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(54) **Control panel, in particular for controlling an air conditioning assembly for vehicles**

Bedienfeld, insbesondere für eine Klimaanlage eines Kraftfahrzeuges

Tableau de commande, en particulier pour appareil de climatisation de véhicule

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(73) Proprietor: **DENSO THERMAL SYSTEMS S.p.A.**
10046 Poirino (Torino) (IT)

(72) Inventor: **Musso, Marco**
10046 Poirino (IT)

(74) Representative: **Marchitelli, Mauro**
Buzzi, Notaro & Antonielli d'Oulx
Via Maria Vittoria 18
10123 Torino (IT)

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Description

[0001] The present invention relates to a control panel, in particular for controlling an air-conditioning assembly for vehicles. More precisely, the invention relates to a control panel comprising at least one rotary knob, connected via gears with a certain transmission ratio to a driven member.

[0002] EP-A-1750292 discloses a control panel corresponding to the features of the preamble of claim 1.

[0003] In a control panel of this type, it is necessary to guarantee the coupling between the control knob and the driven member, pre-set in phase with one another.

[0004] The object of the present invention is to provide a control panel that will enable coupling to one another of the control knob and the driven member in a pre-set relative angular position and without having to perform operations of adjustment.

[0005] According to the present invention, this object is achieved by a control panel having the characteristics forming the subject of Claim 1.

[0006] The characteristics and advantages of the present invention will emerge clearly in the course of the ensuing detailed description, which is provided purely by way of non-limiting example, with reference to the attached drawings, wherein:

- Figures 1 to 3 are perspective views that show the sequence of assembly of a control knob on a first body of a support;
- Figures 4, 5 and 6 are schematic cross sections according to the lines IV-IV, V-V and VI-VI of Figures 1-3, respectively;
- Figures 7, 8 and 9 are schematic cross sections illustrating the sequence of assembly of a driven member on a second body of the support; and
- Figure 10 is a cross section illustrating the condition of mutual coupling between the first and second bodies of the support.

[0007] With reference to Figures 1 to 6, the number 10 designates a part of a control panel according to the present invention. The control panel 10 comprises a support 12 including two bodies coupled to one another in the way that will be described in what follows. In Figures 1 to 6 designated by 14 is a first body of the support 12.

[0008] Once again with reference to Figures 1 to 6, the control panel 10 comprises at least one control knob 16, which can turn with respect to the support 12 about an axis 18. The knob 16 is preferably made of injection-moulded plastic material. The control knob 16 comprises a gear 20 sharing the axis of rotation 18 of the knob 16, preferably formed of a single piece with the body of the knob 16. The control knob 16 is moreover provided with an annular flange 22 projecting from an external circumferential wall 24 of the body of the knob 16. The annular flange 22 is preferably situated at the base of the toothing 20. The annular flange 22 is provided with a notch 26,

the function of which will emerge clearly in the following of the description.

[0009] The first body 14 of the support 12 is preferably made of injection-moulded plastic material and comprises a hub 28 with a cylindrical outer wall on which a cylindrical internal surface 30 of the control knob 16 is rotatably coupled. The first body 14 comprises a plurality of snap-engagement teeth 32 that are designed to engage the annular flange 22 of the control knob 16 so as to constrain the knob 16 to the first body 14 in the direction of the axis of rotation 16, leaving, however, the knob 16 free to turn about the axis 18.

[0010] As illustrated in Figures 1 to 3, the first body 14 of the support 12 carries an idle gear 34, which can turn about an axis 36 parallel to the axis of rotation 18 of the control knob 16. The idle gear 34 is inserted in meshing contact with the toothing 20 of the control knob 16 when the knob 16 has been inserted on the hub 28 (Figure 2).

[0011] The first body 14 of the support 12 moreover comprises anelastically deformable tongue 38 which is integrally formed with the body 14 and is able to bend in the direction of the axis 18. The deformable tongue 38 has an end 40 that is designed to engage the notch 36 of the annular flange 22.

[0012] With reference to Figures 7, 8 and 9, the support 12 comprises a second body 42 designed to be coupled and fixed to the first body 14. Preferably, also the second body 42 is made of injected plastic material. The second body 42 has a seat 44, within which a driven member 46 is rotatably engaged. The driven member 46 can turn with respect to the second body 42 about an axis 48. The driven member 46 has a toothing 50 coaxial with the axis of rotation 48. The member 46 is moreover provided with an annular flange 52 similar to the annular flange 22 of the control knob 16. The annular flange 52 of the driven member 46 is provided with a notch 54 similar to the notch 26 of the control knob 16.

[0013] Once again with reference to Figures 7 to 9, the second body 42 of the support 12 is provided with a flexible tab 56, which is elastically deformable in the direction of the axis 48. The flexible tab 56 has an end 58 that is designed to engage the notch 54 of the annular flange 52.

[0014] The sequence of assembly of the control panel 10 according to the present invention is described in what follows.

[0015] In a first step, the control knob 16 is inserted in the direction of its own axis 18 on the hub 28 of the first body 14 in the direction indicated by the arrow in Figures 1 and 2. The control knob 16 has a random angular orientation with respect to the first body 14. Following upon fitting on the hub 28 in an axial direction, the teeth 32 engage by snap action the top side of the annular flange 22, axially withholding the control knob 16 with respect to the first body 14. As is illustrated in Figure 2, the annular flange 22 interferes with the end 40 of the flexible tab 38 and produces elastic bending of the tab 38. Subsequently, as illustrated in Figure 3, the control knob 16 is turned about the axis 18 in the direction indicated by the arrow.

Following upon said rotation, the notch 26 of the annular flange 22 moves to the end 40 of the flexible tab 38. When the notch 26 is positioned at the end 40, the flexible tab 38 returns into its undeformed condition, bringing the end 40 into engagement with the notch 26. In this condition, illustrated in Figure 3, the control knob 16 is blocked angularly with respect to the first body 14 and is withheld in a pre-set angular position.

[0016] With reference to Figures 7, 8 and 9, the driven member 46 is mounted on the second body 42 with a sequence substantially similar to the sequence of assembly of the control knob 16 on the first body 14. In a first step, as illustrated in Figures 7 and 8, the driven member 46 is inserted in the direction of its own axis 48 in the seat 44 of the second body 42. In this step, the angular orientation of the driven member 46 with respect to the second body 42 is random. The annular flange 52 of the driven member 46 interferes with the end 58 of the flexible tab 56 and elastically deforms the tab 56, as illustrated in Figure 8. Subsequently, the driven member 46 is turned about its own axis 48 until engagement of the end 58 of the flexible tab 56 with the notch 54 (configuration of Figure 9) is obtained. In this condition, the driven member 46 is blocked in a pre-set angular position with respect to the second body 42.

[0017] Finally, as illustrated in Figure 10, the first and second bodies 14, 42 are coupled to one another with a movement in the direction of the axes 18, 48. In the condition of mutual coupling illustrated in Figure 10, a member 60 for disengagement of the first body 14 acts on the flexible tab 56 of the second body 42. Accordingly, a member 62 for disengagement of the second body 42 acts on the flexible tab 38 of the first body 14. The disengagement members 60, 62 push the flexible tabs 56, 38 into an elastically deformed position, in which the respective ends 58, 40 are disengaged by the notches 54, 26. In this condition, the control knob 16 and the driven member 46 are free to turn about the axes 18, 48.

[0018] During the movement of mutual coupling between the two bodies 14, 42, the toothing 50 of the driven member 46 engages the gear 36, carried by the first body 14 or else a further fixed gear coaxial with respect to the gear 36.

[0019] In the example illustrated in the figures, the axes of rotation of the control knob 16 and of the driven member 46 are coincident with one another. Alternatively, the control knob 16 and the driven member 46 could be able to turn about non-coaxial parallel axes.

[0020] It will be understood that the system according to the present invention enables mounting of the control knob 16 and the driven member 46 pre-set in phase with one another, without any need to perform operations of adjustment or setting. The system according to the invention does not enable mutual coupling between the bodies 14, 42 if not in the condition in which the control knob 16 is in the correct phase relationship with respect to the driven member 46.

[0021] The control knob 16 and the driven member 46

could be mounted both on the same body 14 or 42. In this case, the disengagement members 60, 62 would both be provided, on a body 14 or 42 complementary to the one carrying the control knob 16 and the driven member 46.

Claims

1. A control panel, in particular for controlling an air-conditioning assembly for vehicles, comprising:

- a support (12);
- at least one control knob (16), which can turn with respect to the support (12); and
- at least one driven member (46), which can turn with respect to the support (12) and is connected to the control knob (16) by means of gears (20, 34, 50),

said control panel being **characterized in that** said support (12) comprises first and second retention means (38, 56) co-operating with complementary retention means (26, 54) of the control knob (16) and of the driven member (46) for constraining the control knob (16) and the driven member (46) with respect to the support (12) in respective pre-set angular positions, and **in that** the support (12) comprises a first body (14) and a second body (42), which can be coupled to one another and are equipped with disengagement means (60, 62) co-operating with said first and second retention means (38, 56) for disengagement of the control knob (16) and the driven member (46) from the respective retention means (38, 56) when the first and second bodies (14, 42) of the support (12) are coupled to one another.

2. Control panel according to Claim 1, **characterized in that** said retention means comprise flexible tabs (38, 56), which are elastically deformable and co-operate with notches (26, 54) provided on annular flanges (22, 52) of the control knob (16) and of the driven member (46).

3. Control panel according to Claim 2, **characterized in that** said disengagement members (60, 62) push the respective flexible tabs (38, 56) in a deformed position, in which the flexible tabs (38, 56) are disengaged by the control knob (16) and by the driven member (46).

4. Control panel according to Claim 2 or Claim 3, **characterized in that** said flexible tabs (38, 56) are made integrally on at least one of said bodies (14, 42).

Patentansprüche

1. Steuerfeld, insbesondere für die Steuerung einer Klimaanlage-Anordnung für Fahrzeuge, enthaltend:

- eine Halterung (12);
- wenigstens einen Steuerknopf (16), der sich im Bezug auf die Halterung (12) drehen kann; und
- wenigstens ein angetriebenes Element (46), das sich im Bezug auf die Halterung (12) drehen kann und mit dem Steuerknopf (16) mit Hilfe von Zahnrädern (20, 34, 50) verbunden ist,

wobei das Steuerfeld **dadurch gekennzeichnet ist, dass** die Halterung (12) eine erste und eine zweite Rückhalteeinrichtung (38, 56) enthält, die mit komplementären Rückhalteeinrichtungen (26, 54) des Steuerknopfes (16) und des angetriebenen Elementes (46) zusammenwirken, um den Steuerknopf (16) und das angetriebene Element (46) im Bezug auf die Halterung (12) auf entsprechende voreingestellte Winkelstellungen zu beschränken, und dadurch, dass die Halterung (12) einen ersten Körper (14) und einen zweiten Körper (42) enthält, die miteinander gekoppelt werden können und mit Löseeinrichtungen (60, 62) ausgestattet sind, die mit der ersten und der zweiten Rückhalteeinrichtung (38, 56) zusammenwirken, um den Steuerknopf (16) und das angetriebene Element (46) aus den entsprechenden Rückhalteeinrichtungen (38, 56) zu lösen, wenn der erste und der zweite Körper (14, 42) der Halterung (12) miteinander gekoppelt sind.

2. Steuerfeld nach Anspruch 1, **dadurch gekennzeichnet, dass** die Rückhalteeinrichtungen flexible Nasen (38, 56) enthalten, die elastisch verformbar sind und mit Kerben (26, 54) zusammenwirken, die an ringförmigen Flanschen (22, 52) des Steuerknopfes (16) und des angetriebenen Elementes (46) vorgesehen sind.

3. Steuerfeld nach Anspruch 2, **dadurch gekennzeichnet, dass** die Löseelemente (60, 62) die jeweiligen flexiblen Nasen (38, 56) in eine verformte Stellung drücken, in der die flexiblen Nasen (38, 56) von dem Steuerknopf (16) und dem angetriebenen Element (46) gelöst sind.

4. Steuerfeld nach Anspruch 2 oder 3, **dadurch gekennzeichnet, dass** die flexiblen Nasen (38, 56) integral an wenigstens einem der Körper (14, 42) ausgebildet sind.

der un ensemble climatiseur pour des véhicules, comprenant :

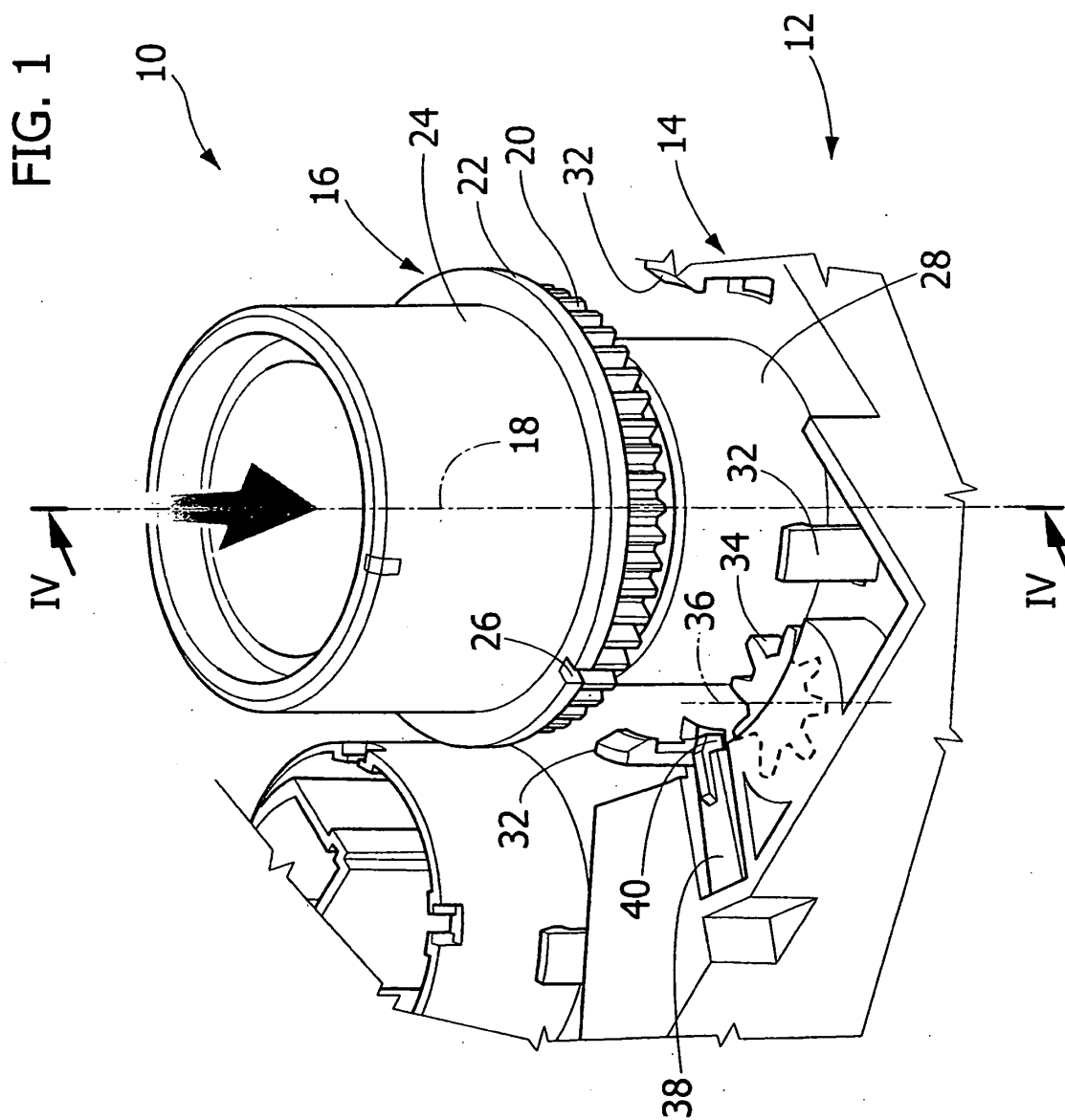
- un support (12) ;
- au moins un bouton de commande (16), qui peut tourner par rapport au support (12) ; et
- au moins un élément entraîné (46), qui peut tourner par rapport au support (12) et est relié au bouton de commande (16) au moyen de roues dentées (20, 34, 50),

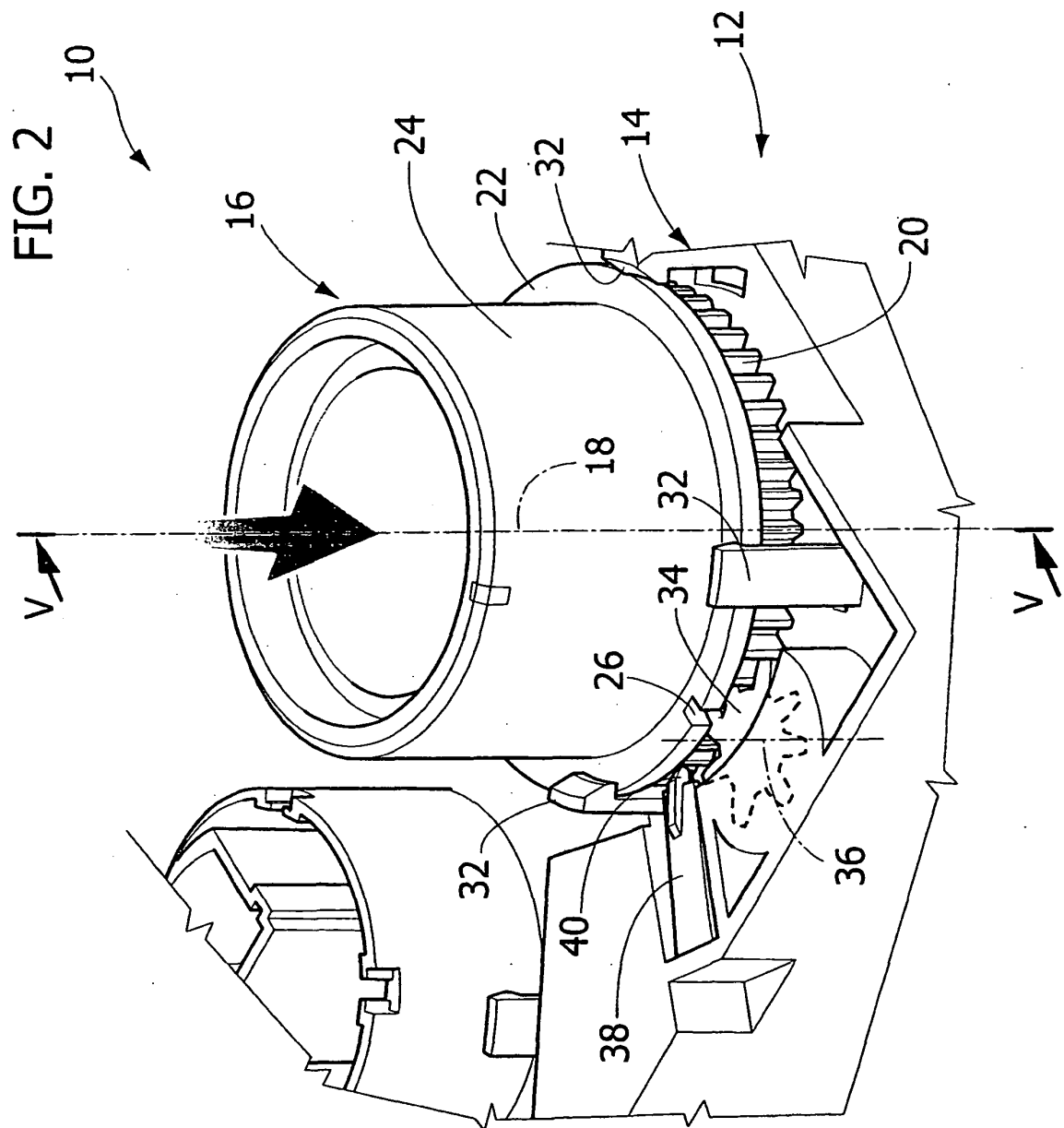
ledit tableau de commande étant **caractérisé en ce que** ledit support (12) comprend des premier et second moyens de retenue (38, 56) coopérant avec des moyens de retenue complémentaires (26, 54) du bouton de commande (16) et de l'élément entraîné (46) pour contraindre le bouton de commande (16) et l'élément entraîné (46) par rapport au support (12) dans des positions angulaires prédéterminées respectives, et **en ce que** le support (12) comprend un premier corps (14) et un second corps (42), qui peuvent être accouplés l'un à l'autre et sont équipés de moyens de séparation (60, 62) coopérant avec lesdits premier et second moyens de retenue (38, 56) pour la séparation du bouton de commande (16) et de l'élément entraîné (46) à partir des moyens de retenue respectifs (38, 56) lorsque les premier et second corps (14, 42) du support (12) sont accouplés l'un à l'autre.

2. Tableau de commande selon la revendication 1, **caractérisé en ce que** lesdits moyens de retenue comprennent des languettes flexibles (38, 56), qui sont déformables de façon élastique et coopèrent avec des encoches (26, 54) prévues sur des brides annulaires (22, 52) du bouton de commande (16) et de l'élément entraîné (46).
3. Tableau de commande selon la revendication 2, **caractérisé en ce que** lesdits éléments séparation (60, 62) poussent les languettes flexibles respectives (38, 56) dans une position déformée, dans laquelle les languettes flexibles (38, 56) sont séparées par le bouton de commande (16) et par l'élément entraîné (46).
4. Tableau de commande selon la revendication 2 ou la revendication 3, **caractérisé en ce que** lesdites languettes flexibles (38, 56) sont réalisées de façon intégrée sur au moins un desdits corps (14, 42).

Revendications

1. Tableau de commande, en particulier pour comman-





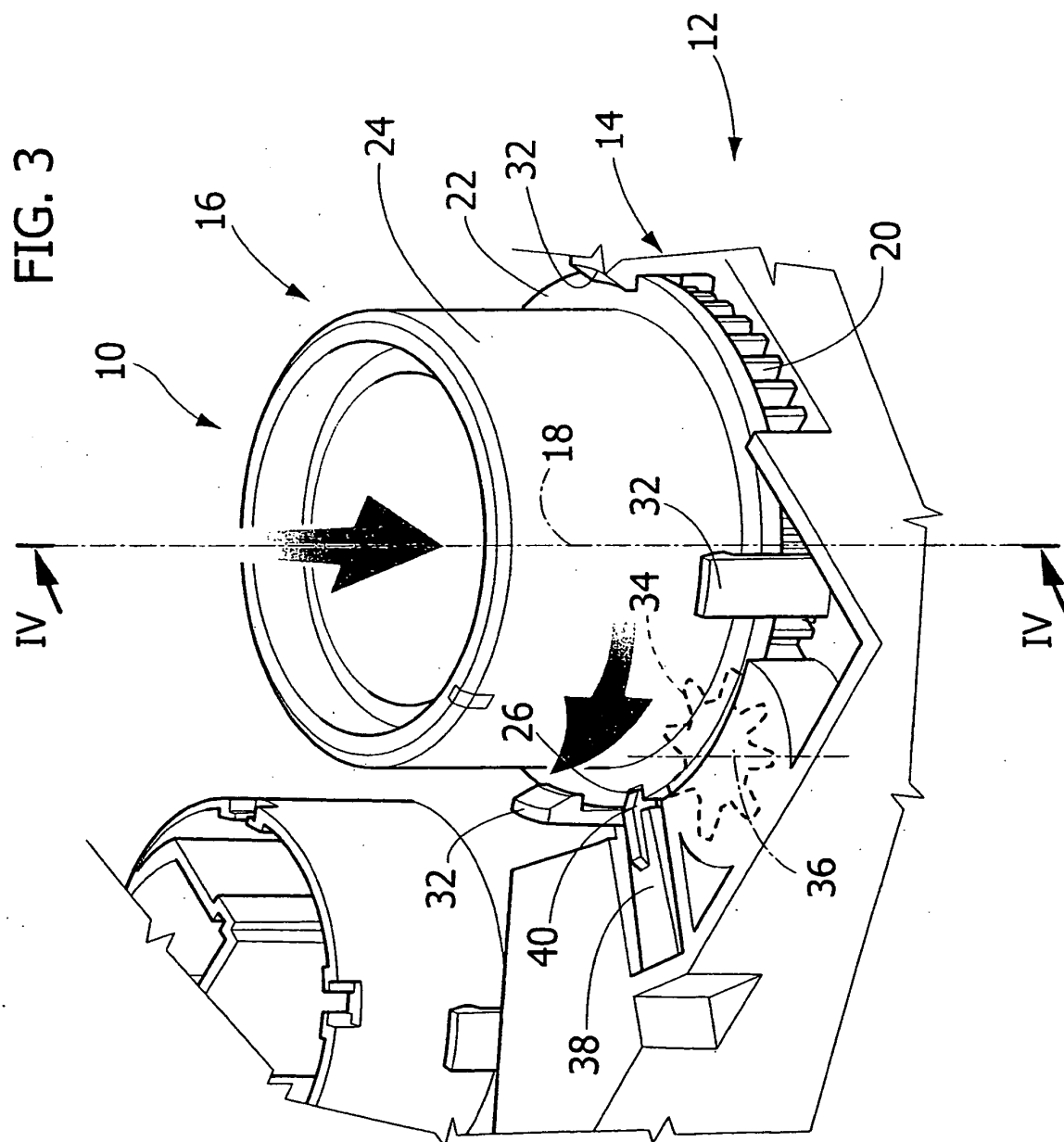


FIG. 4

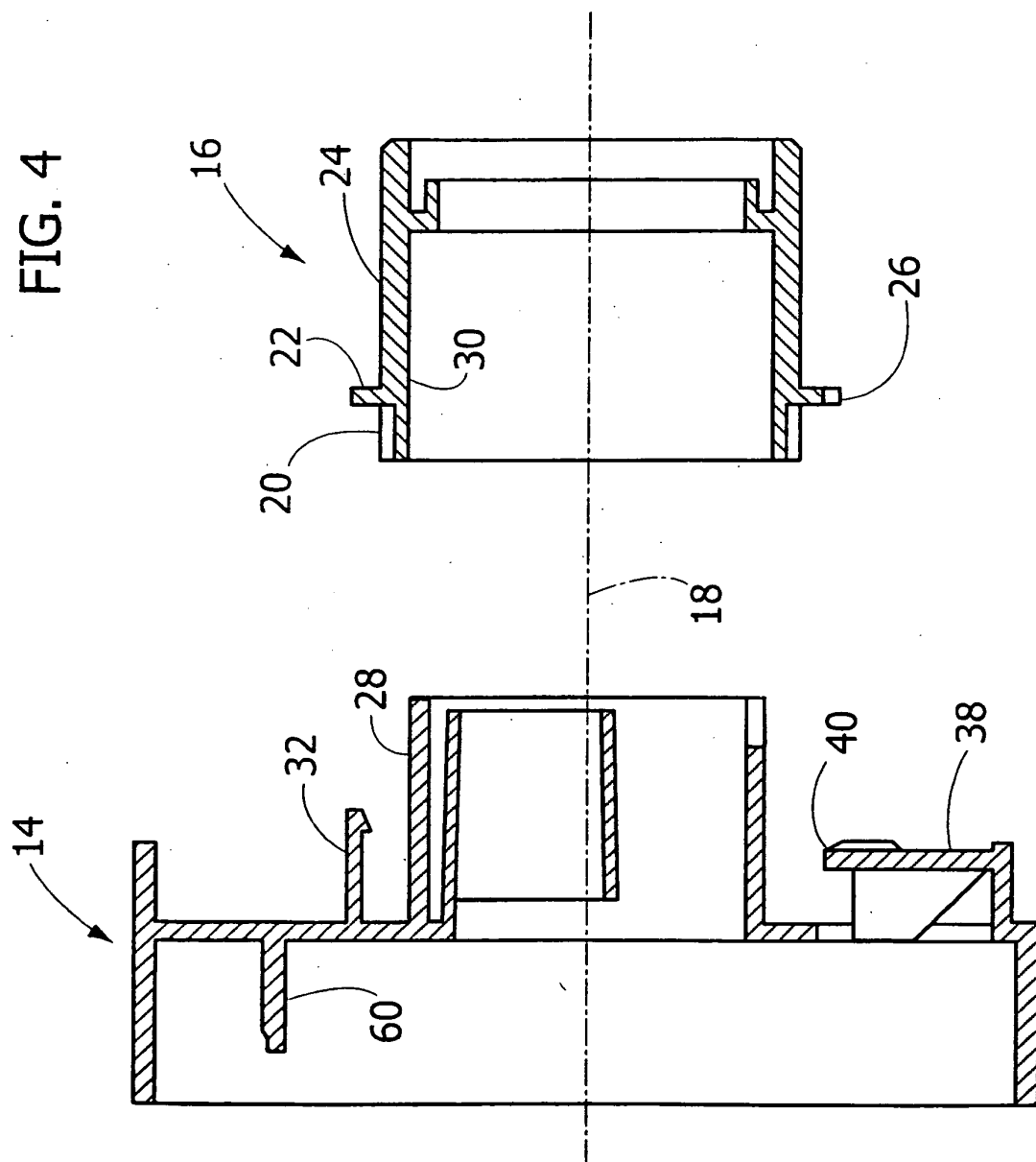


FIG. 5

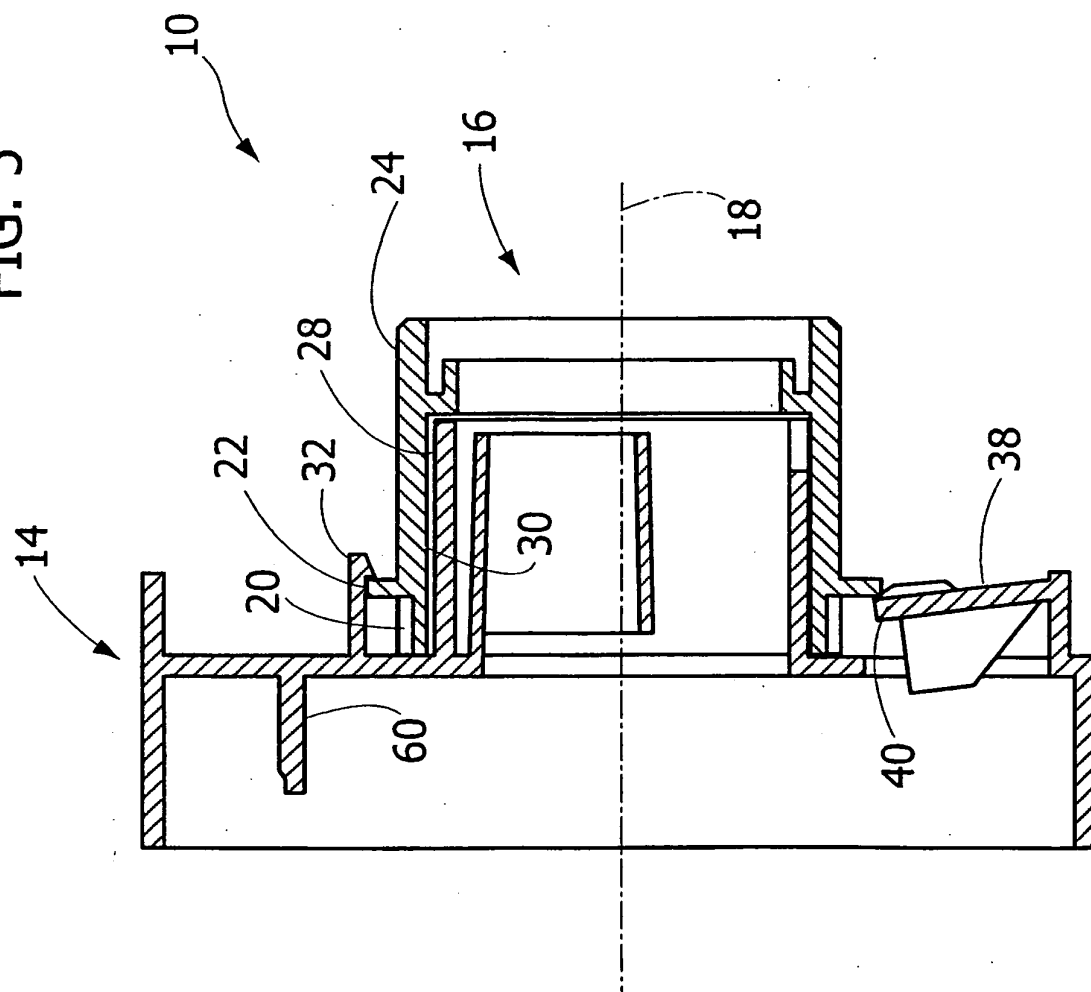


FIG. 6

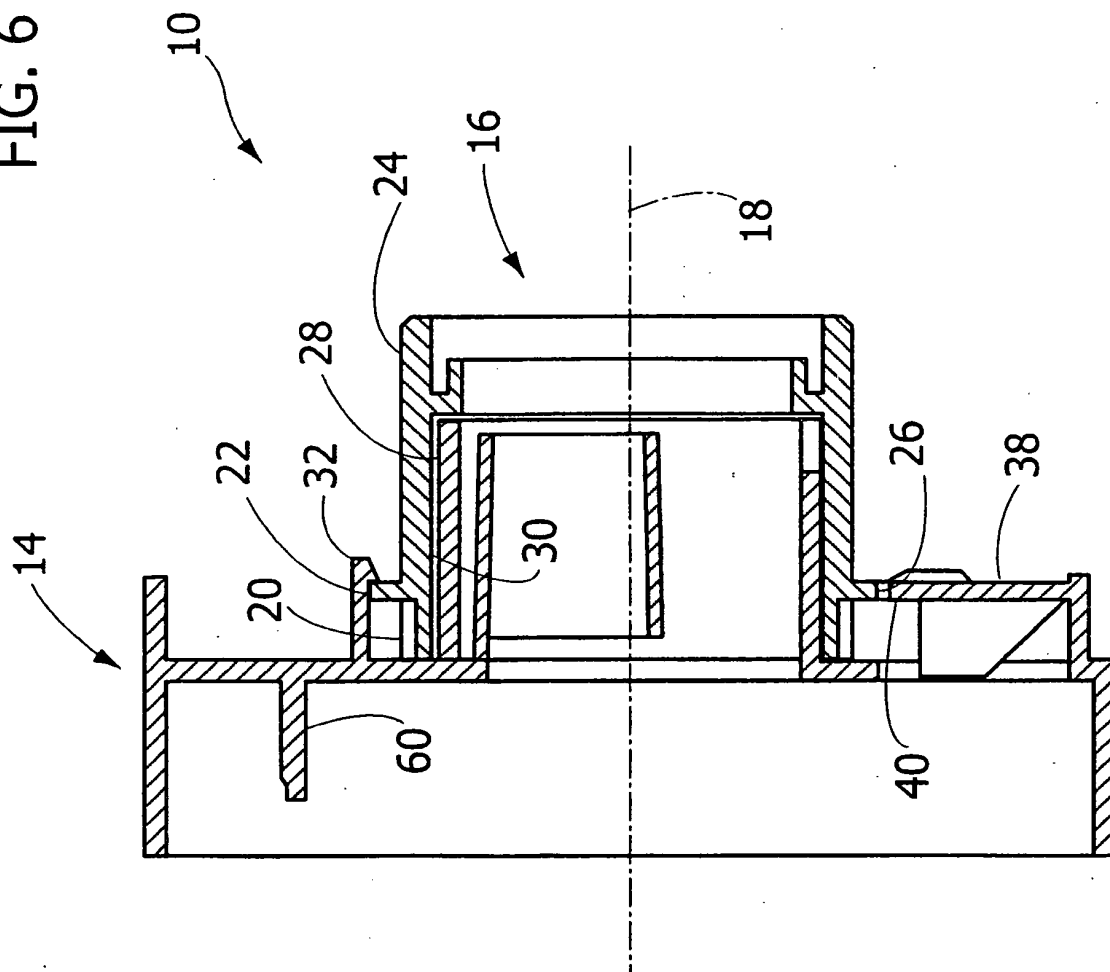


FIG. 7

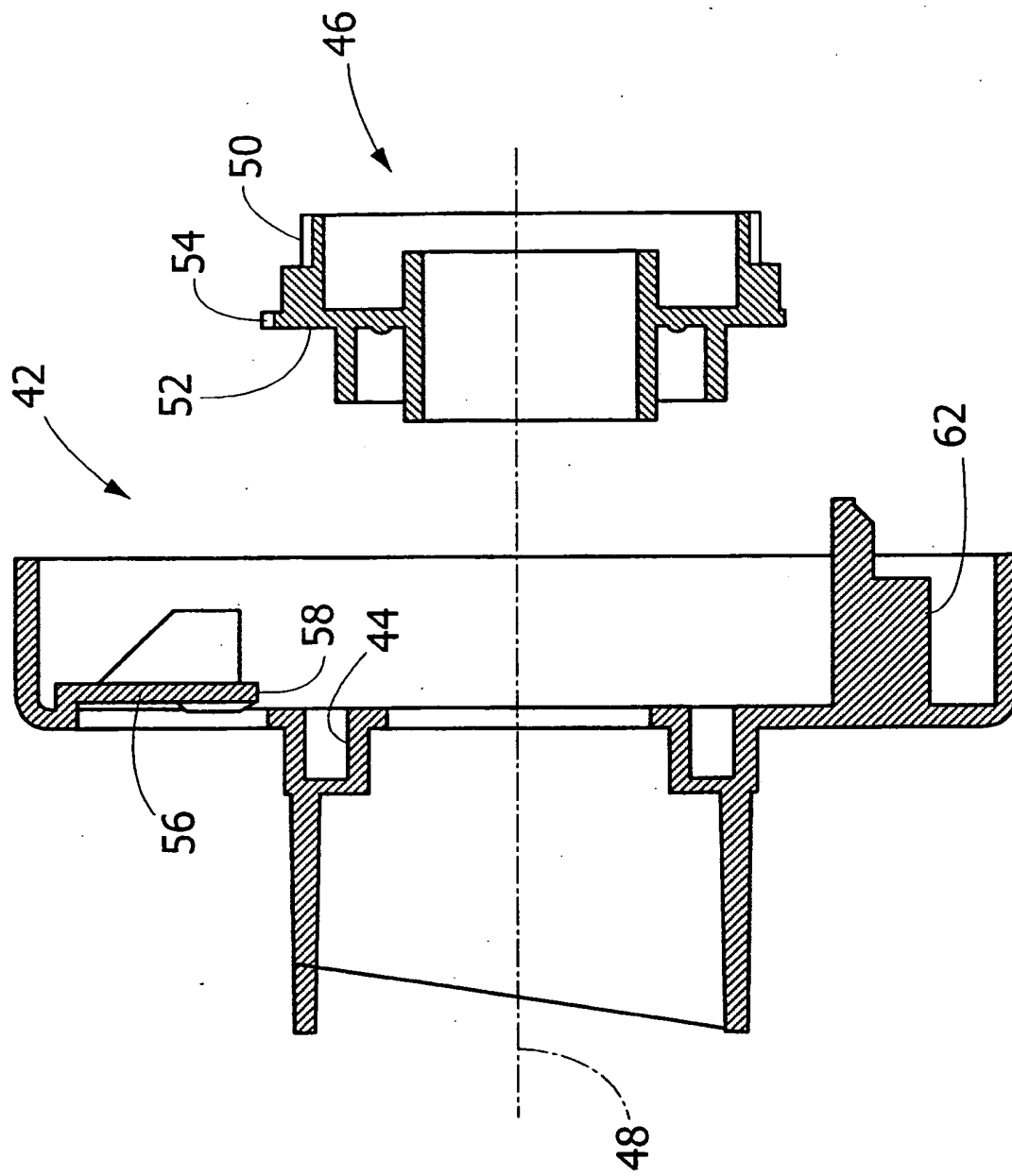


FIG. 8

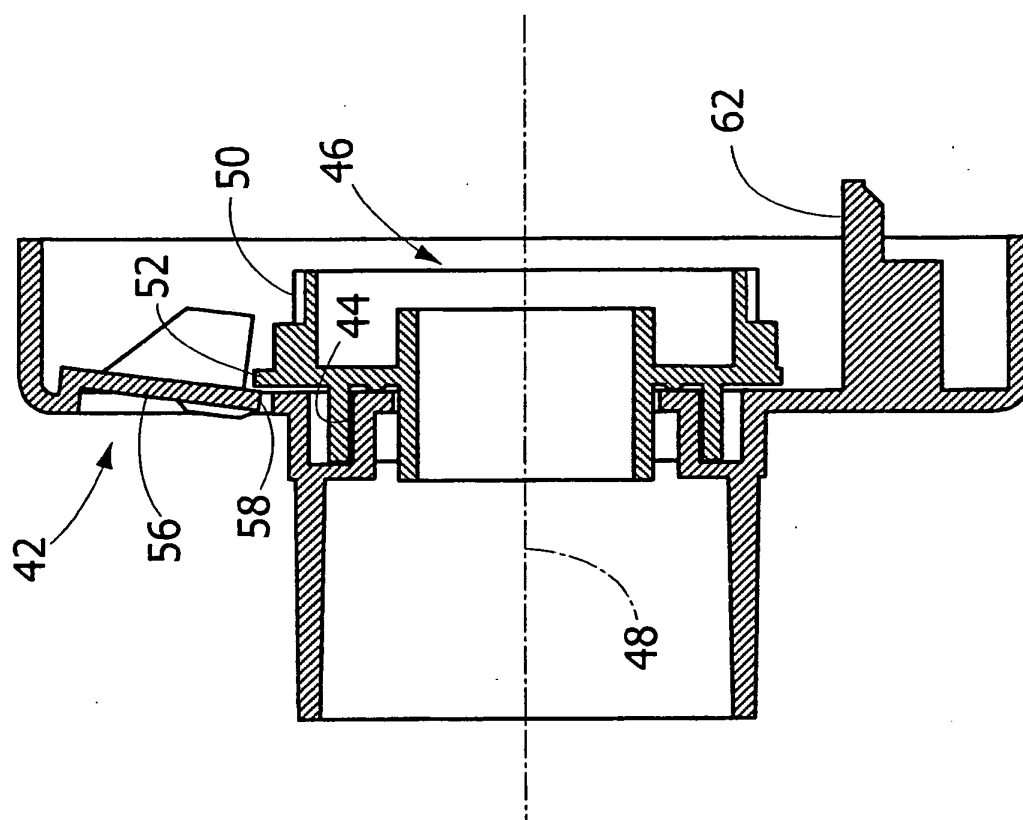


FIG. 9

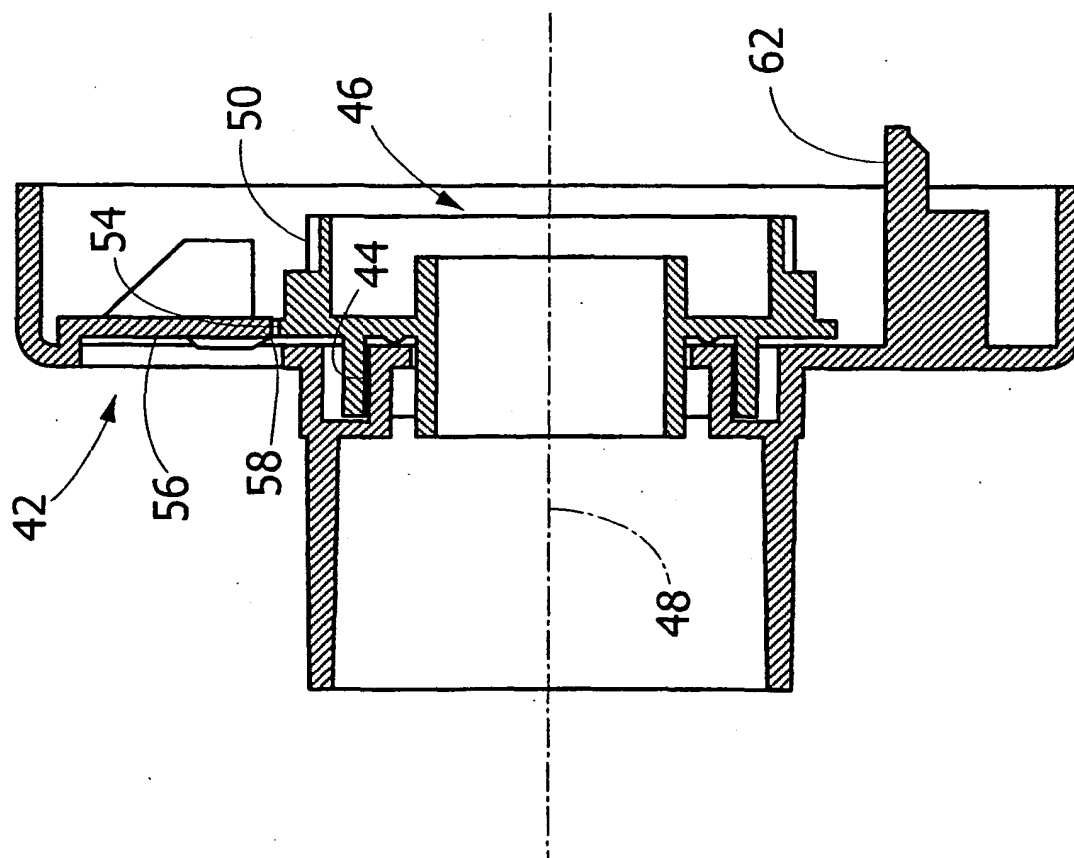
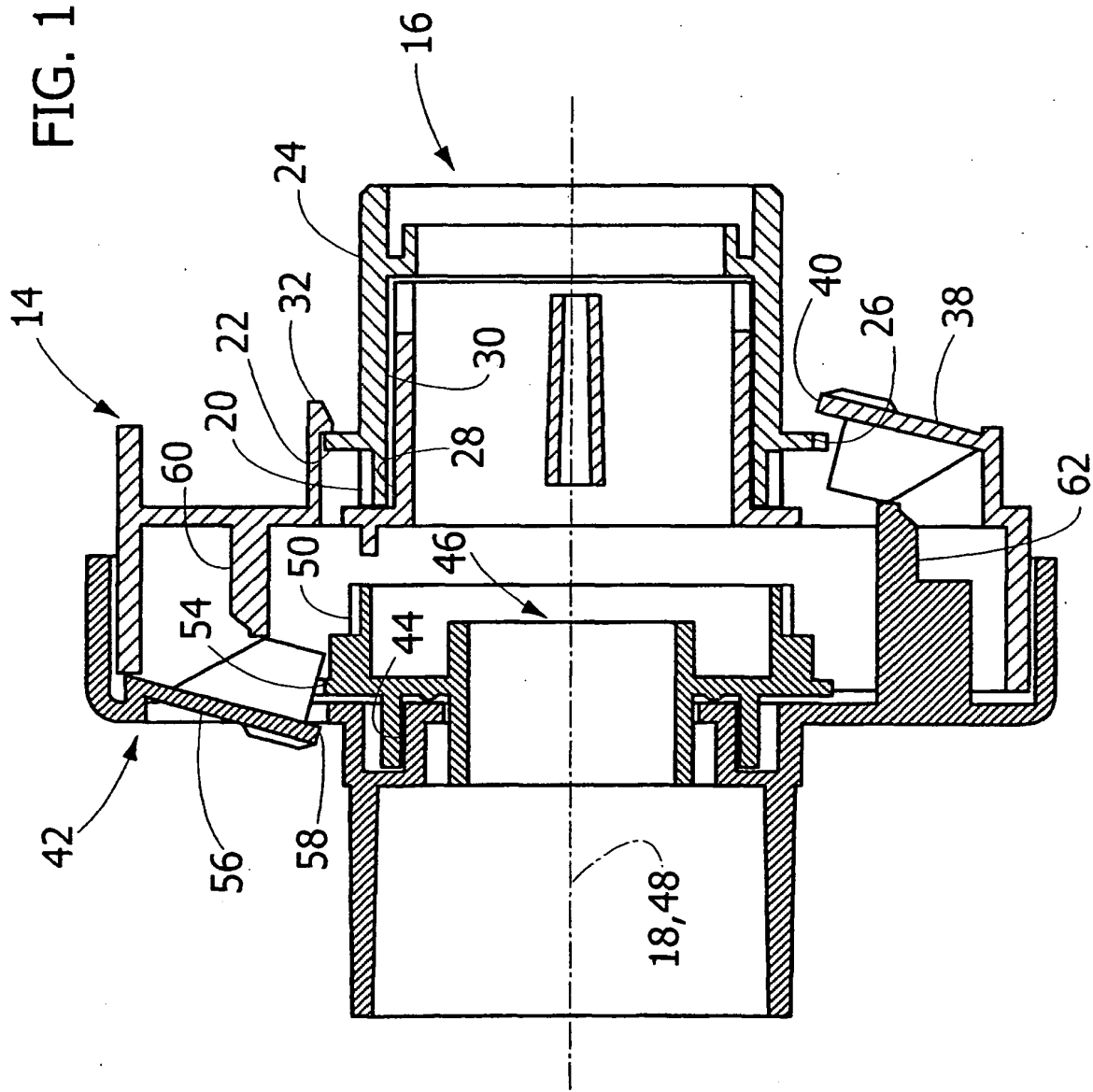


FIG. 10



REFERENCES CITED IN THE DESCRIPTION

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