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

(11) **EP 4 101 630 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
12.03.2025 Bulletin 2025/11

(21) Application number: **21750737.5**

(22) Date of filing: **26.01.2021**

(51) International Patent Classification (IPC):
B31B 50/02 *(2017.01)* ***B31B 50/04*** *(2017.01)*
B31B 50/06 *(2017.01)* ***B31B 50/07*** *(2017.01)*
B65B 35/18 *(2006.01)* ***F16H 21/14*** *(2006.01)*
F16H 21/22 *(2006.01)* ***F16H 21/30*** *(2006.01)*
B65H 3/08 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
B31B 50/04; B31B 50/06; B31B 50/07; B65H 3/0808; B65H 3/0883; B65H 2403/53; B65H 2403/531; B65H 2405/52; B65H 2406/341; B65H 2701/1764

(86) International application number:
PCT/ES2021/070055

(87) International publication number:
WO 2021/156528 (12.08.2021 Gazette 2021/32)

(54) MECHANISM FOR FEEDING SHEETS OF CARDBOARD INTO A BOX FORMING MACHINE

VORRICHTUNG ZUM ZUFÜHREN VON KARTONBÖGEN IN EINE KARTONFORMMASCHINE

MÉCANISME D'APPROVISIONNEMENT DE FEUILLES EN CARTON DANS UNE FORMEUSE DE BOÎTES

(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

(30) Priority: **05.02.2020 ES 202030195 U**

(43) Date of publication of application:
14.12.2022 Bulletin 2022/50

(73) Proprietor: **Boix Maquinaria Spain, S.L.U.**
03349 San Isidro de Albatera, Alicante (ES)

(72) Inventor: **BOIX JAEN, José**
03349 San Isidro de Albatera (Alicante) (ES)

(74) Representative: **Ungria López, Javier**
Avda. Ramón y Cajal, 78
28043 Madrid (ES)

(56) References cited:
EP-A1- 3 202 563
EP-B1- 1 181 151
WO-A1-2016/044744
WO-A1-2016/203073
WO-A1-2017/064649
ES-A1- 2 660 059
ES-A1- 2 678 672
EP-A1- 3 202 563
WO-A1-2016/044744
WO-A1-2016/203073
WO-A1-2017/064649
ES-A1- 2 660 059
ES-A1- 2 678 672
ES-A1- 2 739 389

EP 4 101 630 B1

Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a box-making machine that incorporates a mechanism in charge of sucking the cardboard sheets from a reception area, where they are stacked to place them on a conveyor line to be taken to the shaping area where they are made into boxes. The mechanism is configured to reduce the amount of space needed to a minimum and enable the machine to optimise the manufacturing speed of the boxes based on the size thereof. Thus, it is activated by a geared motor, which is located next to the geared motor in charge of activating the male shaper, such that the mechanism can place the sheets on the conveyor line at the same level as the shaping area.

[0002] The invention is especially applicable to the industry of mechanisms for the manufacturing of folded cardboard boxes.

TECHNICAL PROBLEM TO BE RESOLVED AND BACKGROUND OF THE INVENTION

[0003] Currently known in the state of the art are several different box-making machines in which a common feature is based on the preparation of boxes before they arrive to the shaping area from a reception area in which the boxes are stacked in the form of folded sheets.

[0004] Document ES-2660059_B1 represents a box-making machine formed mainly by a reception area that incorporates a stacking area wherein the folded boxes are placed in the form of sheets and in which the boxes are collected, and a shaping area, defined by a pressing station that is delimited by longitudinal rails for guiding the box to be shaped, wherein the box is given its definitive shape. A shaping device is in charge of moving the box from the reception area to the shaping area, and by means of a conveyor device, it collects a box by moving a pick-up arm that incorporates a system of suction cups in the direction of the reception area, along a front axis, to then moves in the direction of the shaping area, along a transverse axis, and delivers the box to the pressing station, where the box will then be finally shaped.

[0005] In this machine, the shaping device incorporates a curved bar that causes the box to unfold in its turning movement along to the front axis, the box being sucked by the suction cup system but in an open-box position. The box-making machine also incorporates two transverse folders, in charge of folding the transverse flaps of the base of the box and a pair of longitudinal folders, both separated the same distance from the width of the box to be shaped and configured in the form of inclined sheets that interfere with the longitudinal flaps of the box to fold them as the box advances.

[0006] This way, the shaping device positions the box, held by the suction cup system and with the four bottom flaps already folded, in the shaping area to finish shaping the box into its definitive shape.

[0007] However, this invention has a drawback in that it includes too many mechanisms for moving the box from the reception area to the shaping area, requiring large dimensions for the machine.

[0008] Document ES-1127280_U describes a box-making machine that incorporates a cardboard sheet collection mechanism to take the sheets from the supply area to the conveyor line. To do so, the mechanism is formed by two arms with suction cups joined by a shaft that is activated by a geared motor to be able to collapse and move from a vertical position in which the sheets are collected, to horizontal position in which they are placed on a conveyor line. The mechanism is located in the lower area of the machine, placed within the conveyor line, such that it does not occupy additional space.

[0009] However, this mechanism cannot be used in any machine, especially if the machine is not specifically designed for it.

[0010] The present invention describes a box-making machine that incorporates a sheet supply mechanism that solves the previously mentioned problems. To do so, it incorporates a pick-up arm, which comprises a system of suction cups with the ability to rotate to suck the boxes, such that the sheets are collected in a vertical position in accordance with how they are located in the stacking area of the reception area, to be placed on a conveyor line, by which they are taken to the shaping area, thereby reducing the dimensions of the machine without affecting the functionality thereof. The mechanism is actuated by a geared motor located at the same level as the geared motor that activates the male shaper, in the upper area, so that it does not interfere with other elements of the machine.

[0011] Document WO 2017064649 A1 refers to a mechanism for supplying cardboard sheets of a box-making machine that is connected to a geared motor located on a base and which comprises a pick-up arm with a plurality of suction cups located in one of the ends. The pick-up arm is configured as an elongated body that can rotate around a shaft of the motor to which it is joined that is located in a middle area. The ends of the elongated body are linked with pins to joining pieces which in turn are linked to respective arms in an intermediate area. Each of the arms is linked, by one of the ends, to each of the supports and, by the other end, to each of the ends of an elongated piece which is linked in the middle to the shaft of the motor with ability to rotate. One of the supports houses the system of suction cups to capture the cardboard sheets. The mechanism turns 180° to go from a position where a cardboard sheet is captured to another position where the sheet is placed.

[0012] Document ES 2739389 A1 discloses a machine configured to form boxes by folding and gluing sheet material, comprising a sheet feeder of sheet material, and method for forming boxes of sheet material by means of such machine.

DESCRIPTION OF THE INVENTION

[0013] With the aim of achieving the objectives and avoiding the previously mentioned drawbacks, the present invention describes a mechanism for supplying cardboard sheets of a box-making machine that is activated by a geared motor located on a fixed base, in addition to a cardboard sheet stacking area, a shaping area and a conveyor line intended to convey the collected sheets to the shaping area. To do so, the mechanism comprises a plurality of suction cups connected to a pneumatic system configured to create a depression when activated and thereby be able to suck the sheets.

[0014] It is important to consider that the mechanism is located in the proximity of the shaping area with the aim of having the lower edge of the sheets, according to the placement thereof in the stacking area, always next to the end of the conveyor line, where the glue guns are located, just before heading to the shaping area, being free at the other end to receive cardboard sheets with greater dimensions. This way, the cycle time is reduced to the minimum, thereby increasing the productivity of the machine.

[0015] The mechanism is configured by means of a pick-up arm formed by a first segment and a second segment joined in an articulated fashion by one of the ends thereof.

[0016] The first segment is solidly joined at the other end to the shaft of the geared motor.

[0017] The second segment is solidly joined at the other end to a support element to which a plurality of suction cups is fastened.

[0018] Furthermore, the second segment is joined, with sliding ability, to a fastening element which, in turn, is joined to the fixed base by a shaft with the ability to freely rotate. This way, movement of the geared motor causes a rotation of the first segment, which causes both the rotation as well as the sliding of the second segment with respect to the fixed base. With this configuration, the geared motor has rotational movement to make the second segment rotate at the same time that it initially slides with respect to the fastening element to withdraw from the conveyor line and, continuing to rotate, slide in the opposite direction to move towards the stacking area and collect a cardboard sheet by suction. Then, the geared motor changes the direction of the rotation so that the second segment does the opposite movement, sliding with respect to the fastening element to withdraw from the stacking area, with the sheet collected, and then slide in the opposite direction to place it on the conveyor line, where the cycle ends. The positions of the mechanism where the geared motor changes the direction of rotation are determined by detectors.

[0019] To provide the system with possibilities for adjustment, the support element of the mechanism can be a support shaft in which a pair of longitudinal members on each one of the ends, to which the plurality of suction cups is fastened.

[0020] Furthermore, the location of the suction cups on the longitudinal members as well as the longitudinal members on the support shaft is adjustable, such that the dimension of the cardboard sheets is not a limitation for the mechanism of the invention.

BRIEF DESCRIPTION OF THE FIGURES

[0021] To complete the description of the invention, and for the purpose of helping to make the features thereof more readily understandable, according to a preferred exemplary embodiment thereof, a set of drawings is included wherein, by way of illustration and not limitation, the following figures have been represented:

- Figure 1 represents a side view of the inside of a box-making machine incorporating the mechanism of the invention on the conveyor line, the cardboard sheet stacking area and the box-shaping area.
- Figure 2a represents a perspective view of the mechanism of the invention in a position of collecting a cardboard sheet.
- Figure 2b represents a perspective view of the mechanism of the invention with a sheet collected in the rotation process to be placed on the conveyor line.
- Figure 2c represents a perspective view of the mechanism of the invention in a position of releasing a sheet on the conveyor line.
- Figure 3 represents an isolated perspective view of the mechanism of the invention to more clearly show the components thereof.

[0022] A list of the references used in the figures is provided below:

1. Stacking area.
2. Conveyor line.
3. Shaping area.
4. Cardboard sheet.
5. Fixed base.
6. Pick-up arm.
7. First segment.
8. Second segment.
9. Fastening element.
10. Support shaft.
11. Longitudinal members.
12. Suction cups.
13. First detector.
14. Second detector.

DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

[0023] The present invention relates to a mechanism for supplying cardboard sheets (4) that is incorporated in a box-making machine by means of which the cardboard sheets (4) are collected in a stacking area (1) to be placed on a conveyor line (2) that takes them to the shaping area

(3).

[0024] Figure 1 represents a side view of the mechanism of the invention located in the box-making machine. In this figure it may be seen how the space between the stacking area (1) and the shaping area (3) is reduced to the minimum to provide a conveyor line (2) with a linear dimension that can be as small as the dimension of the cardboard sheets of the box to be shaped. This way, the machine is dimensioned to be able to receive cardboard sheets (4) with a specific maximum size. In the case of shaping boxes with cardboard sheets (4) of smaller dimensions, the bottom side of the sheet (4), according to how it is placed in the stacking area (1), is always positioned in the gluing area, located at the entrance of the shaping area (3), the free space being in proximity to the stacking area (1). This way, the production speed is always the same, regardless of the size of the cardboard sheet (4), and the path of the conveyor belt (2) is optimised with respect to the length of the cardboard sheet (4).

[0025] Figure 2a represents the phase of collecting the cardboard sheet (4) from the stacking area (1) by the pick-up arm (6) of the mechanism.

[0026] Figure 2c represents the phase of placing the cardboard sheet (4) on the conveyor line (2).

[0027] Figure 3 represents the mechanism of the invention in an isolated fashion to show the components thereof in greater detail.

[0028] As represented in figure 3, the mechanism is located on a fixed base (5) that supports the geared motor. The mechanism is located in proximity to the shaping area (3), such that the sheets (4) can always be placed in proximity to the same, leaving a free space for production using sheets (4) of greater dimensions in proximity to the stacking area (1).

[0029] The mechanism is configured by a pick-up arm (6) that comprises a first segment (7) and a second segment (8) joined in an articulated fashion by one of the ends thereof.

[0030] The first segment (7) is solidly joined by the free end to the shaft of the geared motor.

[0031] The second segment (8) is joined by an intermediate area to a C-shaped fastening element (9), having the ability to slide on the same. The fastening element (9) is joined to the fixed base (5) by means of a shaft with the ability to rotate freely.

[0032] A support shaft (10) is solidly joined to the free end of the second segment (8) by a central area, making up arms, to each one of which a longitudinal member (11) is fastened. At least one suction cup (12) is fastened to each one of the longitudinal members (11). The position of the suction cups (12) on the longitudinal members (11) and the longitudinal member (11) on the support shaft (10) can be adjusted according to the user's specific needs, as well as the number of suction cups (12) and the dimensions of both the longitudinal members (11) and the support shaft (10), such that there is no limitation when collecting a cardboard sheet (4) due to the size thereof, the only limitation being the size of the machine.

[0033] With this configuration of the pick-up arm (6), given that the mechanism in the initial resting position is in the position of having just placed a sheet (4) on the conveyor line (2), an anticlockwise rotational movement, as shown in figure 3, of the geared motor causes the first segment (7) to rotate in the same direction, which implies a rotation and a sliding with respect to the fastening element (9) of the second segment (8) to withdraw from the conveyor line (2). As the rotation of the first segment (7) continues, the second segment (8) also continues rotating in order to change the sliding direction and move towards the stacking area to collect a cardboard sheet by suction. At that moment, the first detector (13) detects that the second segment (8) has reached its limit position and causes the geared motor to change the direction of rotation so that the second segment (8) carries out the opposite movement, sliding with respect to the fastening element (9) to remove itself from the stacking area (1), with the collected sheet (4), and then sliding in the opposite direction to place it on the conveyor line (2), where the second detector (14) detects the position of the second segment (8) and causes a change in the direction of rotation of the geared motor to begin a new cycle.

[0034] Once the cardboard sheet (4) has been placed on the conveyor belt (2), it is conveyed to the shaping area (3), where the box-shaping process continues while the mechanism begins a new cycle to collect the next sheet (4).

[0035] Lastly, it must be taken into account that the present invention must not be limited by the embodiment described herein. Other configurations may be carried out by those skilled in the art based on the present description. Accordingly, the scope of the invention is defined by the following claims.

Claims

1. A mechanism for supplying cardboard sheets of a box-making machine that comprises a stacking area (1) for cardboard sheets (4), a shaping area (3) and a conveyor line (2) intended to convey the cardboard sheets (4) collected in the stacking area (1) to the shaping area (3), wherein the mechanism comprises a geared motor located on a fixed base (5), wherein the mechanism comprises a plurality of suction cups (12) connected to a pneumatic system configured to create a depression when activated, wherein the mechanism comprises a pick-up arm (6) formed by a first segment (7) and a second segment (8), the mechanism being **characterised in that**:

    - the second segment (8) is joined with sliding ability to a fastening element (9) that is joined to the fixed base (5) with the ability to rotate freely,
    - the first segment (7) and the second segment (8) are joined in an articulated fashion by some

of the ends thereof,
- the other end of the first segment (7) is solidly joined to the shaft of the geared motor;
- the other end of the second segment (8) is solidly joined to a support element that incorporates the plurality of suction cups (12);

such that the rotation of the geared motor implies the collection of a cardboard sheet (4) in the stacking area (1) to be placed on the conveyor line (2).

2. The mechanism for supplying cardboard sheets of a box-making machine, according to claim 1, **characterised in that** the support element is a support shaft (10) fastened to the second segment (8) by an intermediate area that incorporates longitudinal members (11) on the ends thereof, on which the suction cups (12) are located.

3. The mechanism for supplying cardboard sheets of a box-making machine, according to claim 2, **characterised in that** the location of the suction cups (12) on the longitudinal members (11) is adjustable.

4. The mechanism for supplying cardboard sheets of a box-making machine, according to claim 2, **characterised in that** the location of the longitudinal members (11) on the support shaft (10) is adjustable.

5. The mechanism for supplying cardboard sheets of a box-making machine, according to claim 2, **characterised in that** it comprises a first detector (13) configured for detecting the final movement of the second segment (8) of the pick-up arm (6) when the plurality of suction cups (12) have collected a cardboard sheet (4) from the stacking area (1) and cause the second segment (8) to move in the opposite direction by means of a change in the direction of rotation of the geared motor.

6. The mechanism for supplying cardboard sheets of a box-making machine, according to claim 2, **characterised in that** it comprises a second detector (14) configured for detecting the final movement of the second segment (8) of the pick-up arm (6) when the plurality of suction cups (12) have placed a cardboard sheet (4) on the conveyor line and cause the second segment (8) to move in the opposite direction by means of a change in the direction of rotation of the geared motor.

Patentansprüche

1. Mechanismus zum Zuführen von Bögen aus Pappe einer Maschine zum Herstellen von Kartons, der einen Stapel-Bereich (1) für Bögen (4) aus Pappe, einen Formgebungs-Bereich (3) und ein Förderband (2) umfasst, das dazu bestimmt ist, die in dem Stapel-Bereich (1) gesammelten Bögen (4) aus Pappe zu dem Formgebungs-Bereich (3) zu befördern, wobei der Mechanismus einen Getriebemotor umfasst, der sich auf einem stationären Sockel (5) befindet, wobei der Mechanismus eine Vielzahl von Saugnäpfen (12) umfasst, die mit einem pneumatischen System verbunden sind, das so ausgeführt ist, dass es einen Unterdruck erzeugt, wenn es aktiviert wird, wobei der Mechanismus einen Aufnahmearm (6) umfasst, der durch ein erstes Segment (7) und ein zweites Segment (8) gebildet wird, und der Mechanismus **dadurch gekennzeichnet ist, dass:**

- das zweite Segment (8) gleiten kann und mit einem Befestigungselement (9) verbunden ist, das mit dem stationären Sockel (5) verbunden ist und sich frei drehen kann,
- das erste Segment (7) und das zweite Segment (8) an einigen ihrer Enden gelenkig verbunden sind,
- das andere Ende des ersten Segments (7) fest mit der Welle des Getriebemotors verbunden ist;
- das andere Ende des zweiten Segments (8) fest mit einem Trägerelement verbunden ist, in das die Vielzahl von Saugnäpfen (12) integriert sind,

so dass die Drehung des Getriebemotors das Aufnehmen eines Bogens (4) aus Pappe in dem Stapel-Bereich (1) zum Auflegen auf das Förderband (2) bewirkt.

2. Mechanismus zum Zuführen von Bögen aus Pappe einer Maschine zum Herstellen von Kartons nach Anspruch 1, **dadurch gekennzeichnet, dass** das Trägerelement ein Trägerschaft (10) ist, der an dem zweiten Segment (8) über einen Zwischenbereich befestigt ist, in den an seinen Enden Längselemente (11) integriert sind, an denen sich die Saugnäpfe (12) befinden.

3. Mechanismus zum Zuführen von Bögen aus Pappe einer Maschine zum Herstellen von Kartons nach Anspruch 2, **dadurch gekennzeichnet, dass** die Position der Saugnäpfe (12) an den Längselementen (11) verstellt werden kann.

4. Mechanismus zum Zuführen von Bögen aus Pappe einer Maschine zum Herstellen von Kartons nach Anspruch 2, **dadurch gekennzeichnet, dass** die Position der Längselemente (11) an dem Trägerschaft (10) verstellt werden kann.

5. Mechanismus zum Zuführen von Bögen aus Pappe einer Maschine zum Herstellen von Kartons nach Anspruch 2, **dadurch gekennzeichnet, dass** er

einen ersten Detektor (13) umfasst, der so ausgeführt ist, dass er die abschließende Bewegung des zweiten Segments (8) des Aufnahmearms (6) erfasst, wenn die Vielzahl von Saugnäpfen (12) einen Bogen (4) aus Pappe aus dem Stapel-Bereich (1) aufgenommen haben, und mittels einer Änderung der Drehrichtung des Getriebemotors bewirkt, dass sich das zweite Segment (8) in der entgegengesetzten Richtung bewegt.

6. Mechanismus zum Zuführen von Bögen aus Pappe einer Maschine zum Herstellen von Kartons nach Anspruch 2, **dadurch gekennzeichnet, dass** er einen zweiten Detektor (14) umfasst, der so ausgeführt ist, dass er die abschließende Bewegung des zweiten Segments (8) des Aufnahmearms (6) erfasst, wenn die Vielzahl von Saugnäpfen (12) einen Bogen (4) aus Pappe auf das Förderband aufgelegt haben, und mittels einer Änderung der Drehrichtung des Getriebemotors bewirkt, dass sich das zweite Segment (8) in der entgegengesetzten Richtung bewegt.

Revendications

1. Mécanisme pour alimenter des feuilles en carton d'une machine de fabrication de boîtes qui comprend une zone d'empilement (1) pour les feuilles en carton (4), une zone de formage (3) et une ligne de transporteur (2) prévue pour transporter les feuilles en carton (4) collectées dans la zone d'empilement (1) jusqu'à la zone de formage (3), dans lequel le mécanisme comprend un motoréducteur situé sur une base fixe (5), dans lequel le mécanisme comprend une pluralité de ventouses (12) raccordées à un système pneumatique, configurées pour créer une dépression lorsqu'elles sont activées, dans lequel le mécanisme comprend un bras de prélèvement (6) formé par un premier segment (7) et un deuxième segment (8), le mécanisme étant **caractérisé en ce que** :

- le deuxième segment (8) est assemblé, avec une capacité de coulissement, à un élément de fixation (9) qui est assemblé à la base fixe (5), avec la capacité de tourner librement,
- le premier segment (7) et le deuxième segment (8) sont assemblés d'une manière articulée par certaines de leurs extrémités,
- l'autre extrémité du premier segment (7) est assemblée, de manière solidaire, à l'arbre du motoréducteur ;
- l'autre extrémité du deuxième segment (8) est assemblée, de manière solidaire, à un élément de support qui comprend la pluralité de ventouses (12) ;

de sorte que la rotation du motoréducteur implique la collecte d'une feuille en carton (4) dans la zone d'empilement (1) destinée à être placée sur la ligne de transporteur (2).

2. Mécanisme pour alimenter des feuilles en carton d'une machine de fabrication de boîtes selon la revendication 1, **caractérisé en ce que** l'élément de support est un arbre de support (10) fixé au deuxième segment (8) par une zone intermédiaire qui comprend des éléments longitudinaux (11) sur ses extrémités, sur lesquels les ventouses (12) sont positionnées.

3. Mécanisme pour alimenter des feuilles en carton d'une machine de fabrication de boîtes selon la revendication 2, **caractérisé en ce que** l'emplacement des ventouses (12) sur les éléments longitudinaux (11) est réglable.

4. Mécanisme pour alimenter des feuilles en carton d'une machine de fabrication de boîtes selon la revendication 2, **caractérisé en ce que** l'emplacement des éléments longitudinaux (11) sur l'arbre de support (10) est réglable.

5. Mécanisme pour alimenter des feuilles en carton d'une machine de fabrication de boîtes selon la revendication 2, **caractérisé en ce qu'**il comprend un premier détecteur (13) configuré pour détecter le mouvement final du deuxième segment (8) du bras de prélèvement (6) lorsque la pluralité de ventouses (12) a collecté une feuille en carton (4) de la zone d'empilement (1) et pour amener le deuxième segment (8) à se déplacer dans la direction opposée au moyen d'un changement de direction de rotation du motoréducteur.

6. Mécanisme pour alimenter des feuilles en carton d'une machine de fabrication de boîtes selon la revendication 2, **caractérisé en ce qu'**il comprend un deuxième détecteur (14) configuré pour détecter le mouvement final du deuxième segment (8) du bras de prélèvement (6) lorsque la pluralité de ventouses (12) a placé une feuille en carton (4) sur la ligne de transporteur et pour amener le deuxième segment (8) à se déplacer dans la direction opposée au moyen d'un changement de direction de rotation du motoréducteur.

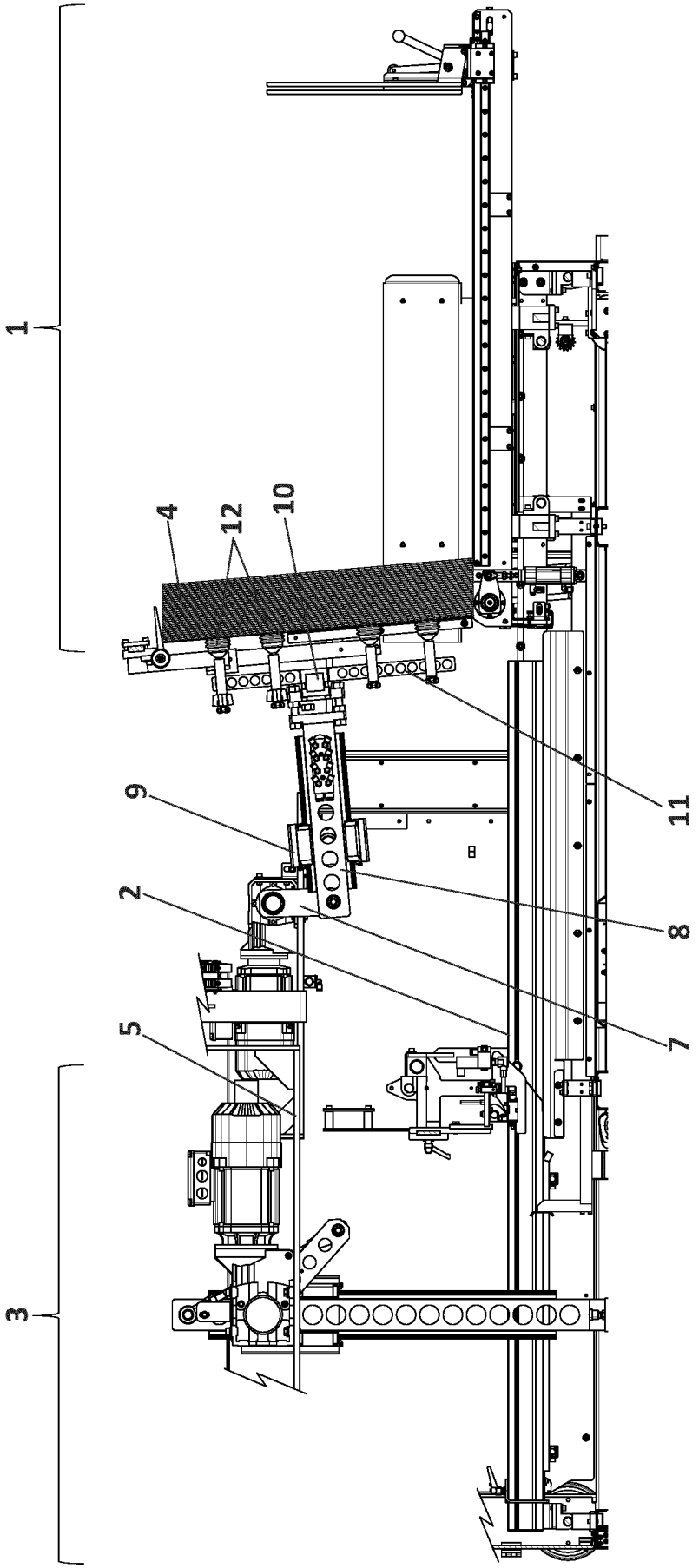

FIG. 1

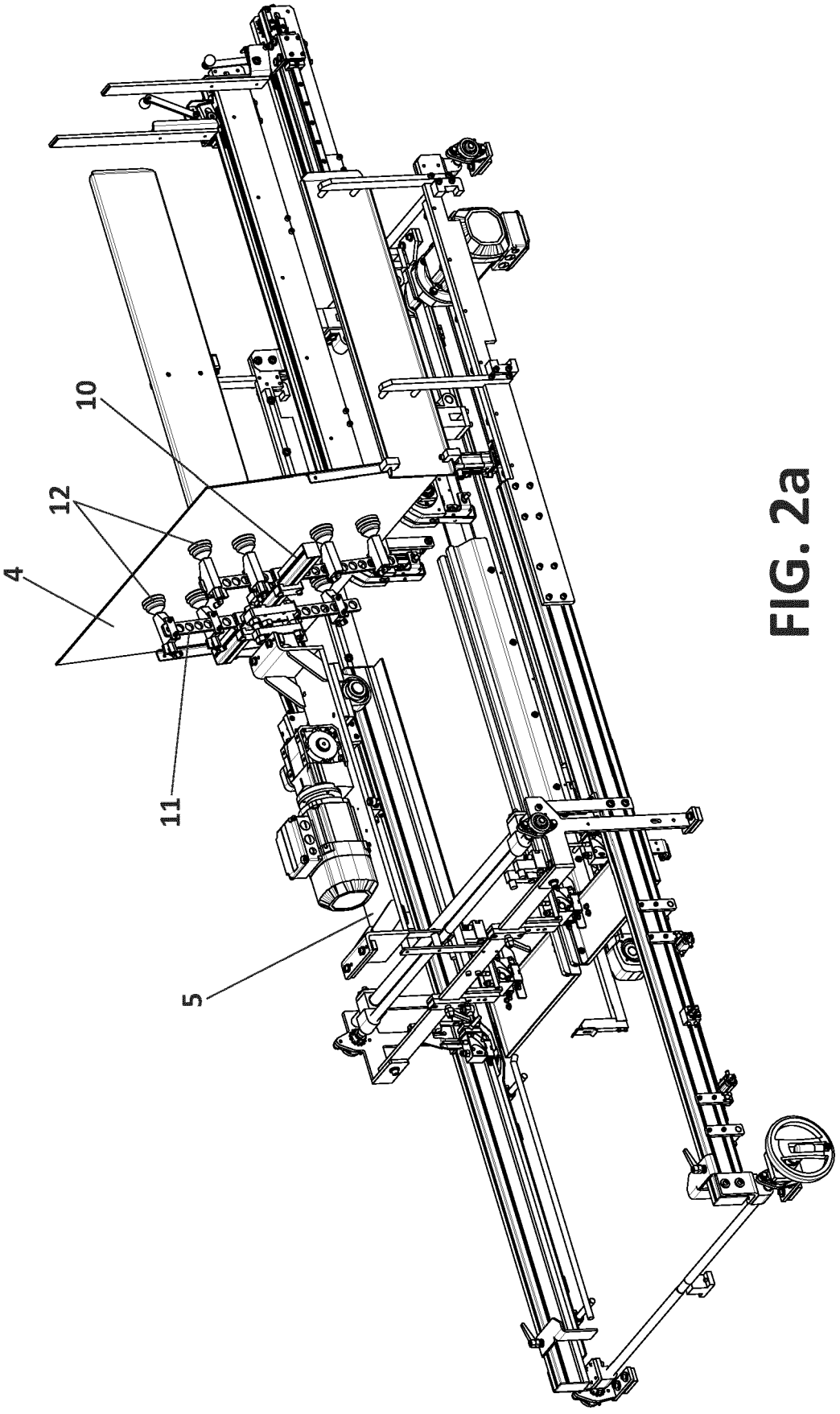

FIG. 2a

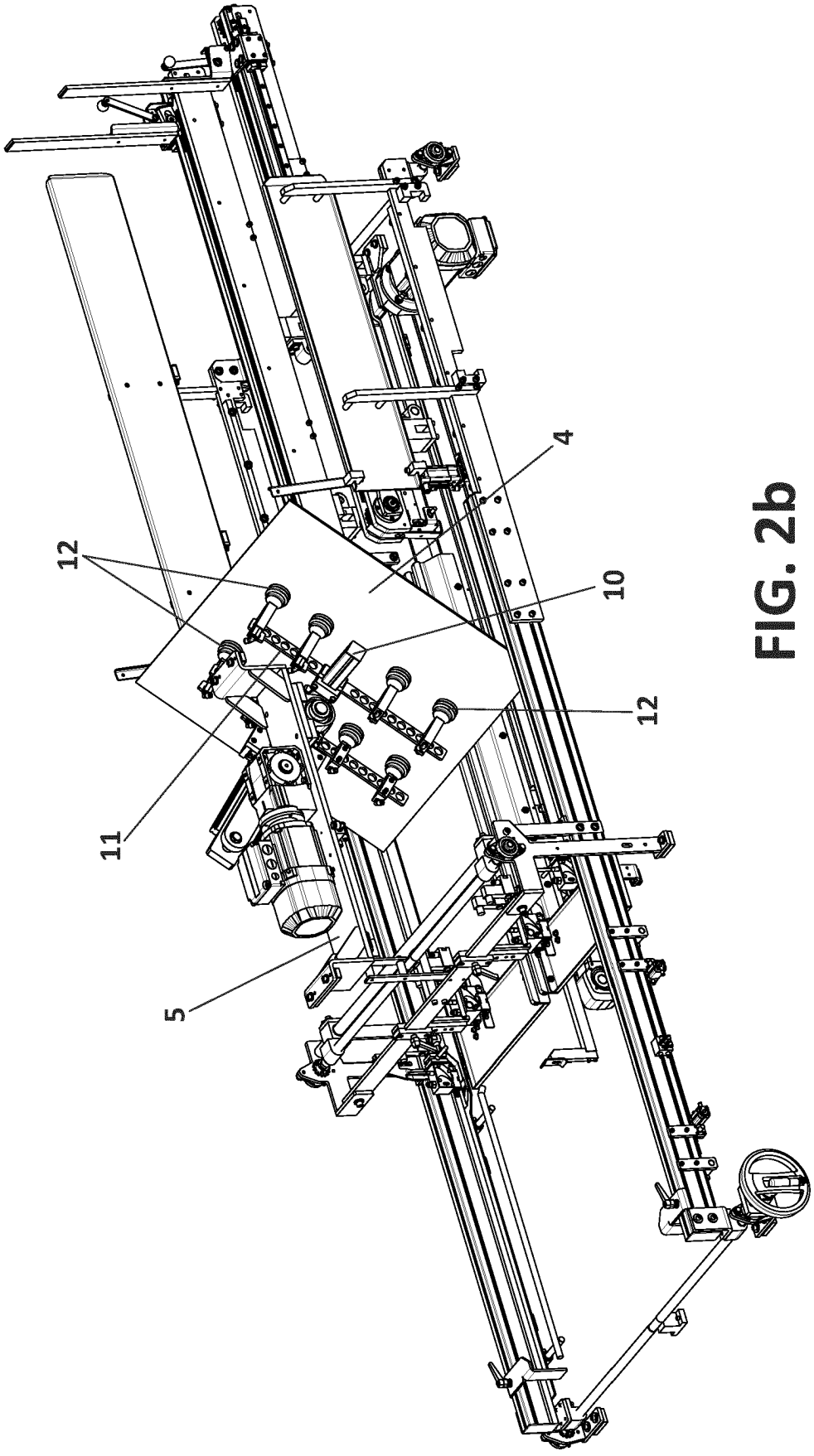

FIG. 2b

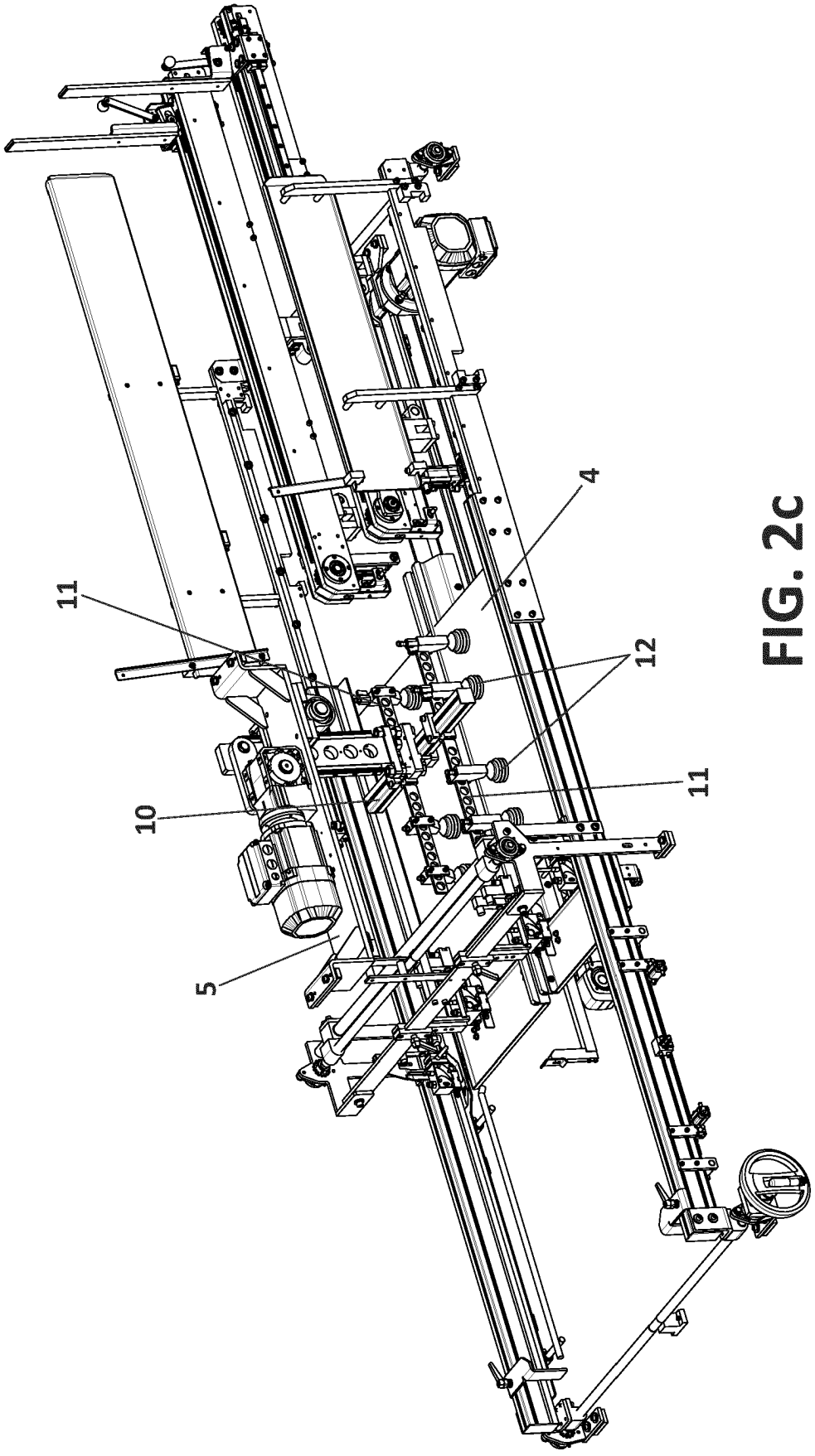

FIG. 2c

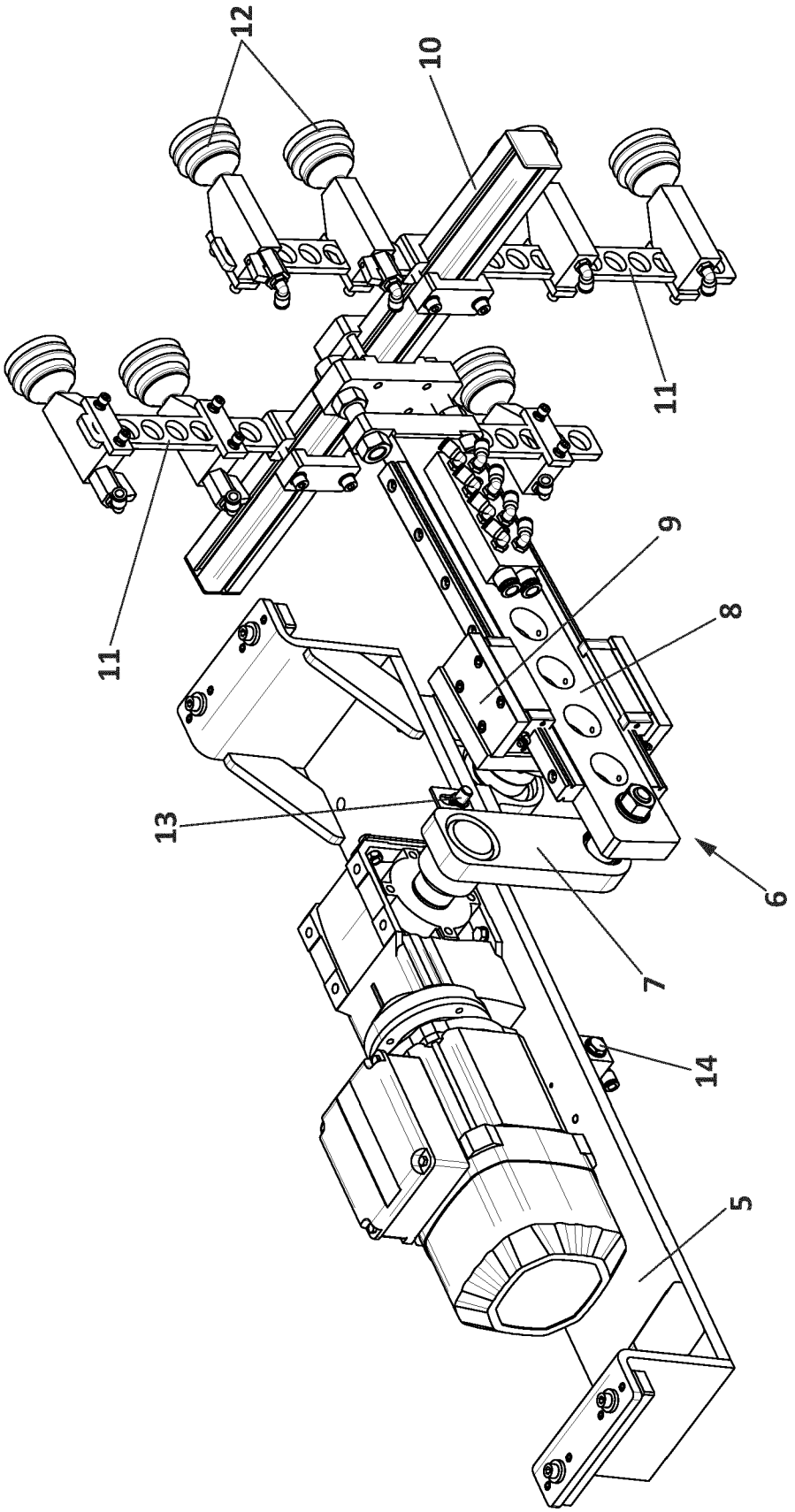

FIG. 3

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

- ES 2660059 B1 **[0004]**
- ES 1127280 U **[0008]**
- WO 2017064649 A1 **[0011]**
- ES 2739389 A1 **[0012]**