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(54) **Device for restoring the centering of tire rims**

(57) Device for restoring the centering of tire rims comprising: a rod (1), which can be connected to a convenient support (201) to be inserted into the coupling hole (12) of a rim (10) with a tire hub, and which is provided with blocking means (2, 102, 202), coaxial with said rod (1), for the plate (11) of said rim (10), so as to

position said rod (1) along the direction of the axis of said rim (10); thrust means (3, 103, 113) acting along any direction perpendicular to said rod (1), which can shift along the latter and are provided with adjustment means (303) and with blocking means (313) for their position along said rod (1).

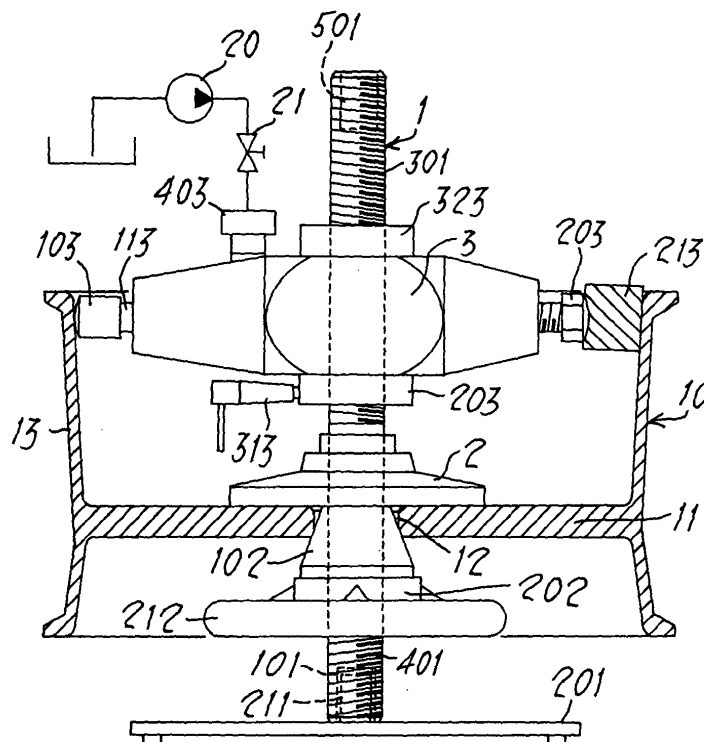


Fig. 1

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Description

[0001] The present invention relates to a device for repairing hollow metal bodies, and in particular to a device for restoring the centering of tire rims.

[0002] The more and more frequent use of alloy rims as on-board equipment on cars, beyond as parts for special applications on request, and the common tendency to combine them with tires commonly referred to as having a "lowered profile", has pointed out the evident problem involving the deformation of the rim channel as a consequence of occasional collisions against obstacles such as sidewalks, stones, holes and the like, if tire elasticity is not enough to absorb its whole intensity.

[0003] Until today the damage has been repaired with basically manual interventions, by hammering the damaged rim portion, which results in dents and inaccurate centerings. Some highly specialized people working in this field use lathes for this kind of repairs, which obviously results in higher machining costs.

[0004] The present invention therefore aims at providing a device enabling to restore the centering in a damaged rim using simple procedures; said device should have an extremely high versatility of use as well as a simple structure and operation.

[0005] The object of the present invention therefore is a device for restoring the centering of tire rims comprising: a rod, which can be connected to a convenient support to be inserted into the coupling hole of a rim with a tire hub, and which is provided with blocking means, coaxial with said rod, for the plate of said rim, so as to position said rod along the direction of the axis of said rim; thrust means acting along any direction perpendicular to said rod, which can move along the latter and are provided with blocking and adjustment means for their position along said rod.

[0006] In an embodiment, said thrust means comprise a jack equipped on one end with a tool for machining the side wall of said rim, and on the opposite end with abutment means, which can be applied to the portion of rim side wall diametrically opposite the one undergoing machining.

[0007] Said rod can be a threaded rod, and the thrust means can be mounted, freely turning, onto a threaded bushing coupled with said rod equipped with blocking means.

[0008] The means for blocking the tire plate with respect to said rod can comprise a radial flange fitted onto said rod, and a self-centering element equipped with screw clamping means coupled with said rod, said rim plate being placed between said flange and said self-centering element.

[0009] Further advantages and characteristics of the device according to the present invention will be evident from the following detailed description of an embodiment of said invention, made by way of non-limiting example with reference to the accompanying drawing ta-

bles, in which:

Figure 1 is a view in side elevation with sectioned portions of an embodiment of the device according to the present invention;

Figure 2 is a magnified sectioned view of the device of Figure 1;

Figure 3 is a detail referring to an execution variant of the present invention; and

Figures 4 and 5 show the operation of the device according to the present invention.

[0010] Figure 1 shows the device according to the present invention; number 10 refers to a tire rim. The hole 12 made in the middle of the plate 11 of the rim 10 is inserted onto the threaded rod 1, which has on one end the cavity 101 into which is inserted the pin 211 of the support platform 201; a cavity 501 wholly similar to the one referred to with 101 is made on the opposite end of the rod 1. The plate 11 is placed between the flange 2 fitted onto the rod 1 and the conical body 102, pushed against said plate 10 and into the hole 12 through the metal ring 202 equipped with the driving handwheel 212. The hydraulic jack 3 is mounted, moving along said rod and freely turning, onto the rod 1, at an end of said jack the tool 103 being mounted onto the arm 113; on the opposite end the jack 3 has the bolt 203 abutting against the abutment wedge 213, which is in its turn pushed against the side wall 13 of the rim 10. The jack 3 is supplied by the compressor 20 connected to the supply outlet 403 by means of the valve 21. The bushing 303 onto which the jack 3 is fitted is coupled with the threaded rod 1 and is equipped with the blocking handle 313; the bushing has on the end opposite the blocking handle 313 the adjustment ring 323, integral with said handle.

[0011] Figure 2 shows a sectioned view of the device according to the invention; the same parts have the same numbers. The jack 3 can turn with respect to the bushing 303 since the latter is provided with the ball bearings 333, which enable free rotation; the handle 313 allows to block the movement of the bushing 303 along the rod thanks to its threaded end 343 inserted into the threaded radial hole 353 of the bushing 303. In the jack 3 the fluid under pressure supplied to the supply outlet 403 gets into a chamber 413 in which the central piston 123 integral with the arm 114 sealingly slides; the chamber is equipped with the sealing means 423 enabling the axial sliding of the arm 113. The arm 113 is equipped with an axial threaded cavity into which the tool 103 is screwed, the latter being provided with the threaded tang 143. On the opposite end of the jack 3, the bolt 203 is coupled with the threaded hollow 503 and abuts, as already previously described, against the abutment wedge 213 resting onto the side wall 13 of the rim 10. The flange 2 shows in this figure an axial cavity 302 shaped as a frustum of cone, positioned towards the conical body 102, which is equipped in its turn with the axial hole 112 in which the rod 1 slides; it should be fur-

ther pointed out that the rod 1 is equipped with the threading 301 in the portion on which the jack 3 moves thanks to the bushing 303, and with the threading 401 in the opposite direction in the portion onto which the metal ring 202 acting upon the conical body 102 is screwed.

[0012] Figure 3 shows a detail of an execution variant of the present invention; in this case the tool 603, which has a cavity with right angles, is mounted onto the arm 113 of the jack, which cavity enables the tool to act upon the ring-shaped relief 14 of the wall 13 of the rim 10.

[0013] The operation of the device according to the present invention will be evident from the following, with particular reference to Figures 4 and 5 of the accompanying drawings. First of all, the rim to be repaired, for instance a rim as the one referred to with 30 in Figure 4, which has the deformation 35 on the side wall 33, has to be firmly coupled with the device according to the invention. To said purpose the rod 1 is placed onto the platform 201 by inserting the pin 211 protruding from said platform into the cavity 501 of said rod; then the rim is positioned by inserting the end of the rod having the cavity 101 into the hole of the rim plate. The rim plate gets in contact with the flange 2 radially protruding from the rod 1, and then the conical body 102 is arranged onto the rod and clamped against the rim plate by means of the metal ring 202. After blocking the whole, the rod is taken off the pin 211 and the assembly device-rim is turned upside down, inserting the pin 211 into the cavity 101 of the rod 1. Now the position of the jack 3 with respect to the deformation on the side wall of the rim should be adjusted; height adjustment takes place by turning the adjustment ring 323 integral with the bushing. Once the desired position has been reached, the bushing 303 is blocked by acting upon the handle 313. The jack 3 should now be oriented with respect to the deformation and conveniently blocked also as far as rotation is concerned; the bolt 203 is extended towards the rim wall and pushed against the abutment wedge 213.

[0014] The device is ready for working onto the deformation of the rim, just as inferable from figure 4 of the accompanying drawings, by means of the tool 103 resting onto the surface of the wall 33 of the rim 30 on the deformation 35. When the jack is pushed by actuating the valve 21 of the compressor 20, the tool reaches the thrust position 103' shown with a hatched and dotted line in the figure, and the deformation 35 is extroverted as referred to with 35'. After a given thrust time, jack pressure is discharged, and the material the rim is made of revives so as to restore its centering, as shown in Figure 5.

[0015] The tools used on the arm 113 of the jack 3 can have different shape and size, depending on the type of rim deformation to be machined and also of the deformed rim portion. As is evident from Figure 3, when the rim has to be restored in the area corresponding to its ring-shaped relief 14, the tool 603 is advantageously

shaped so as to ensure the thrust only on said relief, and therefore has the cavity with right angles 613.

[0016] The jack 3 of the embodiment shown and described above is a hydraulic jack, but it is wholly evident that the same result can be achieved by a merely mechanical drive; in the same way, the bolt 203 acting upon the abutment wedge 213 could be replaced by a hydraulically driven arm like arm 113.

[0017] The device thus conceived enables to restore the centering for tire rims in a rapid and efficient way, without sophisticated equipment but with a clearly higher degree of precision and accuracy.

15 Claims

1. Device for restoring the centering of tire rims comprising: a rod (1), which can be connected to a convenient support (201) to be inserted into the coupling hole (12) of a rim (10) with a tire hub, and which is provided with blocking means (2, 102, 202), coaxial with said rod (1), for the plate (11) of said rim (10), so as to position said rod (1) along the direction of the axis of said rim (10); thrust means (3, 103, 113) acting along any direction perpendicular to said rod (1), which can shift along the latter and are provided with adjustment means (303) and with blocking means (313) for their position along said rod (1).
2. Device according to claim 1, in which said thrust means comprise a jack (3) equipped on one end with a tool (103; 603) for machining the side wall (13) of said rim (10), and on the opposite end equipped with abutment means (203, 213), which can be applied to the portion of side wall (13) of rim (10) diametrically opposite the one undergoing machining.
3. Device according to claim 1 or 2, **characterized in that** said rod is a threaded rod (1, 301, 401) and the thrust means are mounted, freely turning, onto a threaded bushing (303) coupled with at least a portion (301) of said rod (1), provided with blocking means (313).
4. Device according to any of the preceding claims 1 to 3, in which said means for blocking the plate (11) of the rim (10) with respect to said rod (1) comprise a radial flange (2) fitted onto said rod (1), and a self-centering element (102) equipped with screw clamping means (202, 212) coupled with said rod (1), said plate (11) of the rim (10) being placed between said flange (2) and said self-centering element (102).
5. Device according to claim 4, in which said self-centering element is a conical element (102) pro-

vided with an axial through hole (112).

6. Device according to any of the preceding claims 2 to 5, in which said tool (103; 603) is mounted in a removable way onto said jack (3).

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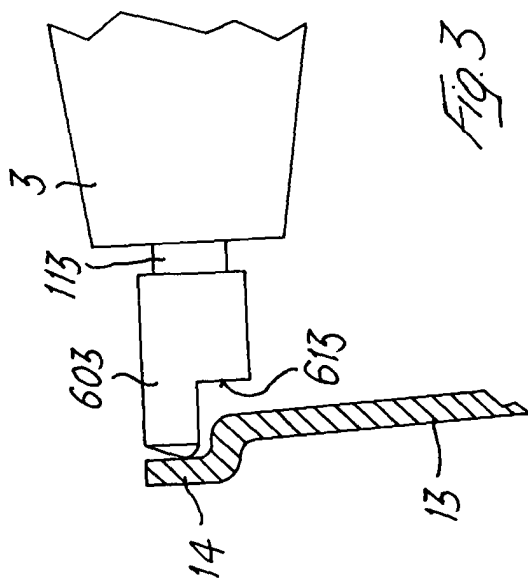
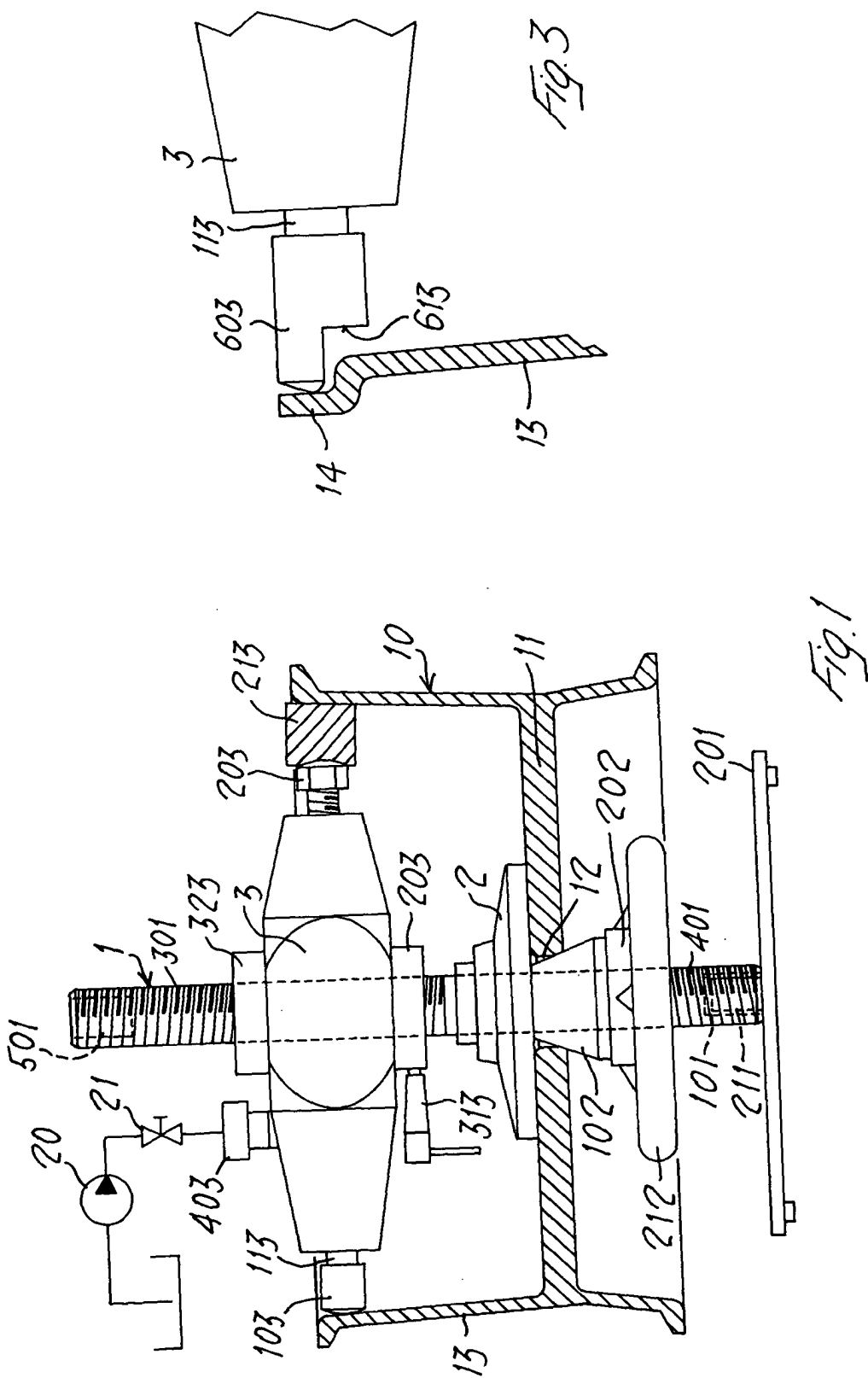
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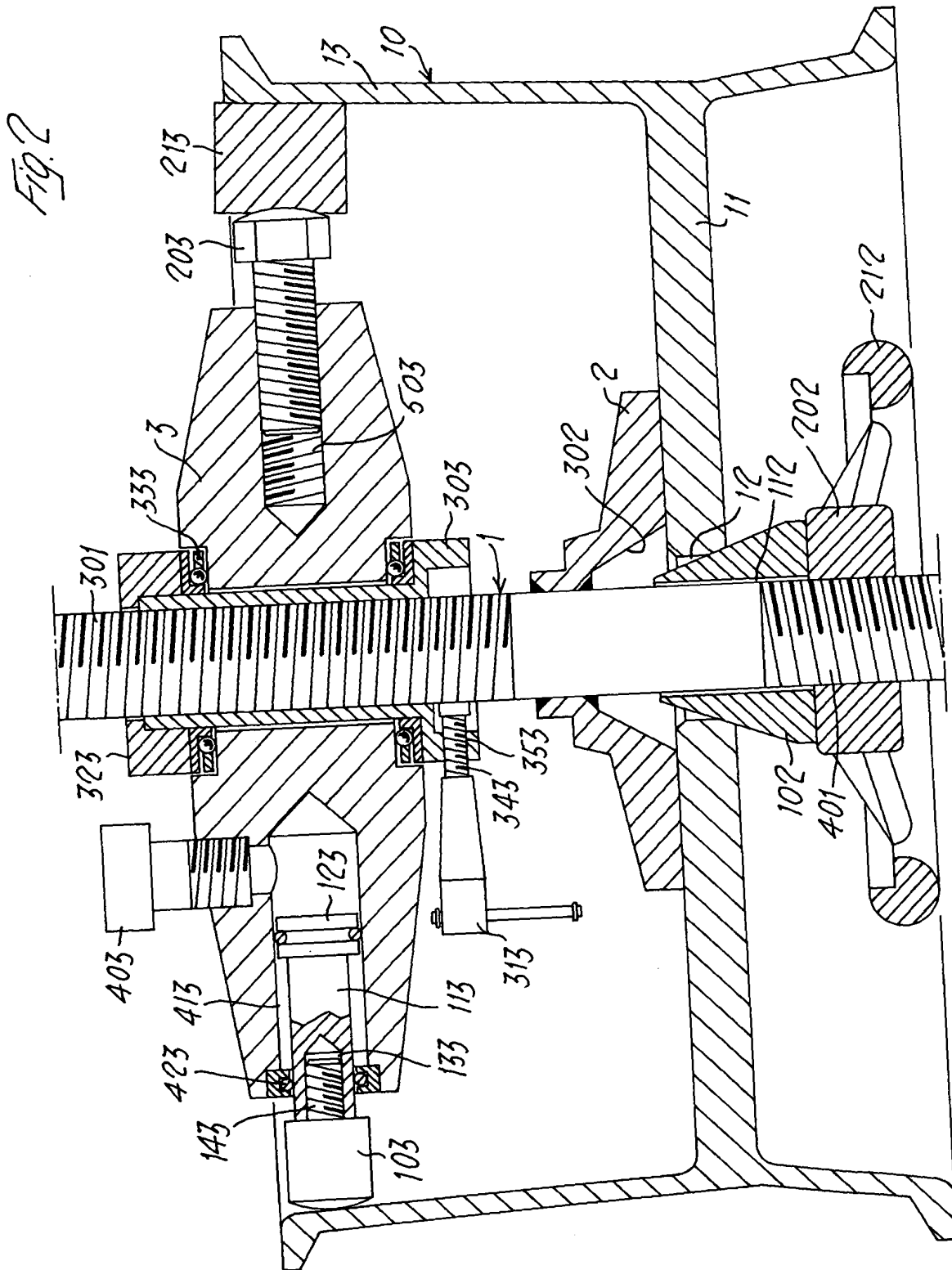
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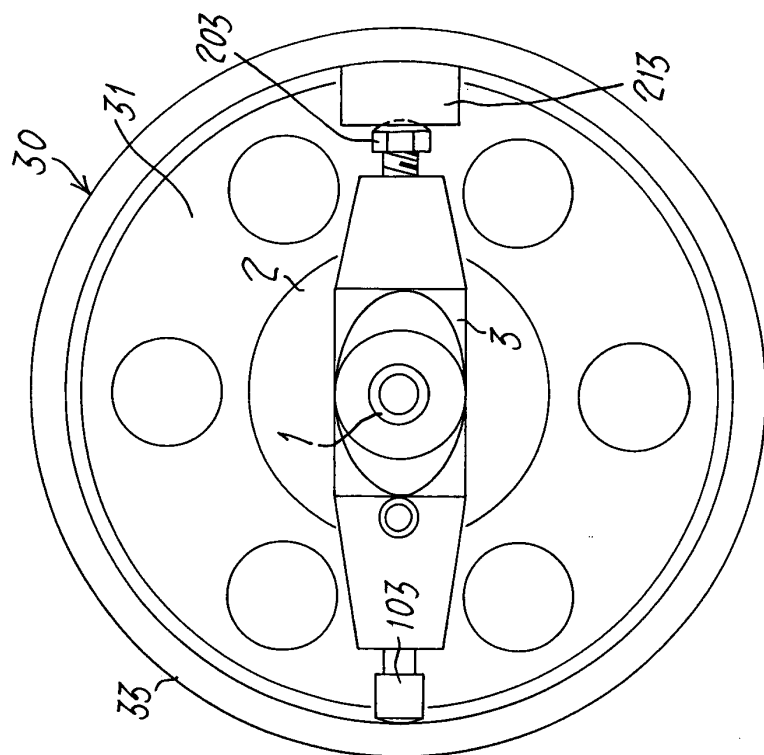


Fig. 5

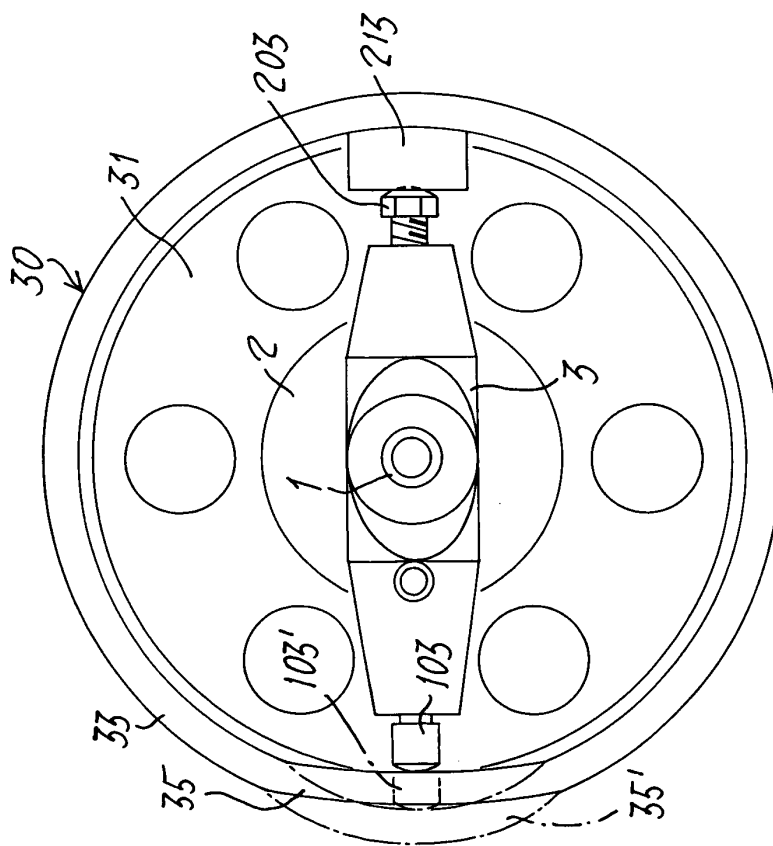


Fig. 4