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(54) **MACHINE FOR APPLYING DECORATIONS**

(57) A machine (M) for applying decorations configured to apply an adhesive rhinestone to a fabric and comprising a feed conveyor (1) provided with a succession of seats (1b) configured to contain at least one adhesive rhinestone. The conveyor (1) is movable to cyclically carry at least one seat (1b) at a pickup station (P). The machine (M) further comprises an applicator device (2) configured to pick up a rhinestone from the conveyor (1) and to position it on a fabric in a release station (R). The applicator device (2) is movable in rotation between the

pickup station (P) and the release station (R). The machine (M) further comprises a gripping portion (3) configured to engage with a rhinestone. The gripping portion (3) is movable according to an alternate linear motion between a position distal to the applicator device (2) and a position proximal thereto. At least one among the rotation movement of the applicator device (2) and the translation movement of the gripping portion (3) is carried out by means of an electric actuator (5a, 5b).

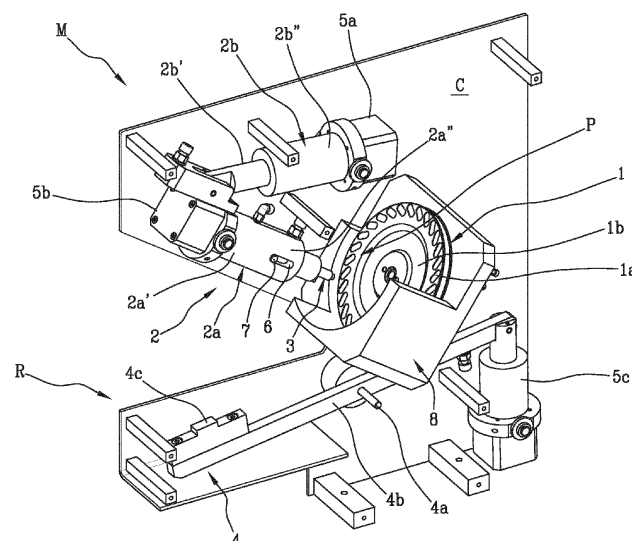


Fig.1

Description

TECHNICAL FIELD

[0001] The present invention relates to a machine for applying decorations which is widely used in the textile and footwear industry.

PRIOR ART

[0002] To decorate clothing and/or footwear rhinestones are usually used, such as beads, glitter, studs and the like, having a lower base, preferably flat, on which an adhesive substance is applied so that the rhinestone can be attached to the surface to be decorated.

[0003] Machines are used to apply the aforesaid rhinestones, comprising a mechanical arm configured to pick up a rhinestone from a feeding means and position it on a fabric or footwear.

[0004] Usually, the mechanical arm is moved by means of a pneumatic system which is responsible for ensuring picking up the rhinestone from the feeding means and releasing it on the fabric.

[0005] Document KR 2017/0040728 A, in accordance with its abstract, states an automatic rhinestone attaching apparatus including a work table moving device, which automates a process of adsorbing rhinestones from an arranging box and a process of attaching the adsorbed rhinestones to transfer paper; and which automatically moves a work table where the transfer paper is attached to a preset position. The disclosed automatic rhinestone attaching apparatus including a work table moving device comprises: a main body; the work table; a first working device; a second working device; and a moving means moving the work table to a preset position, and clamping the work table to the present position for attaching the rhinestones to the transfer paper.

[0006] Document IT 1281740 B1, in accordance with its abstract, states a machine for setting and applying rhinestones or other ornamental stones, to fabrics or the like. The machine comprises a bezel loader, which feeds a bezel dispensing guide, along the development of which a waiting station for a bezel is provided. The machine comprises a rhinestone loader, which positions, from time to time, a rhinestone in the vicinity of the waiting station. The machine also includes a pick-up organ for the bezel placed in the waiting station; this pick-up organ has a punch head, which can be inserted into the bezel and is provided with a means for picking up the rhinestone, positioned near the waiting station. The pick-up organ is movable by command, from the waiting station to an application station, and is provided with means of pushers, which cooperate with a riveting organ, placed in the application station, to operate, from time to time, the application of the bezel and of the set rhinestone, over a fabric or other material, placed in the application station.

[0007] Document KR 200401680 Y1, in accordance

with its abstract, states a suction nozzle positioning device for an ornament attachment machine. The positioning device of the present invention comprises an air cylinder for raising the suction nozzle to a ready position, which is a height capable of suctioning the ornaments of the rotating plate, and an air motor for rotating the suction nozzle of the ready position to the suction position, which is an angle capable of suctioning the ornaments of the rotating plate, and the air cylinder comprises a piston for raising the suction nozzle to the ready position at a top dead centre, wherein the air motor comprises a motor shaft for rotating the suction nozzle to the suction position in a first rotation position and for rotating the suction nozzle to the ready position in a second rotation position, the suction nozzle positioning device of the ornament attachment machine comprising: top dead centre adjustment means for adjusting the top dead centre of the piston of the air cylinder so as to adjust the ready position of the suction nozzle in accordance with the height of the ornament on the rotating plate; and rotation position adjustment means for adjusting the first rotation position of the motor shaft so as to adjust the suction position of the nozzle in accordance with the centre of the ornamental hole of the rotating plate.

[0008] The known machines further comprise a thermal activation device arranged below the area of fabric to be decorated. Once a preconfigured rhinestone with a thermo-adhesive layer is positioned on the fabric, the thermal activation device raises a temperature of the adhesive substance present on the rhinestone, activating it.

[0009] In other words, to apply an adhesive rhinestone to the fabric, the latter is arranged between the mechanical arm and the thermal activation device. More specifically, the fabric is placed substantially in contact with the thermal activation device so that, once the rhinestone is positioned, the adhesive substance placed on the latter can be activated and the rhinestone fixed.

[0010] Disadvantageously, the known machines have drawbacks related to construction costs and management complexity.

[0011] In particular, being entirely moved by means of a pneumatic system, the known machines are particularly expensive both during manufacture and during maintenance.

[0012] The pneumatic system is also very noisy and cumbersome, making the machines suitable for industrial use only, thus excluding the possibility of using such machines for artisan and/or private use. In fact, in such environments the noise level and the overall dimensions represent particularly sensitive aspects for users.

[0013] In addition, the mechanical complexity of the pneumatic machines makes them scarcely versatile.

[0014] A further disadvantage is that, during the application of the adhesive rhinestones on the fabric, the latter can remain in contact with the thermal activation device until the end of the creation of the decoration. This can cause damage to the fabric, as the high temperature of the device can create burn marks, blackening and/or

holes on the fabric itself.

SUMMARY

[0015] The technical task of the present invention is thus to provide a machine able to overcome the drawbacks which have emerged from the prior art. An object of the present invention is to propose a machine which is easy to assemble, manage and maintain.

[0016] A further object of the present invention is to create a machine which does not damage the fabric on which the adhesive rhinestones are applied.

[0017] A further object of the present invention is to provide a machine which is less expensive than the known machines.

[0018] A further object of the present invention is to create a machine which has smaller dimensions and a lower noise level with respect to the known machines.

[0019] The specified technical task and indicated objects are substantially achieved by a machine comprising the technical features set forth in one or more of the appended claims. The dependent claims correspond to possible embodiments of the invention.

[0020] In particular, the specified technical task is achieved by a machine configured to apply an adhesive rhinestone to a fabric. The machine comprises a feed conveyor having a front surface provided with a succession of seats each configured to contain at least one adhesive rhinestone and movable to cyclically carry at least one seat at a pickup station. The machine further comprises an applicator device configured to pick up an adhesive rhinestone from the feed conveyor in the pickup station and to place the adhesive rhinestone on a fabric at a release station. The applicator device is movable in rotation between the pickup station and the release station. The machine further comprises a gripping portion connected to one end of the applicator device and configured to engage with the adhesive rhinestone. The gripping portion is movable according to an alternate linear motion between a position distal to the applicator device, in which the gripping portion is at least partially extracted from the applicator device, and a position proximal to the applicator device, in which the gripping portion is at least partially retracted in the applicator device. The machine further comprises a thermal activation device located in the release station and configured to define a support for the fabric during the application of the rhinestone. The thermal activation device is configured to raise the temperature of at least one adhesive portion of the adhesive rhinestone positioned on the fabric in the release station, in particular while the rhinestone is still supported by the applicator device. The machine subject-matter of the present invention is characterised in that at least one among the rotation movement of the applicator device and the translation movement of the gripping portion is obtained by means of an electric actuator.

[0021] Preferably, both of the aforesaid movements are obtained by means of electric actuators.

[0022] Even more preferably, the electric actuators are of the type selectable from: a worm screw stepper motor; a direct current gear motor; a servomotor; a brushless motor.

[0023] Advantageously, the use of electric actuators greatly simplifies the machine, reducing costs and dimensions thereof and therefore making it accessible also for artisan and/or private use.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] Further features and advantages of the present invention will become more apparent from the indicative and thus non-limiting description of an embodiment of a machine in accordance with the present invention.

[0025] Such a description will be set out below with reference to the appended drawings, which are provided solely for illustrative and therefore non-limiting purposes, in which figures 1-6 show various perspective views of the machine during different use steps.

DETAILED DESCRIPTION

[0026] With reference to the appended drawings, "M" refers to a machine for applying an adhesive rhinestone (not shown) to a fabric (not shown).

[0027] The term "adhesive rhinestone" means beads, studs, sequins and similar decorative elements having at least one base, preferably flat, provided with an adhesive substance, whose adhesion properties are activated by heat (thermo-adhesive substance).

[0028] The machine "M" comprises a feed conveyor 1 having a front surface 1b provided with a succession of seats 1a each configured to contain at least one adhesive rhinestone. The feed conveyor 1 is movable to cyclically carry at least one seat 1a at a pickup station "P", in which the adhesive rhinestone is picked up in order to be applied to the fabric to be decorated, as will be described in detail below.

[0029] The feed conveyor 1 is also cyclically movable to carry at least one seat 1a at a reservoir 8 containing a plurality of rhinestones, so that each seat 1a can accommodate at least one adhesive rhinestone. Preferably, the seats 1a which are carried at the reservoir 8 are the seats 1a from which the rhinestones have just been picked up and are therefore empty. Such seats 1a are filled again with adhesive rhinestones, so that the base having the adhesive substance is in contact with the surface of the seat 1a, while the decorated surface of the rhinestones is arranged outside the seat 1a itself.

[0030] In the embodiment illustrated in the appended drawings, the feed conveyor 1 is made in the form of a rotating drum in which the succession of seats 1a is arranged circumferentially on its front surface 1b. Preferably, the seats 1a have a substantially elongated shape in plan and are inclined so as to be oriented according to a rotation direction of the drum. Such an aspect is advantageous as it facilitates the insertion of the adhe-

sive rhinestones in the seats 1a, which are at least partially immersed within the reservoir 8, as well as prevents the fall of the adhesive rhinestones contained within the seats 1a placed at the pickup station "P". In accordance with a further aspect, the seats 1a are shaped to accommodate the base of the rhinestones. In particular, the seats are shaped and/or have a depth such as to stably accommodate the base of the rhinestones, but not the decorated surface thereof. Advantageously, this aspect ensures that the rhinestones are arranged inside the seats 1a with their decorated part exposed outwards.

[0031] The machine "M" further comprises an applicator device 2 configured to pick up an adhesive rhinestone from the feed conveyor 1 in the pickup station "P" (for example, figure 1) and to position it on a fabric at a release station "R" (figure 5).

[0032] In particular, the applicator device 2 is movable in rotation between the pickup station "P" and the release station "R" and vice versa.

[0033] In the embodiment illustrated in the appended figures, the applicator device 2 comprises a first arm 2a, movable in rotation around a first end 2a', so that a second end 2a" of the first arm 2a is cyclically facing the pickup station "P" and the release station "R" to manage the movement of the adhesive rhinestones. In such an embodiment, the applicator device 2 further comprises a second arm 2b engaged with a first end 2b' to the first end 2a' of the first arm 2a and pivoted, with a second end 2b", to a wall of a casing "C" of the machine "M". In such an embodiment, the first end 2b' of the second arm 2b is movable according to an alternate linear translation motion so as to allow an elongation and a retraction of the second arm 2b itself. Such movement causes the rotation motion of the first arm 2a, in particular, an elongation of the second arm 2b causes the first arm 2a to rotate towards the pickup station "P", while a retraction of the second arm 2b causes a rotation of the first arm 2a towards the release station "R".

[0034] In a further embodiment not shown, the applicator device 2 may comprise a single arm pivoted to the casing "C" of the machine "M" to rotate between the pickup station "P" and the release station "R" and vice versa. In use, therefore, while the feed conveyor 1 rotates to provide the pickup station "P" with seats 1a occupied by the adhesive rhinestones, the applicator device 2 is moved in rotation between the pickup station "P" and the release station "R", in order to pick up an adhesive rhinestone from the relative seat 1a and appropriately arrange it on the fabric.

[0035] In a preferred embodiment, to make the positioning of the rhinestone on the fabric more precise, for example in the case of creations of edges, lines or hems with adhesive rhinestones, the machine "M" comprises a laser pointer (not depicted) configured to project a light point in the release station "R", and in particular on the fabric, so as to indicate the positioning area of the adhesive rhinestone to the applicator device 2. Advantageously, the presence of the laser pointer helps the operator

avoid making positioning errors, especially of alignment, in the decoration to be made.

[0036] According to a further aspect of the present invention, the machine "M" further comprises a gripping portion 3 connected to an end 2a of the applicator device 2 and configured to engage with an adhesive rhinestone. In the embodiment shown in the appended figures, the gripping portion 3 is housed within the second end 2a" of the first arm 2a, so as to be moved in rotation with the first arm 2a between the pickup station "P" and the release station "R" and vice versa.

[0037] Preferably, the gripping portion 3 has an end surface counter-shaped to an external profile of the adhesive rhinestone.

[0038] Advantageously, such a feature allows the gripping portion 3 to better retain the adhesive rhinestone during the movement of the applicator device 2 from the pickup station "P" to the release station "R".

[0039] As shown in the appended sequence of figures, the gripping portion 3 is also movable according to an alternate linear motion between a position distal to the applicator device 2 (figure 2), in which the gripping portion 3 is at least partially extracted from the applicator device 2, and a position proximal to the applicator device 2 (figure 1), in which the gripping portion 3 is at least partially retracted in the applicator device 2 itself.

[0040] In more detail, as shown in the appended figures, the gripping portion 3 is in the distal position when the applicator device 2 is facing the pickup station "P" (figure 2). In such a situation, in fact, the gripping portion 3 is extracted from the applicator device 2 to engage an adhesive rhinestone contained in a seat 1a of the feed conveyor 1 transiting in the pickup station "P". Subsequently, the gripping portion 3 is brought into the position proximal to the applicator device 2, carrying the adhesive rhinestone therewith (figure 3). Subsequently, or almost simultaneously, the applicator device 2 rotates so as to be facing the release station "R" (figure 4). In the release station "R", the gripping portion 3 again performs a linear translation motion so as to move, first in the distal position to release the adhesive rhinestone on the underlying fabric, and then in the proximal position so as to be ready for a subsequent picking up of an adhesive rhinestone from the pickup station "P" (figure 5 and 6).

[0041] In other words, in the pickup station "P", the alternate motion of the gripping portion 3 allows the adhesive rhinestone to be picked up from the feed conveyor 1 (figure 1, 2 and 3), while, in the release station "R", the alternate motion of the gripping portion 3 allows the adhesive rhinestone to be released on the fabric (figure 4, 5 and 6).

[0042] To allow the gripping portion 3 to pick up and retain the adhesive rhinestone during the movements of the machine "M", the gripping portion 3 is provided with a suction duct 6 connected or connectable to a vacuum pump (not shown) to exert a suction action in the suction duct and thus pick up the adhesive rhinestone.

[0043] Preferably, the applicator device 2 comprises a

shutter 7 active within the suction duct 6 between a closed position, in which it obstructs a connection opening between the suction duct 6 and the vacuum pump in order to interrupt the suction action, and an open position, in which the shutter 7 is distal with respect to the opening in order to allow the suction action.

[0044] In more detail, as shown in the sequence of the appended figures, when picking up a rhinestone from the feed conveyor 1, the applicator device 2 is facing the pickup station "P" and the gripping portion 3 is in the distal position so that its end surface comes into contact with the adhesive rhinestone to be picked up (figure 2).

[0045] In such a situation, the shutter 7 occupies the open position, in order to allow a suction of the adhesive rhinestone to be picked up. Once the gripping portion 3 firmly retains the adhesive rhinestone, it is carried into the proximal position, i.e., it is retracted towards the applicator device 2 (figure 3). In such a situation, the applicator device 2 rotates from the pickup station "P" towards the release station "R", so that the gripping portion 3, and therefore the adhesive rhinestone just picked up, is facing the fabric to be decorated (figure 4).

[0046] The gripping portion 3 is then moved again in translation from the proximal to the distal position, so as to arrange the adhesive rhinestone on the underlying fabric (figures 5 and 6). In such a situation, the shutter 7 passes from the open position to the closed position so as to disconnect the suction duct 6 from the vacuum pump. Thereby, the suction action ceases to retain the adhesive rhinestone in contact with the end surface of the gripping portion 3 allowing the rhinestone to be released on the fabric. Preferably, the shutter 7 is configured to disconnect the suction duct 6 from the vacuum pump before the gripping portion 3 reaches the distal position. Thereby, the release of the rhinestone is faster, while ensuring that the rhinestone remains inside the gripping portion. In fact, the stretch travelled by the gripping portion 3 without the suction being activated is configured to be so short as not to leave time for the rhinestone to randomly fall on the fabric.

[0047] Advantageously, the suction action created by the cooperation of the shutter 7 with the vacuum pump significantly reduces the size, complexity and costs of the machine "M". In fact, the suction action created by the cooperation of the shutter 7 with the vacuum pump is mechanically simple, but at the same time reliable, making the machine "M" especially suitable for artisan and private uses.

[0048] Therefore, during its operation, the machine "M" subject-matter of the present invention picks up and releases the adhesive rhinestones by means of a rotation movement of the applicator device 2 and by means of an alternate linear translation movement of the gripping portion 3. In such a situation, at least one of the aforesaid movements is obtained by means of an electric actuator.

[0049] In other words, the rotation movement of the applicator device 2 and/or the translation movement of the gripping portion 3 are obtained by means of an electric

actuator.

[0050] Preferably, both movements are obtained by means of at least one electric actuator.

[0051] In the preferred embodiment, the machine "M" comprises two electric actuators. In particular, the machine "M" comprises a first and a second electric actuator 5a, 5b dedicated respectively to the rotation movement and the translation movement.

[0052] In fact, as shown in the appended figures, the electric actuator 5a relative to the rotation movement of the applicator device 2 is placed on the second end 2b' of the second arm 2b, while the electric actuator 5a relative to the translation movement of the gripping portion 3 is placed near the first end 2a' of the first arm 2a.

[0053] In a further possible embodiment, not shown, the machine "M" comprises a single electric actuator configured to manage both movements, i.e., both the rotation movement of the applicator device 2 and that of translation of the gripping portion 3. In such a situation, the applicator device 2 and the gripping portion 3 are connected to each other mechanically, for example by means of a mechanical transmission, so that by activating the single electric actuator both the rotation movement of the applicator device 2 and the translation movement of the gripping portion 3 are possible. Preferably, each electric actuator 5a, 5b comprised in the machine "M" is of the type selectable from: a worm screw stepper motor; a direct current gear motor; a servomotor; a brushless motor.

[0054] Advantageously, the possibility of electrically moving the machine "M" allows a considerable structural simplification of the machine "M", as well as a reduction in the size of the machine "M" itself.

[0055] Advantageously, the possibility of electrically moving the machine "M" allows a considerable reduction in manufacturing and maintenance costs, allowing the machine "M" to also be used for artisan/private use. Advantageously, the possibility of electrically moving the machine "M" allows simplification in the electronic programming of the machine "M", which can be programmed with electronic boards, including commercial boards, such as the so-called Arduino®.

[0056] According to a further aspect of the present invention, the machine "M" further comprises a thermal activation device 4 located at the release station "R" (as described in detail below) and configured to define a support for the fabric, during the application of the rhinestone. The thermal activation device 4 is also configured to raise the temperature of at least one adhesive portion of the adhesive rhinestone positioned on the fabric in the release station "R", in particular, while the rhinestone is still in contact with the applicator device 2.

[0057] Preferably, the thermal activation device 4 has a temperature comprised between 250 °C and 300 °C. Even more preferably, the temperature is approximately equal to 270°C in order to activate the adhesive properties of the adhesive substance normally used on the rhinestones.

[0058] In other words, the thermal activation device 4

is configured to be arranged near a portion of the fabric in which it is desired to apply the adhesive rhinestone, so as to raise the temperature of the aforesaid portion. In such a situation, when the adhesive rhinestone is released on the fabric by the gripping portion 3, the heat activates the adhesive substance allowing the rhinestone to be fixed to the fabric.

[0059] As shown in the appended figures, the thermal activation device 4 is movable between an operating position, in which it reaches the release station "R" to be in contact with the fabric (figures 2-5), and a rest position, in which it occupies a position away from the release station "R" to disengage the fabric (figures 1 and 6).

[0060] Preferably, the thermal activation device 4 travels a stroke comprised between 20 mm and 30 mm between the rest position and the operating position.

[0061] The movement of the thermal activation device 4 occurs by virtue of the action of a further electric actuator 5c of the type selectable from: a worm screw stepper motor; a direct current gear motor; a servomotor; a brushless motor.

[0062] In the preferred embodiment, the thermal activation device 4 is movable between the operating position and the rest position by means of an oscillation motion around a pin 4a.

[0063] In accordance with a further aspect, the thermal activation device 4 has a rocker configuration 4b hinged to the pin 4a in an intermediate portion thereof. In such a configuration, the further electric actuator 5c is active on one end of the rocker 4b, while the other end of the rocker is equipped with a heating member 4c, so as to allow the activation of the adhesive substance.

[0064] In a further possible embodiment, the thermal activation device 4 passes from the operating position to the rest position by means of a translation motion.

[0065] In use, therefore, while the applicator device 2 is in the pickup station "P" and the gripping portion 3 passes from the distal to the proximal position to pick up an adhesive rhinestone from the feed conveyor 1 (figure 1 and 2), the thermal activation device 4 is rotated so as to pass from the rest position to the operating position, thus being arranged in the release station "R" below the fabric. The operating position is maintained by the thermal activation device 4 until the adhesive rhinestone is released from the gripping portion 3 on the fabric. Once the rhinestone is released, the applicator device 2 returns to the pickup station "P" and the thermal activation device 4 returns to the rest position.

[0066] In other words, therefore, the operating position is maintained by the thermal activation device 4 during the rotation movement of the applicator device 2 from the pickup station "P" to the release station "R" and during the translation mode of the gripping portion 3 to pick up the adhesive rhinestone from the feed conveyor 1 and release it on the fabric.

[0067] Advantageously, the possibility of moving the thermal activation device 4 away when there is no need to activate the adhesive substance of any rhinestones

prevents the fabric from being damaged and/or burned due to high temperatures. In more detail, the possibility of moving the thermal activation device 4 away from the fabric with each application of an adhesive rhinestone prevents the fabric from remaining in contact with the thermal activation device 4, being ruined or burned, when the feed device 2 returns from the release station "R" to the pickup station "P" to pick up a further adhesive rhinestone from the feed conveyor 1.

[0068] The present invention achieves the proposed objects, eliminating the disadvantages which have emerged in the prior art.

[0069] In particular, the machine "M" subject-matter of the present invention has lower costs than the known machines as it has an electrical type handling. Furthermore, the machine "M" subject-matter of the present invention is smaller than the known machines, as well as easier to program and manage, as the suction for the picking up and release of the rhinestones occurs by virtue of the cooperation of the vacuum pump and the shutter 7. In addition, the machine "M" subject-matter of the present invention avoids ruining and/or burning the fabrics on which the rhinestones must be applied, since the thermal activation device 4 can be removed from the fabric itself in the moments when no rhinestones must be applied.

[0070] A further advantage of the machine subject-matter of the present invention is that it is extremely light, weighing even less than 10 kg, in particular 5-6 kg.

[0071] Furthermore, despite the reduced dimensions, weight and costs, a machine according to the invention is advantageously able to ensure a number of cycles/hour (or stops/hour) comparable to that of the pneumatic machines intended for so-called "professional" use.

Claims

1. A machine (M) configured to apply an adhesive rhinestone to a fabric, said machine (M) comprising:

- a feed conveyor (1) having a front surface (1a) provided with a succession of seats (1b) each configured to contain at least one adhesive rhinestone, said conveyor being movable to cyclically carry at least one seat (1b) at a pickup station (P);
- an applicator device (2) configured to pick up an adhesive rhinestone from the feed conveyor (1) in said pickup station (P) and to position said adhesive rhinestone on a fabric at a release station (R), said applicator device (2) being movable in rotation between said pickup station (P) and said release station (R);
- a gripping portion (3) connected to an end (2a) of said applicator device (2) and configured to engage with said adhesive rhinestone, said grip-

- ping portion (3) being movable by translation according to an alternate linear motion between a position distal to said applicator device (2), in which said gripping portion (3) is at least partially extracted from said applicator device (2), and a position proximal to the applicator device (2), in which said gripping portion (3) is at least partially retracted in said applicator device (2);
- a thermal activation device (4) located at the release station (R) and configured to define a support for said fabric during the application of the rhinestone, said thermal activation device (4) being configured to raise the temperature of at least one adhesive portion of the adhesive rhinestone positioned on said fabric in the release station (R), in particular while said rhinestone is still in contact with said applicator device (2);
- wherein at least one among said rotation movement of the applicator device (2) and said translation movement of the gripping portion (3) is obtained by means of an electric actuator (5a, 5b);
- wherein each gripping portion (3) is provided with a suction duct (6) connected or connectable to a vacuum pump to exert a suction action on said adhesive rhinestone;
- characterised in that** said applicator device (2) comprises an active shutter (7) within said suction duct (6) between a closed position, in which it obstructs a connection opening between the suction duct (6) and said vacuum pump in order to interrupt the suction action, and an open position, in which said shutter (7) is distanced from said opening in order to allow the suction action.
2. The machine (M) according to claim 1, wherein also the other among said rotation movement of the applicator device (2) and said translation movement of said gripping portion (3) is obtained by means of an electric actuator (5a, 5b).
 3. The machine (M) according to claim 2, wherein said rotation movement of the applicator device (2) and said translation movement of said gripping portion (3) are obtained by means of the same electric actuator (5a); or wherein said rotation movement of the applicator device (2) and said translation movement of said gripping portion (3) are obtained by means of separate electric actuators (5a, 5b).
 4. The machine (M) according to one or more of the preceding claims, wherein said electric actuator (5a, 5b) is selectable from: a worm screw stepper motor; a direct current gear motor; a servomotor; a brushless motor.
 5. The machine (M) according to one or more of the preceding claims, wherein said thermal activation device (4) is movable between an operating position, in which it is arranged in the release station (R) to be in contact with a portion of fabric configured to receive said adhesive rhinestone, and a rest position, away from the release station (R) to disengage said fabric.
 6. The machine (M) according to claim 5, comprising a further electric actuator (5c) configured to move said thermal activation device (4) between said operating position and said rest position.
 7. The machine (M) according to claim 6, wherein said further electric actuator (5c) is selectable from: a worm screw stepper motor; a direct current gear motor; a servomotor; a brushless motor.
 8. The machine (M) according to one or more of the preceding claims from 5 to 7, wherein said thermal activation device (4) is movable between the operating position and the rest position by means of an oscillating motion around a pin (4a).
 9. The machine (M) according to claim 8, wherein said thermal activation device (4) has a rocker configuration (4b) hinged to said pin (4a) in an intermediate portion thereof, and wherein said further electric actuator (5c) is active on one end of the rocker (4b), the other end of the rocker (4b) being equipped with a heating member (4c) of the thermal activation device (4).
 10. The machine (M) according to one or more of the preceding claims from 5 to 7, wherein said thermal activation device (4) is movable between the operating position and the rest position by means of a translation motion.
 11. The machine (M) according to one or more of the preceding claims from 5 to 10, wherein the thermal activation device (4) travels a stroke between 20 mm and 30 mm between the rest position and the operating position.
 12. The machine (M) according to one or more of the preceding claims, wherein said thermal activation device (4) has a temperature between 250°C and 300°C, said temperature preferably being equal to 270°C.
 13. The machine (M) according to one or more of the preceding claims, wherein said gripping portion (3) has an end surface counter-shaped to an external profile of said adhesive rhinestone.
 14. The machine (M) according to one or more of the preceding claims, comprising a laser pointer config-

ured to project a light point in the release station (R),
and in particular on said fabric, so as to indicate the
positioning of said adhesive rhinestone.

15. The machine (M) according to one or more of the
preceding claims, wherein said feed conveyor (1) is
made in the form of a rotating drum in which said
succession of seats (1a) is arranged circumferential-
ly on a front surface (1b) of the rotating drum.

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Fig.1

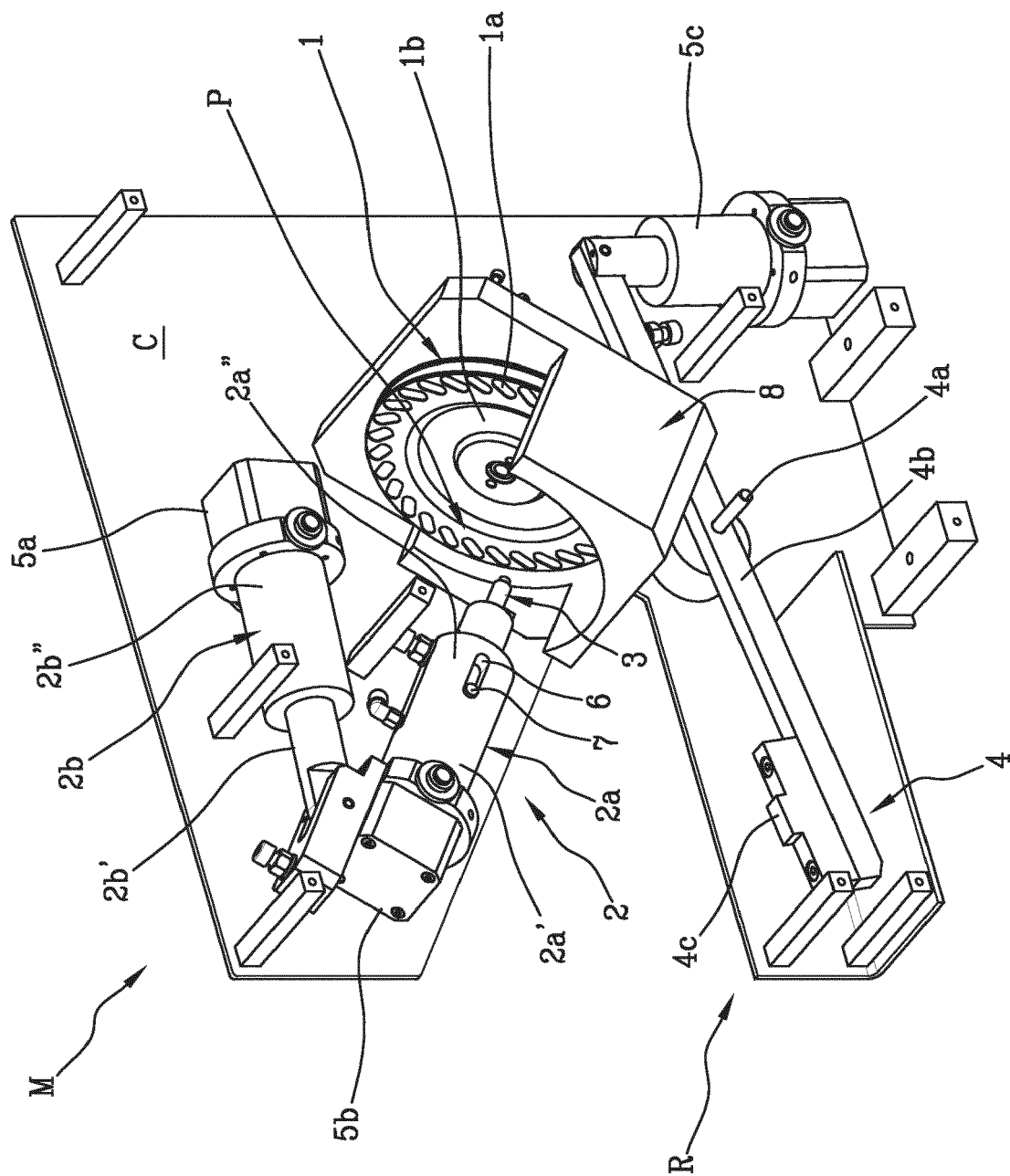


Fig.2

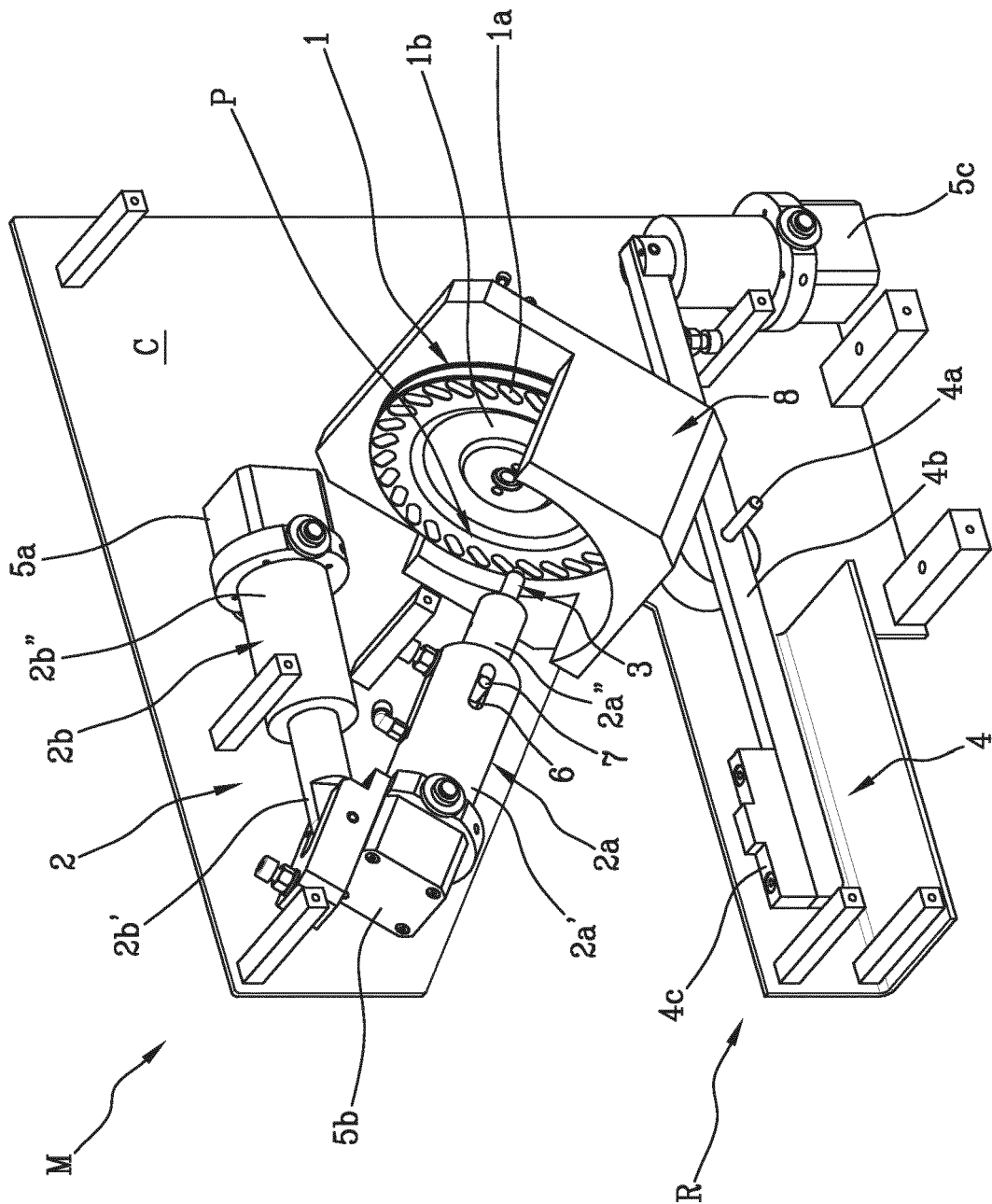


Fig. 3

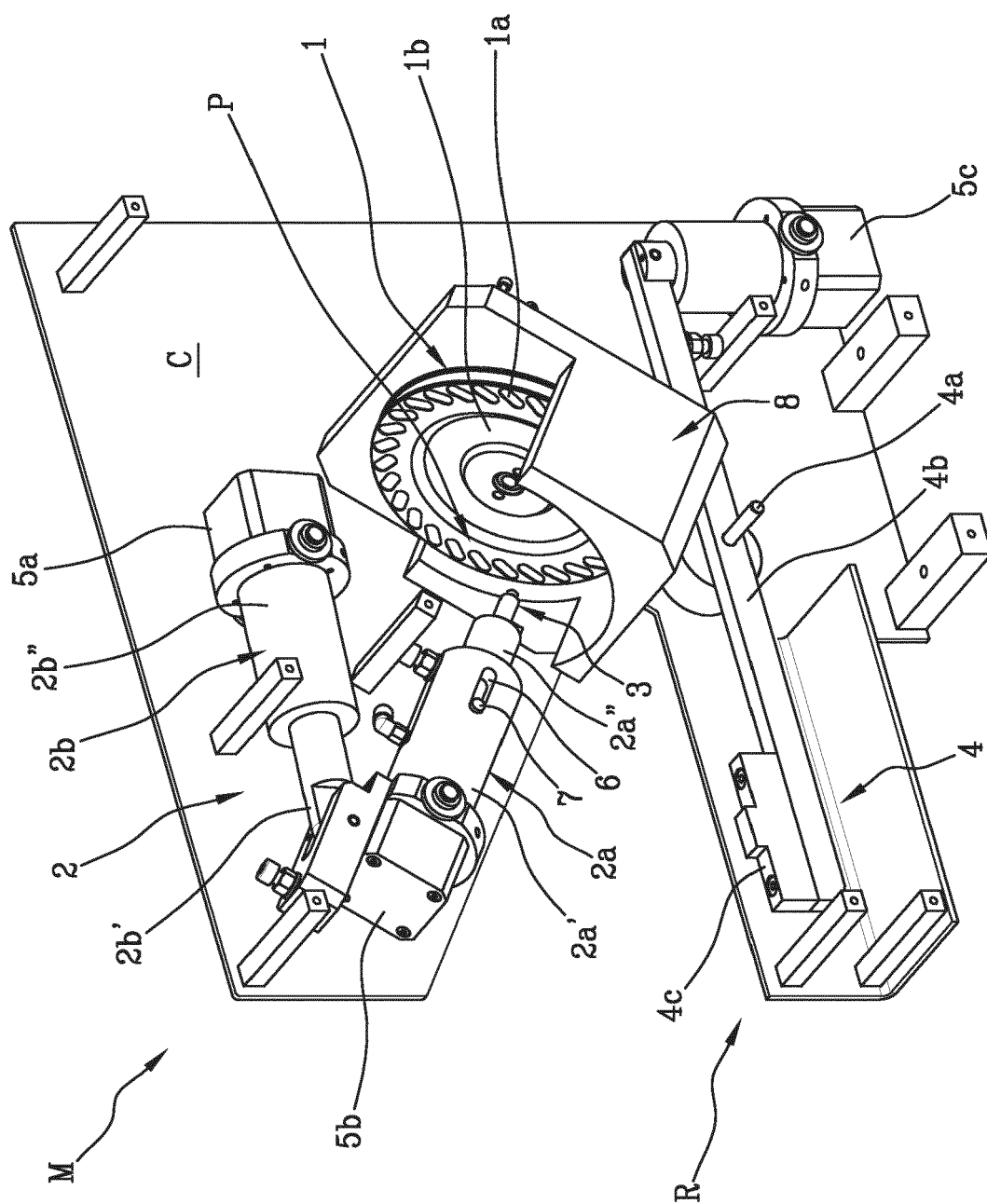


Fig.4

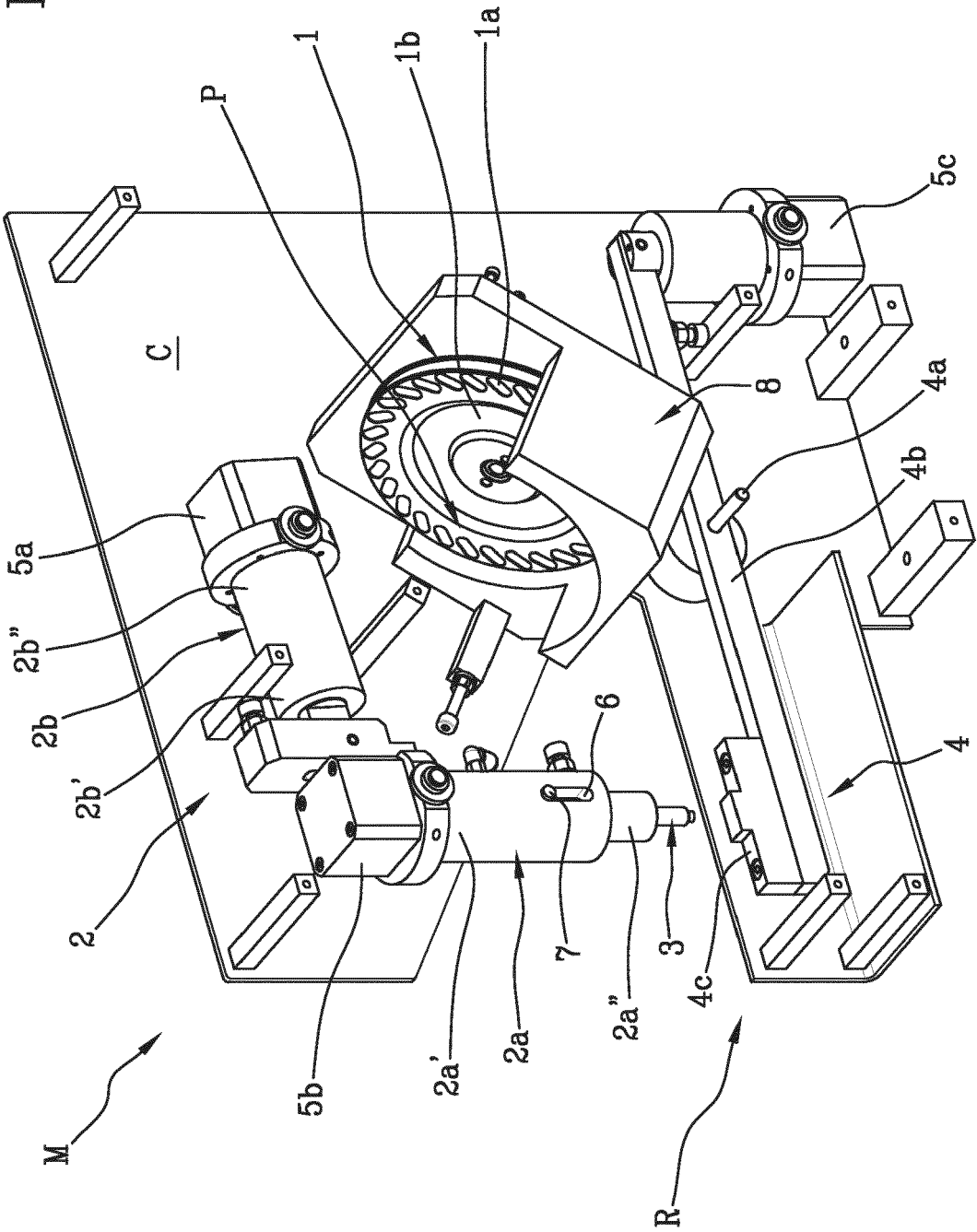


Fig.5

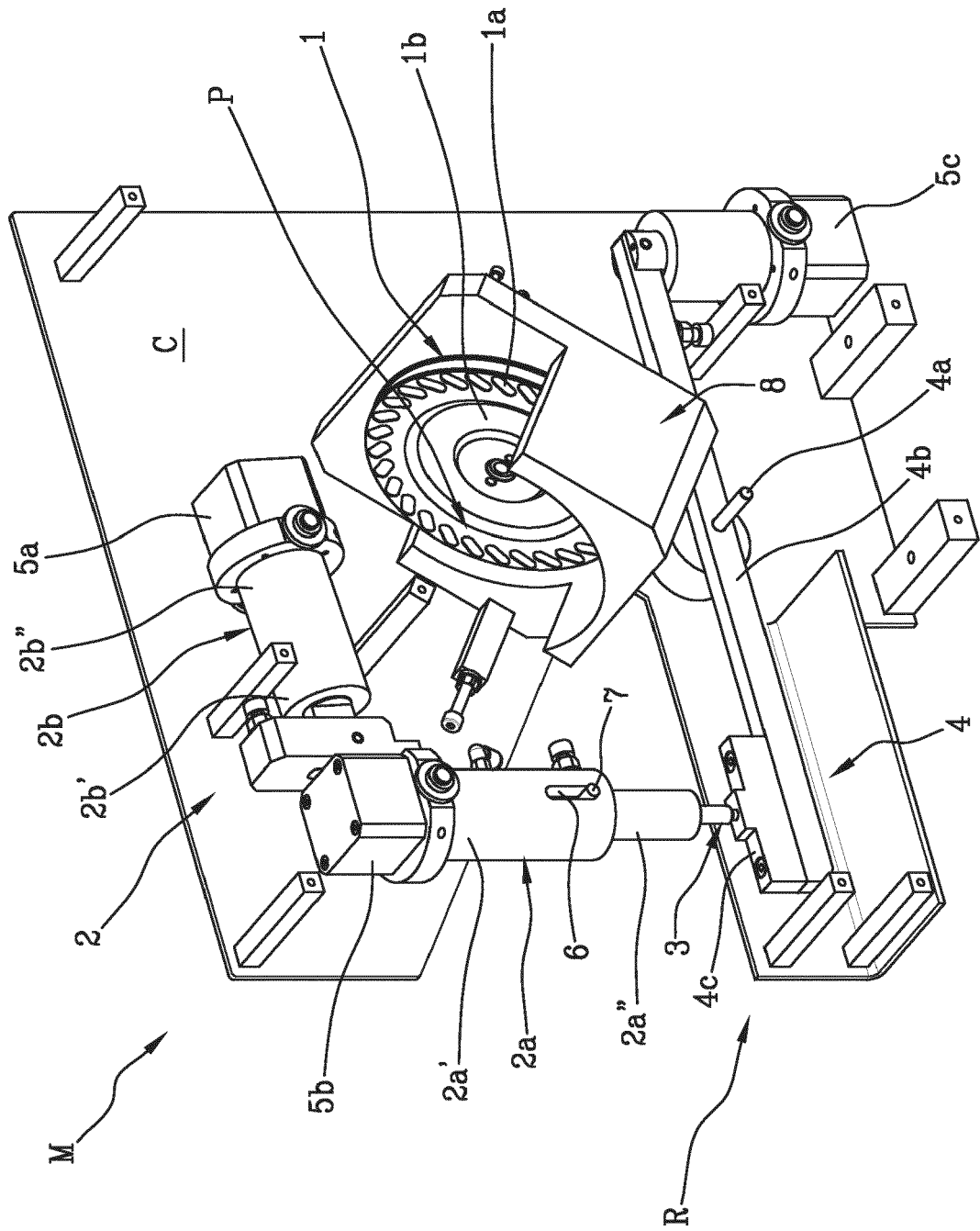
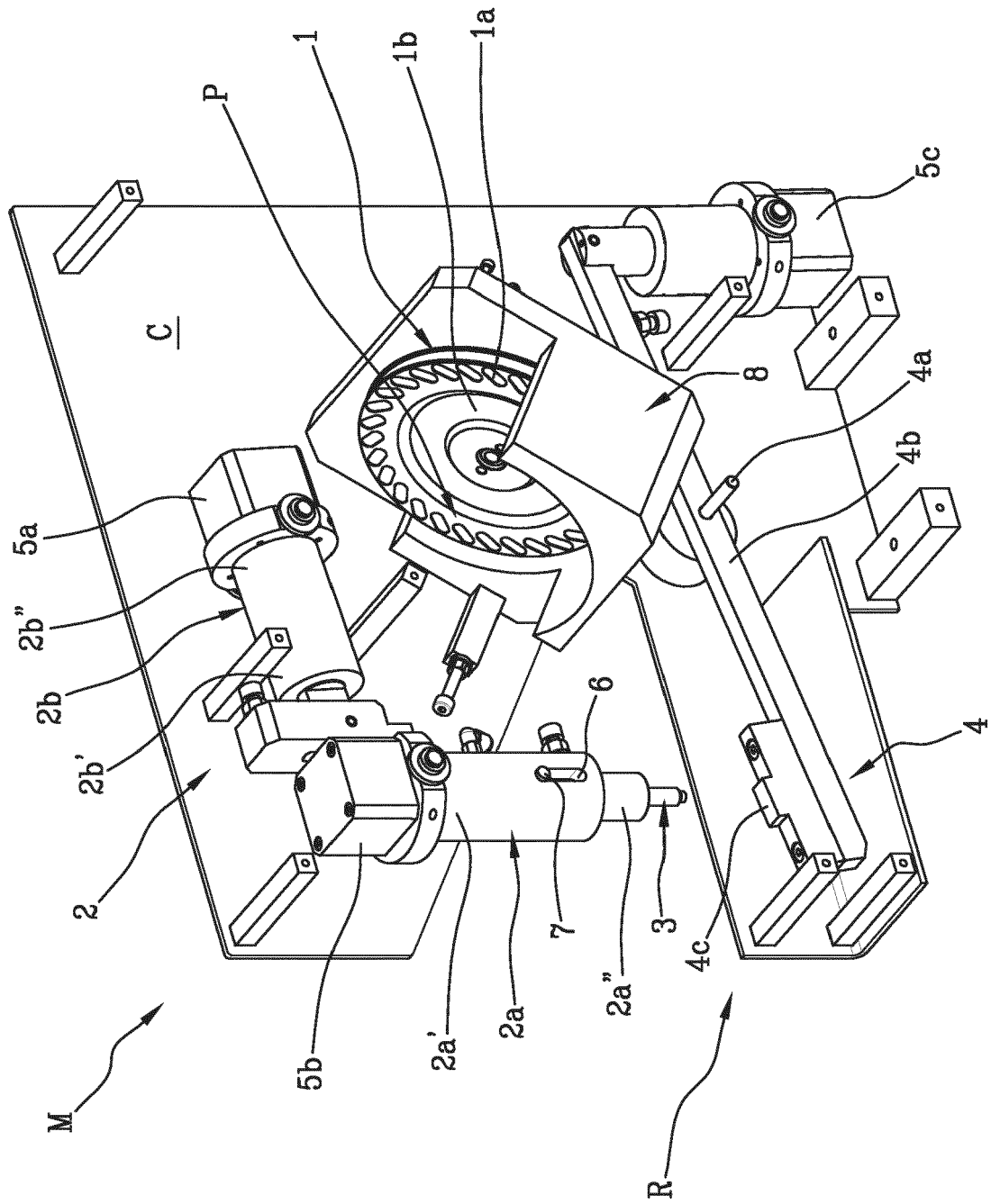


Fig. 6





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Munich		26 August 2024	Tischler, Christian
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 26 August 2024	Examiner Tischler, Christian
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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