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(54) **Gas tap for a cooking appliance**

(57) The present invention relates to a gas tap comprising a tap body with an inner housing suitable for receiving a rotary regulating plug for regulating gas, a rotary shaft (4) coupled to the rotary plug, and provided with a transverse means (6), a return spring, and a cover (7) covering the housing of the tap body and guiding the rotation of the shaft (4) at an angle (A) in the two directions from an initial position (8) corresponding to the OFF po-

sition for cutting off the gas flow, and a final position (9) corresponding to a specific gas flow, the cover (7) comprising a sliding surface (10) for the transverse means (6), comprising a plurality of housings (11) for the transverse means (6) in the movement thereof over said surface (10), these housings (11) defining different positions for regulating the gas flow.

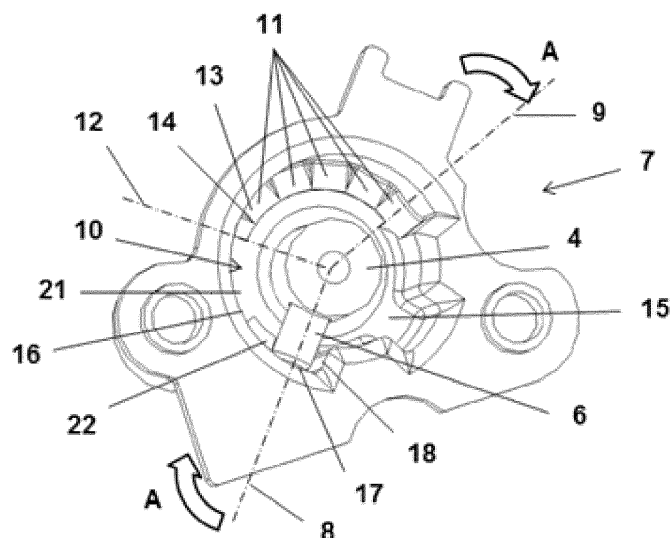


Fig. 2

Description

TECHNICAL FIELD

[0001] The present invention relates to a gas tap of the type having a conical regulating plug and a rotary operated shaft used in a gas cooking appliance, and particularly to the definition of different positions for regulating gas.

PRIOR ART

[0002] Gas taps with rotation means that allow rotating plugs for regulating the gas flow are known. These rotation means have elements limiting said rotation to an angle between an initial locking position or OFF position for cutting off the gas supply, and an open position for supplying a specific gas flow. These taps comprise positioning means which allow audibly indicating when a predetermined position of the rotation means has been reached.

[0003] GB682095 A describes a gas tap comprising a tap body with a conical inner housing suitable for receiving a rotary conical regulating plug for regulating the gas flow, and a manually operated rotary shaft integrally coupled to the conical regulating plug, and provided with transverse locking means for locking rotation. Said transverse locking means comprise a positioning washer integrally fitted to the rotary shaft, said fitting allowing the axial sliding and not the rotary sliding over said shaft, the washer projecting perpendicularly from said shaft, and having at least one pair of projections on the outer edge, between which gaps are formed in which steel balls are housed. The transverse means also comprise an elastic washer mounted in the rotary shaft which can rotate about the shaft and slide axially along the shaft. The steel balls of the positioning washer are supported on the elastic washer and project from the upper face of the positioning washer.

[0004] The gas tap comprises a return spring of the rotary shaft, which is mounted on the shaft and retained between a flange of the shaft and the lower part of the elastic washer. The gas tap also comprises a cover covering the housing of the tap body, said cover guiding the rotation of the shaft with the cooperation of the transverse locking means. Said rotation is limited by means existing in the cover and in the positioning washer, at an angle between a closed position without a gas supply, and an open position for supplying a specific gas flow. The cover comprises a planar inner sliding surface comprising at least one positioning means, the transverse locking means sliding along said planar sliding surface by means of the balls of the positioning washer when the shaft is subjected to a rotation action. When the balls slide on the planar surface of the cover, the gas regulation is linear between different gas flow positions, and when the closed position is reached, the balls of the positioning washer interact with the positioning means of the cover,

retaining the balls in said position and producing a sound notifying the user that the closed position has been reached.

5 DISCLOSURE OF THE INVENTION

[0005] The object of the invention is to provide a gas tap for a cooking appliance as described in the claims.

[0006] The gas tap for a cooking appliance of the invention comprises a tap body with a conical inner housing, suitable for receiving a rotary conical regulating plug for regulating the gas flow, a manually operated rotary shaft coupled to the conical regulating plug, and provided with a transverse means, a return spring of the rotary shaft arranged between the conical regulating plug and the rotary shaft, and a cover covering the housing of the tap body and guiding the rotation of the shaft in cooperation with the transverse means, at an angle in any of the two directions, from an initial position corresponding to the position for cutting off the gas flow, and a final position corresponding to a specific gas flow. The inside of the cover comprises a sliding surface over which the transverse means slide when the rotary shaft is subjected to a rotation action.

[0007] The inner sliding surface of the cover comprises a plurality of housings for the transverse locking means, in the movement thereof over said sliding surface, these housings defining different positions for regulating the gas flow.

[0008] The main advantage of the invention is that, while in the prior art the rotation of the shaft for operating the tap allows regulating the gas flow linearly and progressively, the gas tap of the invention allows regulating the gas flow discretely, i.e., it defines different specific positions with a specific gas flow in each position. This allows the user to relate the specific positions for regulating the gas with cooking habits.

[0009] These and other advantages and features of the invention will become evident in view of the drawings and the detailed description of the invention.

DESCRIPTION OF THE DRAWINGS

[0010]

Figure 1 shows a section view of an embodiment of a gas tap for a cooking appliance according to the invention.

Figure 2 shows a perspective view of the cover and the rotary shaft of the tap according to line II-II of Figure 1.

Figure 3 shows a section view of the development of the angle of rotation of the shaft of the gas tap of Figure 1.

Figure 4 shows a schematic view of the angle of ro-

tation of the shaft of the tap of Figure 1.

Figure 5 shows a plan view of the cover of the gas tap of Figure 1.

Figure 6 shows a section view of the cover according to line VI-VI of Figure 5.

DETAILED DISCLOSURE OF THE INVENTION

[0011] In reference to Figure 1, an embodiment of the gas tap for a cooking appliance of the invention comprises a tap body 2 with a conical inner housing 2a, suitable for receiving a rotary conical regulating plug 3 for regulating the gas flow G. The tap 1 also comprises a manually operated rotary shaft 4 coupled to the conical regulating plug 3, said rotary shaft 4 being provided with a transverse means 6 for locking rotation, a return spring 5 of the rotary shaft 4, and a cover 7 covering the housing 2a of the tap body 2, and guiding the rotation of the shaft 4 in cooperation with the transverse means 6. The shaft 4 can rotate at an angle A in any of the two directions, usually greater than 160°, for supplying the gas flow G, which is determined by the position of the transverse means 6, as shown in Figure 2. The angle A is developed from an initial position 8 corresponding to the OFF position for cutting off the gas flow supply, and a final position 9 corresponding to a minimum gas flow, passing through an intermediate maximum gas supply flow position 12. The cover 7 is in the form of a tubular bushing, comprising a narrow tubular part the inner diameter of which fits with the diameter of the shaft 4, a cylindrical part provided with a closing base resting against the tap body 2, and with a substantially larger diameter than the diameter of the tubular part, and a flap projecting from the closing base having two fixing tabs for fixing the closing base against the tap body 2.

[0012] The cover 7 comprises a sliding surface 10 on its inner face extending in the angle of rotation A, the transverse means 6 sliding over the sliding surface 10 when the rotary shaft 4 is subjected to a rotation action. The inner sliding surface 10 is a surface that is recessed in an axial direction with respect to the closing edge of the cover 7, being arranged at the bottom 15 of said cover 7. Said sliding surface 10 comprises a plurality of housings 11, specifically five in the embodiment shown in Figure 2, the transverse means 6 being placed in said housings 11 in the movement thereof over said surface 10 when the rotary shaft 4 is subjected to a rotation action. Different positions for regulating the gas flow G are thereby defined when the transverse means 6 are located in the housings 11.

[0013] As shown in Figure 3, the sliding surface 10 of the cover 7 is developed over an arc length I less than arc length L of the angle A of rotation of the shaft 4. The housings are arranged in an undulated sector 13 of the sliding surface 10, the undulated sector 13 being limited between the maximum flow position 12 and the minimum

flow position 9. In this embodiment, the maximum flow position 12 is in a position of the angle A which is approximately 90°, and the minimum flow position 9 is in a position of the angle A of approximately 210°, as shown in Figure 4. In other embodiments, the minimum flow position 9 can be between approximately 160° and 270°.

[0014] The undulated sector 13 is a series of protuberances 14, i.e., small mounds with an up ramp and down ramp, with an intermediate preferably round summit, the housings 11 being arranged between every two protuberances 14 such that the undulated sector 13 is converted into a series of slopes and valleys. The maximum flow position 12 is therefore arranged at the beginning of the ramp of the first protuberance 14, considering the path from the closed OFF position, and the minimum flow position 9 is in the last housing 11, also considering the path from the closed OFF position, as can be seen in Figures 1 and 2.

[0015] Figure 5 shows a plan view of the cover 7 in which section line VI-VI which allows showing the undulated sector 13 is defined. Figure 6 shows a section view of the cover 7 according to line VI-VI, where the protuberances 14 and the housings 11 can be seen. The protuberances 14 have a height h measured from the bottom of the housings 11 to the peak of the protuberances 14. Said height h is comprised between approximately 0.4 millimeters and approximately 0.8 millimeters.

[0016] The sliding surface 10, which is arranged at the bottom 15 of the cover 7, is surrounded by a substantially circular wall 16. The sliding surface 10 extends between a housing groove 17 for housing the transverse means 6, corresponding to the initial position 8 or closed OFF position of the rotation of the shaft 4, and the minimum flow position 9. The groove 17 is substantially located at the same height as the sliding surface 10 and has the same width as the width of the transverse means 6 partially housed in said groove 17. For the exit of the transverse means 6 from the groove 17, the shaft 4 is pushed by the user towards the inside of the tap 1, overcoming the force F of the return spring 5, and then the gas flow is supplied by means of rotating the shaft 4 from the maximum flow position 12. The groove 17 comprises an end 18 that is closed with a stop wall 19 substantially perpendicular to the wall 16, closing off the trajectory of the angle A of the shaft 4. The trajectory of the angle A is closed off at the other end by means of a stop wall 20 substantially perpendicular to the wall 16.

[0017] The sliding surface 10 also comprises a linear sector 21 extending from the groove 17 to the maximum flow position 12. The beginning of the linear sector 21, considering the position of the beginning from the closed OFF position, has a short and substantially upward sector 22 in the closing direction of the tap 1, such that when the tap 1 is closed by sliding the transverse means 6 along the linear sector 21, it overcomes sector 22 to be introduced in the groove 17. When opening the tap 1, the rest of the path of the linear sector 21 until the maximum flow position 12 is substantially planar, allowing gentle

sliding of the transverse means 6 and therefore gentle rotation of the rotary shaft 4.

[0018] The transverse means 6 for locking the rotation in the embodiment of the gas tap shown in Figures 1 and 2 is a pin transversely housed in the rotary shaft 4, but in other embodiments it can be a transverse projection forming a single part with the rotary shaft 4, this transverse projection preferably having a substantially rectangular shape. When the transverse means 6 slide over the sliding surface 10, it is exerting a friction force due to the force F exerted by the return spring 5. A tactile and/or sound indication of the rotation of the rotary shaft 4 which the user can perceive is produced in the undulated sector 13 of the sliding surface 10, and due to the sliding of the transverse means 6 over the protuberances 15 and housings 11.

[0019] When the transverse means 6 is located in the housings 11, different positions for regulating the gas flow G are defined, which allows discretely regulating the gas flow, i.e., defining different specific positions with a specific gas flow range. This defined position of the housings 11 allows defining visual indications that can be related with the user's cooking habits. For example by graphically indicating on the control knob, or in the control panel, or directly in the gas cooking appliance (not shown), the positions for regulating gas corresponding to the different positions of the gas tap 1.

[0020] The cover 7 of the gas tap 1 is made from a thin metal sheet by means of stamping operations, the different parts of said cover 7 being formed such that subsequent machining operations can be omitted. However, the cover 7 can also be made by means of molding a lightweight metal alloy, performing subsequent machining operations.

Claims

1. A gas tap for a cooking appliance, comprising a tap body (2) with a conical inner housing (2a), suitable for receiving a rotary conical regulating plug (3) for regulating the gas flow (G), a manually operated rotary shaft (4) coupled to the conical regulating plug (3), and provided with a transverse means (6), a return spring (5) of the rotary shaft (4), and a cover (7) covering the housing (2a) of the tap body (2), and guiding the rotation of the shaft (4) in cooperation with the transverse means (6) at an angle (A) in any of the two directions, from an initial position (8) corresponding to the OFF position for cutting off the gas flow, and a final position (9) corresponding to a specific gas flow, the cover (7) comprising an inner sliding surface (10) for the transverse means (6), **characterized in that** the inner sliding surface (10) comprises a plurality of housings (11) for the transverse means (6) in the movement thereof over said surface (10), these housings (11) defining different positions for regulating the gas flow (G).
2. The gas tap according to claim 1, wherein the cover (7) guides the rotation of the shaft (4) at an angle (A) from the initial position (8), to the final position (9) corresponding to a minimum gas flow, passing through an intermediate maximum flow position (12), the sliding surface (10) extending over an arc length (l) less than the arc length (L) of the angle (A) of rotation of the shaft (4), the housings (11) being arranged in an undulated sector (13) of the sliding surface (10) between the maximum flow position (12) and the minimum flow position (9).
3. The gas tap according to the preceding claim, wherein the maximum flow position (12) is approximately 90°, and the minimum flow position (9) is between approximately 160° and approximately 270°, preferably being 210°.
4. The gas tap according to claim 2 or 3, wherein the undulated sector (13) is a series of protuberances (14), the housings (11) being arranged between every two protuberances (14), the maximum flow position (12) being arranged at the beginning of the first protuberance (14) from the OFF position, and the minimum flow position (9) being arranged in the last housing (11) from the OFF position.
5. The gas tap according to the preceding claim, wherein the protuberances (14) have a height (h) above the bottom of the housings (11) comprised between approximately 0.4 millimeters and approximately 0.8 millimeters.
6. The gas tap according to any of the preceding claims, wherein the sliding surface (10) is arranged at the bottom (15) of the cover (7) and is surrounded by a substantially circular wall (16), the sliding surface (10) extending in an arc between a housing groove (17) for housing the transverse means (6), corresponding to the initial position (8) of the shaft (4), and the minimum flow position (9), an end (18) of the groove (17) being arranged in the wall (16), closing off the circular path of angle (A) of the shaft (4) at one end with a stop wall (19), and closing off the circular path of angle (A) at the other end with a stop wall (20) of the wall (16).
7. The gas tap according to the preceding claim, wherein the sliding surface (10) comprises a linear sector (21) extending from the groove (17) to the maximum flow position (12), the beginning of the linear sector (21), from the OFF position, having a substantially short downward sector (22) to facilitate the rotation of the rotary shaft (4), the rest of the trajectory of the linear sector (21) to the maximum flow position (12) being substantially planar.
8. The gas tap according to any of the preceding claims,

wherein the transverse means (6) for locking rotation is a pin housed in the rotary shaft (4), or a projection preferably having a substantially rectangular shape forming a single part with the rotary shaft (4).

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9. The gas tap according to any of the preceding claims, wherein when the transverse means (6) produce a tactile and/or sound indication as it slides over the sliding surface (10), in opposition to the force (F) exerted by the return spring (5).

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10. The gas tap according to any of the preceding claims, wherein the position of the housings (11) of the sliding surface (10) coincides with visual indications of the different positions for regulating the gas flow (G).

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11. The gas tap according to any of the preceding claims, wherein the cover (7) is manufactured from a thin metal sheet by means of stamping operations.

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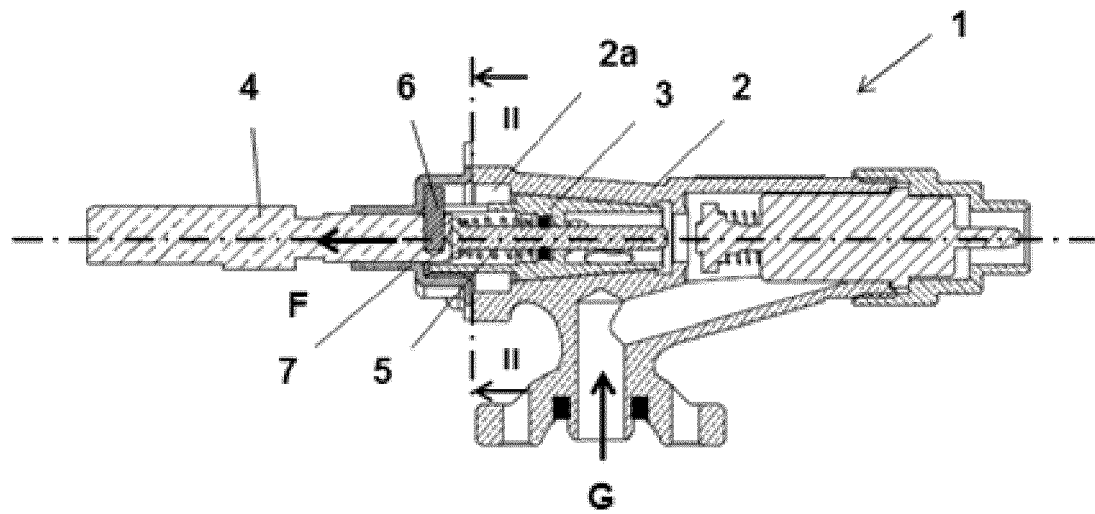


Fig. 1

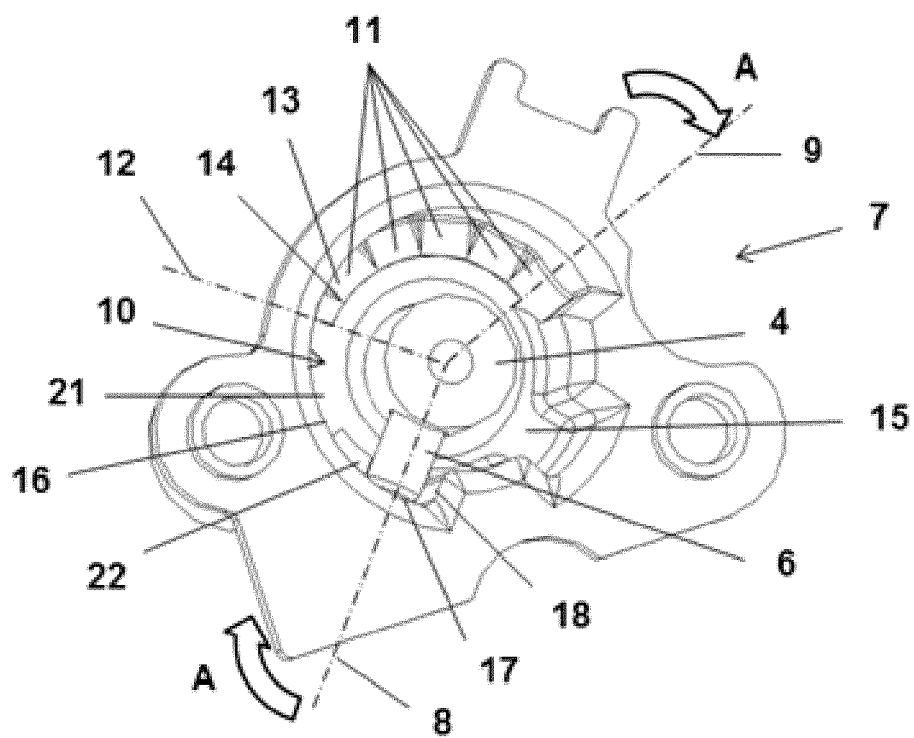


Fig. 2

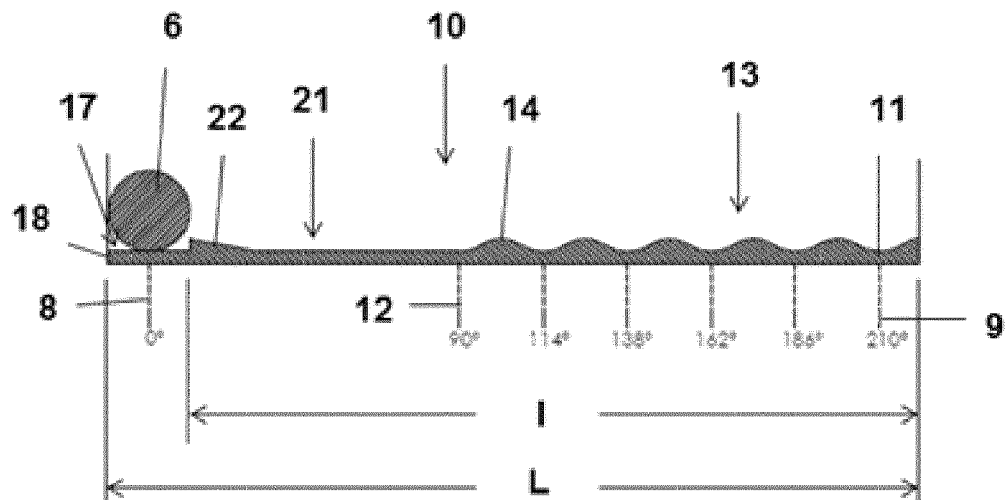


Fig. 3

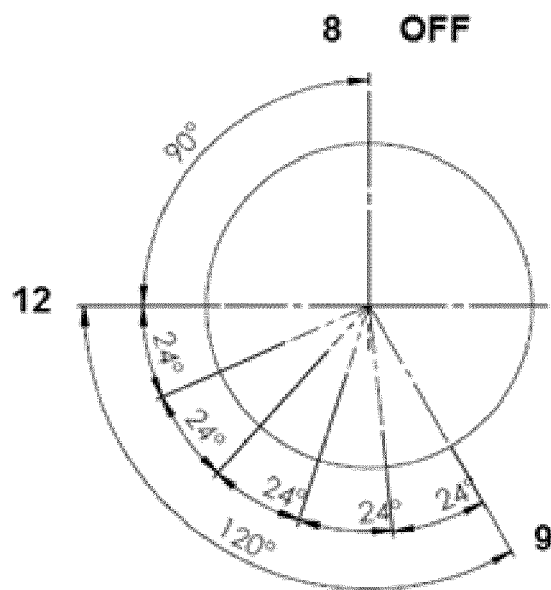


Fig. 4

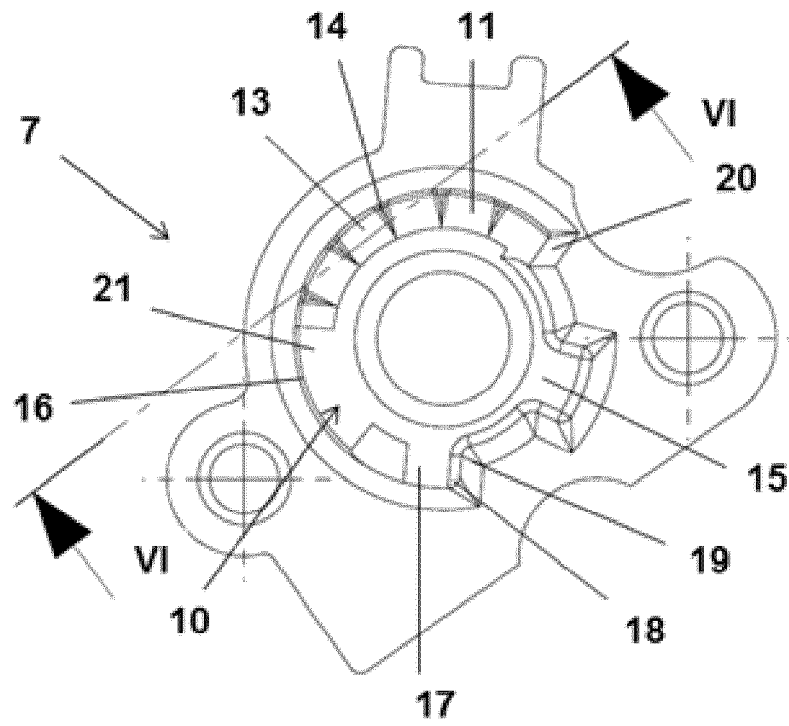


Fig. 5

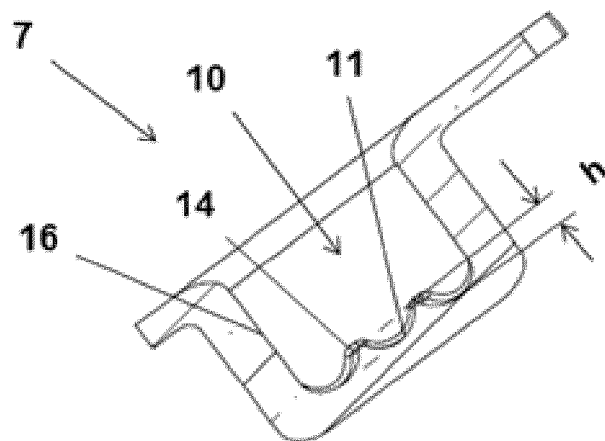


Fig. 6



EUROPEAN SEARCH REPORT

Application Number
EP 12 38 2467

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 18 April 2013	Examiner Harder, Sebastian
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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