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(54) **ACCESSORY APPARATUS FOR FEEDING SHEETS OF MATERIAL TO BE CUT IN NUMERICALLY CONTROLLED MACHINES (NCMS), AND NCM COMPRISING SAID ACCESSORY APPARATUS**

(57) Accessory apparatus (50) for feeding sheets of material comprising at least two beams (51) which are fixable, in a mounted configuration, to a numerical control cutting machine (1), wherein in said mounted configuration the beams (51) develop in projection with respect to a frontal portion of said machine (20), said beams (51)

supporting, in spaced relation with respect to the frontal portion of the machine (1), at least two pairs of opposite main slots (52) for holding as many transversal support bars (53) intended to support a roll (57) or another supporting element for supporting a sheet (2) of material to be cut.

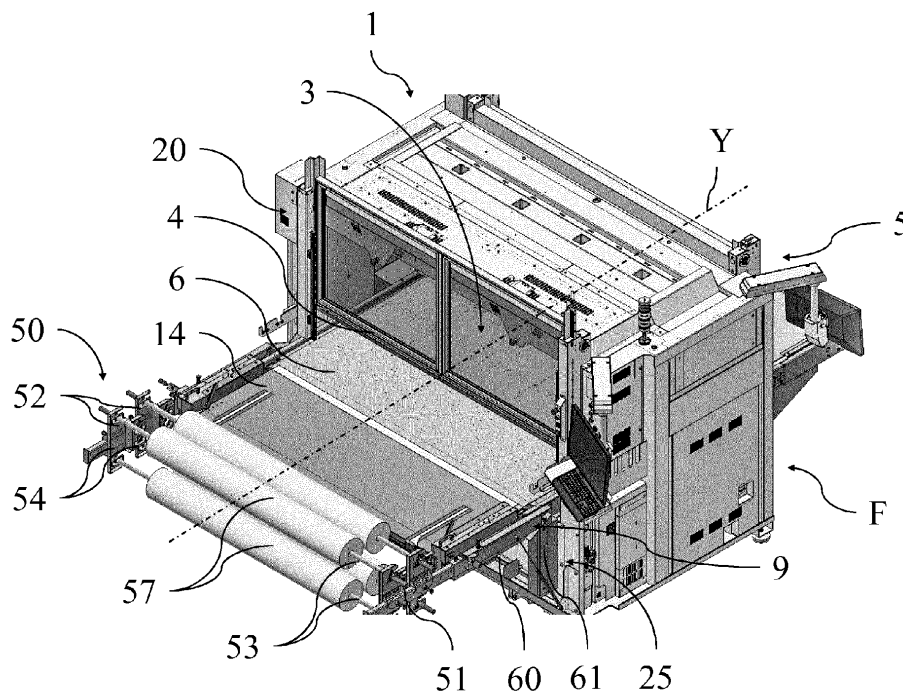


Fig. 5

Description

Field of application

[0001] The present invention relates to an accessory apparatus for a numerical control machine.

[0002] More particularly, the invention relates to an apparatus for feeding sheets of material to be processed in blade cutting machines, for instance for cutting sheets of material such as fabrics for clothing and hide goods, footwear items, automotive and furnishing articles or non-woven fabrics, leather, natural or synthetic hides, synthetic materials and the like.

[0003] The invention also relates to a numerical control machine for cutting at least one sheet or a multilayer of sheets of material to be processed comprising said accessory apparatus.

[0004] Said numerical control machine is preferably of the type comprising:

- a processing chamber or room;
- conveying means adapted to feed the sheet into said processing chamber along a forward direction;
- tool heads adapted to operate on the sheet in said processing chamber.

Prior art

[0005] As it is well known in this technical field, there are numerical control cutting machines or apparatuses capable of cutting sheets of material in an automated manner according to a predefined cutting pattern. The material to be cut may be for instance a sheet of plastic material, a natural hide, a fabric, a non-woven fabric, a cellulose-based material and the like. The cutting may be performed on a unique sheet or on a plurality of sheets stacked upon each other so as to form what is known in the field as mattress.

[0006] In particular, these machines are equipped with a conveyor belt capable of moving the sheet to be cut along a plane XY, which will be hereinafter also defined cutting table, and inside a cutting chamber, which is provided with cutting tool heads actuated by computerized means for processing the material.

[0007] The sheet or sheets to be cut in the machine are unrolled from rolls or other supports which rest on independent racks, placed at a short distance from the mouth of the machine.

[0008] Although other constructions are possible for the roll-holder structure, the most widespread is that of a frame with wheels equipped with a series of vertical bars; these support the rolls at different heights, so as to also allow the feeding of more sheets to the machine for forming a mattress.

[0009] Although substantially satisfying the purpose, these roll-holder structures have the obvious drawback

of high overall dimensions and of a not negligible logistical constraint linked to their movement. Moreover, it should be noticed how the weight of the structure itself loaded by the rolls is relatively high, especially in the event in which the material to be cut is leather or another material of similar specific weight.

[0010] The technical problem underlying the present invention is to provide an accessory apparatus for feeding the sheet material, which replaces the above roll-holder structures, thus solving the above-mentioned drawbacks, and which in particular is slim and easy to be repositioned and/or stored in case of non-use.

[0011] A further object of the invention is to provide a numerical control machine which integrates, at least in a use condition, an accessory apparatus for feeding sheets according to the above-mentioned features.

Summary of the invention

[0012] The solution idea underlying the present invention is to provide an accessory apparatus which performs the function of the roll-holder rack directly fastened, in a fixed or removable manner, to the frontal portion of the cutting machine.

[0013] The above technical problem is thus solved by an accessory apparatus for feeding sheets of material comprising at least two beams that are fixable, in a mounted configuration, to a numerical control cutting machine, wherein in said mounted configuration the beams develop in projection with respect to a frontal portion of said machine, said beams supporting, in spaced relation with respect to the frontal portion of the machine, at least two pairs of opposite main slots for supporting as many transversal support bars for holding a roll or another supporting element for supporting a sheet of material to be cut.

[0014] It is easy to see how the above proposed structure is particularly slim, since the support function is entirely performed by the two beams that are fixable to the machine.

[0015] Thanks to said structure, the accessory apparatus may be removably associated with the machine; the beams may be for instance introduced in a releasable manner into suitable attachment seats obtained on the machine or on intermediate elements fixed to the machine.

[0016] Of course, nothing prevents from definitively fixing, for instance by welding, the beams to the front part of the machine or to another intermediate element fixed to the machine.

[0017] Advantageously, the entire accessory apparatus may be cantilever supported by the beams in the mounted configuration. This expedient allows an extremely quick mounting, since just the fixing of the beams is necessary to configure the support structure. Furthermore, this solution allows a complete freedom of maneuver for the operators and/or the other machinery below the beams.

[0018] Alternatively, discharge feet may be arranged, preferably at the distal end of the beams, to discharge part of the weight of the structure to the ground. The discharge feet may be hinged to the beam, so as to be brought to rest only in a mounted and/or operating configuration.

[0019] Preferably, two of the pairs of main slots are respectively placed below and above the substantially horizontal plane defined by the beams.

[0020] In particular, the two pairs of slots may be overlapped.

[0021] In this way, the axial dimension of the beam is advantageously used to fix a plurality of rolls, thus favouring the simultaneous unrolling of two rolls at different heights to define a mattress of several sheets.

[0022] It is noticed that, especially in case of rolls of material having a high specific weight, the possibility to hang more than one roll in the axial positions allows reducing the bending loads on the structure thanks to the lower torque arm.

[0023] The accessory apparatus may advantageously comprise a plurality of attachments, still associable in opposite pairs on the length of the two beams.

[0024] The attachments have the main slots for the attachment of the transversal support bars and may advantageously be removably associated to the beams.

[0025] In this way, when the attachments are disassembled the beam is free to slide in a telescopic manner within a housing which is integral to the machine, thus favouring the assembly and configuration operations.

[0026] Each attachment preferably comprises: an upper wing on which a main slot is obtained; and a lower wing, on which another main slot is obtained.

[0027] The attachments preferably comprise at least one secondary slot in addition to the above main slots.

[0028] The secondary slots of opposite attachments on the two beams face each other for supporting a transversal guide bar having a guide function for the sheet of material unrolled from the roll.

[0029] Said secondary slots are placed in a closer position to the beam and nearer to the machine with respect to one of the main slots formed on the corresponding attachment. Thus, the sheet unrolled from the roll supported by the main slots is then deviated by the transversal guide bar supported by the secondary slots, so as to take up the correct horizontal orientation which substantially corresponds to the plane defined by the beams.

[0030] Preferably, a secondary slot is provided for each main slot.

[0031] Preferably, the secondary slots are formed on a front wing of the attachments, said front wing being in a retracted position towards the inside of the apparatus with respect to the upper and lower wings.

[0032] Preferably, the attachments may be mounted in a plurality of different axial positions along the beam. In this way, it is possible to configure the accessory apparatus according to the number and position of the rolls to be used for a determined cutting operation.

[0033] To allow the mounting, the attachments may have a coupling pin, preferably biased in a coupling position by elastic means, said pin being alternatively insertable into a plurality of holes of the beam.

[0034] Preferably, the attachments have a planar configuration, the slots being obtained as open cuts on the outer profile of the attachment. In particular, the slots have a substantially C-shaped configuration, with a lead-in feature in a position higher than the seat to define a stable gravitational balance of the transversal bar.

[0035] As previously mentioned, the beams may advantageously slide in a telescopic manner with respect to the machine.

[0036] The beams may be blocked in a plurality of different positions which are more or less extracted based on the axial extension needs linked to the number of rolls used in the planned cutting operation.

[0037] Their progressive extraction with respect to the housing may be motorized or manual.

[0038] The transversal support bars not necessarily must support a roll. Indeed, between two successive transversal support bars a support sheet may be laid as a hammock for a sheet of material to be cut folded on itself. As an alternative to the support sheet a rigid support plane with analogous function may be used. The sheet is then progressively fed and unrolled during the cutting operations of the machine.

[0039] The above-mentioned technical problem is also solved by a numerical control machine for cutting at least one sheet or a multilayer of sheets of material to be processed, comprising:

- a processing area (preferably defined by a chamber or room);
- conveying means adapted to feed the sheet into said processing area along a forward direction;
- tool heads adapted to operate on the sheet in said processing area; characterized in that it further comprises:
- an accessory apparatus associated with said machine and structured according to what has been described above.

[0040] The accessory apparatus may be a part of the machine, possibly also integrated thereto; or alternatively it may be a distinct apparatus associable with the machine in the use conditions.

[0041] The above machine may comprise a front device equipped with a support plane for the sheets which is foldable between: a vertical rest position; and a horizontal operating position in which it is in substantial continuity with the conveying means.

[0042] In this case, the beams of the accessory apparatus may be associated with the distal end of said plane; for instance, they may be introduced in a telescopic man-

ner into lateral arms of the movable plane.

[0043] Of course, in this case the beams are mounted and/or extracted with respect to the plane when the plane itself is in the raised operating configuration.

[0044] As an alternative to what has been stated above, the accessory apparatus may be positioned in a lower position with respect to the plane of the machine. In this case, the machine may or not provide the above front device.

[0045] Advantageously, the accessory apparatus mounted in a lower position may be horizontally movable between a retracted position, in which it is housed below said conveying means of the machine, and an extracted position in which it extends in front of the machine.

[0046] Thanks to this expedient the accessory apparatus does not clutter the volumes in front of the machine when it is in the rest configuration.

[0047] The features and advantages of the apparatus according to the invention will become apparent from the following description of some exemplary embodiments given by way of non-limiting example with reference to the accompanying drawings.

Brief description of the drawings

[0048] In those drawings:

- figure 1 shows a perspective view of a machine equipped with an accessory apparatus according to a first embodiment of the present invention, wherein the accessory apparatus is configured to support two rolls of material both in the upper position;
- figure 2 shows a perspective view of a machine equipped with an accessory apparatus according to the first embodiment of the present invention, wherein the accessory apparatus is configured to support two rolls of material both in the lower position;
- figure 3 shows a perspective view of a machine equipped with an accessory apparatus according to the first embodiment of the present invention, wherein the accessory apparatus is configured to support two rolls of material both in the overlapped configuration;
- figure 4 shows a perspective view of a machine equipped with an accessory apparatus according to the first embodiment of the present invention, wherein the accessory apparatus is configured to support four rolls of material both in the lower position;
- figure 5 shows a perspective view of a machine equipped with an accessory apparatus according to the first embodiment of the present invention, wherein the accessory apparatus is configured to support four rolls of material in a configuration overlapped two by two;

- figure 6 shows a perspective view of a machine equipped with an accessory apparatus according to the first embodiment of the present invention, wherein the accessory apparatus is configured to support eight rolls of material in a configuration overlapped four by four;

- figure 7 shows an enlarged detail of figure 2, relating to the bar attachments attached to the rack of the accessory apparatus;

- figure 8 shows an enlarged detail of figure 3, relating to the bar attachment attached to the rack of the accessory apparatus;

- figure 9 shows a perspective view of a machine equipped with an accessory apparatus according to a second embodiment of the present invention, said machine being moreover equipped with a front fold-away plane;

- figure 10 shows a perspective view of a machine equipped with an accessory apparatus according to the second embodiment of the present invention, said machine being without the front foldaway plane of figure 9, the accessory apparatus being in an extracted position;

- figure 11 shows a simplified side view of the machine with accessory apparatus in figure 10;

- figure 12 shows a perspective view of the machine with accessory apparatus in figure 10, the accessory apparatus being in a retracted position;

- figure 13 shows a simplified side view of the machine with accessory apparatus in the position of figure 12;

- figure 14 shows a perspective view of a machine equipped both with a first accessory apparatus according to the first embodiment of the present invention, and with a second accessory apparatus according to the second embodiment of the present invention.

Detailed description

[0049] With reference to those figures 1-6, a numerical control machine for cutting sheets of material according to the present invention with an accessory apparatus 50; 50' removably associated with the apparatus 1 is globally and schematically indicated with reference number 1.

[0050] The figures represent schematic views and are not drawn to scale, but instead they are drawn so as to emphasize the important features of the invention. Moreover, in the figures, the different elements are depicted in a schematic manner, their shape varying depending on the application desired.

[0051] Moreover, the same reference numbers refer to elements that are identical in shape or function. Finally, particular features described in relation to an embodiment illustrated in a figure are also applicable to the other embodiments illustrated in the other figures.

[0052] In its more general form, the machine 1 is adapted to process, and in particular is adapted to automatically cut, folding or flexible sheets 2 of material, for instance fabrics for clothing items or accessories, leather, natural or synthetic hides, non-woven fabrics, cellulose-based material, other synthetic materials and the like.

[0053] In the context of the present invention, the term "sheet" indicates any element of any shape and material, having a substantially two-dimensional size and a certain thickness (generally reduced), which must be cut through the machine. As it will be noticed hereinafter in greater detail, often the cutting of a plurality of sheets stacked on top of each other so as to form a multilayer, and having substantially coincident shape and size, even if not necessarily, is often performed.

[0054] The machine 1 is thus a numerical control machine equipped with data and program memories. In particular, the apparatus 1 comprises a control unit including said memories and suitably programmed and configured for the management and automatic control thereof. The control unit may be for instance an integrated computerized unit or may be external to the machine 1 and operatively connected thereto. Furthermore, it is noticed that the control unit may be a unique central unit or may comprise a plurality of local units, considered as controllers associated with various actuators arranged on and in the machine.

[0055] In general, the machine 1 of the present invention comprises a frame F, made for instance from a metallic material, which supports and encloses the main components of the machine.

[0056] More particularly, the machine 1 comprises a cutting chamber or working room 3 inside which the sheet 2 processing occurs. The cutting chamber 3 has a loading inlet 4 through which the sheet 2 is fed and an unloading outlet 5 from which the cut portions of said sheet 2 are recovered.

[0057] Furthermore, the apparatus 1 comprises a motorized conveyor belt 6 which crosses the cutting chamber 3 from the inlet 4 to the outlet 5 and is adapted to feed and convey the sheet 2 into said cutting chamber 3.

[0058] The conveyor belt 6 may be covered by a sacrificial and breathable support layer (not illustrated in the figures) which is subjected to multiple cutting steps during various processing and which is periodically replaced. Below the support layer, conventional suction means are provided (also not illustrated in the figures), which allow holding the sheet 2 in place on the conveyor belt 6 during the forward movement due to suction.

[0059] Inside the cutting chamber one or more tool heads (not illustrated), which are adapted to operate on the sheet 2 for the cutting, are active.

[0060] The machine 4 may or not comprise a front de-

vice 9 to facilitate the feeding of said sheet 2.

[0061] Said front device 9 is associated with the apparatus 1 and comprises at least one movable element or plane 14 supported in an operating position close to a proximal end of the conveyor belt 6 through a suitable support structure 25 connected to the lower part of a frontal portion 20 of the frame F of the apparatus 1.

[0062] The movable plane 14 is substantially a rectangular-shaped plate support, on which surface the sheet 2 to be loaded on the conveyor belt 6 is arranged.

[0063] The movable plane 14 is movably guided from a rest position, in which it is vertically extended close to the above lower frontal portion 20, to an operating position in which it is horizontally extended.

[0064] In the patent figures, when it is present, the movable plane 14 is always represented in the horizontal operating position.

[0065] Support motorized means for supporting the movable plane 14 for actuating said plane are provided between the two extreme positions. Said motorized means are step electric motors which are adjustable with particular precision and interlocked to the control unit of the apparatus 1.

[0066] Said motorized means, and the related support guides, are structured to actuate the movable plane 14 in roto-translation from a rest laying position and to make it take up an operating position in which it is partially above the proximal end 13 of the conveyor belt 6. In the rest position the plane 14 is folded away parallel to the lower frontal portion 20 of the frame F.

[0067] The motorized plane 14 is configured to facilitate the feeding of a sheet 2 to be processed on the conveyor belt 6, said movable plane 14 being movably guided towards and away from the proximal end of the conveyor belt 6.

[0068] Still more particularly, the movable plane 14 is moved in horizontal translation in a direction parallel to the movement direction of the conveyor belt 6 (i.e. the direction Y) and is particularly movably guided between a backward or retracted position, in which it is spaced from the proximal end of the conveyor belt 6, as illustrated in figure 3, to a feeding position, in which it is overlapped to said proximal end 13 of the conveyor belt 6, as illustrated in figure 4.

[0069] Instead, when it is in the feeding position, a distal portion of the movable plane 14 is capable of partially overlapping to the conveyor belt 6, for instance by a stretch of some tens of centimeters, so as to easily feed the sheet 2, making the free end of the sheet 2 lay on said conveyor belt 6.

[0070] Thanks to the presence of the frontal device 9, the sheet 2 may be positioned on the conveyor belt 6 in a simple and effective manner. In fact, the movable plane 14 is substantially cantilever supported outside the machine 1 and makes the activity of preparing the new sheet to be loaded easy for the operator. Furthermore, it also makes the mutual alignment of the various layers of sheets 2 and their alignment with respect to the move-

ment of the conveyor belt easy.

[0071] Suitably, the movement of the movable plane 14 is controlled in an automated manner by the control unit 21 and, in an embodiment, it is synchronized with that of the conveyor belt 6.

[0072] The movable plane 14 laterally has two arms 60 hinged with respect to as many uprights 61 integral with the support structure 25.

[0073] The previously introduced accessory apparatus 50; 50' is made of two beams 51, a plurality of planar attachments 54 associable with said beams 51 and transversal support 53 and guide 56 bars supported by attachments 54 located in opposite position on the two beams 51.

[0074] The above elements are variably configurable, as exemplified by figures 1-6, to support one or more rolls 57 - placed on the support bars 53 - in different positions of the material 2 to be cut. The use of several rolls 57 allows simultaneously unrolling several layers of material 2 to make a mattress to be cut in the machine 1.

[0075] The guide bars 56, visible in figure 6, allow the rolls to be deviated to a planar orientation which is substantially continuous with respect to that of the conveying means 6, thus avoiding interference between sheets unrolled from successive rolls 57.

[0076] In a configuration not shown in the enclosed figures, two successive transversal support bars 53 may support a support sheet, laid as a hammock, arranged to support the sheet 2 of material to be cut which is folded several times on itself; or as an alternative a support plane with analogous function. In this case there is an alternative type of feeding, which is suitable for some materials 2 which are not provided rolled in rolls.

[0077] The beams 51 are preferably made as metal sections having rectangular or square section, and are cantilever fixed to the machine 1 or to the movable plane 14.

[0078] The attachments 54 are a plurality of pairs comprising a right attachment and a left attachment which are specular to each other. The attachments 54 of each pair must be associated facing opposite the two beams 51 and provide for different main 52 and secondary 55 slots, which are adapted to support the support 53 and transversal guide bars 56, respectively.

[0079] The attachments 54 are removably mounted on the beams 51, so that in the various configurations of the apparatus 50 they can be used in a different number.

[0080] Each attachment 54 is preferably made of metal sheet and thus has a substantially planar conformation.

[0081] It has two wings, an upper one 54a and a lower one 54b, which are opposite and substantially specular to each other. Both wings have a main slot 52. Said slot is made as a C-shaped recess, preferably made by shearing, which leads to a lowered seat where the transversal bar 53 is housed.

[0082] Friction reduction means 70, visible in figure 7, may be attached to the sheet metal at the bottom of each lowered seat, to facilitate the rotation of the transversal

bar 53 within said seat.

[0083] The attachment 54 also comprises a frontal wing 54c, facing towards the machine 1, defined by a recess of the sheet inwards (i.e.: towards the opposite attachment 54) with respect to the upper 54a and lower 54b wing, which instead are coplanar to each other.

[0084] The frontal wing has two secondary slots 55, shaped analogously to the main slots 52 and also equipped with friction reduction means. Said secondary slots 55, as previously stated, are arranged to support a guide transversal bar 56, which is slightly shorter than the transversal support bars 53.

[0085] The secondary slots 55 are arranged above and below with respect to the beam 51 and are closer to the beam with respect to the corresponding main slot 52. Thus, the transversal support bar 53 is positioned downstream with respect to the roll unrolled from the transversal support bar, and in a close position to the plane defined by the beams 51.

[0086] The attachment 54 also comprises, on the outer face thereof, a rest flange 54d equipped with a flap and arranged to straddle the beam 51 which the attachment is associated with.

[0087] On the flap of the rest flange 54 a coupling pin 58 is introduced, which introduces into one of a plurality of equidistant holes 59 formed on the outer face of the beam 51. The coupling pin 58 thus allows fixing the attachment 54 in the desired position along the beam 51.

[0088] The coupling pin 58 is equipped with elastic means which keep it in an inserted position within the selected hole 59.

[0089] The accessory apparatus 50; 50' is illustrated in the enclosed figures in two different embodiments, which are different only in the different attachment point of the beams 51. The foregoing description applies to both embodiments.

[0090] In a first embodiment, represented in figures 1-8, the accessory apparatus 50 is associated with the end of the movable plane 14 when it is in the raised configuration.

[0091] In this case, the plane defined by the beams 51 is substantially at the height of the plane of the machine 1, namely it is a feeding plane which is substantially continuous with respect to that of the conveying means 6.

[0092] The beams 51 are introduced, in this case telescopically, into the arms 60 of the movable plane, which are advantageously configured as hollow sections. The beams 51 may be blocked in a position which is more or less extracted with respect to the arms, according to the needs of use of the machine.

[0093] In a second embodiment, represented in figures 9-13, the accessory apparatus 50' is directly associated with the machine 1; in this case the beams 51 are introduced into a sliding seat below the conveying means 6.

[0094] The plane defined by the beams 51 is thus considerably below the plane of the machine 1, namely that of the conveying means 6.

[0095] In this case the machine 1 may not be provided

with the front device 9 equipped with the movable plane 14.

[0096] The accessory device 50' according to the second embodiment may advantageously be brought to a retracted position which is completely housed below the conveying means 6, as illustrated in the enclosed figures 12 and 13.

[0097] The machine 1 may also be equipped with two accessory devices 50; 50', an upper one according to the first embodiment and a lower one according to the second embodiment. Said configuration is illustrated by way of example in figure 14.

[0098] In an embodiment not represented, the extraction of the beams 51 may be motorized and possibly interlocked to the control unit of the machine.

[0099] Obviously, a person skilled in the art, in order to meet particular needs and specifications, can carry out several changes and modifications, all included in the protection scope of the invention as defined by the following claims.

Claims

1. Accessory apparatus (50; 50') for feeding sheets of material comprising at least two beams (51) which are fixable, in a mounted configuration, to a numerical control cutting machine (1), wherein in said mounted configuration the beams (51) develop in projection with respect to a frontal portion of said machine (20), said beams (51) supporting, in spaced relation with respect to the frontal portion of the machine (1), at least two pairs of opposite main slots (52) for holding as many transversal support bars (53) intended to support a roll (57) or another support element for supporting a sheet (2) of material to be cut.
2. Accessory apparatus (50; 50') according to claim 1, wherein said accessory apparatus (50) is removably associable with the machine (1).
3. Accessory apparatus (50; 50') according to one of the previous claims, wherein in the mounted configuration the entire accessory apparatus (50) is cantilever supported by the beams (51).
4. Accessory apparatus (50; 50') according to one of the previous claims, wherein two of the pairs of main slots (52) are placed below and above the plane of the beams (51), respectively.
5. Accessory apparatus (50; 50') according to claim 4, comprising at least two attachments (54) which are associable in opposite position on the two beams (51), each attachment comprising an upper wing (54a) equipped with at least one first main slot (52) and a lower wing (54b) equipped with a second main slot (52).
6. Accessory apparatus (50; 50') according to claim 5, wherein said attachments (54) further comprise at least one secondary slot (55), said secondary slots (55) being opposite each other for supporting a transversal guide bar (56) having a guide function for the sheet of material unrolled from the roll (57), said secondary slots (55) being placed in a position closer to the beam (51) and nearer to the machine (1) with respect to a main slot (52) formed on the corresponding attachment (54).
7. Accessory apparatus (50; 50') according to one of claims 5 or 6, wherein said attachments (54) are removably associable with the beam (51).
8. Accessory apparatus (50; 50') according to claim 7, wherein said attachments (54) may be mounted in a plurality of different axial positions along the beam (51).
9. Accessory apparatus (50; 50') according to one of claims 7 or 8, wherein the attachments (54) have a coupling pin (58) which is alternatively insertable into a plurality of holes (59) of the beam (51).
10. Accessory apparatus (50; 50') according to one of the previous claims, wherein said beams (51) slide in a telescopic manner with respect to the machine (1).
11. Accessory apparatus (50; 50') according to claim 10, wherein the telescopic movement of said beams (51) is motorized.
12. Accessory apparatus (50; 50') according to one of the previous claims, wherein between two successive transversal support bars (53) a support sheet or plane is laid for a sheet (2) of material to be cut, folded on itself.
13. Numerical control machine (1) for cutting at least one sheet (2) or a multilayer of sheets of material to be processed, comprising:
 - a processing area;
 - conveying means (6) adapted to feed the sheet (2) into said processing area along a forward direction (Y);
 - tool heads adapted to operate on the sheet (2) in said processing area; **characterized in that** it further comprises:
 - an accessory apparatus (50; 50') associated with said machine (1) and structured according to any one of claims 1 to 13.
14. Machine (1) according to claim 13, further compris-

ing a front device (9) equipped with a support plane (14) for supporting the sheets which is foldable between: a vertical rest position; and a horizontal operating position in which it is in substantial continuity with the conveying means (6); the beams (51) of the accessory apparatus (50) being associable with the distal end of said plane (14). 5

15. Machine (1) according to claim 13, wherein said accessory apparatus (50') is horizontally movable between a retracted position, in which it is housed below said conveying means (6), and an extracted position, in which it extends in front of the machine (1). 10

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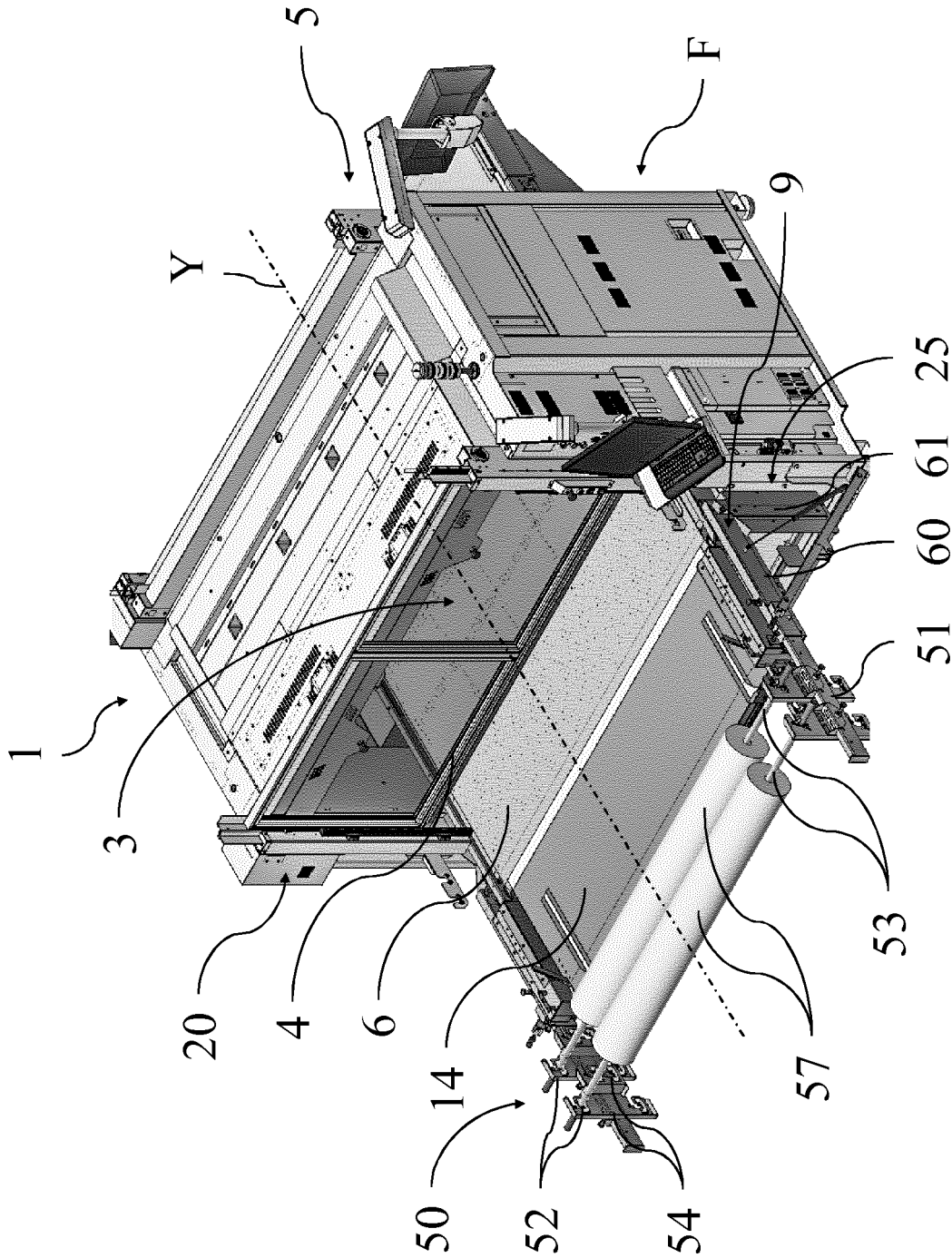


Fig. 1

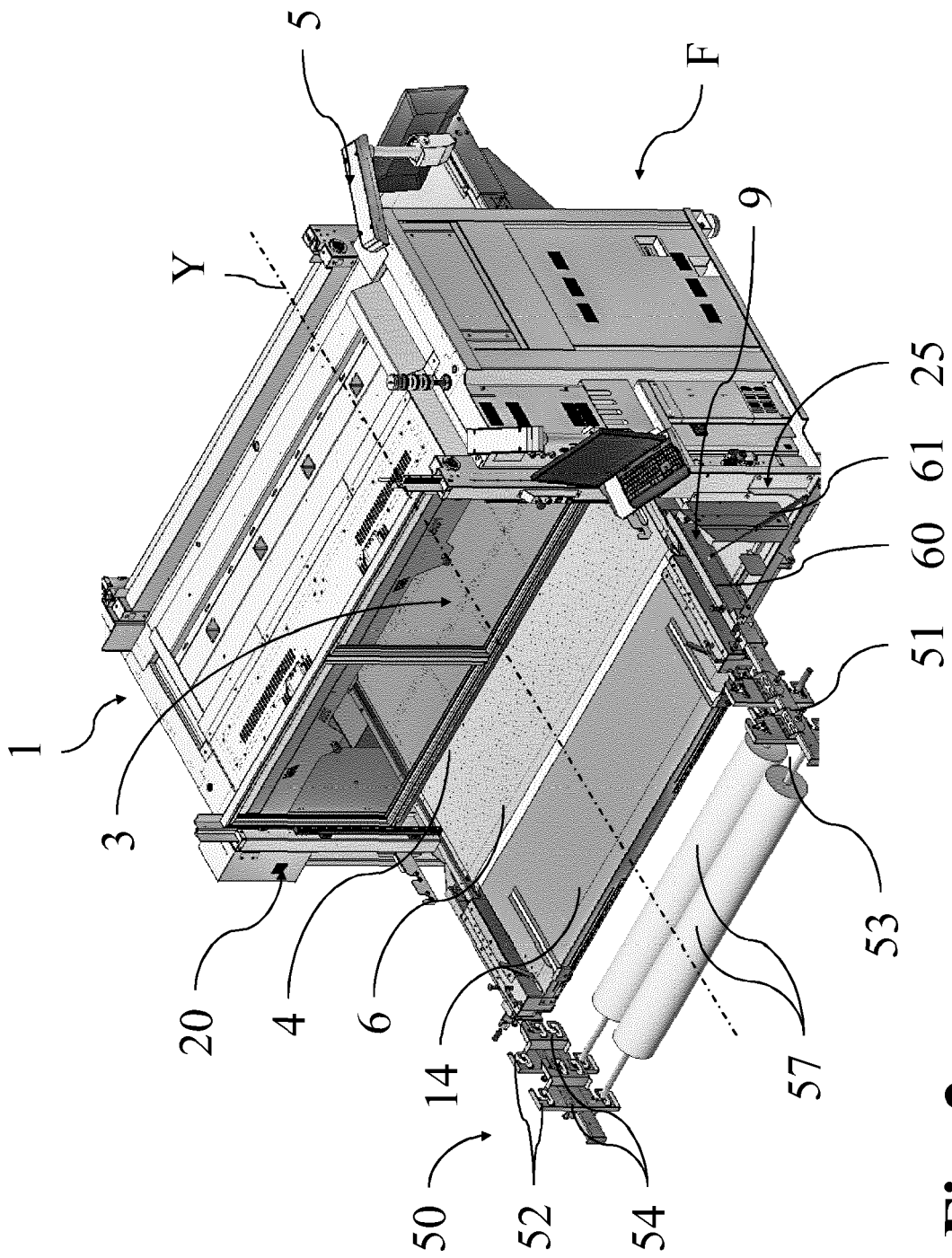


Fig. 2

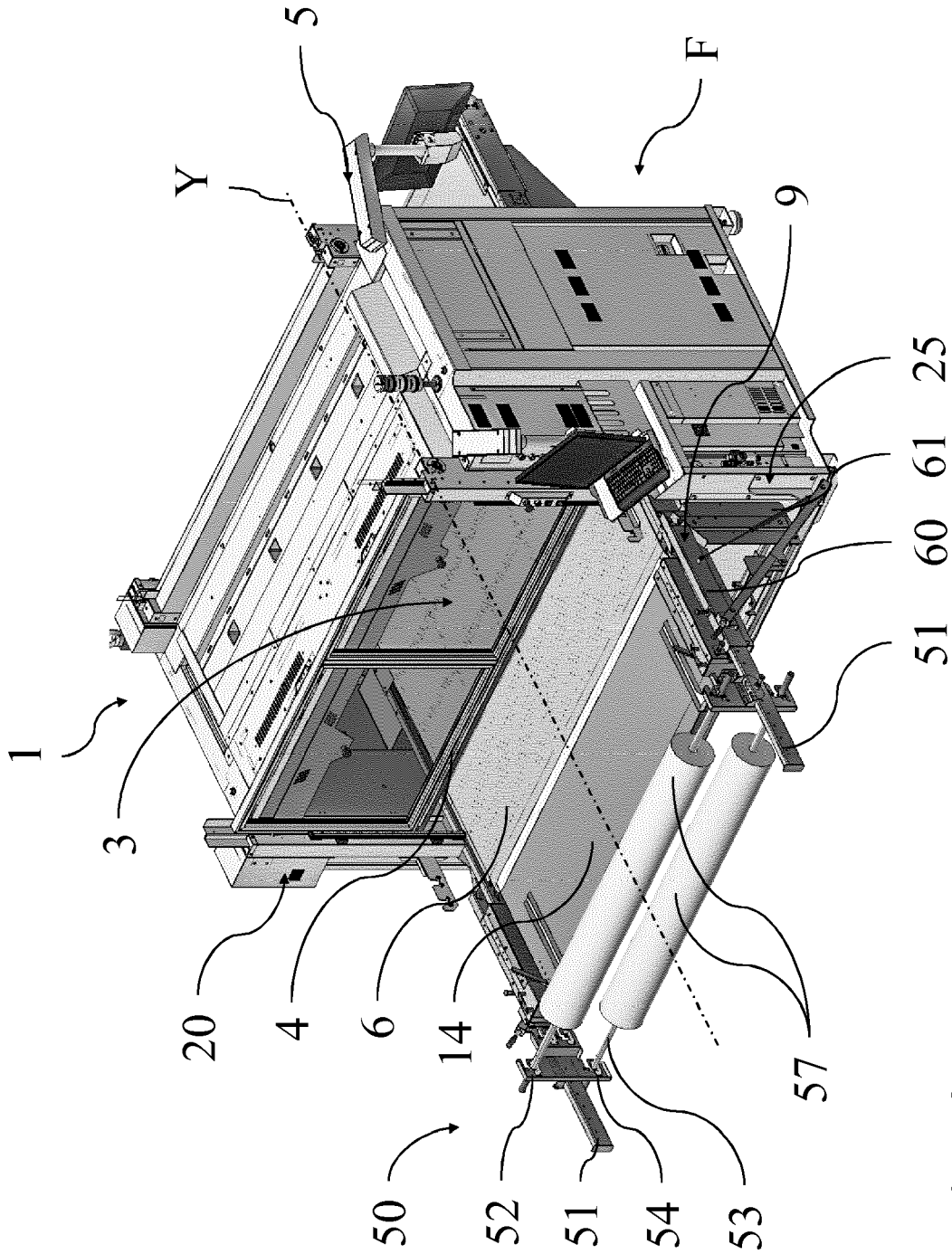


Fig. 3

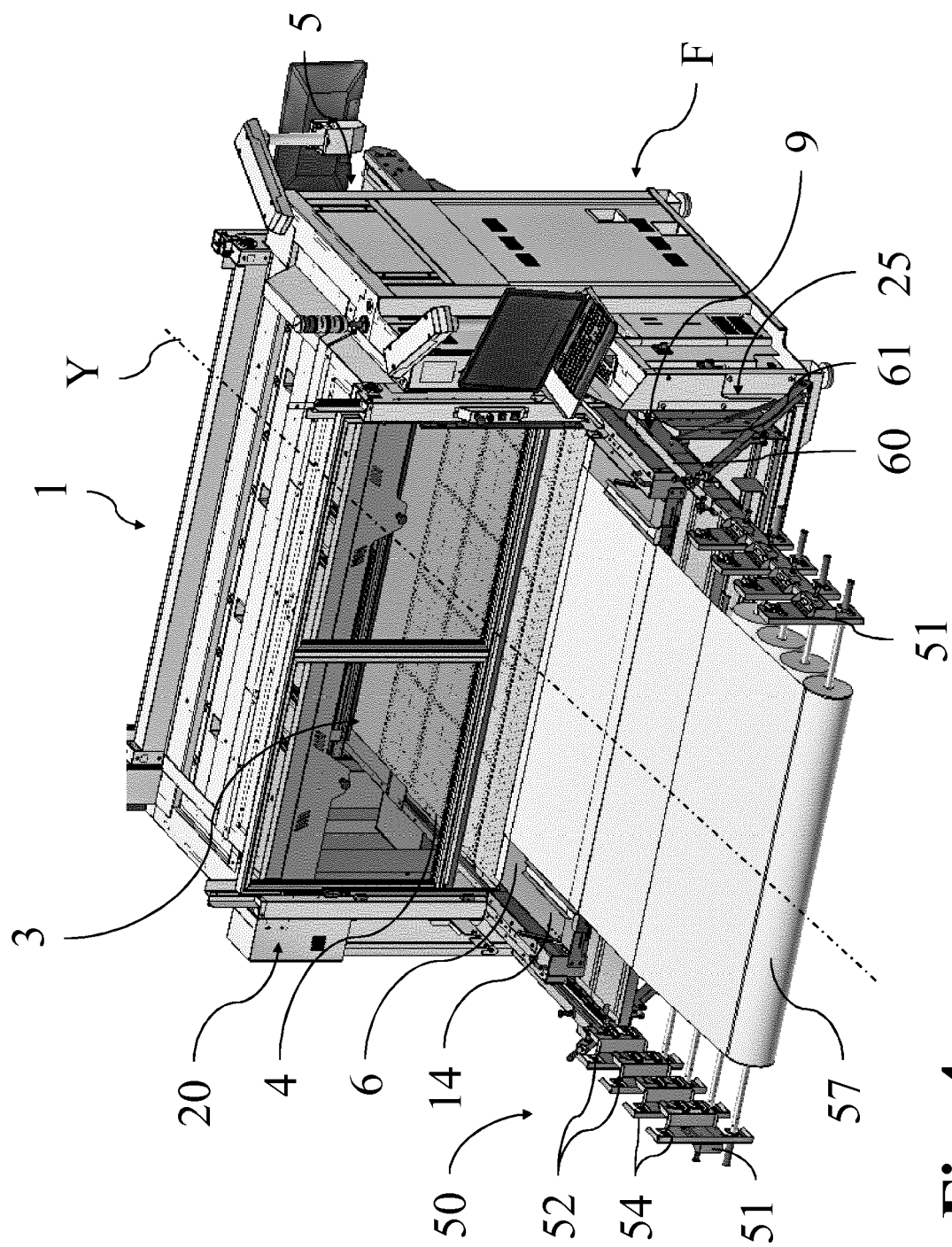


Fig. 4

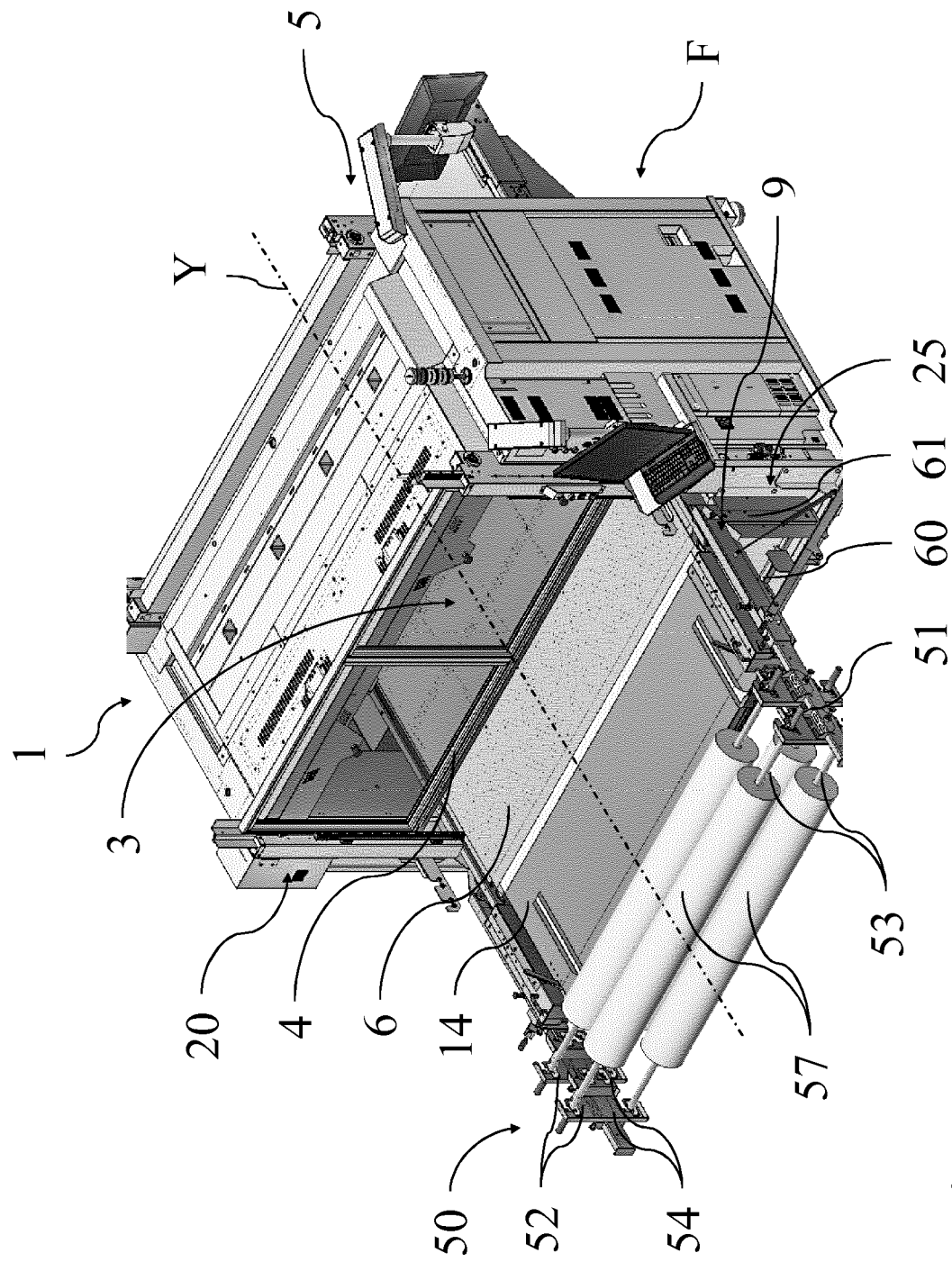


Fig. 5

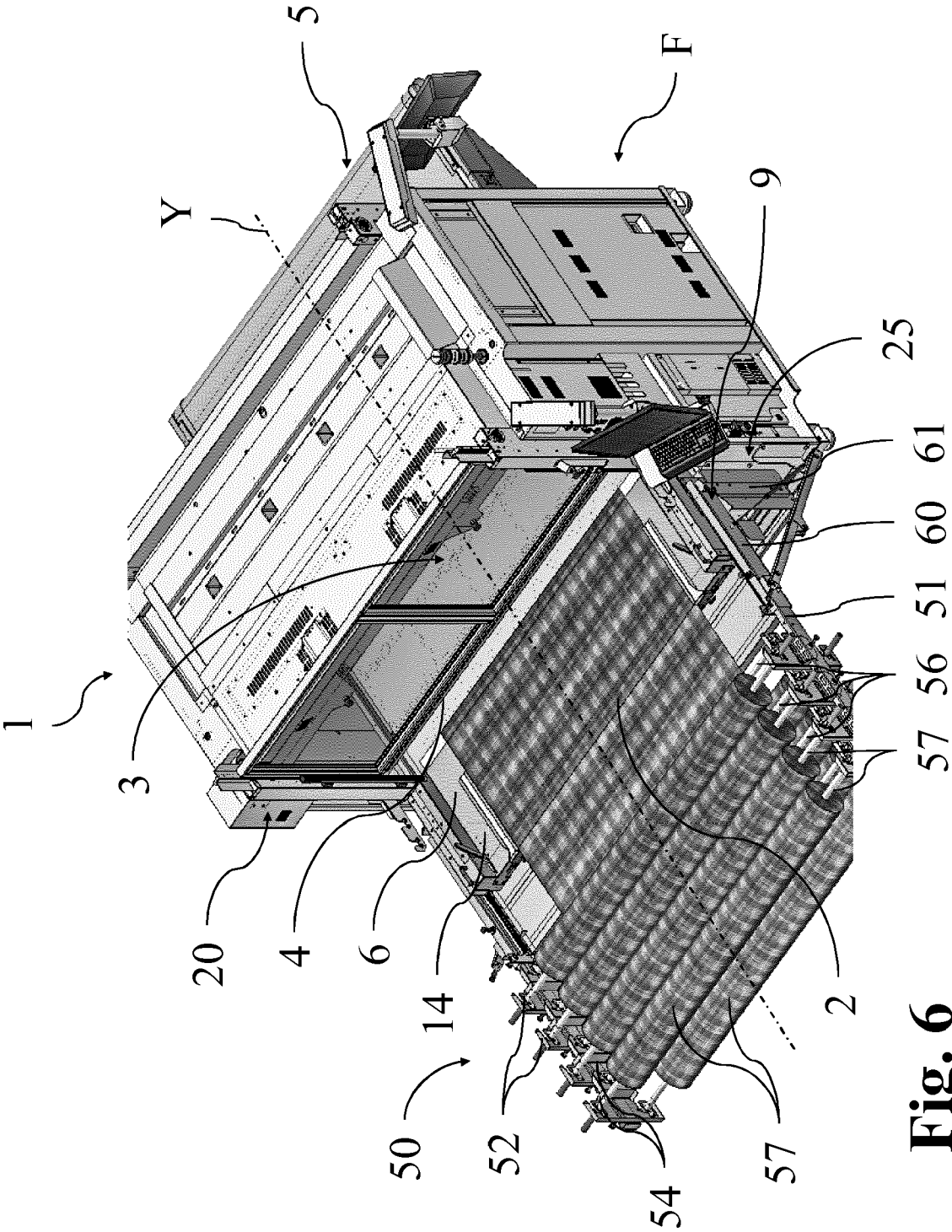


Fig. 6

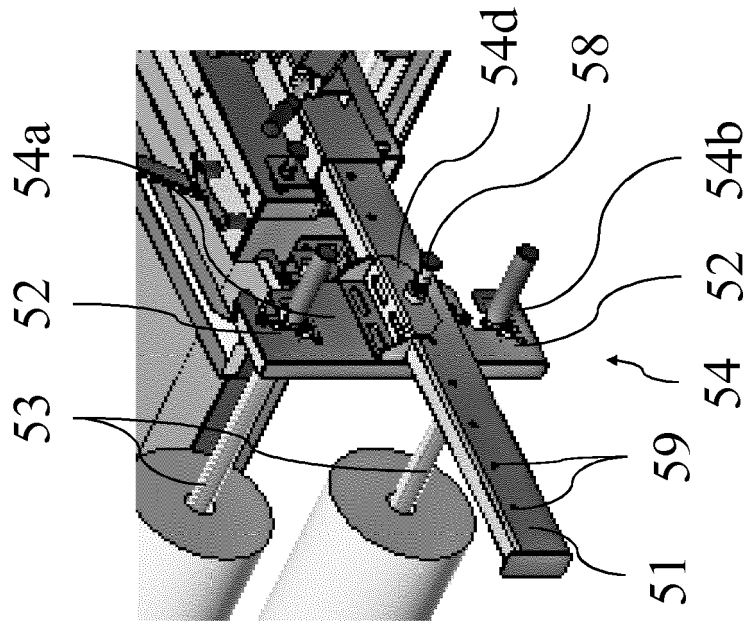


Fig. 7

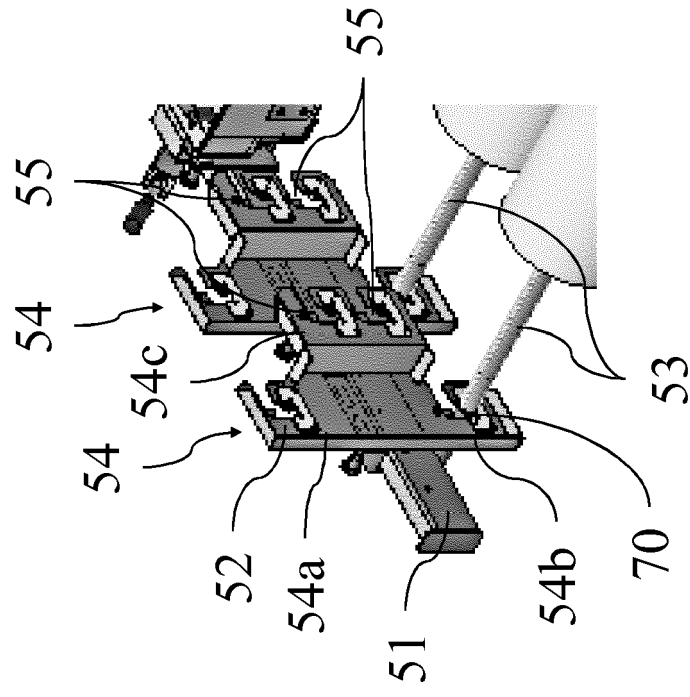


Fig. 8

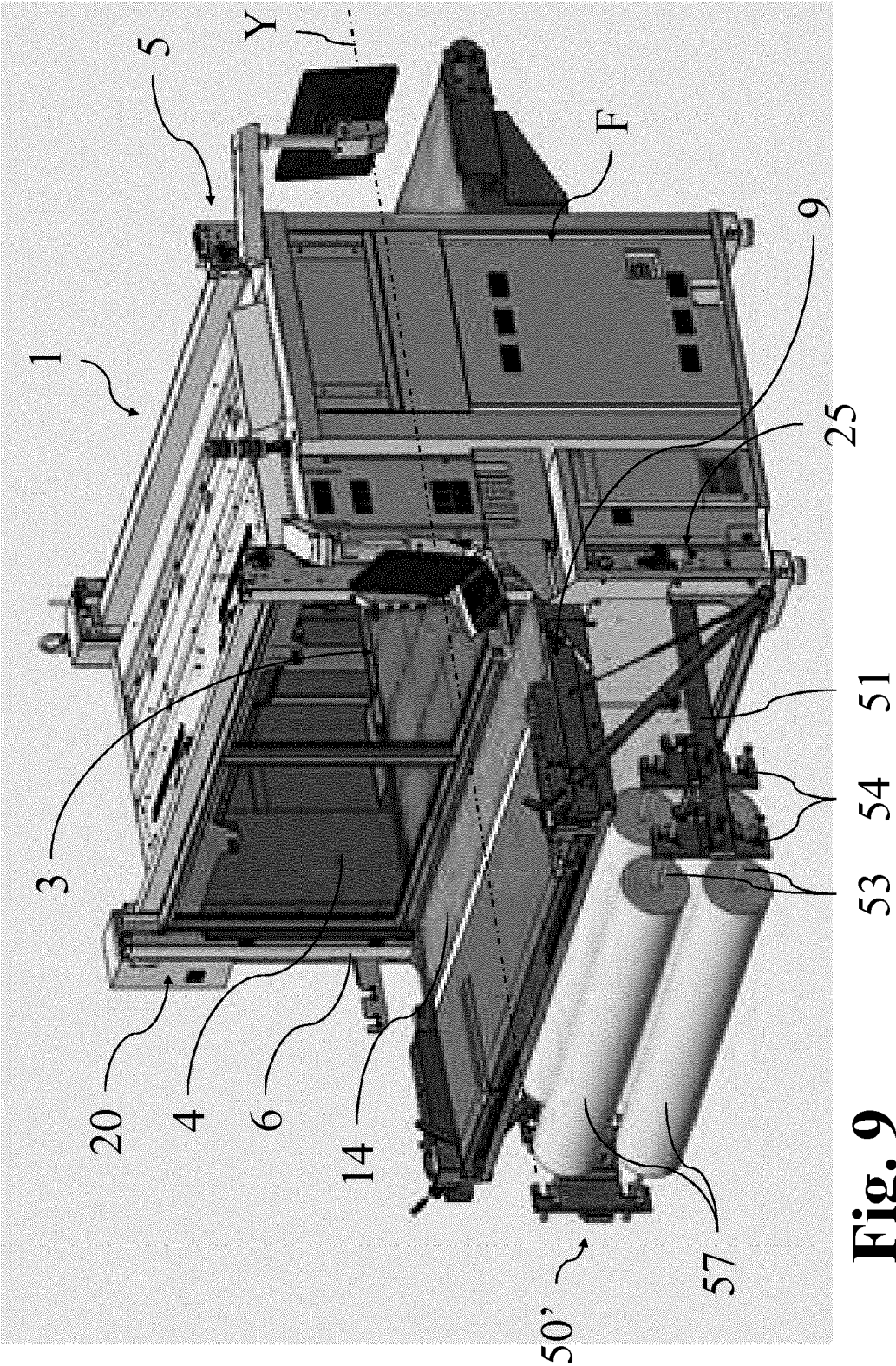


Fig. 9

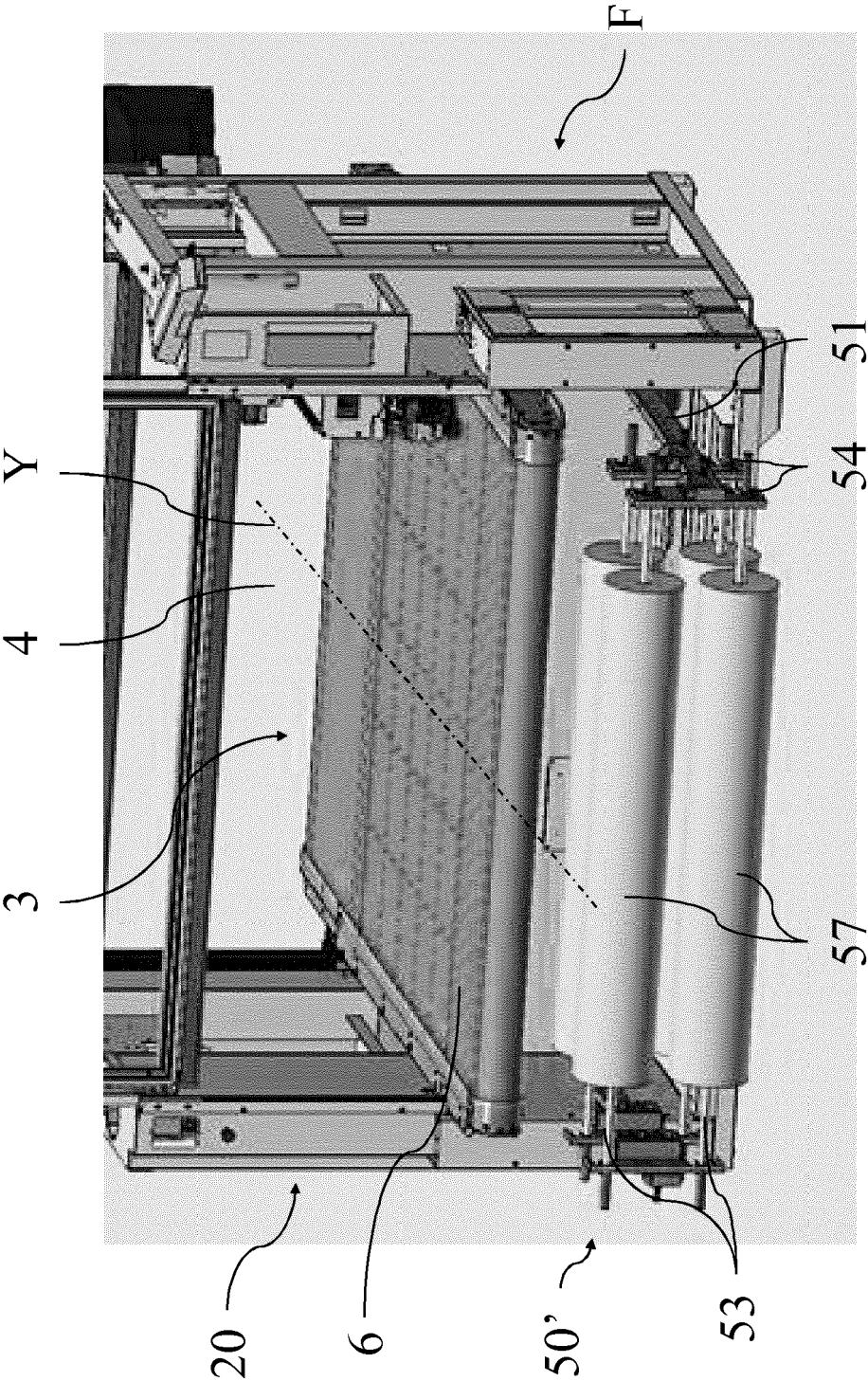


Fig. 10

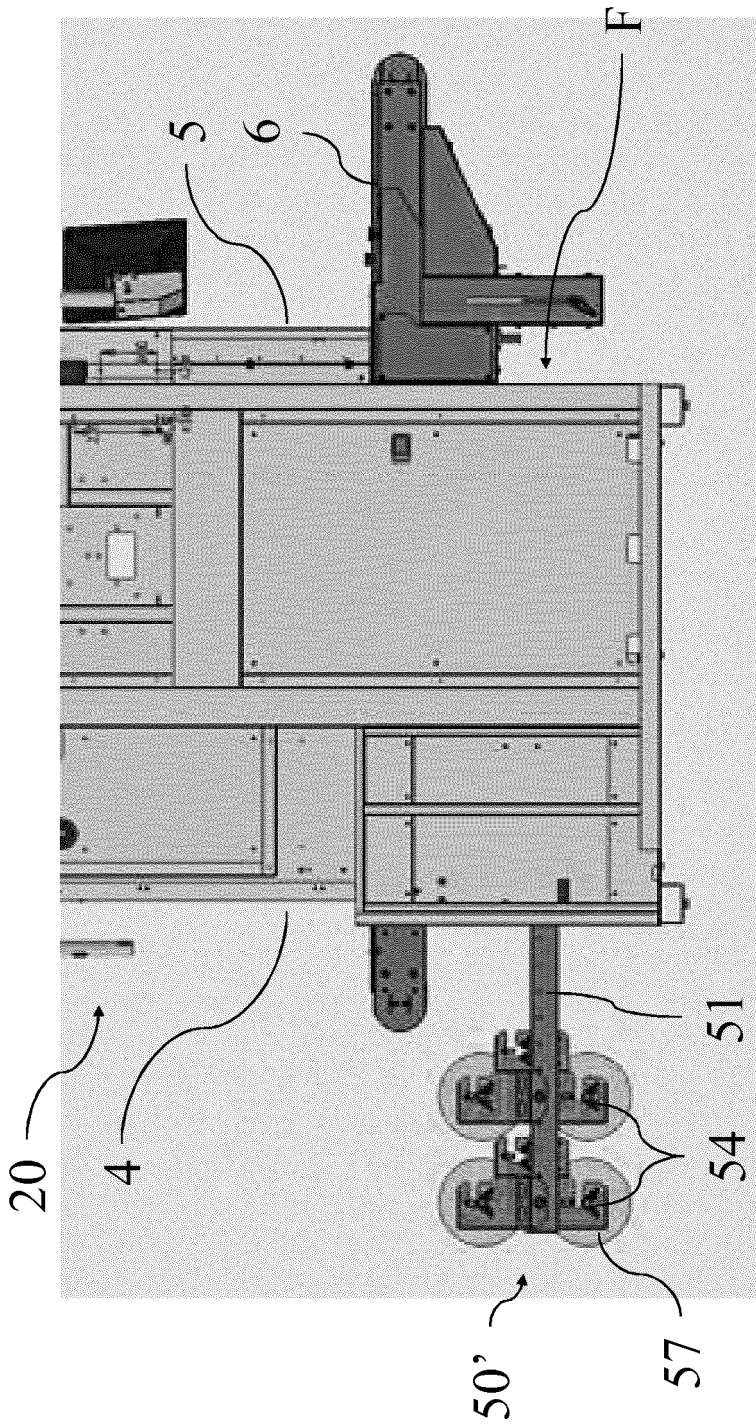


Fig. 11

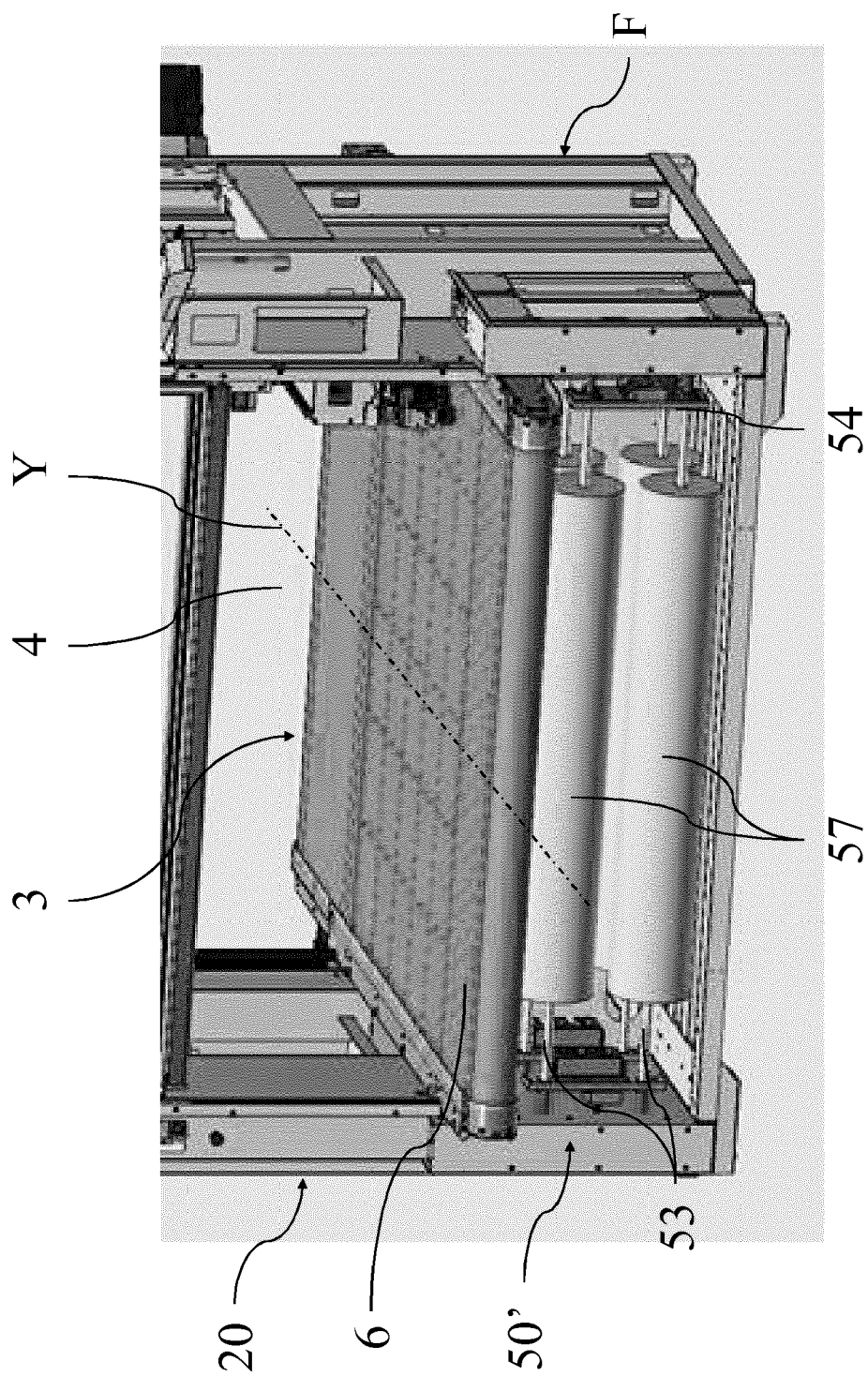


Fig. 12

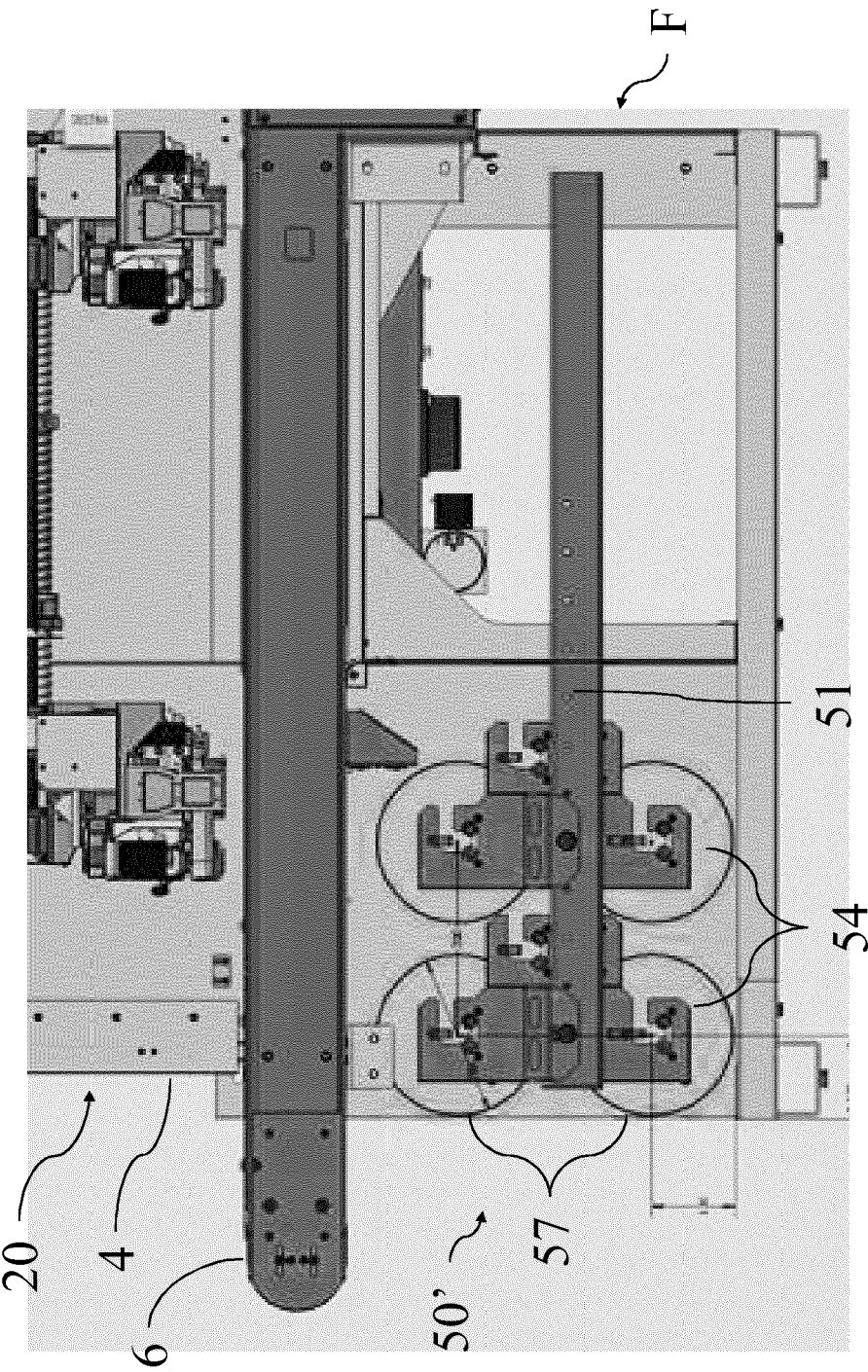


Fig. 13

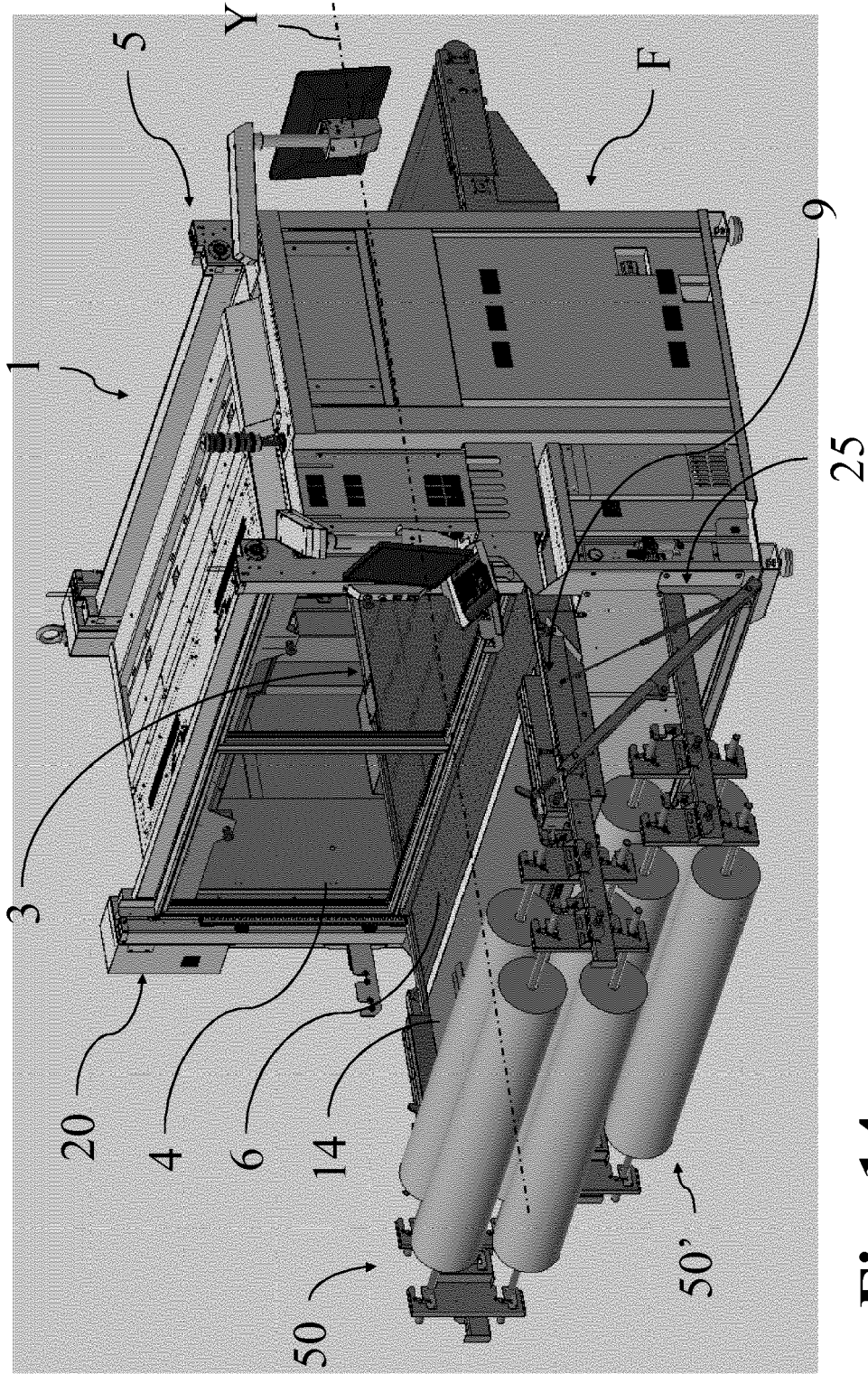


Fig. 14



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Place of search Munich		Date of completion of the search 28 January 2020	Examiner Iamandi, Daniela
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