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# DESCRIPTION

**[0001]** The invention relates to a ceramic valve unit for a beverage machine.

**[0002]** Such ceramic valve units are generally known and one example is described in US6682047, also published as WO00/45073A1. Because such valve units are used to distribute hot water or steam between different flow paths in a beverage preparing machine, a suitable material for the valve elements that come into contact with the hot water or steam has been found in ceramic materials. While such materials give excellent service and allow fluid tightness under demanding circumstances, their manufacture and cost have remained critical factors.

**[0003]** Accordingly it is an object of the present invention to propose an improved ceramic valve unit. In a more general sense it is thus an object of the invention to overcome or reduce at least one of the disadvantages of the prior art. It is also an object of the present invention to provide alternative solutions which are less cumbersome in assembly and operation and which moreover can be made relatively inexpensively. Alternatively it is an object of the invention to at least provide a useful alternative.

**[0004]** To this end the invention provides a ceramic valve unit as defined in one or more of the appended claims. Such a valve unit is efficient and economical to manufacture, in that the size of the necessary ceramic elements can be kept as small as possible. Thereby the materials that do not come in direct contact with hot water or steam can be made from less expensive materials, while using less critical manufacturing processes. It thereby also becomes economically feasible to offer a greater selection of valve positions, without significantly increasing the size of the ceramic elements.

**[0005]** In particular the invention relates to a ceramic valve unit for a beverage preparation machine, which ceramic valve unit includes a housing, a water inlet pipe for receiving hot water, an outflow opening, and first and second ceramic elements within the housing, the first and second ceramic elements each having mutually abutting surfaces and being relatively movable in a plane common to the abutting surfaces, wherein the plane common to the abutting surfaces is downstream of the water inlet pipe and the first ceramic element, but upstream of the second ceramic element and the outflow opening, wherein the first ceramic element has at least differently sized first and second openings for allowing a liquid flow there through, wherein the second ceramic element has only a single liquid flow opening permanently aligned with the outflow opening, and wherein the first ceramic element is engaged for sliding movement by an operating arm sector of a material different from ceramic. Optionally the first ceramic element can be selectively slidable between at least first and second different positions in a path of movement about a centre of rotation positioned beyond the boundaries of the first ceramic element. Further optionally the first opening can be a nozzle for generating a jet. Alternatively in this regard the second opening of the first ceramic element and the single liquid flow opening of the second ceramic element can be of the same size.

**[0006]** In one example the first and second ceramic elements can be biased in mutual abutting relationship by a compression spring. Optionally the first and second ceramic valve elements are biased against a resilient elastomeric pad resting against an inside of the housing that is coincident with the outflow opening and has a through flow opening corresponding therewith. Then optionally, when having an air inlet passage outside of the path of movement of the first ceramic element, it can be arranged to cooperate with a movable valve element that is integrally formed with the resilient sealing pad. Furthermore

**[0007]** the air inlet passage can then join the outflow downstream of the second ceramic element. The air inlet passage can then also join the outflow in a T-junction.

**[0008]** In yet another example the first ceramic element can be movable between at least three different positions, and an additional third position can be a closed position. Also in this particular example the first ceramic element can be arranged to be movable between at least four different positions, and an additional fourth position can then have a plurality of nozzles aligned with the single liquid flow opening of the second ceramic element.

**[0009]** As a further option movement of the first ceramic element between at least its first and second different positions can be effected by an electric motor. Rotation of the electric motor can then be governed by an encoder that is arranged to detect the at least first and second positions. When a path of movement of the first ceramic element is about a centre of rotation, the encoder can include an encoder wheel, and at least one encoder sensor. Then as a further option the encoder wheel can have a plurality of equally spaced dents about its outer periphery, and the at least one encoder sensor can be a middle one of first, second, and third sensors positioned in a sensing path coincident with the plurality of spaced dents. The first, second, and third sensors can then be spaced from one another at an interval that is less than two-times a spacing distance between adjacent dents on the encoder wheel, to more accurately detect the position of the encoder wheel than would be possible with only a single encoder sensor.

**[0010]** In one option the ceramic valve unit can be arranged in combination with a mixing chamber, which mixing chamber is integrally formed with the housing of the ceramic valve unit. In that particular option the mixing chamber can have an inlet that is adapted to connect to an outlet of a dosing device for a liquid beverage related product. The dosing device can then be part of an exchangeable product supply pack.

**[0011]** The ceramic valve unit in another option can be part of a beverage preparation machine. The beverage preparation machine comprising a mixing chamber having an inlet for receiving a doser outlet of an exchangeable supply pack, a beverage outlet, liquid supply means including a liquid flow path for supplying a liquid [water under pressure] to the mixing chamber; air supply means for supplying air to the liquid flow path, a drive shaft, and the valve unit according to one of the above examples.

**[0012]** A system for preparing beverage consumptions can optionally comprise: a beverage preparation machine, and at least one exchangeable supply pack arranged for holding a beverage related ingredient; while the beverage preparation machine comprises a mixing chamber having a beverage outlet, liquid supply means including a liquid flow path for supplying a liquid [water under pressure] to the mixing chamber; air supply means for supplying air to the liquid flow path, and a drive shaft; while the at least one exchangeable supply pack includes a container for holding a beverage related ingredient, and a doser having an outlet, wherein the doser is arranged for supplying the beverage related ingredient from the container to the outlet of the doser in a dosed manner; while the at least one exchangeable supply pack and the beverage preparation machine are mechanically connectable, and when connected the outlet of the doser is brought in fluid communication with the mixing chamber and the beverage preparation machine is arranged for activating the doser for supplying the ingredient from the outlet of the doser into the mixing chamber, while the liquid flow path is arranged to include a second nozzle for generating a jet of liquid which, in use, spouts into the mixing chamber, characterized in that the system further comprises a ceramic valve unit integrated into the beverage device, the ceramic valve unit including a first, second and third ceramic element wherein the third ceramic element including an outflow opening and the second element includes an inflow opening which is at least substantially aligned with the outflow opening, and while the first element is sandwiched between the third and second element, the first, second and third ceramic elements each having mutually abutting surfaces and while the first element is movable relative to the third and second element in a plane common to the abutting surfaces, wherein the first ceramic element comprises the second nozzle for allowing a liquid flow there through if the nozzle is substantially aligned with the inflow and outflow opening, and wherein the first ceramic element is selectively slidable between at least first and second different positions in a path of movement about a centre of rotation beyond the boundaries of the first ceramic element wherein in the first position the second nozzle is substantially aligned with the inflow and outflow opening so that a jet of the fluid is generated by the second nozzle and spouts via the outlet opening into the mixing chamber and wherein in the second position the second nozzle is not aligned with the inflow and outflow opening so that fluid can not flow from the inlet opening to the nozzle for generating the jet. As a further option of such a system the liquid flow path can include a first nozzle arranged for generating a hollow jet of liquid having an outer liquid portion and an inner air portion. Also optionally the first nozzle can be arranged to terminate at a side wall of the mixing chamber, and the outer liquid portion of the hollow jet can then contact a substantial portion of an inner surface of the first nozzle in an area adjacent to the mixing chamber. In association therewith the first nozzle can also taper towards the mixing chamber, and the liquid flow path can then comprise the second nozzle located upstream from the first nozzle and be arranged for generating a substantially solid jet of liquid. Then also in the first position the first and second nozzle can be positioned relative to each other such that the substantially solid jet of liquid generated by the second nozzle impacts an inner surface of the first nozzle in an impact zone causing the jet to swirl around the inner surface of the first nozzle and form a hollow jet of liquid which spouts into the mixing chamber. Additionally or alternatively in a third position of the first element relative the third and second element the first and second nozzle can be positioned relative to each other such that the substantially solid jet of liquid impact

generated by the second nozzle is at least substantially aligned with the first nozzle so that the solid jet from the second nozzle flows along an inner surface of the first nozzle and the jet remains solid so that the jet which spouts into the mixing chamber is a solid jet.

**[0013]** Further advantageous aspects of the invention will become clear from the appended description and in reference to the accompanying drawings, in which:

Figure 1 is a partial elevation in cross section of a ceramic valve unit in accordance with the invention;

Figure 2 is a partial isometric view, partially in cross section, of the ceramic valve unit of Figure 1;

Figure 3 is an isometric view of a housing part of the ceramic valve unit of Figure 1 and 2;

Figure 4 is a rear elevation of the housing part of Figure 3, showing a downstream inside thereof;

Figure 5 is a cross section according to the arrows P-P indicated in Figure 4;

Figure 6 is a resilient sealing pad associated with the housing part of Figures 3-5;

Figure 7A shows an operating arm sector and an associated encoder in a first end position;

Figure 7B shows the operating arm and encoder of Figure 7A in a second end position;

Figure 8 shows the encoder of Figures 7A and 7B on another housing part;

Figure 9 is an enlarged elevation of a detail of the encoder of Figures 7A, 7B, and 8;

Figure 10 is a ceramic side element of the ceramic valve unit of Figures 1 and 2;

Figure 11 is a schematic view of another form of ceramic slide element alternative to that of Figure 10;

Figure 12 is yet another ceramic slide element alternative to Figures 10 or 11

Figure 13 shows an optional embodiment of the invention, viewed in an direction opposite to that of Figure 1.

**[0014]** In the partial cross section of Figure 1 is shown a ceramic valve unit 1, which includes a first housing part 3 and a second housing part 5. The first housing part 3 accommodates a water inlet pipe 7. The water inlet pipe 7 has a flanged end 7A, against which an expansion spring 9 bears to bring the water inlet pipe 7 in abutment with a ceramic inlet element 11. A sealing ring, such as an O-ring 13 is interposed between the flanged end 7A and the inlet disk 11 to ensure fluid tightness. The ceramic inlet element 11 bears against a ceramic slide element 15. The ceramic slide element 15 is accommodated within an aperture of an operating

arm sector 17 to be engaged thereby for sliding movement. The operating arm sector 17 is driven by an electric motor 19. The ceramic slide element 15 is also biased by the spring loaded ceramic inlet element 11 into a fluid tight contact with a further ceramic element in the form of outflow element 21. The outflow element 21 bears against a resilient elastomeric sealing pad 23. Resilient sealing pad 23 may conveniently, but not necessarily, be made from silicone. The outflow element 21 and the sealing pad 23 are accommodated within a cavity (39 in Figure 4) of the second housing part 5. The second housing part 5 can further be associated with a mixing chamber 25, which receives a liquid beverage concentrate through an inlet 27 and dispenses a beverage from an outflow 29. The first housing part 3 also includes an air inlet pipe 31.

**[0015]** As further shown in the isometric partial cross section of Figure 2 the air inlet pipe 31 via a channel (43 in Figure 4) in the second housing part 5 can join a water flow through the water inlet pipe 7, the inlet element 11, the slide element 15, the outflow element 21, and the resilient sealing pad 23 via a T-junction 33. The T-junction 33 is integrally formed in the second housing part 5 and includes a channel (43 in Figure 4) that is shared by both the air inlet pipe 31 and a flush water input 35. Flush water from the flush water input 35 and air from the air inlet pipe 31 are separated by a valve element 37 that is integrally formed in the resilient pad 23, as will be explained herein below.

**[0016]** Figure 3 is an isometric view of the second housing part 5, and Figure 4 is a rear elevation of the second housing part of Figure 3. As further shown in Figure 4, the second housing part 5 has a cavity or recess 39 for receiving the sealing pad 23 and the outflow element 21. Within the cavity 39 is an outflow opening 41, which is aligned with the water inlet pipe 7, when the ceramic valve unit 1 is assembled. The flush water input 35 is in fluid communication with outflow opening 41 via a connecting channel 43 extending from the flush water input 35 to the T-junction 33. A central journal 45 is provided for pivotally receiving the operating arm sector 17.

**[0017]** Figure 5 is an elevation in cross section according to the line P-P in Figure 4, and shows the relative positions of the cavity 39 and the central journal 45.

**[0018]** In Figure 6 is shown the sealing pad 23, which is formed in a resilient elastomer, which can be silicone or other suitable material. In particular Figure 6 illustrates the integrally formed valve element 37 which is movable to allow air from the air inlet pipe 31 to enter the connecting channel 43, but which also will automatically close the air inlet by the pressure of flush water when this is admitted in flush water input 35 and the connecting channel 43. The resilient sealing pad 23 is also equipped with a central opening 41A, which will align with the outflow opening 41 of the second housing part 5. The perimeter contour of the sealing pad 23 corresponds to the cavity 39 as shown in Figure 4. On top of the sealing pad 23 will be placed the outflow element 21 which has a generally similar perimeter contour to the slide element 15, and occupies only a lower portion of the cavity 39. The outflow element 21 has a central opening in correspondence with the central opening 41A and outflow opening 41, but leaves free an area of the cavity 39 corresponding to the valve element 37 of the sealing pad 23. The

ceramic outflow element 21 shown in Figures 1 and 2 has a configuration as described above and is further in Figures 7A and 7B.

**[0019]** Figures 7A and 7B respectively show a first and a second end positions of the operating arm sector 17. It is further seen in both of Figures 7A and 7B, that the operating arm has an aperture 17A for holding the slide element 15, which is deleted in these Figures to reveal the outflow element 21 behind. The operating arm sector 17 is arranged to pivot about a pivot shaft 45A, which is concentric to the central journal 45. The pivot shaft 45A is driven in a known manner by geared DC motor 19. To provide proper control for the positioning of the operating arm sector 17 in predefined positions in-between the end positions of Figures 7A and 7B, an encoder wheel 61 is connected to the pivot shaft 45A for simultaneous rotation with the operating arm sector 17. The encoder wheel 61 has a plurality of equally spaced dents 63 about its outer periphery. The equally spaced dents 63, upon rotation of the operating arm sector 17 and the encoder wheel 61, pass between an array of three successive sensors 65, 66, 67. These successive first, second, and third sensors 65, 66, 67, as best seen in Figure 8, are positioned on a common circuit board 69, and may conveniently be formed by light sensors. The common circuit board 69 further has a electric cable 71 for connection to a control unit of the beverage machine. The encoder wheel 61 on its leading end, as seen in Figure 7B, has a relatively large interval 73 in advance of a first one of its dents 63. This relatively large interval 73 in combination with the successive sensors 65, 66, 67 triggers and resets the encoder operation. As further shown in Figure 9 the encoder sensors 65, 66, 67 are so spaced in relation to the spacing between the individual dents 63 on the encoder wheel 61 that light transmitter and light receiver of one sensor, in this case the third sensor 67, is fully blocked by the relevant dent 63. At the same time the second sensor 66 is in a fully light transmitting state, while the first sensor 65 is in a half light transmitting state. This positioning of the first to third sensors 65, 66, 67 is achieved by spacing each sensor at an interval to the other sensor that is less than two-times the spacing distance between adjacent dents 63 on the encoder wheel 61.

**[0020]** In Figure 10 is shown a first embodiment of the ceramic slide element 15. The ceramic slide element 15 has a first face 47 and a second face 49. The first face 47 is abutted by the spring biased inlet element 11, and the second face 49 abuts the ceramic outflow element 21. The abutting faces are preferably polished to ensure an appropriate fluid tight sealing between the abutting faces. In the example shown in Figure 10 the ceramic slide element 15 has a small nozzle 51 and a relatively large unrestricted opening 53. In between the nozzle 51 and opening 53 is a closed area with a sufficient margin with respect to the outflow opening 41 to enable a closed position to be selected for the slide element 15. It will be clear to the skilled person that angular rotation of the operating arm sector 17 by motor 19 can selectively position one of the nozzle 51, the closed area, or the larger opening 53 in an outlined position with respect to the outflow opening 41. When the nozzle 51 is in an aligned position with respect to the outflow opening 41, hot water entering the water inlet pipe 7 will form a jet of water that enters the mixing chamber 25 to form a foamed beverage. When the larger opening 53 is brought into position with respect to the outflow opening 41 then a flat beverage, such as black coffee without foam may be obtained. In an intermediate closed position the hot water supply

will be completely closed, and the hot water supply may be diverted to another location in the beverage machine in which the present ceramic valve unit is mounted. Figure 11 schematically illustrates a further example of a ceramic slide element 15A, which may replace the slide element of the previous example. The ceramic slide element 15A of Figure 11 is for a four position valve. A first position I corresponds to a large opening 53A, a second position II to a closed position 55, a third position III to a first nozzle 51A and a fourth position IV to a second nozzle 51B. Because there needs to be a sufficient margin of overlap between the positions to ensure fluid tightness the distance of movement between the boundaries of the successive openings the angle of movement 57, between positions I and II is larger than the angular movements 57, 58 between the positions II and III, and III and IV. This is to ensure a sufficient margin 62 between the large opening 53A and the contour of the outflow opening 41 indicated in dash dotted lines in Figure 11. The sliding movement of the slide element 15A is about a circular path 64 about a radius 66 about a centre of the central journal 45. The individual positions I, II, III, IV of the slide element 15A are controlled by an electric motor such as 19 in Figure 1 and may be programmed in a suitable control unit. As further shown in Figure 12 it is further possible in another four position example to have a position wherein multiple nozzles 68 are aligned with the outflow opening 41 of the second housing part 5. The other positions are again a closed position, a large opening 53B and a nozzle 51C.

**[0021]** The valve nozzle geometry and these of the larger sized openings has been chosen to be entirely and uninterruptedly straight in their axial directions. This geometry helps to prevent the deposition or accumulation of lime scale particles. Furthermore it has been discovered that regular operation of the ceramic valve to select a different nozzle or opening also shears any lime deposited lime scale particles so that the so formed smaller particles can easily pass through the nozzle to disappear. This action has been termed "particle scraping".

**[0022]** The valve element 37 provides a simple and efficient water/air control.

**[0023]** When a closed position is selected for the ceramic slide element 15, 15A, 15B the water supply is completely separated from the outflow opening 41, but a return path for the hot water may be formed on the first face 47 of the ceramic slide element.

**[0024]** It is further conceivable that a cleaning agent is introduced through a special opening or nozzle of the ceramic slide element.

**[0025]** In a further optional embodiment of the invention, as illustrated in Figure 13, a connecting channel 143 for allowing air and flush water to flow to the T-junction with the water flow path is arranged in a modified outflow element 121. The modified outflow element 121 cooperates with an also modified slide element 115, and an also modified inlet element 111. This modification also requires modified first and second housing parts 103, 105, while the other components can remain substantially as described above.

**[0026]** While in the above the inlet element 11, 111, the slide element 15, 115, and the outflow element 21, 121 have been referred to as ceramic elements, it is to be understood that other

wear resistant, such as POM, may also be employed for one or more of these components.

**[0027]** Also, when a slide element is used that only needs to select between a nozzle position and a closed position, it is also possible to provide the nozzle aperture in one of the inlet or outflow elements. In that arrangement the slide element need only have a relatively large opening.

**[0028]** Hence a ceramic valve unit (1) for a beverage machine is described that includes a housing (first part 3, second part 5), a water inlet pipe (7) for receiving hot water, an outflow opening (41), and first and second ceramic elements (ceramic slide element 15, outflow element 21) within the housing. The first and second ceramic elements (15, 21) each have mutually abutting surfaces (including second face 49 of slide element 15) and are relatively movable in a plane common to the abutting surfaces. The plane common to the abutting surfaces (49) is downstream of the water inlet pipe (7) and the first ceramic element (15), but upstream of the second ceramic element (21) and the outflow opening (41). The first ceramic element (15) has at least differently sized first and second openings (small nozzle 51, larger opening 53) for allowing a liquid flow there through. The second ceramic element (21) has only a single liquid flow opening permanently aligned with the outflow opening (41) in the second housing part (5). The first ceramic element (15) is selectively slidable between at least first and second different positions in a path of movement about a centre of rotation (about central journal 45) beyond the boundaries of the first ceramic element (15).

It is thus believed that the operation and construction of the present invention will be apparent from the foregoing description and drawings appended thereto. For the purpose of clarity and a concise description features are described herein as part of the same or separate embodiments, however, it will be appreciated that the scope of the invention may include embodiments having combinations of all or some of the features described. It will be clear to the skilled person that the invention is not limited to any embodiment herein described and that modifications are possible which may be considered within the scope of the appended claims. Also kinematic inversions are considered inherently disclosed and can be within the scope of the invention. In the claims, any reference signs shall not be construed as limiting the claim. The terms 'comprising' and 'including' when used in this description or the appended claims should not be construed in an exclusive or exhaustive sense but rather in an inclusive sense. Thus expression as 'including' or 'comprising' as used herein does not exclude the presence of other elements, additional structure or additional acts or steps in addition to those listed. Furthermore, the words 'a' and 'an' shall not be construed as limited to 'only one', but instead are used to mean 'at least one', and do not exclude a plurality. Features that are not specifically or explicitly described or claimed may additionally be included in the structure of the invention without departing from its scope. Expressions such as: "means for ..." should be read as: "component configured for ..." or "member constructed to ..." and should be construed to include equivalents for the structures disclosed. The use of expressions like: "critical", "preferred", "especially preferred" etc. is not intended to limit the invention. To the extent that structure, material, or acts are considered to be essential they are inexpressively indicated as such. Additions, deletions, and modifications within the purview of the skilled person may generally be made without departing from the scope of the invention, as determined by the

claims.

## REFERENCES CITED IN THE DESCRIPTION

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### Patent documents cited in the description

- US6682047B [0002]
- WO0045073A1 [0002]

## PATENTKRAV

1. Drikkevaretilberedningsmaskine, der omfatter et blandingskammer (25) med et indløb til modtagelse af et doseringsenhedsudløb i en udskiftelig forsyningspakke, et  
5 drikkevareudløb, væsketilførselsmidler, der indbefatter en væskestrømningsvej til tilførsel af vand under tryk til blandingskammeret; lufttilførselsmidler til tilførsel af luft til væskestrømningsvejen og en drivaksel, **kendetegnet ved, at**  
drikkevaretilberedningsmaskinen endvidere omfatter en keramisk ventilenhed (1), hvilken keramiske ventilenhed (1) indbefatter et hus (3, 5), et vandindløbsrør (7) til modtagelse af  
10 varmt vand, en udstrømningsåbning (41) og et første og et andet keramisk element (15, 21) inde i huset, idet det første og det andet keramiske element (15, 21) hver især har indbyrdes sammenstødende flader (49) og er relativt bevægelige i et plan, der er fælles for de sammenstødende flader, hvor det plan, der er fælles for de sammenstødende flader (49), er nedstrøms for vandindløbsrøret (7) og det første keramiske element (15), men opstrøms for  
15 det andet keramiske element (21) og udstrømningsåbningen (41), hvor det første keramiske element (15) har mindst forskelligt dimensionerede første og sekundære åbninger (51, 53) med henblik på at muliggøre, at en væske strømmer derigennem, hvor det andet keramiske element (21) kun har en enkelt væskestrømningsåbning permanent flugtende med udstrømningsåbningen (41), og hvor det første keramiske element (15) er sat i indgreb med  
20 henblik på forskydelig bevægelse ved hjælp af en driftsarmssektor (17) af et materiale, der er forskelligt fra keramik.
2. Drikkevaretilberedningsmaskine ifølge krav 1, hvor det første keramiske element (15) er selektivt forskydeligt mellem mindst en første og en anden forskellig position (I, II)  
25 i en bevægelsesbane omkring et rotationscentrum (45), der er positioneret uden for afgrænsningerne for det første keramiske element.
3. Drikkevaretilberedningsmaskine ifølge krav 1 eller 2, hvor den første åbning (51) er en dyse til generering af en stråle.  
30
4. Drikkevaretilberedningsmaskine ifølge et af kravene 1-3, hvor det første og det andet keramiske element (15, 21) er forspændt i gensidigt sammenstødende forhold ved hjælp af en trykfjeder.

5. Drikkevaretilberedningsmaskine ifølge krav 4, hvor det første og det andet keramiske ventilelement (15, 21) er forspændt mod en elastisk elastomerpude (23), der hviler mod et indre af huset (3, 5) sammenfaldende med udstrømningsåbningen (41) og med en gennemstrømningsåbning, som svarer dertil.

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6. Drikkevaretilberedningsmaskine ifølge krav 5, der har en luftindtagspassage uden for det første keramiske elements (15) bevægelsesbane og anbragt med henblik på at samvirke med et bevægeligt ventilelement, der er integralt dannet med den elastiske tætningspude (23).

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7. Drikkevaretilberedningsmaskine ifølge et hvilket som helst af kravene 1-6, hvor det første keramiske element (15) er bevægeligt mellem mindst tre forskellige positioner, og hvor en yderligere tredje position (III) er en lukket position.

15 8. Drikkevaretilberedningsmaskine ifølge krav 7, hvor det første keramiske element (15) er bevægeligt mellem mindst fire forskellige positioner, og hvor en yderligere fjerde position (IV) har en flerhed af dyser (68), som flugter med den enkelte væskestrømningsåbning (41) i det andet keramiske element (21).

20 9. Drikkevaretilberedningsmaskine ifølge et hvilket som helst af kravene 1-8, hvor bevægelse af det første keramiske element (15) mellem mindst den første og den anden position (I, II) fremkaldes af en elektrisk motor (19), og den elektriske motors (19) rotation styres af en kodeenhed, der er anbragt med henblik på at detektere mindst den første og den anden position (I, II).

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10. Drikkevaretilberedningsmaskine ifølge krav 9, hvor en bevægelsesbane for det første keramiske element (15) er omkring et rotationscentrum, og hvor kodeenheden indbefatter et kodeenhedshjul (61) og mindst én kodeenhedssensor (65, 66, 67).

30 11. Drikkevaretilberedningsmaskine ifølge krav 10, hvor kodeenhedshjulet (61) har en flerhed af jævnt fordelte indhak (63) omkring den ydre periferi, og hvor den mindst ene kodeenhedssensor (66) er en midte for den første, den anden og den tredje sensor (65, 66, 67) positioneret i en sensorvej sammenfaldende med flerheden af fordelte indhak (63).

12. System til tilberedning af drikkevarer, hvilket system omfatter:  
en drikkevaretilberedningsmaskine ifølge et hvilket som helst af de foregående krav og  
mindst én udskiftelig forsyningspakke, der er indrettet med henblik på at rumme en  
drikkevarerelateret bestanddel;

5 hvor den mindst ene udskiftelige forsyningspakke indbefatter en beholder, der kan  
rumme en drikkevarerelateret bestanddel, og en doseringsenhed med et udløb, hvor  
doseringsenheden er anbragt med henblik på at levere den drikkevarerelaterede bestanddel fra  
beholderen til doseringsenhedens udløb på en doseret måde; hvor den mindst ene udskiftelige  
10 forsyningspakke og drikkevaretilberedningsmaskinen kan forbindes mekanisk, og hvor  
doseringsenhedens udløb, når de er forbundet, bringes i fluidforbindelse med  
blandingskammeret (25), og drikkevaretilberedningsmaskinen er indrettet med henblik på at  
aktivere doseringsenheden til tilførsel af bestanddelen fra doseringsenhedens udløb ind i  
blandingskammeret (25), hvor væskestrømningsvejen er indrettet med henblik på at  
indbefatte en anden dyse (51B) til generering af en væskestråle, som under anvendelse  
15 sprøjter ind i blandingskammeret (25), **kendetegnet ved, at** systemet endvidere omfatter en  
keramisk ventilenhed (1), der er integreret i drikkevareindretningen, idet den keramiske  
ventilenhed (1) indbefatter et første (15), et andet (21) og et tredje keramisk element, hvor det  
tredje keramiske element indbefatter en udstrømningsåbning (41), og det andet element (21)  
indbefatter en indstrømningsåbning, som mindst i det væsentlige flugter med  
20 udstrømningsåbningen (41), og hvor det første element (15) er indeklemt mellem det tredje  
og det andet (21) element, idet det første (15), det andet (21) og det tredje keramiske element  
hver især har indbyrdes sammenstødende flader (49), og hvor det første element (15) er  
bevægeligt i forhold til det tredje og det andet (21) element i et plan, der er fælles for de  
sammenstødende flader (49), hvor det første keramiske element (15) omfatter den anden dyse  
25 (51B) med henblik på at muliggøre en væskestrømning derigennem, hvis dysen i det  
væsentlige flugter med indstrømnings- og udstrømningsåbningen (41), og hvor det første  
keramiske element (15) er selektivt forskydeligt mellem mindst en første og en anden  
forskellig position (I, II) i en bevægelsesbane omkring et rotationscentrum (45) uden for  
afgrænsningerne for det første keramiske element (15), hvor den anden dyse (51B) i den  
30 første position (I) i det væsentlige flugter med indstrømnings- og udstrømningsåbningen (41),  
således at der genereres en stråle af fluidet ved hjælp af den anden dyse (51B), og strålen  
sprøjter via udløbsåbningen ind i blandingskammeret (25), og hvor den anden dyse (51B) i  
den anden position (II) ikke flugter med indstrømnings- og udstrømningsåbningen (41),  
således at der ikke kan strømme fluid fra indløbsåbningen til dysen til generering af strålen.

13. System ifølge krav 12, hvor væskestrømningsvejen indbefatter en første dyse (51A), der er indrettet med henblik på at generere en hul væskestråle, som har en ydre væskedel og en indre luftdel.

5

14. System ifølge krav 13, hvor den første dyse (51A) slutter ved en sidevæg i blandingskammeret (25), og hvor den ydre væskedel af den hule stråle er i kontakt med en væsentlig del af en indre flade af den første dyse (51A) i et område nabostillet til blandingskammeret (25).

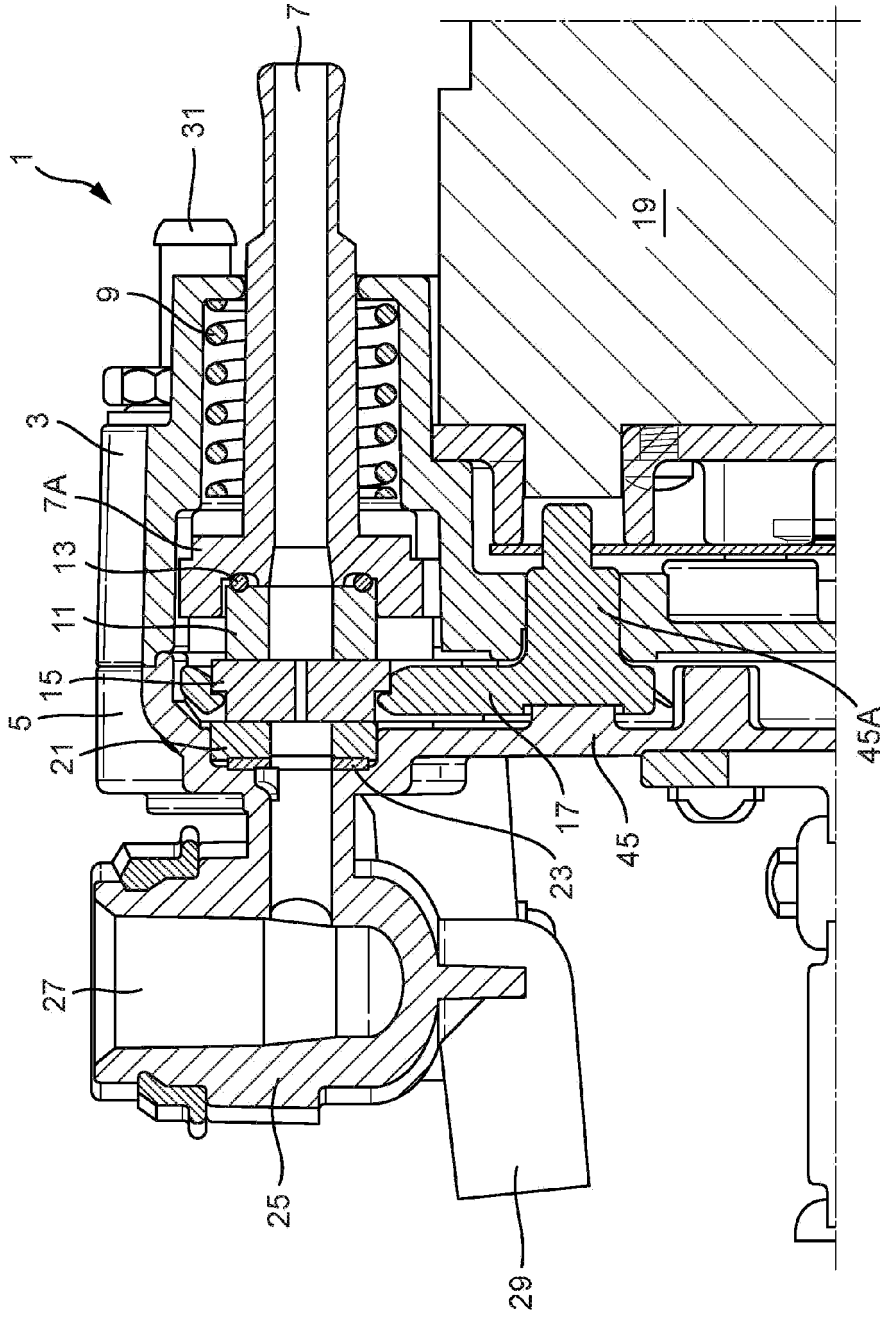
10

15. System ifølge krav 14, hvor den første dyse (51A) indsnævres hen imod blandingskammeret (25), og hvor væskestrømningsvejen omfatter den anden dyse (51B), der er lokaliseret opstrøms for den første dyse (51A) og indrettet til at generere en i det væsentlige fast væskestråle.

15

# DRAWINGS

Fig. 1



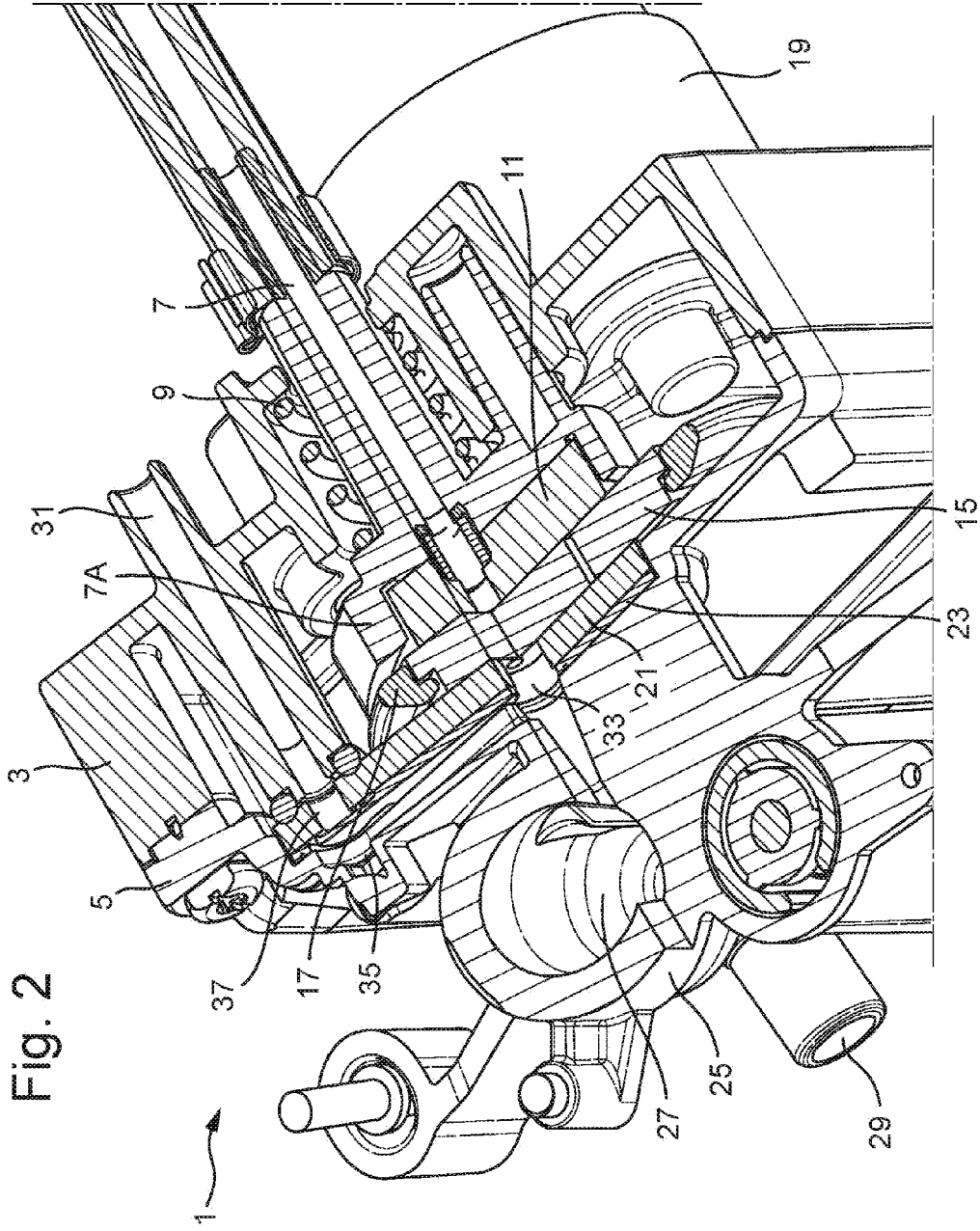


Fig. 3

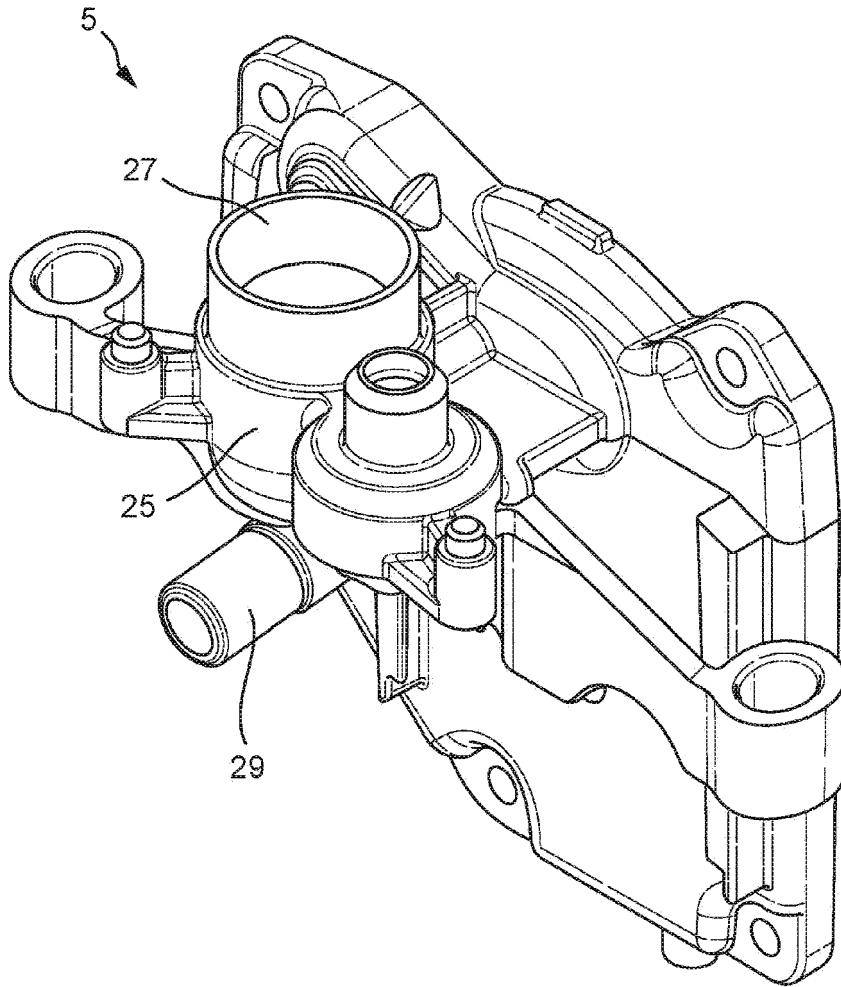


Fig. 4

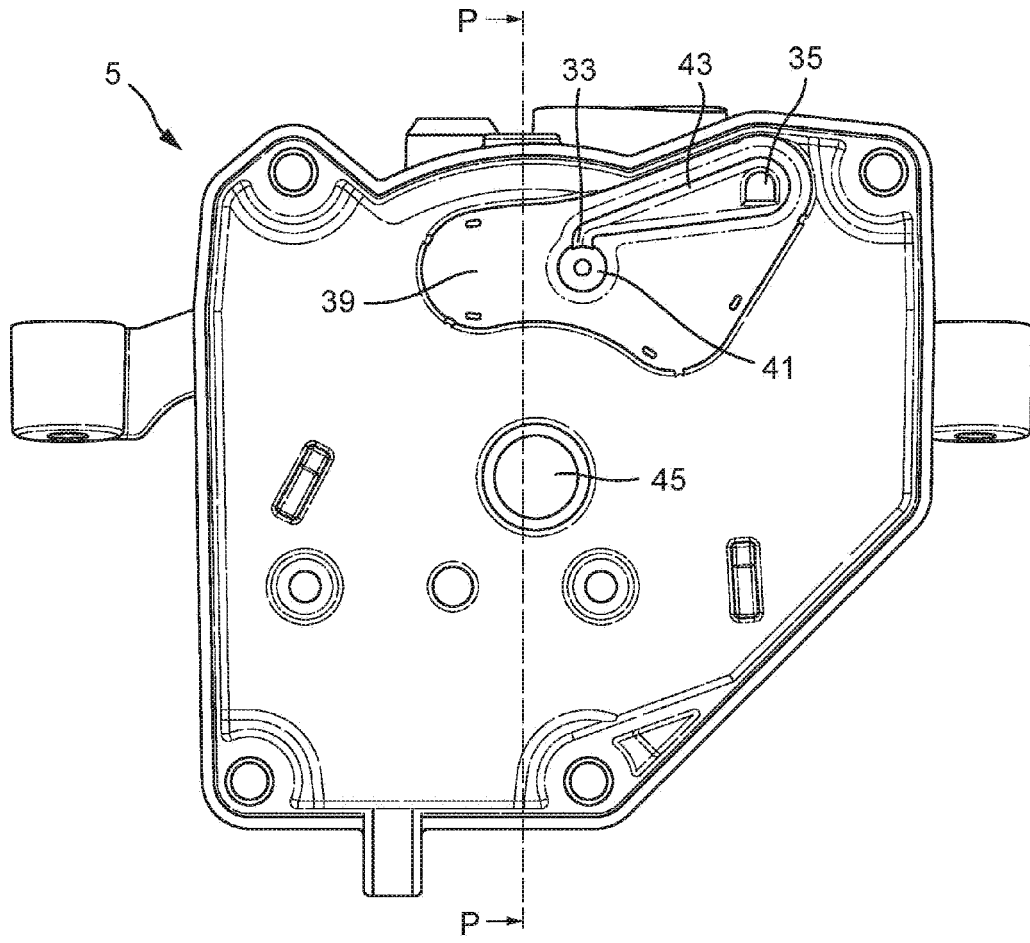
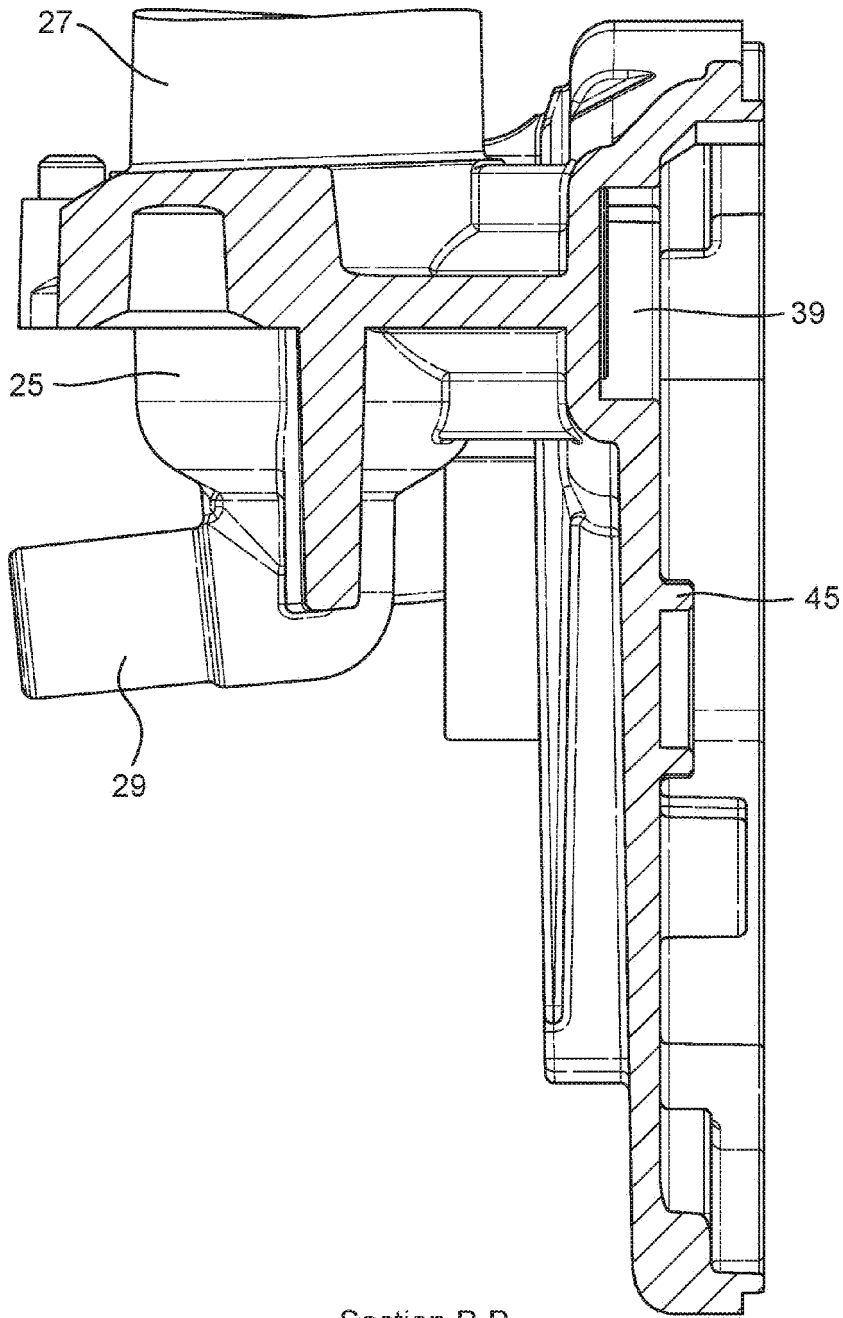


Fig. 5



Section P-P

Fig. 6

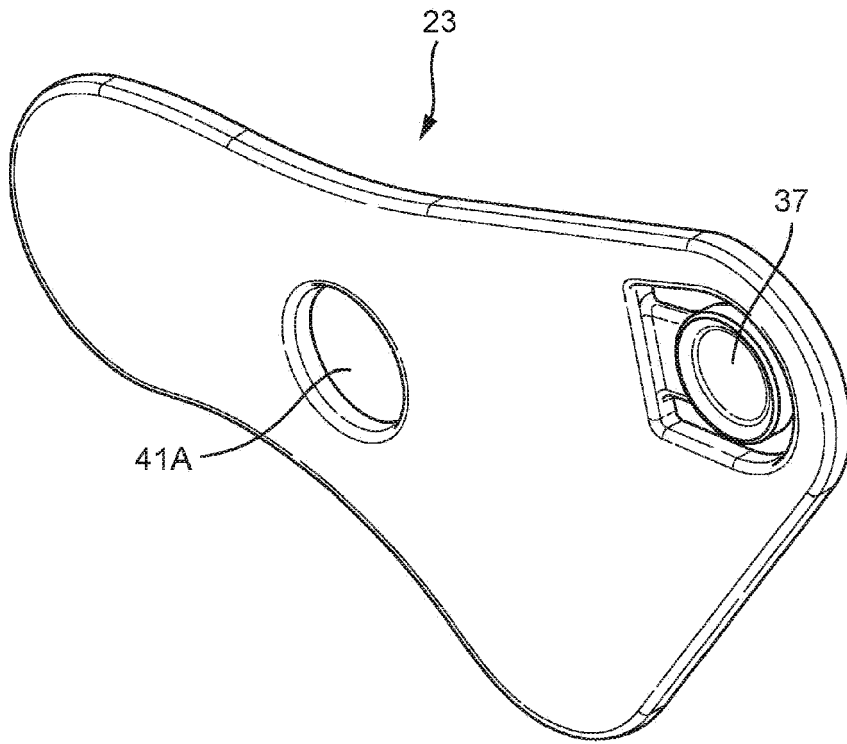


Fig. 7B

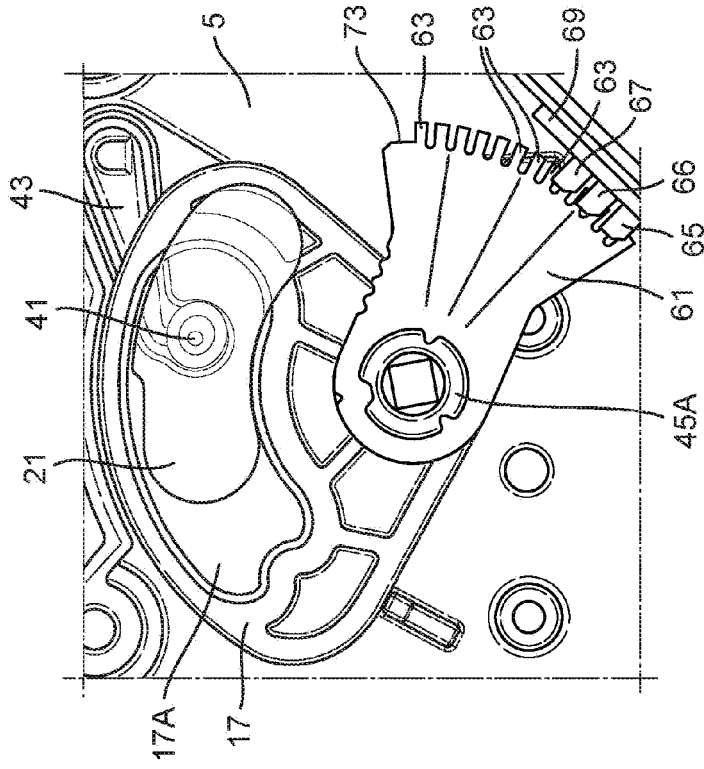
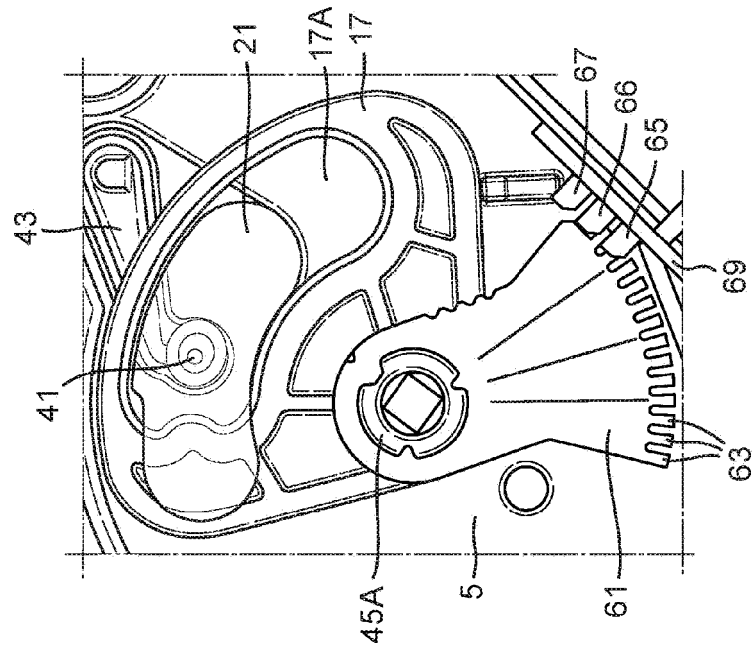


Fig. 7A



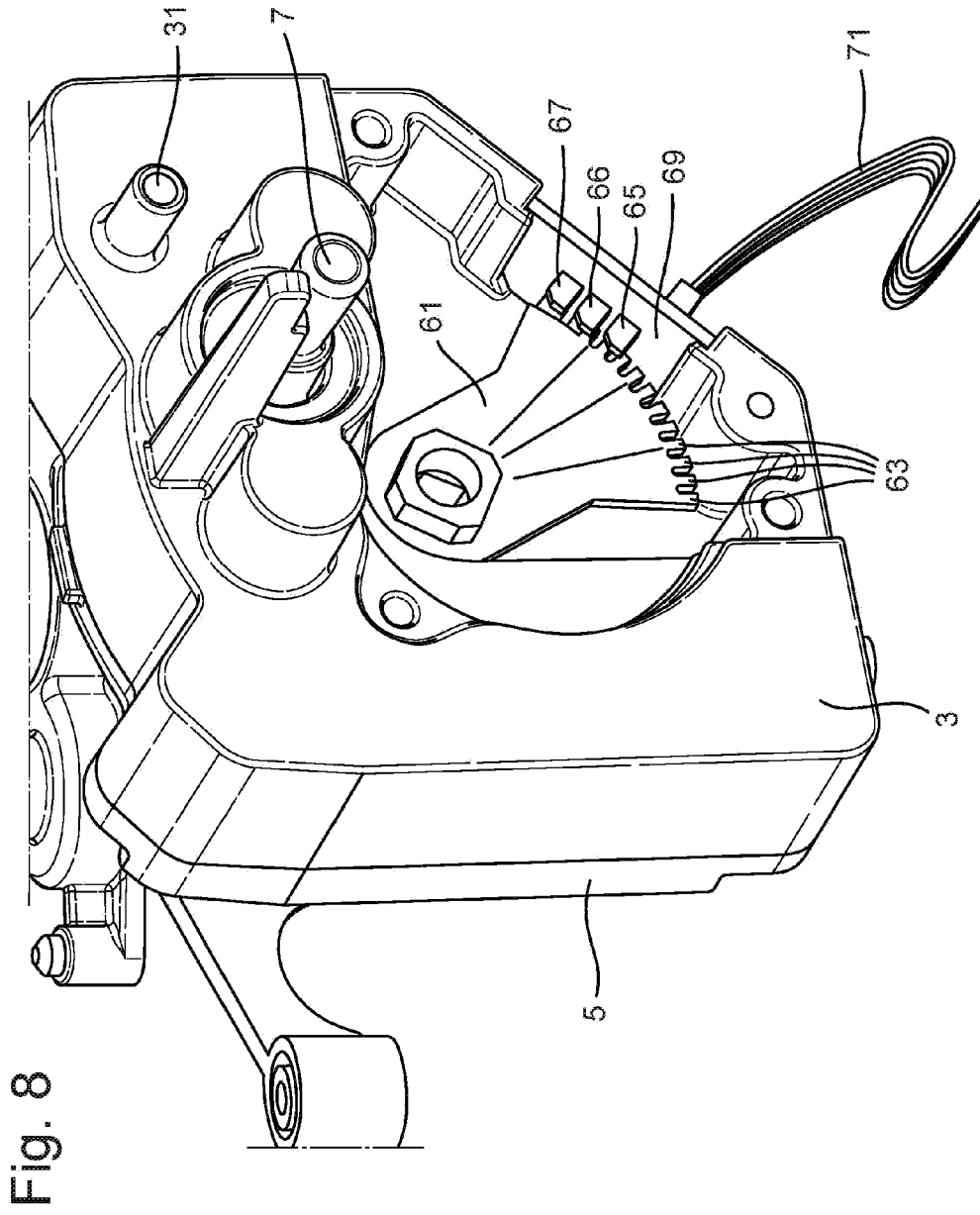


Fig. 9

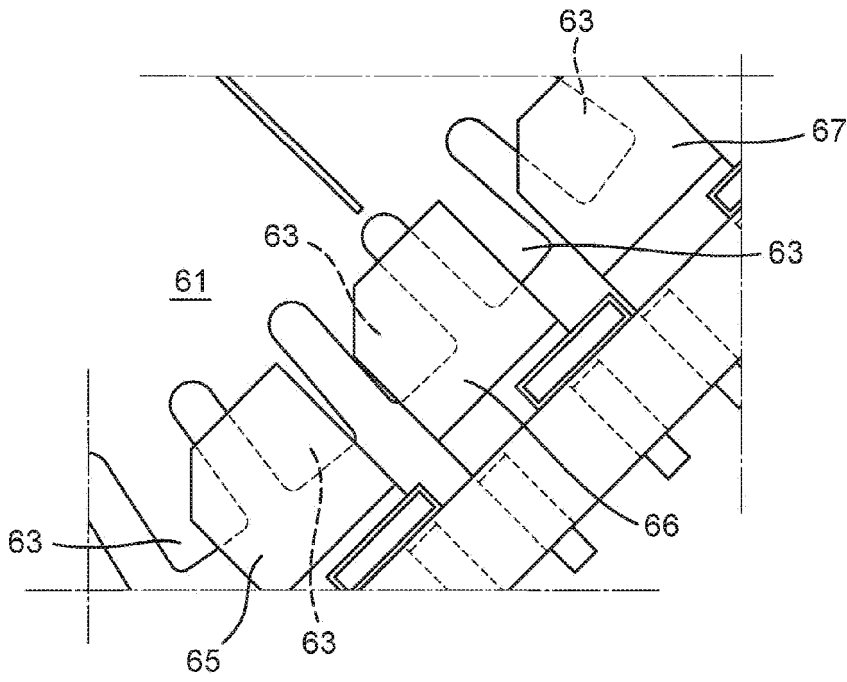


Fig. 10

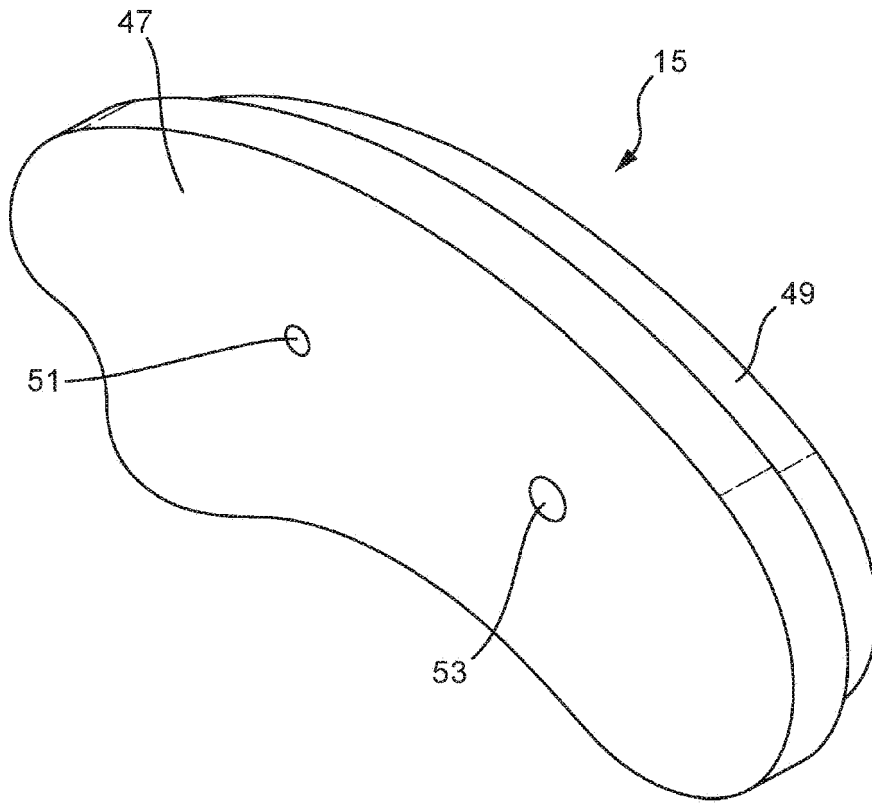


Fig. 11

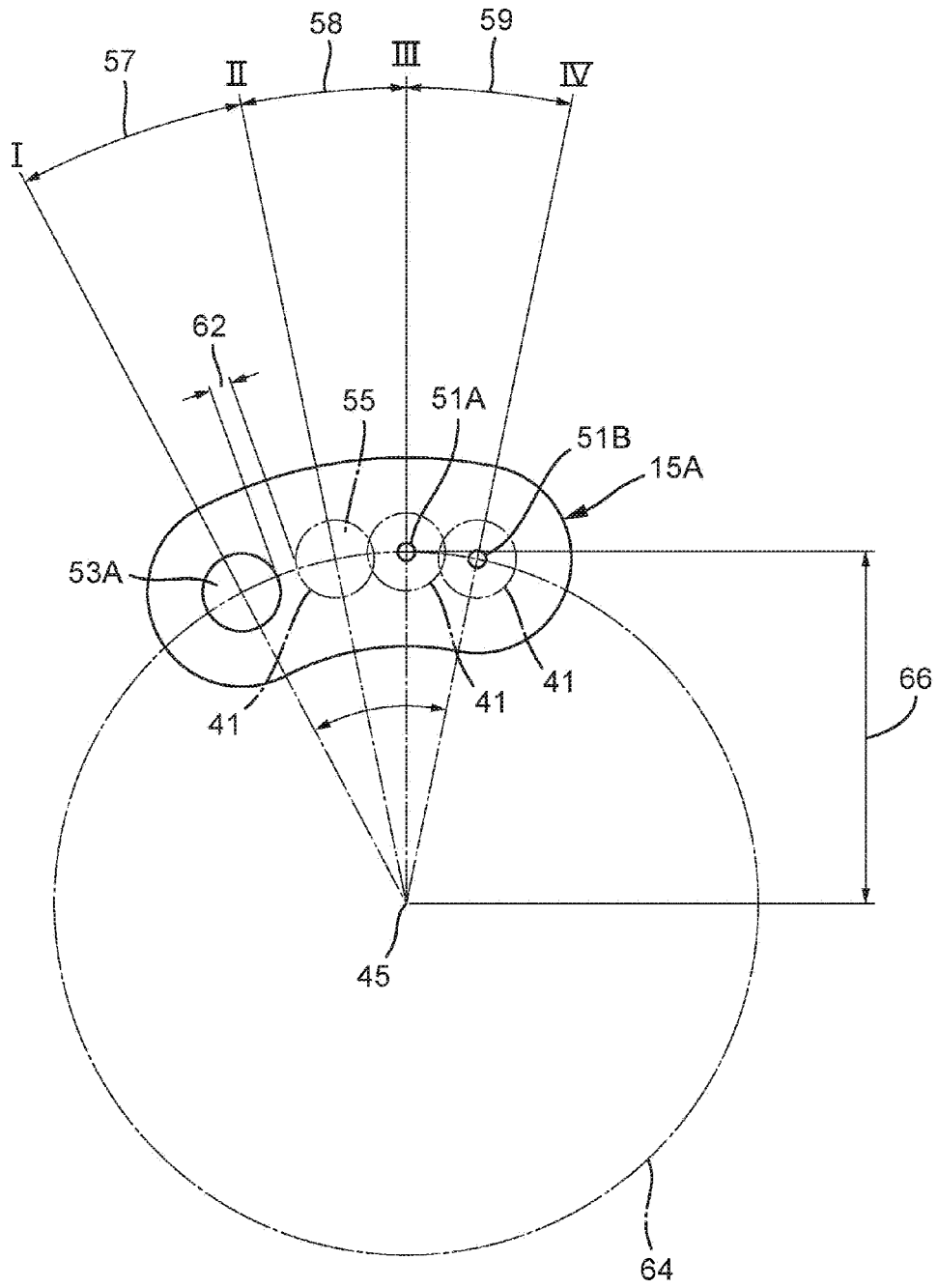


Fig. 12

