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(54) **Cam gas tap with a plug and integrated cam for domestic cooking appliances**

(57) The invention relates to a new gas control system enabling the gas taps used in domestic cooking appliances to be touch controlled by the user and to a gas tap having a male (1.2) with an integrated cam that operates simultaneously with said system.

The tap according to the invention mainly consists of a gear driven by an internal servo motor, a transmission gear connected to said gear, and a male (1.2) that operates simultaneously with said gear and thus controls gas passage. Said male has an integrated cam system and enables the cam to move the shuttle inside the system; and with the movement of the shuttle, the safety valve

inside the system is pushed. Thus, gas passage is allowed. The gears provided in the newly designed tap provide a full transmission rate and transmit the angular movement provided by the motor to the male provided inside the tap, thereby allowing the male to rotate in the same angular rate (i.e. angle factor). When said cam gas tap integrated with the male is connected to gas control system, double safety is achieved. That is, when burning out occurs due to external factors (wind, spilling of food, etc.) in the burner, the flame holder detecting that transfers this information to both safety valve and electronic card.

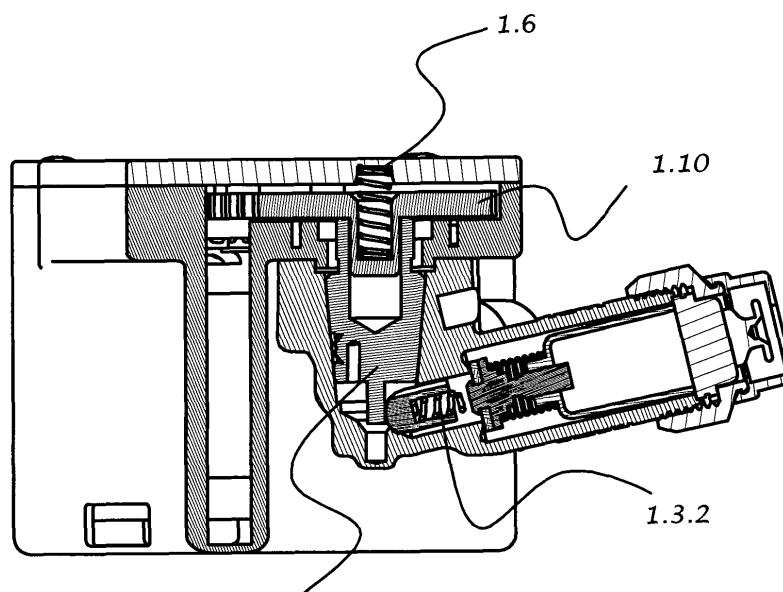


Figure 24 1.2

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Description

TECHNICAL FIELD

[0001] The invention relates to a new gas control system enabling the gas taps used in domestic cooking appliances to be touch controlled by the user and to a gas tap having a male with an integrated cam that operates simultaneously with said system.

[0002] The tap according to the invention mainly consists of a gear driven by an internal servo motor, a transmission gear connected to said gear, and a male that operates simultaneously with said gear and thus controls gas passage. Said male has an integrated cam system and enables the cam to move the shuttle inside the system; and with the movement of the shuttle, the safety valve inside the system is pushed. Thus, gas passage is allowed. The gears provided in the newly designed tap provide a full transmission rate and transmit the angular movement provided by the motor to the male provided inside the tap, thereby allowing the male to rotate in the same angular rate (i.e. angle factor). When said cam gas tap integrated with the male is connected to gas control system, double safety is achieved. That is, when burning out occurs due to external factors (wind, spilling of food, etc.) in the burner, the flame holder detecting that transfers this information to both safety valve and electronic card. In this case, not only does the safety valve automatically stop gas, but also the servo motor is stopped by the information delivered to the electronic card, thereby stopping the gas by taking the gears to the initial position thereof, i.e. to the closed position. Risks are minimized thanks to this double safety.

STATE OF THE ART

[0003] Within the state of the art, there are many applications regarding either touch button and touch control systems, or safety valves. Now, reference will be made to some applications in literature with regard to the subject matter.

[0004] The application made by the company Electrolux Professional and numbered EP 2 273 678 A2 discloses a touch button for cooking appliances. As seen in Fig. 1, the user can adjust any burning state desired by a single touch with his/her finger (F). However, this application covers only touch button, yet it discloses no gas control system or gas tap.

[0005] Again, the application made by the company Electrolux Home Product Corporation and numbered WO 2006/128831 discloses a touch-sensitive control panel. This panel comprises an outer plate (1) (i.e. upper part) with external contact areas (100) and a command assembly (2) (i.e. lower part) with an electronic circuit and components (3) thereof. This application only discloses a touch-sensitive control panel. However, this application also differs from the subject matter of the present invention and discloses no gas control system, gas tap

or burner connected to said panel. The control panel disclosed in our application is completely different from the one disclosed therein. Moreover, our invention directly relates to a new cam gas tap integrated with the male and to be operated in coordination with touch-sensitive gas control systems.

[0006] The application numbered US 2002/0045142 discloses a touch-controlled gas control system. In this application, as seen in Fig. 1, the invention comprises a burner (114) where burning occurs and which is composed of a microcontroller (101), two valves (112, 113), a gas line conduit (123), an igniter (118), a flame holder (117), as well as comprising various modules (igniter module, sensor module, etc.). However, as seen in the figure, this system is quite complicated and two valves (112, 113) within the system are only schematically displayed. In other words, no novelty or improvement on the valves has been made. Within our invention, on the other hand, a new simple cam gas tap integrated with the male and operated in coordination with a gas control system has been developed.

[0007] The application owned by the company Orkli S. Coop. and numbered EP 1 909 029 discloses a safety electromagnetic gas tap. Here, as seen in Fig. 1, an electromagnet (2) is provided in the safety gas tap and the operation of said electromagnet within the system is explained. An electromagnet is used in the gas tap within this application. However, all types of safety valves, apart from electromagnet, can be used as a part of the integrated cam gas tap according to our invention. Further, a new integrated cam male design has been introduced in our invention in order for the shuttle to be pushed. Therefore, our invention is quite a different application from the former application.

[0008] The application owned by the company Mondragon Componentes S. Coop. and numbered EP 2 023 044 discloses a gas tap (3) comprising an electromagnet therein, as in the application numbered EP 1 909 029. The magnet used therein does not function as a part of the touch-sensitive control system, just as in the former application. However, a tap with a new integrated cam male design has been introduced in our invention, as mentioned before. The safety valve used in this tap is a safety valve type other than electromagnet and it is the same as the safety valve used today.

[0009] There are many applications regarding the present subject matter in literature. Only some of these applications have been referred above briefly. As seen, there exist applications regarding the entire touch-sensitive control system, in addition to the applications only focusing on the safety valve. However, our invention is totally different from these applications, wherein a new cam gas tap integrated with the male and designed in accordance with gas control systems used in domestic cooking appliances is disclosed. Detailed explanations on the newly designed gas tap are given below.

OBJECT OF THE INVENTION

[0010] The object of the invention is to introduce a new touch-sensitive gas control system which allows touch control of the gas flow rate and which is applicable to smart phones, as well as introducing a new gas tap to operate in coordination with said system, within gas taps used in domestic cooking appliances.

[0011] Another object of the invention is to provide a cam gas tap integrated with the male and which allows the safety valve to be pushed with the rotational movement.

[0012] A preferred embodiment of the invention comprises at least one electronic card where the flow rate of the gas directed to the burners from gas taps in domestic cooking appliances and other commands are adjusted; at least one gas tap made of a cam integrated with the male directing the gas in desired flow rate to the burners; and at least one burner provided thereon with an igniter performing periodical ignition in accordance with the information sent by the system and with a flame holder allowing flame consistency.

[0013] In another preferred embodiment of the invention, cam gas tap directing the gas to the burners by synchronically operating with the gas control system according to the invention comprises a body, a male with an integrated cam, a shuttle having a spring, and a safety valve as main components, as well as comprising a gearbox mounted on said body, a servo motor located in said gearbox, a spring, a drive gear, a transmission gear, and a gear system cover which is mounted on the gearbox in a way to cover it completely in order to prevent food residues and other external residues from getting in the system.

[0014] In another preferred embodiment of the invention, there are two individual longitudinal holes on the present male body in order for LPG and natural gas coming from the gas inlet to pass there through.

[0015] In another preferred embodiment of the invention, there is a square slot on the present male body, said slot allowing maximum gas passage.

[0016] In another preferred embodiment of the invention, there is a helical channel on the present male body, said channel allowing the gas to be lowered gradually.

[0017] In another preferred embodiment of the invention, thanks to the channels and holes mentioned above, gas passage is controlled by the tap in maximum angles, between about 90° and 320°.

[0018] In another preferred embodiment of the invention, there exists a spring that is located in the shuttle and that protects the system against mechanical overloading by damping when the cam is in pushing position as the shuttle starts to push the safety valve and holds the safety valve in the mounted position.

[0019] The structural and the characteristic features and all advantages of the invention will be understood more clearly with the detailed description written by referring to the following figures; therefore, the evaluation

needs to be done by taking these figures and the detailed description into consideration.

DESCRIPTION OF THE FIGURES

[0020]

Fig. 1 is the overall perspective view of a cooker provided with touch-sensitive gas control system according to the invention and with the integrated cam gas tap according to the invention,

Fig. 2 is the perspective view showing the interior of a cooker provided with touch-sensitive gas control system according to the invention and with the integrated cam gas tap according to the invention,

Fig. 3 is the overall schematic view of the gas control system used in domestic cookers,

Fig. 4 is the overall perspective view of the integrated cam gas tap according to the invention,

Fig. 5 is the exploded view of the integrated cam gas tap according to the invention,

Fig. 6 is another perspective view of the integrated cam gas tap according to the invention,

Fig. 7 is the perspective view showing the interior of the integrated cam gas tap according to the invention,

Fig. 8 is the perspective view of the male belonging to the integrated cam gas tap according to the invention,

Fig. 9 is the side view of the male belonging to the integrated cam gas tap according to the invention,

Fig. 10 is another side view of the male belonging to the integrated cam gas tap according to the invention,

Fig. 11 is another side view of the male belonging to the integrated cam gas tap according to the invention,

Fig. 12 is the bottom view of the male belonging to the integrated cam gas tap according to the invention,

Fig. 13 is the top view of the shuttle belonging to the integrated cam gas tap according to the invention,

Fig. 14 is the side view of the shuttle belonging to the integrated cam gas tap according to the invention,

Fig. 15 is the side view of the shuttle belonging to the integrated cam gas tap according to the invention where a spring is comprised,

Fig. 16 is the perspective view showing the gearbox of the integrated cam gas tap according to the invention,

Fig. 17 is the perspective view of the servo motor belonging to the integrated cam gas tap according to the invention,

Fig. 18 is the perspective view showing the upper section of the drive gear belonging to the integrated cam gas tap according to the invention,

Fig. 19 is the perspective view showing the lower

section of the drive gear belonging to the integrated cam gas tap according to the invention,
 Fig. 20 is the perspective view showing the upper section of the transmission gear belonging to the integrated cam gas tap according to the invention, 5
 Fig. 21 is the side view of the transmission gear belonging to the integrated cam gas tap according to the invention,
 Fig. 22 is the perspective view showing the upper section of the gear system cover belonging to the integrated cam gas tap according to the invention, 10
 Fig. 23 is the perspective view showing the lower section of the gear system cover belonging to the integrated cam gas tap according to the invention, 15
 Fig. 24 is the cross-sectional view showing the closed position of the integrated cam gas tap according to the invention,
 Fig. 25 is the cross-sectional view showing the state when the safety valve is pushed in maximum displacement in the integrated cam gas tap according to the invention. 20

REFERENCE NUMERALS

[0021]

A. Touch-sensitive gas control system
 B. Cooker
 Q. Flow rate
 1. Gas tap 30
 1.1. Body
 1.1.1. Gas inlet 35
 1.1.2. Gas outlet
 1.2. Male
 1.2.1. Male (1.2) crack 40
 1.2.2. The cam integrated with the male (1.2)
 1.2.2.1. Cam (1.2.2) length
 1.2.2.2. Cam (1.2.2) angle 45
 1.2.2.3. Cam (1.2.2) auxiliary angle
 1.2.3. Male (1.2) body 50
 1.2.3.1. Longitudinal gas passage holes in the male (1.2) body
 1.2.3.1.1. Longitudinal gas passage hole inlet in the male (1.2) body 55
 1.2.3.1.1.1. Diameter of

the hole inlet (1.2.3.1.1)

1.2.3.1.2. Longitudinal gas passage hole outlet in the male (1.2) body

1.2.3.1.2.1. Diameter of the hole outlet (1.2.3.1.2)

1.2.3.2. Helical channel in the male (1.2) body

1.2.3.2.1. Channel (1.2.3.2) width

1.2.3.2.2. Channel (1.2.3.2) depth

1.2.3.3. Square slot in the male (1.2) body

1.2.3.3.1. Slot (1.2.3.3) width

1.2.3.3.2. Slot (1.2.3.3) height

1.2.3.3.3. Slot (1.2.3.3) depth

1.2.4. Outer diameter of the upper part of the male (1.2)

1.2.5. Inner diameter of the upper part of the male (1.2)

1.2.6. Rotation angle

1.3. Shuttle

1.3.1. Shuttle (1.3) camber

1.3.2. Shuttle (1.3) spring

1.3.2.1. Shuttle (1.3) spring (1.3.2) outer diameter

1.3.3. Shuttle (1.3) spring (1.3.2) hole

1.3.3.1. Shuttle (1.3) spring hole (1.3.3) length

1.3.3.2. Shuttle (1.3) spring hole (1.3.3) diameter

1.4. Safety valve

1.4.1. Safety valve (1.4) connection cable

1.5. Union

1.6. Spring

1.7. Gearbox

1.7.1. Mounting hole onto the body

(1.2.3)		1.10.1. Transmission gear (1.10) spring hole
1.7.2. Servo motor (1.8) connection cable channel		
1.7.3. Male (1.2) passage hole	5	1.10.1.1. Transmission gear (1.10) spring hole (1.10.1) diameter
1.7.3.1. Male (1.2) passage hole (1.7.3) diameter		1.10.2. Transmission gear (1.10) key-shaped ridge
1.7.3.2. Male (1.2) passage hole (1.7.3) inner level	10	1.10.2.1. Ridge (1.10.2) diameter
1.7.3.2.1. Male (1.2) passage hole (1.7.3) inner level (1.7.3.2) diameter		1.10.2.2. Ridge (1.10.2) length
1.7.4. Servo motor (1.8) housing	15	1.10.3. Transmission gear (1.10) diameter
1.7.4.1. Servo motor (1.8) housing (1.7.4) width		1.11. Gear system cover
1.7.5. Circular transmission gear (1.10) housing	20	1.11.1. Connection screw
1.7.5.1. Circular transmission gear (1.10) housing (1.7.5) diameter	25	1.11.2. Connection screw (1.11.1) hole
1.7.6. Mounting screw onto the body (1.2.3)		1.11.3. Cover (1.11) lower surface
1.7.7. Connection screw (1.11.1) hole		1.11.3.1. Circular spring (1.6) housing
1.8. Servo motor	30	1.11.3.2. Servo motor (1.8) fixator
1.8.1. Servo motor (1.8) body		1.11.3.3. Circular drive gear (1.9) housing
1.8.2. Servo motor (1.8) flange		2. Burner
1.8.2.1. Flange (1.8.2) diameter	35	2.1. Igniter
1.8.2.2. Flange (1.8.2) fixing hole		2.1.1. Igniter connecting cable
1.8.2.3. Flange (1.8.2) fixing screw		2.2. Flame holder
1.8.2.4. Connection screw hole		2.2.1. Flame holder connecting cable
1.8.3. Servo motor (1.8) drive pinion	40	2.2.2. Flame holder grounding cable
1.8.3.1. Drive pinion (1.8.3) diameter		3. Cooker (B) grill
1.8.4. Servo motor (1.8) connection cable	45	4. Transformer
1.9. Drive gear		5. Cooker (B) lower plate
1.9.1. Drive gear (1.9) upper surface	50	6. Cooker (B) upper glass
1.9.2. Drive gear (1.9) lower surface		7. Cooker (B) interconnecting pipes
1.9.3. Drive gear (1.9) connection screw		8. Cooker (B) fan
1.9.4. Drive gear (1.9) connection screw hole	55	9. Cooker (B) indicator
1.10. Transmission gear		10. Electronic card

DETAILED DESCRIPTION OF THE INVENTION

[0022] In Fig. 1, the overall perspective view of a cooker (B) which is provided with touch-sensitive gas control system (A) according to the invention, and to which cam gas tap (1) according to the invention operating in coordination with said gas control system (A) is mounted, is given. As seen in the figure, there exist four individual burners (2) on the cooker (B) and an individual grill (3) for each burner (2). Moreover, there is an indicator (9) on the cooker (B) upper glass (6) for making it easier for

the user to select the burner (2). In Fig. 2, another perspective view showing the interior of the same cooker (B) is given. As shown in the figure, there are four individual taps (1) located on the cooker lower plate (5) and serving for directing the gas to each burner (2). The gas exiting gas taps (1) is transferred to burners (2) by means of interconnecting pipes (7).

[0023] In Fig. 4, schematic view of touch-sensitive gas control system (A) developed for domestic cookers or ovens, is given. The system is composed of at least one gas tap (1) directing the gas, at least one burner (2) where the gas at a certain flow rate (Q) passing through this gas tap (1) is directed and where burning takes place, and at least one electronic card (10). In order to exemplify the operation of the system (A), when the user wants the burner (2) to burn in low state, the commands issued to the electronic card (10) are processed and delivered to the servo motor (1.8). The rotational movement driven by the servo motor (1.8) is transferred to the male (1.2) which is integrated with the cam (1.2.2) by means of the transmission gear (1.10), thereby allowing the rotation of the cam (1.2.2) and enabling the spring (1.3.1) positioned inside the shuttle (1.3) to be pushed, and the shuttle (1.3) camber (1.3.1) to press the safety valve (1.4). Thus, gas passage is provided. The gas directed to gas outlet (1.1.2) is transferred to the burner (2) where burning will take place by means of interconnecting pipes (7). Here, when burning out occurs due to external factors (wind, spilling of food, etc.) in the burner (2), flame holder (2.2) detects it. Having been detected, this information gets both to the electronic card (10) and to the safety valve (1.4). Thus, the servo motor (1.8) stops as a result of the information coming to the electronic card (10) and the gears (1.9, 1.10) get to "0" reference position (closed position), thereby stopping the gas; moreover, the safety valve (1.4) stops gas flow. Therefore, gas leakage risks are minimized since double safety is provided.

[0024] The perspective view of a new integrated cam gas tap (1) according to the invention is given in Fig. 4 while the exploded view of said tap (1) is given in Fig. 5. The integrated cam gas tap (1) according to the invention, in most general terms, consists of a body (1.1), a male (1.2) integrated with the cam (1.2.2), a shuttle (1.3) having a spring (1.3.2), a safety valve (1.4), a servo motor (1.8), a drive gear (1.9), a transmission gear (1.10), a spring (1.6) located on the transmission gear (10) and enabling the safety valve (1.4) to be fixed in the tap (1), and a gearbox (1.7) covering this system, as well as the cover thereof (1.11). A circular transmission gear (1.10) housing (1.7.5) and a servo motor (1.8) housing (1.7.4) are provided inside said gearbox (1.7) and the drive gear (1.9) is fixed on the servo motor (1.8) flange (1.8.2) by means of at least two connection screws (1.9.3). Finally, the gear system cover (1.11) is mounted on said gearbox (1.7) by means of at least two connection screws (1.11.1). The reason for using this gear system cover (1.11) in the present invention is to prevent food residues and other external residues from getting in the gearbox (1.7), there-

by avoiding any damage to the system. Another perspective view of the tap (1) according to the invention is given in Fig. 6, while the perspective view showing the interior of the integrated cam gas tap (1), without gear system cover (1.11) thereon, is given in Fig. 7. In Figs. 8, 9, 10, 11 and 12, different views of the male (1.2) are given. The integrated cam male (1.2) according to the invention, as seen in Fig. 8, allows the gas in desired flow rate (Q) to be directed to the gas outlet (1.1.2) in accordance with the burning state sent by the user to the card (10). The function of the cam (1.2.2) which is integrated with said male (1.2) is to take the rotational movement coming from the male (1.2) and thus to allow the shuttle (1.3) to be pushed forward. With the movement of the shuttle (1.3), the spring (1.3.2) located therein presses the safety valve (1.4), thereby directing the gas to the burner (2). In order to push the shuttle (1.3) to the furthest distance, and in order for the shuttle (1.3) camber (1.3.1) to push the safety valve (1.4) till the end, as well as for allowing gas passage through the system, the cam (1.2.2) length (1.2.2.1), said cam being integrated with the male (1.2), is between 2.4 and 4 mm, and the angle (1.2.2.3) thereof helping the shuttle to be pushed is between 10° and 30°. On the other hand, the angle (1.2.2.2) required for the cam (1.2.2) to push the shuttle (1.3) to the maximum position during rotation is between 50° and 80°. With this angle (1.2.2.2), the shuttle (1.3) pushes the safety valve (1.4) to the exactly desired position. After the male (1.2) is rotated, the safety valve (1.4) assumes its initial position by means of the spring (1.3.2) provided in the shuttle (1.3). Hence, the safety system continues operating. Gas passage within the system is assured by the following; the square slot (1.2.3.3) provided on the male (1.2) body (1.2.3), helical channel (1.2.3.2), and longitudinal gas passage holes (1.2.3.1) allowing LPG and natural gas passage. The inlets (1.2.3.1.1) and outlets (1.2.3.1.2) of said holes (1.2.3.1) are provided on the male (1.2). The width (1.2.3.3.1) of the square slot (1.2.3.3) which allows maximum gas passage through the system is between 2 and 4 mm while the height (1.2.3.3.2) thereof is between 5 and 8 mm, and the depth (1.2.3.3.3) thereof is between 1 and 3 mm. The gas passes through this slot (1.2.3.3) and moves towards the gas outlet (1.1.2). Apart from that, the width (1.2.3.2.1) of the helical channel (1.2.3.2) which is provided in the male (1.2) body (1.3.2) and allows gradual lowering of the gas while male (1.2) rotation angle (1.2.6) is maintained between 90° and 100° and the depth (1.2.3.2.2) thereof is decreasing gradually, is between 1.5 and 3 mm. When male (1.2) rotation angle (1.2.6) is between 230° and 280°, the system gets to the minimum position used for the systems utilizing natural gas. The ones using LPG, on the other hand, reaches to the minimum position when the male (1.2) rotation angle (1.2.6) is between 290° and 320°.

[0025] The view of the shuttle (1.3) belonging to the gas tap (1) according to the invention is given in Figs. 13, 14, and 15. As seen, there is a spring hole (1.3.3) inside the shuttle (1.3), said spring hole being provided

in order for the shuttle (1.3) spring (1.3.2) to pass theretrough and being arranged such that the diameter (1.3.3.2) thereof will get into spring (1.3.2) outer diameter (1.3.2.1). The length (1.3.3.1) of said spring (1.3.2) hole (1.3.3), on the other hand, is designed such that the end of the spring (1.3.2) will get out 1-2 spir when spring (1.3.2) is placed therein.

[0026] Given in Fig. 16 is the overall perspective view of the gearbox (1.7). As seen in the figure, the following are designed in said gearbox (1.7); a rectangular servo motor (1.8) housing (1.7.4) in which the servo motor (1.8) driving the system is positioned; circular transmission gear (1.10) housing (1.7.5) fully transferring the movement coming from the drive gear (1.9) to the servo motor (1.8), at least two connection screw (1.11.1) hole (1.7.7) provided with threads in the inner sections thereof and at least two mounting holes (1.7.1) onto the body (1.2.3); as well as a servo motor (1.8) connecting cable (1.8.4) channel (1.7.2) for the outlet of the servo motor (1.8) connecting cable (1.8.4) designed in the lower section. A flange (1.8.2) is provided in the servo motor (1.8) located in said housing (1.7.4), said flange allowing the drive gear (1.) to be fixed in the servo motor (1.8) and being connected to the servo motor (1.8) through the fixing hole (1.8.2.2) by means of a fixing screw (1.8.2.3). Drive pinion (1.8.3) is located on said flange (1.8.2).

[0027] In Figs. 18 and 19, different views of the designed drive gear (1.9) are given for a better understanding thereof. The drive gear (1.9) that is fixed in the servo motor (1.8) flange (1.8.2) by means of at least two connection screws (1.9.3) is capable of fully transferring due to the transmission gear (1.10). Different views of the transmission gear (1.10) are given in Figs. 20 and 21. A key shaped ridge (1.10.2) is seen in the transmission gear (1.10), the function of which is to fully transfer the rotational movement coming from the drive gear (1.9) to the male (1.2). The diameter (1.10.2.1) of said transmission gear (1.10) ridge (1.10.2) is preferably between 4.5 and 8 mm such that it will fit into the inner diameter (1.2.5) of the upper part of the male (1.2) and its length (1.10.2.2) is between 2 and 6 mm such that it will be properly fit into the male crack (1.2.1). With the rotational movement transferred to the male (1.2), gas passage at a certain flow rate (Q) over the male (1.2) is assured.

[0028] Various views of the gear system cover (1.11) are given in Figs. 22 and 23. As seen in top perspective view of the gear system cover (1.11) in Fig. 17, it is designed in such a form that it will completely cover the gearbox (1.7). Said cover (1.11) is mounted on the gearbox (1.7) by way of at least two connection screws (1.11.1). Moreover, a circular spring (1.6) housing (1.11.3.1) in which the spring (1.6) enabling the male (1.2) to be fixed in the system is provided, a servo motor (1.8) fixator (1.11.3.2) enabling the servo motor (1.8) in the tap (1) to be fixed in the gearbox (1.7), and a circular drive gear (1.9) housing (1.11.3.3) are provided under the gear system cover (1.11). Due to the fact that gear system cover (1.11) is mounted on gearbox (1.7) so as

to completely cover it, food residues and other external residues are prevented from getting in gearbox (1.7), thereby avoiding damages to the system operation, as well as prolonging service life thereof.

5 [0029] Cross-sectional view of the cam gas tap (1) according to the invention is given in Fig. 24 in closed position. As seen in the figure, the shuttle (1.3) is not pushed forward since it is not in contact with the cam (1.2.2); therefore, no gas passage is experienced as the safety valve (1.4) is not pressed. As seen in Fig. 25, said shuttle (1.3) of the cam (1.2.2) is pushed in maximum displacement and the spring (1.3.2) inside the shuttle (1.3) moves and presses the safety valve (1.4), thereby allowing gas passage again.

10 [0030] The protection scope of this application is stated under the claims and cannot be restricted to the descriptions given only for illustrative purposes, because it is clear that any person skilled in the art can produce the novelty provided with the invention, without drifting apart from the main subject of the invention and/or s/he can apply this novelty to the other fields used in the related technique with similar purposes. Therefore, it is obvious that such embodiments will lack novelty, and especially will lack the criteria of exceeding the prior art, i.e. comprising inventive step.

Claims

- 30 1. A cam gas tap (1) used in domestic cooking appliances and directing the gas to the burners (2) by operating simultaneously with the gas control system (A) at the desired gas flow rate; **characterized in** comprising at least one body (1.1), at least one safety valve (1.4), at least one shuttle (1.3), at least one spring (1.3.2) provided in the shuttle (1.3) spring (1.3.2) hole (1.3.3), and at least one male (1.2) with an integrated cam (1.2.2) as main components, as well as further comprising at least one gearbox (1.7) mounted on said body (1.1), at least one servo motor (1.8) located in the gearbox (1.7), at least one servo motor (1.8) flange (1.8.2), at least one drive gear (1.9), at least one transmission gear (1.10), at least one spring (1.6) enabling the male (1.2) to be fixed in the tap (1), and a gear system cover (1.11) which is mounted on the gearbox (1.7) in a way to cover it completely in order to prevent food residues and other external residues from getting in the system.
- 40 2. A male (1.2) according to Claim 1; **characterized in** comprising a cam (1.2.2) integrated at the end thereof.
- 45 3. A male (1.2) according to Claims 1 and 2; **characterized in that** the rotation angle (1.2.6) is between 90° and 320° for allowing gas passage, in accordance with the movement coming from the gear (1.10).

4. A male (1.2) according to Claims 1 to 3; **characterized in** comprising longitudinal gas passage holes (1.2.3.1) in the interior thereof in order for the gas coming from the tap (1) gas inlet (1.1.1) to pass there through.
5. A male (1.2) according to Claims 1 to 4; **characterized in** comprising a square slot (1.2.3.3) allowing maximum gas passage in the body (1.2.3) thereof.
6. A male (1.2) according to Claims 1 to 5; **characterized in** comprising a helical channel (1.2.3.2) allowing the coming gas to be gradually lowered in the body (1.2.3) thereof.
7. A cam (1.2.2) according to Claims 1 and 2; **characterized in that** the length (1.2.2.1) thereof is between 2.4 and 4 mm.
8. A cam (1.2.2) according to Claims 1-2, and 7; **characterized in that** the angle (1.2.2.3) thereof helping to push the shuttle (1.3) is between 10° and 30°.
9. A cam (1.2.2) according to Claims 1-2 and 7-8; **characterized in that** the angle (1.2.2.2) required for it to push the shuttle (1.3) to the maximum position during rotation is between 50° and 80°.
10. The square slot (1.2.3.3) according to Claim 5; **characterized in that** the width (1.2.3.3.1) thereof is between 2 and 4 mm.
11. The square slot (1.2.3.3) according to Claims 5 and 10; **characterized in that** the height (1.2.3.3.2) thereof is between 5 and 8 mm.
12. The square slot (1.2.3.3) according to Claims 5 and 10-11; **characterized in that** the depth (1.2.3.3.3) thereof is between 1 and 3 mm.
13. A channel (1.2.3.2) according to Claim 6; **characterized in that** while male (1.2) rotation angle (1.2.6) is maintained between 90° and 100°, the depth (1.2.3.2.2) thereof is decreasing gradually, thereby maintaining gas passage again by lowering gradually.
14. A channel (1.2.3.2) according to Claims 6 and 13; **characterized in that** the width (1.2.3.2.1) thereof is between 1.5 and 3 mm.
15. A gearbox (1.7) according to Claim 1; **characterized in** having a rectangular servo motor housing (1.7.4), at least two mounting holes (1.7.1) onto the body (1.2.3) in order for it to be mounted in tap body (1.1), at least one servo motor (1.8) connecting cable (1.8.4) channel (1.7.2) in order for the servo motor (1.8) connecting cable (1.8.4) to pass there through, and circular transmission gear (1.10) housing (1.7.5).
16. A gearbox (1.7) according to Claims 1 and 15; **characterized in** comprising a hole (1.7.3) through which the male (1.2) passes within the center of said circular transmission gear (1.10) housing (1.7.5), as well as comprising the hole (1.7.3) inner level (1.7.3.2) in a way concentric with the hole (1.7.3) through which the male (1.3) passes in order for the transmission gear (1.10) to be placed.
17. A gearbox (1.7) according to Claims 1 and 15-16; **characterized in** comprising at least two connection screw holes (1.7.7), with the inner part thereof being threaded, in order for mounting the gear system cover (1.11).
18. A transmission gear (1.10) according to Claim 1; **characterized in** having a key-like ridge (1.10.2).
19. A transmission gear (1.10) according to Claims 1 and 18; **characterized in that** the diameter (1.10.3) thereof is either equal to, or smaller than the diameter (1.7.5.1) of the circular transmission gear (1.10) housing in order for it to be properly fit in the circular transmission gear (1.10) housing (1.7.5) on the gearbox (1.7).
20. A transmission gear (1.10) ridge (1.10.2) according to Claim 18; **characterized in that** the length (1.10.2.2) of said ridge (1.10.2) is between 2 and 6 mm in a way to allow being fitted in the male crack (1.2.1).
21. A transmission gear (1.10) ridge (1.10.2) according to Claims 18 and 20; **characterized in that** the diameter (1.10.2.1) thereof is between 4.5 and 8 mm such that the diameter (1.2.5) of the male (1.2) upper part will be fitted.
22. A shuttle (1.3) according to Claim 1; **characterized in** comprising a hole (1.3.3) through which the spring (1.3.2) enabling the safety valve (1.4.) to be pushed passes.
23. A hole (1.3.3) according to Claims 1 and 22; **characterized in that** it has a length (1.3.3.1) such that the end of the spring (1.3.2) will be out 1-2 spir when it is placed in the spring (1.3.2).
24. A hole (1.3.3) according to Claims 1 and 22-23; **characterized in that** it has a diameter (1.3.3.2) such that the outer diameter (1.3.2.1) of the spring (1.3.2) will be fitted therein.
25. A drive gear (1.9) according to Claim 1; **characterized in** comprising at least two connection screw

(1.9.3) holes (1.9.4) in order to be fixed in the servo motor (1.8) flange (1.8.2).

26. A gear system cover (1.11) according to Claim 1; **characterized in** comprising a fixator (1.11.3.2) allowing the servo motor (1.8) to be fixed in the gearbox (1.7) in the lower surface (1.11.3) thereof.

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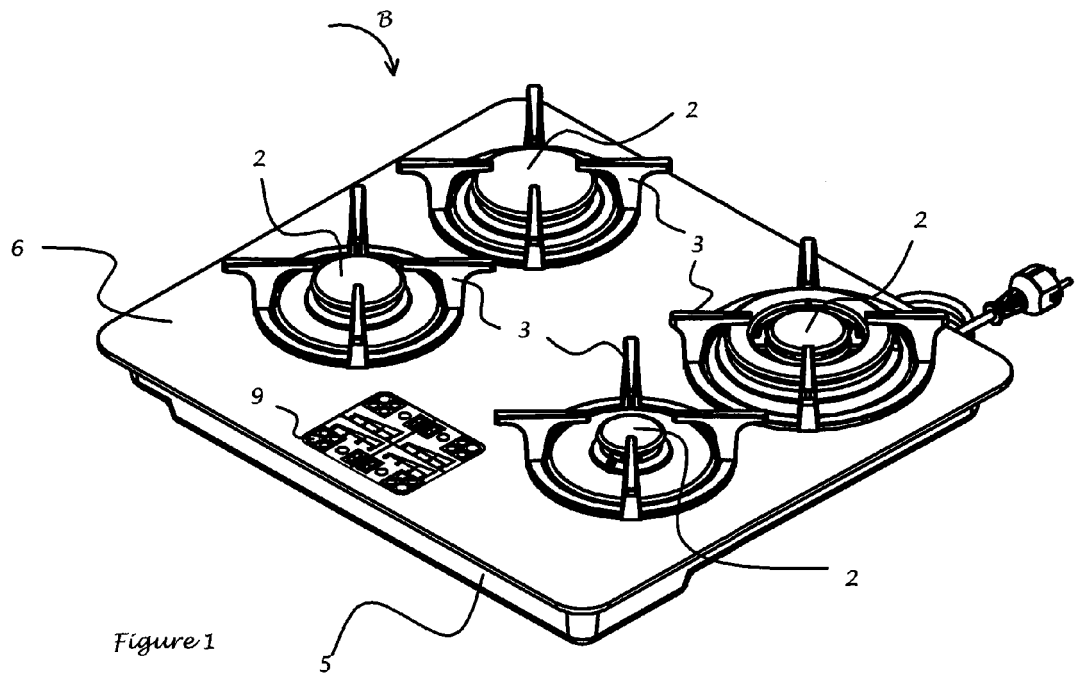


Figure 1

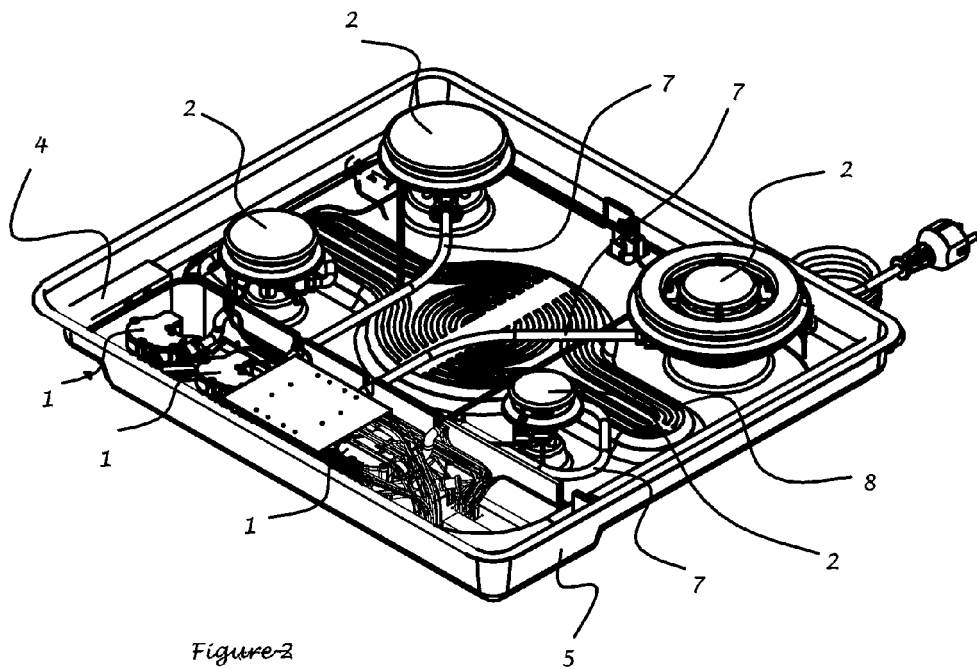
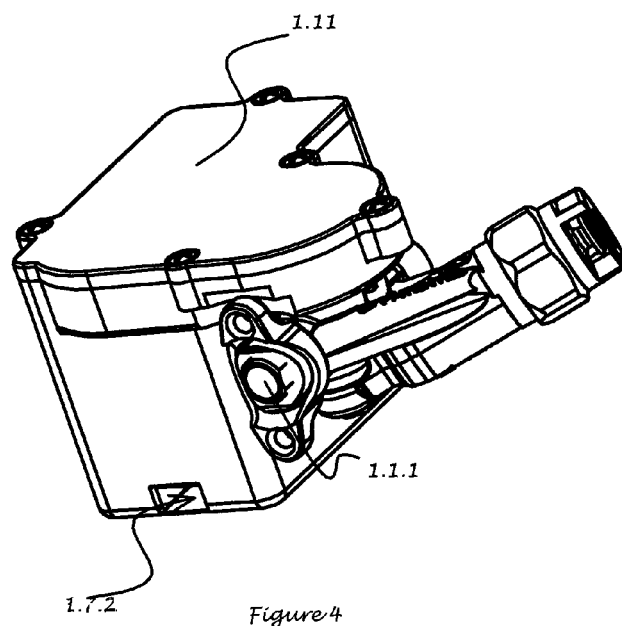
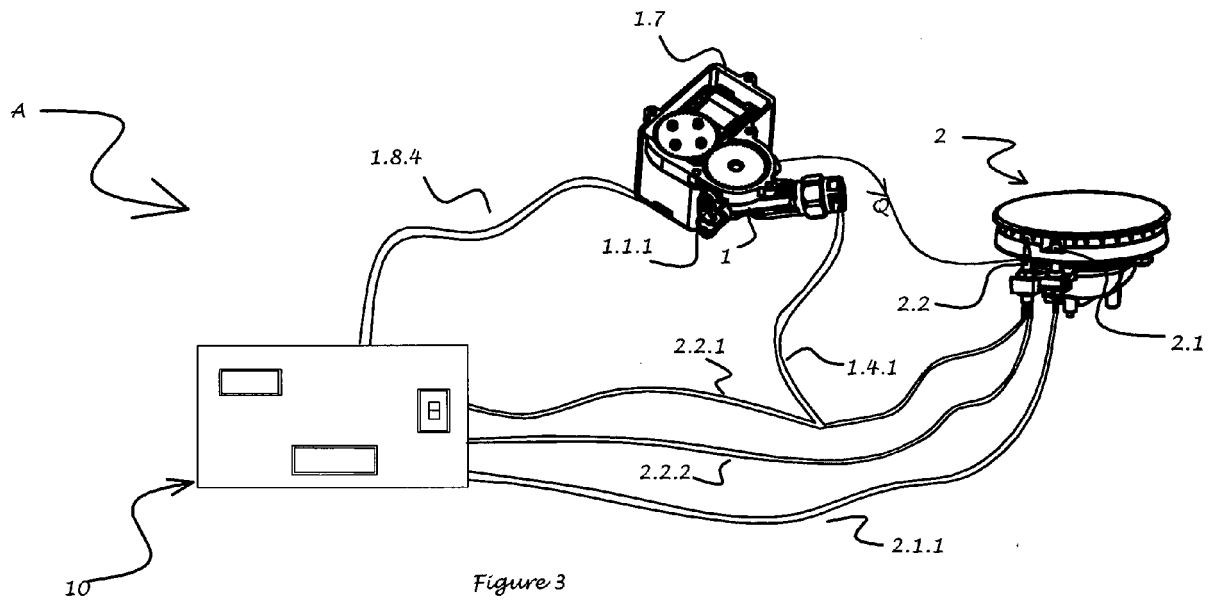


Figure 2



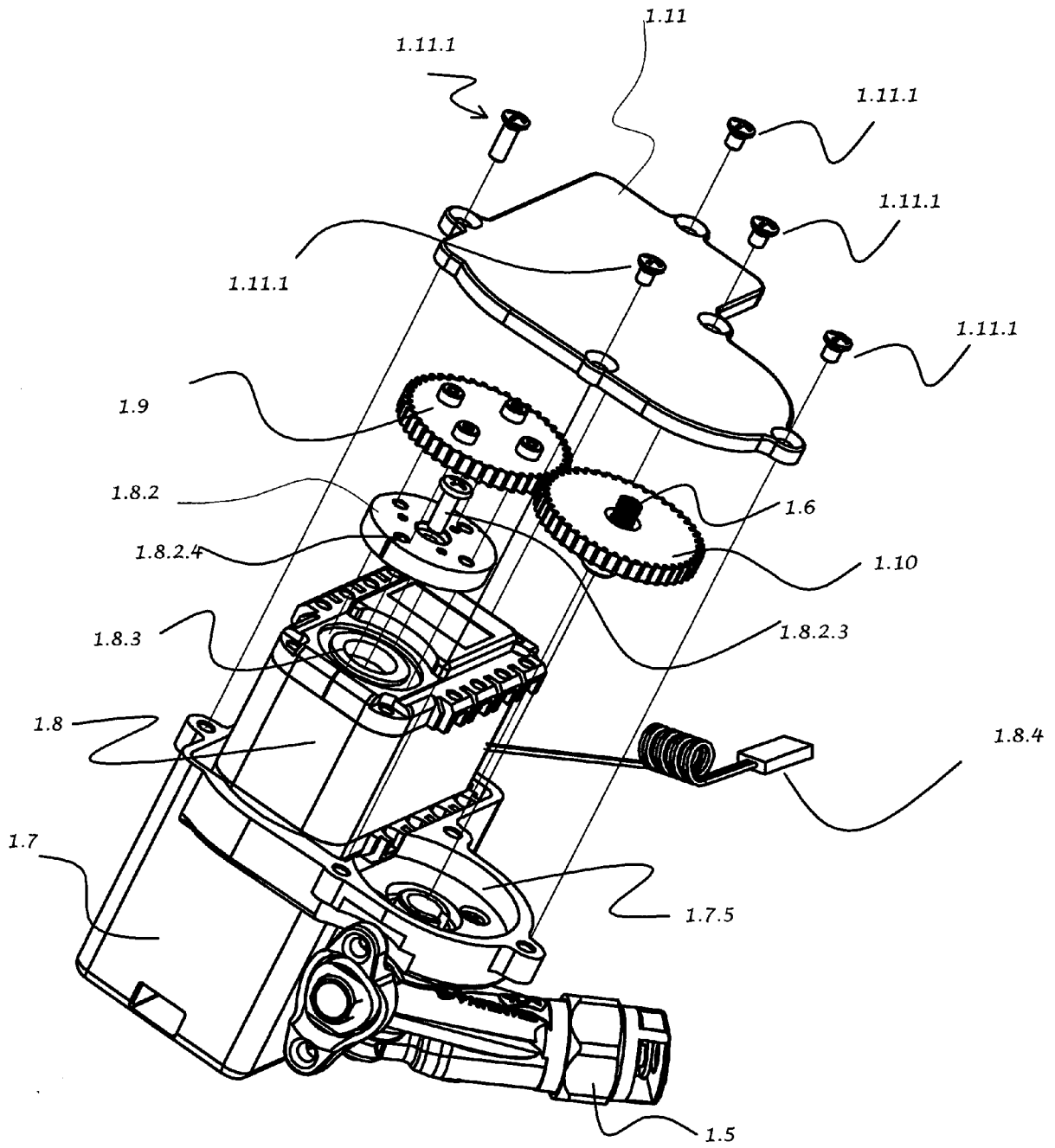


Figure 5

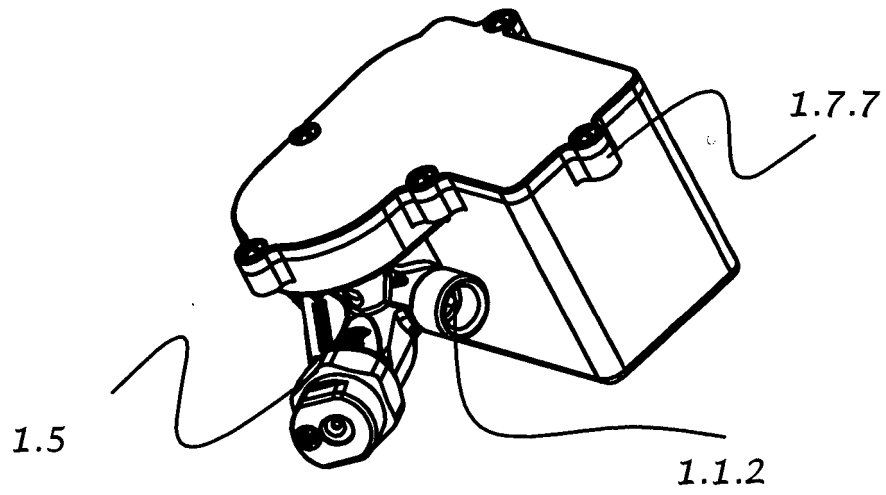


Figure 6

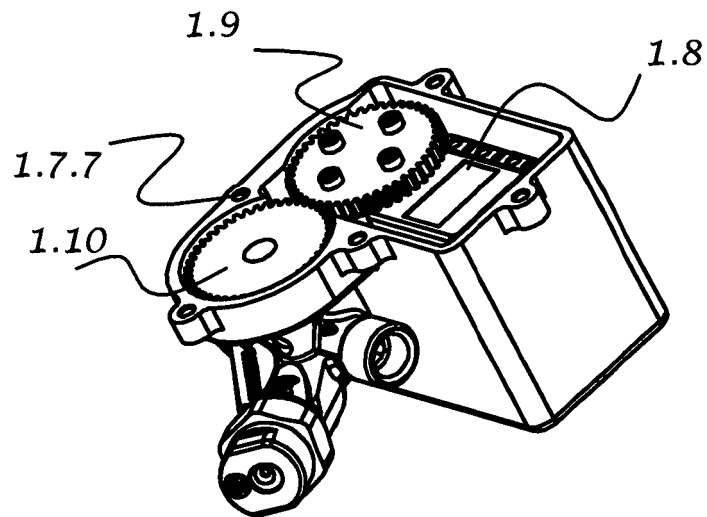


Figure 7

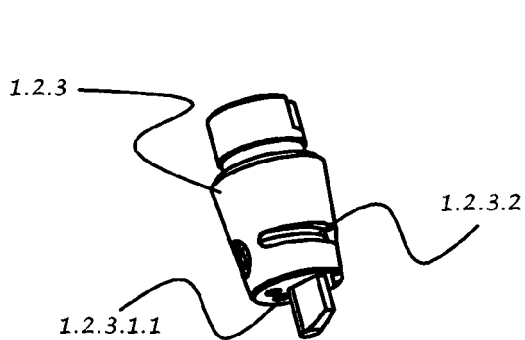


Figure 8

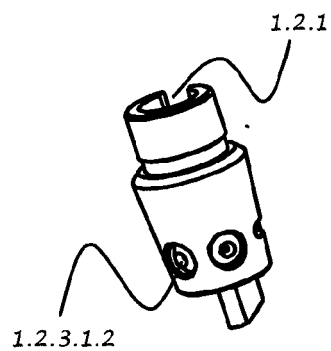


Figure 9

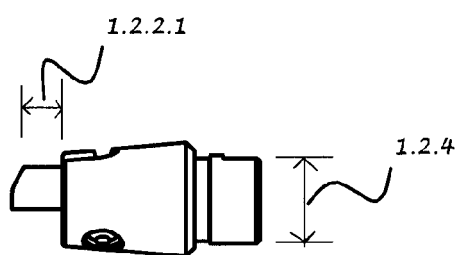


Figure 10

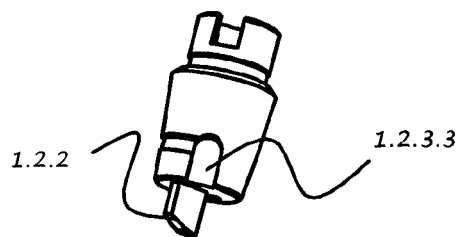


Figure 11

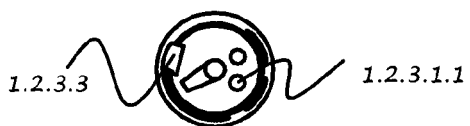


Figure 12

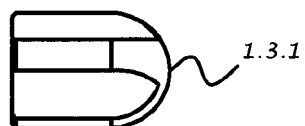


Figure 14

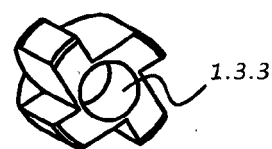


Figure 13

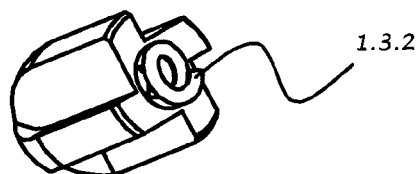


Figure 15

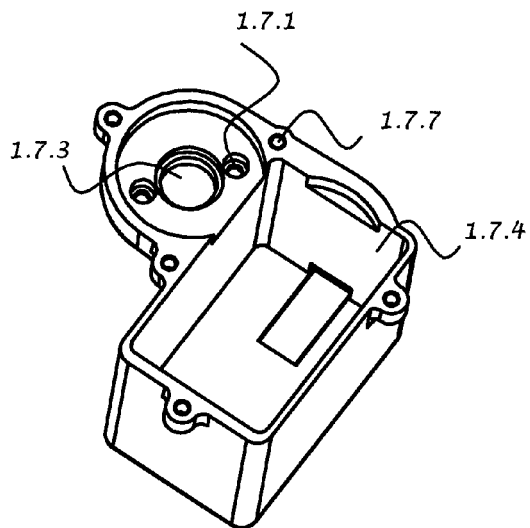


Figure 16

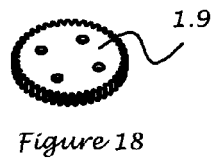


Figure 18



Figure 19



Figure 20



Figure 21

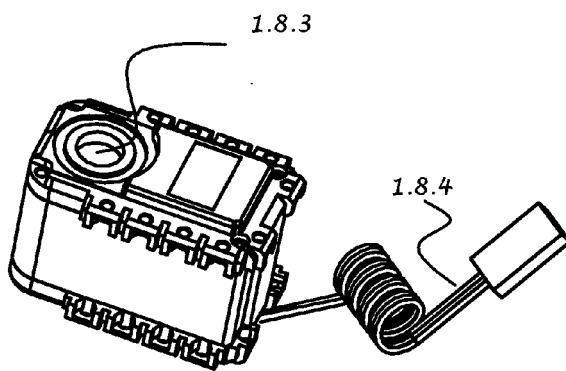


Figure 17

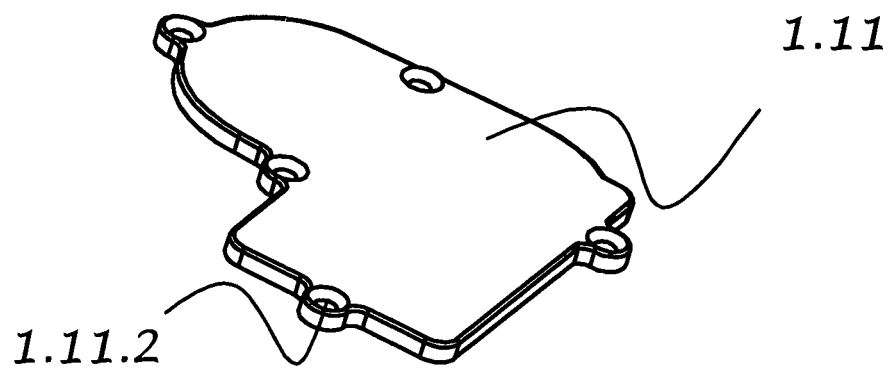


Figure 22

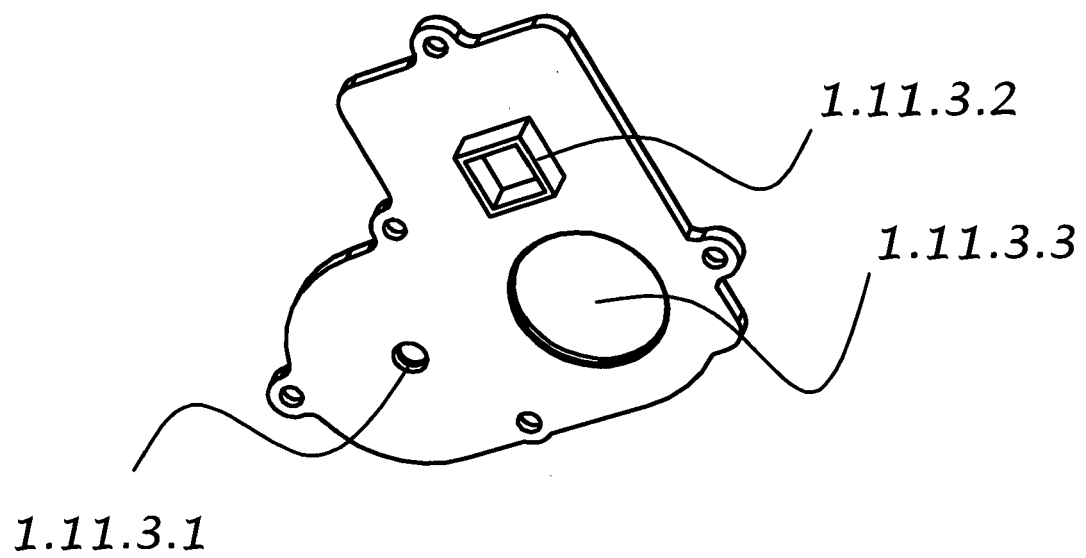


Figure 23

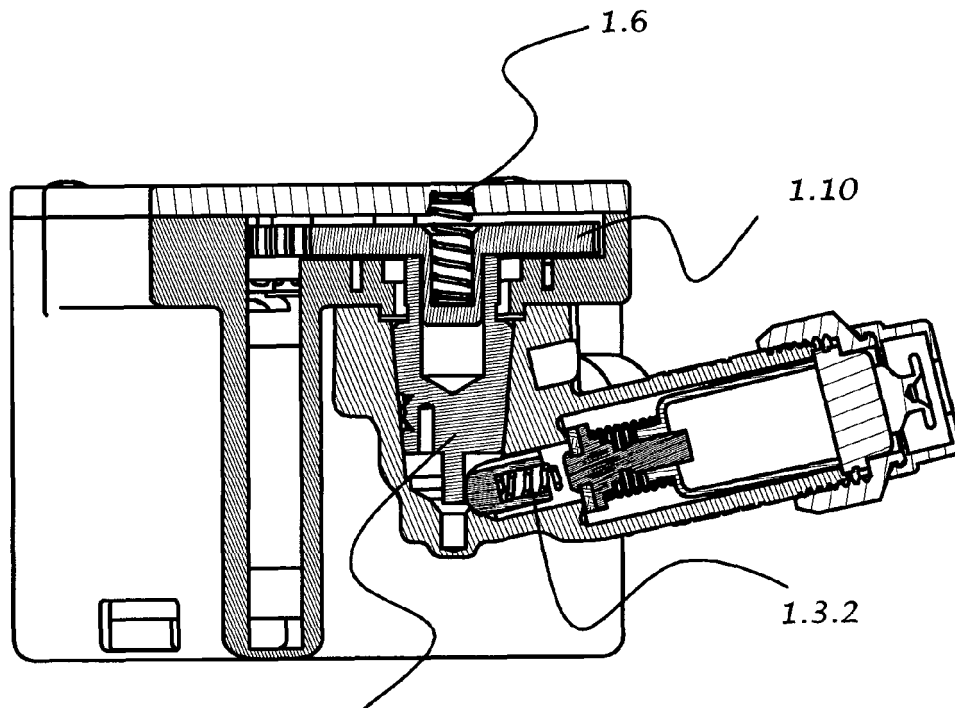


Figure 24 1.2

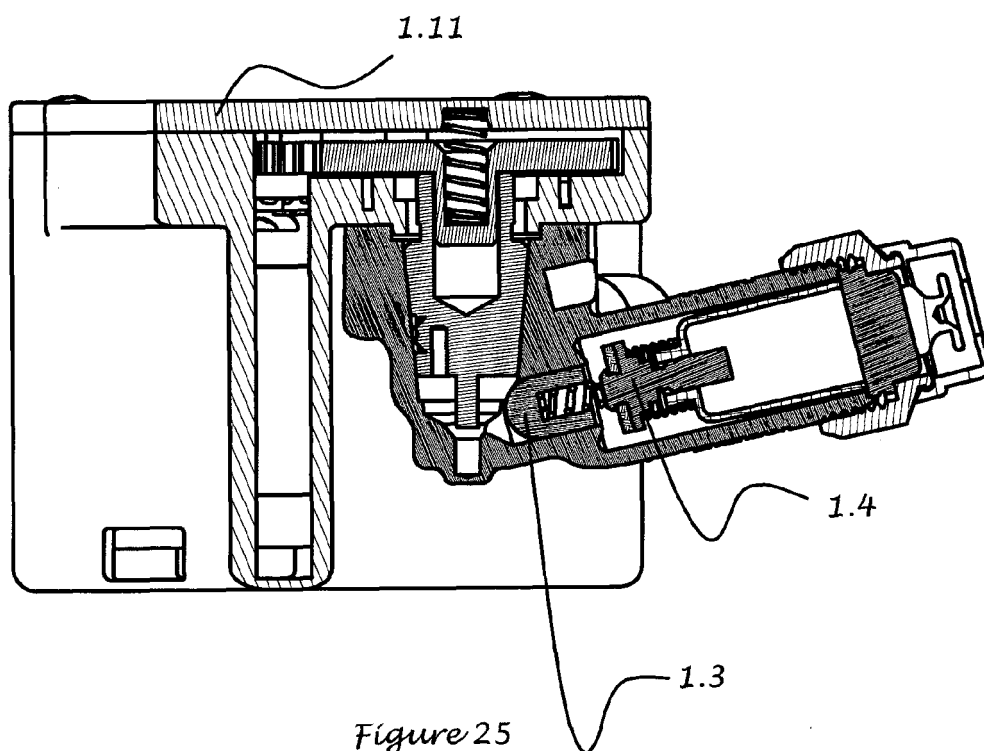


Figure 25



EUROPEAN SEARCH REPORT

Application Number
EP 14 16 4323

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 2 327 749 A (VALOR LTD [GB]) 3 February 1999 (1999-02-03) * page 6 - page 7, line end; figure 3 *	2,7,10,13	INV. F23N1/00 F23N5/00 F16K27/06
X	GB 2 381 849 A (CONCENTRIC CONTROLS LTD [GB]) CONCENTRIC CONTROLS LTD [GB]; TEDDINGTON) 14 May 2003 (2003-05-14)	2	
Y	* page 6, paragraph 4 - page 8, paragraph 1; figure 6 *	1-26	
X	US 2010/282325 A1 (CIMINO OTTAVIO [AU]) 11 November 2010 (2010-11-11)	2,13,15,18,25,26	
Y	* paragraphs [0047], [0048], [0054]; figures 1-10 *	1-26	
X	EP 0 486 796 A1 (IMIT SPA [IT]) 27 May 1992 (1992-05-27) * column 2, line 32 - column 4, line end; figures 1-2 *	2,22-24	
X	DE 10 2006 032020 A1 (HEATEC THERMOTECHNIK GMBH [DE]) 24 January 2008 (2008-01-24) * paragraphs [0019], [0020]; figures 1, 6 *	18	TECHNICAL FIELDS SEARCHED (IPC) F23N F16K
X,P	EP 2 708 816 A2 (TURAS GAZ ARMATUERLERI SANAYI VE TICARET A S [TR]) 19 March 2014 (2014-03-19) * paragraph [0053]; figure 25 *	15,18,26	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 20 November 2014	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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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 16 4323

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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20-11-2014

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2327749 A	03-02-1999	CA 2244307 A1 GB 2327749 A	26-01-1999 03-02-1999
GB 2381849 A	14-05-2003	NONE	
US 2010282325 A1	11-11-2010	AU 2008280829 A1 EP 2183524 A1 US 2010282325 A1 WO 2009012527 A1	29-01-2009 12-05-2010 11-11-2010 29-01-2009
EP 0486796 A1	27-05-1992	EP 0486796 A1 IT 9022131 U1	27-05-1992 20-05-1992
DE 102006032020 A1	24-01-2008	NONE	
EP 2708816 A2	19-03-2014	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 2273678 A2 [0004]
- WO 2006128831 A [0005]
- US 20020045142 A [0006]
- EP 1909029 A [0007] [0008]
- EP 2023044 A [0008]