematic transmission elements 32, 32' in position.

[0071] In the preferred and illustrated embodiment, the cup-holding assembly 20 also comprises a support plate 29 which supports the supporting elements 22, the horizontal rod 23, the lever system 30 and the actuator 51 with the gear 52.

[0072] Optionally, the support plate 29 also supports a resting surface for the cups 28.

[0073] In the example shown, the lever system 30 is positioned on a front face of the support plate 29, so as to be accessible frontally, while the actuator 51 is positioned on a rear face.

[0074] In the lever system 30 shown, the adjustment lever 31 is provided with a guide element 33 which slides inside a guide slot 39, with a curve shape, provided on the support plate 29.

[0075] Preferably, the device 10 also comprises one or more of the following detection means:

- position detection means 61, such as for example position sensors or proximity sensors of microswitches, which are arranged proximate to the stroke start position and/or proximate to the stroke end position, for detecting the position of the cup-holding assembly 20,
- position detection means which are integrated in the cup-holding assembly 20, for detecting the mutual position of the supporting elements 22 (not shown).

[0076] Advantageously, all or part of the above mentioned device 61 are functionally connected to an electronic control system (not shown) which can manage the movement of the cup-holding assembly 20 (by controlling the drive assembly 50) and/or the mutual movement of the supporting elements 22 (for example by controlling the adjustment actuator, if present) and/or can interact with the electronics that control other devices with which the device for the translation of cups is associated (for example devices for dispensing cups).

[0077] In particular, in an advanced embodiment, the device for the translation of cups 10 comprises position detection means 61 which are located proximate to the stroke start and end positions, for detecting the position of the cup-holding assembly 20, and an adjustment actuator controlled electronically by the electronic control system in order to adjust the breadth of the supporting

opening 21 as a function of the position of the cup-holding assembly 20 detected by the position detection means 61.

[0078] Operation of the device for the translation of cups is clear and evident from the foregoing description.

[0079] In practice it has been found that the device for the translation of cups and the like, according to the present invention, achieves the intended aim and objects in that it can be used to translate different cups that have different sizes.

[0080] Another advantage of the device for the translation of cups, according to the invention, is that it can be reconfigured to translate cups of different sizes more rapidly, simply and economically than in the known art.

[0081] Another advantage of the device for the translation of cups, according to the invention, is that it can be reconfigured to translate a wider variety of cups than in the known art.

[0082] Another advantage of the device for the translation of cups, according to the invention, is that it can be used in vending machines that comprise multiple devices for dispensing cups of different dimensions or in which there is a device for dispensing cups of various sizes.

[0083] Another advantage of the device for the translation of cups, according to the invention, is that it is more reliable and less subject to jams when compared to the known art.

[0084] Another advantage of the device for the translation of cups, according to the invention, consists in that it is easy to implement and economically competitive when compared to the known art.

[0085] The device for the translation of cups, thus conceived, is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0086] Moreover, all the details may be substituted by other, technically equivalent elements.

[0087] The disclosures in Italian Patent Application No. 102018000005931 from which this application claims priority are incorporated herein by reference.

[0088] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A device (10) for the translation of cups and the like, which comprises:

   - a load-bearing structure (11) that supports one or more guides (12) along which a cup-holding assembly (20) can slide which is provided with at least one supporting opening (21) which is adapted to be engaged by a cup to be translated, and
   - a drive assembly (50) which is configured to move said cup-holding assembly (20) along said guides (12) between a stroke start position and a stroke end position,

   characterized in that said cup-holding assembly (20) comprises at least two supporting elements (22), which between them define said supporting opening (21), are moveable with respect to each other in order to vary the breadth of said supporting opening (21), and are functionally connected to a mechanism that is configured to move said supporting elements (22) with respect to each other so as to vary in a controlled manner the breadth of said supporting opening (21).

2. The device (10) according to claim 1, **characterized in that** said supporting elements (22) comprise two arms which can slide along a horizontal rod (23).

3. The device (10) according to claim 1 or 2, **characterized in that** said mechanism is actuated by an electronically-controlled adjustment actuator, so as to electronically adjust the breadth of said supporting opening (21).

4. The device (10) according to claim 1 or 2, **characterized in that** said mechanism comprises a lever system (30) which comprises an adjustment lever (31), said lever system (30) being configured to modify the mutual position of said supporting elements (22) as a function of the position of said adjustment lever (31) and being integral with said cup-holding assembly (20),
   and **in that** it comprises at least one abutment element (40A, 40B) which is connected to said load-bearing structure (11) and is arranged so as to interact mechanically with said adjustment lever (31), modifying the position thereof, during at least one portion of the sliding of said cup-holding assembly (20) along said guides (12).

5. The device (10) according to claim 4, **characterized in that** said lever system (30) comprises a plurality of kinematic transmission elements (32, 33), which connect mechanically said adjustment lever (31) to said supporting elements (22); one or more of said kinematic transmission elements (32, 32') being connected to each other and/or to the adjustment lever (31) and/or to the supporting elements (22) in a removable manner; said lever system (30) being configurable, by way of the replacement or the change of position of one or more of said kinematic transmission elements (32, 32'), in a plurality of configurations, each one of which is **characterized by** a mutual movement of said supporting elements (22)

that is different in terms of direction or breadth as a consequence of a same movement of said adjustment lever (31).

6. The device (10) according to claim 4 or 5, **characterized in that** said at least one abutment element (40A, 40B) has an asymmetric contoured profile and can be coupled to said load-bearing structure (11) with different orientations and/or in different positions and/or rotatably with respect to said load-bearing structure (11); the variation of the mutual position of said supporting elements (22) as a consequence of the mechanical interaction between said adjustment lever (31) and said at least one abutment element (40A, 40B) being variable as a function of the orientation and/or position of said at least one abutment element (40A, 40B).

7. The device (10) according to one or more of claims 4 to 6, **characterized in that** it comprises a first abutment element (40A) and a second abutment element (40B), which are arranged respectively at said stroke start position and at the said stroke end position, so that

- when the cup-holding assembly (20) is in said stroke start position, the mechanical interaction between said adjustment lever (31) and said first abutment element (40A) arranges, by way of said lever system (30), said supporting elements (22) in such a position as to define between them a supporting opening (21) which has a first predetermined breadth, and
- when the cup-holding assembly (20) is in said stroke end position, the mechanical interaction between said adjustment lever (31) and said second abutment element (40B) arranges, by way of said lever system (30), said supporting elements (22) in such a position as to define between them a supporting opening (21) which has a second predetermined breadth.

8. The device (10) according to one or more of the preceding claims, **characterized in that** said drive assembly (50) comprises an actuator (51) which guides the sliding of the cup-holding assembly (20) along said guides (12) by way of a gear (52) which is turned by said actuator (50) and which meshes on a rack (53); said rack (53) being rigidly coupled to said load-bearing structure (11), and the actuator (51), together with the gear (52), being integral with the cup-holding assembly (20) or vice versa.

9. The device (10) according to one or more of the preceding claims, **characterized in that** at least one of said supporting elements (22) comprises a contoured distal portion (24), which contributes to define said supporting opening (21) and which can be removably coupled mechanically to a proximal portion (25) which is connected to the rest of the cup-holding assembly (20), so as to be interchangeable.

10. The device (10) according to one or more of the preceding claims, **characterized in that** it comprises one or more of the following detection means:

- position detection means (61), which are arranged proximate to said stroke start position and/or proximate to said stroke end position, for detecting the position of the cup-holding assembly (20),
- position detection means which are integrated in the cup-holding assembly (20), for detecting the mutual position of the supporting elements (22);

said detection means being functionally connected to an electronic control system.

11. The device (10) according to claims 3 and 10, comprising position detection means (61) which are located proximate to said stroke start position and/or proximate to said stroke end position, for detecting the position of the cup-holding assembly (20), **characterized in that** said adjustment actuator is controlled electronically by said electronic control system in order to adjust the breadth of said supporting opening (21) as a function of the position of the cup-holding assembly (20) detected by said position detection means (61).

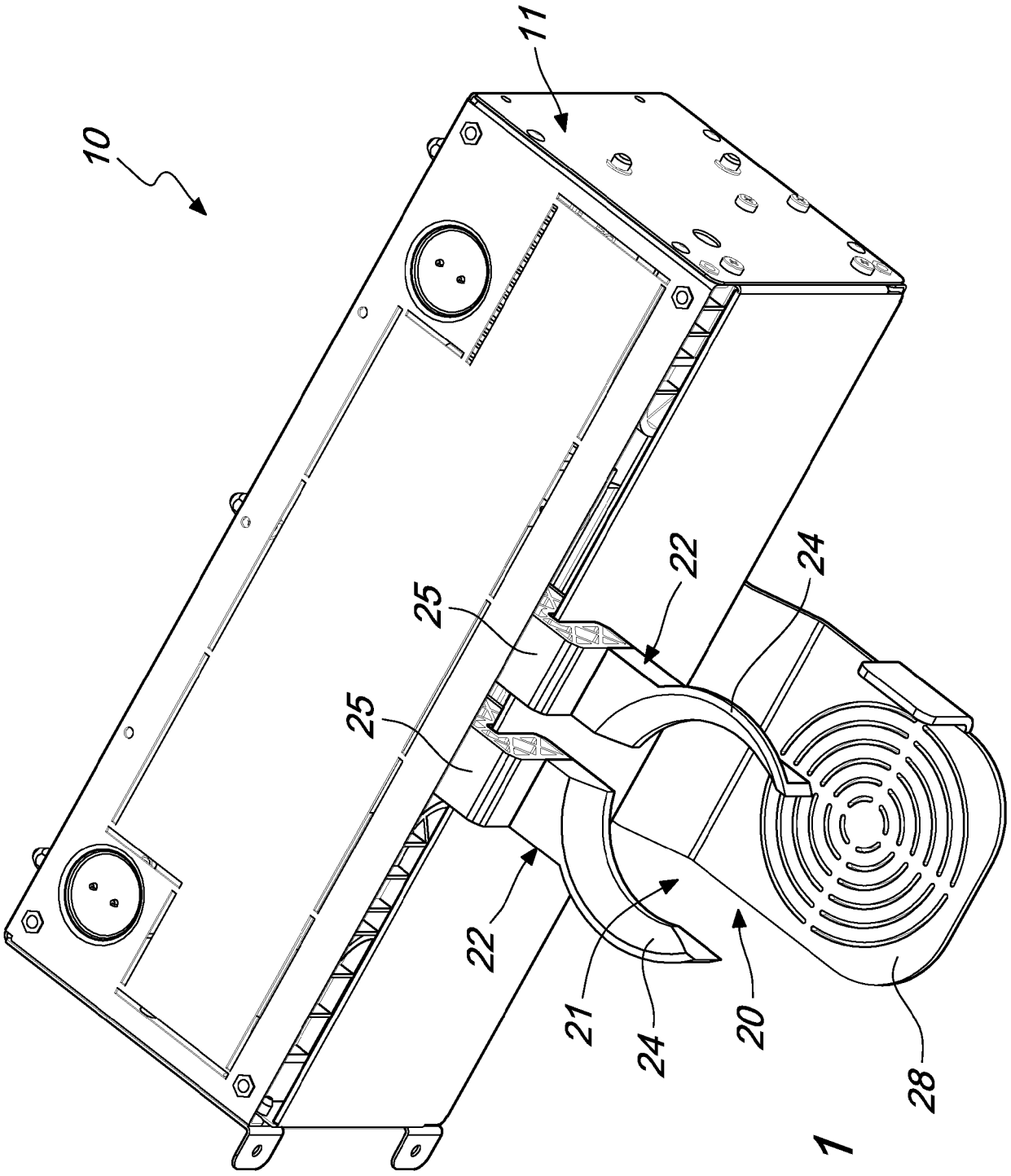

Fig. 1

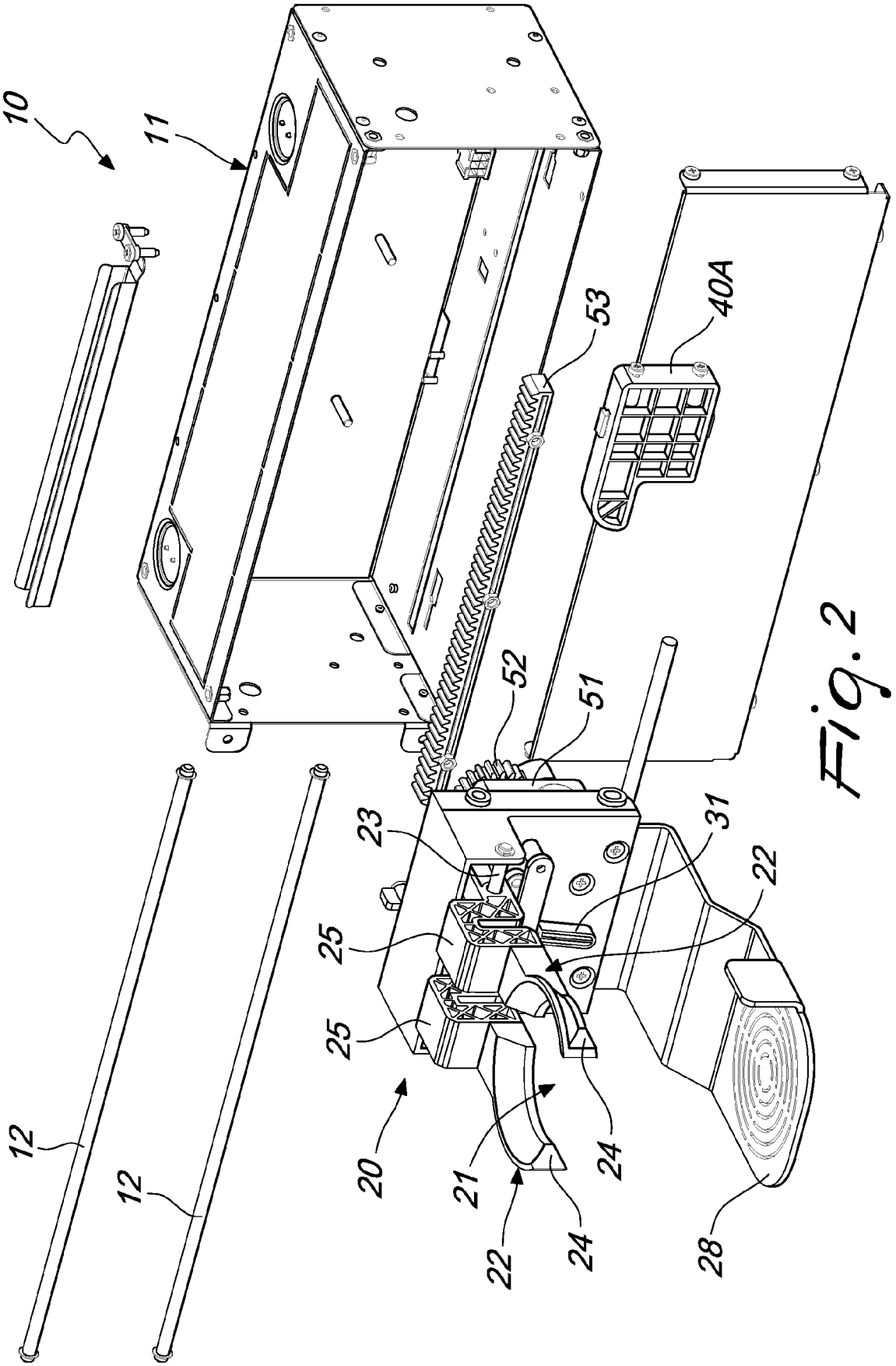

Fig. 2

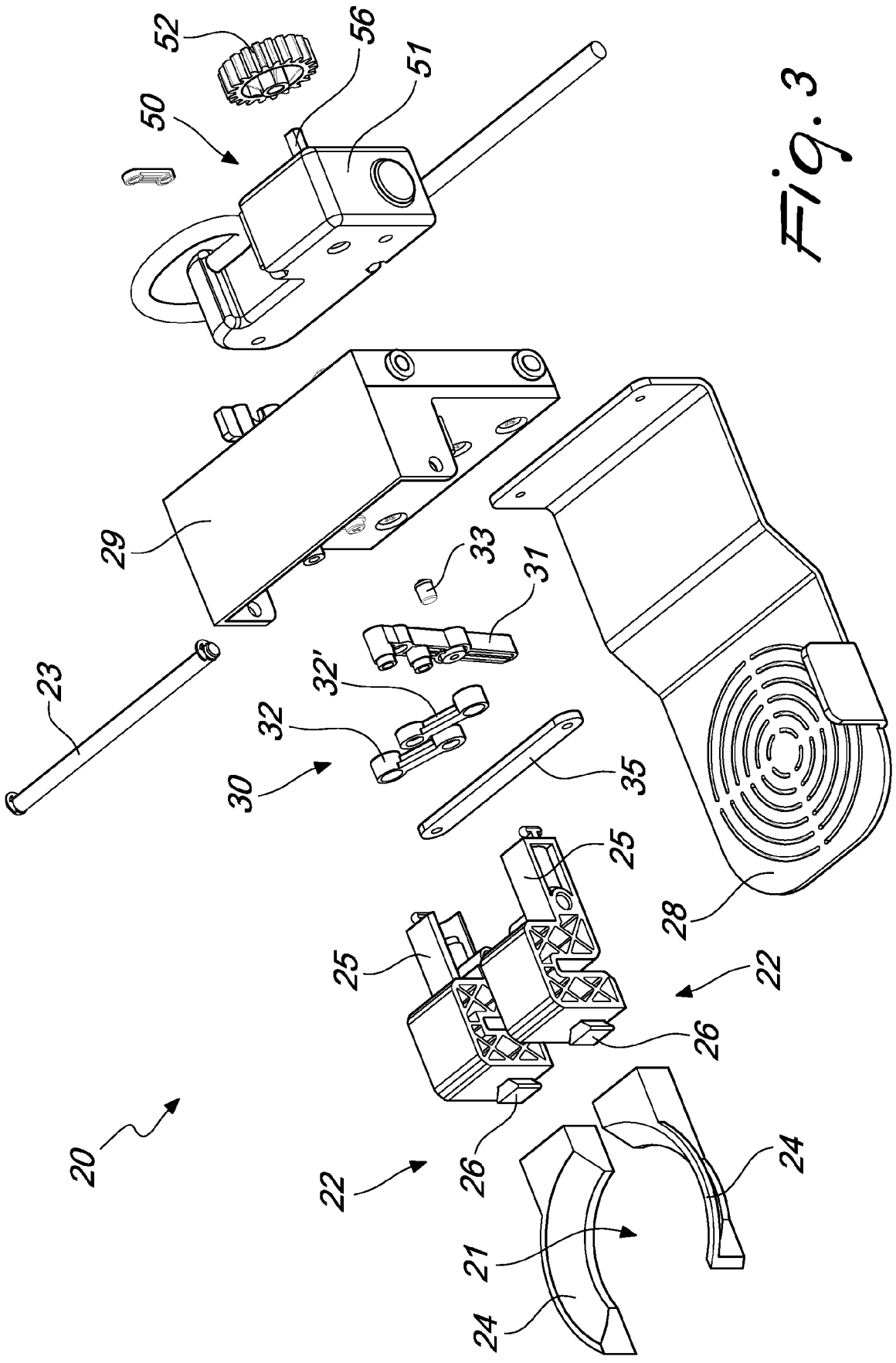

Fig. 3

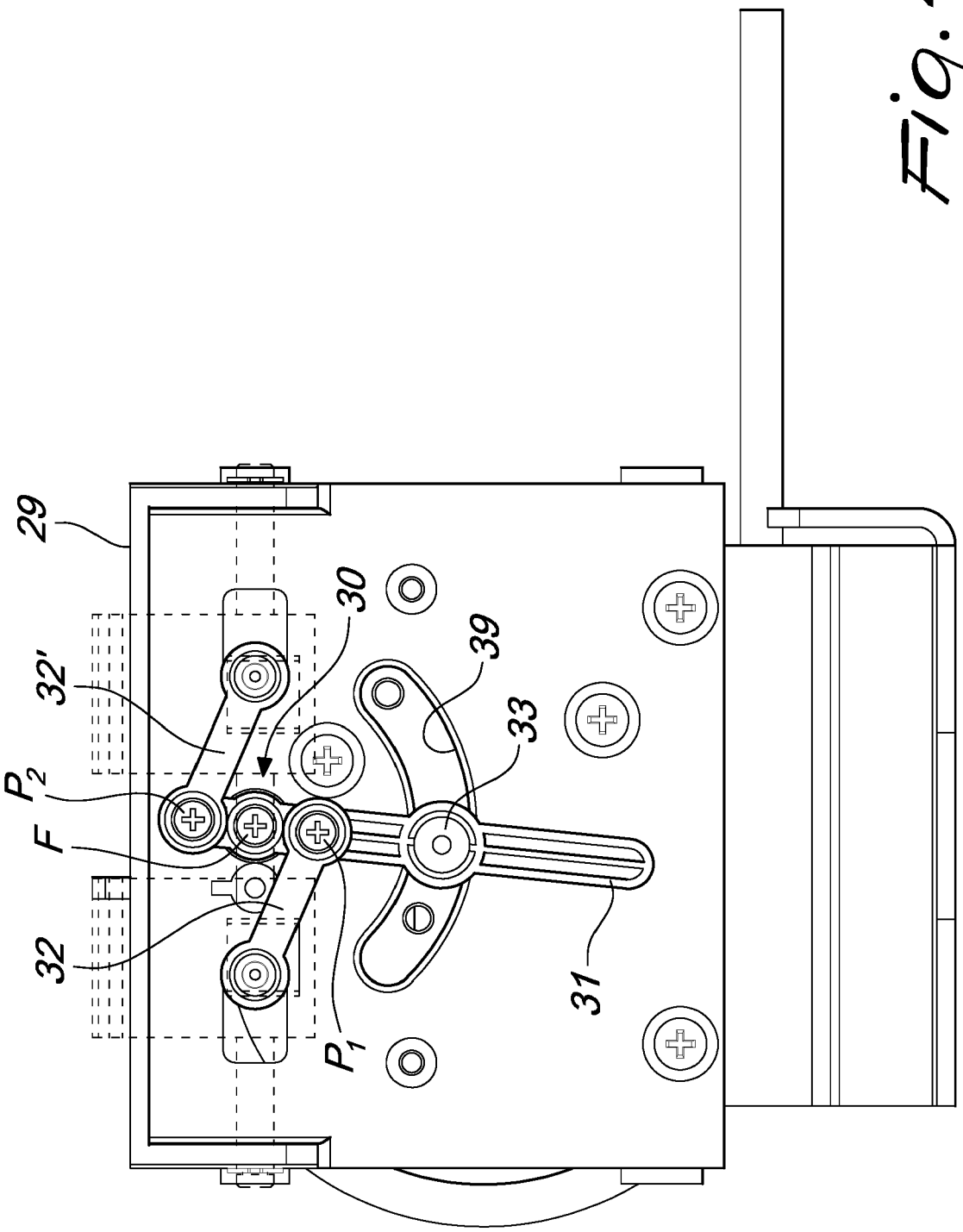

Fig. 4

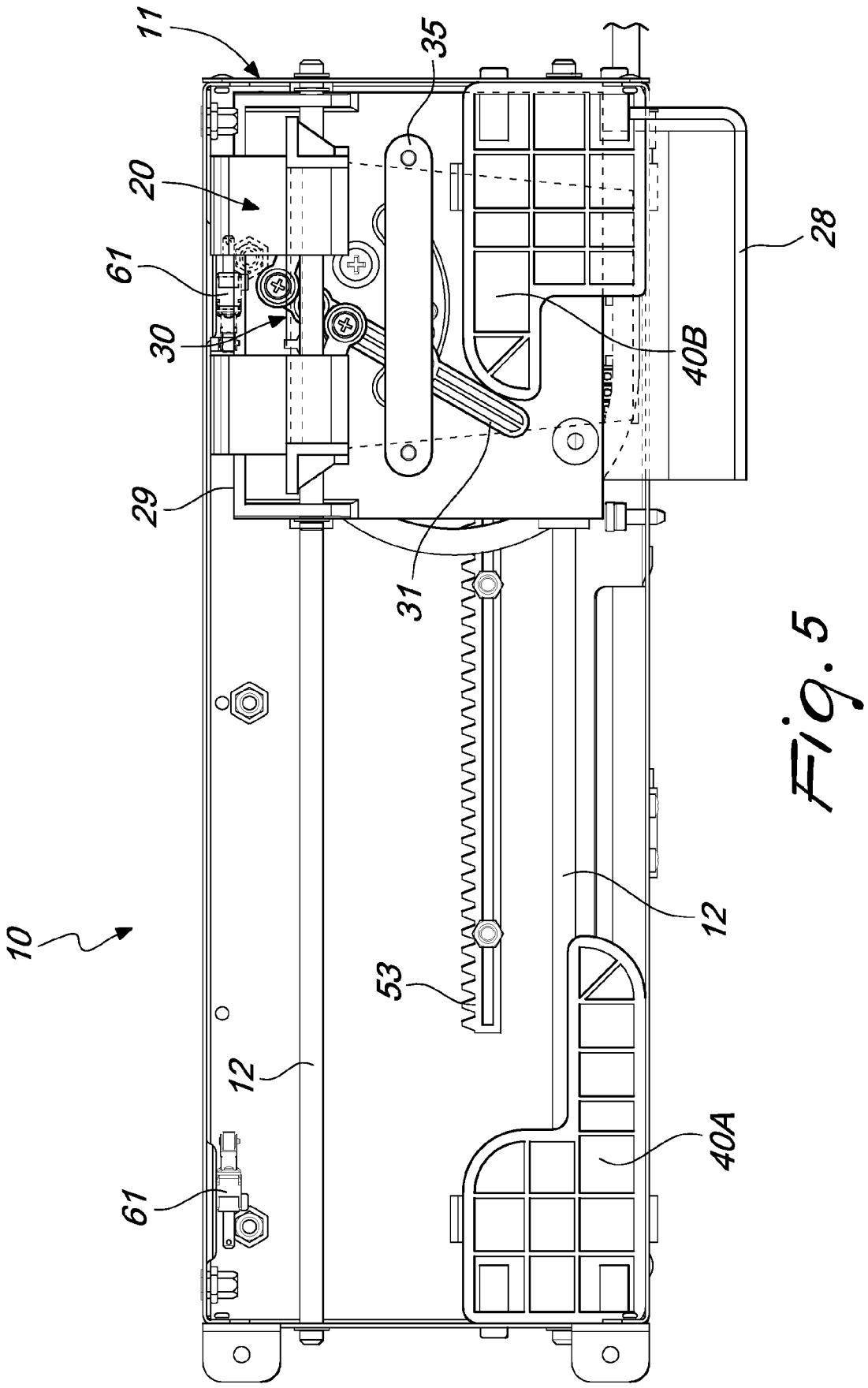

Fig. 5

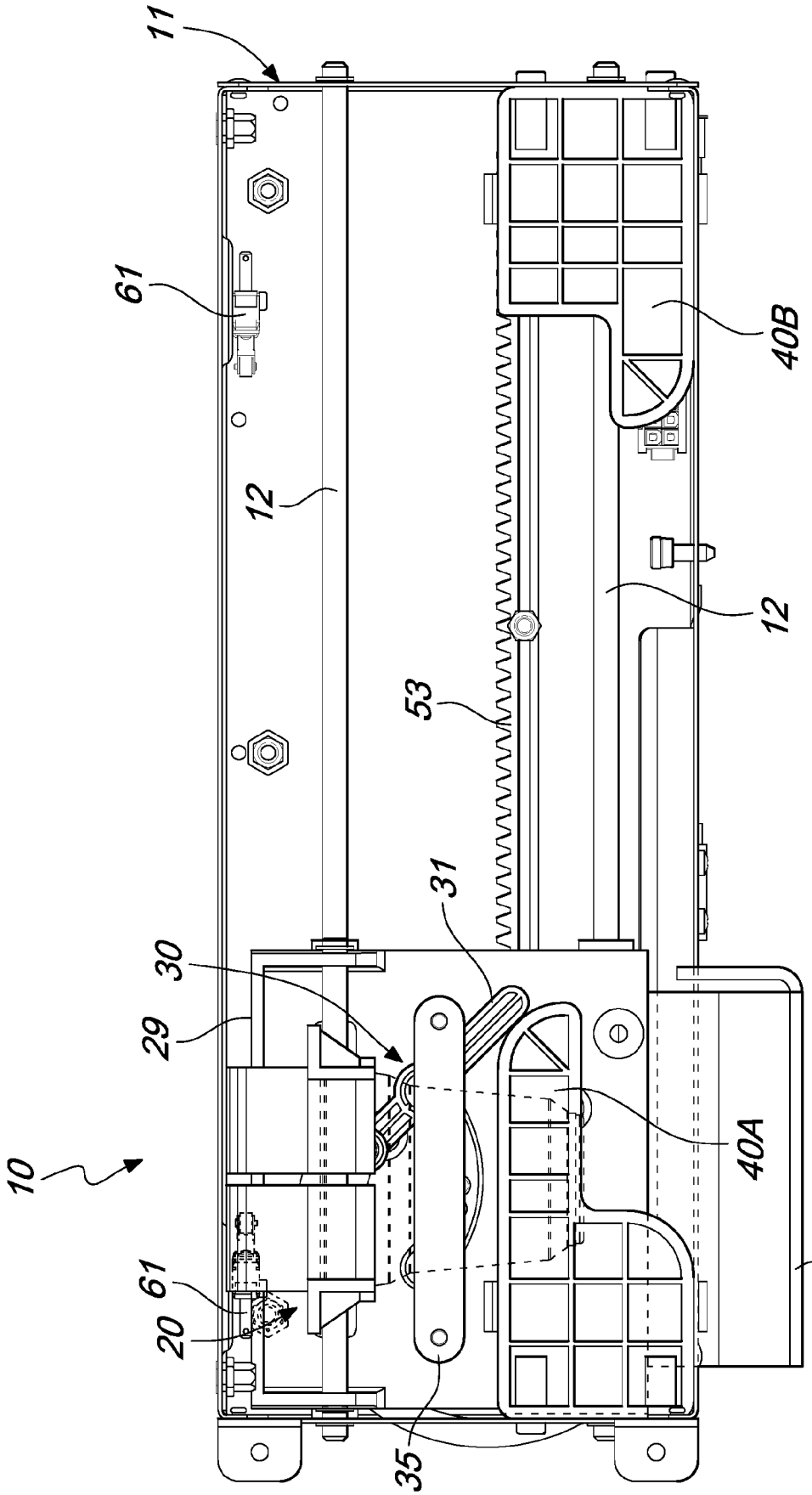

Fig. 6

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 19 17 5202

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 Y A	EP 0 462 591 A1 (SANYO ELECTRIC CO [JP]) 27 December 1991 (1991-12-27) * column 1, line 1 - column 3, line 2 * * column 5, line 20 - column 12, line 31 * * column 18, line 43 - column 20, line 35 * * figures 2-4, 7-12 * * column 17, line 1 - column 18, line 5 *	1-3,8, 10,11 9 4-7	INV. G07F13/10 G07F13/06
X Y A	WO 2014/084435 A1 (ICETRO CO LTD [KR]) 5 June 2014 (2014-06-05) * paragraph [0001] - paragraph [0017] * * paragraph [0048] - paragraph [0112] *	1-3,8, 10,11 9 4-7	
X Y A	WO 2014/115073 A1 (SCHALLER ROMAN [AT]) 31 July 2014 (2014-07-31) * page 1, line 1 - page 3, line 6 * * page 4, line 7 - page 12, line 6 * * figure 6 *	1-3,8, 10,11 9 4-7	
Y	US 3 554 364 A (LANE CURTIS ET AL) 12 January 1971 (1971-01-12) * column 4, line 61 - column 5, line 6 *	9	TECHNICAL FIELDS SEARCHED (IPC) G07F
Y	GB 786 882 A (NAT REJECTORS GMBH) 27 November 1957 (1957-11-27) * page 10, line 48 - line 81 *	9	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	7 June 2019	Mascia, Franco

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 19 17 5202

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-06-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0462591 A1	27-12-1991	DE 69119146 D1	05-06-1996
		DE 69119146 T2	09-01-1997
		EP 0462591 A1	27-12-1991
		KR 950002012 B1	08-03-1995
		US 5261467 A	16-11-1993
WO 2014084435 A1	05-06-2014	KR 101387707 B1	21-04-2014
		WO 2014084435 A1	05-06-2014
WO 2014115073 A1	31-07-2014	NONE	
US 3554364 A	12-01-1971	NONE	
GB 786882 A	27-11-1957	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- IT 102018000005931 **[0087]**