



(11) **EP 2 241 425 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:  
**14.03.2012 Bulletin 2012/11**

(51) Int Cl.:  
**B27M 1/08<sup>(2006.01)</sup> B27F 1/04<sup>(2006.01)</sup>**  
**B23Q 7/04<sup>(2006.01)</sup>**

(21) Application number: **10172236.1**

(22) Date of filing: **22.11.2007**

(54) **Method of machining component parts of wood or similar, in particular door and window frame component parts**

Bearbeitungsverfahren von einem Bauteil aus Holz oder dergleichen, insbesondere für Bestandteile von Tür- oder Fensterrahmen

Méthode d'usinage d'un article en bois ou similaire, en particulier des composants de cadres de portes et fenêtres

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR**

(30) Priority: **14.05.2007 IT BO20070356**

(43) Date of publication of application:  
**20.10.2010 Bulletin 2010/42**

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:  
**07121372.2 / 1 992 464**

(73) Proprietor: **BIESSE S.p.A.**  
**Pesaro (IT)**

(72) Inventor: **Bernardi, Paolo**  
**47841, CATTOLICA (IT)**

(74) Representative: **Jorio, Paolo et al**  
**Studio Torta S.p.A.**  
**Via Viotti, 9**  
**10121 Torino (IT)**

(56) References cited:  
**EP-A1- 0 724 939 EP-A2- 0 894 565**  
**DE-A1- 10 030 997 DE-U1-202004 005 893**

**EP 2 241 425 B1**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

## Description

**[0001]** The present invention relates to a method of machining component parts of wood or similar, in particular door and window frame component parts as per the preamble of claims 1 and 9 as disclosed by EP 1 304 188 A1.

**[0002]** Door and window frame component parts are known to be machined on a machine of the type comprising an elongated bed with two longitudinal guide members; a number of cross members fitted in sliding manner to the longitudinal members; at least one clamp fitted to each cross member to clamp the component parts for machining; a bridge movable along the bed in a first direction; and a machining head movable along the bridge in a second direction crosswise to the first.

**[0003]** The clamps are normally movable along the cross members in the second direction by means of respective actuating devices to machine the two opposite sides of each component part. In actual use, the component part is first clamped by at least one first clamp to enable the machining head to machine a first side of the component part, and is then gripped along the first side by at least one second clamp to remove the component part from the first clamp and enable the machining head to machine a second side of the component part.

**[0004]** Known machines of the above type for working component parts of wood or similar have several drawbacks, mainly due to comprising an actuating device for each clamp, which makes them relatively complicated and expensive.

**[0005]** It is an object of the present invention to provide a method of machining component parts of wood or similar, designed to eliminate the above drawbacks, and which is cheap and easy to implement.

**[0006]** According to the present invention, there is provided a method of machining component parts of wood or similar, as claimed in the accompanying independent claims 1 and 9.

**[0007]** A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic view in perspective of a preferred embodiment of the machine according to the present invention;

Figure 2 shows a schematic side view of the Figure 1 machine;

Figure 3 shows, schematically, one operating mode of the Figure 1 and 2 machine;

Figure 4 shows a schematic side view of a variation of a first detail of the Figure 1 and 2 machine;

Figure 5 shows a schematic side view of a variation of a second detail of the Figure 1 and 2 machine.

**[0008]** Number 1 in Figure 1 indicates as a whole a machine for machining door and window frame component parts 2 of wood or similar, and which comprises an

elongated, substantially U-shaped bed 3 extending in a horizontal direction 4 and having two lateral longitudinal members 5 extending parallel to direction 4 and each supporting a respective rail 6 also parallel to direction 4.

**[0009]** Machine 1 also comprises a bridge 7, in turn comprising an upright 8 which is fitted in known manner to bed 3, is moved linearly in direction 4 along bed 3 by a known actuating device not shown, and is fitted on its free end with a cross member 9 extending over bed 3 in a horizontal direction 10 crosswise to direction 4, and bounded laterally by two opposite faces 11, 12 substantially perpendicular to direction 4.

**[0010]** Bridge 7 supports a known machining head 13 which is fitted to face 11, is fitted in known manner to cross member 9 to move linearly along cross member 9 in direction 10, and comprises at least one tool spindle (not shown) fitted in known manner to head 13 to move in a vertical direction 14 perpendicular to directions 4 and 10.

**[0011]** Machine 1 also comprises a number of cross members 15 - hereinafter referred to as "work surfaces" - which extend between rails 6 in direction 10, and are fitted to rails 6 to slide manually, or by means of respective known actuating devices not shown, along rails 6 in direction 4.

**[0012]** Work surfaces 15 support a number of clamps 16, the arrangement of which on relative work surfaces 15 substantially depends on the size of, and the type of work to be carried out on, component parts 2.

**[0013]** In the example shown, each clamp 16 comprises a fixed bottom jaw 17 fixed to relative work surface 15 and defining, with jaws 17 of the other clamps 16, a substantially horizontal supporting surface P1 for at least one component part 2; and a movable top jaw 18 which extends parallel to surface P1, is fitted to the free end of an output rod (not shown) of an actuating cylinder (not shown), and is moved by the actuating cylinder (not shown) between a clamped position (Figure 1) and a release position respectively clamping and releasing component part 2.

**[0014]** Machine 1 also comprises a feed device 19 for component parts 2, which comprises a bed 20 located alongside bed 3 in direction 4 and supporting a number of belt conveyors 21, which are aligned in direction 4, extend in respective vertical planes parallel to one another and to direction 10, and have respective coplanar top conveying branches defining a horizontal conveying surface P2 parallel to surface P1.

**[0015]** Conveyors 21 extend in direction 10 between a loading station 22 where component parts 2 for machining are loaded onto feed device 19, and an unloading station 23 where component parts 2 for machining are unloaded off feed device 19.

**[0016]** Component parts 2 are transferred between clamps 16 and feed device 19 by a grip-and-carry assembly 24 comprising an arm 25, which projects in direction 4 from face 12 of cross member 9, is fitted in known manner to cross member 9 to move linearly along

cross member 9 in direction 10 under the control of a known actuating device not shown, and is fitted, in the example shown, with two grip-and-carry devices 26, 27 movable with respect to each other in direction 4.

**[0017]** In the example shown, device 26 is fixed to arm 25 in direction 4, while device 27 is fitted in known manner to arm 25 to move linearly along arm 25 in direction 4 under the control of a known actuating device not shown.

**[0018]** With reference to Figure 2, each grip-and-carry device 26, 27 comprises a gripper, in turn comprising a substantially L-shaped bottom jaw 28 movable in direction 14 under the control of a known actuating device not shown; and a top jaw 29 which is fitted to the free end of an output rod 30 of an actuating cylinder 31 fixed to jaw 28, and is moved by actuating cylinder 31 between a grip position and a release position respectively gripping and releasing component part 2.

**[0019]** In actual use, component parts 2 are loaded successively onto feed device 19 at loading station 22, either manually or by means of a known loader not shown, are positioned contacting at least two known stops (not shown) located at loading station 22 to ensure each component part 2 is positioned correctly in direction 10, and are then fed successively in steps to unloading station 23.

**[0020]** Once component parts 2 are loaded onto feed device 19, the component part 2 located at unloading station 23 is transferred by grip-and-carry assembly 24 to clamps 16 for machining by machining head 13, feed device 19 is operated to move another component part 2 into unloading station 23, and the machined component part 2 is transferred by assembly 24 from clamps 16 to loading station 22.

**[0021]** The component part 2 unloaded at loading station 22 is then moved forward, behind the component parts 2 already unloaded at loading station 22 (Figure 2), by a push device (not shown) operated independently of feed device 19 when device 19 is stopped.

**[0022]** The above operating sequence is repeated for all the component parts 2 loaded onto device 19, so as to gradually replace the component parts 2 to be machined with the machined component parts 2.

**[0023]** In the Figure 3 operating mode, the component part 2 for machining is picked up from station 23 by assembly 24; is inserted by assembly 24 inside at least one first clamp 16 (hereinafter indicated 16a) in an insertion direction 10a parallel to direction 10 (Figure 3a) to enable machining head 13 to machine a first side 2a of component part 2 (Figure 3b); is withdrawn from clamp 16a by assembly 24 (Figure 3c); and is inserted by assembly 24 inside at least one second clamp 16 (hereinafter indicated 16b) in an insertion direction 10b parallel to and opposite direction 10a, to enable machining head 13 to machine a second side 2b, opposite side 2a, of component part 2 (Figure 3d).

**[0024]** Obviously, once side 2a is machined, component part 2 may be withdrawn from clamp 16a, moved in directions 10 and 14 onto the opposite side of clamp 16a,

and inserted once more into the same clamp 16a in direction 10b to also machine side 2b.

**[0025]** As will be clear from the above description:

component parts 2 being transferred between clamps 16a and 16b by grip-and-carry assembly 24, clamps 16 may be fixed to relative work surfaces 15 in direction 10, with no need for relative actuating devices in direction 10; and

since feed device 19 provides for both feeding the components parts 2 for machining to grip-and-carry assembly 24, and receiving the machined component parts 2 from assembly 24, machine 1 is relatively compact and cheap.

**[0026]** In Figure 4, grip-and-carry devices 26, 27 are replaced by respective dual grip-and-carry devices 32, 33, each comprising a respective slide 34, which is movable in direction 14 and supports two superimposed grippers 35, 36, with gripper 35 located over gripper 36.

**[0027]** Gripper 35 comprises a bottom jaw 37 projecting in direction 10 from slide 34 and cooperating with a top jaw 38, which is movable in direction 14, with respect to slide 34 and under the control of an actuating cylinder 39 fixed to slide 34, between a grip position and a release position respectively gripping and releasing a first component part 2; and gripper 36 comprises a top jaw defined by bottom jaw 37 of gripper 35, and a bottom jaw 40, which is movable in direction 14, with respect to slide 34, and under the control of an actuating cylinder 41 fixed to slide 34, between a grip position and a release position respectively gripping and releasing a second component part 2.

**[0028]** Obviously, at least slide 34 of device 33 is in turn fitted to a slide (not shown) movable in direction 4 along arm 25.

**[0029]** In actual use, at each operating cycle, grip-and-carry assembly 24 in Figure 4 :

removes a machined component part 2 from clamps 16, and releases a component part 2 for machining to clamps 16; and

as each component part 2 is being machined, unloads the machined component part 2 at loading station 22, and picks up another component part 2 for machining from unloading station 23.

**[0030]** In Figure 5, feed device 19 is replaced by two feed devices 42, which are identical to device 19, define two parallel, superimposed supporting surfaces P2, and are located one (hereinafter indicated 42a) over the other (hereinafter indicated 42b).

**[0031]** Device 42a extends between loading station 22 and unloading station 23, and successively feeds component parts 2 for machining from loading station 22 to unloading station 23; and device 42b feeds the machined component part 2 from an input station 43, projecting beyond unloading station 23 in direction 10, to an output

station 44 opposite station 43 and located at loading station 22.

**[0032]** In the example shown, device 42b is associated with a lifting device 45 comprising a substantially vertical supporting beam 46 facing bed 20 of devices 42a, 42b in direction 10; and a number of arms 47, which project from beam 46 in direction 10, are offset with respect to belt conveyors 21 of device 42b in direction 4, and define a supporting surface P3 for at least one machined component part 2.

**[0033]** Beam 46 is movable in direction 14 between a raised position, in which device 45 receives the machined component part 2 from assembly 24, and a lowered position, in which arms 47 are positioned between conveyors 21, and surface P3 is positioned below surface P2 of device 42b.

**[0034]** In actual use, component parts 2 for machining are fed successively by device 42a from loading station 22 to unloading station 23, are picked up successively at station 23 by assembly 24, are transferred to clamps 16, and are machined by head 13.

**[0035]** The machined component parts 2 are removed from clamps 16 by assembly 24, are released by assembly 24 onto surface P3 when device 45 is in the raised position, are lowered by device 45 at input station 43, are released by device 45 onto device 42b, and are fed by device 42b to output station 44.

**[0036]** Obviously, in a variation not shown, lifting device 45 may be eliminated, and the machined component parts 2 released directly by assembly 24 at input station 43 of device 42b.

**[0037]** In connection with the above, it should be pointed out component parts 2 for machining may be loaded onto device 42a at station 22, and the machined component parts 2 unloaded off device 42b at station 44 either manually or automatically by means of respective feed devices, possibly associated with further machines identical to machine 1.

**[0038]** In a variation not shown, bridge 7 supports machining head 13 only, and grip-and-carry assembly 24 is fitted to a further bridge identical to bridge 7.

## Claims

1. A method of machining component parts (2) of wood or similar, in particular component parts (2) of door and window frames, on a machine comprising a bed (3) extending in a first direction (4); at least two cross members (15) movable along the bed (3) in the first direction (4); at least one clamp (16) fitted to each cross member (15) to clamp at least one component part (2) for machining; a bridge (7) and having at least one machining head (13) movable along the bridge (7) in a second direction (10) crosswise to the first direction (4) **characterized by** the bridge (7) being movable along the bed (3) in the first direction (4); a feed device (19) or feeding the component

parts (2) in steps between a loading station (22) where the component parts (2) for machining are loaded onto the feed device (19), and an unloading station (23) where the component parts (2) for machining are unloaded off the feed device (19); and a grip-and-carry assembly (24) for gripping and carrying the component parts (2), and which is movable in said first and second direction (4, 10); the method comprising the steps of:

transferring at least one component part (2) for machining from the unloading station (23) to at least one clamp (16) by means of the grip-and-carry assembly (24);  
 machining the component part (2); and  
 feeding another component part (2) for machining into the unloading station (23);  
 the method being further **characterized by** also comprising the step of:  
 transferring the machined component part (2) from the clamp (16) to the loading station (22) by means of the grip-and-carry assembly (24).

2. A method as claimed in Claim 1, and also comprising the steps of:

inserting, by means of the grip-and-carry assembly (24), the component part (2) for machining into at least one clamp (16) in a first insertion direction (10a);  
 machining a first side (2a) of the component part (2);  
 removing the component part (2) from the clamp (16) by means of the grip-and-carry assembly (24);  
 inserting the component part (2), by means of the grip-and-carry assembly (24), into at least one clamp (16) in a second insertion direction (10b) opposite the first insertion direction (10a); and  
 machining a second side (2b), opposite the first side (2a), of the component part (2).

3. A method as claimed in Claim 2, wherein the first side (2a) is machined inside at least one clamp (16a), and the second side (2b) is machined inside the same clamp (16a).

4. A method as claimed in Claim 2, wherein the first side (2a) is machined inside at least a first clamp (16a), and the second side (2b) is machined inside at least a second clamp (16b) different from the first clamp (16a).

5. A method as claimed in any one of the preceding Claims, wherein the grip-and-carry assembly (24) comprises at least two grip-and-carry devices (26, 27; 32, 33), each for receiving a relative component

part (2); the method also comprising the steps of:

removing a machined component part (2) from at least one clamp (16) by means of a first said grip-and-carry device (26; 32);  
 inserting a component part (2) for machining into at least one clamp (16) by means of a second said grip-and-carry device (27; 33); and  
 transferring the machined component part (2) to the loading station (22) by means of the first grip-and-carry device (26; 32).

6. A method as claimed in Claim 5, wherein the grip-and-carry devices (32, 33) are arranged to define two substantially parallel, superimposed supporting surfaces.

7. A method as claimed in any one of the preceding Claims, wherein the grip-and-carry assembly (24) comprises a supporting arm (25) extending in the first direction (4); and at least two grip-and-carry devices (26, 27; 32, 33) movable along the supporting arm (25) in the first direction (4); the method also comprising the step of:

selectively controlling the position of the two grip-and-carry devices (26, 27; 32, 33) with respect to each other in said first direction (4).

8. A method as claimed in any one of the preceding Claims, wherein the clamps (16) are fixed in said second direction (10).

9. A method of machining component parts (2) of wood or similar, in particular component parts (2) of door and window frames, on a machine comprising a bed (3) extending in a first direction (4); at least two cross members (15) movable along the bed (3) in the first direction (4); at least one clamp (16) fitted to each cross member (15) to clamp at least one component part (2) for machining; a bridge (7) and having at least one machining head (13) movable along the bridge (7) in a second direction (10) crosswise to the first direction (4) **characterized by** the bridge being movable along the bed (3) in the first direction (4); a first feed device (42a) for feeding the component parts (2) in steps between a loading station (22) where the component parts (2) for machining are loaded onto the feed device (42a), and an unloading station (23) where the component parts (2) for machining are unloaded off the feed device (42a); and a grip-and-carry assembly (24) for gripping and carrying the component parts (2), and which is movable in said first and second direction (4, 10); the method comprising the steps of:

transferring at least one component part (2) for machining from the unloading station (23) to at

least one clamp (16) by means of the grip-and-carry assembly (24); and  
 machining the component part (2);  
 and the method being further **characterized by** also comprising the step of:  
 transferring the machined component part (2) from the clamp (16) to an input station (43) of a second feed device (42b) parallel to and superimposed with the first feed device (42a).

10. A method as claimed in Claim 9, wherein the first feed device (42a) is located over the second feed device (42b).

11. A method as claimed in Claim 9 or 10, and also comprising the step of:

transferring the machined component part (2) from the clamp (16) to the input station (43) by means of the grip-and-carry assembly (24).

12. A method as claimed in Claim 9 or 10, and also comprising the steps of:

transferring the machined component part (2) from the clamp (16) to a lifting device (45) by means of the grip-and-carry assembly (24); and  
 transferring the machined component part (2) to the input station (43) by means of the lifting device (45).

13. A method as claimed in Claim 12, and also comprising the step of moving the lifting device (45) to and from a work position, in which the lifting device (45) is substantially coplanar with the second feed device (42b).

14. A method as claimed in any one of Claims 9 to 13, wherein the second feed device (42b) extends between the input station (43) and an output station (44); the method also comprising the step of feeding the machined component part (2) from the input station (43) to the output station (44) in a first direction (10) parallel to and opposite a second direction (10) in which the component part (2) for machining is fed from the loading station (22) to the unloading station (23).

15. A method as claimed in any one of Claims 9 to 14, and also comprising the steps of manually loading the component parts (2) for machining at the loading station (22), and manually unloading the machined component parts (2) at the output station (44).

16. A method as claimed in any one of Claims 9 to 14, and also comprising the steps of loading the component parts (2) for machining at the loading station (22), and unloading the machined component parts

(2) at the output station (44) by means of automatic feed means.

### Patentansprüche

1. Verfahren zum Bearbeiten von Komponenten (2) aus Holz oder dergleichen, insbesondere von Komponenten (2) für Tür- und Fensterrahmen, auf einer Maschine, umfassend ein Bett (3), das sich in einer ersten Richtung (4) erstreckt, wenigstens zwei Querelemente (15), beweglich entlang dem Bett (3) in der ersten Richtung (4), wenigstens eine Aufspanneinrichtung (16), die an jedem Querelement (15) montiert ist, um wenigstens eine zu bearbeitende Komponente (2) aufzuspannen, eine Brücke (7), die wenigstens einen Bearbeitungskopf (13) aufweist, der in einer zweiten Richtung (10) quer zur ersten Richtung (4) entlang der Brücke (7) bewegbar ist, **dadurch gekennzeichnet, dass** die Brücke (7) entlang des Bettes (3) in der ersten Richtung (4) bewegbar ist, dass eine Zufuhreinrichtung (19) vorgesehen ist zum Zuführen der Komponenten (2) in Schritten zwischen einer Aufgabestation (22), in welcher die zu bearbeitende Komponenten (2) auf die Zufuhreinrichtung (19) aufgegeben werden, und einer Abgabestation (23), wo die zu bearbeitenden Komponenten (2) von der Zufuhreinrichtung (19) abgegeben werden, und dass eine Greif- und Trageinheit (24) vorgesehen ist zum Greifen und Tragen der Komponenten (2), beweglich in der ersten und der zweiten Richtung (4, 10), umfassend die folgenden Verfahrensschritte:

Überführen wenigstens einer zu bearbeitenden Komponente (2) von der Abgabestation (23) zu wenigstens einer Aufspanneinrichtung (16) mittels der Greif- und Trageinheit (24);  
 Bearbeiten der Komponente (2); und  
 Zuführen einer weiteren zu bearbeitenden Komponente (2) zur Abgabestation (23);  
 das Verfahren ist weiterhin **dadurch gekennzeichnet, dass** es die folgenden Schritte aufweist:  
 Überführen der bearbeiteten Komponente (2) von der Aufspanneinrichtung (16) zur Aufgabestation (22) mittels der Greif- und Trageinheit (24).

2. Verfahren nach Anspruch 1, ferner umfassend die folgenden Schritte:

Einführen der zu bearbeitenden Komponente mittels der Greif- und Trageinheit (24) in wenigstens eine Aufspanneinrichtung (16) in einer ersten Einführrichtung (10a);  
 Bearbeiten einer ersten Seite (2a) der Komponente (2);

Entfernen der Komponente (2) von der Aufspanneinrichtung (16) mittels der Greif- und Trageinheit (24);

Einführen der Komponente (2) mittels der Greif- und Trageinheit (24) in wenigstens eine Aufspanneinrichtung (16) in einer zweiten Einführrichtung (10b) entgegen der ersten Einführrichtung (10a); und

Bearbeiten einer zweiten Seite (2b) gegenüber der ersten Seite (2a) der Komponente (2).

3. Verfahren nach Anspruch 2, wobei die erste Seite (2a) innerhalb wenigstens einer Aufspanneinrichtung (16a) bearbeitet wird, und die zweite Seite (2b) innerhalb derselben Aufspanneinrichtung (16a).

4. Verfahren nach Anspruch 2, wobei die erste Seite (2a) innerhalb wenigstens einer ersten Aufspanneinrichtung (16a) bearbeitet wird, und die zweite Seite (2b) innerhalb wenigstens einer zweiten Aufspanneinrichtung (16b), die verschieden ist von der ersten Aufspanneinrichtung (16a).

5. Verfahren nach einem der vorausgegangenen Ansprüche, wobei die Greif- und Trageinheit (24) wenigstens zwei Greif- und Trageinheiten (26, 27; 32, 33) umfasst, jede zum Aufnehmen einer jeweiligen Komponente (2); wobei das Verfahren weiterhin die folgenden Schritte umfasst:

Entfernen einer bearbeiteten Komponente (2) von wenigstens einer Aufspanneinrichtung (16) mittels einer ersten Greif- und Trageinheit (26; 32);

Einrühren einer zu bearbeitenden Komponente (2) in wenigstens eine Aufspanneinrichtung (16) mittels einer zweiten Greif- und Trageinheit (27; 33); und

Überführen der zu bearbeitenden Komponente (2) zur Aufnahmestation (22) mittels der ersten Greif- und Trageinheit (26; 32).

6. Verfahren nach Anspruch 5, wobei die Greif- und Trageinheiten (32, 33) derart angeordnet sind, dass sie zwei im Wesentlichen parallele, überlagerte Tragflächen bilden.

7. Verfahren nach einem der vorausgegangenen Ansprüche, wobei die Greif- und Trageinheit (24) einen Tragarm (25) aufweist, der sich in der ersten Richtung (4) erstreckt, und wenigstens zwei Greif- und Trageinrichtungen (26, 27; 32, 33), die entlang des Tragarmes (25) in der ersten Richtung (4) bewegbar sind, wobei das Verfahren ferner die folgenden Schritte umfasst:

Selektives Kontrollieren der Position der beiden Greif- und

Trageinrichtungen (26, 27; 32, 33) relativ zueinander in der ersten Richtung (4).

8. Verfahren nach einem der vorausgegangenen Ansprüche, wobei die Aufspanneinrichtungen (16) in der zweiten Richtung (10) fixiert sind. 5
9. Verfahren zum Bearbeiten von Komponenten (2) aus Holz oder dergleichen, insbesondere Komponenten von Tür- und Fensterrahmen, auf einer Maschine, umfassend ein Bett (3), das sich in einer ersten Richtung (4) erstreckt, wenigstens zwei Querelemente (15), die entlang des Bettes (3) in der ersten Richtung (4) bewegbar sind; wenigstens eine Aufspanneinrichtung (16), welche an jedem Querelement (15) montiert ist, um wenigstens eine zu bearbeitende Komponente aufzuspannen; eine Brücke (7) mit wenigstens einem Bearbeitungskopf, der entlang der Brücke (7) in einer zweiten Richtung (10) quer zur ersten Richtung (4) entlang der Brücke bewegbar ist, **dadurch gekennzeichnet, dass** die Brücke entlang des Bettes (3) in der ersten Richtung (4) bewegbar ist, mit einer ersten Fördereinrichtung (42a) zum Fördern der Komponente (2) in Schritten zwischen einer Aufgabestation (22), in welcher die zu bearbeitenden Komponenten (2) auf die Fördereinrichtung (42a) aufgegeben werden, und einer Abgabestation (23), in welcher die zu bearbeitenden Komponenten (2) von der Fördereinrichtung (42a) abgegeben werden, und eine Greif- und Trageinheit (24) zum Greifen und Tragen der Komponenten (2), bewegbar in der ersten und zweiten Richtung (4, 10), wobei das Verfahren die folgende Schritte aufweist: 10  
20  
25  
30

Überführen wenigstens einer zu bearbeitenden Komponente (2) von der Aufgabestation (23) zu wenigstens einer Aufspanneinrichtung (16) mittels der Greif- und Trageinheit (24); und Bearbeiten der Komponente (2); wobei das Verfahren weiterhin **dadurch gekennzeichnet ist, dass** es den folgenden Schritt umfasst: Überführen der bearbeiteten Komponente (2) von der Aufspanneinrichtung (16) zu einer Eingabestation (43) einer zweiten Fördereinrichtung (42b) parallel zu und überlagert von der ersten Fördereinrichtung (42a). 35  
40

10. Verfahren nach Anspruch 9, wobei die erste Fördereinrichtung (42a) über der zweiten Fördereinrichtung (42b) angeordnet ist. 45  
50
11. Verfahren nach Anspruch 9 oder 10, weiterhin umfassend den folgenden Schritt:

Überführen der bearbeiteten Komponente (2) von der Aufspanneinrichtung (16) zur Eingabestation (43) mittels der Greif- und Trageinheit (24). 55

12. Verfahren nach Anspruch 9 oder 10, ferner umfassend die folgenden Schritte:

Überführen der bearbeiteten Komponente (2) von der Aufspanneinrichtung (16) zu einer Hubeinrichtung (45) mittels der Greif- und Trageinheit (24), und

Überführen der bearbeiteten Komponente (2) zur Eingabestation (43) mittels der Hubeinrichtung (45).

13. Verfahren nach Anspruch 12, ferner umfassend den Schritt des Bewegens der Hubeinrichtung (45) zu und von einer Arbeitsposition, wobei die Hubeinrichtung (45) im Wesentlichen koplanar zur zweiten Fördereinrichtung (42b) ist. 15

14. Verfahren nach einem der Ansprüche 9 bis 13, wobei sich die zweite Fördereinrichtung (42b) zwischen der Eingabestation (43) und einer Abgabestation (44) erstreckt, wobei das Verfahren ferner den Schritt des Förderns der bearbeiteten Komponente (2) von der Eingabestation (43) zur Abgabestation (44) in einer ersten Richtung (4) parallel zu und entgegen einer zweiten Richtung (10) verläuft, wobei die zu bearbeitende Komponente (2) von der Aufgabestation (22) zur Abgabestation (23) gefördert wird. 20  
25

15. Verfahren nach einem der Ansprüche 9 bis 14, ferner umfassend die Schritte des manuellen Aufgebens der zu bearbeitenden Komponenten (2) an der Aufgabestation (22), und des manuellen Abgebens der bearbeiteten Komponenten (2) an der Abgabestation (44). 30

16. Verfahren nach einem der Ansprüche 9 bis 14, ferner umfassend die Schritte des Aufgebens der zu bearbeitenden Komponenten (2) an der Aufgabestation (22) und zum Abgeben der bearbeiteten Komponenten (2) an der Abgabestation (44) mittels einer automatischen Fördereinrichtung. 35  
40

## Revendications

1. Procédé d'usage d'articles (2) en bois ou similaire, en particulier de composants (2) de cadres de portes et fenêtres, sur une machine comprenant un tapis (3) s'étendant dans une première direction (4) ; au moins deux traverses (15) mobiles le long du tapis (3) dans la première direction (4) ; au moins un élément de serrage (16) équipant chaque traverse (15) pour serrer au moins un composant (2) à usiner ; un pont (7) ayant au moins une tête d'usinage (13) mobile le long du pont (7) dans une deuxième direction (10) transversale à la première direction (4) **caractérisé en ce que** le pont (7) se déplace le long du tapis (3) dans la première direction (4) ; un dispositif 45  
50  
55

d'alimentation (19) pour l'alimentation des composants (2) par paliers entre une station de chargement (22) où les composants (2) à usiner sont chargés sur le dispositif d'alimentation (19), et une station de déchargement (23) où les composants (2) à usiner sont déchargés du dispositif d'alimentation (19) ; et un ensemble de saisie et de transport (24) pour saisir et transporter des composants (2), et qui est mobile dans lesdites première et deuxième directions (4, 10) ; le procédé comprenant les étapes qui consistent :

à transférer au moins un composant (2) à usiner de la station de déchargement (23) jusqu'à au moins un élément de serrage (16) au moyen de l'ensemble de prise et de transport (24) ;  
à usiner le composant (2) ; et  
à alimenter un autre composant (2) à usiner dans la station de déchargement (23) ;  
le procédé étant en outre **caractérisé en ce qu'il** comprend également l'étape qui consiste :  
à transférer le composant usiné (2) de l'élément de serrage (16) jusqu'à la station de chargement (22) au moyen de l'ensemble de prise et de transport (24).

2. Procédé tel que revendiqué dans la revendication 1, et comprenant également les étapes qui consistent :

à insérer, au moyen de l'ensemble de prise et de transport (24), le composant (2) à usiner dans au moins un élément de serrage (16) dans une première direction d'insertion (10a) ;  
à usiner un premier côté (2a) du composant (2) ;  
à retirer le composant (2) de l'élément de serrage (16) au moyen de l'ensemble de prise et de transport (24) ;  
à insérer le composant (2), au moyen de l'ensemble de prise et de transport (24), dans au moins un élément de serrage (16) dans une deuxième direction d'insertion (10b) opposée à la première direction d'insertion (10a) ; et  
à usiner un deuxième côté (2b), opposé au premier côté (2a), du composant (2).

3. Procédé tel que revendiqué dans la revendication 2, dans lequel le premier côté (2a) est usiné à l'intérieur d'au moins un élément de serrage (16a), et le deuxième côté (2b) est usiné à l'intérieur du même élément de serrage (16a).

4. Procédé tel que revendiqué dans la revendication 2, dans lequel le premier côté (2a) est usiné à l'intérieur d'au moins un premier élément de serrage (16a), et le deuxième côté (2b) est usiné à l'intérieur d'au moins un deuxième élément de serrage (16b) différent du premier élément de serrage (16a).

5. Procédé tel que revendiqué dans l'une quelconque des revendications précédentes, dans lequel l'ensemble de prise et de transport (24) comprend au moins deux dispositifs de prise et de transport (26, 27 ; 32, 33), chacun destiné à recevoir un composant relatif (2) ; le procédé comprenant également les étapes qui consistent :

à retirer un composant usiné (2) d'au moins un élément de serrage (16) au moyen d'un premier desdits dispositifs de prise et de transport (26 ; 32) ;  
à insérer un composant (2) à usiner dans au moins un élément de serrage (16) au moyen d'un deuxième desdits dispositifs de prise et de transport (27 ; 33) ; et  
à transférer le composant usiné (2) jusqu'à la station de chargement (22) au moyen du premier dispositif de prise et de transport (26 ; 32).

6. Procédé tel que revendiqué dans la revendication 5, dans lequel les dispositifs de prise et de transport (32, 33) sont disposés de manière à définir deux surfaces de support essentiellement parallèles et superposées.

7. Procédé tel que revendiqué dans l'une quelconque des revendications précédentes, dans lequel l'ensemble de prise et de transport (24) comprend un bras de support (25) s'étendant dans la première direction (4) ; et au moins deux dispositifs de prise et de transport (26, 27 ; 32, 33) mobiles le long du bras de support (25) dans la première direction (4) ; le procédé comprenant également l'étape qui consiste :

à commander sélectivement la position des deux dispositifs de prise et de transport (26, 27 ; 32, 33) l'un par rapport à l'autre dans ladite première direction (4).

8. Procédé tel que revendiqué dans l'une quelconque des revendications précédentes, dans lequel les éléments de serrage (16) sont fixés dans ladite deuxième direction (10).

9. Procédé d'usinage d'articles (2) en bois ou similaire, en particulier de composants (2) de cadres de portes et fenêtres, sur une machine comprenant un tapis (3) s'étendant dans une première direction (4) ; au moins deux traverses (15) mobiles le long du tapis (3) dans la première direction (4) ; au moins un élément de serrage (16) équipant chaque traverse (15) pour serrer au moins un composant (2) à usiner ; un pont (7) ayant au moins une tête d'usinage (13) mobile le long du pont (7) dans une deuxième direction (10) transversale à la première direction (4) **caractérisé en ce que** le pont se déplace le long du tapis

(3) dans la première direction (4) ; un premier dispositif d'alimentation (42a) pour l'alimentation des composants (2) par paliers entre une station de chargement (22) où les composants (2) à usiner sont chargés sur le dispositif d'alimentation (42a), et une station de déchargement (23) où les composants (2) à usiner sont déchargés du dispositif d'alimentation (42a) ; et un ensemble de prise et de transport (24) pour saisir et transporter les composants (2), et qui est mobile dans lesdites première et deuxième directions (4, 10) ; le procédé comprenant les étapes qui consistent :

à transférer au moins un composant (2) à usiner de la station de déchargement (23) jusqu'à au moins un élément de serrage (16) au moyen de l'ensemble de prise et de transport (24) ; et à usiner le composant (2) ;  
et le procédé étant en outre **caractérisé en ce qu'il** comprend également l'étape qui consiste :  
à transférer le composant usiné (2) de l'élément de serrage (16) jusqu'à une station d'entrée (43) d'un deuxième dispositif d'alimentation (42b) parallèle et superposé au premier dispositif d'alimentation (42a).

10. Procédé tel que revendiqué dans la revendication 9, dans lequel le premier dispositif d'alimentation (42a) est placé sur le deuxième dispositif d'alimentation (42b).

11. Procédé tel que revendiqué dans la revendication 9 ou 10, et comprenant également l'étape qui consiste :

à transférer le composant usiné (2) de l'élément de serrage (16) jusqu'à la station d'entrée (43) au moyen de l'ensemble de prise et de transport (24).

12. Procédé tel que revendiqué dans la revendication 9 ou 10, et comprenant également les étapes qui consistent :

à transférer le composant usiné (2) de l'élément de serrage (16) jusqu'à un dispositif de levage (45) au moyen de l'ensemble de prise et de transport (24) ; et  
à transférer le composant usiné (2) jusqu'à la station d'entrée (43) au moyen du dispositif de levage (45).

13. Procédé tel que revendiqué dans la revendication 12, et comprenant également l'étape qui consiste à déplacer le dispositif de levage (45) vers et depuis une position de travail, où le dispositif de levage (45) se trouve pratiquement dans le même plan que le deuxième dispositif d'alimentation (42b).

14. Procédé tel que revendiqué dans l'une quelconque des revendications 9 à 13, dans lequel le deuxième dispositif d'alimentation (42b) s'étend entre la station d'entrée (43) et une station de sortie (44) ; le procédé comprenant également l'étape qui consiste à alimenter le composant usiné (2) de la station d'entrée (43) jusqu'à la station de sortie (44) dans une première direction (4) parallèle et opposée à une deuxième direction (10) où le composant (2) à usiner est alimenté par la station de chargement (22) jusqu'à la station de déchargement (23).

15. Procédé tel que revendiqué dans l'une quelconque des revendications 9 à 13, et comprenant également les étapes qui consistent à charger manuellement les composants (2) à usiner au niveau de la station de chargement (22), et à décharger manuellement les composants usinés (2) au niveau de la station de sortie (44).

16. Procédé tel que revendiqué dans l'une quelconque des revendications 9 à 14, et comprenant en outre les étapes qui consistent à charger les composants (2) à usiner au niveau de la station de chargement (22), et à décharger les composants usinés (2) au niveau de la station de sortie (44) par l'intermédiaire de moyens d'alimentation automatiques.



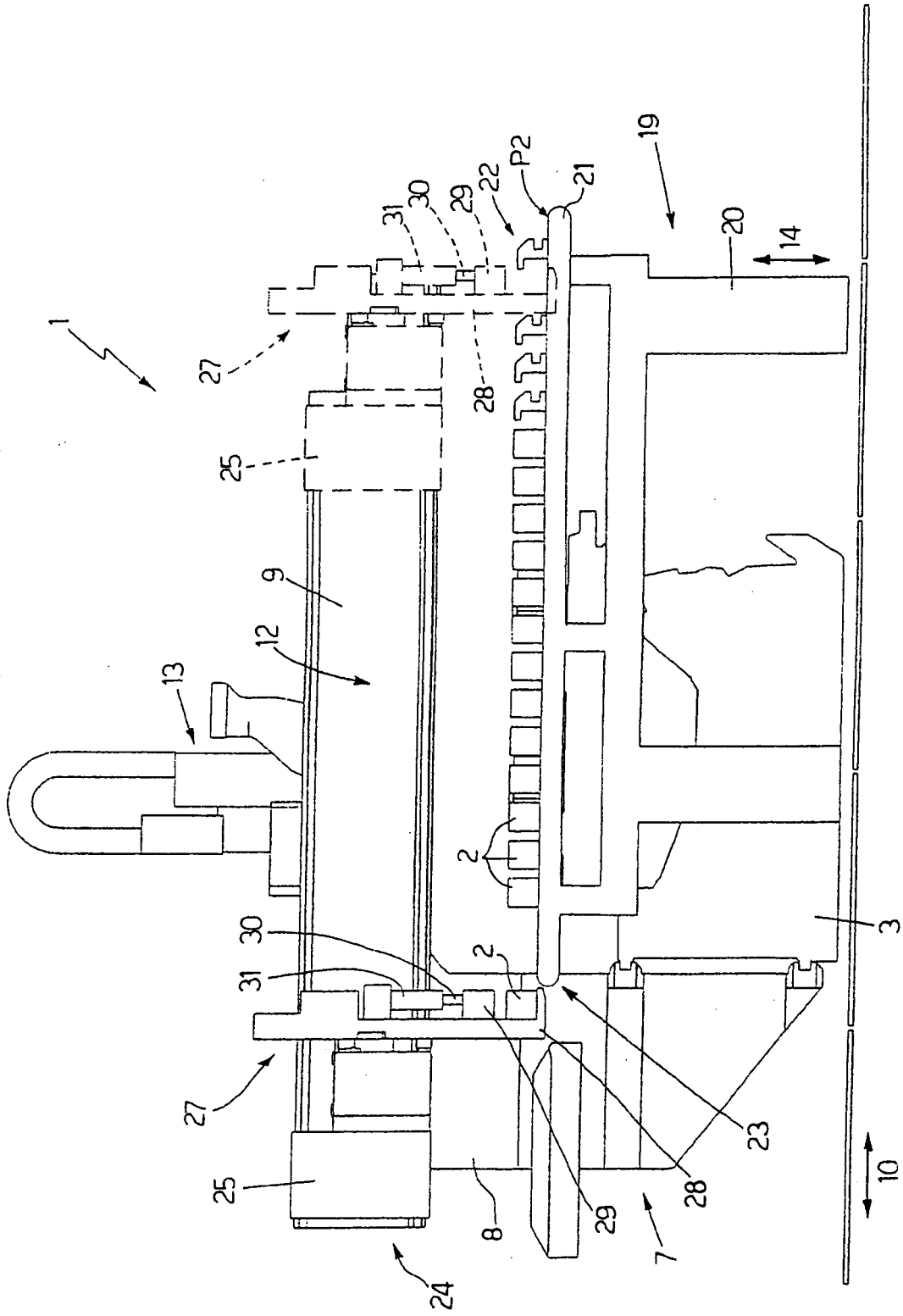


Fig.2

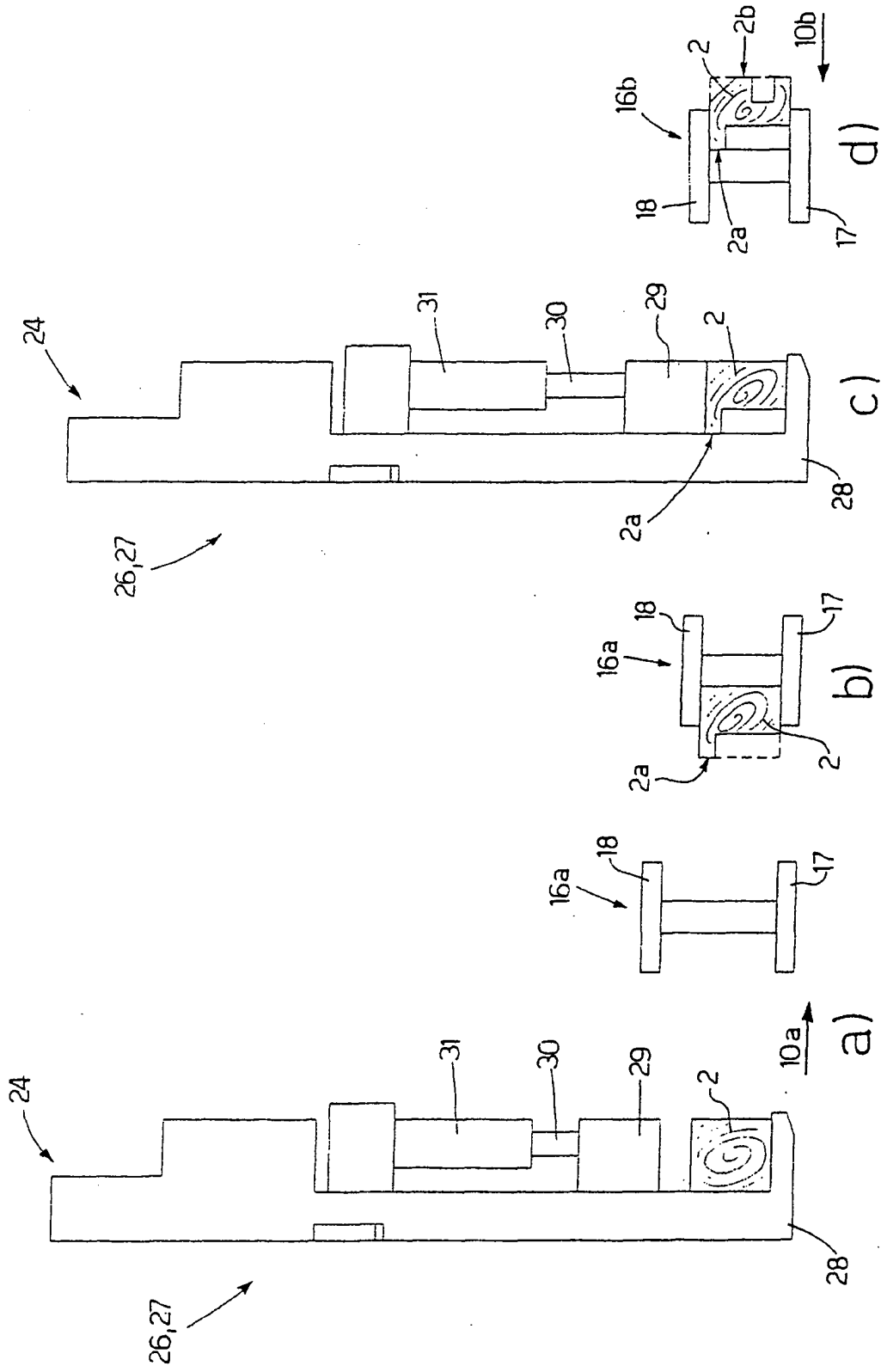


Fig.3

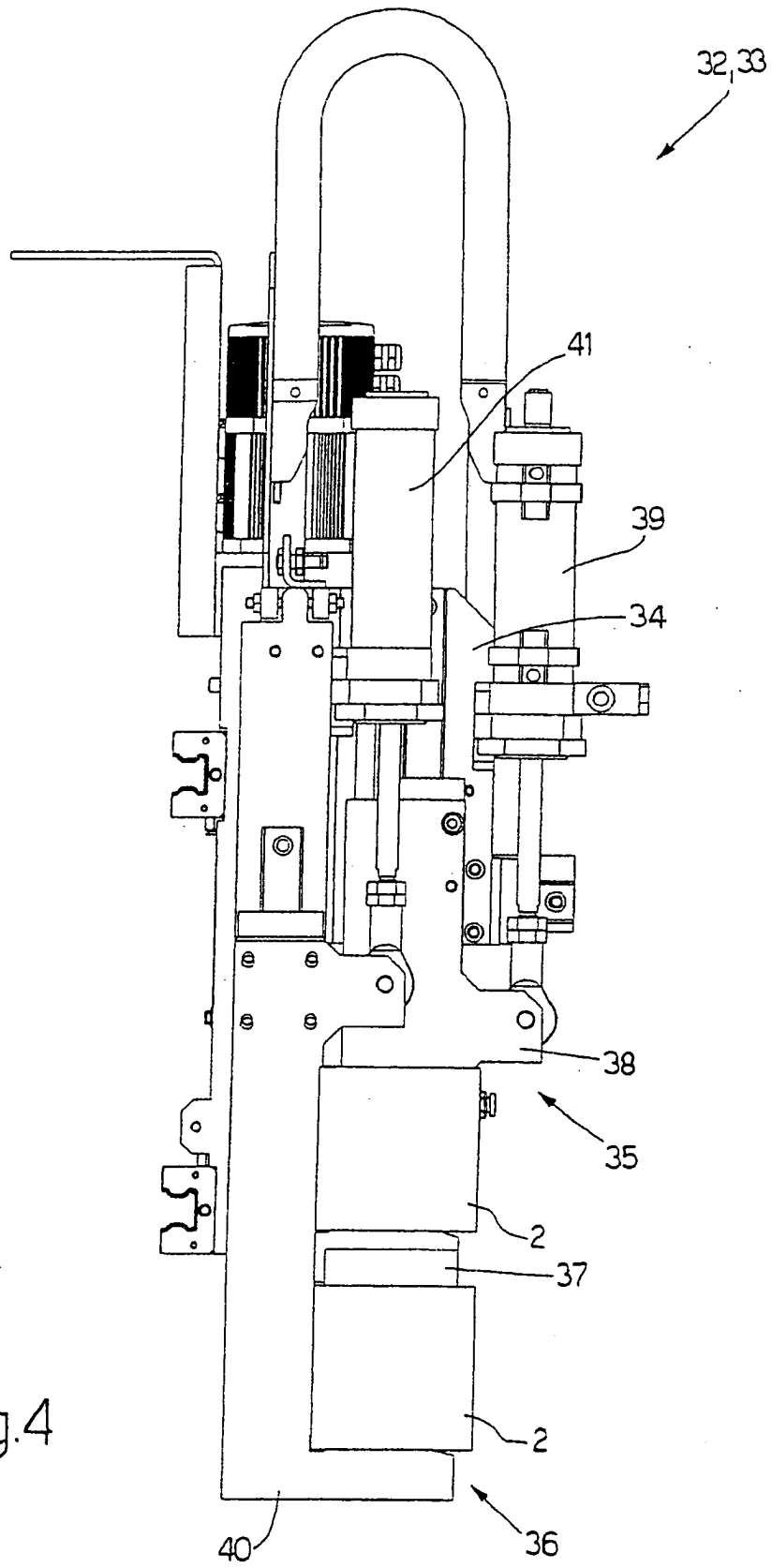


Fig.4

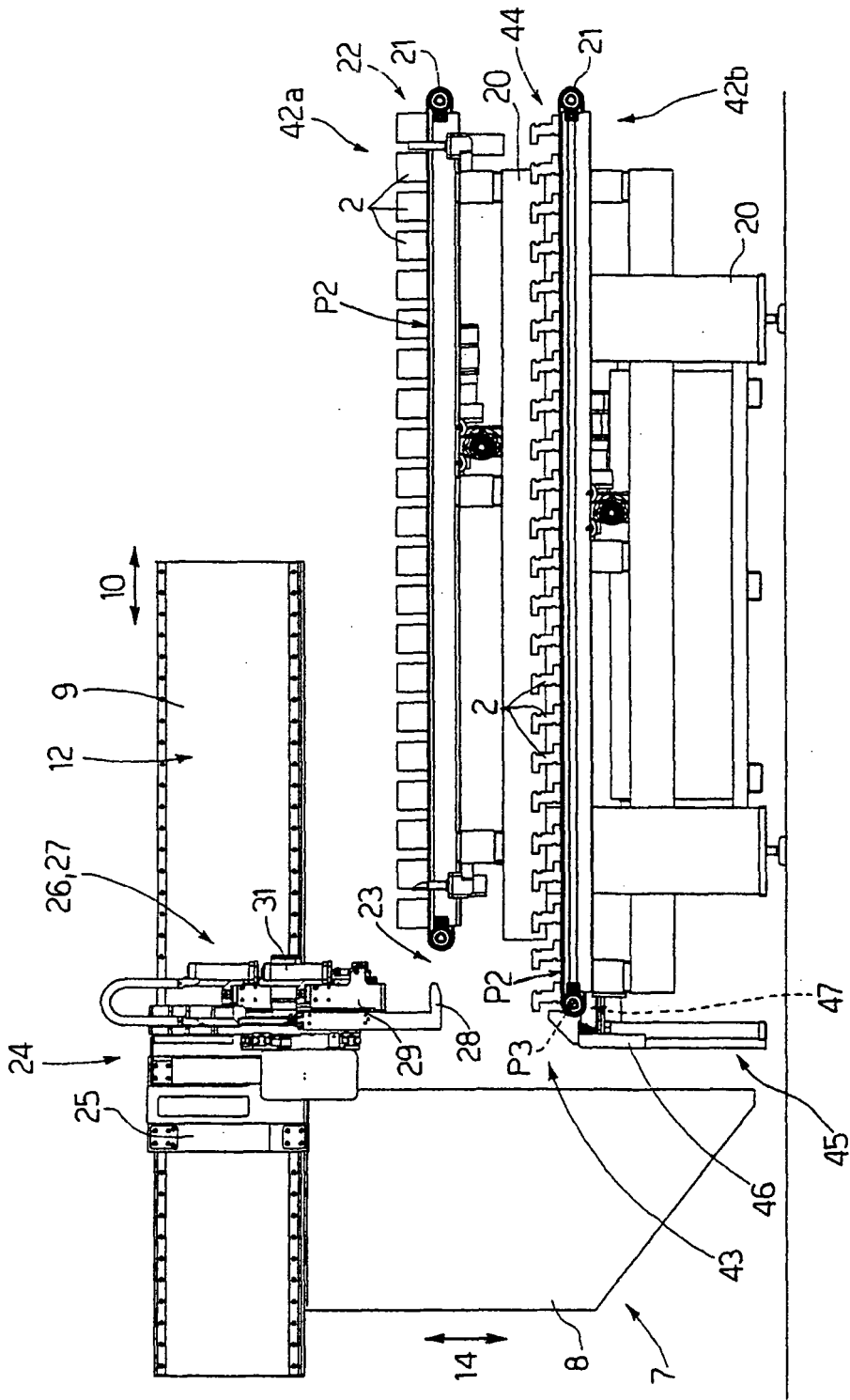


Fig.5

**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**

- EP 1304188 A1 [0001]