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(54) **Rolling head with dynamic balancing**

Anrollkopf mit dynamischer Auswuchtung

Tête de sertissage avec équilibrage dynamique

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EP 1 103 514 B1

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Description

[0001] The present invention refers to a rolling head with dynamic balancing.

[0002] It is known that liquid foodstuffs, e.g. wine, are usually sold in bottles. Such bottles have corked necks on which a seal cap is applied to ensure product hygiene and quality.

[0003] To apply the seal cap, the bottles (already filled and corked) are fed through a sealing machine, provided with an element which deposits a cap onto the cork. Afterwards, rolling heads push and press down the cap until it adheres to and is integral with the cork and the bottle neck.

[0004] A conventional rolling head usually includes a fixed central body which supports an external body. The external body can turn in relation to the central body and supports a number of balances, each of which bears a pressure roller at each end, and a spring at the opposite end. This spring is interposed between the balancer and a contrast ring inserted, in a sliding manner, on the external body and kept in position by a threaded ring screwed to a threaded portion of the same external body. The preloading exerted on the pressure roller may therefore be varied by turning the ring.

[0005] For the sealing process the bottles, complete with caps, are inserted between the pressure rollers. These, which turn due to the dragging effect of the external body, make the caps adhere to the bottle necks. A rolling head having the features of the preamble of claim 1 is known, for example, from EP-A-786 433

[0006] With conventional rolling heads, as is widely known, the adjustment of preloading on the springs proves a labour intensive operation which makes it difficult to reach a sufficient level of accuracy.

[0007] Moreover, due to their complicated structure and the large number of parts which they contain, conventional rolling heads prove very difficult to assemble and maintain.

[0008] This is particularly due to the positioning of the springs.

[0009] The conventional rolling heads are also of considerable radial bulk, which would need to be limited.

[0010] The aim of the present invention is to eliminate the technical problems experienced, by producing a rolling head with dynamic balancing, through which the operation of preloading adjustment can be performed in a simple and, at the same time, very precise way.

[0011] Another aim of the present invention is to produce a rolling head of simple structure, which is basically easy to assemble and maintain.

[0012] Another aim of the present invention is to produce a rolling head of substantially limited radial bulk.

[0013] Not the least aim of the invention is to produce a rolling head with dynamic balancing, which is basically simple, sure and reliable.

[0014] These and other aims, according to the present invention, are reached by producing a rolling

head with dynamic balancing as in claim 1.

[0015] Other characteristics of the present invention are also defined in the subsequent claims.

[0016] Additional characteristics and advantages of a rolling head with dynamic balancing, according to the present invention, will become apparent from the description that follows, supplied simply as explanatory and non-limiting, referring to the outline designs enclosed, in which:

- figure 1 is a longitudinal section of the rolling head according to the invention;
- figure 2 shows an additional longitudinal section of the rolling head according to the invention, made from a different angle;
- figure 3 is an enlarged sectional plan view of a rolling head according to the invention, made along the line III-III of figure 1; and
- figure 4 shows an enlarged longitudinal section of an external preloading adjustment device of one pusher of the rolling head according to the invention.

[0017] With reference to the cited figures, a rolling head with dynamic balancing, indicated as a whole by 11, is shown.

[0018] The head 11 includes an internal body, consisting of a tubular part 12 with a threaded end to which a threaded ring 14 is screwed. The ring 14 is set on the ledge of a first end of a fixed support 16, consisting of a bush from which a radial appendix protrudes for connection to a rolling machine (not shown). The tubular part 12 also supports two bearings 18.

[0019] The bearings 18 are distanced by a spacer and are set the one on the ledge of a second end of the fixed support 16 and the other set on the ledge of a ring 20.

[0020] The bearings 18 support an external body consisting of a second tubular part. This has a first portion 22a, where the bearings 18 are connected and a second portion or sleeve 22b which protrudes in relation to the tubular part 12. The sleeve 22b has a flange 24 at its free end to which an entrance ring 26 is fixed by spacers.

[0021] The sleeve 22b has eight longitudinal grooves 28 into each of which a rod 30 is inserted. Each rod 30 has an end connected to the sleeve 22b by an articulated connection 32. The opposite end of each rod 30, instead, crosses oblong through holes 34 of flange 24 and bearing a pressure roller 36. The rollers 36 are housed in an area between the flange 24 and the entrance ring 26.

[0022] As is clear in figure 1, when the rolling head 11 is in a rest position without a bottle, a pusher 38 is placed between the rollers 36. The pusher 38 has a portion which is integral with a cup plate 40, with its edge turned towards the sleeve 22b.

[0023] The end of a rod is fixed to the plate 40 opposite to that where the pusher 38 is connected. This rod is made up of two portions, the first portion 42a is wider

and is fixed to the plate 40, a second portion 42b, instead, is inserted inside the tubular part 12.

[0024] A bush 44 is inserted on the first rod portion 42a, next to plate 40. In turn, a helical spring 46 is inserted on the bush 44 as elastic part. The spring 46 is locked between the plate 40 and the ring 20.

[0025] The other end of the first portion 42a of the rod is in sliding contact with a raised edge 48 internally protruding from one end of the tubular part 12. In this way, it is the first portion 42a, and never the second portion 42b, which is always in contact with the raised edge 48 for any rod position.

[0026] The second portion 42b, inside the tubular part 12, also slides, guided by a bushing 50 housed at the other end of the tubular part 12. The end of the portion 42b of the rod is threaded and a nut is fixed to it which locks a striker plate 52 able to set against the ledge end of the tubular part 12.

[0027] A pulley 54, is fixed on the portion 22a of the second tubular part, serving as a drive component on which a drive belt is wound, not shown for purposes of simplicity.

[0028] The pulley 54 has eight dead holes 56 in each of which an arm 58 is connected by a spherical knuckle. Each arm 58 bears a socket 60, which can be inserted into a groove 62 of a ring-shaped part or sleeve 64 of the rolling head 11, which constitutes a support part.

[0029] The socket 60 has a slot which houses a helical spring 66 as elastic part. The spring 66 is locked, on the other side, in a slot of a second socket 68 which instead slides in a through hole 70 of the ring-shaped part 64.

[0030] The socket 68 has a hollow rear portion, which encloses the rods 30, and inclined lateral walls, which join with the inclined walls of the grooves 28.

[0031] On the ring-shaped part or sleeve 64, at each of the grooves 62, a pin 72 is fixed which constitutes a central fulcrum of a lever 74. The lever 74 has a hook shaped end 76, able to hook up a pin 78 which is integral with the socket 60. At the opposite end of the lever 74 is pivoted a presser component or U-bolt 80, which radially pushes against the rods 30.

[0032] The socket 68 is set on the side of the pulley 54 while the lever 74 is set on the side of the pressure rollers 36.

[0033] The ring-shaped part 64 has locking parts which lock it and prevent its translation along the rolling head 11.

[0034] Such locking parts include two ratchet gears 82, pivoted at 84 each being inside a groove 86. The two grooves 86 are made in diametrically opposite positions to the ring-shaped part 64. The ends of the ratchet gears 82 are inserted inside notches 88 each being kept in position by a spring 90.

[0035] The rolling head 11, according to the invention, can be also supplied with an external preloading adjustment device 92 of the pusher 38.

[0036] When such device 92 is present, a bush 94 locked by threaded dowels is placed at the end of the

tubular part 12. The bush 94 has a squared portion where one end of a sleeve 96 is locked. The other end of the sleeve 96 is closed by a plate 98 with a threaded through hole. Through this hole into sleeve 96 is inserted a threaded rod 100 bearing a piston 102 at its end. A spring 104 is locked between the piston 102 and the plate 52. A striker nut 106, is also screwed on rod 100, placed against plate 98 outside sleeve 96.

[0037] The functioning of the rolling head with dynamic balancing, according to the invention, is basically as follows.

[0038] The pulley 54, and the second tubular part 22a, 22b integral with it, is previously rotated; thus the bottle neck (complete with cap) is inserted inside the second tubular part 22a, 22b.

[0039] The bottle neck bears the cap beat against the pusher 38 and, overcoming the elastic reaction of the springs 66 and spring 46, moves the pressure rollers 36 radially and the pusher 38 axially, inserting itself inside the sleeve 22b of the second tubular part.

[0040] The rotation of the second tubular part 22a, 22b causes the rotation of rods 30 and, therefore of rollers 36. Thus the rollers 36, press down the cap making it adhere to the bottle neck and cork, also at the undercuts.

[0041] During rotation, the centrifugal force tends to move the rods 30 radially outwards. However, when this occurs, the springs 66 are compressed and the sockets 60 are, in turn, pushed radially outwards. The levers 74 therefore turn around the respective pins 72 and radially push the U-bolts 80 on rods 30, to balance the head 11 again; in practice, the sockets 60 show a swing motion around the spherical knuckles inserted in the guide holes 56.

[0042] In actual fact, the rolling head 11 is only dynamically balanced at a precise position of the ring-shaped part 64 (preloading on the pressure rollers 36 independent of the rotation speed).

[0043] If the ring-shaped part 64 is moved towards the pressure rollers 36, the rolling head 11 is self-closing, i.e. the load on rollers 36 increases with an increase in the rotation speed of pulley 54.

[0044] Instead, if the ring-shaped part 64 is moved towards pulley 54, the roller head 11 is self-opening, i.e. the load on rollers 36 decreases with an increase in the rotation speed of pulley 54.

[0045] From that stated, it is possible to vary the preloading on rollers 36 by axially moving the ring-shaped part 64 and locking it axially in various positions, inserting the ratchet gears 82 into the appropriate notch 88.

[0046] The rotation of the ring-shaped part 64 around the second tubular part 22a, 22b is prevented by the presence of two spaces arranged according to a straight angle, which join with two grooves on the sleeve 22b

[0047] The lever 74, with hook 76, allows the quick release from socket 60. This allows the easy assembly and maintenance of the rolling head 11, in general, and

especially of springs 66 and, at the same time, allows the notable radial reduction of the roller head 11 bulk.

[0048] In addition, the preloading of the pusher 38 can be adjusted, to adapt it to particular working requirements, by using the device 92 in figure 4, when this is present. In this case, adjustment proves particularly simple, quick and very accurate. In order to do this, simply screw or unscrew the rod 100 from the plate 98 so as to axially move the rod 100 in relation to the sleeve 96. Since the spring 104 is locked between the piston 102 and the plate 52, this operation alters the preloading on the pusher 38.

[0049] In practice, it has been observed how the rolling head with dynamic balancing, according to the invention, proves particularly advantageous since its assembly and maintenance are very simple which can lead to a notable reduction in radial bulk. In addition, use of the rolling head according to the present invention means that extreme accuracy in the preloading of the pressure rollers is obtained.

[0050] Numerous modifications and variations can be made to the rolling head with dynamic balancing thus devised, all of which are relevant to the invention.

[0051] In practice the materials used, as well as the dimensions can be changed to satisfy technical requirements.

Claims

1. A rolling head (11) with dynamic balancing, includes an internal body (12, 16) that supports an external body (22a, 22b) there being at least one rod(s) (30) articulated to said external body which bears a pressure roller (36), said external body (22a, 22b) also having at least one drive component(s) (54) for its rotary operation, said external body (22a, 22b) bears at least one support part(s) (64), rotationally integral with it, to which, for each rod, there is a lever (74) fixed around a fulcrum, **characterized in that** said lever (74) having one end hinged to a presser part (80), which works against said rod (30) and an opposite end hinged to a socket (60) which pushes an elastic part (66) against said rod (30), said socket (60) being articulated to said rolling head (11) by an arm (58) articulated to said external body (22a, 22b), so that it can move towards or away from the external body (22a, 22b).
2. A rolling head (11) as in claim 1, **characterised in that** said support part(s) (64) includes at least one ring-shaped part inserted on said external body (22a, 22b).
3. A rolling head (11) as in claim 2, **characterised in that** said ring-shaped part (64) is axially sliding on said external body (22a, 22b) and has locking parts (82, 84).
4. A rolling head (11) as in claim 2, **characterised in that** said ring-shaped part (64) has grooves (62) in which said sockets (60) are inserted.
5. A rolling head (11) as in claim 2, **characterised in that** said ring-shaped part (64) has through holes (70) through which said elastic parts (66) pass to bring themselves against said rod (30).
6. A rolling head (11) as in claim 5, **characterised in that** in said through holes (70) and at the ends of said elastic parts (66) are set second sockets (68) which enclose said rod (30).
7. A rolling head (11) as in claim 1, **characterised in that** said levers (74) have a presser (80), at least one end of said rod (30), which encloses said rod (30).
8. A rolling head (11) as in claim 1, **characterised in that** said end of said lever (74) hinged to said socket (60) is hook shaped (76) and is engaged with pin (78) of said socket (60), so as to constitute a quick release device.
9. A rolling head (11) as in claim 1, **characterised in that** said external body (22a, 22b) has longitudinal grooves (28) containing said rods (30).
10. A rolling head (11) as in claim 9, **characterised in that** said longitudinal grooves (28) have inclined walls so as to join with the inclined walls of a second socket (68) joined to said rods (30).
11. A rolling head (11) as in claim 3, **characterised in that** said locking parts (82, 84) include ratchet gears (82) pivoted (at 84) to said ring-shaped part (64) and having ends which insert into notches (88) of said external body (22a, 22b).
12. A rolling head (11) as in claim 1, **characterised in that** said socket (60) is set on the side of said pulley (54) while the lever (74) is set on the side of the said pressure rollers (36).

Patentansprüche

1. Anrollkopf (11) mit dynamischer Auswuchtung, der einen einen äußeren Körper (22a, 22b) tragenden inneren Körper (12, 16) umfasst, wobei zumindest eine Stange (30) zum eine Druckrolle (36) tragenden äußeren Körper gelenkig angebracht ist, und der äußere Körper (22a, 22b) zumindest eine Antriebskomponente (54) für seinen Drehbetrieb umfasst, und der äußere Körper (22a, 22b) wenigstens ein Trägerteil (64) vollständig drehbar abstützt, wobei für jede Stange ein Hebel (74) vorge-

sehen ist, der um eine Hebelstütze montiert ist, **dadurch gekennzeichnet, dass** der Hebel (74) wenigstens ein Ende hat, das an einem gegen die Stange arbeitenden Druckteil (80) abgestützt ist, und ein anderes Ende, das an einem elastischen Teil (66) gegen die Stange (30) drückenden Sockel (60) abgestützt ist, wobei der Sockel (60) durch einen mit dem äußeren Körper (22a, 22b) gelagerten Arm (58) mit dem Anrollkopf gelenkig verbunden ist, so dass er eine Vor- und Zurückbewegung vom äußeren Körper (22a, 22b) ausführen kann.

2. Anrollkopf (11) **nach Anspruch 1, dadurch gekennzeichnet, dass** das Trägerteil (64) zumindest ein in den äußeren Körper (22a, 22b) hineingestecktes ringförmiges Teil umfasst.

3. Anrollkopf (11) **nach Anspruch 2, dadurch gekennzeichnet, dass** das ringförmige Teil (64) axial auf dem äußeren Körper (22a, 22b) gleitet und Sperrteile (82, 84) umfasst.

4. Anrollkopf (11) **nach Anspruch 2, dadurch gekennzeichnet, dass** das ringförmige Teil (64) Nuten (62) aufweist, in denen die Sockel (60) eingesetzt sind.

5. Anrollkopf (11) **nach Anspruch 2, dadurch gekennzeichnet, dass** das ringförmige Teil (64) Durchtrittslöcher (70) umfasst, durch die sich elastischen Teile (66) erstrecken, um gegen die Stangen (30) zu drücken.

6. Anrollkopf (11) **nach Anspruch 5, dadurch gekennzeichnet, dass** in den Durchtrittslöchern (70) und an den Enden der elastischen Teile (66) zweite Sockel (68) vorgesehen ist, die die Stange (30) umschließen.

7. Anrollkopf (11) **nach Anspruch 1, dadurch gekennzeichnet, dass** die Hebel (74) eine Druckvorrichtung (80) an zumindest einem Ende der Stange (30) umfassen, die die Stange (30) umschließen.

8. Anrollkopf (11) **nach Anspruch 1, dadurch gekennzeichnet, dass** das mit dem Sockel (60) gelagerte Ende des Hebels (74) hakenförmig ist (76) und mit dem Bolzen (78) des Sockels (60) fest verbunden ist, so daß es eine Schnellauslösvorrichtung darstellt.

9. Anrollkopf (11) **nach Anspruch 1, dadurch gekennzeichnet, dass** der äußere Körper (22a, 22b) Längsnuten (28) hat, in denen die Stangen (30) geführt sind.

10. Anrollkopf (11) **nach Anspruch 9, dadurch gekennzeichnet, dass** die Längsnuten (28) sich neigende Wände umfassen, so daß sie mit den sich neigenden Wänden des zweiten, mit den Stangen (30) verbundenen Sockels (68) verbunden sind.

11. Anrollkopf (11) **nach Anspruch 3, dadurch gekennzeichnet, dass** die Sperrteile (82, 84) Sperrklinkengetriebe (82) umfassen, die (bei 84) mit dem ringförmigen Teil (64) drehbar verbunden sind, und deren Enden in Einkerbungen (88) des äußeren Körpers (22a, 22b) münden.

12. Anrollkopf (11) **nach Anspruch 1, dadurch gekennzeichnet, dass** der Sockel (60) auf der Seite der Riemenscheibe (54) eingesetzt ist, während dessen der Hebel (74) auf der Seite der Druckrolle (36) eingesetzt ist.

Revendications

1. Tête de sertissage (11) à équilibrage dynamique, comportant un corps intérieur (12, 16) qui supporte un corps extérieur (22a, 22b), au moins une tige (30) étant montée articulée(s) sur ledit corps extérieur qui porte un galet presseur (36), ledit corps extérieur (22a, 22b) comportant également au moins un organe d'entraînement (54) pour son fonctionnement en rotation, ledit corps extérieur (22a, 22b) porte au moins un élément de support (64), d'un seul tenant à rotation avec lui, auquel, pour chaque tige, est fixé un levier (74) autour d'un point d'appui, **caractérisé en ce que** ledit levier (74) a une extrémité montée articulée sur un élément presseur (80), qui travaille contre ladite tige (30) et une extrémité opposée montée articulée sur une embase (60) qui pousse un élément élastique (66) contre ladite tige (30), ladite embase (60) étant montée articulée sur ladite tête de sertissage (11) par un bras (58) monté articulé sur ledit corps extérieur (22a, 22b), de sorte qu'elle peut s'approcher ou s'éloigner du corps extérieur (22a, 22b).

2. Tête de sertissage (11) selon la revendication 1, **caractérisée en ce que** ledit élément(s) de support (64) comporte au moins un élément annulaire inséré sur ledit corps extérieur (22a, 22b).

3. Tête de sertissage (11) selon la revendication 2, **caractérisée en ce que** ledit élément annulaire (64) coulisse axialement sur ledit corps extérieur (22a, 22b) et comporte des éléments de blocage (82, 84).

4. Tête de sertissage (11) selon la revendication 2, **caractérisée en ce que** ledit élément annulaire (64) comporte des rainures (62) dans lesquelles sont insérées lesdites embases (60).

5. Tête de sertissage (11) selon la revendication 2, **caractérisée en ce que** ledit élément annulaire (64) comporte des trous (70) par lesquels passent lesdits éléments élastiques (66) pour se mettre contre ladite tige (30). 5
6. Tête de sertissage (11) selon la revendication 5, **caractérisée en ce que** dans lesdits trous (70) et aux extrémités desdits éléments élastiques (66) sont placées des deuxième embases (68) qui enferment ladite tige (30). 10
7. Tête de sertissage (11) selon la revendication 1, **caractérisée en ce que** lesdits leviers (74) comportent un élément presseur (80), au moins à une extrémité de ladite tige (30), qui enferme ladite tige (30). 15
8. Tête de sertissage (11) selon la revendication 1, **caractérisée en ce que** ladite extrémité dudit levier (74) montée articulée sur ladite embase (60) est en forme de crochet (76) et est en prise avec un axe (78) de ladite embase (60), afin de constituer un dispositif à déblocage rapide. 20
25
9. Tête de sertissage (11) selon la revendication 1, **caractérisée en ce que** ledit corps extérieur (22a, 22b) comporte des rainures longitudinales (28) contenant lesdites tiges (30). 30
10. Tête de sertissage (11) selon la revendication 9, **caractérisée en ce que** lesdites rainures longitudinales (28) ont des parois inclinées afin de rejoindre les parois inclinées d'une deuxième embase (68) reliée auxdites tiges (30). 35
11. Tête de sertissage (11) selon la revendication 3, **caractérisée en ce que** lesdits éléments de blocage (82, 84) comportent des rochets (82) montés pivotants (en 84) sur ledit élément annulaire (64) et ayant des extrémités qui s'insèrent dans des encoches (88) dudit corps extérieur (22a, 22b). 40
12. Tête de sertissage (11) selon la revendication 1, **caractérisée en ce que** ladite embase (60) est placée 45
sur le côté de ladite poulie (54) tandis que le levier (74) est placé sur le côté desdits galets presseurs (36).
50
55

Fig.1

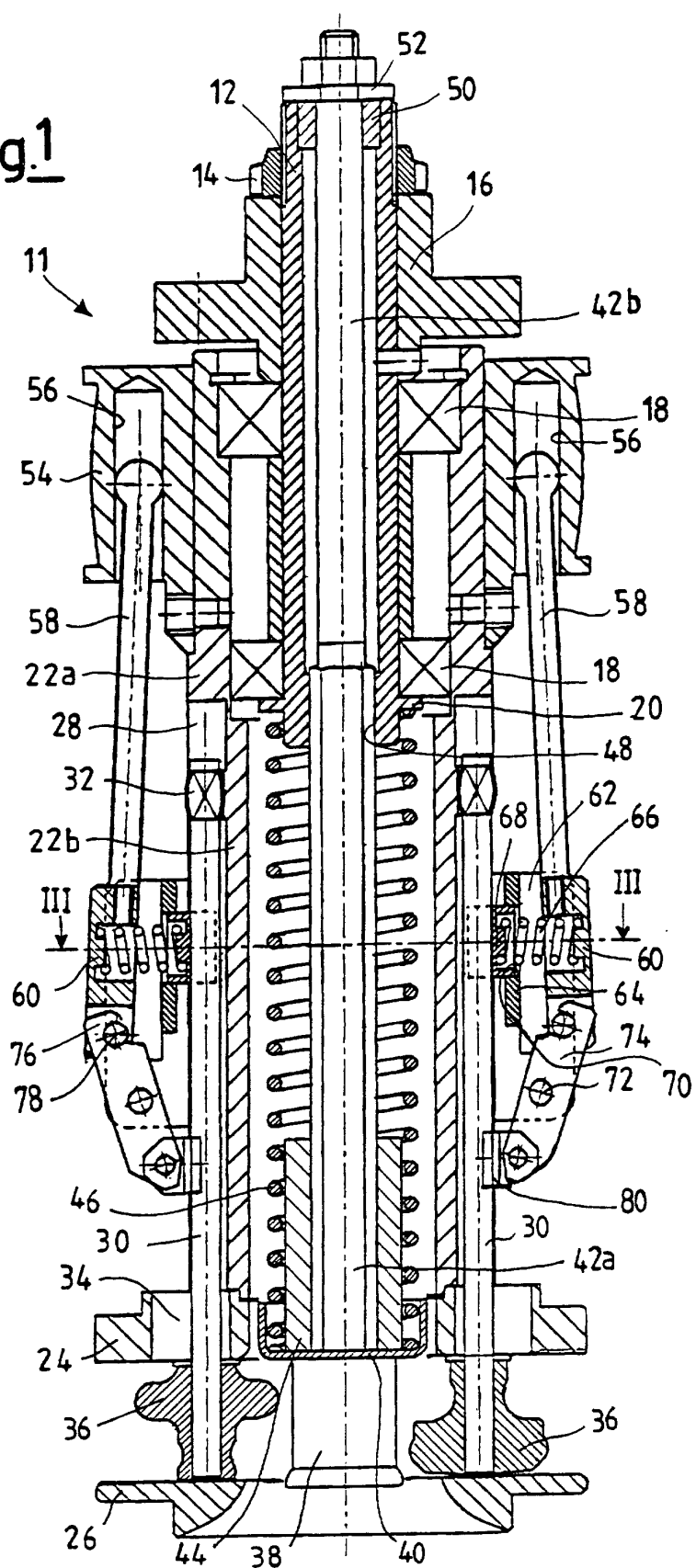


Fig.2

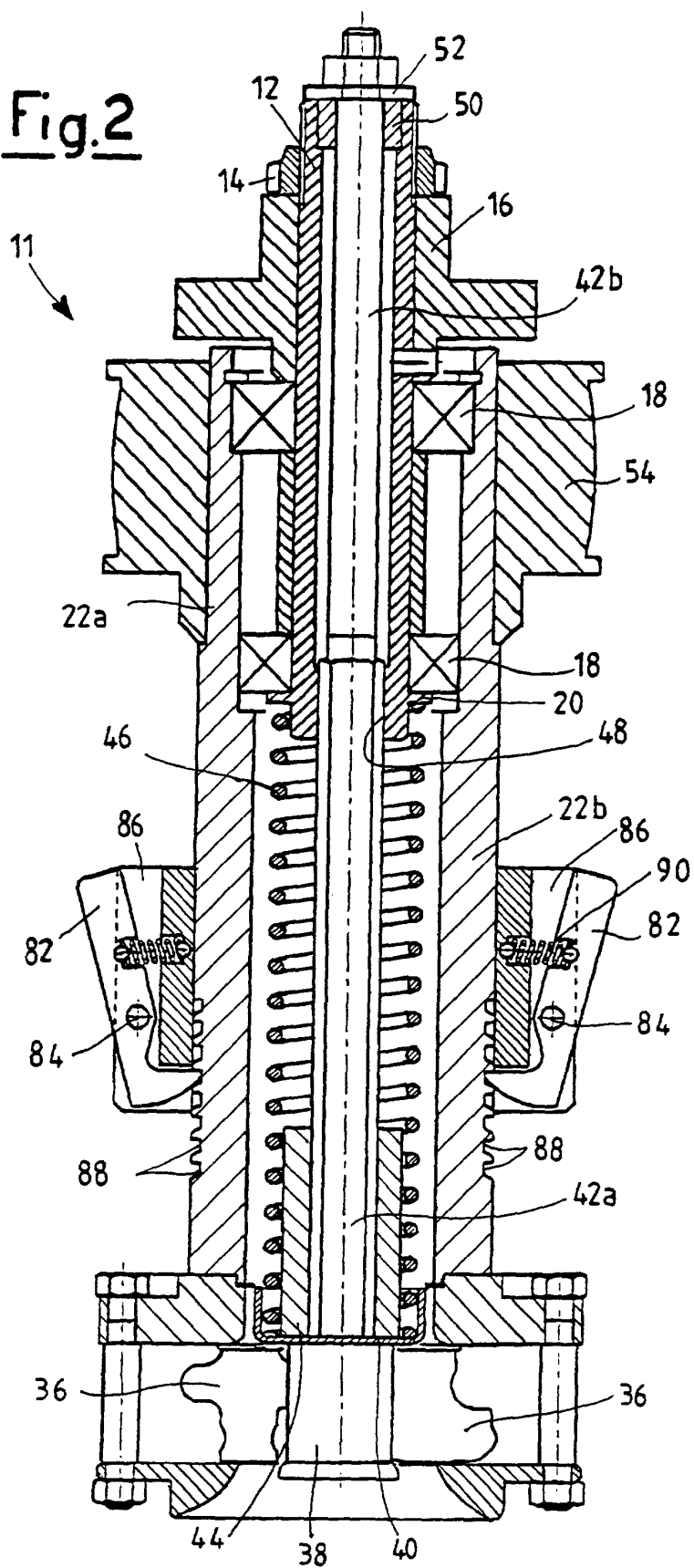


Fig.3

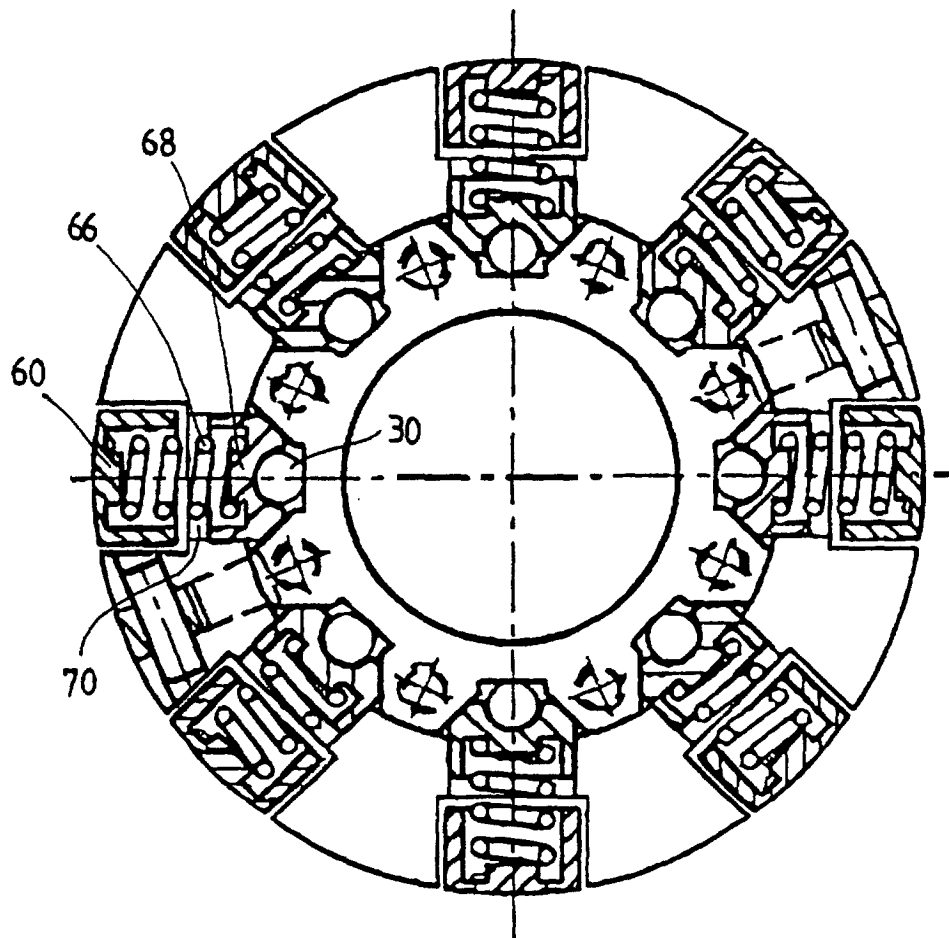


Fig.4

