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(54) **CUTTING UNIT AND METHOD TO REMOVE A STRAP FROM A WALL OF A PACK**

SCHNEIDEVORRICHTUNG UND VERFAHREN ZUM ENTFERNEN EINES BANDES VON EINER
PACKUNGSWAND

UNITÉ DE COUPE ET MÉTHODE POUR ENLEVER UNE SANGLE D'UNE PAROI D'UN
EMBALLAGE

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This Patent Application claims priority from Italian Patent Application No. 102021000030185 filed on November 30, 2021.

TECHNICAL FIELD

[0002] The present invention relates to a cutting unit and method to remove a strap from a wall of a pack, in particular of smoking articles.

[0003] The present invention finds advantageous application in a packing machine (for example a cellophane wrapping machine) for manufacturing a pack of cigarettes known as "*book-pack*", to which the following disclosure will make explicit reference without thereby losing generality.

PRIOR ART

[0004] A "*book-pack*" pack of cigarettes comprises (at least) two containers, which house respective wrapped groups of cigarettes, have respective open upper ends, and are hinged to one another so as to rotate between a closed configuration, in which the two containers are overlapping one another, and an open configuration, in which the two containers are separate; furthermore, a lid is provided which is hinged to a rear container and, when in a closed position, embraces the upper part of both containers.

[0005] The production of a "*book-pack*" pack of cigarettes provides for the forming of the two containers by using two corresponding blanks which are folded around the respective wrapped groups of cigarettes, coupling (overlapping) the two containers, and then folding around the two coupled (overlapped) containers a third blank that joins the two containers and forms the common lid.

[0006] After folding the third blank, it is necessary to make a cut in the bottom wall of the "*book-pack*" pack of cigarettes to allow the separation of the two containers (namely to allow the two containers to rotate relative to one another); normally a double cut is made (that is, two close and parallel cuts) to remove a flap (strap) from the bottom wall so as to obtain a clear separation between the two containers. For said purpose a cutting unit is used that is provided with two parallel and adjacent rotary blades, which are partially housed in a collecting chamber subject to suction, which should capture and remove the strap as soon as the strap itself has been separated from the rest of the bottom wall. However, it is not infrequent that even after the cut made by the two rotary blades, the strap remains stuck in the bottom wall and therefore is not removed by the suction; consequently, downstream of the cutting unit some "*book-pack*" pack of cigarettes still have the strap on the bottom which may be more or less in the original position. This can generate

various problems such as the loss of the strap in the machine before applying the transparent plastic over-wrap or the wrapping (with the transparent plastic over-wrap) of the strap together with the pack in completely random positions giving the final user the impression of a low-quality pack of cigarettes.

[0007] US7415812B2 describes a packing machine for manufacturing a pack of cigarettes and comprising: a first wrapping unit for forming a first wrap containing a group of cigarettes, a second wrapping unit for forming a second wrap containing another group of cigarettes, and a third wrapping unit for joining the two wraps by means of an outer blank provided with a hinge which allows the two wraps to rotate relative to one another.

DESCRIPTION OF THE INVENTION

[0008] The object of the present invention is to provide a unit and a cutting method to remove a strap from a wall of a pack, in particular of smoking articles, which allow to ensure the removal of the strap after cutting and, at the same time, are easy and inexpensive to implement.

[0009] According to the present invention, a unit and a cutting method are provided to remove a strap from a wall of a pack, in particular of smoking articles, according to what is claimed in the attached claims.

[0010] The claims describe embodiments of the present invention forming an integral part of the present description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The present invention will now be described with reference to the attached drawings, which illustrate a non-limiting embodiment thereof, wherein:

- Figure 1 is a perspective view of a "*book-pack*" pack of cigarettes in a closed configuration;
- Figure 2 is a perspective view of the pack of cigarettes of Figure 1 in an open configuration;
- Figure 3 is a view of a blank used to manufacture the pack of cigarettes of Figure 1;
- Figure 4 is a perspective view of a cutting unit to remove a strap from a bottom wall of the pack of cigarettes of Figure 1;
- Figure 5 is a further perspective view of the cutting unit of Figure 4;
- Figure 6 is a perspective view of a cutting assembly of the cutting unit of Figure 4;
- Figure 7 is a perspective view of a pneumatic distributor of the cutting assembly of Figure 6;

- Figure 8 is an exploded perspective view of rotary blades of the cutting assembly of Figure 6;
- Figure 9 is a longitudinal sectional view of the rotary blades of the cutting assembly of Figure 6; and
- Figure 10 is a perspective view from below of the pack of cigarettes of Figure 1 in the closed configuration and highlighting a strap being removed from the bottom wall.

PREFERRED EMBODIMENTS OF THE INVENTION

[0012] In Figures 1 and 2, number 1 denotes as a whole a "book-pack" pack of cigarettes comprising two containers 2 and 3, which house respective wrapped groups of cigarettes, which have respective open upper ends, and are hinged to one another so as to rotate between a closed configuration (illustrated in Figure 1), in which the two containers 2 and 3 overlap one another, and an open configuration (illustrated in Figure 2), in which the two containers 2 and 3 are separated; moreover, a lid 4 is provided which is hinged to a rear container 2 and, when in a closed position, embraces the upper part of both containers 2 and 3.

[0013] According to a preferred embodiment illustrated in the attached figures, the rear container 2 is larger and houses a larger wrapped group of cigarettes (for example formed by two layers of seven cigarettes each), whereas the front container 3 is smaller and houses a smaller wrapped group of cigarettes (e.g., formed by a single layer of six cigarettes); according to a different embodiment not illustrated, the two containers 2 and 3 have the same size.

[0014] The production of the pack 1 of cigarettes provides for the forming of the two containers 2 and 3 by using two corresponding blanks (not illustrated) which are folded around the respective wrapped groups of cigarettes, coupling (overlapping) the two containers 2 and 3, and then folding a third blank 5 (illustrated in Figure 3) around the two coupled (overlapped) containers 2 and 3 which joins the two containers 2 and 3 and forms the common lid 4.

[0015] The pack 1 of cigarettes comprises a bottom wall 6 (illustrated for example in Figure 3) which is arranged on the outside, is part of the blank 5, and embraces both containers 2 and 3; namely, the bottom walls of the two containers 2 and 3 rest against the bottom wall 6 which covers the same.

[0016] After folding the blank 5 it is necessary to make a cut 7 (schematically illustrated in Figure 3) on the bottom wall 6 of the pack 1 of cigarettes to allow the separation of the two containers 2 and 3 (namely, to allow the two containers 2 and 3 to rotate relative to one another). In other words, initially the bottom wall 6 is completely intact and therefore free from any division and consequently does not allow any movement between the two containers 2 and 3; it is therefore necessary to make the cut 7 to

divide the bottom wall 6 into two parts which can be moved away from one another to allow movement between the two containers 2 and 3. In Figure 4, number 8 denotes as a whole a cutting unit which, in order to make a clear separation between the two containers 2 and 3, makes the cut 7 of a pack 1 of cigarettes which is fed along a straight path P by a conveyor 9; the cut 7 is double (that is, it is formed by two close and parallel cuts) to remove from the bottom wall 6 a strap B or strip (illustrated in Figure 10) having a width of about 1 mm; namely the cutting unit 8 removes from the bottom wall 6 of a pack 1 of cigarettes a relatively thin central part (the strap B) to divide the two containers 2 and 3.

[0017] As illustrated in Figure 9, the cutting unit 8 comprises two coaxial and horizontally arranged rotary blades 10, which are mounted so as to rotate around the same vertical rotation axis 11 at a given distance from one another and make, in the wall 6 of a pack 1 of cigarettes that moves along the path P, a double cut 7 that separates the strap B from the rest of the wall 6 of the pack 1 of cigarettes. In other words, the two rotary blades 10 having circular shape are parallel and adjacent to one another and are mounted so as to rotate around the same vertical rotation axis 11 (namely, the two rotary blades 10 are identical and coaxial to one another); in use the two rotary blades 10 make, in the bottom wall 6 of a pack 1 of cigarettes that moves along the path P, two parallel cuts which separate the strap B from the rest of the bottom wall 6 of the pack 1 of cigarettes.

[0018] According to a further embodiment not illustrated, the two rotary blades 10 could have a predominantly vertical orientation rather than a predominantly horizontal one as illustrated in the accompanying figures. Furthermore, the two rotary blades 10 may also not be perfectly identical to one another (twins) and therefore may be different one from the other. Finally, the two cuts which separate the strap B from the rest of the bottom wall 6 and are made by the two rotary blades 10 may also not be perfectly parallel to one another (namely, they may be slightly convergent or divergent one from the other).

[0019] As illustrated in Figure 5, the cutting unit 8 comprises an actuator device 12 that comprises an electric motor and sets the rotation of the two rotary blades 10 around the rotation axis 11; the two rotary blades 10 rotate, for example, at a rotation speed of about 1500 rpm, which always remains constant.

[0020] As illustrated in Figure 5, the cutting unit 8 comprises a sucking duct 13 (namely, connected to a suction source) arranged to suck the strap B which has just been cut by the two rotary blades 10; namely, the function of the sucking duct 13 is to convey by suction the strap B which has been separated from the bottom wall 6 by the double cut 7 so as to bring the strap B into a suitable collecting area (not illustrated). By way of example, the suction in the sucking duct 13 can be made by using an impeller or a flow accelerator. According to a preferred embodiment, an initial end of the sucking duct 13 has a conical shape having the minimum size in the area of the

rotary blades 10 (namely, having a size that progressively widens moving away from the rotary blades 10) so as to have the maximum depression in the area of the rotary blades 10.

[0021] As illustrated in Figure 5, the cutting unit 8 comprises a fixed containing guide 14 against which the bottom wall 6 of the pack 1 of cigarettes slides and that is provided with a through slot 15 through which the two rotary blades 10 are arranged (namely, through which the two rotary blades 10 come into contact with the bottom wall 6 of the pack 1 of cigarettes); for said purpose, the through slot 15 of the fixed guide 14 is slightly wider than the pair of rotary blades 10 to allow the insertion thereof beyond the fixed guide 14 with minimum clearance.

[0022] As illustrated in Figure 6, the cutting unit 8 comprises a pneumatic device 16 configured to apply, between the two rotary blades 10, suction, which acts upon the strap B that is separate from the bottom wall 6 of the pack 1 of cigarettes by the double cut 7 made by the two rotary blades 10. Namely, the suction generated by the pneumatic device 16 tends to make the strap B adhere between the two rotary blades 10, thus "tearing" the strap B from the bottom wall 6 of the pack 1 of cigarettes as the double cut 7 proceeds. In this way, the strap B does not remain stuck in the bottom wall 6 of the pack 1 of cigarettes, but is removed from the bottom wall 6 of the pack 1 of cigarettes as the double cut 7 proceeds. Furthermore, according to a preferred embodiment, the pneumatic device 16 is also configured to apply a jet of air between the two rotary blades 10 which acts upon the strap B after performing the double cut 7 (namely, once the double cut 7 has been completed) to remove the strap B from the rotary blades 10 and therefore allows the sucking duct 13 to "capture" and therefore definitively remove the strap B. In other words, the pneumatic device 16 is configured to alternately apply, between the two rotary blades 10, suction, which acts upon the strap B during the execution of the double cut 7 (to remove the strap B from the bottom wall 6 of the pack 1 of cigarettes) and a jet of air which acts upon the strap B after the execution of the double cut 7 (to push the strap B towards the sucking duct 13).

[0023] As illustrated in Figures 8 and 9, the cutting unit 8 comprises a support disc 17, which is coaxial with the two rotary blades 10, is interposed between the two rotary blades 10 so as to form a single assembly with the rotary blades 10 (namely, it is tightly packed with the two rotary blades 10) and is mounted so as to rotate together with the two rotary blades 10 around the rotation axis 11. The support disc 17 laterally delimits a plurality of chambers 18, each open towards the outside and in which suction and overpressure (to generate a compressed jet of air) are applied alternately. The chambers 18 are evenly distributed around the rotation axis 11 and each have a substantially parallelepiped shape. Each chamber 18 is laterally delimited by the support disc 17 and is delimited, at the top and at the bottom, by the rotary blades 10. In

other words, each chamber 18 is formed by a through opening which passes through the support disc 17 from one wall to the other.

[0024] As illustrated in Figure 8, the support disc 17 has an outer edge 19 which is arranged between the two rotary blades 10 and is interrupted by the openings of the chambers 18 from which the suction and the jet of air alternately are let out; in use the strap B, separated by the double cut 7 from the bottom wall 6 of the pack 1 of cigarettes and attracted by the suction let out by the openings of the chambers 18 rests against the outer edge 19 of the support disc 17 and remains in contact with the outer edge 19 of the support disc 17 until a compressed jet is let out from the openings of the chambers 18.

[0025] As illustrated in Figure 8, each chamber 18 has an inner end 20, which is connected to a pneumatic distributor 21 (illustrated in Figures 6 and 7) and an outer end 22, which is radially opposite the inner end 20 and is open through the outer edge 19 of the support disc 17; therefore in use the suction and the overpressure run along each chamber 18 from the inner end 20 to the outer end 22 from which they are let out from the support disc 17 thus acting on the strap B separated by the double cut 7 from the bottom wall 6 of the pack 1 of cigarettes.

[0026] As illustrated in Figure 8, the two rotary blades 10 are perfectly identical to one another for constructive simplicity (so as not to have to make two rotary blades 10 slightly different from one another and therefore have a single type of perfectly interchangeable rotary blades 10) and then each rotary blade 10 has a series of through holes 23, each axially overlapped by an inner end 20 of a corresponding chamber 18. For a single rotary blade 10 each through hole 23 connects the inner end 20 of a corresponding chamber 18 with the pneumatic distributor 21 arranged beyond the rotary blade 10, whereas for the other rotary blade 10 each through hole 23 has no function since beyond the rotary blade 10 there is nothing (namely, each through hole 23 ends against a solid wall which seals the through hole 23). Therefore, for constructive simplicity both the rotary blades 10 have through holes 23, but only the through holes 23 of a single rotary blade 10 have the function of connecting the inner end 20 of the chambers 18 with the pneumatic distributor 21, whereas the through holes 23 of the other rotary blade 10 have no function.

[0027] As illustrated in Figures 6 and 7, the pneumatic distributor 21 comprises a cylindrical body 24 which is still, namely does not rotate around the rotation axis 11, and is coupled to the rotary blades 10. In other words, an upper rotary blade 10 is arranged in contact with the cylindrical body 24 and, by rotating around the rotation axis 11, it slides against the cylindrical body 24 that instead does not rotate around the rotation axis 11. As illustrated in Figure 7, the cylindrical body 24 has a compartment 25 which is shaped like an arc of a circle, is coaxial with the rotation axis 11, can be permanently connected to a suction source, and is arranged in the

area of the through holes 23 of the rotary blades 10 and therefore in the area of the inner ends 20 of the chambers 18 of the support disc 17. Furthermore, the cylindrical body 24 has a compartment 26 which is shaped like an arc of a circle, is coaxial with the rotation axis 11, can be permanently connected to a source of compressed air, and is arranged next to the compartment 25 in the area of the through holes 23 of the rotary blades 10 and therefore in the area of the inner ends 20 of the chambers 18 of the support disc 17.

[0028] During the rotation of the assembly formed by the rotary blades 10 and by the support disc 17, the inner end 20 of each chamber 18 of the support disc 17 is isolated by about 180° from both the compartments 25 and 26, it is arranged at approximately 90° in connection (through the corresponding through hole 23) with the compartment 25 to receive suction (whereas the rotary blades 10 are making the double cut 7 which separates the strap B from the bottom wall 6 of the pack 1 of cigarettes) and it is subsequently connected by about 90° (through the corresponding through hole 23) with the compartment 26 so as to receive an overpressure (when the rotary blades 10 have completed the double cut 7 that separates the strap B from the bottom wall 6 of the pack 1 of cigarettes and therefore the strap B must be pushed towards the sucking duct 13).

[0029] According to a possible embodiment, the cutting unit 8 comprises a cleaning device (namely a kind of scraper) which is arranged in a fixed position around the two rotary blades 10, arranged at a small distance from the two rotary blades 10, and has the function of cleaning the two rotary blades 10 from any extraneous elements (pieces of cardboard of the bottom wall 6) that have become wedged between the two rotary blades 10 or stuck to a rotary blade 10. In other words, the cleaning device separates from the rotary blades 10 any extraneous elements (pieces of cardboard from the bottom wall 6) wedged between the two rotary blades 10 or stuck to a rotary blade 10.

[0030] According to a possible embodiment, a control station is also provided which could be arranged along the path P downstream of the cutting unit 8 and is provided with a viewing device which, by acquiring and analysing one or more images of the pack 1 of cigarettes, is able to establish whether the strap B produced by the double cut 7 has been correctly eliminated. Obviously, any packs 1 of cigarettes which do not conform to the desired specifications (namely, in which the strap B produced by the double cut 7 has not been correctly eliminated) would be discarded in a discard station arranged downstream of the control station.

[0031] The embodiments described herein can be combined with one another without departing from the scope of the present claims. The cutting unit 8 described above has numerous advantages.

[0032] In the first place, the cutting unit 8 described above allows to ensure the removal of the strap B after the double cut 7, avoiding that the strap B (or a piece of the

strap B) can remain in contact with the bottom wall 6 of the pack 1 of cigarettes.

[0033] Furthermore, the cutting unit 8 described above is simple and inexpensive to implement since, compared to a similar known cutting unit, it requires modifications that are quick to make using commercial pieces or pieces that can be easily obtained with standard machining.

[0034] Finally, the cutting unit 8 described above allows the cut 7 of the bottom wall 6 to be made in a very precise and accurate way, always ensuring optimal functionality of the pack 1 of cigarettes.

LIST OF REFERENCE NUMBERS OF THE FIGURES

[0035]

1	pack of cigarettes
2	rear container
3	front container
4	lid
5	blank
6	bottom wall
7	cut
8	cutting unit
9	conveyor
10	rotary blades
11	rotation axis
12	actuator device
13	sucking duct
14	fixed guide
15	through slot
16	pneumatic device
17	support disc
18	chambers
19	outer edge
20	inner end
21	pneumatic distributor
22	outer end
23	through hole
24	cylindrical body
25	compartment
26	compartment
B	strap
P	path

Claims

1. A cutting unit (8) to remove a strap (B) from a wall (6) of a pack (1), in particular of smoking articles, which is fed along a path (P); the cutting unit (8) comprises two coaxial rotary blades (10), which are mounted so as to rotate around a same rotation axis (11) at a given distance from one another and make, in the wall (6) of the pack (1), a double cut (7), which separates the strap (B) from the rest of the wall (6) of the pack (1); the cutting unit (8) is **characterized in that** it comprises a pneumatic device (16), which is configured

- to apply, between the two rotary blades (10), suction, which acts upon the strap (B).
2. The cutting unit (8) according to claim 1, wherein the pneumatic device (16) is configured to apply, between the two rotary blades (10), suction, which acts upon the strap (B) during the execution of the double cut (7). 5
 3. The cutting unit (8) according to claim 2, wherein the pneumatic device (16) is configured to alternatively apply, between the two rotary blades (10), suction, which acts upon the strap (B) during the execution of the double cut (7), and a jet of air, which acts upon the strap (B) after the execution of the double cut (7). 10
 4. The cutting unit (8) according to claim 1, 2 or 3 and comprising a support disc (17), which is coaxial with the two rotary blades (10), is interposed between the two rotary blades (10) so as to form one single assembly with the rotary blades (10), is mounted so as to rotate together with the two rotary blades (10) around the rotation axis (11) and delimits at least one chamber (18), which is open towards the outside and in which suction is applied. 20
 5. The cutting unit (8) according to claim 4, wherein: the support disc (17) has an outer edge (19), which is arranged between the two rotary blades (10) and is interrupted by an opening of the chamber (18) letting out the suction; and in use, the strap (B), which is attracted by the suction, rests against the outer edge (19) of the support disc (17). 25
 6. The cutting unit (8) according to claim 4 or 5, wherein the support disc (17) delimits a plurality of chambers (18), which are evenly distributed around the rotation axis (11). 30
 7. The cutting unit (8) according to claim 4, 5 or 6, wherein the chamber (18) is laterally delimited by the support disc (17) and is delimited, at the top and at the bottom, by the two rotary blades (10). 40
 8. The cutting unit (8) according to one of the claims from 4 to 7, wherein the chamber (18) has an inner end (20), which is connected to a pneumatic distributor (21), and an outer end (22), which is radially opposite the inner end (20) and is open through an outer edge (19) of the support disc (17). 45
 9. The cutting unit (8) according to claim 8, wherein at least one rotary blade (10) has a through hole (23), which is arranged in the area of the inner end (20) of the chamber (18) of the support disc (17) in order to connect the chamber (18) to the pneumatic distributor (21). 50
 10. The cutting unit (8) according to claim 8 or 9, wherein the pneumatic distributor (21) comprises a cylindrical body (24), which is still, namely does not rotate around the rotation axis (11), is in contact with a rotary blade (10) against which it slides and has a first compartment (25), which is shaped like an arc of a circle, is coaxial with the rotation axis (11), can be connected to a suction source and is arranged in the area of the inner end (20) of the chamber (18) of the support disc (17). 55
 11. The cutting unit (8) according to claim 10, wherein the cylindrical body (24) has a second compartment (26), which is shaped like an arc of a circle, is coaxial with the rotation axis (11), can be connected to a compressed air source and is arranged beside the first compartment (25) in the area of the inner end (20) of the chamber (18) of the support disc (17).
 12. The cutting unit (8) according to one of the claims from 1 to 11 and comprising a sucking duct (13), which is arranged beside the rotary blades (10) and is configured to suck the strap (B), which is in contact with the rotary blades (10).
 13. The cutting unit (8) according to one of the claims from 1 to 12 and comprising a cleaning device, which is arranged in a fixed position around the two rotary blades (10), is at a small distance from the two rotary blades (10) and has the function of cleaning the two rotary blades (10) from possible foreign elements stuck between the two rotary blades (10) or sticking to a rotary blade (10).
 14. The cutting unit (8) according to one of the claims from 1 to 13 and comprising a fixed containing guide (14), against which the wall (6) of the pack (1) slides and which is provided with a through slit (15), through which the two rotary blades (10) are arranged.
 15. A cutting method to remove a strap (B) from a wall (6) of a pack (1), in particular of smoking articles; the method comprises the steps of:
 feeding the pack along a path (P); and
 making, in the wall (6) of the pack (1), a double cut (7), which separates the strap (B) from the rest of the wall (6) of the pack (1), by means of two coaxial rotary blades (10), which are mounted so as to rotate around a same rotation axis (11) at a given distance from one another; the cutting method is **characterized in that** it comprises the further step of applying, between the two rotary blades (10), suction, which acts upon the strap (B).

Patentansprüche

1. Schneideinheit (8), um einen Streifen (B) von einer Wand (6) einer Packung (1), insbesondere von Rauchwaren, die entlang eines Wegs (P) zugeführt wird, zu entfernen; wobei die Schneideinheit (8) zwei koaxiale Drehklingen (10) umfasst, die derart angebracht sind, dass sie sich in einem gegebenen Abstand voneinander um eine gleich Drehachse (11) drehen und in der Wand (6) der Packung (1) einen Doppelschnitt (7) durchführen, der den Streifen (B) vom Rest der Wand (6) der Packung (1) trennt; wobei die Schneideinheit (8) **dadurch gekennzeichnet ist, dass** sie eine Druckluftvorrichtung (16) umfasst, die konfiguriert ist, zwischen den zwei Drehklingen (10) Saugkraft auszuüben, die auf den Streifen (B) wirkt. 5
2. Schneideinheit (8) nach Anspruch 1, wobei die Druckluftvorrichtung (16) konfiguriert ist, zwischen den zwei Drehklingen (10) während der Ausführung des Doppelschnitts (7) Saugkraft auszuüben, die auf den Streifen (B) wirkt. 10
3. Schneideinheit (8) nach Anspruch 2, wobei die Druckluftvorrichtung (16) konfiguriert ist, abwechselnd zwischen den zwei Drehklingen (10) während der Ausführung des Doppelschnitts (7) Saugkraft, die auf den Streifen (B) wirkt, und nach der Ausführung des Doppelschnitts (7) einen Luftstrahl, der auf den Streifen (B) wirkt, auszuüben. 15
4. Schneideinheit (8) nach Anspruch 1, 2 oder 3, und umfassend eine Trägerscheibe (17), die zu den zwei Drehklingen (10) koaxial ist, zwischen den zwei Drehklingen (10) angeordnet ist, derart, um mit den Drehklingen (10) eine einzige Baugruppe zu bilden, derart angebracht ist, um sich zusammen mit den zwei Drehklingen (10) um die Drehachse (11) zu drehen, und mindestens eine Kammer (18) begrenzt, die nach außen geöffnet ist und in der Saugkraft ausgeübt wird. 20
5. Schneideinheit (8) nach Anspruch 4, wobei: die Trägerscheibe (17) eine Außenkante (19) aufweist, die zwischen den zwei Drehklingen (10) angeordnet ist und durch eine Öffnung der Kammer (18) unterbrochen ist, durch die die Saugkraft herausgelassen wird; und, im Gebrauch, der Streifen (B), der durch die Saugkraft angezogen wird, an der Außenkante (19) der Trägerscheibe (17) ruht. 25
6. Schneideinheit (8) nach Anspruch 4 oder 5, wobei die Trägerscheibe (17) mehrere Kammern (18) begrenzt, die gleichmäßig um die Drehachse (11) verteilt sind. 30
7. Schneideinheit (8) nach Anspruch 4, 5 oder 6, wobei die Kammer (18) durch die Trägerscheibe (17) seitlich begrenzt ist und auf der Oberseite und auf der Unterseite durch die zwei Drehklingen (10) begrenzt ist. 35
8. Schneideinheit (8) nach einem der Ansprüche von 4 bis 7, wobei die Kammer (18) ein inneres Ende (20), das mit einem Druckluftverteiler (21) verbunden ist, und ein äußeres Ende (22), das dem inneren Ende (20) radial gegenüberliegt und durch eine Außenkante (19) der Trägerscheibe (17) offen ist, aufweist. 40
9. Schneideinheit (8) nach Anspruch 8, wobei mindestens eine Drehklinge (10) ein Durchgangsloch (23) aufweist, das im Bereich des inneren Endes (20) der Kammer (18) der Trägerscheibe (17) angeordnet ist, um die Kammer (18) mit dem Druckluftverteiler (21) zu verbinden. 45
10. Schneideinheit (8) nach Anspruch 8 oder 9, wobei der Druckluftverteiler (21) einen zylindrischen Körper (24) umfasst, der stillsteht, das heißt sich nicht um die Drehachse (11) dreht, sich mit einer Drehklinge (10) in Kontakt befindet, an der er gleitet, und einen ersten Raum (25) aufweist, die wie ein Bogen eines Kreises geformt ist, zur Drehachse (11) koaxial ist, mit einer Saugkraftquelle verbunden sein kann und im Bereich des inneren Endes (20) der Kammer (18) der Trägerscheibe (17) angeordnet ist. 50
11. Schneideinheit (8) nach Anspruch 10, wobei der zylindrische Körper (24) einen zweiten Raum (26) aufweist, die wie ein Bogen eines Kreises geformt ist, zur Drehachse (11) koaxial ist, mit einer Quelle für komprimierte Luft verbunden sein kann und neben dem ersten Raum (25) im Bereich des inneren Endes (20) der Kammer (18) der Trägerscheibe (17) angeordnet ist. 55
12. Schneideinheit (8) nach einem der Ansprüche von 1 bis 11 und umfassend eine Saugleitung (13), die neben den Drehklingen (10) angeordnet ist und konfiguriert ist, den Streifen (B), der sich mit den Drehklingen (10) in Kontakt befindet, anzusaugen.
13. Schneideinheit (8) nach einem der Ansprüche von 1 bis 12 und umfassend eine Reinigungsvorrichtung, die an einer feststehenden Position um die zwei Drehklingen (10) angeordnet ist, sich in einem geringen Abstand von den zwei Drehklingen (10) befindet und die Funktion des Reinigens der zwei Drehklingen (10) von möglichen Fremdkörpern, die zwischen den zwei Drehklingen (10) stecken oder an einer Drehklinge (10) haften, aufweist.
14. Schneideinheit (8) nach einem der Ansprüche von 1 bis 13 und umfassend eine feststehende Aufnahme-führung (14), gegen die die Wand (6) der Packung

(1) glisset und die mit einem Durchgangsschlitz (15) versehen ist, durch den die zwei Drehklingen (10) angeordnet sind.

15. Schneidverfahren, um einen Streifen (B) von einer Wand (6) einer Packung (1), insbesondere von Rauchwaren, zu entfernen; wobei das Verfahren die Schritte umfasst:

Zuführen der Packung entlang eines Wegs (P); und
Durchführen eines Doppelschnitts (7) in der Wand (6) der Packung (1), der den Streifen (B) vom Rest der Wand (6) der Packung (1) trennt, mittels zweier koaxialer Drehklingen (10), die derart angebracht sind, dass sie sich mit einem gegebenen Abstand voneinander um eine gleiche Drehachse (11) drehen;
wobei das Schneidverfahren **dadurch gekennzeichnet ist, dass** es den weiteren Schritt des Ausübens von Saugkraft zwischen den zwei Drehklingen (10), die auf den Streifen (B) wirkt, umfasst.

Revendications

1. Unité de coupe (8) pour retirer une bande (B) d'une paroi (6) d'un paquet (1), en particulier d'articles à fumer, qui est acheminé le long d'un trajet (P); l'unité de coupe (8) comprend deux lames rotatives coaxiales (10), qui sont montées de manière à tourner autour d'un même axe de rotation (11) à une distance donnée l'une de l'autre et à réaliser, dans la paroi (6) du paquet (1), une double coupe (7), qui sépare la bande (B) du reste de la paroi (6) du paquet (1); l'unité de coupe (8) est **caractérisée en ce qu'elle** comprend un dispositif pneumatique (16), qui est configuré pour appliquer, entre les deux lames rotatives (10), une aspiration, qui agit sur la bande (B).
2. Unité de coupe (8) selon la revendication 1, dans laquelle le dispositif pneumatique (16) est configuré pour appliquer, entre les deux lames rotatives (10), une aspiration, qui agit sur la bande (B) lors de l'exécution de la double coupe (7).
3. Unité de coupe (8) selon la revendication 2, dans laquelle le dispositif pneumatique (16) est configuré pour appliquer alternativement, entre les deux lames rotatives (10), une aspiration, qui agit sur la bande (B) pendant l'exécution de la double coupe (7), et un jet d'air, qui agit sur la bande (B) après l'exécution de la double coupe (7).
4. Unité de coupe (8) selon la revendication 1, 2 ou 3 et comprenant un disque de support (17), qui est coaxial avec les deux lames rotatives (10), est interposé

entre les deux lames rotatives (10) de manière à former un seul ensemble avec les lames rotatives (10), est monté de manière à tourner avec les deux lames rotatives (10) autour de l'axe de rotation (11) et délimite au moins une chambre (18), qui est ouverte en direction de l'extérieur et dans laquelle une aspiration est appliquée.

5. Unité de coupe (8) selon la revendication 4, dans laquelle :
le disque de support (17) présente un bord externe (19), qui est agencé entre les deux lames rotatives (10) et est interrompu par une ouverture de la chambre (18) laissant sortir l'aspiration; et lors de l'utilisation, la bande (B), qui est attirée par l'aspiration, repose contre le bord externe (19) du disque de support (17).
6. Unité de coupe (8) selon la revendication 4 ou 5, dans laquelle le disque de support (17) délimite une pluralité de chambres (18), qui sont réparties uniformément autour de l'axe de rotation (11).
7. Unité de coupe (8) selon la revendication 4, 5 ou 6, dans laquelle la chambre (18) est délimitée latéralement par le disque de support (17) et est délimitée, au niveau de la partie supérieure et de la partie inférieure, par les deux lames rotatives (10).
8. Unité de coupe (8) selon l'une des revendications 4 à 7, dans laquelle la chambre (18) présente une extrémité interne (20), qui est raccordée à un distributeur pneumatique (21), et une extrémité externe (22), qui est radialement opposée à l'extrémité interne (20) et est ouverte à travers un bord externe (19) du disque de support (17).
9. Unité de coupe (8) selon la revendication 8, dans laquelle au moins une lame rotative (10) présente un trou traversant (23), qui est agencé dans la zone de l'extrémité interne (20) de la chambre (18) du disque de support (17) afin de raccorder la chambre (18) au distributeur pneumatique (21).
10. Unité de coupe (8) selon la revendication 8 ou 9, dans laquelle le distributeur pneumatique (21) comprend un corps cylindrique (24), qui est immobile, à savoir ne tourne pas autour de l'axe de rotation (11), est en contact avec une lame rotative (10) contre laquelle il coulisse et présente un premier compartiment (25), qui est en forme d'arc de cercle, est coaxial à l'axe de rotation (11), peut être raccordé à une source d'aspiration et est agencé dans la zone de l'extrémité interne (20) de la chambre (18) du disque de support (17).
11. Unité de coupe (8) selon la revendication 10, dans laquelle le corps cylindrique (24) présente un second

compartiment (26), qui en forme d'arc de cercle, est coaxial avec l'axe de rotation (11), peut être raccordé à une source d'air comprimé et est agencé à côté du premier compartiment (25) dans la zone de l'extrémité interne (20) de la chambre (18) du disque de support (17). 5

12. Unité de coupe (8) selon l'une des revendications 1 à 11 et comprenant un conduit d'aspiration (13), qui est agencé à côté des lames rotatives (10) et est configuré pour aspirer la bande (B), qui est en contact avec les lames rotatives (10). 10

13. Unité de coupe (8) selon l'une des revendications 1 à 12 et comprenant un dispositif de nettoyage, qui est agencé dans une position fixe autour des deux lames rotatives (10), est à une faible distance des deux lames rotatives (10) et a pour fonction de nettoyer les deux lames rotatives (10) d'éventuels éléments étrangers coincés entre les deux lames rotatives (10) ou adhérant à une lame rotative (10). 15
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14. Unité de coupe (8) selon l'une des revendications 1 à 13 et comprenant un guide de contenant fixe (14), contre lequel coulisse la paroi (6) du paquet (1) et qui est doté d'une fente traversante (15), à travers laquelle sont agencées les deux lames rotatives (10). 25

15. Méthode de coupe pour retirer une bande (B) d'une paroi (6) d'un paquet (1), notamment d'articles à fumer ; la méthode comprend les étapes de : 30

acheminement du paquet le long d'un trajet (P) ;
et
réalisation, dans la paroi (6) du paquet (1), d'une double coupe (7), qui sépare la bande (B) du reste de la paroi (6) du paquet (1), au moyen de deux lames rotatives coaxiales (10), qui sont montées de manière à tourner autour d'un même axe de rotation (11) à une distance donnée l'une de l'autre ; 35
40
le procédé de coupe est **caractérisé en ce qu'il** comprend l'étape supplémentaire d'application, entre les deux lames rotatives (10), d'une aspiration, qui agit sur la bande (B). 45

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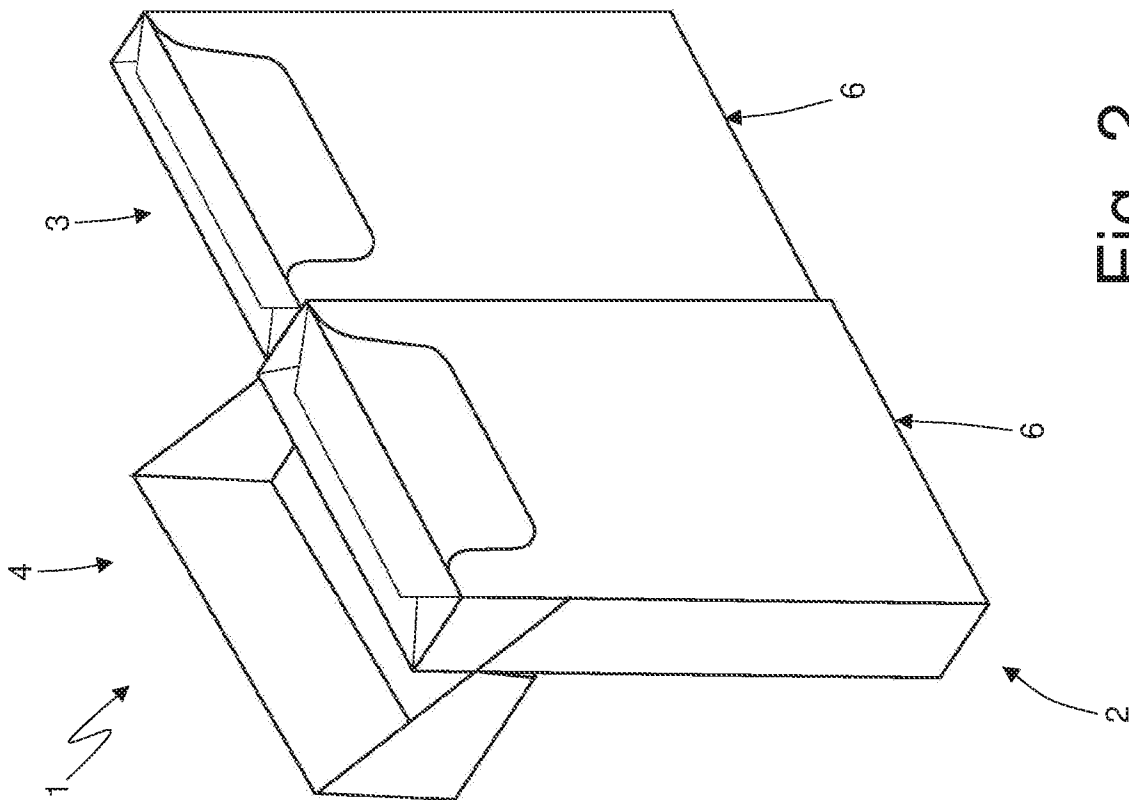


Fig. 2

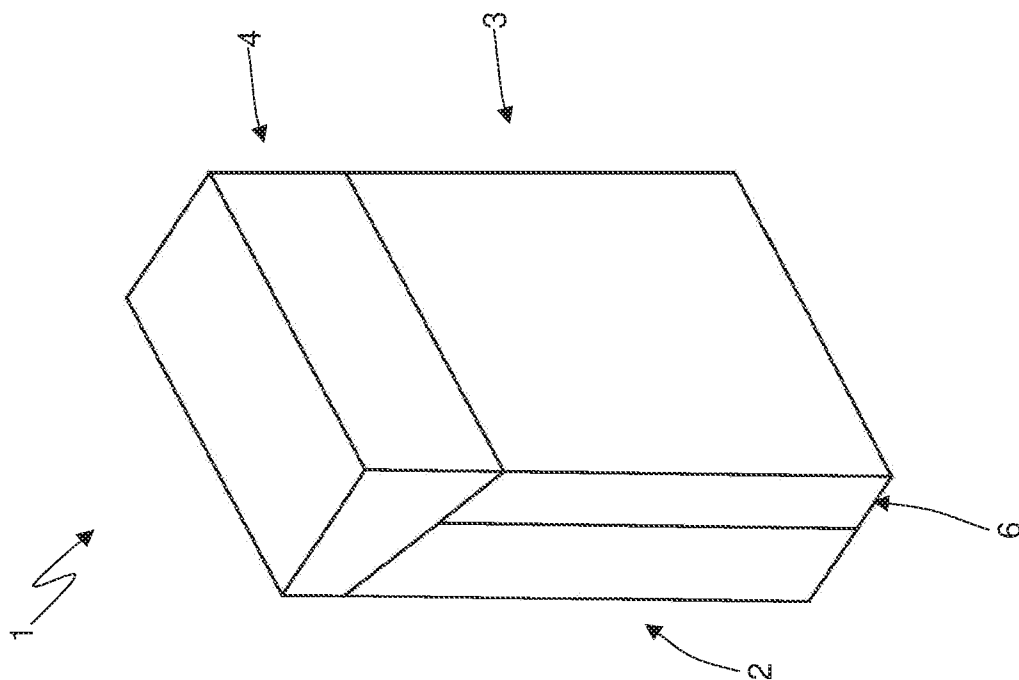


Fig. 1

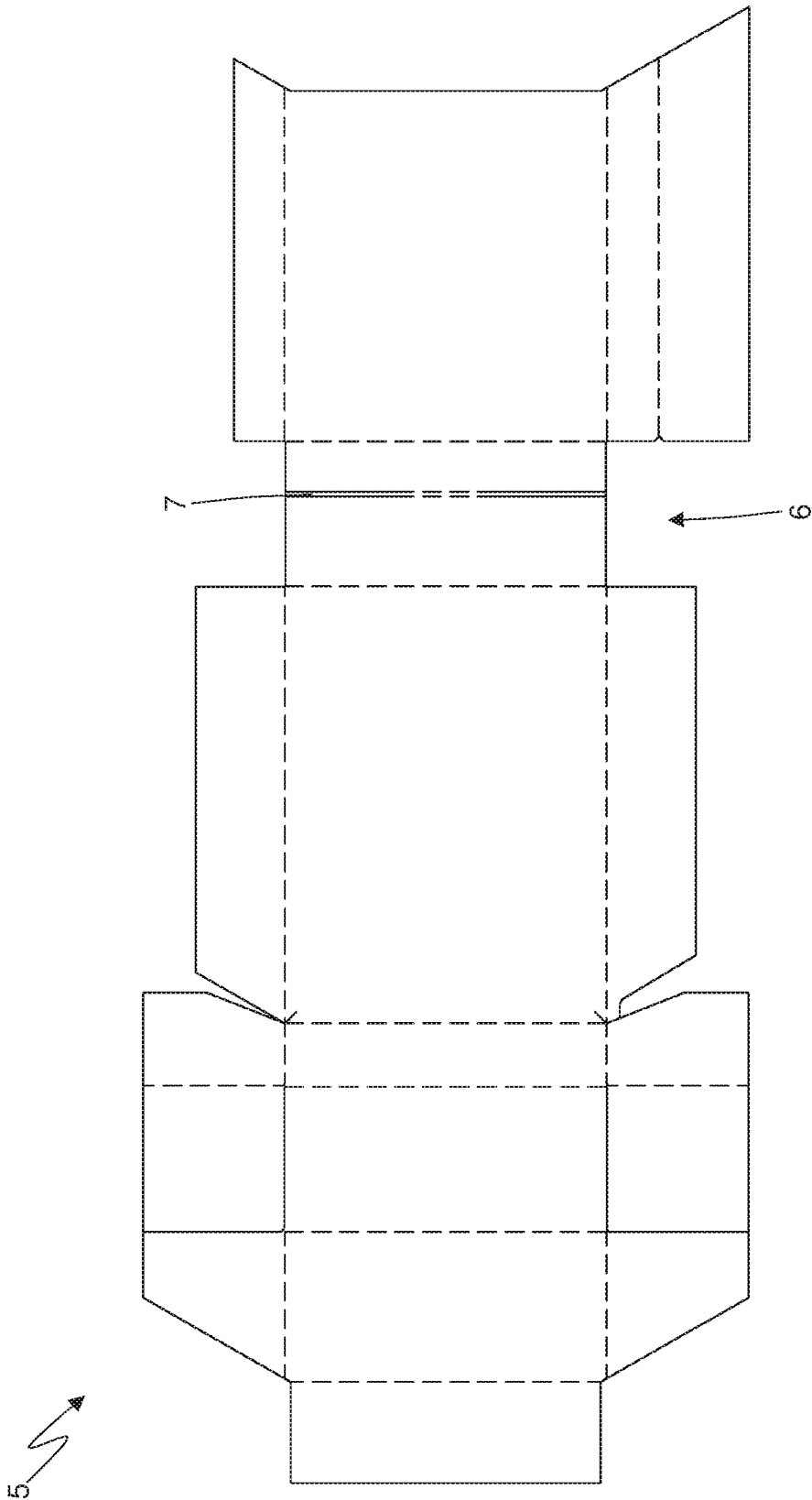


Fig. 3

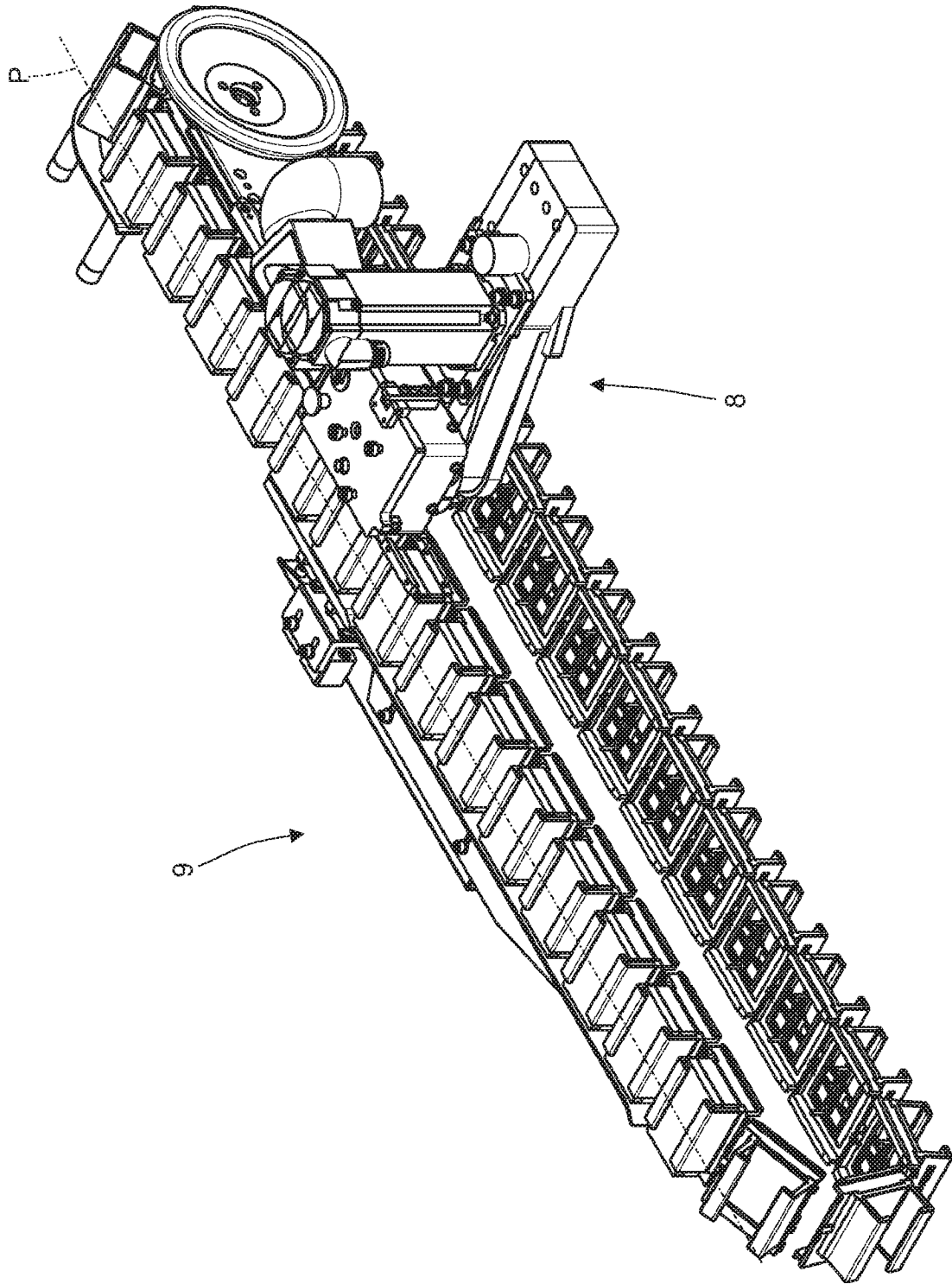


Fig. 4

Fig. 5

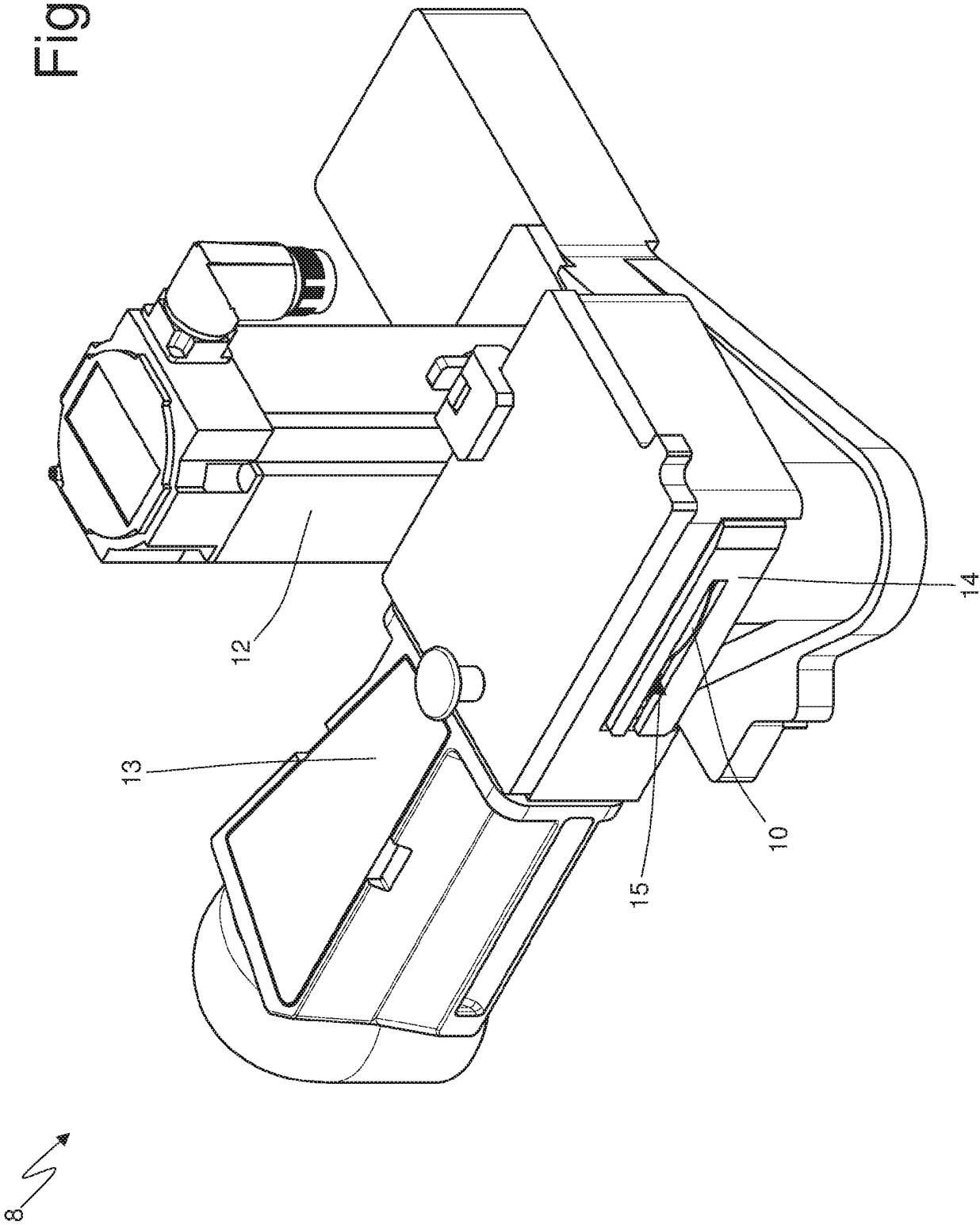


Fig. 6

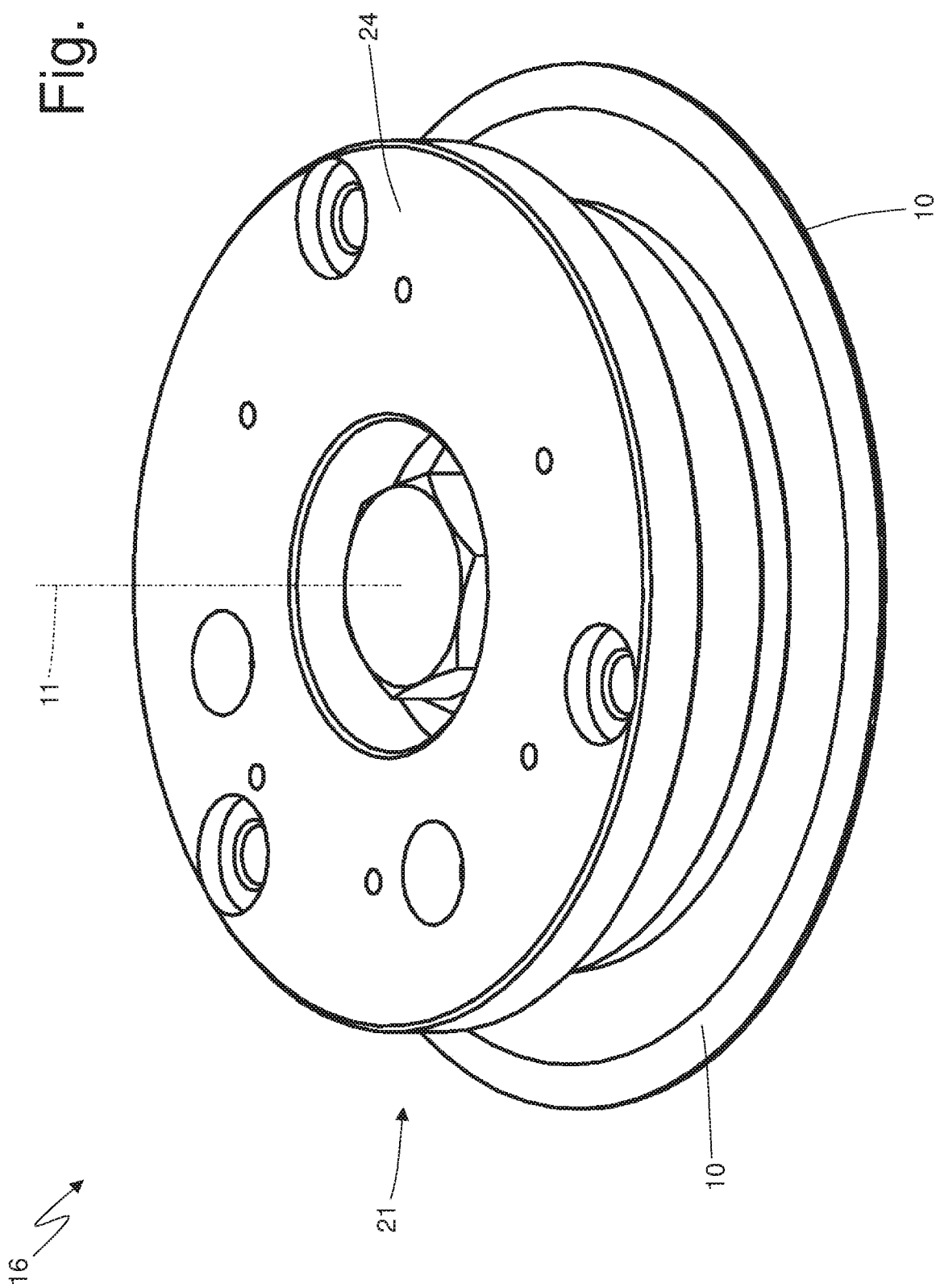
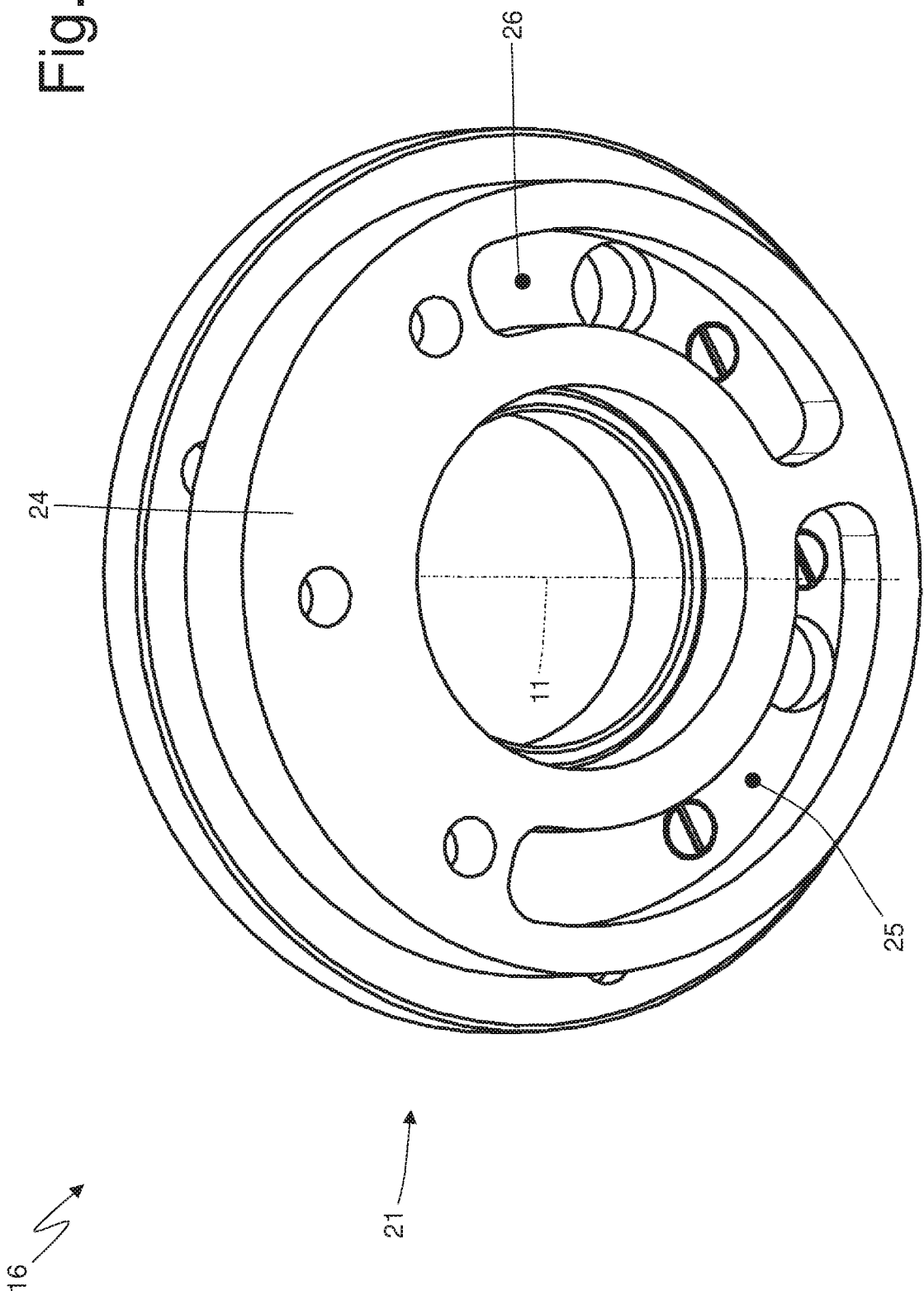


Fig. 7



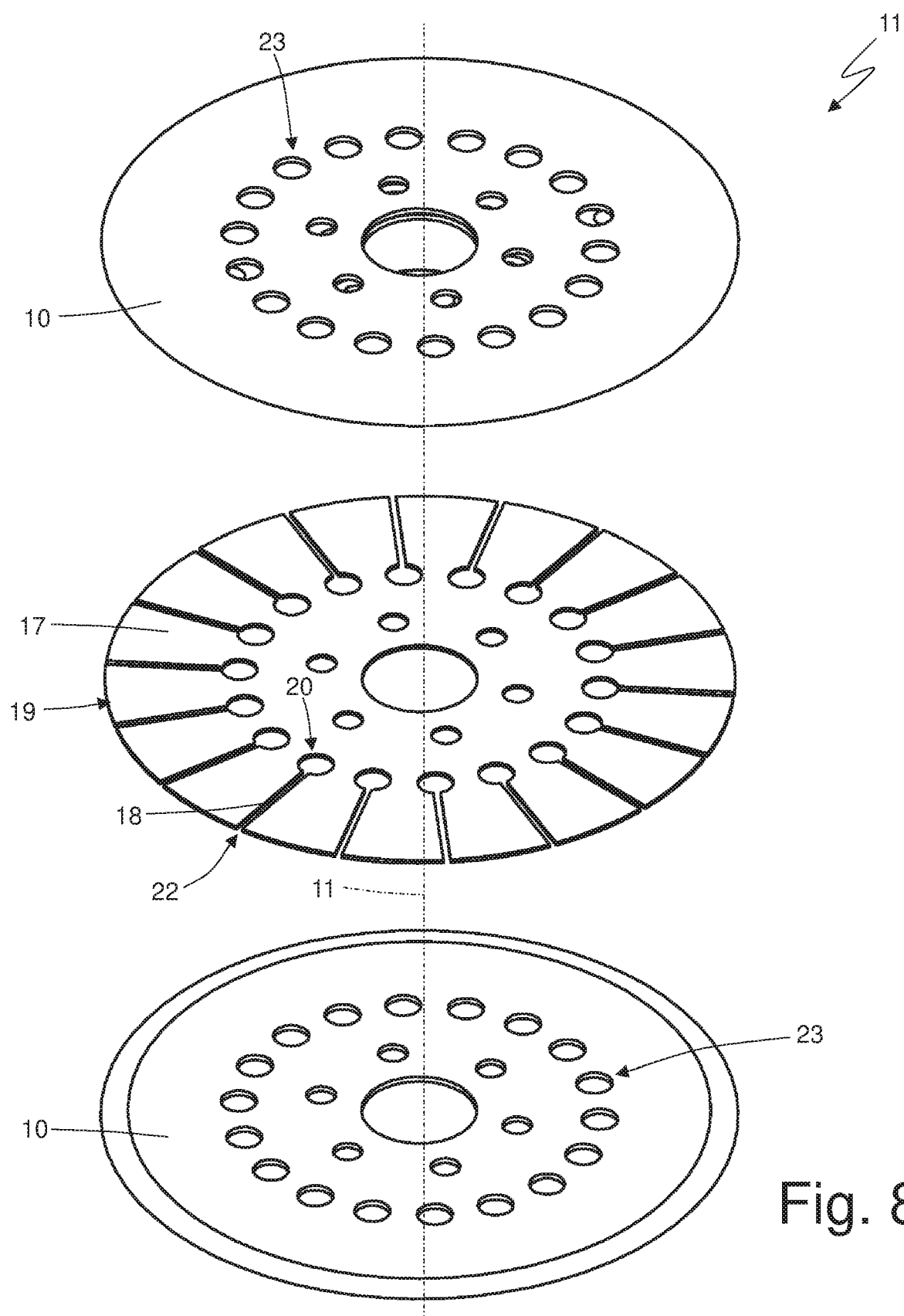
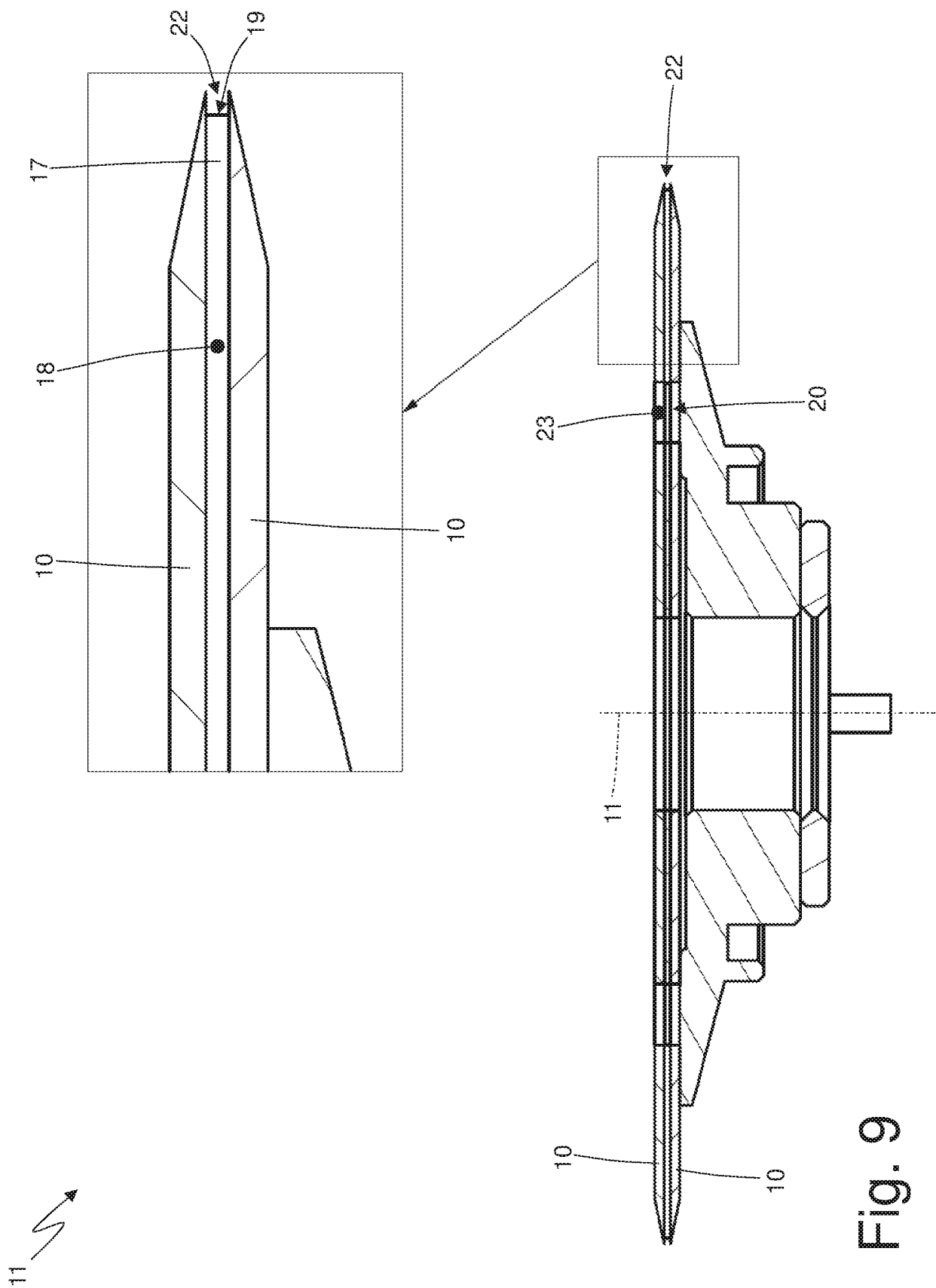


Fig. 8



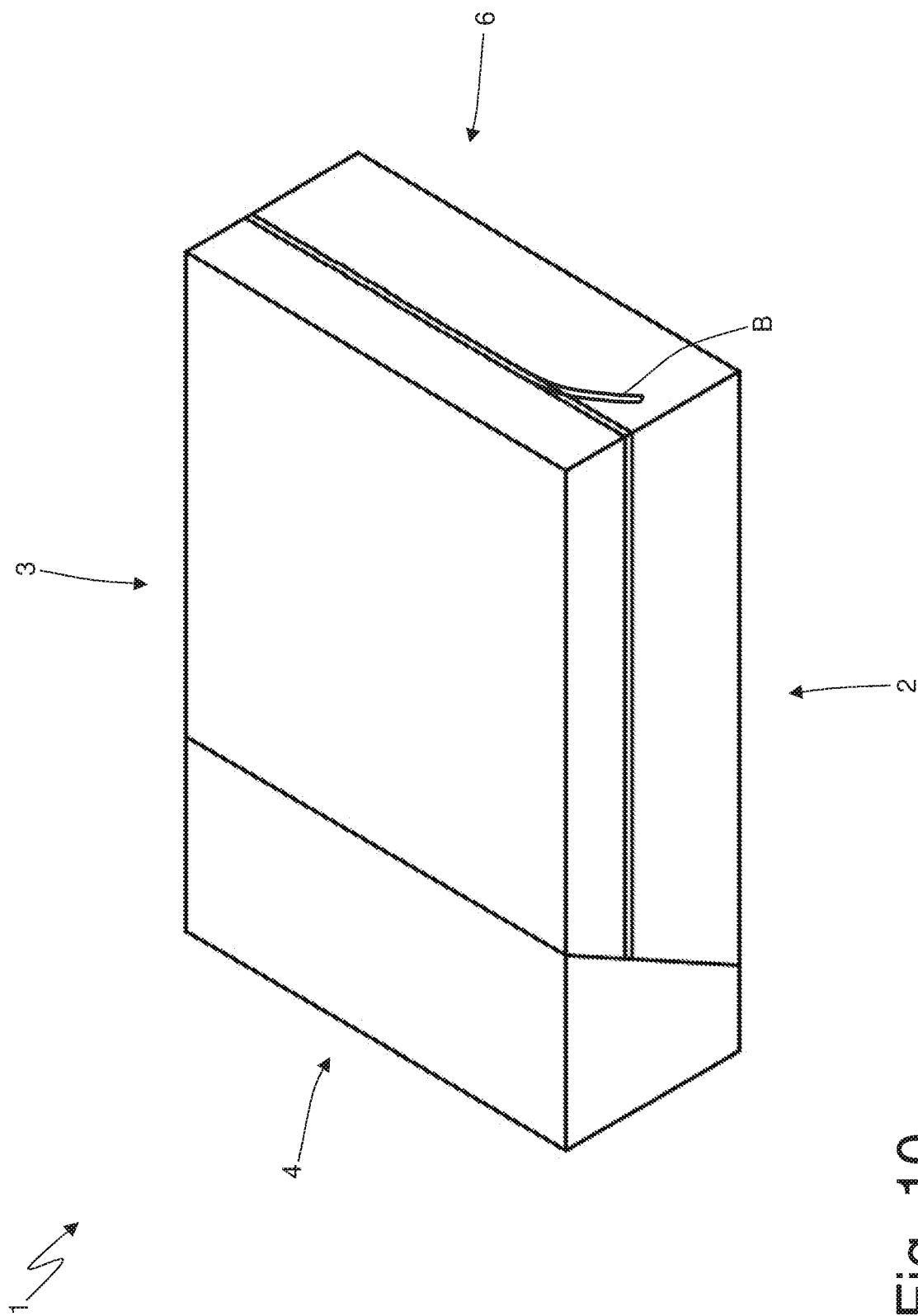


Fig. 10

REFERENCES CITED IN THE DESCRIPTION

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