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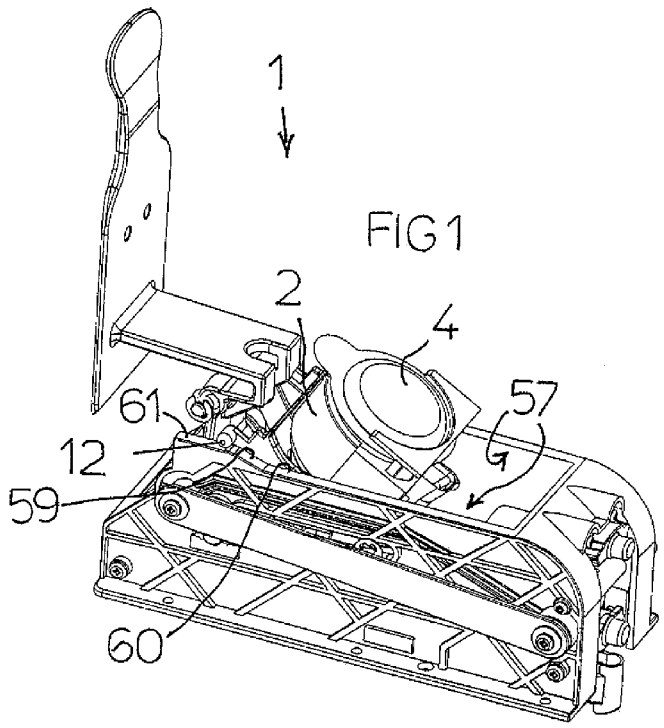
(54) **Title**: INFUSION UNIT FOR MAKING AN AROMATIC DRINK



(57) **Abstract**: The infusion unit (1) for making an aromatic drink comprises an infusion cylinder (2) having a chamber (3) for receiving a package (4) of an aromatic essence charge, a piston (5) for closing the chamber (3), the chamber (3) being mobile between a charging position of the package (4) wherein it has a longitudinal axis (6) substantially oriented horizontally or oriented upwards, and a dispensing position wherein it engages with the piston (5) with the longitudinal axis (6) substantially oriented horizontally, means (7) for a releasable retaining of an external edge (8) of the package (4) against the front delimiting surface (9) of the chamber (3) in a temporary position of the package (4) spaced from the bottom of the chamber (3), and means (10) for actuating the retaining means (7), suitable for actuating the retaining means (7) in the stroke of the chamber (3) towards the dispensing position for retaining the package (4) in the temporary position.

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INFUSION UNIT FOR MAKING AN AROMATIC DRINK

DESCRIPTION

The present invention relates to an infusion unit for producing an aromatic beverage.

The infusion unit, which without distinction may have automatic, semi-automatic or manual movement, is of the type comprising an infusion cylinder having a seating chamber for a package, in particular a paper capsule, containing a charge of aromatic essence and a chamber closing piston which is mobile between a package charging position and a dispensing position, wherein it engages with the piston with the longitudinal axis substantially oriented horizontally.

The aromatic essence may be of any kind, for example coffee powder, barley, tea, etc.

In a traditional infusion unit for coffee machine of the type described above, one of the main problems to solve is that, inserting the capsule in the relevant chamber and moving the chamber to the dispensing position, the capsule may come out of the chamber before it is positioned against the piston for dispensing.

Another problem is that in order to obtain a good extraction of coffee liquid while dispensing, the capsule must be constantly compressed between the chamber and closing piston. Otherwise, since the paper capsule has no stiff containment for the coffee powder, the extracted liquid would be little dense and with a poor amount and quality of the cream.

The technical task of the present invention therefore is to provide an infusion unit for making an aromatic drink which allows eliminating the above technical drawbacks of the prior art.

Within the scope of this technical task, an object of the invention is to provide an infusion unit for making an aromatic drink which allows the package of aromatic essence charge to keep the correct position into the chamber in a simple, effective, safe and precise manner during the handling thereof towards the dispensing position.

Another object of the invention is to provide an infusion unit for making an aromatic drink which allows making the aromatic drink with the desired fullness, amount and quality of cream.

Last but not least, another object of the invention is to provide a method for handling a package of an aromatic essence charge in an infusion unit for making an aromatic drink having optimal organoleptic properties.

The technical task, as well as these and other objects, according to the present invention are achieved by providing an infusion unit according to claim 1.

The infusion unit of the invention allows having the package of aromatic essence charge in the correct position when the chamber reaches the dispensing position, so as to have the ideal conditions to obtain a very effective infusion.

Further features of the present invention are further defined in the following claims.

Further features and advantages of the invention will appear more clearly from the description of preferred but non-exclusive embodiments of the infusion unit according to the invention, illustrated by way of a non-limiting example in the annexed drawings, wherein:

figure 1 shows a perspective view of the infusion

unit in charging position;

figure 2 shows a view of the infusion unit of figure 1 in the charging position, cutaway along a vertical plane containing the horizontal axis of connection between the closing piston and the cylinder;

figure 3 shows a view of the infusion unit of figure 1 in the dispensing position, cutaway along a vertical plane containing the horizontal axis of connection between the closing piston and the cylinder, and with the mobile portion of the closing piston in retracted position;

figure 4 shows an axial section of the closing piston of the infusion unit of figure 1, with the mobile portion thereof in the extended position;

figure 5 shows an axial section of the closing piston of the infusion unit of figure 1, with the mobile portion thereof in the retracted position;

figure 6 shows a perspective view of the cylinder of the infusion unit of figure 1, with the stop in release position; and

figure 7 shows a perspective view of the cylinder of the infusion unit of figure 1, with the stop in

gripping position on the capsule edge;

figure 8 shows a view of the infusion unit according to a second preferred embodiment of the invention, in the charging position, partially cutaway along a vertical plane containing the horizontal axis of connection between the closing piston and the cylinder;

figure 9 shows a view of the infusion unit of figure 8 in the charging position, partially cutaway along a vertical plane containing the horizontal axis of connection between the closing piston and the cylinder;

figures 10 and 11 show a view of the infusion unit of figure 8 in the charging position, partially cutaway along a vertical plane containing the horizontal axis of connection between the closing piston and the cylinder, with the charge in two sequential positions during the charging;

figure 12 shows a view of the infusion unit of figure 8 in the infusion position, partially cutaway along a vertical plane containing the horizontal axis of connection between the closing piston and the cylinder; and

figure 13 shows a view of the infusion unit of figure 8, during the opening of the infusion unit, partially cutaway along a vertical plane containing the horizontal axis of connection between the closing piston and the cylinder.

Equivalent parts in the different preferred embodiments of the invention will be indicated with the same reference numerals.

With reference to figures 1-7, there is shown an infusion unit for making an aromatic drink, globally indicated with reference numeral 1.

The infusion unit 1 comprises an infusion cylinder 2 having a chamber 3 for receiving a package 4 of an aromatic essence charge, and a piston 5 for closing chamber 3.

Package 4 in particular is a paper capsule containing powder of the aromatic essence, for example coffee.

Chamber 3 is mobile, by the effect of a rotary-translation, between a charging position of package 4, wherein it has a longitudinal axis 6 oriented upwards, and a dispensing position wherein it engages with piston 5 with the

longitudinal axis 6 substantially oriented horizontally.

In this specific case, a handle 35 is provided for actuating cylinder 2 from the charging position to the dispensing position and vice versa. As an alternative, cylinder 2 may also be motor-driven.

Handle 35 is hinged at 36 at the opposite shoulders 57 of the frame of the infusion unit 1 that contain cylinder 2 and piston 5.

Handle 35 is hinged in 37 with an end of a connecting rod 38 the other end whereof is in turn hinged to a pin 39 supporting cylinder 2 in rotation.

Pin 39 is positioned eccentric-wise relative to cylinder 2 and it slides in a guiding slot 40 obtained on shoulders 57 with development parallel to the coupling axis substantially horizontal between chamber 3 and piston 5.

The axes of hinges 36, 37 and 39 are parallel to each other and are orthogonal to the substantially horizontal coupling axis between chamber 3 and piston 5.

The translation of cylinder 2 along the

substantially coupling axis between chamber 3 and piston 5 is ensured by a translation guide 51 protruding from the opposite shoulders 57 of the frame of the infusion unit 1.

Advantageously, the infusion unit 1 has means 7 for a releasable retaining of the external edge 8 of package 4 against the front delimiting surface 9 of chamber 3 in a temporary position of package 4 spaced from the bottom of chamber 3, and means 10 for actuating the retaining means 7, suitable for actuating the retaining means 7 in the stroke of chamber 3 towards the dispensing position for retaining package 4 in its temporary position.

The retaining means 7 comprise a stop 11 preferably plate-shaped that extends above the front delimiting surface 9 of chamber 3 and is slidingly supported by cylinder 2 relative whereto it is mobile by the effect of the actuating means 10 between a position spaced from the front delimiting surface 9 of chamber 3 and a position juxtaposed to the front delimiting surface 9 of chamber 3 whereat the external edge 8 of package 4 remains stuck between stop 11 and the front delimiting surface 9 of chamber 3.

Stop 11 has a profile matching that of the external edge of package 4 for having an extended overlapping portion therewith and as a consequence, for exerting a firm retaining.

In the case shown by way of an example wherein package 4 is a circular capsule, stop 11 has an arched profile 30 having the same bending as the peripheral capsule edge.

The front delimiting surface 9 of chamber 3 has a lowering 31 where stop 11 is seated in the position juxtaposed to the front delimiting surface 9 of chamber 3.

Lowering 31 has a depth substantially equal to the thickness of stop 11 so that in the position juxtaposed to the front delimiting surface 9 of chamber 3, the front surface of stop 11 is substantially aligned with the non-lowered portion of the front delimiting surface 9 of chamber 3.

Stop 11 is supported by two bars 32 sliding parallel to the axis of chamber 3 along guides 33 obtained in the body of cylinder 2 laterally to chamber 3.

Bars 32 are in turn supported by a slide 50.

The actuating means 10 comprise a pin 12 that extends from slide 50.

Pin 12 slides along a cam profile 20 obtained on shoulders 57 of the support frame of the infusion unit 1.

Pin 12 is mobile along the cam profile 20 by the action of and in contrast with an elastic element 13, for example a helical spring, which connects slide 50 with cylinder 2.

The cam profile 20 comprises an inclined plane 59 that separates two horizontal planes 60 and 61.

When pin 12 is on plane 61 stop 11 is in the release position, spaced from the front delimiting surface 9 of chamber 3, whereas when pin 12 is on plane 60 stop 11 is in the gripping position, juxtaposed to the front delimiting surface 9 of chamber 3.

The retaining force exerted by stop 11 depends on the deformation and stiffness of the elastic element 13 and is calibrated so as to allow the extraction of the external edge 8 of package 4 by the effect of the thrust exerted by the closing piston 5 against package 4 when chamber 3 reaches

the dispensing position.

The closing piston 5 comprises a fixed portion 14 whereon a mobile portion 15 is mounted, having a valve 16 suitable, upon dispensing, for creating a pressure drop that generates a thrust force on the mobile portion 15 for extracting it from the fixed portion 14 and compressing package 4 moving it from its temporary position to a final position against the bottom of chamber 3.

One or more automatic return springs 17 of the mobile portion 15 towards the retracted position into the fixed portion 14 are provided between the fixed portion 14 and the mobile portion 15.

Valve 16 is a mushroom-shaped on-off valve mobile in contrast with and by the action of a spring 63, inserted along a conduit 64 for feeding water to a closed chamber 65 delimited between the inner fixed portion 14 and the outer mobile portion 15.

A conduit 66 for feeding the infusion water to the front filter 67 of piston 5 is also provided in piston 5, wherefrom the infusion water enters the infusion chamber 3.

An on-off valve 68 mobile in contract with and by

the action of a spring 69 is provided in conduit 66, too.

Springs 63 and 69 are calibrated so that the opening of the on-off valve 16 takes place at a pressure below that required for opening the on-off valve 68.

Cylinder 2 underneath the base of chamber 3 has a conduit 70 for conveying the infusion produced in chamber 3 outwards.

Chamber 3 seats a sliding stem 18 for ejecting package 4.

Stem 18 has an enlarged and flattened head 71 that, as shall be seen, acts as support and guide for package 4 during the charging thereof in the temporary position in chamber 3.

Shoulders 57 of the support frame of the infusion unit 1 carry a pin 52 for intercepting the base of stem 18 for the extraction thereof from chamber 3.

The interception pin 52 is freely mobile along a vertical guide 72 for releasing stem 18 during the rotation of cylinder 2.

The support frame of the infusion unit 1 further has a stopping surface 19 suitable for

intercepting the ejecting stem 18 during the rotation of cylinder 2 for locking it into a position substantially flush with the front delimiting surface 9 of chamber 3 so that with its head 71 it may act, as said above, as support and guide for package 4 when, with chamber 3 in the charging position, package 4 is charged into the temporary position thereof.

The operation of the infusion unit briefly is as follows.

The infusion unit 1 initially is with handle 35 in open position wherein chamber 3 is inclined upwards for receiving package 4, stop 11 is in the release position and stem 18 is positioned with its head 71 flush with the front delimiting surface 9 of chamber 3.

Package 4 fed towards chamber 3 slides on head 71 of stem 18 and achieves its temporary position. Without this device, package 4, especially if in the form of a paper capsule, may enter chamber 3 bending its paper edge in an abnormal manner, thus impairing the correct execution of the grip by stop 11.

During the closing of handle 35 pin 12, sliding on cam 20, moves from plane 61 to plane 60 causing the actuation of stop 11 which, retracting, traps the edge of package 4 against the front delimiting surface 9 of chamber 3. In this way, package 4 moves integrally with chamber 3 until it encounters piston 5.

Cylinder 2 rotates up to aligning its axis with that of piston 5 it couples with.

At the time of contact with piston 5, package 4 is pushed into chamber 3. The edge of package 4 trapped between the front delimiting surface 9 of chamber 3 and stop 11 slips away by the effect of the pulling of package 4 inside chamber 3.

The subsequent compression of package 4 takes place after the start of the pump (not shown) that dispenses the hot infusion water towards the infusion unit 1.

More precisely, when the pump is started, chamber 65 of water under pressure is created between fixed portion 14 and mobile portion 15 of piston 5.

At the time of dispensing, the pressure drop makes

the mobile portion 15 move away from the fixed portion 14 and compress package 4 present in chamber 3 against the bottom of chamber 3: the extent of the compression is determined by the extent of the pressure drop created by the on-off valve 16.

With reference to figures 8-13, there is shown an infusion unit for making an aromatic drink, globally indicated with reference numeral 1.

The infusion unit comprises an infusion cylinder 2 having a chamber 3 for receiving a package 4 of an aromatic essence charge, and a piston 5 for closing chamber 3.

Chamber 3 is mobile, by the effect of a translation, between a charging position of package 4, wherein it has a longitudinal axis 6 substantially oriented horizontally, and a dispensing position wherein it engages with piston 5 with the longitudinal axis 6 always substantially oriented horizontally.

Also in this specific case, a handle 35 is provided for actuating cylinder 2 from the charging position to the dispensing position and

vice versa.

Handle 35 is hinged at 36 at the opposite shoulders 57 of the frame of the infusion unit 1 that contain cylinder 2 and piston 5.

Handle 35 is hinged in 37 with an end of a connecting rod 38 the other end whereof is in turn hinged to a pin 39 supporting cylinder 2 in rotation.

Pin 39 is positioned eccentric-wise relative to cylinder 2 and it slides in a guiding slot 40 obtained on shoulders 57 with development parallel to the coupling axis substantially horizontal between chamber 3 and piston 5.

The translation of cylinder 2 along the substantially coupling axis between chamber 3 and piston 5 is ensured by a translation guide 51 protruding from the opposite shoulders 57 of the frame of the infusion unit 1.

Advantageously, the infusion unit 1 has means 7 for a releasable retaining of the external edge 8 of package 4 against the front delimiting surface 9 of chamber 3 in a temporary position of package 4 spaced from the bottom of chamber 3, and means

10 for actuating the retaining means 7, suitable for actuating the retaining means 7 in the stroke of chamber 3 towards the dispensing position for retaining package 4 in its temporary position.

The retaining means 7 comprise a stop 11 preferably plate-shaped that extends above the front delimiting surface 9 of chamber 3 and is slidingly supported by cylinder 2 relative whereto it is mobile by the effect of the actuating means 10 between a position spaced from the front delimiting surface 9 of chamber 3 and a position juxtaposed to the front delimiting surface 9 of chamber 3 whereat the external edge 8 of package 4 remains stuck between stop 11 and the front delimiting surface 9 of chamber 3.

Stop 11 has a profile matching that of the external edge of package 4 for having an extended overlapping portion therewith and as a consequence, for exerting a firm retaining.

The front delimiting surface 9 of chamber 3 has a lowering 31 where stop 11 is seated in the position juxtaposed to the front delimiting surface 9 of chamber 3.

Stop 11 is supported by two bars 32 sliding parallel to the axis of chamber 3 along guides 33 obtained in the body of cylinder 2 laterally to chamber 3.

The actuating means 10 comprise an abutment 12 against a stop 20.

The closing piston 5 comprises a fixed portion 14 whereon a mobile portion 15 is mounted.

Its structure is similar to that described for the first preferred embodiment of the invention.

Chamber 3 seats a sliding stem 18 for ejecting package 4.

Stem 18 has an enlarged and flattened head 71.

The rear abutment 52 of ejector 18 is integral with a slot that hinges in pin 37. For a wide rotation of lever 3 from horizontal to the vertical position, slot 101 makes the rear abutment 52 stay still and perform its function for ejecting the empty charge. Beyond a certain angle, slot 101 ends and abutment 52 is lifted, thus releasing ejector 18 (as is seen in figure 8).

During the closing of handle 35 abutment 12,

intercepted by the cam stop 20, causes the actuation of stop 11 which, retracting, traps the edge of package 4 against the front delimiting surface 9 of chamber 3. In this way, package 4 moves integrally with chamber 3 until it encounters piston 5.

Cylinder 2 translates horizontally until the edge of package 4 trapped between the front delimiting surface 9 of chamber 3 and stop 11 slips away by the effect of the pulling of package 4 inside chamber 3.

A possible version (not shown) of the invention keeps into account the fact that it was found that for an optimum dispensing, the capsule should be compressed well before the dispensing starts and a space should be left wherein the capsule may expand (it swells as water is absorbed) during the dispensing.

The version consists in inserting an interposition spring between the bottom of chamber 3 and the back of head 71 of stem 18. The capsule, during the movement of piston 5 for closing chamber 3, compresses in contrast to the interposition spring that keeps head 71 of stem 18 slightly lifted from

the bottom of chamber 3. At the end of the movement of piston 5, when the dispensing of the infusion water starts, the pressure force generated by the expansion of the capsule is released against head 71 of stem 18, which moves back towards the bottom of chamber 3, the combination of the compression force of the piston and of the pressure force of the capsule being higher than the elastic force of the interposition spring.

A further possible version of the invention relates to the thrust of the mobile portion 15 of piston 5 towards the extended portion, which may be generated also without the need of on-off valves that create the pressure drop, but more simply using the difference between inside and outside area of the mobile portion 15 exposed to the water pressure orthogonally to the moving direction. The outer wet front surface of the mobile portion 15 of piston 5 is less extended than the inner wet surface of the rear side of the mobile portion 15 so that the water pressure generates an extension force on the mobile portion 15 stronger than the retraction force.

The infusion unit of the present invention allows optimising the infusion quality since package 4 achieves with accuracy and certainty any subsequent position of the correct design path that brings it from the charging position to the infusion position wherein it can thus be subject to the correct compression force by the closing piston.

The infusion unit thus conceived is susceptible to numerous modifications and variants, all falling within the inventive concept; moreover all details can be replaced by other technically equivalent details.

In the practice, the materials used as well as the sizes, can be whatever, according to the technical requirements and to the prior art.

CLAIMS

1. Infusion unit (1) for making an aromatic drink, of the type comprising an infusion cylinder (2) having a chamber (3) for receiving a package (4) of an aromatic essence charge, and a piston (5) for closing said chamber (3), said chamber (3) being mobile between a charging position of said package (4) wherein it has a longitudinal axis (6) substantially oriented horizontally or oriented upwards, and a dispensing position wherein it engages with said piston (5) with said longitudinal axis (6) substantially oriented horizontally, characterized in that it has means (7) for the releasable retaining of an external edge (8) of said package (4) against the front delimiting surface (9) of said chamber (3) in a temporary position of said package (4) spaced from the bottom of said chamber (3), and means (10) for actuating said retaining means (7), suitable for actuating said retaining means (7) in the stroke of said chamber (3) towards said dispensing position

for retaining said package (4) in said temporary position.

2. Infusion unit (1) according to claim 1, characterized in that said retaining means (7) comprise a stop (11) that extends above said front delimiting surface (9) of said chamber (3) and is slidingly supported by said cylinder (2) relative whereto it is mobile by the effect of said actuating means (10) between a position spaced from said front delimiting surface (9) and a position juxtaposed to said front delimiting surface (9) wherein said external edge (8) is stuck between said stop (11) and said front delimiting surface (9).

3. Infusion unit (1) according to the previous claim, characterized in that the retaining force exerted by said stop (11) is calibrated so as to allow the extraction of said external edge (8) by the effect of the thrust exerted by said closing piston (5) against said package (4).

4. Infusion unit (1) according to the previous claim, characterized in that said front

surface (9) has a lowering with a depth equal to the thickness of said stop (11) suitable for receiving it at said juxtaposed position.

5. Infusion unit (1) according to one or more of the previous claims, characterized in that said actuating means (10) comprise a pin (12) integral to said stop (11) and sliding along a cam profile (20) obtained on a support frame of said chamber (3).

6. Infusion unit (1) according to one or more of the previous claims, characterized in that said actuating means (10) comprise an abutment (12) against a stop (20).

7. Infusion unit (1) according to one or more of the previous claims, characterized in that said closing piston (5) comprises a fixed portion (14) whereon a mobile portion (15) is mounted, extractable from said fixed portion (14) for compressing said package (4) moving it from said temporary position to a final position against or in the proximity of the bottom of said chamber (3).

8. Infusion unit (1) according to the previous claim, characterized in that said mobile

portion (15) has a valve (16) suitable, upon dispensing, for creating a pressure drop that generates a thrust force on said mobile portion (15) for extracting it from said fixed portion (14) and compressing said package (4) moving it from said temporary position to a final position against the bottom of said chamber (3).

9. Infusion unit (1) according to claim 7, characterized in that the thrust of said mobile portion (15) towards the extended position is created by the difference between outer area and inner area of said mobile portion (15) exposed to the water pressure orthogonally to the moving direction of said mobile portion.

10. Infusion unit (1) according to one or more of the previous claims, characterized in that it is provided with at least one spring (17) for the automatic return of said mobile portion (15) towards a retracted position into said fixed portion (14).

11. Infusion unit (1) according to one or more of the previous claims, characterized in

that said chamber (3) seats an axially sliding stem (18) for the ejection of said package (4).

12. Infusion unit (1) according to one or more of the previous claims, characterized in that the support frame of said infusion unit has a surface (19) for stopping said ejection stem (18) in a position substantially flush with said front delimiting surface (9) of said chamber (3) so as to act as support and guide for said package (4) when, with said chamber (3) in said charging position, said package (4) is charged into said temporary position.

13. Infusion unit (1) according to one or more of the previous claims, characterized in that said package (4) is a paper capsule.

14. Infusion unit (1) according to one or more of the previous claims, characterized in that it has an interposition spring between the bottom of said chamber (3) and an enlarged head (71) of said stem (18) said interposition spring being suitable for keeping said head (71) of said stem (18)

slightly lifted from the bottom of said chamber (3) during the movement of said piston (5) for closing said chamber (3) for creating a compression of the capsule before dispensing.

15. Infusion unit according to claim 14, characterized in that said interposition spring during the dispensing yields for retracting said head (71) towards said bottom of said chamber (3) so as to create an additional volume in said chamber (3) wherein said capsule may expand.

16. Method for handling a package (4) of an aromatic essence charge in an infusion unit (1) of the type comprising an infusion cylinder (2) having a chamber (3) for seating said package (4), and a piston (5) for closing said chamber (3), said chamber (3) being mobile between a charging position of said package (4) wherein it has a longitudinal axis (6) substantially oriented horizontally or oriented upwards and a dispensing position, wherein it engages with said piston (5) with said longitudinal axis

(6) substantially oriented horizontally, characterized in that it consists in charging said package (4) in a temporary position spaced from the bottom of said chamber (3), moving said chamber (3) towards said dispensing position while creating a joint of an external edge (8) of said package (4) against the front surface (9) of said chamber (3), and transforming a pressure drop that the infusion water determines between said chamber (3) and a space delimited by a fixed portion (14) and a mobile portion (15) of said piston (5) into a thrust against said package (4) for releasing it from said joint and moving it from said temporary position to a final position wherein it is compressed against the bottom of said chamber (3).

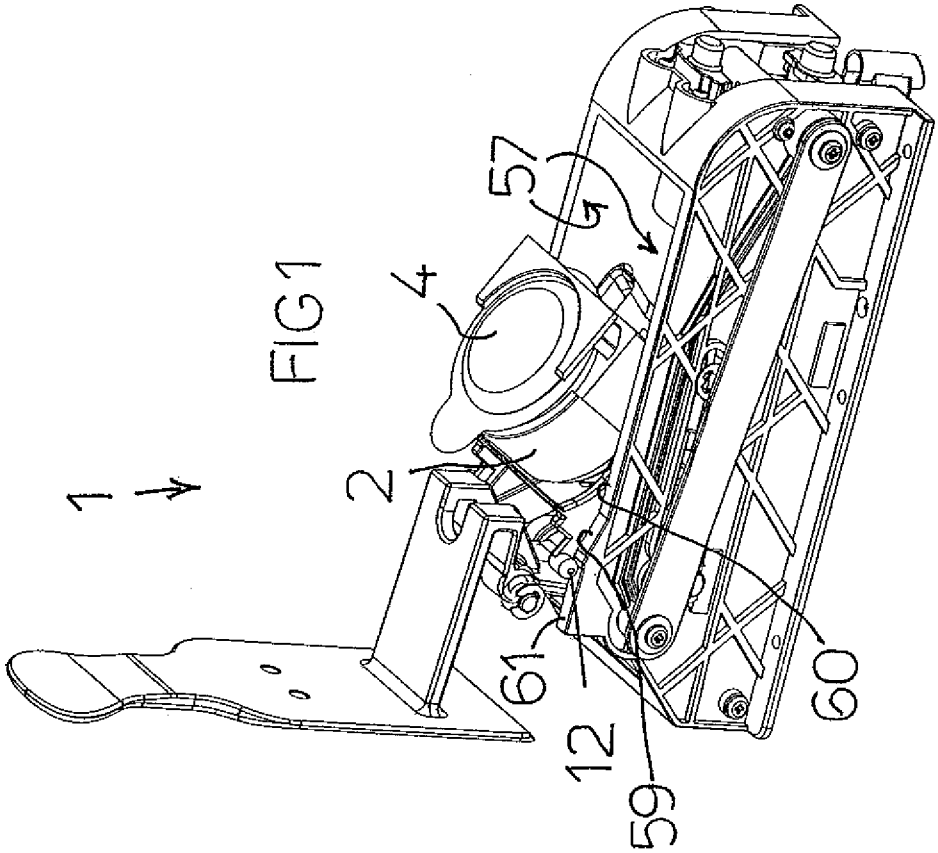


FIG1

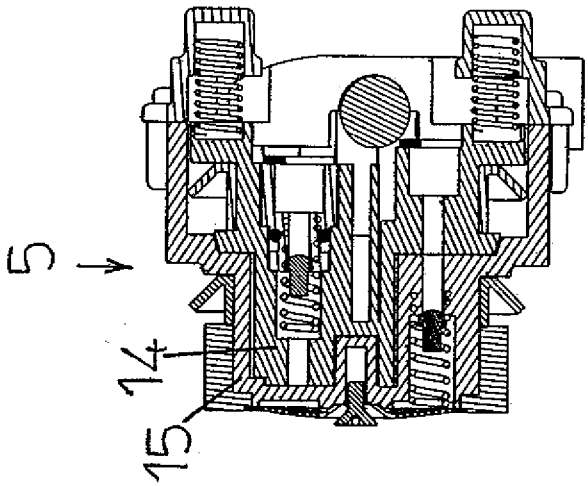


FIG5

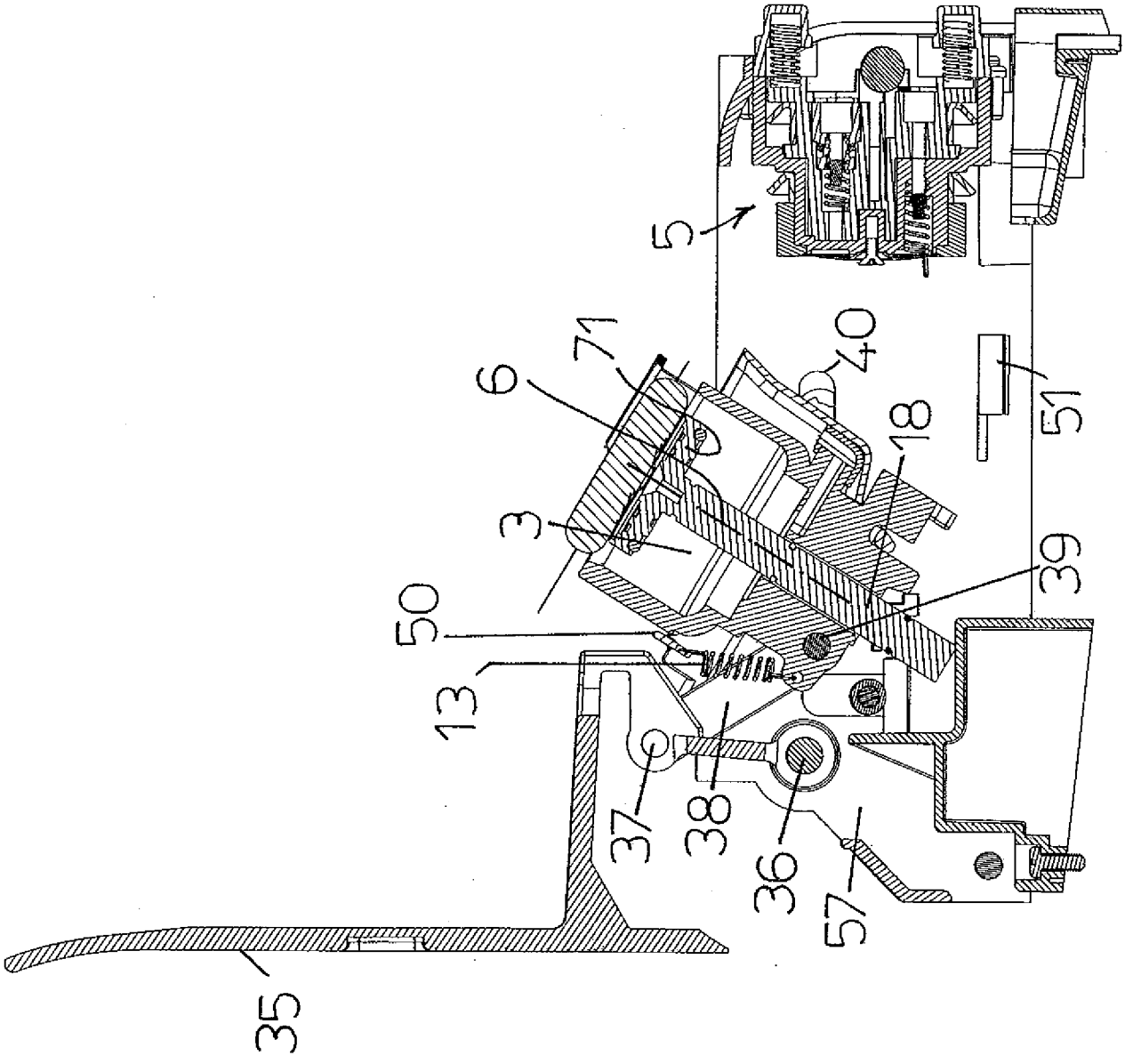


FIG 2

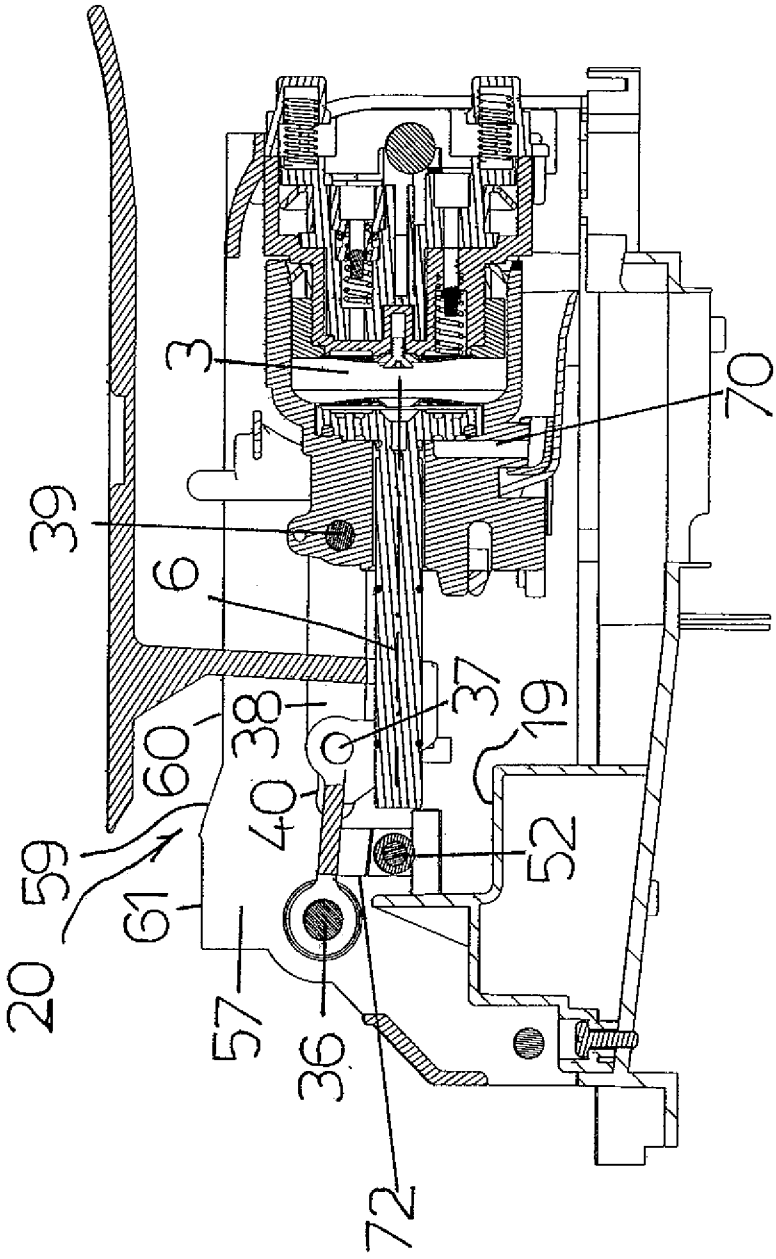


FIG 3

FIG 6

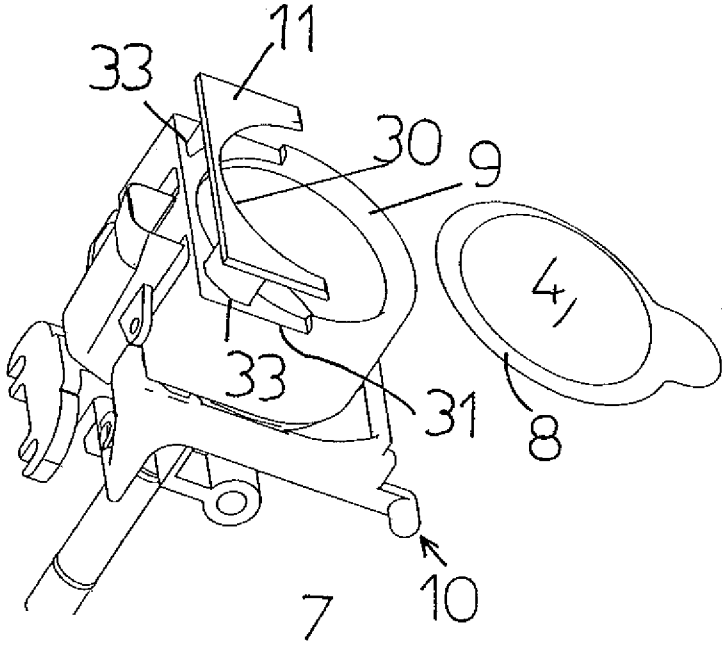
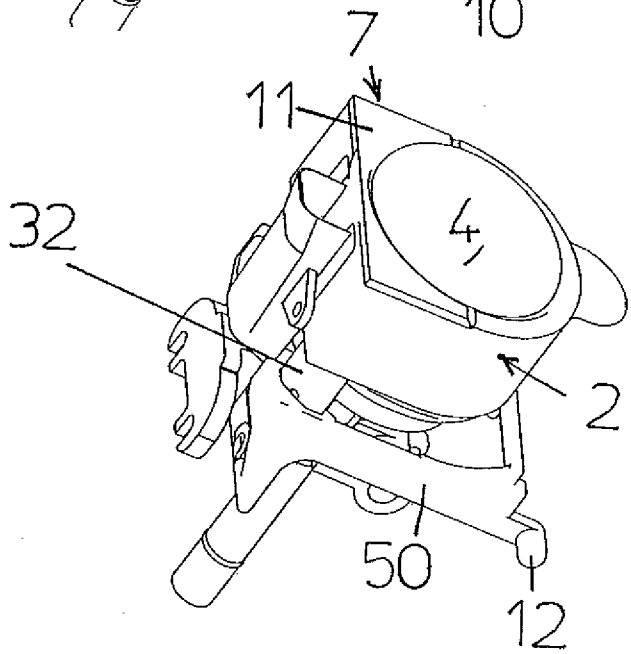


FIG 7



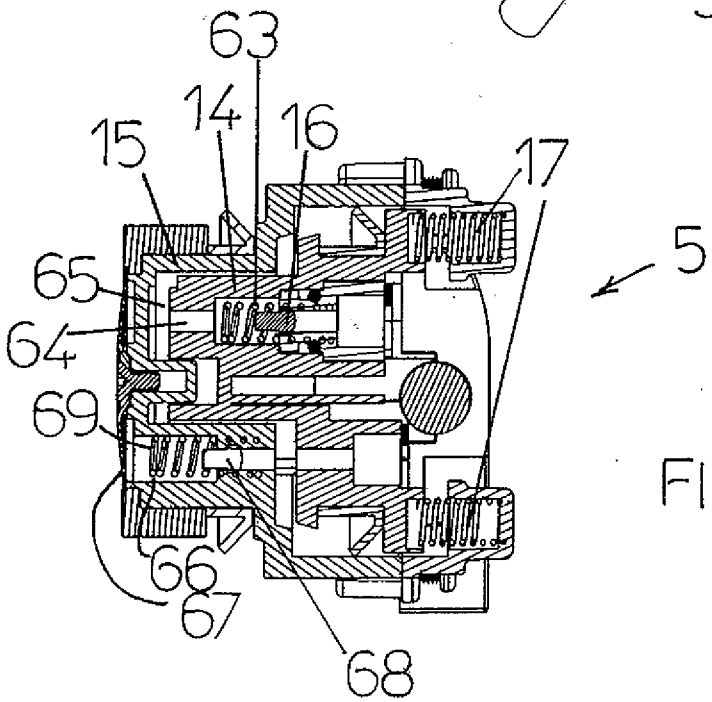


FIG 4

FIG 8

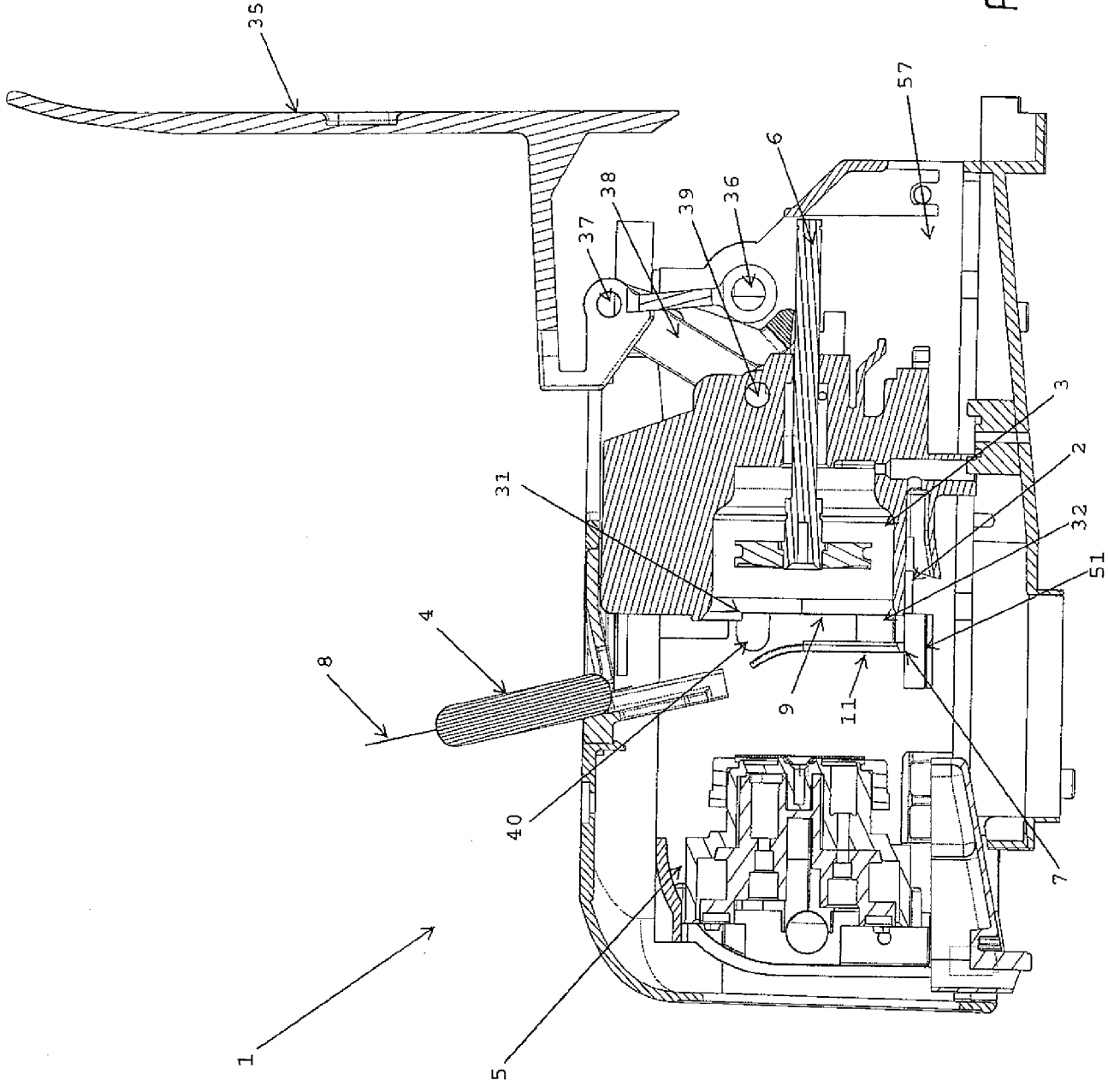


FIG9

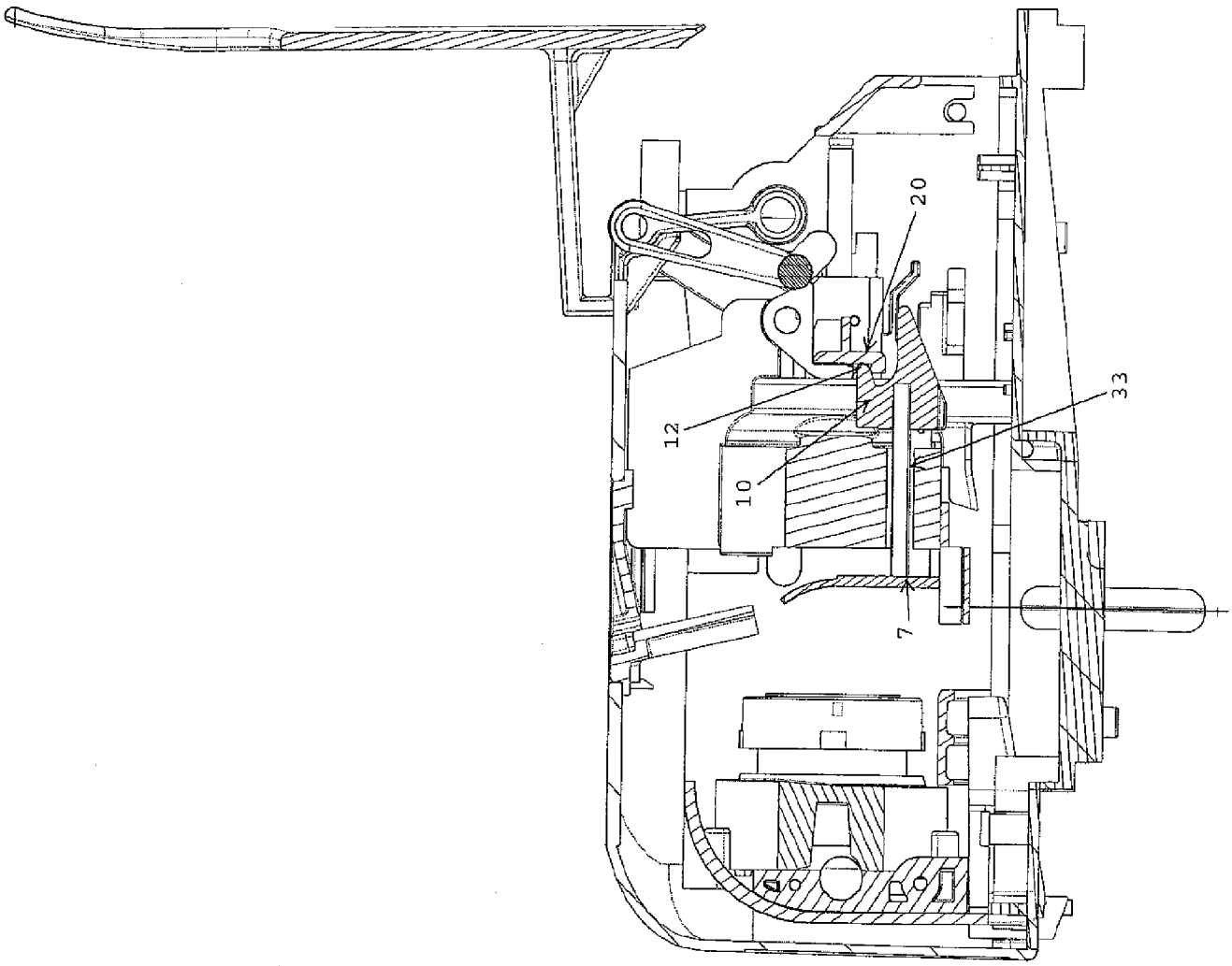


FIG10

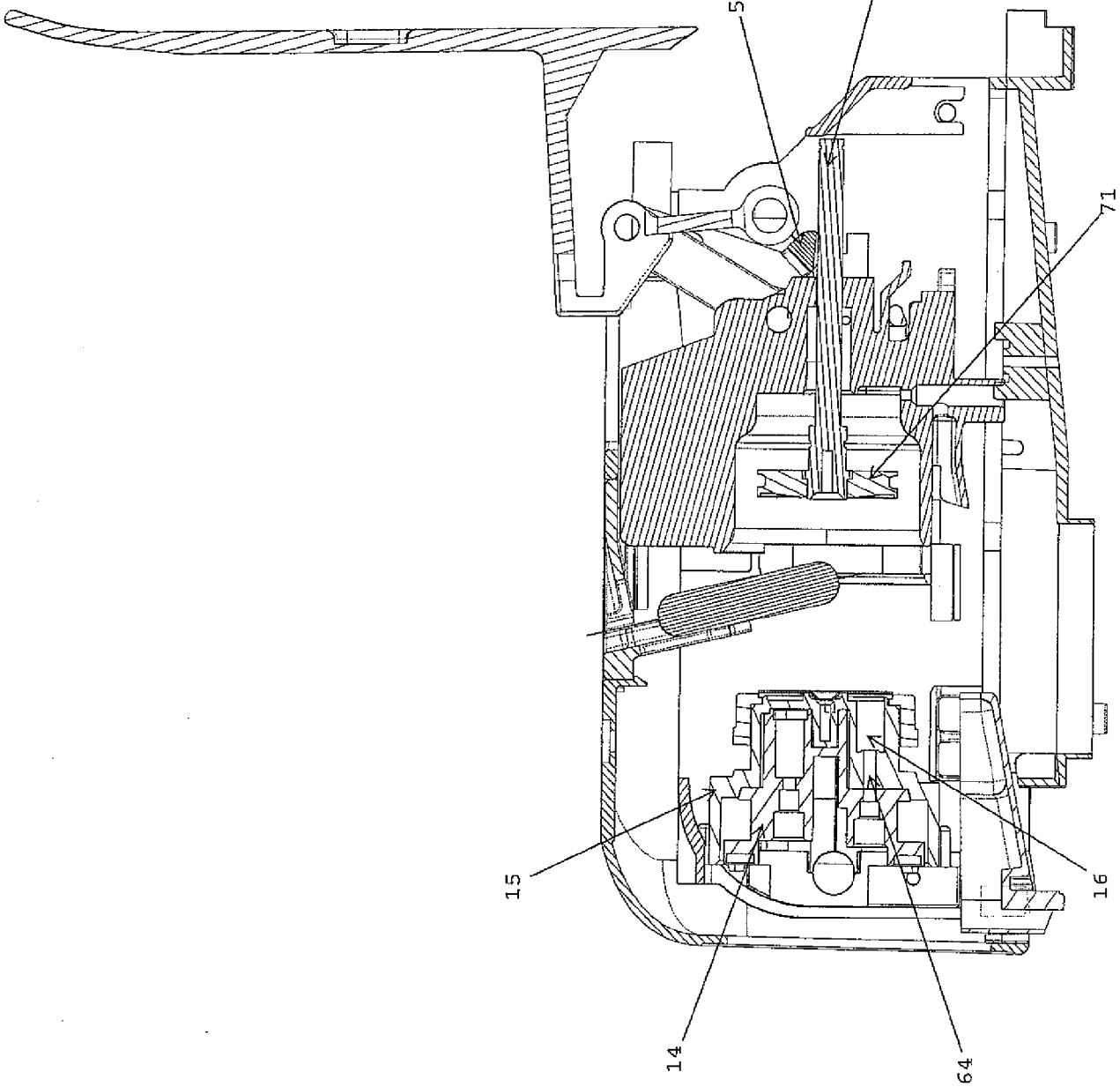
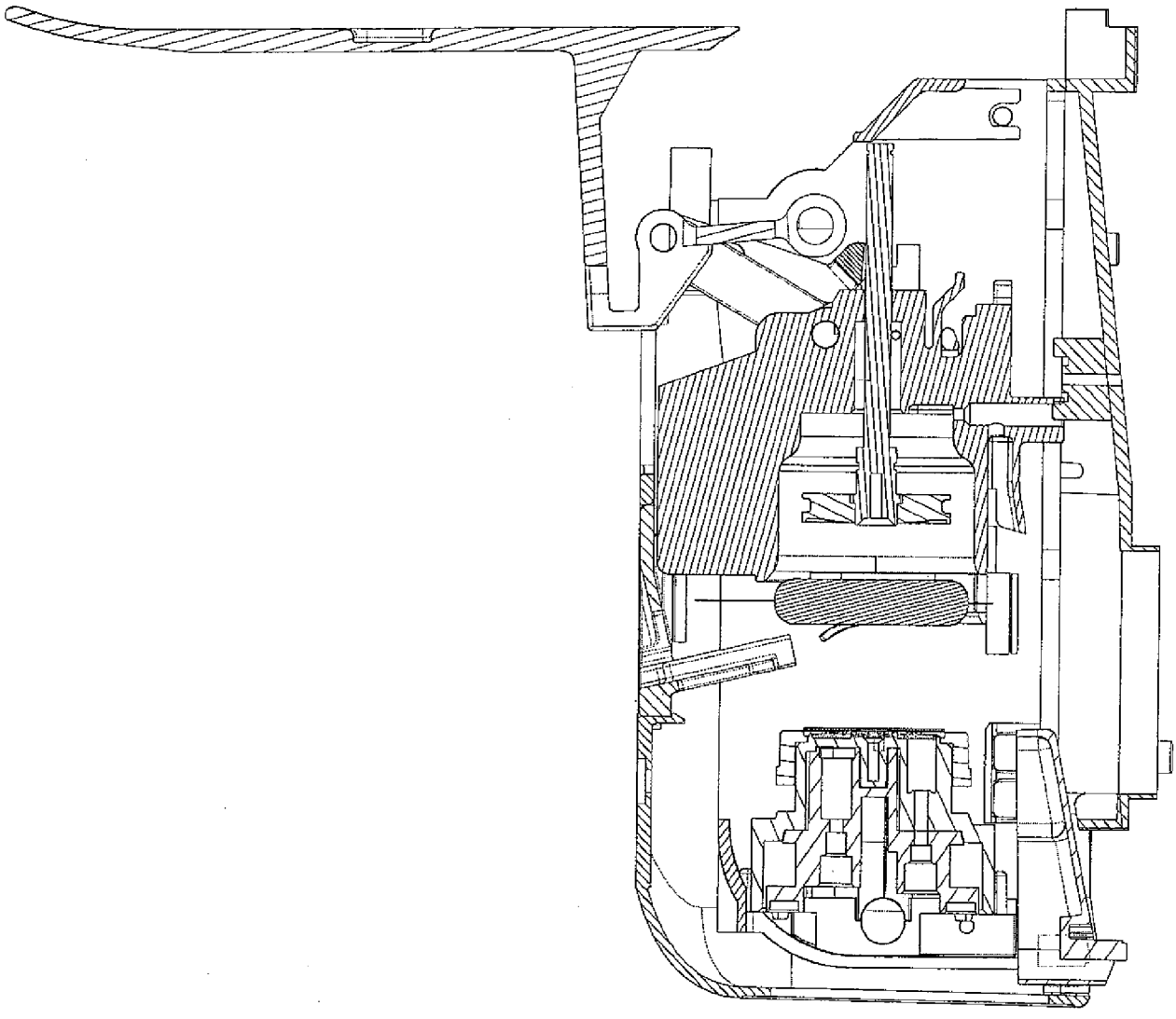


FIG11



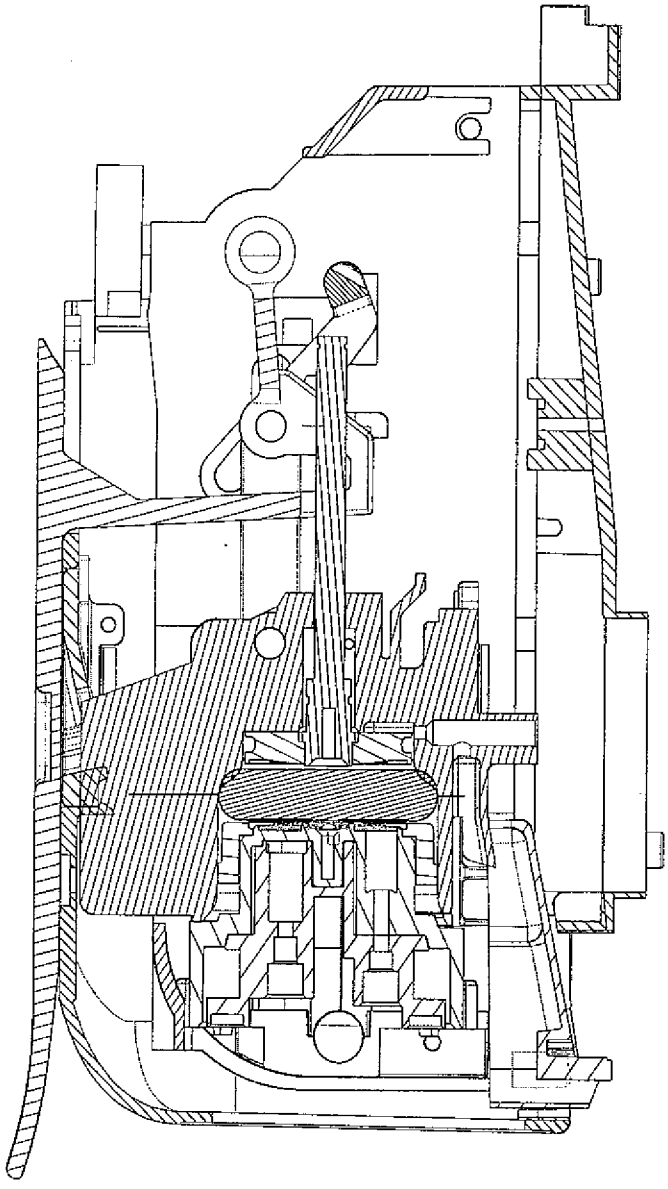


FIG 12

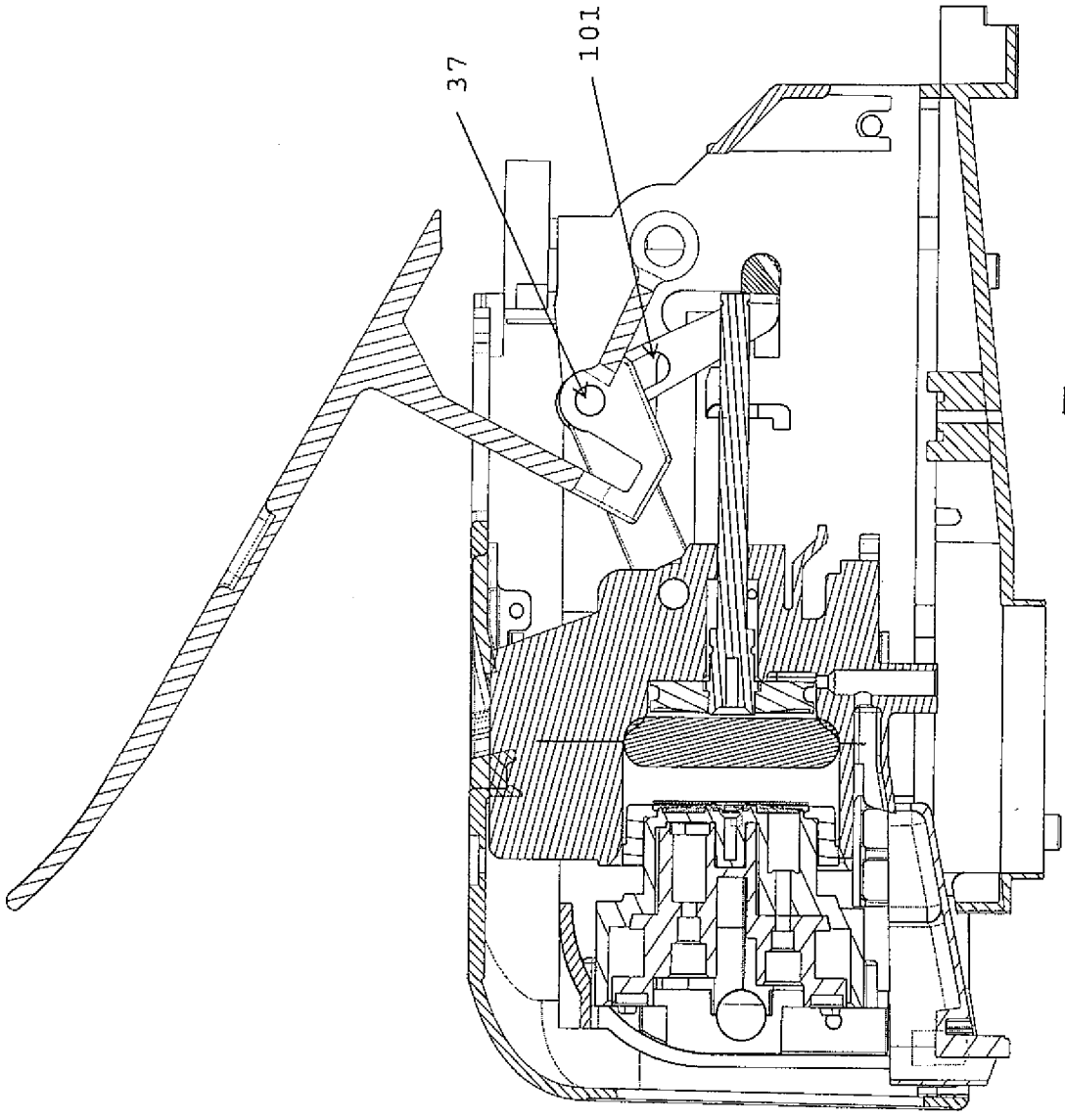


FIG 13

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2010/057534

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47J31/36
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	WO 2005/002405 A2 (TERMOZETA S P A [IT]; BARDAZZI BRUNO [IT]) 13 January 2005 (2005-01-13) page 7, paragraph 2 - page 8, paragraph 1 page 9, paragraph 4 - page 10, paragraph 2 page 11, paragraph 1 figure 8	1,16
A	CN 101 411 587 A (NINGBO BRASILIA & AAA COFFEE A [CN]) 22 April 2009 (2009-04-22) figures 7,8,9	1,16
A	EP 1 625 815 A1 (MELITTA FRANCE SAS [FR] MELITTA HAUSHALTSPRODUKTE [DE]) 15 February 2006 (2006-02-15) column 3, paragraph 15 - column 4, paragraph 22 figures 1-5	1,16

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
3 November 2010	10/11/2010

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Kempeneers, Johanna

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2010/057534

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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