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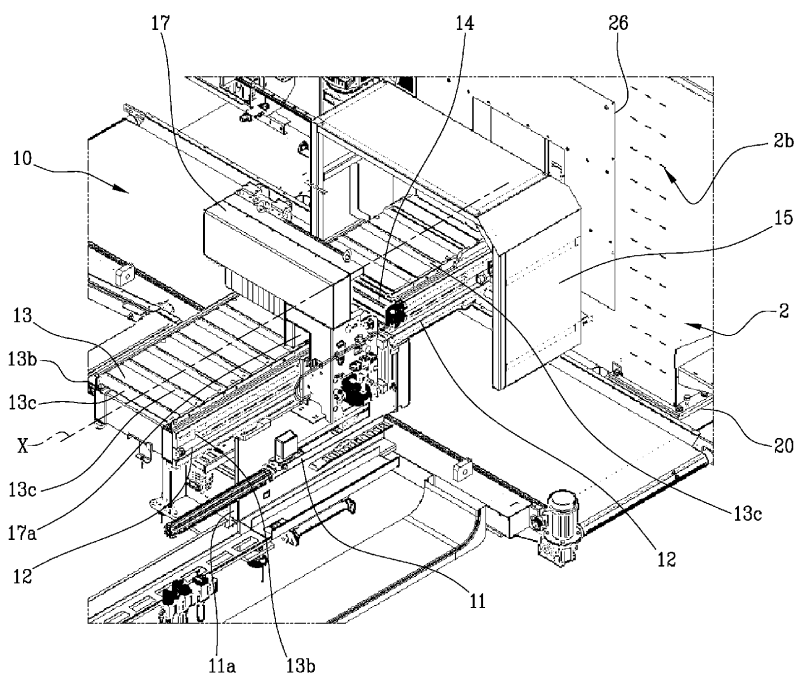
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GE KH MA MD TN(71) Applicant: **SCM Group S.p.A.****47921 Rimini (RN) (IT)**(72) Inventor: **GIGLIOTTI, Fabrizio****c/o SCM Group S.p.A. - Via Emilia, 77 RIMINI - 47921 (IT)**(74) Representative: **Gallo, Gianluca****Bugnion S.p.A.****Via di Corticella, 87****40128 Bologna (IT)**(30) Priority: **12.05.2023 IT 202300009651****(54) MACHINE AND METHOD FOR WORKING WOODEN ELONGATED WORKPIECES**

(57) Described is a machine for machining elongated, wooden semiproducts (P), such as planks, slats, crossbeams, boards and the like, equipped with a withdrawal system (10), comprising, on a load-bearing frame (11), a conveyor (13) extending along a longitudinal direction (X) for moving the semiproducts (P) and a slidable gripper (14) positioned above the conveyor (13). The conveyor (13) is movable between a position for collecting the semiproduct (P), wherein it is at least partly po-

sitioned inside the machining cabin (2), and a rest position. The slidable gripper (14) comprises a first (14a) and a second (14b) jaw, movable relative to each other along a transversal axis (Y) relative to the longitudinal direction (X), for gripping and releasing the semiproduct (P) interposed between them. The slidable gripper (14) is also movable on the conveyor (13) along the longitudinal direction (X), independently of the conveyor (13).

**Fig.2****EP 4 461 491 A1**

Description

[0001] This invention relates to a machine (1) for machining elongated, wooden semiproducts (P), such as planks, slats, crossbeams, boards and the like; the machine is equipped with a system for picking up semiproducts. The invention also relates to the system for picking up semiproducts. The invention also relates to a method for picking up elongated, wooden semiproducts.

[0002] The machines for machining wood for machining long semiproducts, such as planks, slats, crossbeams, boards or the like, are usually equipped with one or more machining units, a work support and a conveying device for moving and positioning the semiproducts.

[0003] In the machining centres, a series of motor-driven conveyors feed a machining cabin with one wooden semiproduct at a time and are equipped with pickup means for the finished semiproducts for their transport towards a storage area.

[0004] Generally, the finished semiproducts come out from the machining unit using a gripper with the aid of pressers which transport them towards a storage area, passing through the outfeed unit.

[0005] An example of machines for machining wood, in particular for elongated semiproducts for making structural elements, which use systems for picking up the machined parts is described in prior patent document EP 2353820 (A2).

[0006] Since there is strongly felt need for compactness of machines for machining wood, especially because the need to optimise the spaces in the workshops has now become strategic, machines with reduced dimensions are increasingly required.

[0007] Moreover, the prior art pickup means do not guarantee that the finished semiproduct leaves the machining cabin in a clean and linear manner, without the risk of suffering impacts which could generate irreparable defects.

[0008] The aim of the invention is to overcome the above-mentioned drawbacks by allowing the withdrawal system to be made according to the invention, which ensures high performance levels with small dimensions.

[0009] In the context of the above-mentioned purpose, an aim of the invention is to provide an effective and safe withdrawal system, in such a way as to guarantee a high-end production.

[0010] Another aim of the invention is to allow a perfect movement of the finished semiproduct at the outfeed from the machining unit towards the storage. Yet another aim of the invention is to provide a machine for machining wood which, thanks also to the contribution of the picking system according to the invention, can provide returns of a level higher than the prior art.

[0011] This purpose, as well as these and other aims, which are described in more detail below, are achieved by a withdrawal system according to the invention comprising the technical features described in one or more of the appended claims. The dependent claims corre-

spond to possible different embodiments of the invention.

[0012] In particular, according to a first aspect, the invention relates to a system for picking up, but also for supporting and/or moving and/or referencing, in particular for elongated, wooden semiproducts, such as such as planks, slats, crossbeams, boards and the like, machined in a machining unit of a machine for machining wood.

[0013] The withdrawal system comprises, on a load-bearing frame, a conveyor which extends along a longitudinal direction and which moves the semiproducts (or the workpieces or the groups of workpieces to be machined which are not divisible, such as packet beams) from the machining unit to the storage area or vice versa (that is, from the storage area to the machining unit): in the first case, the storage area will be positioned upstream of the machining area, in the second case it will be located downstream.

[0014] The conveyor is movable between a position for collecting the semiproduct, wherein it is at least partly positioned inside the machining cabin, and a rest position.

[0015] In practice, the conveyor is retractable along the longitudinal direction by its sliding on tracks formed in the load-bearing frame.

[0016] There is also a slidable gripper, positioned above the conveyor, which comprises a first and a second jaw, movable relative to each other along an axis transversal to the longitudinal direction, for gripping and releasing the semiproduct interposed between them.

[0017] According to another embodiment, it is preferable that only one of the jaws is movable along the transversal axis, between an open and closed position on the semiproduct, and the other is fixed to act as a contact element.

[0018] In practice, the gripper opens and closes in a radial direction relative to the direction of extension of the semiproduct, that is, in a perpendicular direction relative to the longitudinal direction, for collecting or unloading the semiproduct and, during the closed position, the workpiece is subjected to a pressure applied along the transversal axis by at least one of the two jaws, which allows the retaining.

[0019] The slidable gripper is also movable on the conveyor along the longitudinal direction, independently of the conveyor itself, between an end portion of the conveyor, corresponding to the point where the conveyor faces the machining unit, and an unloading or loading point.

[0020] Preferably, the unloading or loading point is substantially defined in the mid portion of the conveyor.

[0021] As mentioned, the withdrawal system also has the functions of supporting the movement and referencing the semiproducts.

[0022] In effect, according to a first embodiment the withdrawal system feeds the semiproducts moving them from the storage area upstream of the machine for machining wood towards the machining unit.

[0023] According to a variant, the system has the load-bearing frame adapted to be connected to a machining cabin of the machine for machining wood, at the outfeed unit of the finished semiproducts, that is, machined by the machine.

[0024] In this case, during the machining of the tail of the semiproducts, the slidable gripper supports the part (a portion of which is in the machining cabin) whilst it is machined by the tools, and the conveyor surface, coplanar with the sliding plane of the semiproducts, becomes a reference. In short, the slidable gripper may be positioned on the infeed conveyor (that is, for feeding the machining unit from the storage area) and/or on the outfeed conveyor (that is, for transporting finished workpieces from the machining unit towards storage).

[0025] In this document, the terms "upper" and "lower" refer to that element or that part of an element which, with respect to another element or to another part thereof, has a distance which is greater or less with respect to the floor.

[0026] Inside the machining cabin, the conveyor has a configuration of maximum and minimum extension, therefore with maximum and minimum dimensions for the roto-translation of the machining tools, respectively at the collection position of the finished semiproduct and at the rest position. Preferably, the load-bearing frame is associated with the machining cabin. The Applicant has provided a system for picking up the finished semiproducts which therefore minimises the overall dimensions inside the machining cabin in such a way as to allow the tools to operate in the best possible way, occupying space only when it is necessary, that is to say, during the collection of the finished workpiece.

[0027] Moreover, during the machining of the rear portion of the workpiece, that is to say, in the tail machining performed in the cabin, the gripper supports the semiproduct whilst the tools are active.

[0028] Advantageously, the slidable gripper moves on a horizontal guide integral with the retractable conveyor and extending along the longitudinal direction, at least between the end portion of the conveyor and the unloading or loading point of the semiproduct.

[0029] Preferably, the horizontal guide is defined on the supporting frame of the conveyor.

[0030] According to the preferred embodiment, the slidable gripper is mounted on a slider carriage which engages directly on the horizontal guide.

[0031] Once the semiproduct has been unloaded (or loaded) by the slidable gripper on the conveyor, a pusher, integral with the load-bearing frame, transports the semiproduct from the unloading (or loading) point to the storage area.

[0032] In order to avoid the risk that the machining dust can damage the mechanics of the conveyor, the Applicant has provided that the end portion of the conveyor, that is to say, the portion in direct contact with the machining cabin, is protected from dust by means of a cover integral with the conveyor.

[0033] Preferably, the cover is associated with the supporting frame of the conveyor.

[0034] Consequently, the cover is adapted to penetrate inside the machining cabin in the collection position of the semiproduct.

[0035] It preferably has a width at least equal to the difference between the maximum stroke and the minimum stroke of the conveyor, in its configuration of maximum and minimum extension, respectively. Moreover, the cover is preferably shaped in such a way that in the position of gripping the workpiece from the machining cabin it houses inside the slider carriage and the slidable gripper.

[0036] There is also advantageously a control unit for the synergic control of the movement of the conveyor along the longitudinal direction and the movement of the slidable gripper along the horizontal axis and along the longitudinal direction, in such a way that the two elements, conveyor and gripper, are coordinated in the collection and unloading of the finished semiproduct.

[0037] In particular, the control unit is for coordinating, by means of a suitable processing program, all the movements of the conveyor and of the gripper, to perform all the functions described (feeding of the workpiece, machining, collection and movement of the finished semiproduct, etc.).

[0038] Another aspect for which the Applicant seeks protection relates to a machine for machining elongated, wooden semiproducts, such as planks, slats, crossbeams, boards and the like, which comprises the withdrawal system described.

[0039] Yet another aspect of the invention relates to a method for picking up and conveying elongated, wooden semiproducts, such as planks, slats, crossbeams, boards and the like, from a machining unit of a machine for machining wood, to a storage area, which comprises the following steps. A conveyor is moved to transport semiproducts along a longitudinal direction, from its rest position to a position for collecting a finished semiproduct at the outfeed from a machining cabin of the machine, in such a way that, in the collection position, the conveyor has a relative prominent end portion inside the machining cabin. The finished semiproduct is collected inside the machining zone, from the end portion of the conveyor. The slidable gripper is moved along the longitudinal direction towards a gripping position of the semiproduct, in such a way as to withdraw the semiproduct by moving at least one of its jaws along the transversal axis when it is at the end portion of the retractable conveyor, where there is, in short, the exchange of the workpiece being machined between the conveyor and the slidable gripper.

[0040] The conveyor is then made to withdraw by moving it, again along the longitudinal direction, from the collecting position to the rest position, in such a way as to minimise the dimensions in the machining cabin. Therefore, the slidable gripper which retains the semiproduct is moved along the longitudinal direction up to an unloading point substantially defined in the mid portion of the

conveyor.

[0041] The semiproduct is released on the conveyor by opening reciprocally the jaws of the slidable gripper, and, subsequently, it is transported from the unloading point to the storage area.

[0042] Preferably, during gripping of the semiproduct by the conveyor by the slidable gripper and/or during the release of the semiproduct on the conveyor, the gripper is stationary in the gripping position along the longitudinal direction: in this position at least one of the jaws opens and closes for gripping or releasing the semiproduct.

[0043] There is also a coordinated command for moving the conveyor and the slidable gripper along the longitudinal direction, in such a way that the respective positions during the gripping and unloading of the semiproduct, by the gripper, from and on the conveyor are synchronised.

[0044] This command is entrusted to a control unit which controls the movements of the elements of the withdrawal system.

[0045] Similarly to what has been said for the withdrawal system, the method described above is also not only for picking up, but also for supporting and/or moving and/or referencing.

[0046] Obviously, for conveying semiproducts from a storage area to the machining unit of the machine for machining wood on which it is installed, there will be substantially the same steps but, in this case, the conveyor is moved for transporting the semiproducts along the longitudinal direction, from its rest position to the collecting position of the workpiece to be machined in the storage area for feeding it into the machining unit. Advantageously, the machine for machining wood has two withdrawal systems of this kind: one at the infeed and the other at the outfeed of its machining unit.

[0047] Further features and advantages of the invention are more apparent in the detailed description below, with reference to a preferred, non-limiting embodiment of the withdrawal system, illustrated by way of example and without limiting the scope of the invention, with the aid of the accompanying drawings, in which:

Figure 1 is a side cross-section view substantially normal relative to the floor of the working zone 200 of a machine 1 for machining wood, on which is installed the system 10 for picking up elongated, wooden semiproducts P according to the invention;

Figure 2 is a perspective view of a detail of the withdrawal system 10;

Figure 3 is a perspective view of the machine 1 for machining wooden semiproducts P, which shows in sequence a loading unit 100, a machining unit 200 and an outfeed unit 300, with an enlarged detail of the withdrawal system 10 showing the conveyor 13 in a collecting position;

Figure 4 is a perspective view of the machine 1 for machining wooden semiproducts P, which shows in sequence a loading unit 100, a machining unit 200

and an outfeed unit 300, with an enlarged detail of the withdrawal system 10 showing the conveyor 13 in the rest position.

[0048] The above-mentioned drawings show a preferred embodiment of a system for picking up elongated, wooden semiproducts, according to the invention, which is identified in its entirety with the numeral 10 and which comprises a load-bearing frame 11 adapted to be associated with the casing 20 of a machining cabin 2 of a machine 1 for machining wood, at the outfeed unit 300 of the finished semiproducts P.

[0049] The frame 11 has a conveyor 13, that is to say, a roller which comprises a set of rollers 13c supported by a frame 13b shaped like a pair of beams which support the rollers 13c.

[0050] The conveyor 13 extends along a longitudinal direction X (which coincides with the direction of extension of the semiproduct P) and allows the movement of the semiproducts P from a machining unit 200 to a storage area, located downstream of the outfeed unit 300. The conveyor 13 is movable between a position for collecting the semiproduct P from the inside of the machining cabin 2 and a rest position (Figures 3 and 4).

[0051] The roller of the conveyor 13 is preferably adapted to slide on the tracks 11b of the frame 11 supported by column elements 11a associated with the floor (Figure 3).

[0052] The sliding occurs, for example, by using rolling means.

[0053] There is a slidable gripper 14 positioned above the conveyor 13, equipped with two jaws: a first jaw 14a and a second jaw 14b.

[0054] The jaw 14a is fixed, whilst the jaw 14b is movable on the sliding guide 14c which extends along a transversal axis Y substantially normal to the longitudinal direction X, by the action of a pneumatic cylinder 14d, for gripping and releasing the semiproduct P interposed between the jaws 14a and 14b.

[0055] As shown in Figure 2, the guide 14c is supported by a support 17 (which obviously translates with the gripper unit 14 along the direction X).

[0056] The gripper is also movable along the direction X where it translates independently relative to the retractable conveyor 13, between at least one end portion 13a of the conveyor 13, which faces the machining unit 200 - using an access opening 26 defined on the wall 2b of the cabin 2 - and an unloading point substantially defined in the mid portion of the conveyor 13. According to the preferred embodiment, the gripper 14 translates along the entire conveyor, in any position.

[0057] The translation of the conveyor 13 along the longitudinal direction X allows the gripper 14 to withdraw the semiproduct P collected by the conveyor close to the end portion 13a to move it to the unloading position.

[0058] For this reason, in the proximity of the rest position, the slidable gripper 14 picks up the semiproduct P from the conveyor 13 and, close to the unloading point,

the gripper 14 releases the semiproducts P on the conveyor 13.

[0059] As a result of its movement, in the machining cabin 2 the retractable conveyor 13 has a configuration of maximum and minimum extension, respectively in the collecting position of the semiproduct P and in the rest position.

[0060] The movement of the gripper 14 on the conveyor 13 is performed by means of a pair of horizontal guides 12 defined on the beams of the frame 13b of the conveyor 13 (which also extends along the longitudinal direction X). The guides 12 are located on the sides of the conveyor 13 and comprise the sliding of the gripper 14 by means of a device, of the known type, with recirculating ball screw runners driven by an electric motor 12a. With reference to Figure 4, the system 10 includes a pusher 16, integral with the load-bearing frame 11, for pushing the semiproduct P from the unloading point to the storage area along the transversal axis Y, in such a way as to move the finished semiproduct P away from the gripper 14, after the gripper 14 has moved the semiproduct P to the unloading point and has therefore opened the jaw 14b releasing it: once the semiproduct P has been released by the gripper 14 on the roller conveyor 13, the gripper 14 moves forwards, along the longitudinal direction X towards the storage area, and the pusher 16 enters into action.

[0061] In order to allow the reciprocal sliding of the gripper 14 and of the pusher 16, the support 17 defines a slot 17a.

[0062] In order to avoid contamination of the roller of the retractable conveyor 13 by machining dust, a protective cover 15 is installed for the end portion 13a. The cover 15 is associated with the frame 13b of the conveyor 13 and moves with it.

[0063] For this reason, as shown in Figure 1, the cover 15 penetrates inside the machining cabin 2, together with the portion 13a, by means of the access opening 26, in the collecting position of the semiproduct and leaves in the rest position.

[0064] Obviously, the cover 15 has a width at least equal to the difference between the maximum stroke and the minimum stroke of the conveyor 13, in its maximum and minimum extension configurations, respectively, and is shaped in such a way that it can house the gripper unit in the gripping position.

[0065] The movement of the conveyor 13 and of the gripper 14, as well as the control of the reciprocal positions, is controlled by a control unit which synergically commands the translation of the conveyor 13 and the slidable gripper 14 along the longitudinal direction X as well as the movement of the jaw 14a along the transversal axis Y so that the workpiece P is correctly retained by the gripper 14.

[0066] During operation, the control unit firstly commands the movement of the retractable conveyor 13 along the longitudinal direction X, from its rest position to the collecting position of the semiproduct P. After

reaching this position, the conveyor 13 has the prominent end portion 13a inside the cabin 2, in such a way as to collect the finished semiproduct P on its end portion 13a; from here on the gripper 14 and the conveyor 13 travel together, integrally.

[0067] The control unit allows the slidable gripper 14 to be translated, along the direction X, towards the gripping position of the semiproduct P, close to the end portion 13a and therefore the movable jaw 14b moves to close on the semiproduct P along the transversal axis Y, to grip on the semiproduct P.

[0068] The control unit actuates the conveyor 13 making it withdraw, from the collecting position, to the rest position, so as to minimise the dimensions in the machining cabin 2 and, at the same time, translates the slidable gripper 14, which retains the semiproduct P, along the longitudinal direction X, to the unloading point substantially defined in the mid portion of the conveyor 13.

[0069] The slidable gripper 14 conveys the semiproduct P to the unloading point and the jaw 14b is moved by the logic unit away from the fixed jaw 14a, in such a way as to release the semiproduct P.

[0070] The gripper 14 moves away along the direction X towards the storage area and the pusher 16, which is also controlled by the control unit, enters into operation, translating along the longitudinal direction up to a pushing position in such a way as to push the workpiece P along the axis Y, in an unloading area.

[0071] The control unit controls in a coordinated manner the movement of the conveyor 13 and the slidable gripper 14 along the longitudinal direction X, in such a way that the respective positions during the gripping of the semiproduct P by the conveyor 13 and during the unloading of the semiproduct P on the conveyor 13 by the slidable gripper 14, occur in a synchronised fashion.

[0072] From the above description it may be seen how the invention achieves the preset purpose and aims and in particular it should be noted that a withdrawal system is made which, with a movement which allows the recovery of many dimensions, guaranteeing a high quality standard of the product.

[0073] In particular, the retractable roller, thanks to the exchange of the semiproduct which occurs with the slidable gripper, allows space to be gained inside the machining cabin during the roto-translation of the machining tools.

[0074] Another advantage of the invention is due to the fact that the control unit is able to coordinate the movements of all the components of the withdrawal system so as to ensure effectiveness and safety, guaranteeing a high-end production.

[0075] Lastly, thanks to the withdrawal system and the pickup and conveying method implemented, a machine for machining wood is made, which provides high levels of performance.

[0076] The invention can be modified and adapted in several ways without thereby departing from the scope of the inventive concept.

[0077] Moreover, all the details of the invention may be substituted by other technically equivalent elements.

[0078] In practice, the materials used, as well as the dimensions, may be of any type, depending on requirements, provided that they are consistent with their production purposes.

Claims

1. A machine (1) for machining elongated, wooden semiproducts (P) such as planks, slats, crossbeams, boards and the like, comprising:

- a machining unit (200) for machining the semiproducts (P);
- an infeed unit configured to receive the semiproducts (P) from a storage area and to feed them to the machining unit;
- an outfeed unit (300), positioned downstream of the machining unit and configured to move the semiproducts (P) out of the machine;
- a withdrawal system (10), for withdrawing, guiding and supporting the semiproducts (P), coupled to the infeed unit and/or to the outfeed unit and comprising a load-bearing frame (11):

a conveyor (13), extending along a longitudinal direction (X) to move the semiproducts (P) towards or away from the machining unit (200);

a slidable gripper (14) positioned above the conveyor (13);

the conveyor (13) being movable between a collecting position, for collecting the semiproduct (P), where it is at least partly inside a machining cabin (2), and a rest position; the slidable gripper (14) comprising a first jaw (14a) and a second jaw (14b) movable relative to each other along an axis (Y) transverse to the longitudinal direction (X) to pick up and release the semiproduct (P) interposed between them;

the slidable gripper (14) being also movable on the conveyor (13) along the longitudinal direction (X) independently of the conveyor (13) between an end portion (13a) of the conveyor (13), confronting the machining unit (200), and an unloading or loading point.

2. The machine (1) according to claim 1, wherein the conveyor (13) has a configuration of maximum extension and of minimum extension inside the machining cabin (2) at the semiproduct (P) collecting position and at the rest position, respectively.

3. The machine (1) according to claim 2, comprising a

horizontal guide (12) integral with the conveyor (13), extending along the horizontal direction (X) and adapted to be engaged by the slidable gripper (14) in order to move it between the end portion (13a) and the unloading point of the semiproduct (P); the horizontal guide (12) being preferably defined on the supporting frame (13b) of the conveyor (13).

4. The machine (1) according to one or more of claims 1-3, comprising a pusher (16), integral with the load-bearing frame (11), for pushing the semiproduct (P) along the axis of translation (Y) away from the machining unit (200).

5. The machine (1) according to claim 4, wherein the slidable gripper (14) has a slot (17a) for translating the slidable gripper (14) and the pusher (16) relative to each other along the longitudinal direction (X).

6. The machine (1) according to one or more of claims 1-5, comprising a cover (15) for the end portion (13a), which acts as a protection against machining dust and which is integral with the conveyor (13).

7. The machine (1) according to one or more of claims 1-5, comprising a control unit for the synergically controlling the movement of the conveyor (13) along the longitudinal direction (X) and the movement of the slidable gripper (14) along the vertical axis (Z) and along the longitudinal direction (X).

8. The machine (1) according to one or more of claims 1-6, wherein the slidable gripper (14) is adapted to work substantially at an outfeed unit (300) for the semiproduct (P) and interposed between the machining unit (200) for machining the semiproduct (P) and the storage area for storing the finished semiproduct (P).

9. A method for withdrawing elongated, wooden semiproducts (P), such as planks, slats, crossbeams, boards and the like, from a machine unit (200) of a machine (1) for machining wood, according to claim 8, toward a storage area for storing the finished semiproducts (P), comprising the following steps:

- moving the conveyor (13) to transport the semiproducts (P) along a longitudinal direction (X) from its rest position to a collecting position for collecting a semiproduct (P) so that, at the collecting position, the conveyor (13) has an end portion (13a) that extends into a machining cabin (2) of the machine (1);
- collecting the finished semiproduct (P) on the end portion (13a) of the conveyor (13);
- moving the slidable gripper (14) along the longitudinal direction (X) towards a gripping position for gripping the semiproduct (P) in the prox-

imity of the end portion (13a), so as to grip the semiproduct (P) and lift it off the conveyor (13) by moving the slidable gripper (14) along a vertical axis (Z) substantially normal to the floor;

- moving the conveyor (13) from the collecting position to the rest position along the longitudinal direction (X) so as to minimize the dimensions of the machining cabin (2);
- moving the slidable gripper (14), holding the semiproduct (P), along the longitudinal direction (X) up to an unloading point substantially defined in the mid portion of the conveyor (13);
- resting the semiproduct (P) on the conveyor (13) by moving the slidable gripper (14) along the vertical axis (Z) towards the floor;
- transporting the semiproduct (P) from the unloading point to the storage area.

10. The method according to claim 9, comprising coordinating the movement of the conveyor (13) and the slidable gripper (14) along the longitudinal direction (X), so that the respective steps of positioning while the semiproduct (P) is picked up by the conveyor (13) and while the semiproduct (P) is unloaded onto the conveyor (13) by the slidable gripper (14) are carried out in synchrony.

11. The method according to claim 10, wherein while the semiproduct (P) is gripped by the conveyor (13) and/or while the semiproduct (P) is then unloaded onto the conveyor (13), the slidable gripper (14) is stopped at the gripping position along the longitudinal direction (X) and is lowered and raised along the vertical axis (Z) to cover the distance between the operating plane of the slidable gripper (14) itself and positioning plane defined by the conveyor (13).

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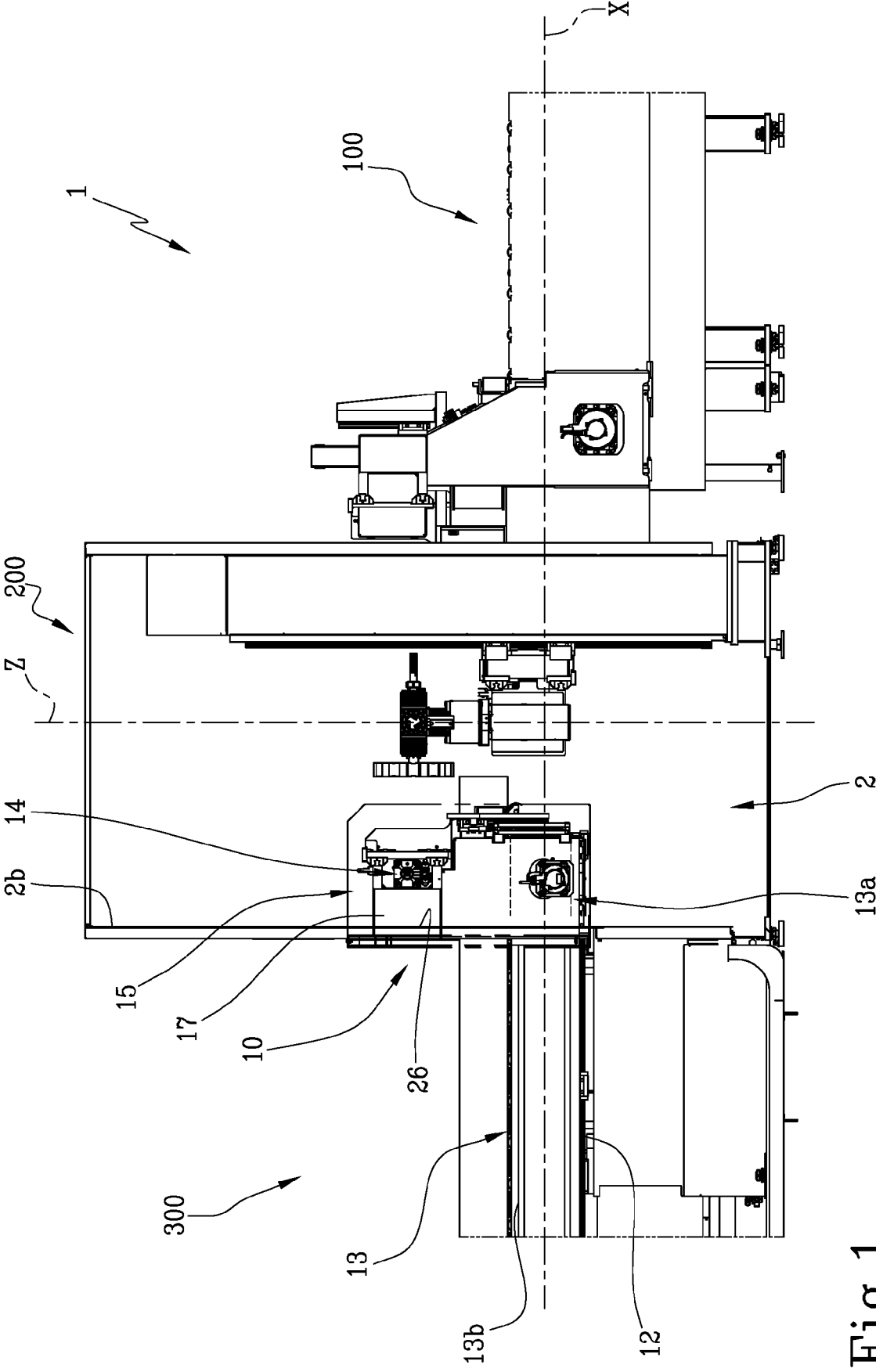
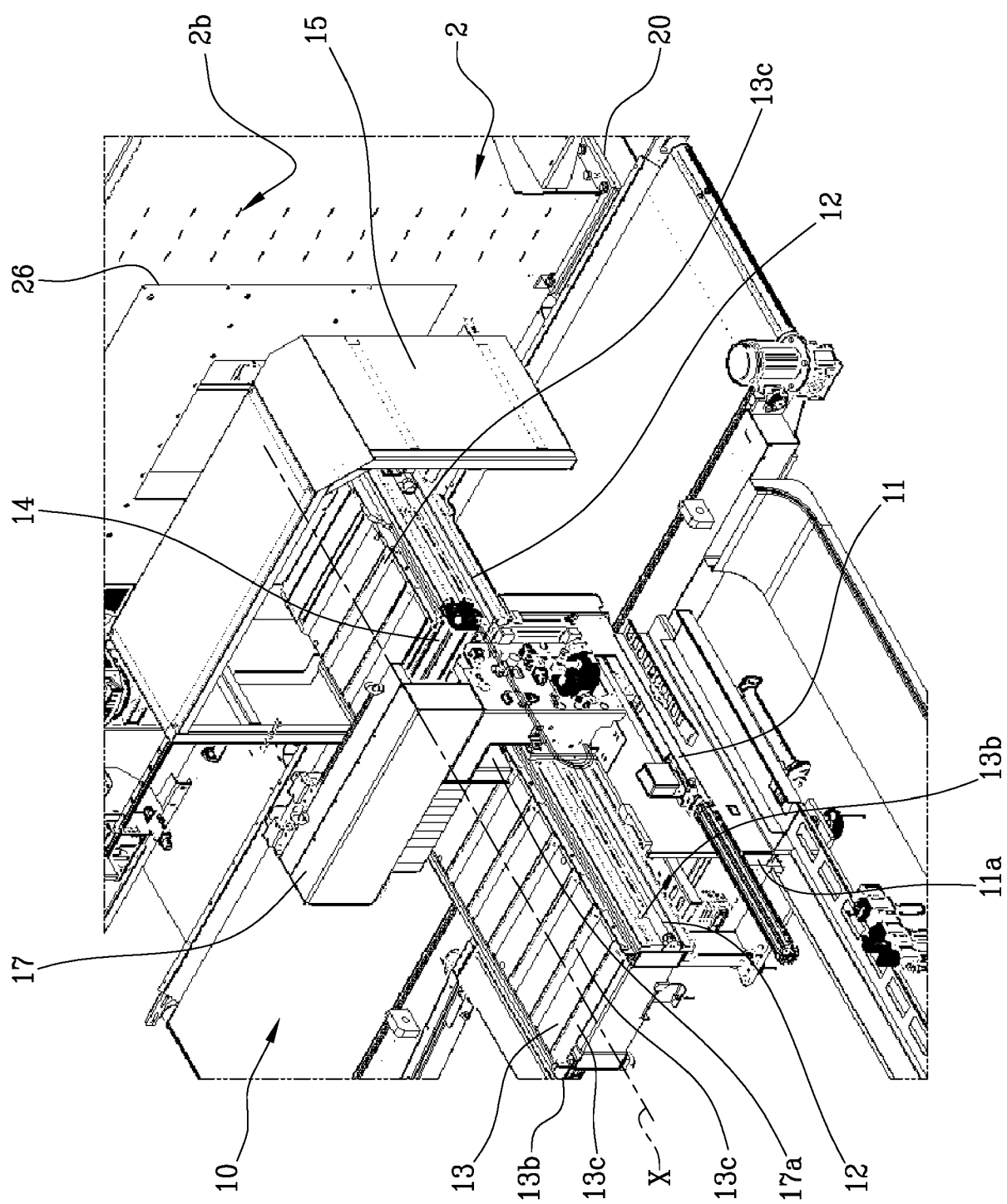


Fig.1



Fi. 2.

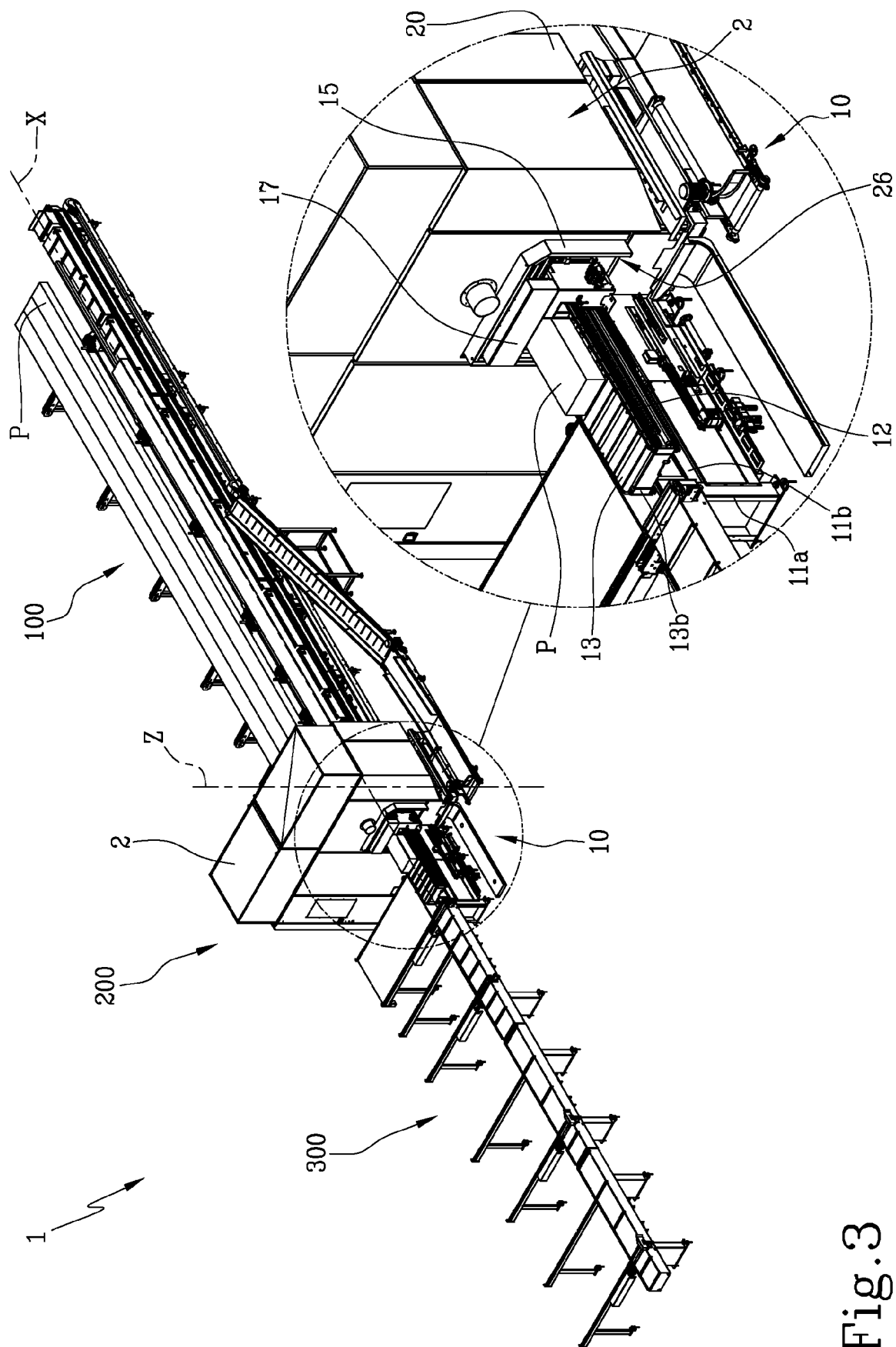


Fig. 3

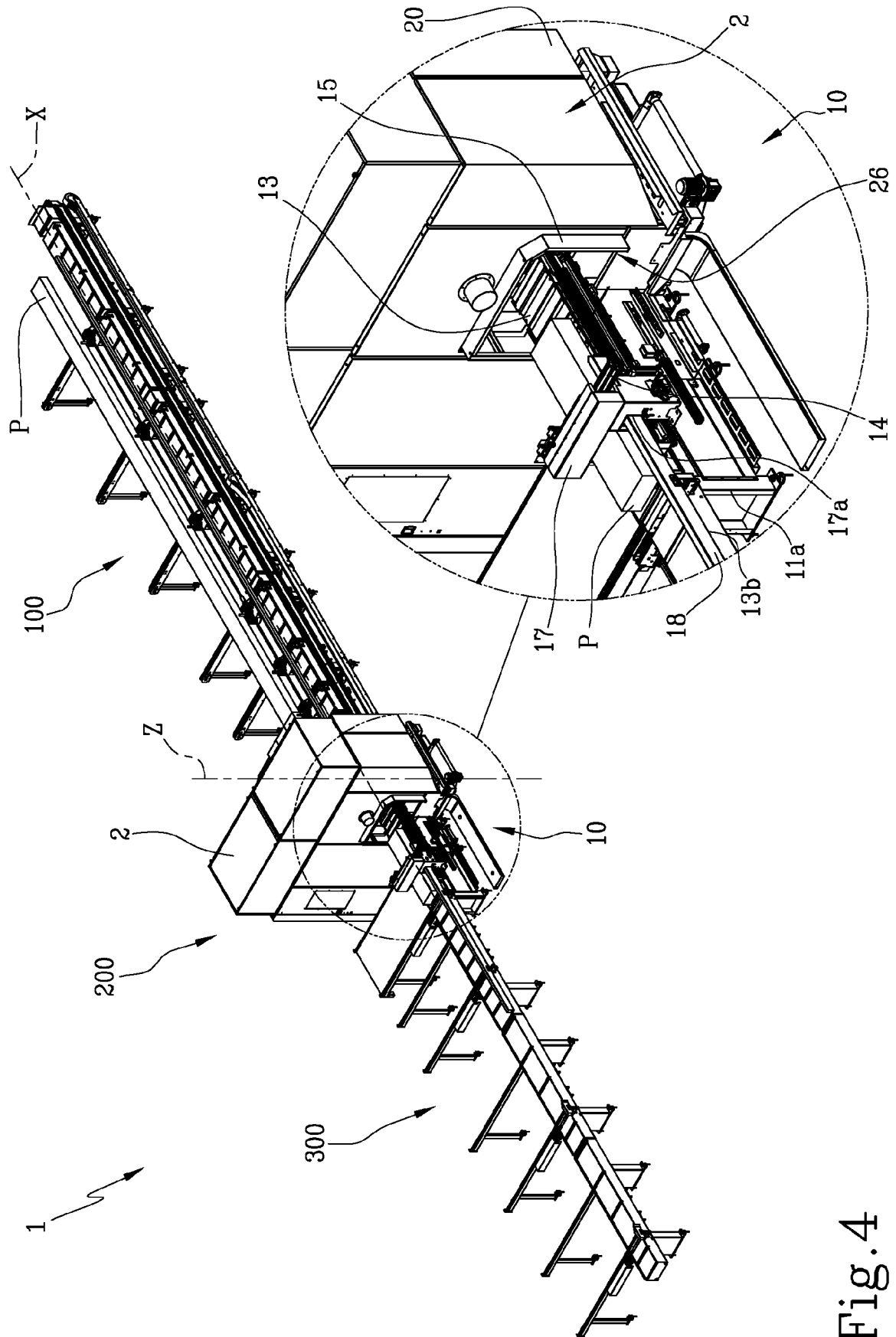


Fig. 4



EUROPEAN SEARCH REPORT

Application Number

EP 24 17 5171

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EPO FORM 1503 03.82 (P04C01)

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	EP 0 562 216 A1 (ALBISRIEDEN FENSTER [CH]) 29 September 1993 (1993-09-29)	1-4,7-11	INV.
A	* column 3, lines 27-49 * * figures *	5,6	B27M1/08 B27C5/06

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A	* paragraphs [0046] - [0052] * * figures *	3,5	

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A	* figures * * paragraphs [0025] - [0027] * * paragraphs [0044] - [0048] *	5,6	

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A	* figures 2, 4 * * page 5, lines 6-31 *	5,6	

			TECHNICAL FIELDS SEARCHED (IPC)
			B27M B27C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 17 July 2024	Examiner Mirza, Anita
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