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(54) **Block-support head for corking machine**

Kopf mit Klauen für eine Vorrichtung zum Verkorken von Flaschen mit Korken

Tête de support de mors d'une boucheuse

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Description

[0001] The present invention relates to a block-support head for a corking machine according to the preamble of claim 1.

[0002] More particularly, the head in question is intended to be used advantageously in the bottling industry for compressing stoppers made of cork or synthetic material until they have a size slightly smaller than the mouth of the neck of the bottle to be corked.

[0003] At present, as is known from documents FR 2290386 and EP 1314683 for example, conventional corking machines envisage the use of a plurality of corking heads mounted rotatably in the form of carousel about a fixed vertical shaft on which a pusher cam is concentrically keyed in order to impart the necessary movement to the components of the head which perform corking.

[0004] Each head comprises gripping members able to compress the stoppers supplied from a suitable loading hopper until they have a size suitable to allow them to be inserted inside the neck of the bottles under the vertical thrust of pusher elements.

[0005] As is known, each head is composed of two block-supporting slides, one of which is movable, being mechanically connected to a cam by means of a guide and a counter-guide, and the other fixed, being fastened on the housing structure of the machine by means of key-type retaining means.

[0006] The same housing structure of the machine allows guiding of the to-and-fro movement of the movable slide actuated by the cam with respect to the fixed slide.

[0007] For this purpose, suitable lubricating means intended to allow sliding of the movable slide inside the housing structure are envisaged.

[0008] The to-and-fro movement of the movable slide is necessary in order to allow the blocks, which form the gripping means, to move between an open configuration, where they define an opening having a cross-section which is sufficiently wide to receive a stopper, and a closed configuration where the receiving opening is narrowed so as to compress the stopper until it has a cross-section slightly smaller than the mouth of the bottle neck so as to allow it to be inserted inside it. The block-support heads known hitherto of the type briefly described above have proved to have certain drawbacks.

[0009] A first drawback arises from the fact that movement of the movable slide involves the need for fairly complex lubricating means in that they must be suitably designed to allow the continued to-and-fro operation of the movable slide without the risk of seizing. Basically these means generally consist of a recessed zone formed on the lateral sliding surfaces of the movable slide which retains inside it a lubricating fluid such as oil or grease. A second drawback arises from the fact that these lubricating means require constant maintenance in order to ensure optimum operation of the head.

[0010] In fact, the quantity of lubricating fluid contained inside the recessed zone needs to be renewed frequently

in order to ensure correct sliding of the movable slide.

[0011] Obviously, the considerable degree of maintenance required penalises the performance of the corking machine in that it necessarily involves temporary stoppage of the machine, which negatively affects the production costs and times.

[0012] A further drawback arises from the fact that the replacement of the parts subject to wear as a result of the abovementioned to-and-fro movement is somewhat difficult. In fact, in the event of wear, it is required to replace the whole movable slide in order to restore the correct play with respect to the housing structure.

[0013] The main object the present invention is therefore that of overcoming the drawbacks associated with the solutions of the known type mentioned above, by providing a block-support head for a corking machine which does not require particular lubricating means in order to allow the to-and-fro movement of the movable slide inside the housing structure.

[0014] Another object of the present invention is that of providing a block-support head, of which the components allowing sliding can be easily manufactured by means of simple mechanical machining processes.

[0015] A further object of the present invention is that of providing a block-support head which requires a limited amount of maintenance and allows the parts subject to wear to be replaced quickly and at very little cost.

[0016] A further object of the present invention is that of providing a block-support head which does not give rise, even after numerous production cycles, to significant variations in the quality or the efficiency of the corking operations.

[0017] A further object of the present invention is that of providing a corking head which is constructionally simple and inexpensive to manufacture and operationally entirely reliable.

[0018] These and other objects are all achieved by the block-support head according to claim 1.

[0019] The technical characteristics of the invention, in accordance with the abovementioned objects, may be determined from the contents of the claims indicated below, and the advantages thereof will emerge more clearly from the detailed description which follows, provided with reference to the accompanying drawings, which show a purely exemplary and non-limiting example of embodiment in which:

- Figure 1 shows an overall view of several heads operationally associated with each other inside a housing structure of a corking machine;
- Figure 2 shows in schematic form a top plan view of an example of embodiment of the block-support head according to the present invention with some parts removed so that other parts may be seen more clearly;
- Figure 3 shows a cross-sectional view of the block-support head according to Figure 2 along the line III-III in Figure 2;

- Figure 4 shows in schematic form a perspective view, from below, of an example of embodiment of the block-support head according to the present invention;
- Figure 5 shows a side view of the block-support head according to Fig. 4;
- Figure 6 shows an enlarged detail of the preceding figures, consisting of a perspective view of a self-lubricating plate;
- Figure 7 shows a plan view of the self-lubricating plate in Figure 6;
- Figure 8 shows a schematic view of an actuating system for a single-head machine;
- Figure 9 shows a schematic view of a further actuating system for a single-head machine.

[0020] In accordance with the figures in the accompanying drawings, the block-support head forming the subject of the present invention is denoted in its entirety by 1.

[0021] It is intended to be mounted on a corking machine comprising one or more heads, in particular of the rotating carousel type provided with a housing structure 2 having a plurality of chambers which are spaced from each other circumferentially and inside each of which a block-support head 1 is housed (see Figure 1).

[0022] The housing structure 2 allows the heads 1 to be supported rotatably about the shaft of the rotating carousel of the corking machine, absorbing the compressive forces exerted by the heads 1 during the corking operations.

[0023] Each head 1 is suitable for use in association with stoppers made of any material (cork, synthetic material, as well as "technical stoppers" made of cork composites, both of the flat and sparkling wine type).

[0024] Each head 1 is essentially composed of a fixed slide 3 which is removably mounted inside a chamber 50 of the housing structure 2 by means of key-type retaining means 4 of the type known per se and a movable slide 5 which can be actuated with a relative linear to-and-fro movement in a radial direction R with respect to the fixed slide 3, by suitable actuating means 6.

[0025] The latter, which are only partly shown in the accompanying figures, advantageously comprise a wheel 7, which is mounted on the movable slide 5 and is free to rotate about a vertical axis Z perpendicular with respect to the radial direction R and capable of imparting the to-and-fro movement to the movable slide 5 as a result of interaction with a cam 70. Adjusting means 80 of a type known per se are also envisaged for varying the relative position of the slides depending in particular on the type of stopper.

[0026] It must be remembered that the block-support head forming the subject of the present invention may also be mounted on a single-head machine where actuation of the movable slide may be performed by a rotating cam 100 or by a generic pusher element such as, for example, a movable cam 110 or a pneumatic cylinder (as indicated in a very schematic manner in Figures 8

and 9).

[0027] Two pairs of blocks are also envisaged, i.e. a first pair 8, mechanically and operationally associated with the fixed slide 3, and a second pair 9, mechanically and operationally associated with the movable slide 5, said pairs defining a receiving opening 10 inside which a stopper (not shown in the accompanying figures) is intended to be inserted.

[0028] Owing to the effect of the linear to-and-fro movement imparted to the movable slide 5, the blocks vary their arrangement between an open configuration 11, shown in Figure 4, where a stopper may be conveyed inside the receiving opening 10, and a closed configuration 12, shown in Figure 2, where the side walls of the receiving opening 10 compress the stopper to a size slightly smaller than the mouth of a bottle neck, so as to allow suitable pusher means to push the stopper inside the said neck.

[0029] It can be noted in Figure 2 that the upper closing plate 90 has been removed in order illustrate other parts more clearly. The same plate 90 is instead visible in Figures 4 and 5.

[0030] The corking head 1 also comprises sliding means 13 for allowing the movement of the movable slide 5 with respect to the fixed slide 3 inside the chamber of the housing structure 2.

[0031] According to the invention, the sliding means 13 comprise a plate of self-lubricating material arranged between the walls of the chamber 50 formed in the housing structure 2 and the movable slide 5.

[0032] In greater detail, in accordance with the example of embodiment illustrated in the accompanying figures, two self-lubricating plates 14', 14" are envisaged, each of said plates being removably connected by means of fixing means 15 inside a seat 16 formed on one lateral side face 17 of the movable slide 5.

[0033] The self-lubricating plates 14', 14" thus slide on the lateral walls of the chamber, allowing the movable slide to move in a guided manner in the radial direction R during its linear to-and-fro movement with a very small amount of friction.

[0034] The self-lubricating plate may be advantageously made of PTFE (polytetrafluoroethylene, better known by the registered trademark Teflon®) or special sintered bronze or also of any other self-lubricating material with a low coefficient of friction.

[0035] Advantageously, the abovementioned fixing means 15 are formed by threaded screws inserted inside one or more through-holes 18 formed on the self-lubricating plate 14', 14" in the region of the portion associated with the movable slide 5 and engaging in threaded holes formed in the body of the said movable slide 5.

[0036] The purpose of the plates 14', 14" is that of favouring sliding of the movable slide 5 inside the chamber 50 of the housing structure 2 or also allowing relative sliding of the two slides 3, 5, without requiring the use of lubricants.

[0037] Moreover, in accordance with the invention,

once the plates 14', 14" have become worn following numerous hours of operation, it is possible to replace them easily at very little cost and very quickly.

[0038] In accordance with the example of embodiment illustrated in particular in the accompanying Figures 6 and 7, the self-lubricating plates 14', 14" have a thin substantially parallelepiped-shaped form with two parallel faces, one being a sliding face 60 intended to come into contact with the side walls of the chamber 50 of the housing structure 2, and the other being a connecting face 61 fixed over a first section 62 to the movable slide 5 and extending over a second section 63 towards the fixed slide 3. Each part 14', 14" is mounted in a guided manner on the fixed slide 3 by means of its second projecting section 63.

[0039] The self-lubricating plates 14' or 14" may advantageously be provided with grooves 64 on the sliding face 60 able to receive dust or other material, thus avoiding any risk of seizing of the head 1.

[0040] The relative sliding of the two slides 3, 5 is advantageously improved by means of guide means 20.

[0041] In greater detail, the guide means 20 comprise a longitudinal groove 21 formed on the connecting face 61 of each self-lubricating plate 14', 14" in the direction of its main extension indicated by "X" in Figure 7 and a slide element 22 integral with the fixed slide 3 and able to be inserted slidably inside the groove 21 so as to allow the guided relative movement of the two slides 3, 5.

[0042] The slide element 22 may be simply formed by the head of a screw which is engaged by means of screwing of its shank inside a threaded hole formed on the fixed slide 3.

[0043] As may be observed from the same Figure 7, the longitudinal groove 21 is connected continuously to a section 23 forming a right-angled branch which extends as far as the peripheral edge 24 of the self-lubricating plate.

[0044] In this way, when it is required to extract the slides 3, 5 from the chamber 50 of the housing structure 2, it is possible to release firstly the key-type retaining means 4 and then simply extract the fixed slide 3 which, by means of the connection ensured by the self-lubricating plates, will allow the extraction also of the movable slide 5. At this point, the two slides 3, 5 may be separated simply by removing the head of the screw 22 fixed to the fixed slide 3 from the groove 21 formed in the movable slide 5 via the section 23.

[0045] As described hitherto, the self-lubricating plates 14', 14" have been envisaged, in accordance with a preferred embodiment of the present invention, connected to the movable slide 5; however it is possible to envisage in another embodiment that they are instead fixed to the fixed slide 3 and that they form a guide for the movable slide 5 in a manner similar to that described hitherto.

[0046] Alternatively, it will also be possible to envisage that the self-lubricating plates 14', 14" are simply fixed to the side walls of the chamber 50 of the housing structure 2.

[0047] Operationally speaking, the block-support head 1 in question is functionally more reliable than the heads known hitherto, avoiding entirely the risk of seizing of the slides 3, 5 during the corking operations.

[0048] Advantageously, the head 1 according to the present invention has low production costs, since it does not require complex mechanical machining operations for its manufacture, and low maintenance costs since, in the event of wear, it is possible to replace simply only the self-lubricating plate 14', 14", instead of the whole movable slide, as was required hitherto by the known solutions.

[0049] The invention this conceived therefore achieves the predefined objects.

Claims

1. Block-support head (1) for a machine for corking bottles with stoppers, intended to be mounted on a housing structure (2) of a corking machine, comprising a fixed slide (3) adapted to be removably mounted on said housing structure (2), a movable slide (5) which can be actuated with a relative linear to-and-fro movement with respect to said fixed slide (3), and sliding means (13) for allowing the movement of said movable slide (5) inside said housing structure (2), **characterized in that** said sliding means (13) comprise at least one plate (14', 14") of self-lubricating material adapted to be arranged between said housing structure (2) and said movable slide (5), so as to favour sliding of the latter during its to-and-fro movement.
2. Head according to Claim 1, **characterized in that** said self-lubricating plate (14', 14") has a thin, substantially parallelepiped-shaped form with at least one connecting face (61) and at least one sliding face (60).
3. Head according to Claim 1, **characterized in that** said self-lubricating plate (14', 14") is removably fixed to said movable slide (5) by means of fixing means (15).
4. Head according to Claim 1, **characterized in that** said self-lubricating plate (14', 14") is removably fixed to said housing structure (2) by means of fixing means (15).
5. Head according to Claim 1, **characterized in that** it comprises at least two self-lubricating plates (14', 14"), each of which is removably connected by means of fixing means (15) to a lateral side face (17) of said movable slide (5).
6. Head according to Claim 5, **characterized in that** each said lateral side face (17) is provided with a

seat (16) inside which said self-lubricating plate (14', 14'') is removably connected.

7. Head according to any one of the preceding claims, **characterized in that** at least one of said self-lubricating plates (14', 14'') is connected to said fixed slide (3) by means of guide means (20). 5
8. Head according to Claim 7, **characterized in that** said guide means (20) comprise at least one longitudinal groove (21) formed on a connecting face (61) of said self-lubricating plate (14', 14'') and at least one slide element (22) integral with said fixed slide (3) and able to be inserted slidably inside said longitudinal groove (21) so as to allow said to-and-fro movement. 10
9. Head according to Claim 8, **characterized in that** said slide element (22) is formed by the head of a screw engaging with its shank inside said fixed slide (3). 15
10. Head according to Claim 8, **characterized in that** said longitudinal groove (21) is extended continuously by a section (23) which extends as far as the peripheral edge (24) of said self-lubricating plate (14', 14'') so as to allow the extraction of said slide element (22) from the longitudinal groove (21) of the said self-lubricating plate (14', 14''). 20
11. Head according to Claim 9, **characterized in that** said self-lubricating plate (14', 14'') is substantially made of PTFE or special sintered bronze or also any other self-lubricating material with a low coefficient of friction. 25
12. Head according to Claim 1, **characterized in that** said self-lubricating plate (14', 14'') has a sliding face (60) with grooves (64) formed therein. 30
13. Head according to Claim 3 or Claim 4, **characterized in that** said fixing means (15) consist of screw/female thread coupling systems. 35

Patentansprüche

1. Backenträgerkopf (1) für eine Maschine zum Verkorken von Flaschen mit Stopfen, der an einem Gehäuseaufbau (2) einer Verkorkungsmaschine zu montieren ist, enthaltend ein feststehendes Gleitstück (3), das dafür ausgelegt ist, abnehmbar an dem Gehäuseaufbau (2) angebracht zu werden, ein bewegliches Gleitstück (5), das mit einer linearen Hin-und-Her-Relativbewegung in Bezug auf das feststehende Gleitstück (3) betätigbar ist, und eine Schieber-einrichtung (13), um die Bewegung des beweglichen Gleitstücks (5) innerhalb des Gehäuseaufbaus (2)

zuzulassen, **dadurch gekennzeichnet, dass** die Schieber-einrichtung (13) mindestens eine Platte (14', 14'') aus selbstschmierenden Material aufweist, die dafür ausgelegt ist, zwischen dem Gehäuseaufbau (2) und dem beweglichen Gleitstück (5) angeordnet zu werden, um so die Gleitbewegung desselben während seiner Hin-und-Her-Bewegung zu begünstigen.

2. Kopf nach Anspruch 1, **dadurch gekennzeichnet, dass** die selbstschmierende Platte (14', 14'') eine dünne, im wesentlichen quaderförmige Form mit mindestens einer Verbindungsfläche (61) und mindestens einer Gleitfläche (60) hat. 40
3. Kopf nach Anspruch 1, **dadurch gekennzeichnet, dass** die selbstschmierende Platte (14', 14'') mittels einer Befestigungseinrichtung (15) an dem beweglichen Gleitstück (5) abnehmbar befestigt ist. 45
4. Kopf nach Anspruch 1, **dadurch gekennzeichnet, dass** die selbstschmierende Platte (14', 14'') mittels einer Befestigungseinrichtung (15) an dem Gehäuseaufbau (2) abnehmbar befestigt ist. 50
5. Kopf nach Anspruch 1, **dadurch gekennzeichnet, dass** er mindestens zwei selbstschmierende Platten (14', 14'') aufweist, die jeweils mittels einer Befestigungseinrichtung (15) an einer seitlichen befestigt sind. 55
6. Kopf nach Anspruch 5, **dadurch gekennzeichnet, dass** jede seitliche Seitenfläche (17) mit einem Sitz (16) versehen ist, in welchem die selbstschmierende Platte (14', 14'') abnehmbar angebracht ist.
7. Kopf nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet, dass** mindestens eine der selbstschmierenden Platten (14', 14'') mit dem feststehenden Gleitstück (3) mittels einer Führungseinrichtung (20) verbunden ist.
8. Kopf nach Anspruch 7, **dadurch gekennzeichnet, dass** die Führungseinrichtung (20) mindestens eine Längsnut (21) aufweist, die auf einer Verbindungsfläche (61) der selbstschmierenden Platte (14', 14'') gebildet ist, und mindestens ein Gleitelement (22), das mit dem feststehenden Gleitstück (3) einstückig ist und in der Lage ist, verschiebbar in die Längsnut (21) eingeführt zu werden, um so die Hin-und-Her-Bewegung zu erlauben.
9. Kopf nach Anspruch 8, **dadurch gekennzeichnet, dass** das Gleitelement (92) durch den Kopf einer Schraube gebildet ist, die mit ihrem Schaft in das Innere des feststehenden Gleitstücks (3) eingreift.
10. Kopf nach Anspruch 8, **dadurch gekennzeichnet,**

dass die Längsnut (21) durchgehend durch einen Abschnitt (23) fortgeführt ist, der sich bis zu dem Umfangsrand (24) der selbstschmierenden Platte (14', 14'') erstreckt, um so das Herausziehen des Gleitelements (23) aus der Längsnut (21) der selbstschmierenden Platte (14', 14'') zu erlauben.

11. Kopf nach Anspruch 9, **dadurch gekennzeichnet, dass** die selbstschmierende Platte (14', 14'') im Wesentlichen aus beliebigen anderen selbstschmierenden Material mit einem niedrigen Reibungskoeffizienten hergestellt ist.
12. Kopf nach Anspruch 1, **dadurch gekennzeichnet, dass** die selbstschmierende Platte (14', 14'') eine Gleitfläche (60) mit darin gebildeten Nuten (64) hat.
13. Kopf nach Anspruch 3 oder Anspruch 4, **dadurch gekennzeichnet, dass** die Befestigungseinrichtung (15) aus Schraube/Innengewinde-Verbindungssystemen besteht.

Revendications

1. - Tête de support de mors (1) pour une machine à boucher les bouteilles par des bouchons, destinée à être montée sur une structure de carter (2) d'une machine à boucher, comprenant une glissière fixe (3) apte à être montée de façon amovible sur ladite structure de carter (2), une glissière mobile (5) qui peut être actionnée avec un mouvement de va-et-vient linéaire relatif par rapport à ladite glissière fixe (3), et un moyen de coulissement (13) pour permettre le déplacement de ladite glissière mobile (5) à l'intérieur de ladite structure de carter (2), **caractérisée par le fait que** ledit moyen de coulissement (13) comprend au moins une plaque (14', 14'') de matière auto-lubrifiante apte à être disposée entre ladite structure de carter (2) et ladite glissière mobile (5), de façon à favoriser le coulissement de cette dernière pendant son mouvement de va-et-vient.
2. - Tête selon la revendication 1, **caractérisée par le fait que** ladite plaque auto-lubrifiante (14', 14'') a une forme sensiblement parallélépipédique, mince, avec au moins une face de connexion (61) et au moins une face de coulissement (60).
3. - Tête selon la revendication 1, **caractérisée par le fait que** ladite plaque auto-lubrifiante (14', 14'') est fixée de façon amovible à ladite glissière mobile (5) à l'aide de moyens de fixation (15).
4. - Tête selon la revendication 1, **caractérisée par le fait que** ladite plaque auto-lubrifiante (14', 14'') est fixée de façon amovible à ladite structure de réception (2) à l'aide de moyens de fixation (15).
5. - Tête selon la revendication 1, **caractérisée par le fait qu'elle** comprend au moins deux plaques auto-lubrifiantes (14', 14''), dont chacune d'elles est connectée de façon amovible à l'aide de moyens de fixation (15) à une face latérale (17) de ladite glissière mobile (5).
6. - Tête selon la revendication 5, **caractérisée par le fait que** chaque face latérale précitée (17) est dotée d'un siège (16) à l'intérieur duquel ladite plaque auto-lubrifiante (14', 14'') est connectée de façon amovible.
7. - Tête selon l'une quelconque des revendications précédentes, **caractérisée par le fait qu'au moins** l'une desdites plaques auto-lubrifiantes (14', 14'') est connectée à ladite glissière fixe (3) à l'aide de moyens de guidage (20).
8. - Tête selon la revendication 7, **caractérisée par le fait que** ledit moyen de guidage (20) comprend au moins une rainure longitudinale (21) formée sur une face de connexion (61) de ladite plaque auto-lubrifiante (14', 14'') et au moins un élément de glissière (22) d'un seul tenant avec ladite glissière fixe (3) et apte à être introduit de façon coulissante à l'intérieur de ladite rainure longitudinale (21) de façon à permettre ledit mouvement de va-et-vient.
9. - Tête selon la revendication 8, **caractérisée par le fait que** ledit élément de glissière (22) est formé par la tête d'une vis s'engageant avec sa tige à l'intérieur de ladite glissière fixe (3).
10. - Tête selon la revendication 8, **caractérisée par le fait que** ladite rainure longitudinale (21) est étendue de façon continue par une partie (23) qui s'étend aussi loin que le bord périphérique (24) de ladite plaque auto-lubrifiante (14', 14'') de façon à permettre l'extraction dudit élément de glissière (22) de ladite rainure longitudinale (21) de ladite plaque auto-lubrifiante (14', 14'').
11. - Tête selon la revendication 9, **caractérisée par le fait que** ladite plaque auto-lubrifiante (14', 14'') est sensiblement faite de polytétrafluoroéthylène ou de bronze fritté spécial ou également de n'importe quel autre matériau auto-lubrifiant avec un coefficient de frottement faible.
12. - Tête selon la revendication 1, **caractérisée par le fait que** ladite plaque auto-lubrifiante (14', 14'') a une face coulissante (60) avec des rainures (64) formées dans celle-ci.
13. - Tête selon la revendication 3 ou la revendication 4, **caractérisée par le fait que** lesdits moyens de fixation (15) consistent en des systèmes de couplage

de vis/filetage femelle.

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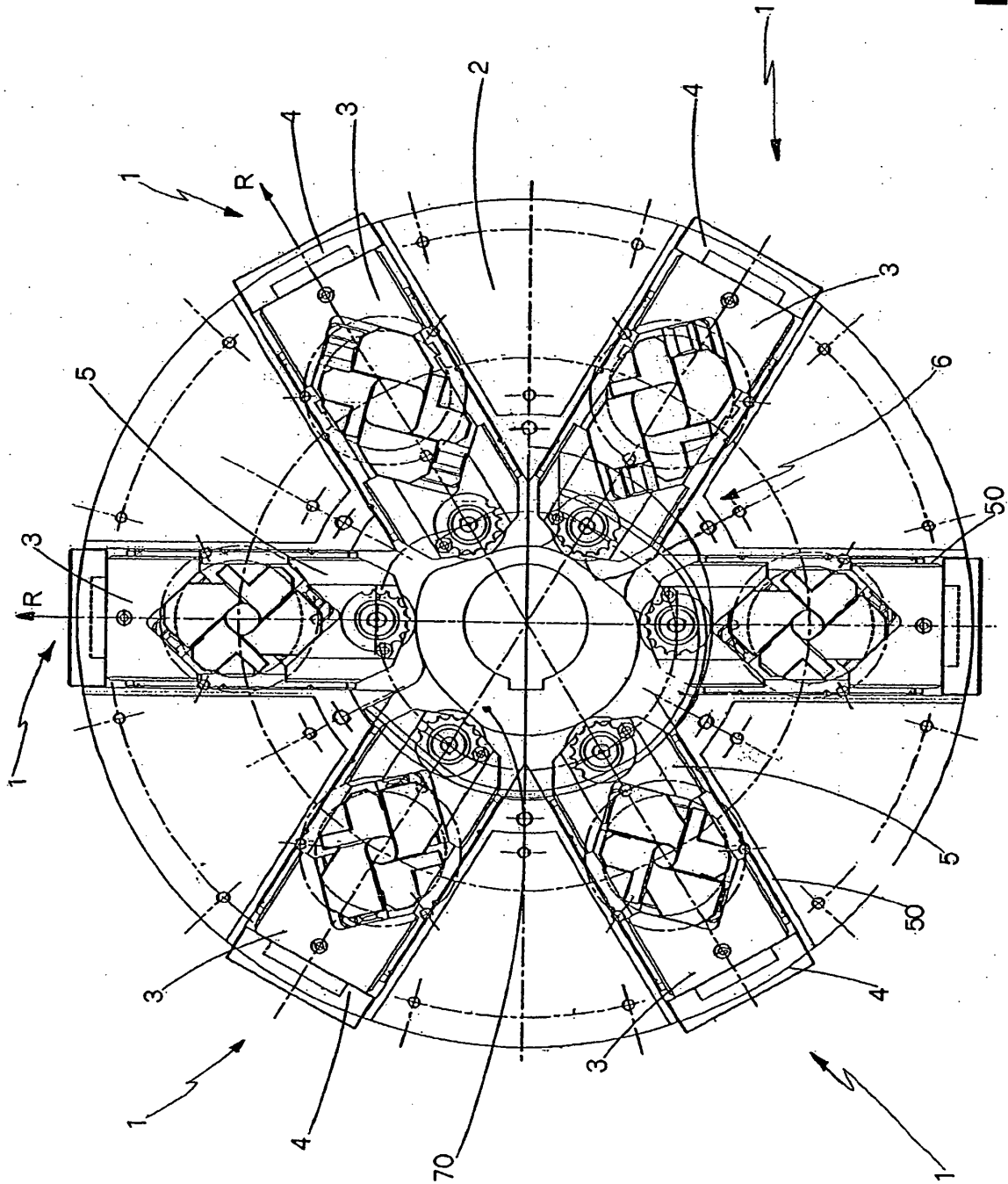


Fig. 1

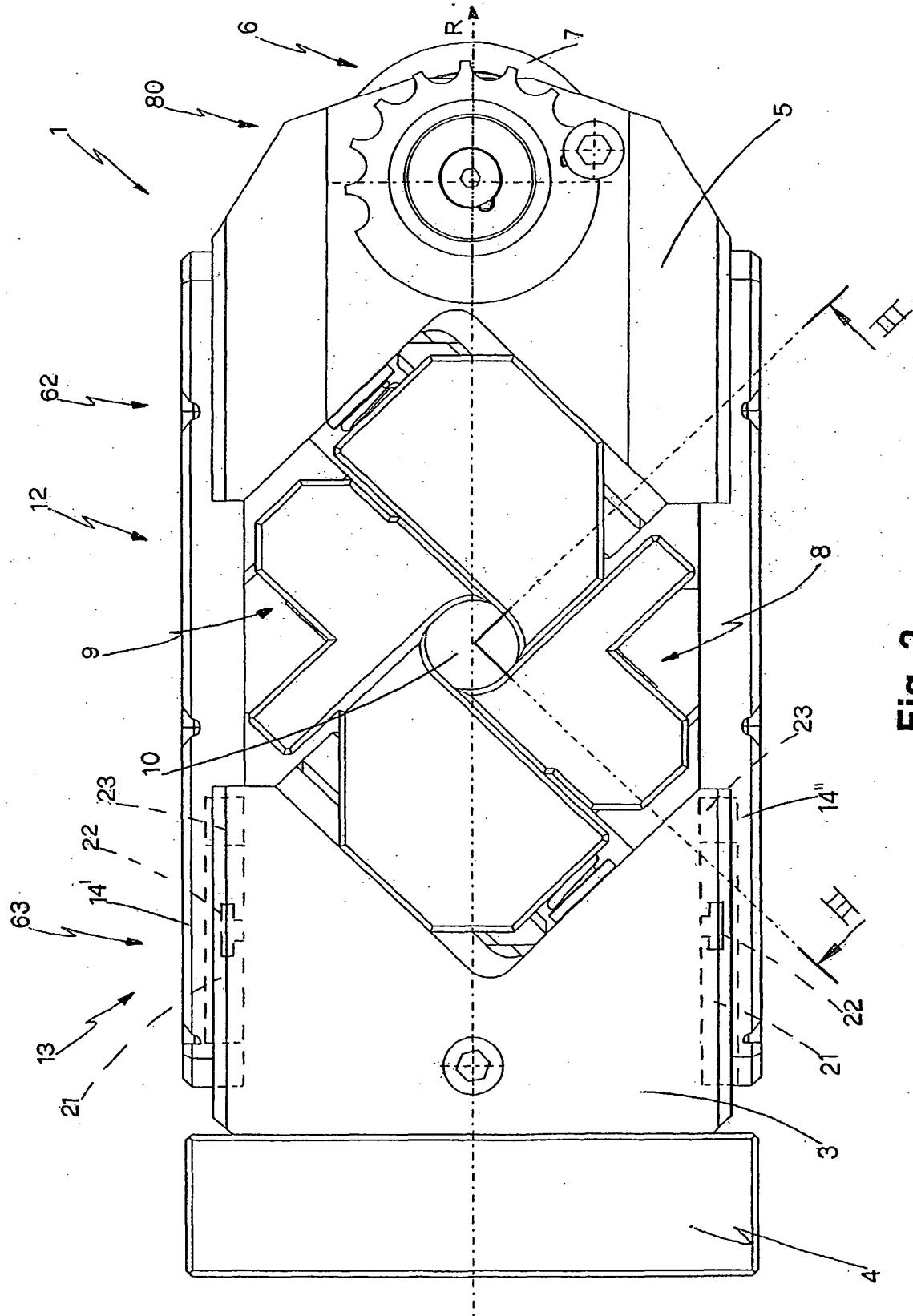


Fig. 2

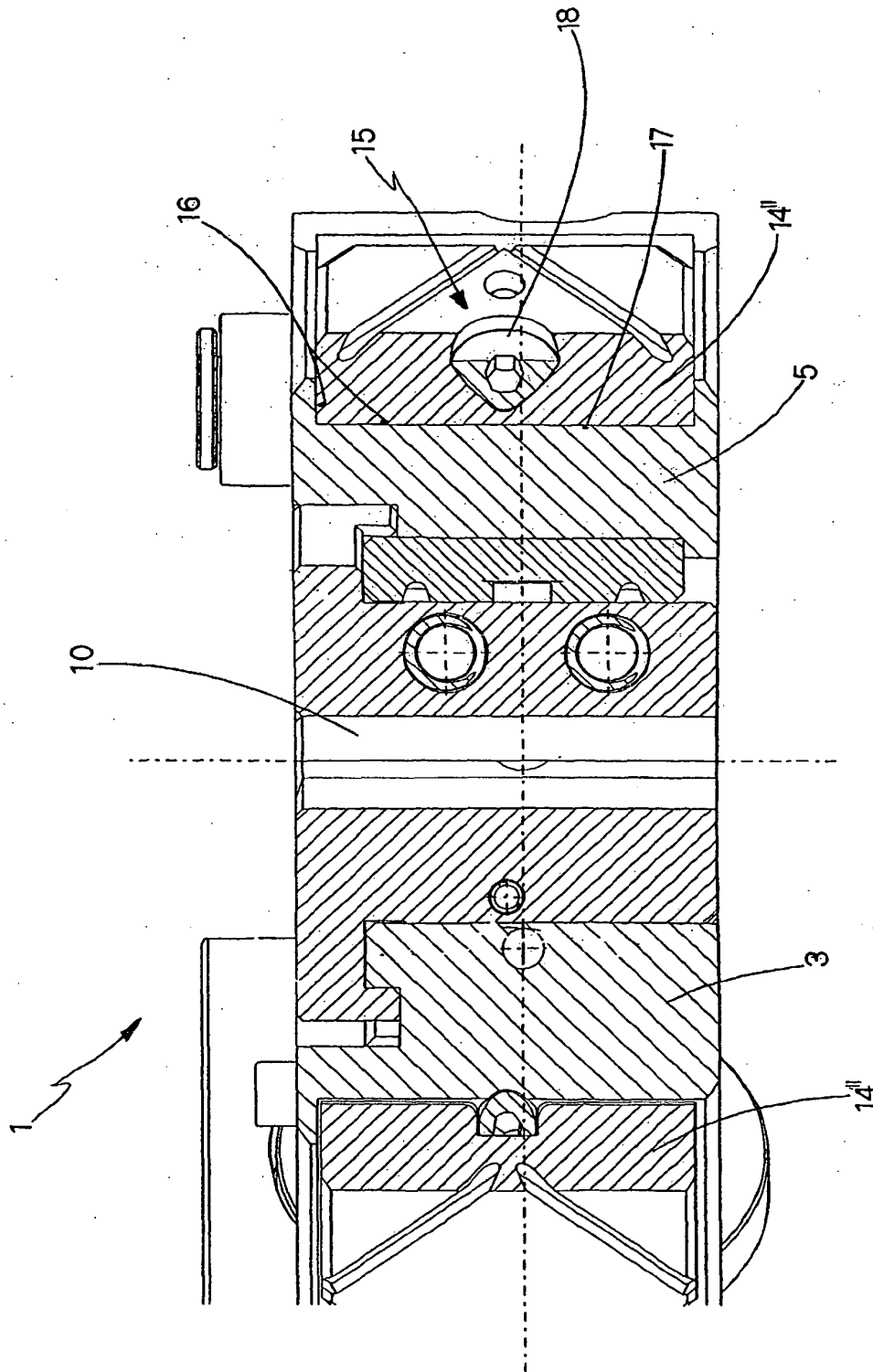


Fig. 3

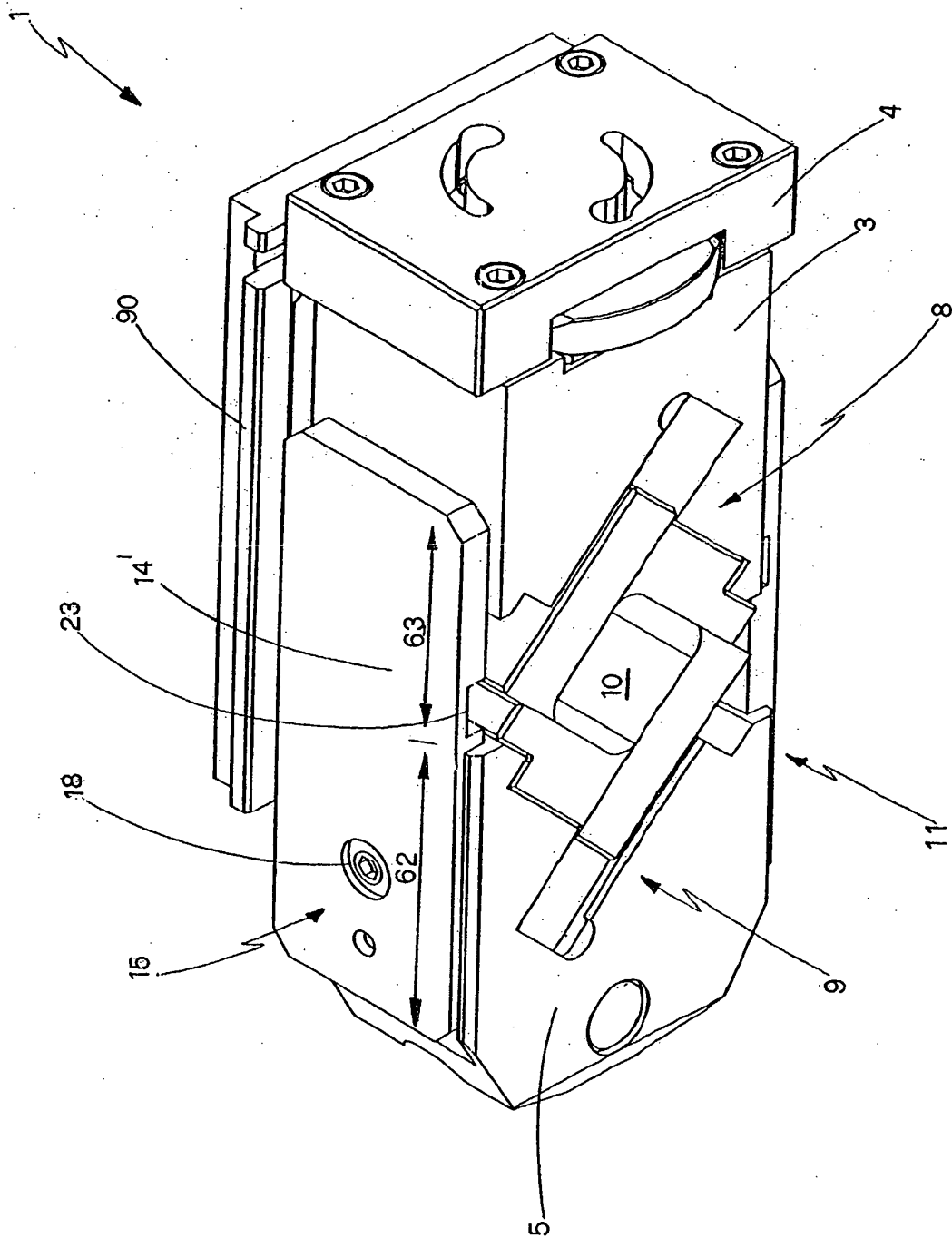


Fig. 4

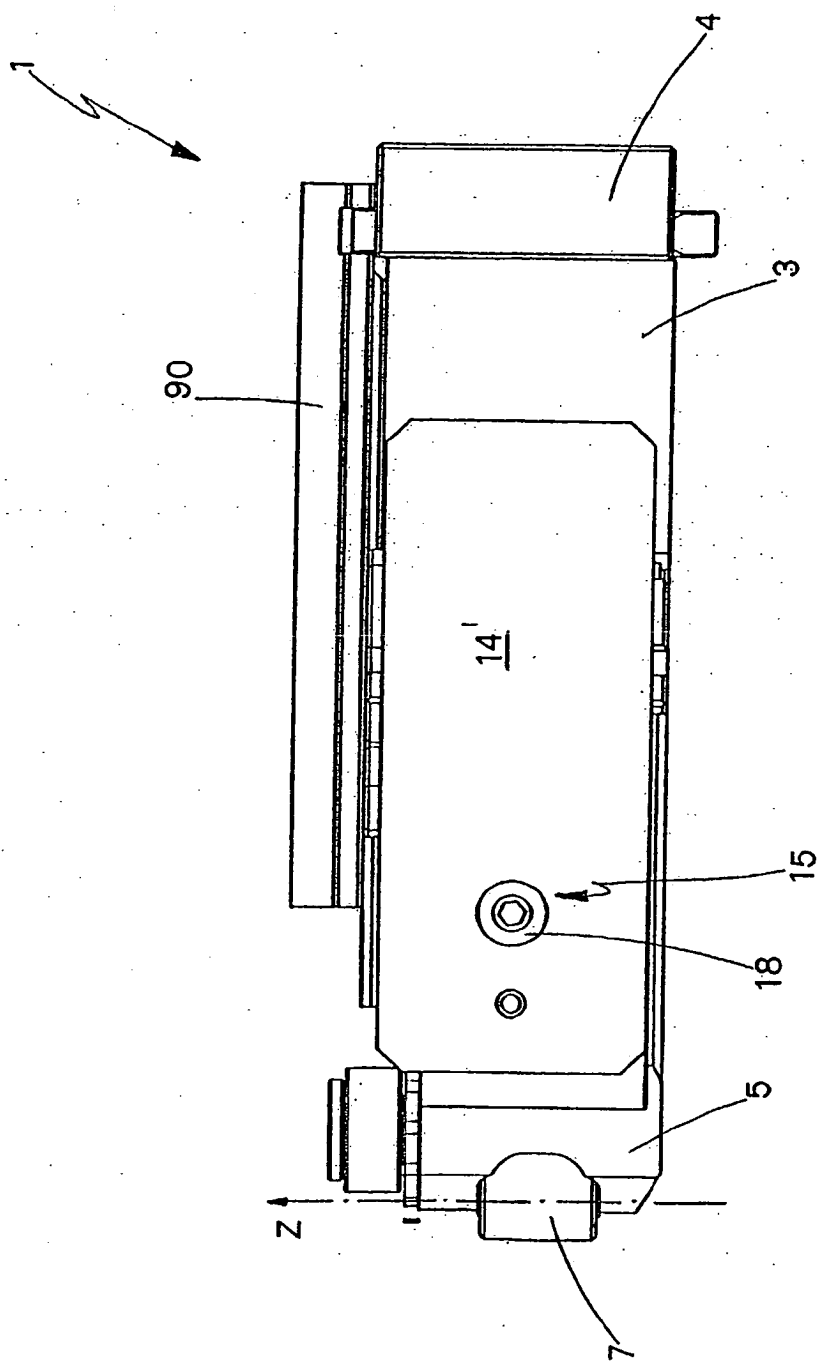


Fig. 5

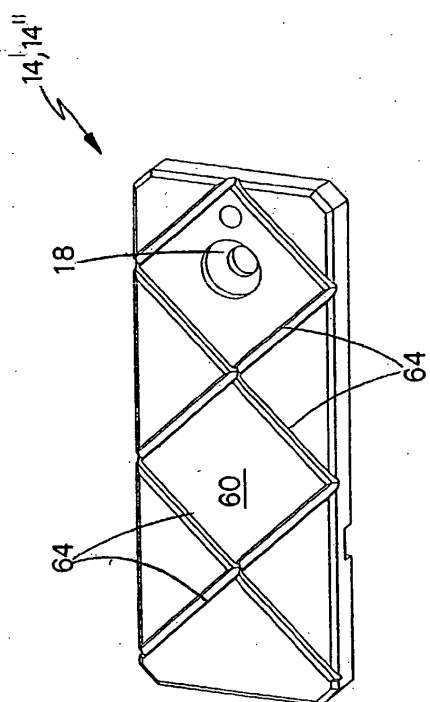


Fig. 6

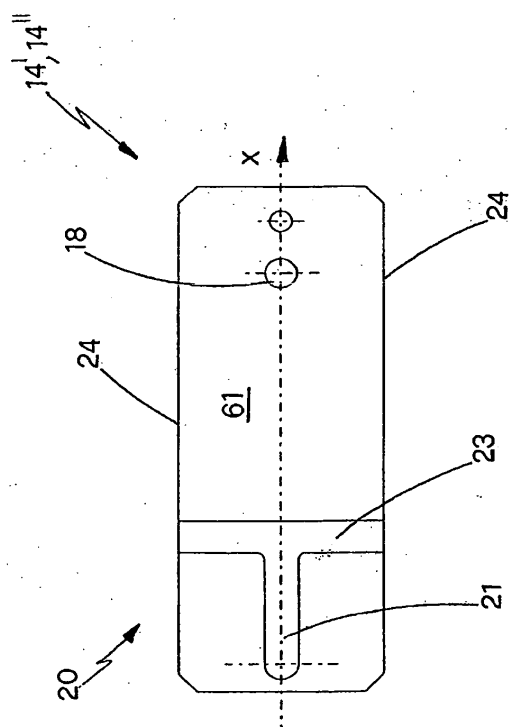


Fig. 7

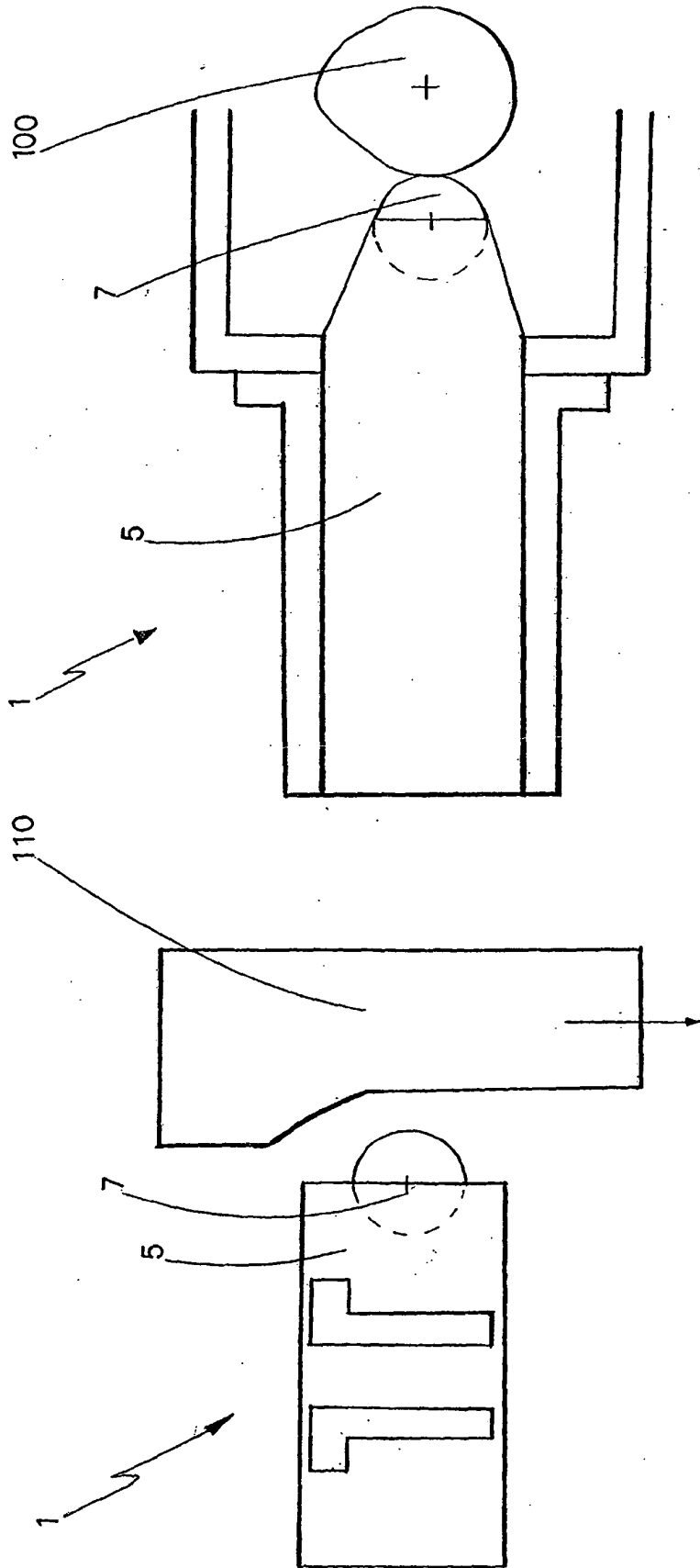


Fig. 9

Fig. 8