

(19)



(11)

EP 2 917 593 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

30.11.2016 Bulletin 2016/48

(51) Int Cl.:

F15B 15/14^(2006.01) F16J 15/40^(2006.01)

(86) International application number:

PCT/IB2013/053241

(21) Application number: **13728525.0**

(22) Date of filing: **24.04.2013**

(87) International publication number:

WO 2014/072841 (15.05.2014 Gazette 2014/20)

(54) **SCRAPING ASSEMBLY**

ABSTREIFVORRICHTUNG

ENSEMBLE DE GRATTAGE

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(30) Priority: **09.11.2012 IT BS20120160**

(43) Date of publication of application:

16.09.2015 Bulletin 2015/38

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Description

[0001] The present invention relates to a scraper for cleaning the guide element of a sliding member, or of a stem or of a piston of a piston cylinder unit, and an assembly comprising said scraper.

[0002] The use of cylinder and piston mechanisms is widespread for performing various types of work which may range from the sphere of manufacturing to waste disposal, the motor or aero-space industry, building industry and medical or scientific spheres.

[0003] There are applications however in which, when the piston is extracted from the cylinder, it is vulnerable to aggression by corrosive or deteriorating agents and may act as a preferential substrate for dirt, dust or external material which in the long run prejudice the correct functioning of the mechanism.

[0004] In fact, the generation or accumulation of incrustations on the outer surface of the piston considerably complicates the return thereof inside its cylinder, especially when such incrustations reach a considerable consistency or thickness; in addition such deposits are sometimes able to penetrate inside the drive circuit of the piston, whether hydraulic or pneumatic so that in this case the partial occlusion of the aforesaid circuit may occur, or it may be necessary to regularly replace the fluid contained therein to restore optimal functioning conditions.

[0005] A similar problem also occurs in equipment with sliding guides, for example, in the machine tool sector, where the generation of dust, shavings or the like may entail serious difficulties in the movement of the relative components. For example, document US2010/0200024 A1 discloses a device according to the preamble of claim 1.

[0006] The present invention sets out to overcome the drawbacks related to the prior art, in particular by setting out to provide a scraper suitable for preserving the surface condition of the guide elements or of the pistons, and doing so at virtually nil cost thanks to the air used. The use of the scraper may even go so far as to effectively prevent the formation of surface deposits at each movement of the linear actuator of a component (such as a slide or sliding member) on its relative guide element.

[0007] Such objective is achieved by a scraper according to claims 1 and 17, and by a scraping assembly according to claim 10. The dependent claims describe embodiment variants.

[0008] The object of the present invention will now be described in detail with the help of the appended drawings, wherein:

- figure 1 shows an assembly which the present invention relates to according to a possible embodiment, in which the scraper illustrated is partially in cross-section at the first aperture;
- figures 2a to 2g show guide elements, stems or pistons suitable for using in the aforesaid assembly;

- figures 3a, 3b, 4a, 4b and 5a, 5b show, in pairs, a perspective view (in partial cross-section except for figure 5a) and an exploded view of scrapers according to different embodiments where, for the sake of clarity, only the guide element, stem or piston engaged with said scrapers is shown;

- figures 6a, 6b shows an assembly which the present invention relates to according to a further embodiment, in which the scraper of figure 6a is partially in cross-section at the first and the second aperture, the scraper in figure 6a being shown with separated parts.

[0009] With reference to the aforementioned drawings, reference numeral 1 globally denotes a scraping assembly comprising a guide element 4a-4c for a sliding member (not shown) having a main extension axis Y, or a linear actuator 2 having a main working axis X, and a scraper 10, 12, 14, 16', 16'', preferably pneumatic, acting on the linear actuator 2 or on the guide element according to the manner described below.

[0010] The linear actuator 2 comprises a stem 4d-4g which delimits an outer surface 6 and which, according to an embodiment variation, further comprises an external body or cylinder 38 which houses said stem at least partially and so as to slide. For example in the case of a pneumatic or hydraulic actuator, the stem 4d-4g is part of a piston sliding inside said cylinder 38.

[0011] Alternatively, for the variants providing a guide element 4a-4c, it is the latter which identifies the outer surface 6. Preferably, the guide element comprises a rail or shaped guide (for example extruded or metallic) extending along the main extension axis Y.

[0012] Within the present description the terms "stem" and "piston" will be used substantially interchangeably, such terms referring to the component of the linear actuator 2 movable along the main working axis X, or fixed but suitable for moving the external body/cylinder. Moreover, without prejudice to the fact that the same reference numerals correspond to identical components or characteristics (except as otherwise specified), the guide element described may have the same characteristics as the stem.

[0013] In the embodiment shown in figure 1, provided by way of a non-limiting example, the linear actuator 2 is a cylinder-piston group, for example of the hydraulic or pneumatic type. In fact, in such drawing it may be seen how two or more connectors 46, 48 are inserted in the outer body or cylinder 38 for the entrance and exit of a movement fluid (such as oil or air), the latter fluid being destined to move the piston (or the cylinder) along the main working axis X.

[0014] According to a further variant (not shown), the linear actuator is of the mechanical type, and in such circumstance the stem defines a cochlea or worm to perform a roto-translation.

[0015] In other words, a first embodiment provides for a piston which translates only, and a further embodiment

a piston roto-translating in relation to the outer body or to the cylinder 38.

[0016] In the same way, the guide element may thus be configured to cause a roto-translation of a component or of a slide sliding thereon, or a mere translation parallel to the main extension axis Y.

[0017] For the purposes of illustration only, three guide elements (indicated by reference numerals 4a-4c) and four stems/pistons (4d-4g) are shown in figure 2; nonetheless this should not be considered limiting in that the components 4d-4g may also be independently used as guide elements, the inverse condition applying.

[0018] According to an advantageous variant of the invention, the scraper 10 (and in particular the relative scraper body 8) is directly constrained to the outer body or to the cylinder 38, in the absence of further support elements or components. With reference for example to the variant shown in figure 1, the scraper 10 is provided with one or more attachment seats 50 to the cylinder 38. For example such seats comprise through holes or slots, engaged by complementary threaded means 52.

[0019] According to a further variant, the scraper 12, 14, 16', 16" may be connected to a support component 40, 42, 44 separate from the external body or from the cylinder 38 of the linear actuator 2, or separate from the guide element 4a-4c.

[0020] With reference to figure 3a, one variant provides that such scraper 12 is connected to a side bracket 40 connected to a not shown support surface. To such purpose, threaded attachment means 52 acting between the bracket 40 and the scraper body 20 may be provided. Preferably, such means 52 cross at least one portion of the side bracket 40 completely and the scraper body 20 partially. For example the side bracket may be "L" or "T" shaped.

[0021] According to a further embodiment, for example shown in figures 3 and 4, the support component 42, 44 may comprise an attachment plate which acts as the base 14 for one or more scrapers 16', 16". Preferably, for the second of such variants, the attachment plate 44 presents a first 16' and a second 16" scraper joined to opposite support surfaces 54, 56 which define it. For example such support surfaces 54, 56 lie on orthogonal planes in relation to the main axis X, and advantageously define the thickness of such plate 44.

[0022] According to yet a further embodiment, the support component may be a portion of the component or of the slide sliding along the guide element, in a direction parallel to the main extension axis Y.

[0023] The scraper 10, 12, 14, 16', 16" thus comprises the scraper body 8, 18, 20 mentioned above, which defines at least a first aperture 22 suitable for being connected to a compressed air source or to a suction source (not shown).

[0024] According to a first embodiment, the scraper which the present invention relates to thus functions with compressed air while, according to a further embodiment, the present scraper functions with aspirated air.

Consequently, such variants differ mainly in the directions of transit (indicated by letters "T" or "A" in the drawings) of the flow of air respectively used, as well as by the characteristics of the relative generation means.

[0025] In the embodiment shown in figure 3a, the letter T has been used to denote the direction of transit of the compressed air inside the scraper body 8, 18, 20. In the embodiment of figure 6b, the letter A instead indicates the direction of an aspiration flow coming out of such body. This should not however be understood as a limitation of such or other embodiments, in that any of the scrapers described or illustrated is suitable for functioning both with compressed air and aspirated air.

[0026] The scraper body 8, 18, 20 further defines a through chamber 24, 26 for the partial and sliding housing of the element/stem 4a-4g parallel to the main axis X, Y, and delimits at least partially one or more second apertures 28, 30, 68; such latter apertures 28, 30, 68 are supplied through the first aperture 22 and are configured to place the through chamber 24, 26 in fluidic communication with the outside environment. This way, the flow of air generated by the source is suitable for shifting or removing deposits, residues, impurities or the like from the outer surface 6.

[0027] In fact, whether the movement or removal from the outer surface 6 takes place by means of an aspiration of the flow of air from the through chamber or by means of the injection of a flow of air into such chamber the cleaning action of the scraper according to the invention takes place without contact, by means of the mere direction of the flow of air (preferably pressurised) without creating obstructions to the movement of the piston or guide element.

[0028] Consequently, downstream of the direction of transit T of the compressed air (or upstream of the direction of transit A of the flow of aspirated air), the second aperture 28, 30, 68 communicates with the outside environment; consequently the pneumatic scraping circuit is an open system.

[0029] Preferably, the second aperture 28, 30 is oriented to direct a jet or plurality of jets towards the outer surface 6 of the piston and/or element so as to shift or remove deposits, residues or the like.

[0030] As shown for example in the drawings, the first aperture 22 is engaged by a connector 58 which, by means of a feed pipe (not shown), connects such aperture 22 to a compressed air source or to a suction source.

[0031] Preferably, the second apertures 28, 30, 68 flow into (for example directly) the through chamber 24, 26.

[0032] Consequently, the flow of compressed air entering through the first aperture 22 and coming out of the second aperture 28, 30 transits towards the through chamber 24, 26; from there, according to an advantageous embodiment, the air passes through a calibrated interstice 36 defined between the outer surface 6 of the piston 4d-4g or the guide element 4a-4c and the scraper body 8, 18, 20, so that such interstice 36 permits the exit of the compressed air from the through chamber 24, 26.

[0033] In the same way, under the effect of the suction source, the aspirated air enters the second aperture 68 from the outside environment, transits inside the through chamber 24, 26 and flows out through the first aperture 22.

[0034] For example as shown schematically in the variant of figures 6a and 6b, the second aperture 68 is made in the scraper body 8, 18, 20, and in particular is made in the form of a duct which crosses the (entire) thickness.

[0035] In a preferred embodiment, the second aperture 68 may be engaged by a filtering member 70, in particular a strainer, to retain any impurities entering the through chamber 24, 26 through such aperture. Preferably, for the apertures made in the form of a duct, such duct houses at least partially the filtering member (as shown for example in schematic manner in figure 6a).

[0036] According to a further embodiment, the calibrated interstice 36 may act as the second aperture so that, during the actuation of the aspiration source, the flow of aspirated air transits in the through chamber through the space identified between the outer surface 6 of the piston 4d-4g (or of the guide element 4a- 4c) and the scraper body 8, 18, 20. In such circumstance, and in particular in the absence of a separate second aperture 68, the scraper body 8, 18, 20 only partially defines a second aperture, namely in the form of a calibrated interstice 36.

[0037] Preferably, the calibrated interstice 36 is defined between the free end 60 of the scraper body 8, 18, 20 closer to the element/piston and the aforesaid outer surface 6. Advantageously, the free end 60 axially defines the through chamber 24, 26 in particular forming an annular lip facing inwards radially. For example the annular lip has a substantially wedge-shaped cross-section.

[0038] According to a possible variant, a pair of such free ends 60 may be provided, positioned at both axial ends of the scraper body 20 (to such purpose refer for example to figure 3a).

[0039] Optionally the scraper body 8, 18, 20 defines at least one body seat 64 for housing at least one fluidic sealing element 62, for example a gasket or O-ring. Preferably, such seat 64 is positioned at the axial end opposite the through chamber 24, 26 in relation to the calibrated interstice 36, where provided.

[0040] For the variants providing for use of an element /piston translating only, a circumstance arising for example with the components indicated by reference numerals 4a, 4b, 4c, 4d, 4e and 4f shown in figure 2, at least a portion of such element/piston 4a-4f forms a prismatic torque with the body of the scraper 18.

[0041] Consequently, given the outer profile of the element/piston (for example polygonal) or of a longitudinal rib 66 of such element/piston (in particular projecting towards the body), a reciprocal rotation of the scraper-piston/guide element is substantially prevented.

[0042] According to a further embodiment, the piston or guide element 4g is housed in a (roto-)translatable manner in the through chamber 24. Such variant refers,

for example to the element/piston indicated by reference numeral 4g in figure 2 or to the cochlea or worm discussed earlier.

[0043] Preferably, the scraper body 8, 18, 20 extends in a perimetral direction of the element/piston 4a- 4g to house at least a portion thereof. For example the shape of such body may be (semi-)annular or angular. As regards such last variant, with reference for example to figure 5a, where the chamber defined by the scraper body 18 has a polygonal cross-section (for example, generally trapezoidal), preferably so as to partially house the longitudinal rib 66. The latter in fact extends substantially parallel to the main extension axis Y (or to the main working axis X in some variants).

[0044] Consequently, the "at least partial" housing refers to an axial direction and/or to a circumferential direction of such piston.

[0045] According to the variants shown, the body seats 64 have a profile corresponding to the outer perimeter of the element/piston 4a- 4g, and in particular trace in undercut the cross-section of the respective through chamber 24, 26.

[0046] According to one embodiment, a plurality of second apertures distributed around the element/piston, for example at constant intervals, is provided.

[0047] Preferably, the second aperture 28, 30 is in the form of a continuous groove or furrow which extends along the scraper body 8, 18, 20, in particular on a plane orthogonal to the main axis X, Y. For example the second aperture 28, 30, or optionally the continuous furrow, has a flared cross-section towards the outer surface 6 of the element/piston 4a-4g.

[0048] Even more preferably, a pair of continuous furrows 28, 30 axially alongside each other, and separated by at least one intermediate cordon 32 which prevents at least partially the merging of the respective jets air, is provided.

[0049] For the variants with two continuous furrows 28, 30 a calibrated interstice 36 is preferably provided for each furrow, such furrows being suitably facing in opposite directions. Advantageously, for such variant the body may also be without the body seat 64 and fluidic sealing element 62 contained therein.

[0050] With reference to the direction of transit T of the compressed air from the first aperture 22 to the pair of adjacent furrows 28, 30, the scraper body 8, 18, 20 may further comprise at least one channelling element 34 of the flow of air towards each continuous furrow 28, 30. In the variant shown in figure 3a, the channelling element 34 is tapered in the direction of the first aperture 22.

[0051] Preferably, the intermediate cordon 32 forms the channelling element 34 at the first aperture 22.

[0052] The present invention also relates to a compressed air scraper 10, 12, 14, 16', 16" of the outer surface 6 of a guide element 4a-4c having a main extension axis Y, or of a stem 4d-4g of a linear actuator 2 having a main working axis X. Said scraper 10, 12, 14, 16', 16" comprises a scraper body 8, 18, 20 which defines at least

one entrance aperture 22 suitable for being connected to a compressed air source, a through chamber 24, 26 for the partial and sliding housing of the guide element 4a-4c or of the stem 4d-4g parallel to said main axis X, Y, and one or more exit apertures 28, 30 of jets of compressed air from the scraper body 8, 18, 20, supplied through the entrance aperture 22 and oriented to direct the jet or plurality of jets towards the outer surface 6 so as to shift or remove deposits, residues or the like from said surface 6.

[0053] As regards the advantageous or preferred characteristics of such compressed air jet scraper, reference should be made to the variants above.

[0054] Innovatively, the scraper which the present invention relates acts without touching the outer surface, directing flows of air (preferably pressurised) onto it without preventing the movement of the piston (or of the component sliding along the guide element), and in such a way as to preserve satisfactory surface conditions for the entire relative period of actuation/movement.

[0055] In fact, the system described does not require forced/scheduled stops to perform maintenance operations but rather permits the progressive removal of the aforesaid deposits or residues to prevent the formation or build-up of consistent surface deposits.

[0056] Advantageously, the variations in cross-section described make it possible to achieve, from an aerodynamic point of view, the best performance in terms of removing or shifting the aforesaid dust and residues for the same volume of compressed air used.

[0057] Advantageously, some variants of the assembly described make it possible to guide the piston extremely reliably as well as to perform the cleaning function described.

[0058] Advantageously, the source suitable for connecting to the entrance aperture may be the same, or a ramification thereof, as that used to cause the extraction of the piston or stem from the relative cylinder. Consequently, the scraper described can be implemented in any existing pneumatic system without any significant initial investment.

[0059] Advantageously, the scraper which the present invention relates to proves particularly suitable for specific applications, and in particular in conditions in which the deposits, residues, impurities or the like not only need to be removed from the outer surface but also accumulated in confined spaces. For example should the aforesaid scraper be used in aseptic environments which must remain so (for example operating theatres, white rooms etc.) it is fundamental that the dirt does not circulate in the outside environment but that it is conducted to dedicated accumulation areas.

[0060] Advantageously, despite the scraper which the present invention relates to being predisposed to create a depression at the outer surface, it is configured to prevent this from negatively influencing the speed and /or accuracy of the movement of the piston or guide element.

[0061] Advantageously, the scraper which the present

invention relates to is suitable for shifting or removing impurities coming from the linear actuator itself. In fact, the impure air and oil where present which leak out externally to the cylinder are directly aspirated by the present scraper, which is preferably located near the cylinder, thereby preventing any risk of contamination of the surrounding environment.

[0062] A person skilled in the art may make variations to the embodiments of the scraper and assembly described above so as to satisfy specific requirements, replacing elements with others functionally equivalent.

[0063] Such variants are also contained within the scope of protection defined by the following claims.

[0064] In addition, each of the characteristics described as belonging to a possible embodiment may be realised independently of the other embodiments described.

Claims

1. Scraping assembly (1) comprising:

i) a guide element (4a-4c) having a main extension axis (Y), or a linear actuator (2) having a main working axis (X) and comprising a stem (4d-4g);

wherein said guide element (4a-4c) or said stem (4d-4g) identifies an outer surface (6);

ii) a scraper (10, 12, 14, 16', 16'') for cleaning said outer surface (6), comprising a scraper body (8, 18, 20) which defines:

- at least a first aperture (22) suitable for being connected to a compressed air source or to a suction source;
- a through chamber (24, 26) for the partial and sliding housing of the guide element (4a-4c) or of the stem (4d-4g) parallel to said main axis (X; Y); and
- one or more second apertures (28, 30, 36, 68), supplied through the first aperture (22) and configured to place the through chamber (24, 26) in fluidic communication with the outside environment, so that a flow of air generated by said source shifts or removes deposits, residues, impurities or the like from the outer surface (6); and

iii) a calibrated interstice (36) between the outer surface (6) and a free end (60) of the scraper body (8, 18, 20) closer to said element/stem for the entrance or exit of the air flow;

said assembly being **characterized in that** the second aperture (28, 30) is in the form of a continuous groove or furrow which extends along

the scraper body (8, 18, 20), and in that said free end (60) axially defines the through chamber (24, 26) forming an annular lip facing radially inwardly.

2. Assembly according to claim 1, wherein said second aperture (28, 30) is oriented to direct a jet or plurality of jets towards the outer surface (6) so as to shift or remove said deposits.
3. Assembly according to claim 1 or 2, wherein the at least one second aperture (28, 30, 36, 68) of the flow of air flows into the through chamber (24, 26).
4. Assembly according to any of the previous claims, wherein the scraper body (8, 18, 20) extends in a perimetral direction of the guide element (4a- 4c) or of the stem (4d-4g) to house at least a portion thereof.
5. Assembly according to the previous claim, wherein the scraper body (8, 18, 20) extends in a semi-annular or in an angled manner to house said portion.
6. Assembly according to any of the previous claims, wherein said scraper comprises a pair of continuous furrows (28, 30) axially alongside each other, and separated by at least one intermediate cordon (32) which prevents at least partially the merging of the respective air flows, preferably of the respective jets of compressed air.
7. Assembly according to claim 6, wherein, in the transit direction (T) of the air flow from the first aperture (22) to a pair of adjacent furrows (28, 30), the scraper body (8, 18, 20) comprises at least one channelling element (34) of the air flow towards each continuous furrow (28, 30).
8. Assembly according to claim 6 or 7, wherein the intermediate cordon (32) forms the channelling element (34) at the first aperture (22).
9. Assembly according to any of the previous claims, wherein the second aperture (28, 30) or the continuous furrow (28, 30) has a flared cross-section towards the outer surface (6) of the stem (4a-4g).
10. Assembly according to any of the previous claims, wherein the annular lip has a substantially wedge-shaped cross-section.
11. Assembly according to any of the previous claims, wherein the calibrated interstice (36) performs the function of second aperture to aspirate the air flow into the through chamber (24, 26).
12. Assembly according to any of the previous claims, wherein the linear actuator (2) comprises an outer

or cylindrical body (38) to which the scraper is directly constrained (10).

13. Assembly according to any of the previous claims, wherein the scraper (12, 14, 16', 16'') is connected to a support component (40, 42, 44) separate from an external body or cylinder (38) of the linear actuator (2) or separate from the guide element (4a-4c).
14. Assembly according to any of the previous claims, wherein at least a portion of the guide element (4a-4c) or of the stem (4d-4f) forms a prismatic torque with the body of the scraper (18).
15. Assembly according to any of the claims 1-13, wherein the guide element or the stem (4g) is housed in a roto-translatable manner in the through chamber (24).

Patentansprüche

1. Eine Abstreifvorrichtung (1), die Folgendes umfasst:

- i) ein Führungselement (4a - 4c), das eine Haupt-Erstreckungsachse (Y) aufweist, oder ein lineares Stellglied (2), das eine Haupt-Arbeitsachse (X) aufweist und einen Schaft (4d - 4g) umfasst;
- wobei das genannte Führungselement (4a - 4c) oder der genannte Schaft (4d - 4g) eine Außenfläche (6) identifiziert;
- ii) einen Abstreifer (10, 12, 14, 16', 16'') zur Reinigung der genannten Außenfläche (6), der einen Abstreifer-Körper (8, 18, 20) umfasst, der Folgendes definiert:

- mindestens eine erste Öffnung (22), die dazu geeignet ist, mit einer Druckluftquelle oder mit einer Saugquelle verbunden zu werden;
- eine Durchflussskammer (24, 26) zur partiellen und gleitenden Aufnahme des Führungselements (4a - 4c) oder des Schaftes (4d - 4g) parallel zur genannten Hauptachse (X; Y); und
- eine oder mehrere zweite Öffnungen (28, 30, 36, 68), die durch die erste Öffnung (22) bereitgestellt werden und konfiguriert sind, um die Durchflussskammer (24, 26) in Fluidverbindung mit der Außenumgebung zu stellen, sodass eine von der genannten Quelle erzeugte Luftströmung Ablagerungen, Rückstände, Verunreinigungen oder Ähnliches von der Außenfläche (6) verschiebt oder entfernt; und

- iii) ein kalibrierter Zwischenraum (36) zwischen

- der Außenfläche (6) und einem freien Ende (60) des Abstreifer-Körpers (8, 18, 20), der zum genannten Element/Schaft näher ist, für den Eintritt oder Austritt der Luftströmung; wobei die genannte Vorrichtung **dadurch gekennzeichnet ist, dass** die zweite Öffnung (28, 30) die Form einer kontinuierlichen Nut oder Furche aufweist, die entlang des Abstreifer-Körpers (8, 18, 20) verläuft, und dass das genannte freie Ende (60) die Durchflussskammer (24, 26) axial definiert, wobei eine ringförmige Lippe gebildet wird, die radial nach innen gewandt ist.
2. Vorrichtung nach Anspruch 1, wobei die genannte zweite Öffnung (28, 30) ausgerichtet ist, um einen Strahl oder eine Vielzahl von Strahlen in Richtung Außenfläche (6) zu richten, sodass die genannten Ablagerungen verschoben oder entfernt werden.
 3. Vorrichtung nach Anspruch 1 oder 2, wobei die mindestens eine zweite Öffnung (28, 30, 36, 68) der Luftströmung in die Durchflussskammer (24, 26) fließt.
 4. Vorrichtung nach irgendeinem der vorhergehenden Ansprüche, wobei sich der Abstreifer-Körper (8, 18, 20) in eine Umfangsrichtung des Führungselements (4a - 4c) oder des Schaftes (4d - 4g) erstreckt, um zumindest einen Abschnitt davon aufzunehmen.
 5. Vorrichtung nach den vorhergehenden Ansprüchen, wobei sich der Abstreifer-Körper (8, 18, 20) auf halbringförmige oder abgewinkelte Weise erstreckt, um den genannten Abschnitt aufzunehmen.
 6. Vorrichtung nach irgendeinem der vorhergehenden Ansprüche, wobei der genannte Abstreifer ein Paar kontinuierliche Furchen (28, 30) umfasst, die längs- seitlich nebeneinander verlaufen und durch einen dazwischenliegenden Strang (cordon) (32) getrennt sind, der zumindest teilweise die Zusammenführung der jeweiligen Luftströme, vorzugsweise der jeweiligen Druckluft-Strahlen verhindert.
 7. Vorrichtung nach Anspruch 6, wobei der Abstreifer-Körper (8, 18, 20), in der Durchlaufrichtung (T) des Luftstroms von der ersten Öffnung (22) zu einem Paar von benachbarten Furchen (28, 30), mindestens ein Element zur Kanalisierung (34) des Luftstroms hin zu jeder kontinuierlichen Furche (28, 30) umfasst.
 8. Vorrichtung nach Anspruch 6 oder 7, wobei der dazwischenliegende Strang (32) das Kanalisierungselement (34) an der ersten Öffnung (22) bildet.
 9. Vorrichtung nach irgendeinem der vorhergehenden Ansprüche, wobei die zweite Öffnung (28, 30) oder die kontinuierliche Furche (28, 30) hin zur Außenfläche (6) des Schaftes (4a - 4g) einen trichterförmigen Querschnitt aufweist.
 10. Vorrichtung nach irgendeinem der vorhergehenden Ansprüche, wobei die ringförmige Lippe einen im Wesentlichen keilförmigen Querschnitt aufweist.
 11. Vorrichtung nach irgendeinem der vorhergehenden Ansprüche, wobei der kalibrierte Zwischenraum (36) die Funktion einer zweiten Öffnung erfüllt, um den Luftstrom in die Durchflussskammer (24, 26) anzuziehen.
 12. Vorrichtung nach irgendeinem der vorhergehenden Ansprüche, wobei das lineare Stellglied (2) einen äußeren oder zylindrischen Körper (38) umfasst, auf den der Abstreifer direkt eingeschränkt ist (10).
 13. Vorrichtung nach irgendeinem der vorhergehenden Ansprüche, wobei der Abstreifer (12, 14, 16', 16'') mit einer Stützkomponente (40, 42, 44) verbunden ist, die von einem äußeren oder zylindrischen Körper (38) des linearen Stellglieds (2) gesondert ist oder vom Führungselement (4a - 4c) gesondert ist.
 14. Vorrichtung nach irgendeinem der vorhergehenden Ansprüche, wobei mindestens ein Abschnitt des Führungselements (4a - 4c) oder des Schaftes (4d - 4f) ein prismatisches Drehmoment (prismatic torque) mit dem Körper des Abstreifers (18) bildet.
 15. Vorrichtung nach irgendeinem der Ansprüche 1 - 13, wobei das Führungselement oder der Schaft (4g) auf verschiebbare und drehbare Weise in der Durchflussskammer (24) aufgenommen ist.

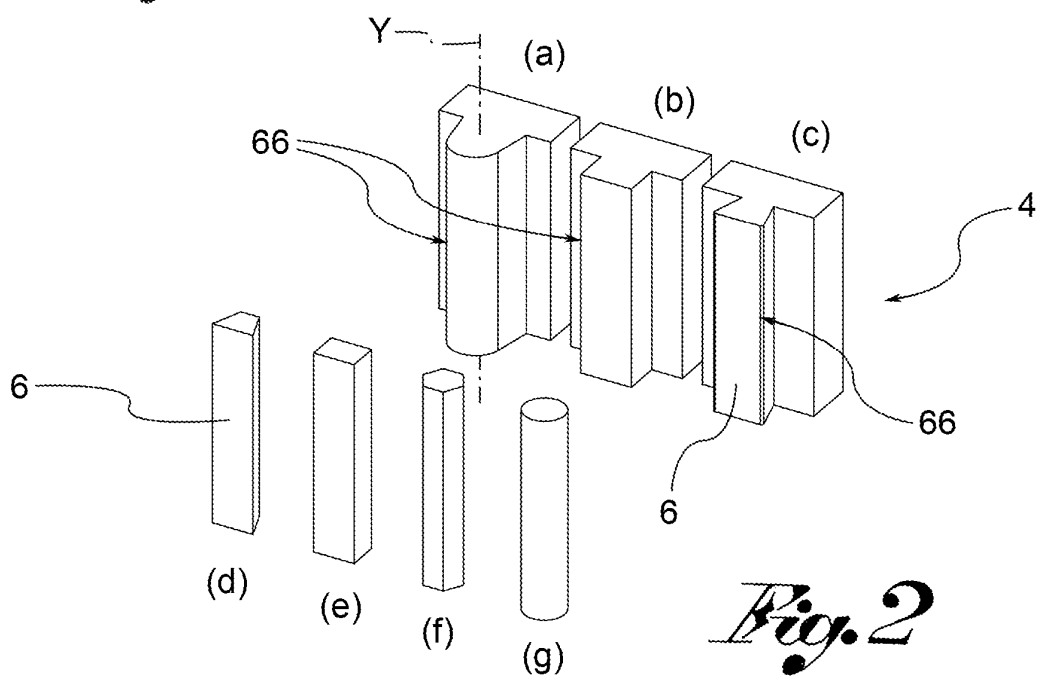
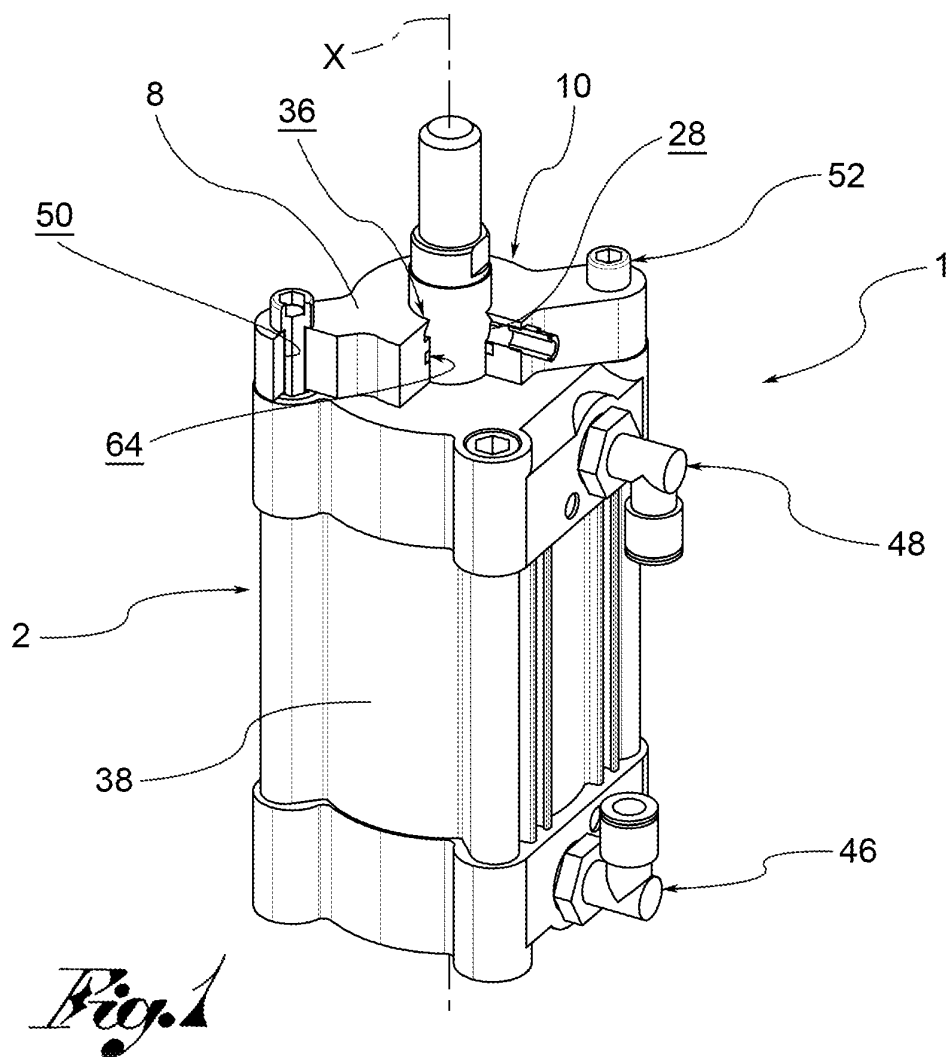
Revendications

1. Ensemble de grattage (1) comprenant:

- i) un élément de guidage (4a-4c) ayant un axe d'extension principal (Y), ou un actionneur linéaire (2) ayant un axe de travail principal (X) et comprenant une tige (4d-4g); dans lequel ledit élément de guidage (4a-4c) ou ladite tige (4d-4g) identifie une surface externe (6);
- ii) un grattoir (10, 12, 14, 16', 16'') pour nettoyer ladite surface externe (6), comprenant un corps de grattoir (8, 18, 20) qui définit:

- au moins une première ouverture (22) apte à être reliée à une source d'air comprimé ou à une source d'aspiration;
- une chambre traversante (24, 26) pour le logement partiel et coulissant de l'élément de guidage (4a-4c) ou de la tige (4d-4g) parallèle audit axe principal (X ; Y); et

- une ou plusieurs secondes ouvertures (28, 30, 36, 68), alimentées au travers de la première ouverture (22) et conçues pour placer la chambre traversante (24, 26) en communication fluïdique avec l'environnement extérieur, de sorte qu'un flux d'air généré par ladite source déplace ou élimine les dépôts, les résidus, les impuretés ou similaires de la surface externe (6); et
- iii) un interstice calibré (36) entre la surface externe (6) et une extrémité libre (60) du corps de grattoir (8, 18, 20) plus proche dudit élément/tige pour l'entrée ou la sortie du flux d'air; ledit ensemble étant **caractérisé en ce que** la seconde ouverture (28, 30) se présente sous la forme d'une rainure ou d'un sillon continu(e) qui s'étend le long du corps de grattoir (8, 18, 20), et **en ce que** ladite extrémité libre (60) définit axialement la chambre traversante (24, 26) formant une lèvre annulaire orientée radialement vers l'intérieur.
2. Ensemble selon la revendication 1, dans lequel ladite seconde ouverture (28, 30) est orientée de manière à diriger un jet ou une pluralité de jets vers la surface externe (6) de manière à déplacer ou éliminer lesdits dépôts.
 3. Ensemble selon les revendications 1 ou 2, dans lequel au moins une seconde ouverture (28, 30, 36, 68) du flux d'air s'écoule dans la chambre traversante (24, 26).
 4. Ensemble selon l'une quelconque des revendications précédentes, dans lequel le corps de grattoir (8, 18, 20) s'étend dans le sens du périmètre de l'élément de guidage (4a-4c) ou de la tige (4d-4g) pour loger au moins une partie de ces derniers.
 5. Ensemble selon la revendication précédente, dans lequel le corps de grattoir (8, 18, 20) s'étend de manière semi-annulaire ou inclinée pour loger ladite partie.
 6. Ensemble selon l'une quelconque des revendications précédentes, dans lequel ledit grattoir comprend deux sillons continus (28, 30) situés axialement le long l'un de l'autre et séparés par au moins un cordon intermédiaire (32) qui empêche au moins partiellement la fusion des flux d'air respectifs, de préférence des jets respectifs d'air comprimé.
 7. Ensemble selon la revendication 6, dans lequel, dans le sens du passage (T) du flux d'air de la première ouverture (22) à deux sillons adjacents (28, 30), le corps de grattoir (8, 18, 20) comprend au moins un élément de canalisation (34) du flux d'air vers chaque sillon continu (28, 30).
 8. Ensemble selon les revendications 6 ou 7, dans lequel le cordon intermédiaire (32) forme l'élément de canalisation (34) sur la première ouverture (22).
 9. Ensemble selon l'une quelconque des revendications précédentes, dans lequel la seconde ouverture (28, 30) ou le sillon continu (28, 30) présente une section transversale évasée en direction de la surface externe (6) de la tige (4a-4g).
 10. Ensemble selon l'une quelconque des revendications précédentes, dans lequel la lèvre annulaire présente une section transversale sensiblement en forme de coin.
 11. Ensemble selon l'une quelconque des revendications précédentes, dans lequel l'interstice calibré (36) remplit la fonction de seconde ouverture pour aspirer le flux d'air dans la chambre traversante (24, 26).
 12. Ensemble selon l'une quelconque des revendications précédentes, dans lequel l'actionneur linéaire (2) comprend un corps externe ou cylindrique (38) auquel le grattoir est directement lié (10).
 13. Ensemble selon l'une quelconque des revendications précédentes, dans lequel le grattoir (12, 14, 16', 16'') est relié à un composant support (40, 42, 44) séparé du corps externe ou du cylindre (38) de l'actionneur linéaire (2) ou séparé de l'élément de guidage (4a-4c).
 14. Ensemble selon l'une quelconque des revendications précédentes, dans lequel au moins une partie de l'élément de guidage (4a-4c) ou de la tige (4d-4f) forme un couple prismatique avec le corps du grattoir (18).
 15. Ensemble selon l'une quelconque des revendications 1 à 13, dans lequel l'élément de guidage ou la tige (4g) est logé d'une manière permettant sa rotation dans la chambre traversante (24).



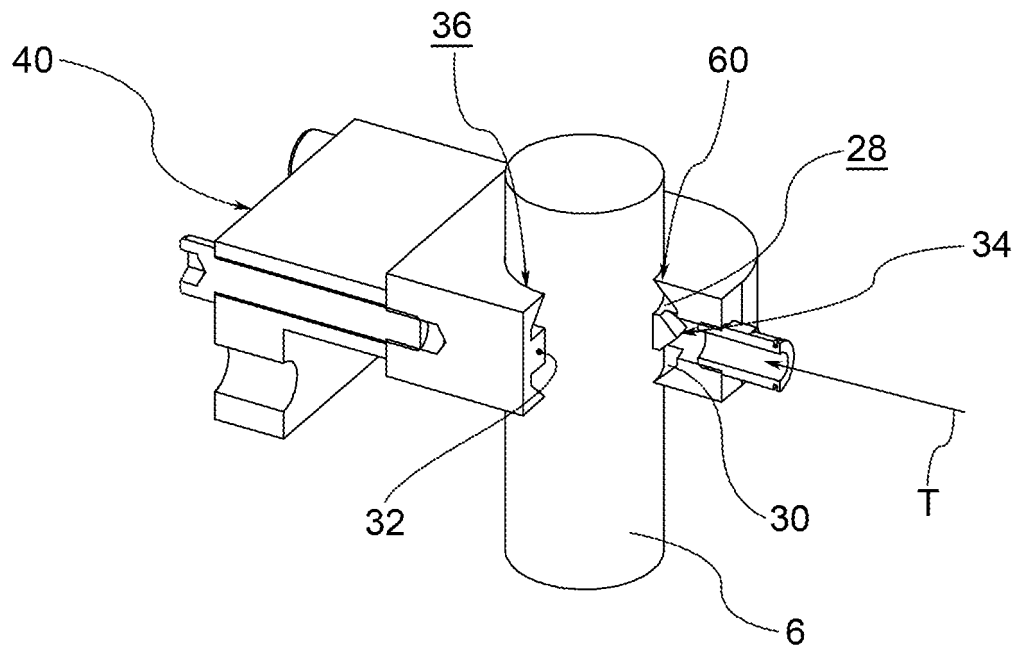


Fig. 3a

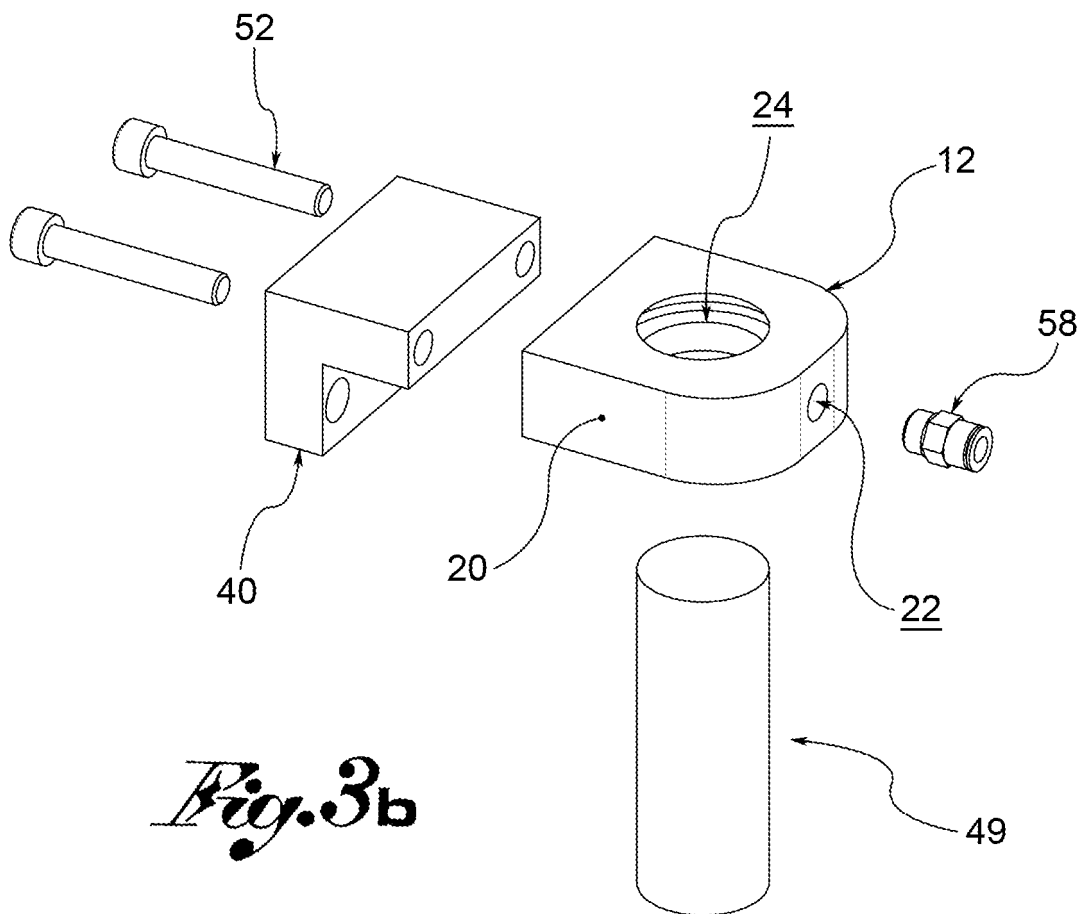


Fig. 3b

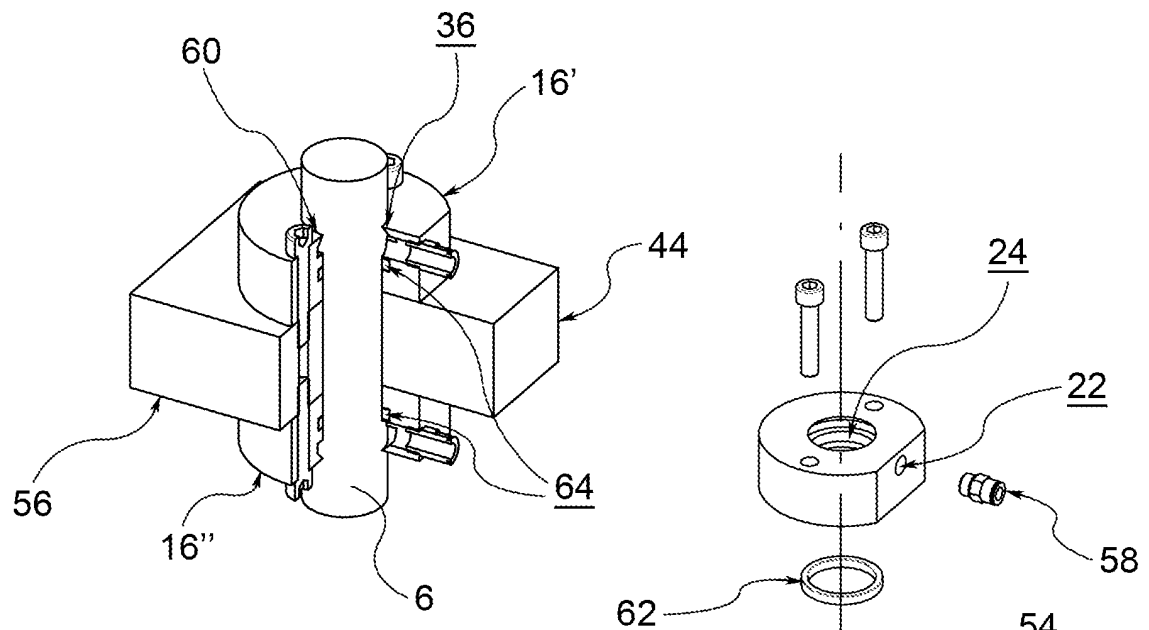


Fig. 4a

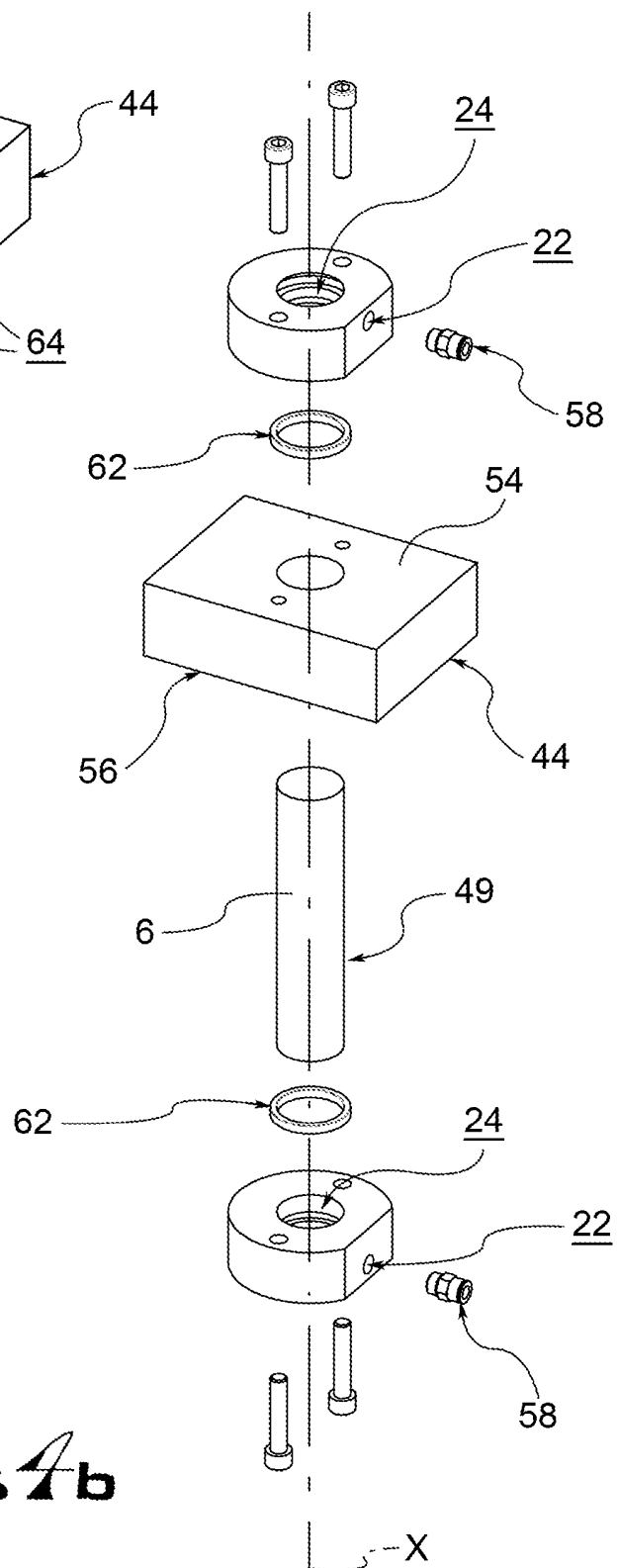


Fig. 4b

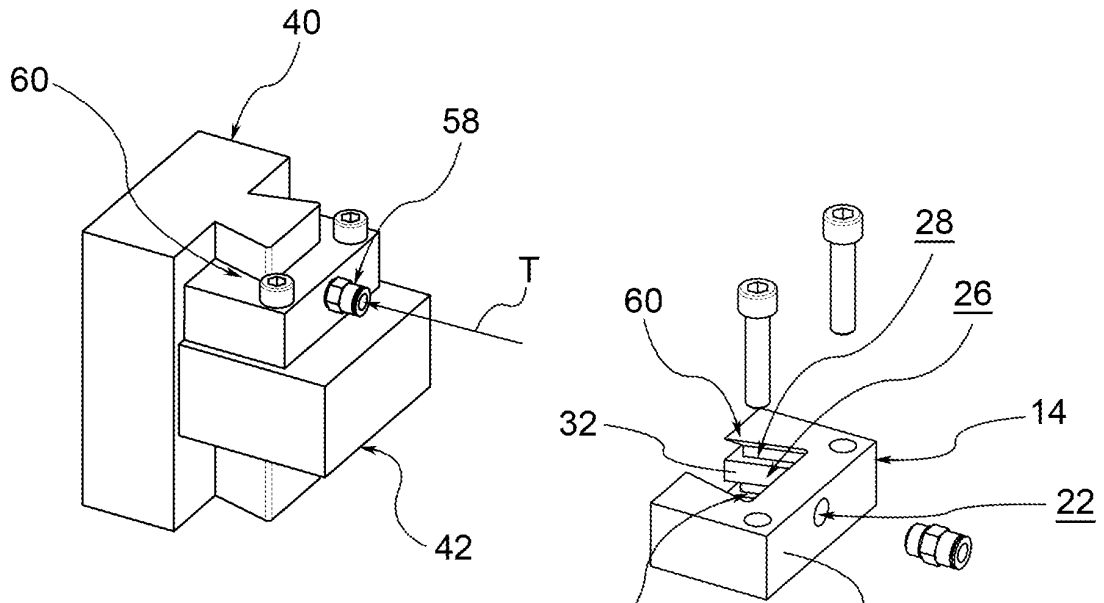


Fig. 5a

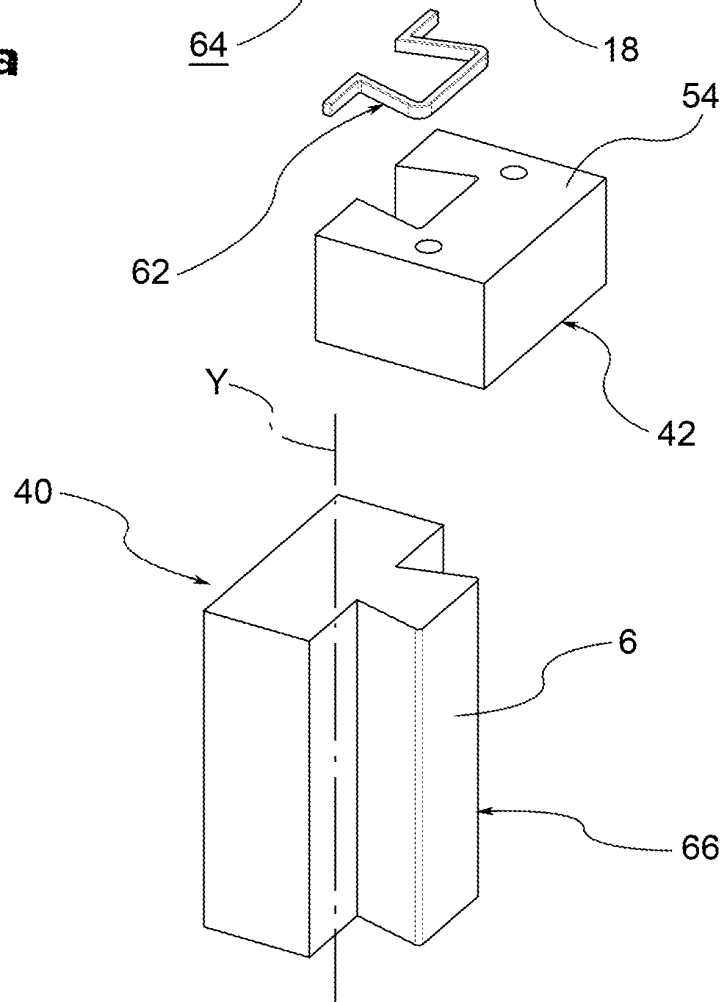


Fig. 5b

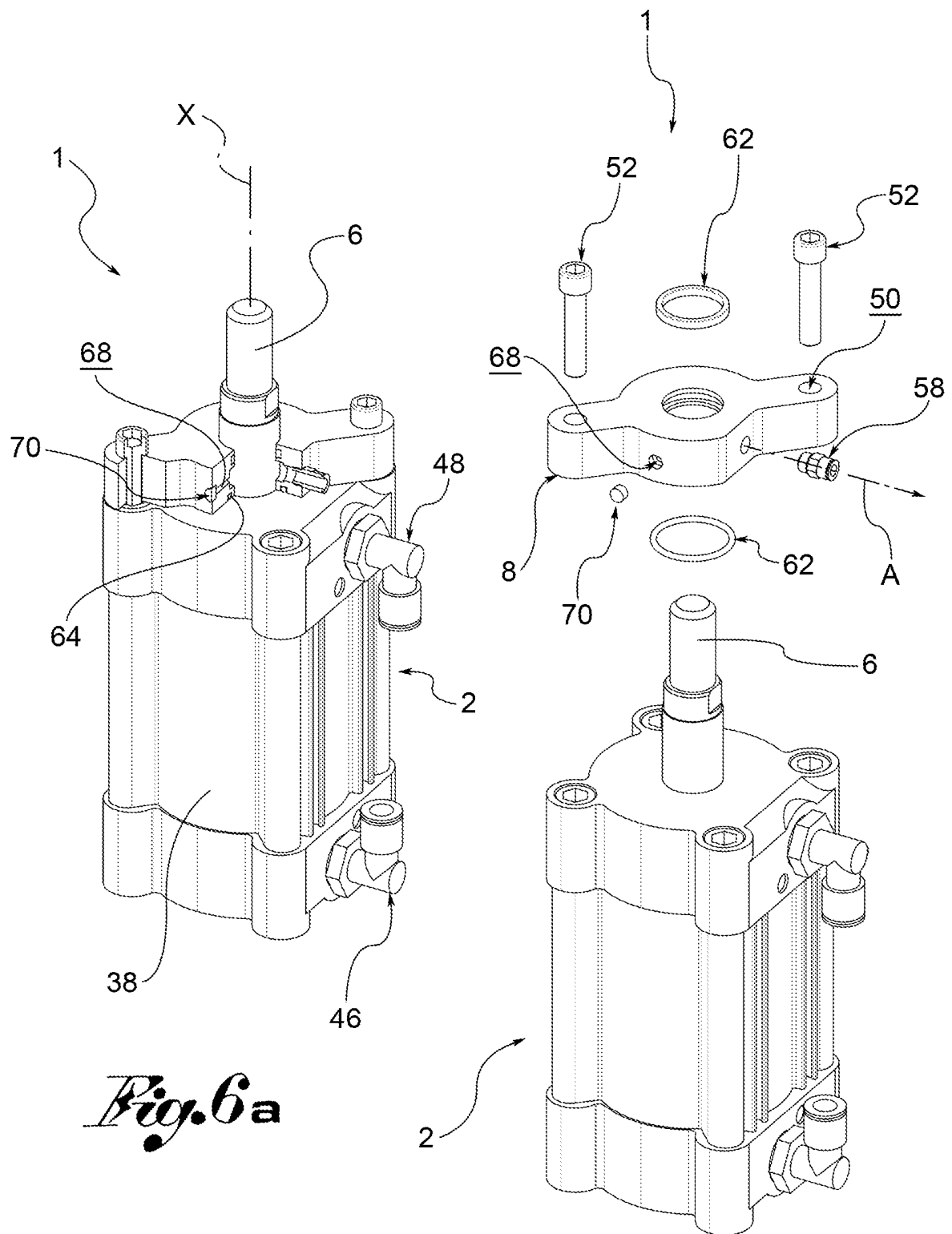


Fig. 6a

Fig. 6b

REFERENCES CITED IN THE DESCRIPTION

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