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(54) **EDGE SEEKING AND GUIDING DEVICE OF A FABRIC**

(57) An edge seeking and guiding device of a fabric for infeed by means of chains into a fabric treatment area, comprising, for each of the two edges of the fabric: a) a chain for moving the fabric, b) holding elements for the edge of the fabric associated with said chain, c) guide means for said chain along its feed path, provided with i) a head part, sliding to follow the variation of the position of the edge of the fabric, ii) and a tail part, substantially fixed with respect to the ground, with said guide means adapted to allow an angular variation of the direction of said feed path of the chain.

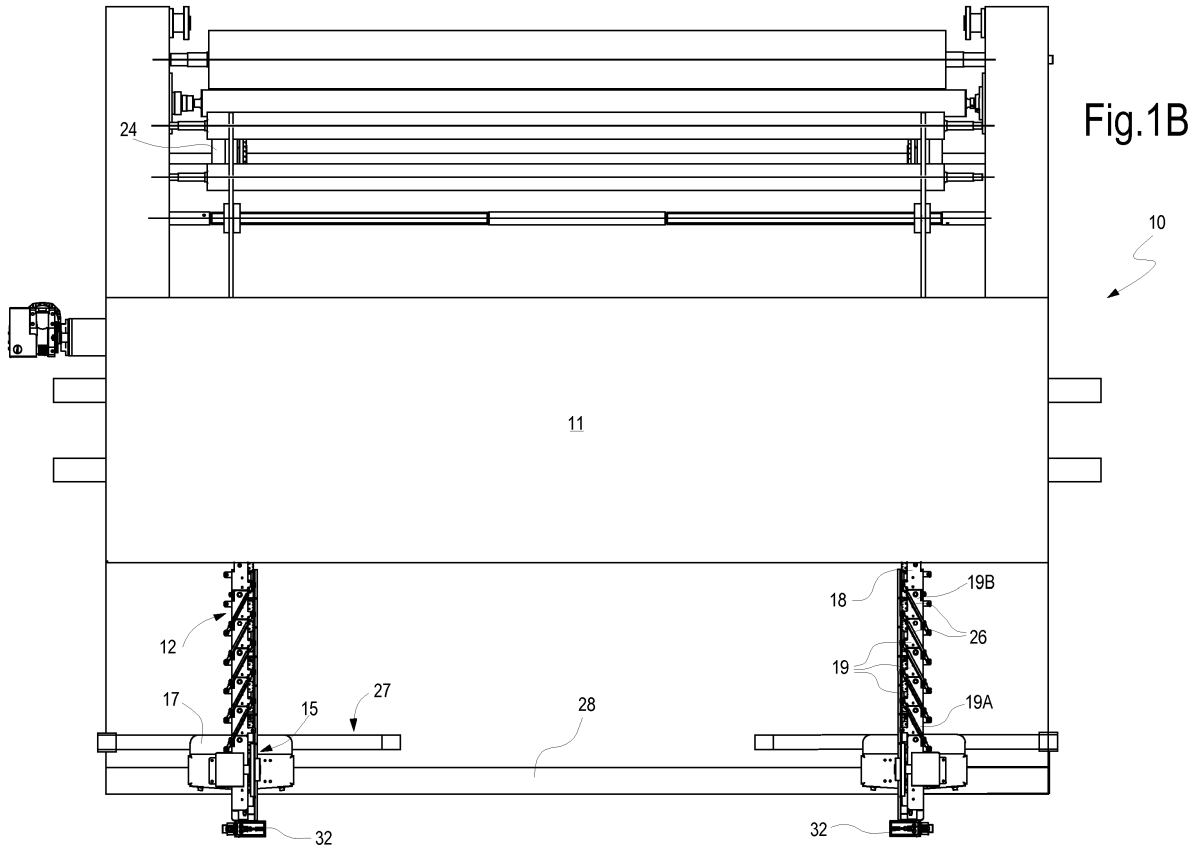

Fig.1B

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Description

TECHNICAL FIELD

[0001] The present invention relates to the field of systems and of machines for the treatment of fabrics, and in particular to an edge seeking and guiding device of the fabric to be moved with the correct alignment into a treatment area. The present invention also relates to a chain drying machine comprising said device at the inlet.

State of the art

[0002] As it is known, chain drying machines for fabrics are characterized by an inlet area in which the fabric, fed by one or more motorized rollers, is accompanied on the moving chain provided with pins and on this, by means of one or more opposing brushes, it is grasped to allow it to be moved into the oven.

[0003] More precisely, there are provided two transfer structures, one on the right and one on the left of the fabric, for fixing to the related edge of the fabric, independent from one another (at a lower speed than the chains) each carrying a moving chain.

[0004] For each structure, the moving chain slides inside containing guides that are hinged with respect to the inlet area of the oven and with respect thereto, through the aid of electric drives, can move independently to the right or to the left so as to follow the edge of the fabric that, by nature, is movable with respect to the theoretic position.

[0005] Due to their design, current edge seeking guides can be angled with respect to the theoretic position by an angle given by the maximum angle obtainable between pin and bushing of the moving chain that normally, for off-the-shelf chains, is between 1° and 1.5°, while for those made to specification, with barrel pins, is between 2° and 2.5°.

[0006] This limit of the chain makes it necessary to produce very long guides to obtain a high range of the seeking area. As reference, a guide with a length of one meter with an off-the-shelf chain cannot seek for more than 17.5 mm per side.

[0007] The increasing need, above all for the digital printing sector of fabrics, to provide increasingly compact ovens to reduce the footprint on the factory floor, as they are normally installed in air-conditioned buildings, does not allow the production of machines that move the fabric on chains, as the edge seeking guides would have to be at least three-four meters in length.

[0008] The length of the guides could be reduced by adopting custom designed chains, but these have a high cost that has a significant influence on the economy of the machine.

[0009] Chain guiding systems in similar machines are disclosed, for example, in GB2085499, US3179977 and US3066377. These documents disclose chain guide systems showing chain guides in which the angles of stretches can be adjusted before the machine is operated, but which remain fixed during feed of the fabric and therefore do not have a head of the guide that moves, and that moves the entire guide, to seek the edge of the fabric.

Object and summary of the invention

[0010] The object of the present invention is to provide an edge seeking and guiding device of a fabric for infeed by means of chains into a fabric treatment area, which is compact while allowing seeking of the edge of the fabric for a spatial range adequate for the requirements.

[0011] Another object of the present invention is to produce an edge seeking and guiding device of a fabric for infeed by means of chains into a fabric treatment area, that can be adapted to various types of treatment machines, and in particular to various types of drying machines.

[0012] A further object of the present invention is to produce a drying oven for fabrics that has an edge seeking and guiding device of a fabric for infeed by means of chains into a fabric treatment area, which is compact and allows effective seeking of the edge of the fabric.

[0013] These and other objects, which will be more apparent below, are achieved with an edge seeking and guiding device of a fabric for infeed by means of chains into a fabric treatment area, comprising, for each of the two edges of the fabric:

- a chain for moving the fabric,
- holding elements for the edge of the fabric associated with said chain,
- guide means for said chain along its feed path, provided with
    - o a head part, sliding to follow the variation of the position of the edge of the fabric,
    - o and a tail part, substantially fixed with respect to the ground, with said guide means adapted to allow an angular variation of the direction of said feed path of the chain;

the device is characterized in that said guide means comprise, between said head part and said tail part, a plurality of intermediate guide modules hinged to one another in series and adapted to be angled relative to one another, so that, when said head part is misaligned with respect to said tail part, the chain, along its feed path, is angled in stretches with an overall concave or convex trend, with the sum of the maximum relative angles that can be reached between the intermediate modules greater than the maximum angle permitted between the links of the chain.

[0014] In practice, the chain can thus be angled, on each stretch corresponding to an intermediate guide module, by a maximum angle equal to the maximum an-

gle structurally permitted between the links of the chain. Therefore, the sum of the maximum relative angles that can be reached between the intermediate modules is greater than the maximum angle permitted between the links of the chain.

[0015] In this way, with the same length of the chain, it can be said that the maximum seeking spatial range of the head part is much wider than in the prior art, in which this range was limited to the sine of a single maximum angle of the chain.

[0016] Preferably, the guide means comprise at least three of said intermediate guide modules hinged to one another in series; each unit formed by three of said intermediate guide modules hinged to one another in series comprising respectively:

- a first intermediate module,
- a second intermediate module hinged to the first module,
- a third intermediate module hinged to the second module,
- and a fourth constraining element, preferably rod-like, hinged respectively to said first intermediate module and to said third intermediate module.

[0017] Preferably, the plan projection of the line on which the hinges of said fourth element lie intersects the plan projection of the line on which the two hinges of said second module lie.

[0018] Preferably, said group of three of said intermediate modules hinged to one another in series, and said fourth constraining element form a flat articulated quadrilateral, with said second module forming a central member, the first and the third module forming respective crank members that extend from opposite sides with respect to the central member, and with the fourth element forming the connecting rod of the quadrilateral.

[0019] Preferably, there is provided between said intermediate modules

- an intermediate head module, hinged to said head part; said head part being movable while remaining substantially parallel to itself on said guide means, no fourth constraining element being provided hinged between said intermediate head module and said head part,
- an intermediate tail module, hinged to said tail part, a corresponding said fourth constraining element being provided hinged respectively to said tail part and to the intermediate module immediately adjacent to said intermediate tail module.

[0020] Preferably, there are associated with said head part sensing means of the edge of the fabric entering the same device.

[0021] Preferably, there are associated with said head part fixing means of the edge of the fabric to said holding elements for the edge of the fabric.

[0022] Preferably, there are associated with said head part motorized moving means, which combine a direction of translation transverse to the direction of feed of the fabric and a direction of translation corresponding to the feed of the fabric,.

[0023] Preferably, said moving means comprise a first transverse guide, fixed with respect to the ground, on which there is provided at least one slide on which there is rotatingly associated a second longitudinal guide, on which there is slidingly provided said head part, so that the head part can move in the two directions defined by said first and second guide.

[0024] Preferably, said intermediate modules are provided with at least one idle upper pinion, on which the chain being moved from said head part to said tail part meshes, and means for preventing disengagement of the chain from the pinion.

[0025] Preferably, said intermediate modules are provided with at least one idle lower pinion on which the chain being moved from said tail part to said head part meshes, that is relating to the return branch with respect to the upper branch for moving of the fabric.

[0026] Preferably, said head part and/or said tail part comprises an idle guide pinion.

[0027] The invention also relates to a drying oven for fabrics, comprising a drying station and, at the inlet thereto, an edge seeking and guiding device of a fabric for infeed into said drying station according to one or more of the configurations indicated above.

[0028] The invention can also be used with products other than fabrics, such as leathers or similar materials.

Brief description of the drawings

[0029] Further characteristics and advantages of the invention will become more apparent from the following description of a preferred but non-exclusive embodiment thereof, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Fig. 1A represents a schematic side view, in longitudinal section, of a drying oven according to the invention;

Fig. 1B represents a schematic top view, in longitudinal section, of the drying oven of Fig. 1A, highlighting the two seeking structures of the seeking device according to the invention;

Fig. 2 represents an axonometric view of part of the edge seeking and guiding device according to the invention, used in the oven of Fig. 1;

Fig. 3 represents a side view of part of the edge seeking and guiding device of Fig. 2, with no protective casings, to view the inside thereof;

Fig. 4 represents a front view of part of the seeking and guiding device of Fig. 2;

Fig. 5 represents an axonometric view of part of the edge seeking and guiding device of Fig. 2, with no protective casings, to view the inside thereof;

Fig. 6 represents an axonometric view of an intermediate guide module of the device of Fig. 2;
Fig. 7 represents a front view of the intermediate guide module of Fig. 6;
Fig. 8 represents an enlargement of Fig. 6;
Fig. 9 represents top view of the device of Fig. 2, with the head part aligned with the tail part, that is with the chain not angled;
Fig. 10 represents a top view of the device of Fig. 2, with the head part seeking to the right of the edge of the fabric, that is in a position misaligned with the tail part, that is with the chain angled;
Fig. 11 represents a top view of the device of Fig. 2, with the head part seeking to the left of the edge of the fabric, that is in a position misaligned with the tail part, that is with the chain angled;
Fig. 12 represents a diagram of articulated quadrilateral produced by three intermediate guide modules of the device of Fig. 2;
Fig. 13 represents a top view of three intermediate guide modules in series, with the diagram of articulated quadrilateral of Fig. 3 viewed over them;
Fig. 14 represents a diagram of the maximum seeking range of the head part of the device of Fig. 2, showing the maximum angles of inclination of the chain;
Fig. 15 represents a diagram of the maximum seeking range with a device of conventional type that has the same length as the one in Fig. 14 and with the chain that can be angled to the same maximum angle x.

Detailed description of an embodiment of the invention

[0030] With reference to Fig. 1 cited above, a drying oven for fabrics according to the invention is indicated as a whole with the number 10.

[0031] This drying oven 10 comprises a drying station 11 and an edge T1 seeking and guiding device 12 of a fabric T for infeed into the drying station according to the invention.

[0032] In this example, the drying station is of "static" type, that is without fans for blowing air onto the fabric, but the device 12 can also be used at the inlet to other types of drying stations, such as blown air or infrared ovens. In other examples, the edge seeking and guiding device 12 can be used at the inlet to other fabric treatment stations. For this reason, no detailed description of the drying station will be given below.

[0033] The edge seeking device 12 for the longitudinal edges (that is those substantially corresponding to the feed movement of the same fabric) of the fabric comprises, for each of the two edges, a structure 12A that allows seeking, holding and guiding of the related edge of the fabric. Therefore, two of these structures 12A are provided, one for each edge of the fabric. In the present description only one is described and shown, as the other is equivalent.

[0034] With reference also to the other figures cited, each structure 12A, relating to an edge of the fabric, comprises a chain 13 for moving the fabric, on which there are arranged holding elements 14 of the fabric (see for example Figs. 5 and 8), for example of the type with needles on which the edges of the fabric are held. For example, these elements have blocks fixed to the chain 13, on which the needles are fixed.

[0035] There are provided fixing means 15 of the edge of the fabric to these holding elements 14, such as a wheel/brush 15A adapted to press the edge of the fabric onto the needles, according to a fixing system of known type.

[0036] Each structure 12A comprises guide means 16 for the chain 13 along its feed path. In particular, the chain 13 moves in a closed loop, along an outward path in which it moves the fabric from a holding area of the fabric to a release area of the fabric, and a lower return path of the chain 13 toward the holding area. As explained below, these guide means 16 also allow an angular variation of the direction of said feed path of the chain 13.

[0037] The guide means 16 comprise a head part 17, sliding both transversely and longitudinally to the direction of feed of the fabric to follow the variation of the position of the edge of the fabric; this head part 17 is movable remaining substantially parallel to itself, as better explained below. The guide means also comprise a tail part 18, substantially fixed with respect to the ground, that is fixed to the frame of the oven.

[0038] Between the head part 17 and the tail part 18 there are provided a plurality of intermediate guide modules 19 hinged to one another in series, with hinge axis preferably vertical, so that they can be angled relative to one another, on a plane substantially parallel to the plane on which the fabric slides on the chain, as better specified below, so that, when the head part 17 (movable transversely and longitudinally) is misaligned with respect to the tail part (fixed), the chain, along its feed path, is angled in stretches substantially with an overall concave or convex trend (see Figs. 9 - aligned, 10, misaligned on the right, 11 misaligned on the left).

[0039] In practice, the chain 13 can be angled in this way, on each stretch corresponding to an intermediate guide module 19, by a maximum angle equal to the maximum angle structurally permitted between the links of the chain, for example 1.5° or 2.5°. Therefore, the sum of the maximum relative angles that can be reached between the intermediate modules is greater than the maximum angle permitted between the links of the chain.

[0040] In this way, with the same length R of the chain, it can be said that the maximum seeking spatial range S of the head part is much wider (case in the diagram of Fig. 14) compared to the prior art (case in the diagram of Fig. 15), in which this range was limited to the sine of a single maximum angle of the chain (S=RsenX).

[0041] Each intermediate guide module 19 is provided with an upper pinion 20, preferably idle, on which the chain 13 being moved from the head part 17 to the tail

part 18 meshes, that is the upper branch of the chain that carries the fabric, and a lower pinion 21, also preferably idle, on which the chain 13 being moved from the tail part 18 to the head part 19 meshes, that is the lower return branch of the chain without fabric.

[0042] Moreover, each intermediate guide module 19 has means for preventing disengagement of the chain 13 from the upper pinion 20, which are represented for example by a slide arranged above the chain and fixed to the module, at a distance from the pinion such that the chain is prevented from escaping from the teeth of the pinion, for example a distance of less than the height of the side of the chain. These means prevent the chain from disengaging from the pinion when the chain is angled.

[0043] The head part 17 has a first pinion 23 on which the chain 13 meshes, for guiding the chain from the lower stretch to the upper stretch. The tail part 18 is similar to the intermediate guide modules 19 with the difference that it is fixed to the frame of the drying station. Inside this latter, there are provided other idle guide pinions 24.

[0044] In a known manner, the chain 13 with the fabric T enters the drying station, travels the necessary distance and, at the outlet thereof, the fabric is detached from the chain and directed toward other treatments by specific systems, while the chain 13 returns toward the inlet area of the oven, meshing on the lower pinions 21 of the intermediate guide modules 19, until reaching the first guide pinion 23.

[0045] The intermediate guide modules 19 are preferably all the same and the mutual articulation hinges are provided with pins 25 fitted in corresponding seats of two adjacent modules.

[0046] In the preferred embodiments, there are provided at least three intermediate guide modules 19 hinged to one another in series. Each group formed of these three of said modules hinged to one another in series are provided respectively (in particular with reference to Fig. 13), a first intermediate module 19', a second intermediate module 19" hinged to the first module 19', a third intermediate module 19'" hinged to the second module 19", and a fourth constraining element 26, for example in the form of rod or tie bar, hinged at its ends respectively to the first intermediate module 19' and to the third intermediate module 19"'.

[0047] In this example, the plan projection of the line on which the hinges of the fourth constraining element 26 lie, intersects the plan projection of the line on which the two hinges of the second module 19" lie at the respective first and third module 19'-19"'.

[0048] In practice, in these examples, the group of intermediate modules 19', 19", 19'" hinged to one another in series, with the fourth constraining element 26, form a flat articulated quadrilateral, with the second module 19" forming the "central member" of the quadrilateral, the first 19' and the third module 19"' forming respective "crank" members that extend from opposite sides with respect to the central member 19", and with the fourth element 26 forming the "crank" member of the quadrilateral, according to the diagrams shown in Figs. 12 and 13. The hinges of the "central member" 19" are associated with rollers, i.e. sliding.

[0049] More in particular, in the preferred embodiments, the intermediate guide modules 19 comprise an intermediate head module 19A, hinged to the head part 17; it must be noted that no fourth constraining element is provided between the intermediate head module 19A and the head part 17.

[0050] The intermediate guide modules 19 further comprise an intermediate tail module 19B, hinged to the tail part 18. In this case, a corresponding fourth constraining element 26 is provided hinged respectively to the tail part 18 and to the intermediate module hinged immediately adjacent to the intermediate tail module 19B.

[0051] There are associated with the head part 17 motorized moving means 27, which combine a direction of translation transverse to the direction of feed of the fabric and a direction of translation corresponding to the feed of the fabric,.

[0052] For example, these moving means 27 comprise (see in particular Figs. 3 and 4) a first transverse guide 28, fixed with respect to the ground, on which there is provided a slide 29 (sliding according to f1) on which there is rotatingly associated (arrow f2) a second longitudinal guide 30, on which there is slidingly provided the head part, so that the head part can move in the two directions defined by the first and second guide. More in particular, in this example the first guide 28 is a linear actuator, of known type, such as pneumatic, hydraulic or electromechanical, provided with the slide 29.

[0053] On this slide 29 there is provided a rotating seat for a pin 31 connected at the bottom to the second guide 30, so that the second guide can rotate on the slide 29.

[0054] On the second guide 30, for example of the recirculating ball type there is provided a slide on which the head part 17 is fixed.

[0055] There are associated with the head part 17 sensing means 32 of the edge of the fabric entering the same device 12. These means 32 allow the position of the edge of the fabric to be detected and communicated to the electronic control unit of the device, which controls the moving means 27 of the head part 17 to move it to follow the edge; these means can be arranged directly on the head parts 17 or in another position, separated therefrom. These means can be substantially of known type, such as mechanical feelers or optical vision systems (such as video cameras connected to suitable software).

[0056] Operation of the oven 10 and of the device 12 is as follows.

[0057] The fabric T reaches, in a known manner, the inlet area, in which the edge seeking and guiding device 12 is provided. In particular, there are provided two structures 12A that form the device 12, one for each edge. Movement of the two structures 12A is independent, that is the head part 17 of each structure, through the sensing

means 32, independently detects the position of the related edge of the fabric and moves independently to the other to follow the variation of the position of this edge.

[0058] Therefore, with reference only to the structure 12A, through the sensing means 32, the electronic control unit of the device sees the position of the edge (and its variation in space) and controls the moving means 27 of the head part 17 to move this to follow the edge so that it is aligned with the fixing means 15 of the edge of the fabric to the holding elements 14. In practice, the edge is aligned with the needles of the chain that travels through the head part 17 and is pressed thereon by the wheel/brush 15A provided on the same head part 17.

[0059] The particular kinematic chain produced by the series of articulated quadrilaterals formed of the intermediate guide modules 19 and of the head and tail parts 17 and 18, allows the same head part 17 to move in practice according to two orthogonal and variable directions, to approximate in practice curvilinear trajectories.

[0060] The projection of the maximum seeking spatial range is given, in practice, between two ends, reached when the intermediate guide modules are hinged to one another all by the same maximum angle that can be reached between the links of the chain (angle on the approximately common plane on which the pins of the links lie) to produce a concave/convex broken line, and for the equivalent negative value of this angle.

[0061] The chain 13 is moved by the motorized pinion 24A positioned in the end area of the oven and, in the device 12 meshes with the upper pinions of the intermediate modules 19. From the head part 17, the chain 13 carries the fabric into the drying station, passing through the tail part 18, which has a fixed position, linked to the size of the oven. The fabric is dried during its travel through the drying station. At the outlet thereof, the fabric, in a known manner, is detached from the chain and moved outside, for any other treatments. The chain returns to the intermediate modules 19, on the lower pinions thereof, to the head part 17.

[0062] It is understood that the drawing only shows possible non-limiting embodiments of the invention, which can vary in forms and arrangements without however departing from the scope of the concept on which the invention is based. Any reference numerals in the appended claims are provided purely to facilitate the reading thereof, in the light of the above description and accompanying drawings, and do not in any way limit the scope of protection.

[0063] In position 41, or preferably outside the oven, there is provided a tensioning device of the moving chain, of mechanical or pneumatic type, required to compensate for slack in the chain following variations in temperature.

Claims

1. An edge (T1) seeking and guiding device (10) of a fabric (T) for infeed by means of chains into a fabric treatment area, comprising, for each of the two edges (T1) of the fabric (T):

- a chain (13) for moving the fabric (T),
- holding elements (14) for the edge (T1) of the fabric associated with said chain (13),
- sensing means (32) of the edge (T1) of the fabric (T) being fed into the device,
- guide means (16) for said chain (13) along its feed path, provided with

  o a head part (17), sliding to follow the variation of the position of the edge of the fabric sensed by said sensing means (32),
  o and a tail part (18), substantially fixed with respect to the ground, with said guide means (16) adapted to allow an angular variation of the direction of said feed path of the chain (13),

characterized in that said guide means (16) comprise, between said head part (17) and said tail part (18), a plurality of intermediate guide modules (19) hinged to one another in series and adapted to be angled relative to one another, so that, when said head part (17) is misaligned with respect to said tail part (18), the chain (13), along its feed path, is angled in stretches with an overall concave or convex trend, with the sum of the maximum relative angles that can be reached between the intermediate modules (19) greater than the maximum angle permitted between the links of the chain (13).

2. The device according to claim 1, wherein said guide means (16) comprise at least three of said intermediate guide modules (19) hinged to one another in series; each group formed by three of said intermediate guide modules hinged to one another in series comprising respectively

- a first intermediate module (19'),
- a second intermediate module (19") hinged to the first module (19'),
- a third intermediate module (19"') hinged to the second module (19"),
- and a fourth constraining element (26), preferably rod-like, hinged respectively to said first intermediate module (19') and to said third intermediate module (19"').

3. The device according to claim 2, wherein the plan projection of the line on which the hinges of said fourth element (26) lie intersects the plan projection of the line on which the two hinges of said second module (19") lie.

4. The device according to claim 2 or 3, wherein said group of three of said intermediate modules (19', 19", 19'") hinged to one another in series, and said fourth constraining element (26) form a flat articulated quadrilateral, with said second module (19") forming a central member, the first (19') and the third module (19'") forming respective crank members that extend from opposite sides with respect to the central member (19"), and with the fourth element (26) forming the connecting rod of the quadrilateral.

5. The device according to one or more of claims 2 to 4, wherein there is provided between said intermediate modules (19', 19", 19"'):

- an intermediate head module (19A), hinged to said head part (17); said head part (17) being movable while remaining substantially parallel to itself on said guide means (16), no fourth constraining element being provided hinged between said intermediate head module (19A) and said head part (17),
- an intermediate tail module (19B), hinged to said tail part (18), a corresponding said fourth constraining element (26) being provided hinged respectively to said tail part (18) and to the intermediate module (19) immediately adjacent to said intermediate tail module (19B).

6. The device according to one or more of the preceding claims, wherein said sensing means (32) of the edge (T1) of the fabric entering the same device are associated with said head part (17).

7. The device according to one or more of the preceding claims, wherein said fixing means (15) of the edge (T1) of the fabric to said holding elements (14) for the edge (T1) of the fabric are associated with said head part (17).

8. The device according to one or more of the preceding claims, wherein there are associated with said head part (17) motorized moving means (27), which combine a direction of translation transverse to the direction of feed of the fabric (T) and a direction of translation corresponding to the feed of the fabric (T).

9. The device according to claim 8, wherein said moving means (27) comprise a first transverse guide (28), fixed with respect to the ground, on which there is provided at least one slide (29) on which there is rotatingly associated a second longitudinal guide (30), on which there is slidingly provided said head part (17), so that the head part (17) can move in the two directions defined by said first (28) and second guide (30).

10. The device according to one or more of the preceding claims, wherein said intermediate modules are provided with at least one idle upper pinion (20), on which the chain (13) being moved from said head part (17) to said tail part (18) meshes, and means for preventing disengagement of the chain (13) from the pinion (20).

11. The device according to one or more of the preceding claims, wherein said intermediate modules (19) are provided with at least one idle lower pinion (21) on which the chain (13) being moved from said tail part (18) to said head part (17) meshes, that is relating to the return branch with respect to the upper branch for moving of the fabric.

12. The device according to one or more of the preceding claims, wherein said head part (17) and/or said tail part (18) comprises an idle guide pinion (23).

13. A drying oven for fabrics, comprising a drying station (11) and, at the inlet thereto, an edge seeking and guiding device (T1) of a fabric (T) for infeed into said drying station according to one or more of the preceding claims.

Fig.1A

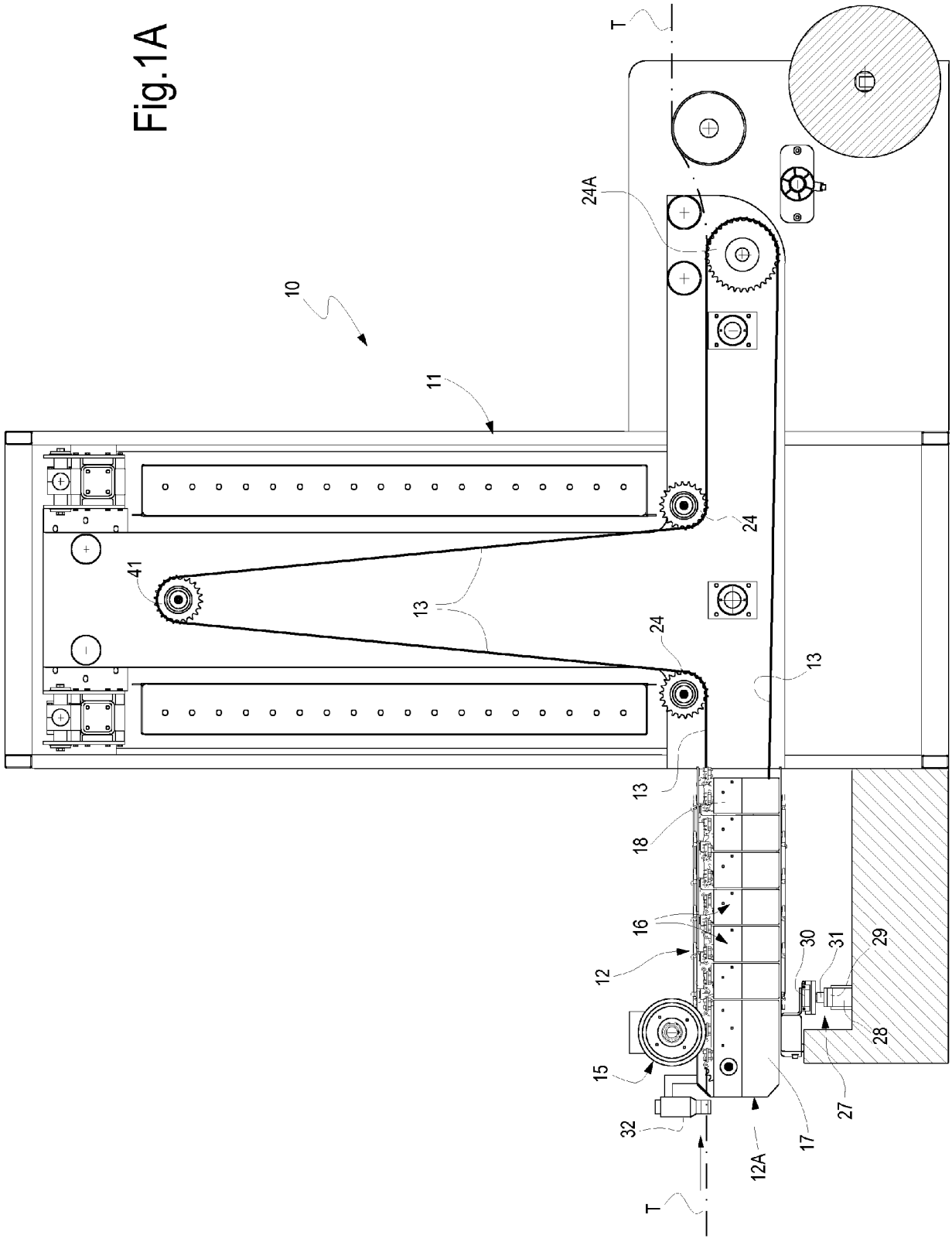

Fig.1B

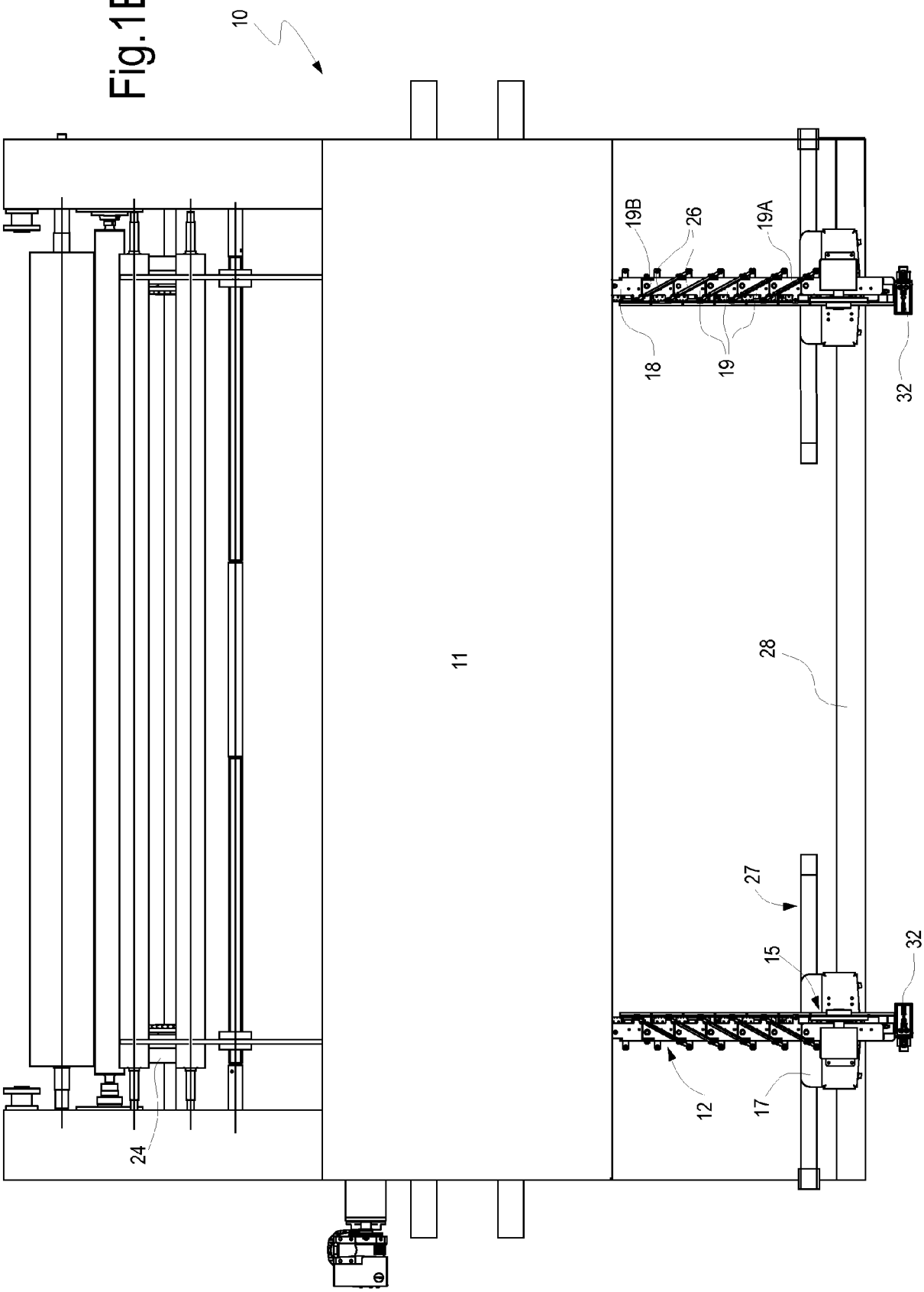

Fig.2

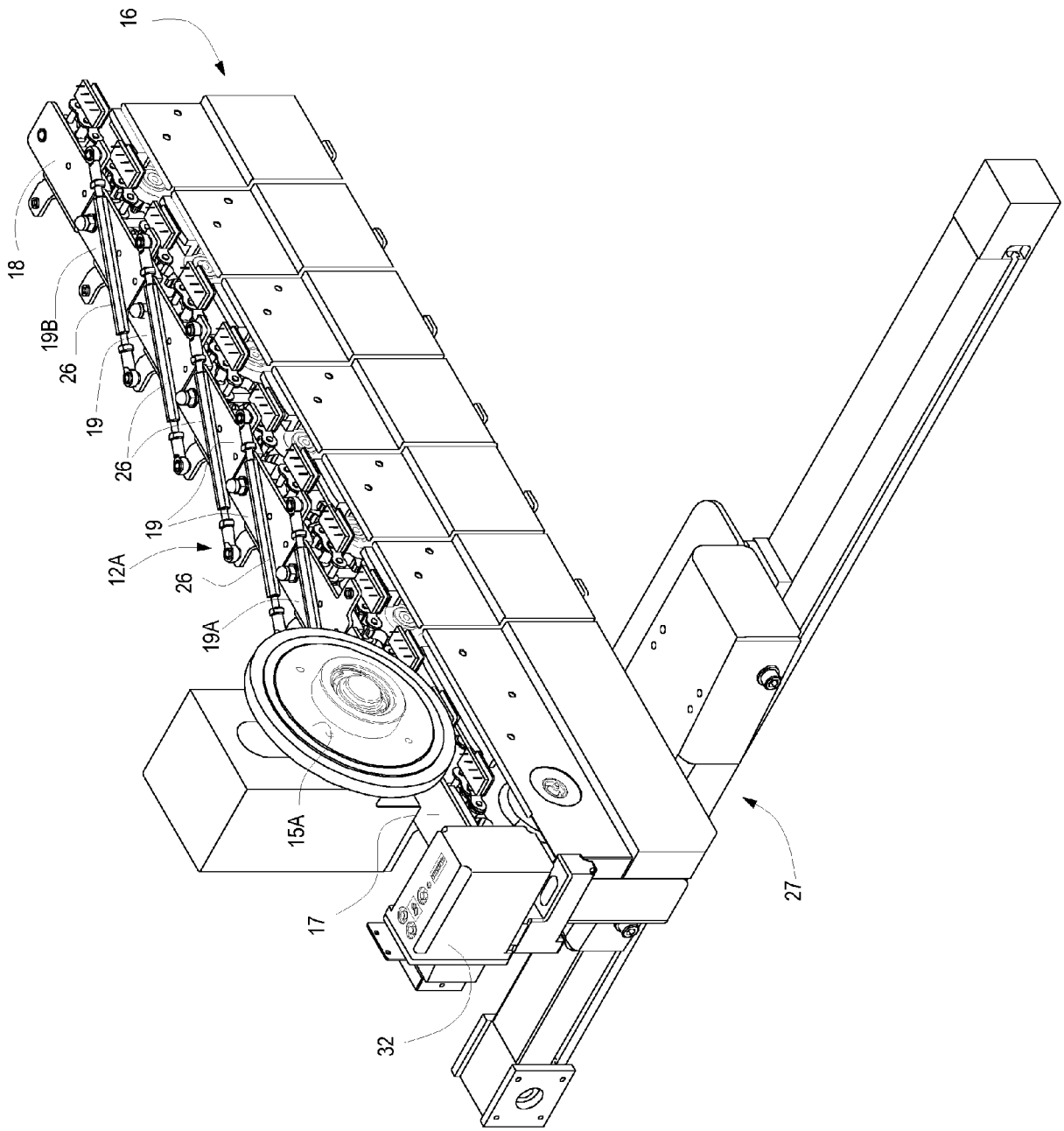

Fig.3

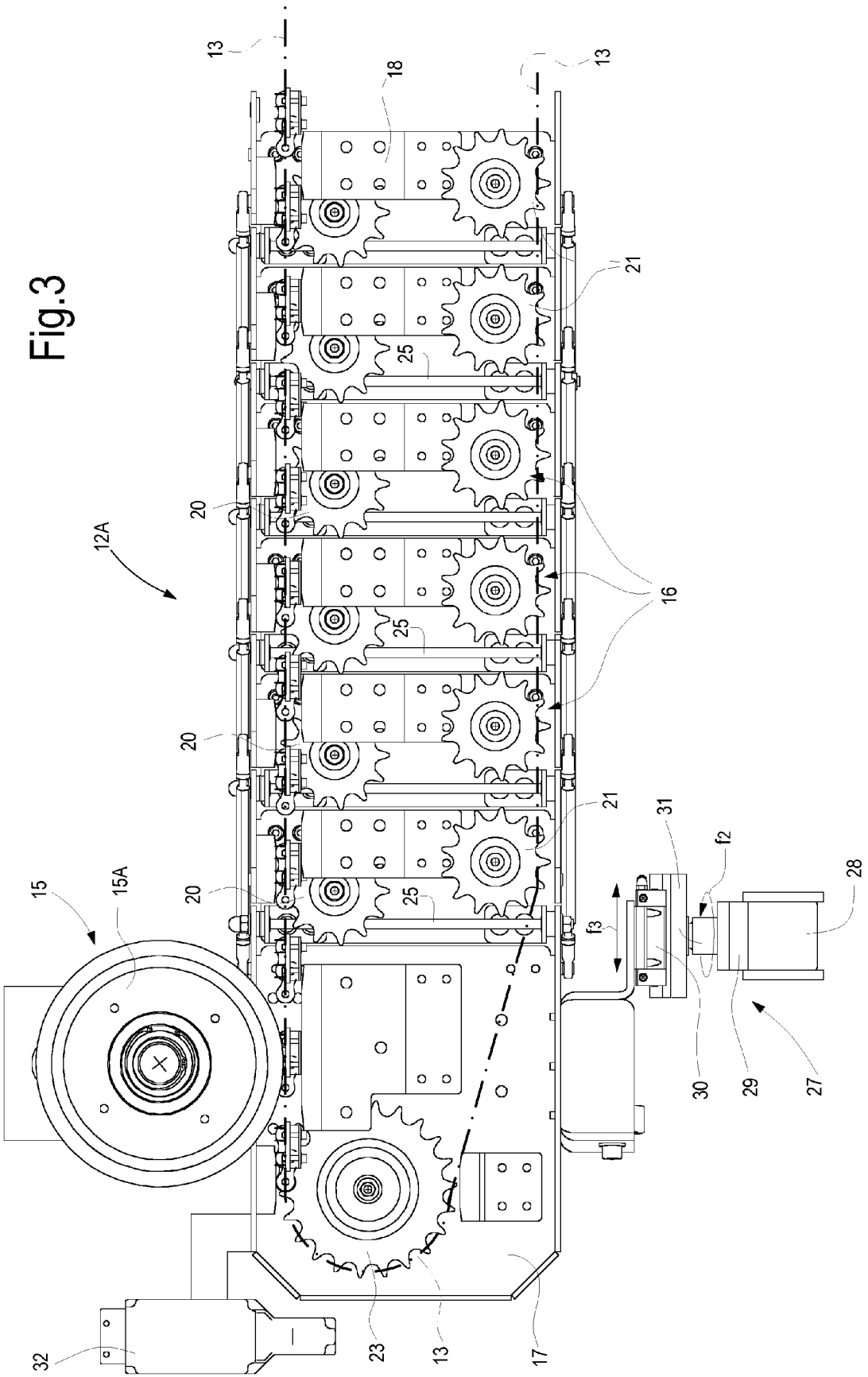
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Fig.4

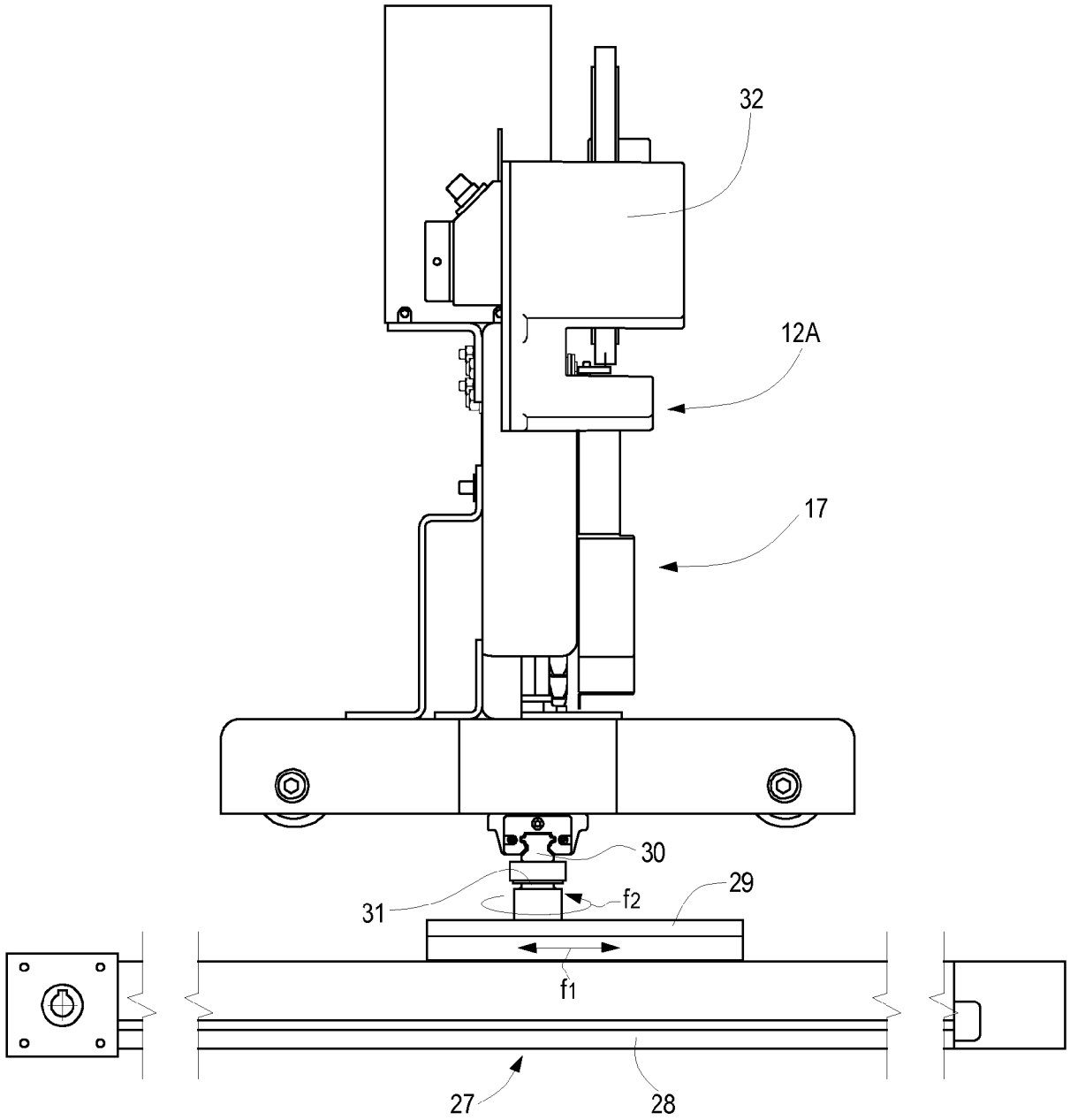


Fig.5

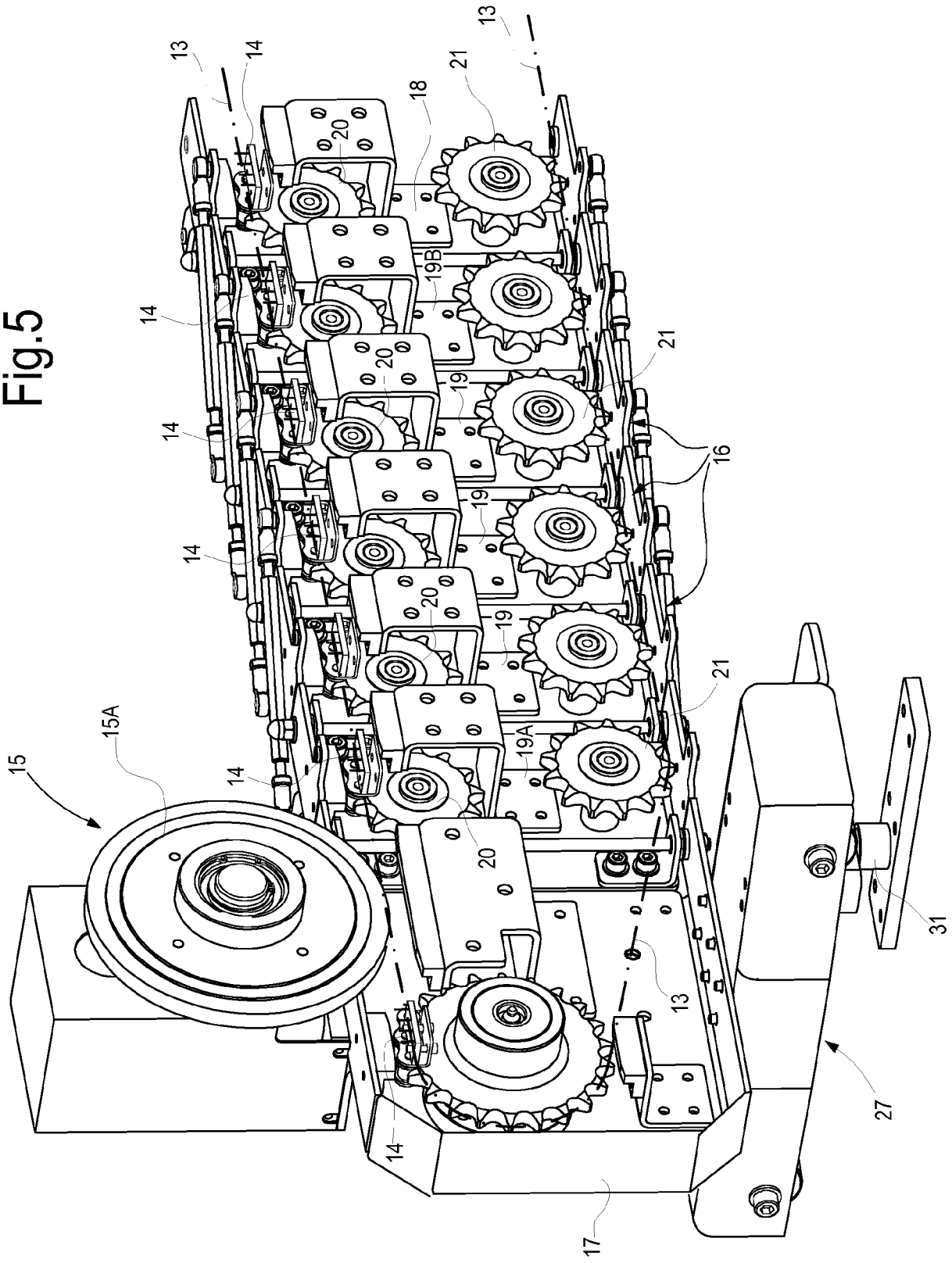


Fig.7

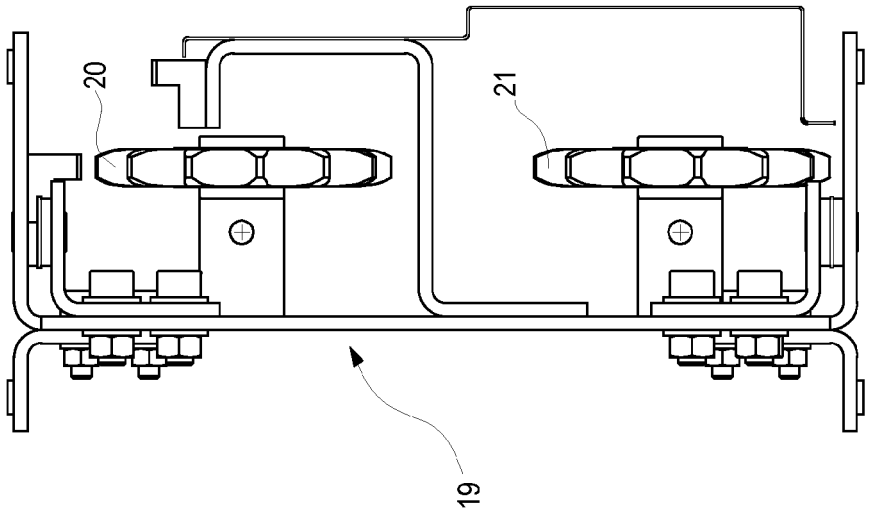


Fig.6

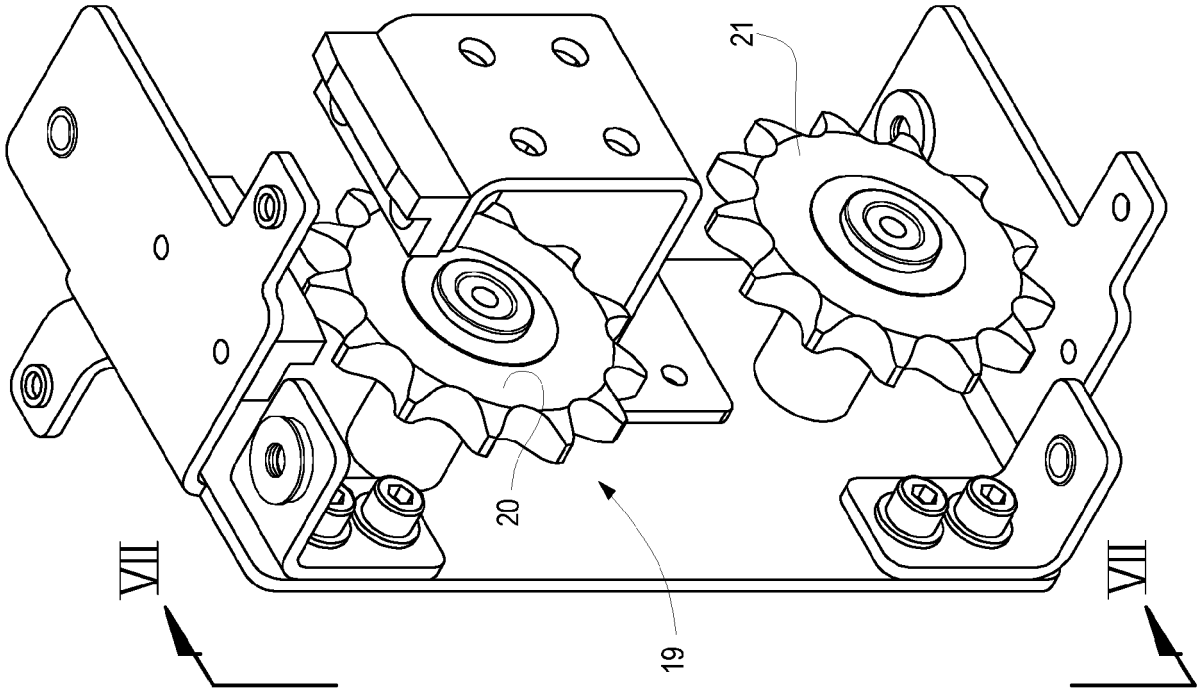


Fig.8

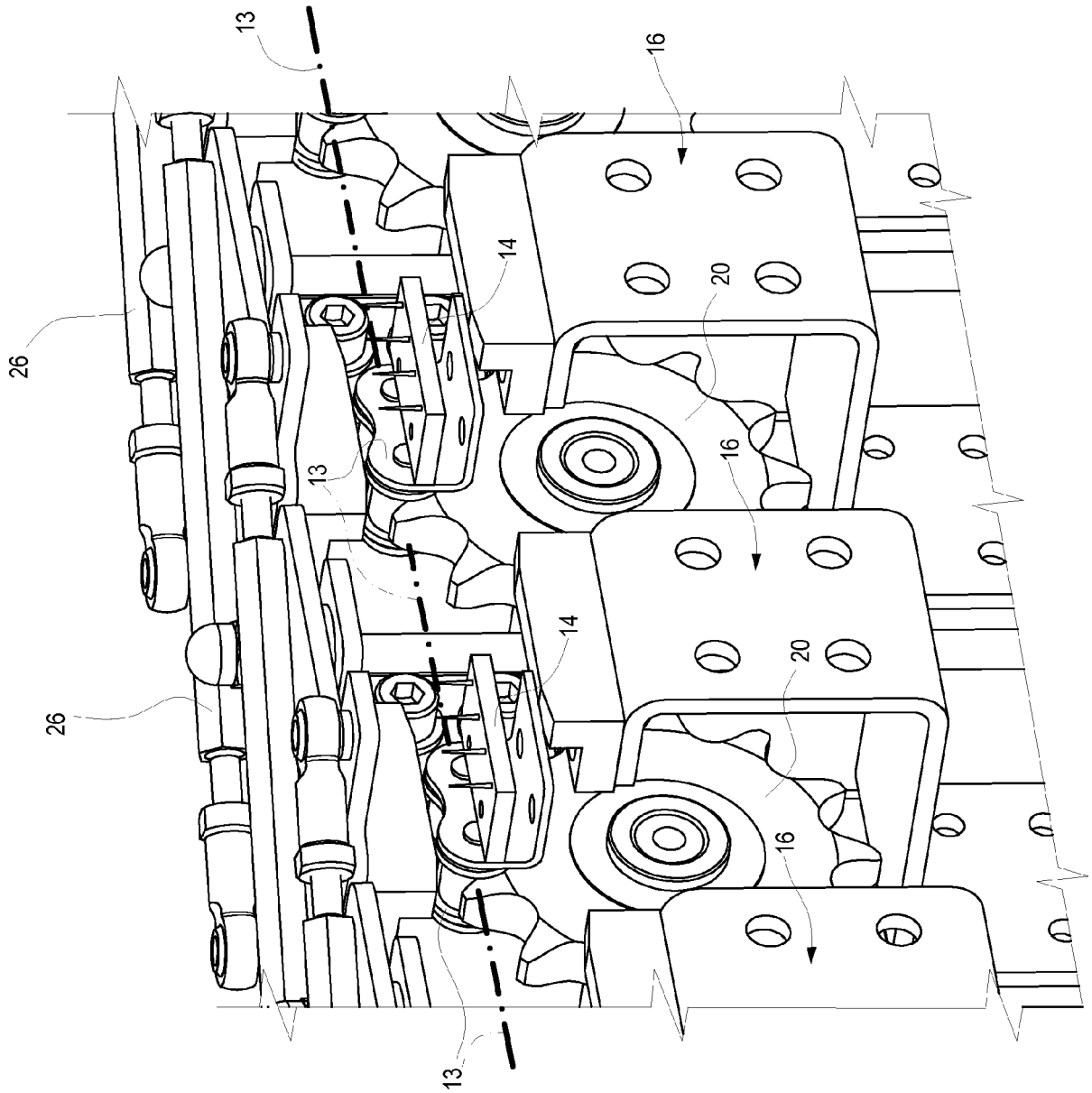


Fig.9

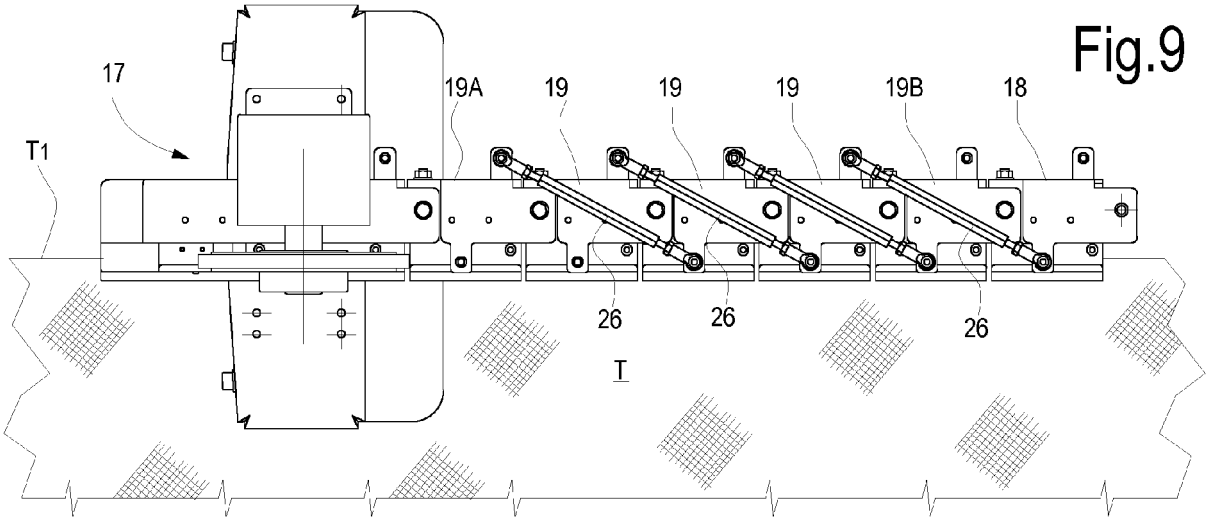


Fig.10

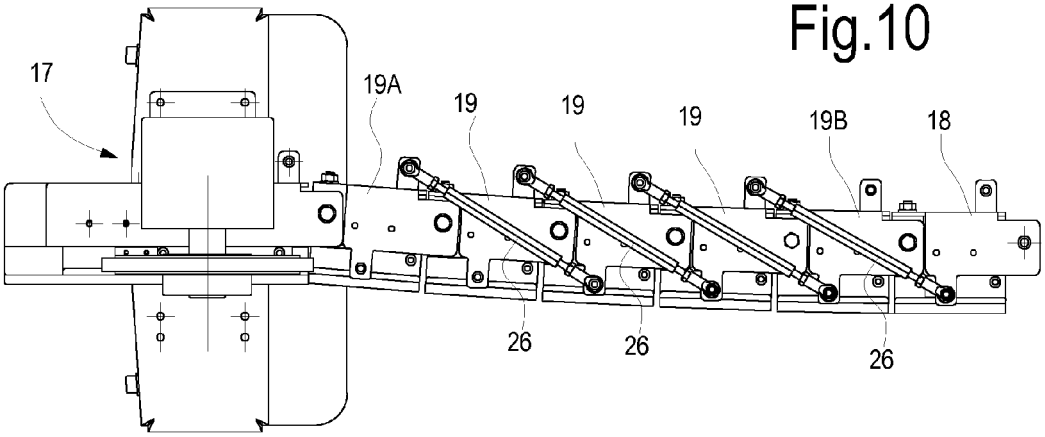
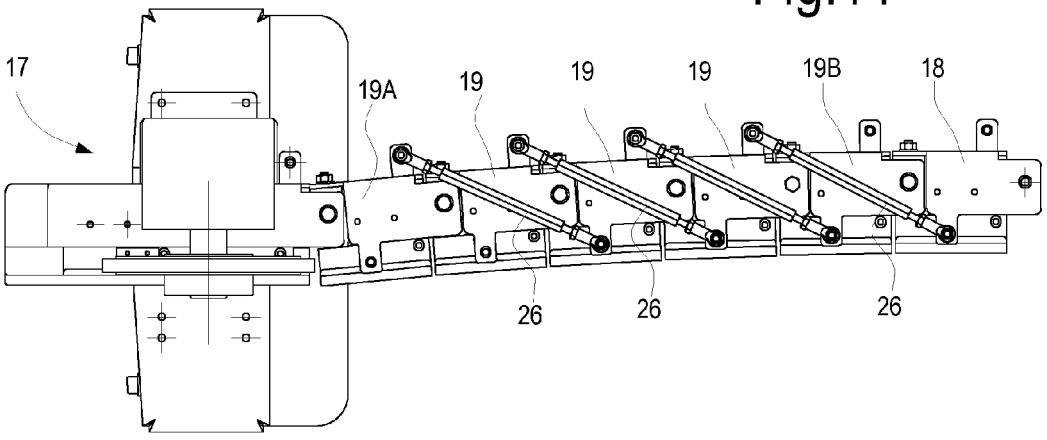


Fig.11



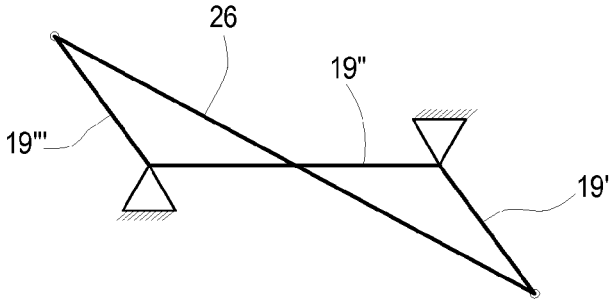


Fig.12

Fig.13

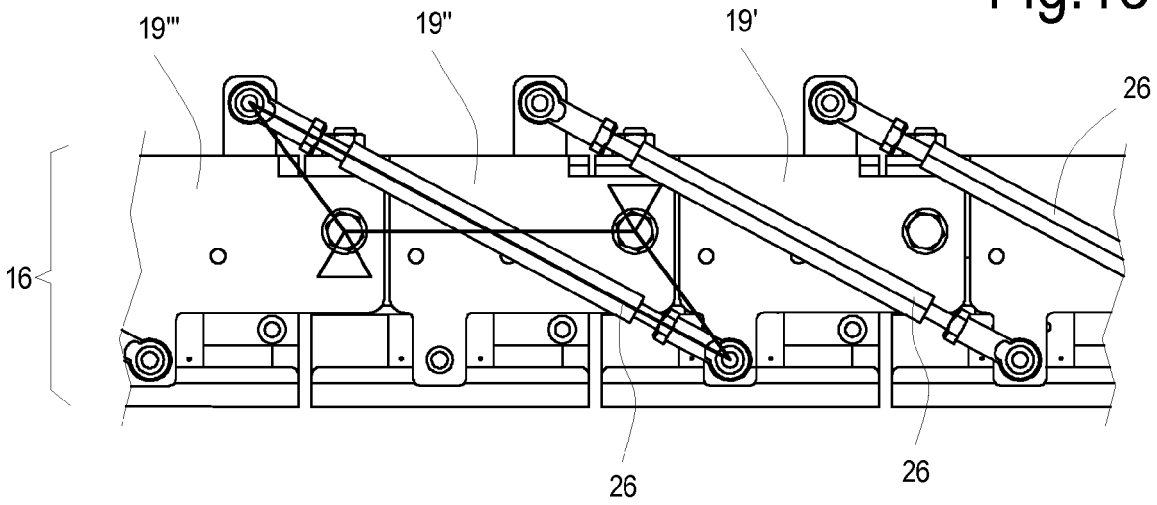


Fig.14

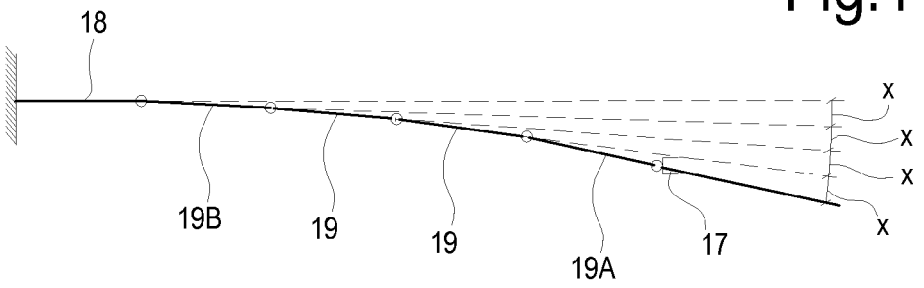
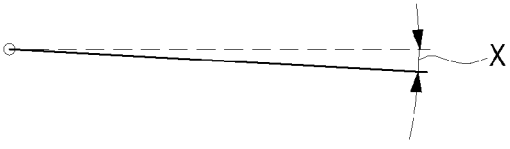


Fig.15



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EUROPEAN SEARCH REPORT

Application Number
EP 16 18 7775

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	GB 2 085 499 A (MARSHALL & WILLIAMS CO) 28 April 1982 (1982-04-28)	1-7,13	INV. D06C3/02
A	* page 3, lines 3-110; figures 1-3,7 *	8-12	
A	US 3 179 977 A (CRANDON NASH JOHN) 27 April 1965 (1965-04-27) * column 1, lines 23-28; claim 1 *	1-13	
A	US 3 066 377 A (WATERMAN JOHN E) 4 December 1962 (1962-12-04) * column 1, line 63 - column 4, line 16 *	1-13	
A	DE 698 317 C (C H WEISBACH KOMM GES) 7 November 1940 (1940-11-07) * page 2, lines 20-102 *	1-13	
A	US 3 551 970 A (COHN EUGENE ET AL) 5 January 1971 (1971-01-05) * column 14, line 18 - column 16, line 75; figures 6,7,10-12 *	1-13	
A	DE 22 37 014 A1 (BRUECKNER TROCKENTECHNIK KG) 7 February 1974 (1974-02-07) * page 6, line 11 - page 7, line 19 *	1-13	TECHNICAL FIELDS SEARCHED (IPC) D06C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	4 January 2017	Bichi, Marco

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04-01-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2085499 A	28-04-1982	DE 3139722 A1	27-05-1982
		FR 2495197 A1	04-06-1982
		GB 2085499 A	28-04-1982
		IT 1142892 B	15-10-1986
		JP S5793846 A	11-06-1982
US 3179977 A	27-04-1965	DE 1504581 A1	09-10-1969
		GB 1038356 A	10-08-1966
		US 3179977 A	27-04-1965
US 3066377 A	04-12-1962	NONE	
DE 698317 C	07-11-1940	NONE	
US 3551970 A	05-01-1971	CH 65469 A4	27-02-1976
		CH 581814 B5	15-11-1976
		DE 1816478 A1	31-07-1969
		FR 1597335 A	22-06-1970
		GB 1254123 A	17-11-1971
		GB 1254124 A	17-11-1971
		NL 6818877 A	22-07-1969
		US 3551970 A	05-01-1971
DE 2237014 A1	07-02-1974	NONE	

EPO FORM P0459

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- GB 2085499 A **[0009]**
- US 3179977 A **[0009]**
- US 3066377 A **[0009]**