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(54) **INTAKE DEVICE OF ENGINE**

ANSAUGVORRICHTUNG EINER BRENNKRAFTMASCHINE

DISPOSITIF D'ADMISSION DE MOTEUR

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- **PATENT ABSTRACTS OF JAPAN vol. 1998, no. 03, 27 February 1998 (1998-02-27) -& JP 09 303164 A (HITACHI LTD), 25 November 1997 (1997-11-25)**
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Description

[0001] The present Invention relates to an air Intake system in an engine, and particularly, to an improvement in an air intake system in an engine, comprising a bypass passage bypassing a throttle valve and connected to an intake passage in a throttle body, and an actuator which is connected to a bypass valve for opening and closing the bypass passage and is operable to open and close the bypass valve.

[0002] Such an air intake system in an engine is conventionally known, for example, as disclosed in US Patent No.5, 711,271 and Japanese Utility Model Application Laid-open No.63-136236.

[0003] The air intake system in the engine disclosed in US Patent No. 5,711,271 is constructed such that a valve member of a bypass valve, a rotational angle encoder, a temperature sensor and a pressure sensor are assembled to a device module, and the resulting assembly is mounted to a housing in which a throttle valve is mounted. The entire bypass passage is defined within the housing of the throttle valve, and during mounting of the device module, the bypass valve is to be incorporated in the midway of the bypass passage within the housing and to be brought into engagement with a valve seat formed in the housing. With such arrangement, it is necessary to define the bypass passage of a bent shape in the throttle body and to provide the valve seat for the bypass valve. For this reason, a complicated working is required and thus, an increase in manufacture cost cannot be avoided.

[0004] Furthermore, such an arrangement is disclosed in Japanese Utility Model Application Laid-open No. 63-136236 that a bypass passage is defined in a separate housing assembled to a throttle body, and a control valve is incorporated in the midway of the bypass passage. A solenoid for opening and closing the control valve is accommodated in a case separate from the housing having the bypass passage and the control valve provided therein, and other components such as a throttle sensor are not shown.

[0005] It is an object of the present invention to provide an automatic starting system for a carburetor of the above-described type, wherein the above disadvantages are solved.

[0006] JP-A-09 303164 discloses an air intake system in an engine comprising a bypass passage bypassing a throttle valve and connected to an intake passage in a throttle body, and an actuator which is connected to a bypass valve for opening and closing the bypass passage and is operable to open and close the bypass valve, the bypass passage being comprised of a bypass inlet bore and bypass outlet bore which are provided in the throttle body and open into an upstream portion and a downstream portion of the intake passage respectively with the throttle valve interposed therebetween.

[0007] The present invention is characterised in that the bypass passage is further comprised of a bypass intermediate portion which is provided in a device block detachably secured to a mounting surface formed on the throttle body and is connected at opposite ends thereof to the bypass inlet bore and the bypass outlet bore, respectively; a metering bore for controlling the flow rate of intake air in the bypass passage by cooperation with the bypass valve is disposed in the midway of the bypass intermediate portion; and the bypass valve, the actuator and an output portion of a throttle sensor for detecting an opening degree of the throttle valve are mounted to the device block to form a bypass valve/sensor assembly.

[0008] With the air intake system of the present invention, the number of working steps for the throttle body is reduced, and the bypass valve/sensor assembly can be fabricated in parallel to the formation of the throttle body, leading to an enhancement in productivity. Moreover, if the device block is removed from the throttle body, the maintenance of the bypass passage, the bypass valve, the throttle sensor and the like can be carried out easily.

[0009] Furthermore, it is possible to simply provide an air intake system of an engine having a different specification while using the same throttle body by changing the specifications of the bypass valve, the actuator, the throttle sensor and the like in the device block, thereby enhancing the mass-productivity of the throttle body.

[0010] The bypass inlet bore and the bypass outlet bore are preferably disposed in parallel to each other.

[0011] With this preferred arrangement, the bypass inlet bore and the bypass outlet bore can be made at a stroke from the side of the mounting surface by a multi-spindle drilling machine or by a plurality of parallel core pins in a casting process, leading to a shortened fabricating time.

[0012] The bypass inlet bore and the bypass outlet bore are preferably disposed in parallel to a shaft bore for a valve shaft of the throttle valve.

[0013] With this preferred arrangement, the bypass inlet bore and the bypass outlet bore can be made at a stroke from the side of the mounting surface along with the shaft bore for the valve shaft by a multi-spindle drilling machine or by a plurality of parallel core pins in a casting process, leading to a shortened fabricating time.

[0014] A bottom surface of a housing integrally formed on the throttle body is preferably the mounting surface, and the device block accommodated in the housing is preferably integrally formed with a collar which watertightly closes an open surface of the housing.

[0015] With this preferred arrangement, the closing of the open surface of the housing can be performed simultaneously with the mounting of the device block to the mounting surface, and an exclusive lid for closing the open surface is not required, which can contribute to the simplification of the construction.

[0016] The device block is preferably made of synthetic resin.

[0017] With this preferred arrangement, the bypass intermediate portion can be made simultaneously with the formation of the device block of the synthetic resin, there-

by shortening the fabricating time. Moreover, the weight of the entire air intake system can be reduced by employing the lightweight device block made of the synthetic resin.

[0018] The metering bore is preferably disposed so as to be located above a bypass inlet bore and a bypass outlet bore of the bypass passage, either when the intake passage is disposed horizontally, or when the intake passage is disposed with an inlet thereof turned upwards.

[0019] With this preferred arrangement, when the air intake system is used as any of a side-draft type and a downdraft type, the metering bore occupies a position above the bypass inlet bore and the bypass outlet bore. Therefore, even if a fluid foreign matter such as oil and water in a blow-by gas or an EGR gas enters the bypass passage, the foreign matter naturally flows down toward the bypass inlet bore and the bypass outlet bore after stoppage of the operation of the engine and hence, can be prevented from remaining deposited on a peripheral edge of the metering bore. Therefore, it is possible to previously avoid the failure of the operation and the deviation of the opening degree of the bypass valve due to the freezing or accumulation of the foreign matter on the peripheral edge of the metering bore. In addition, the Intake system has general-purpose properties as described above and hence, not only the degree of freedom of the layout thereof can be increased, but also the mass-productivity can be enhanced to provide a reduction in cost.

[0020] Incidentally, the actuator corresponds to a step motor 28 in an embodiment of the present invention which will be described hereinafter, and the output portion of the throttle sensor corresponds to a pickup coil 8b.

[0021] A preferred embodiment of the present invention will now be described with reference to the accompanying drawings, in which:

Fig.1 is a side view of an air intake system in an engine according to the present invention;
Fig.2 is a sectional view take along a line 2-2 in Fig.1;
Fig.3 is a sectional view take along a line 3-3 in Fig.1;
Fig.4 is a sectional view take along a line 4-4 in Fig.3;
Fig.5 is a sectional view take along a line 5-5 in Fig.4;
Fig.6 is a sectional view take along a line 6-6 in Fig.3;
Fig.7 is a sectional view take along a line 7-7 in Fig. 3;
Fig.8 is a sectional view take along a line 8 - 8 in Fig. 3; and
Fig.9 is an exploded perspective view of the air intake system.

[0022] Referring first to Figs. 1 and 2, a throttle body 1 has an intake passage 2 extending horizontally. An inlet in the intake passage 2 is funnel-shaped and connected to an air cleaner (not shown), and an outlet of the intake passage 2 is connected to an intake port (not shown) of an engine. A pair of bosses 3 and 3' having shaft bores 4 and 4' perpendicular to the intake passage 2 are formed on opposite sides of an intermediate portion of the throttle body 1, respectively and a butterfly throttle valve 5 for opening and closing the intake passage 2 is secured to a valve shaft 6 rotatably carried in the shaft bores 3 and 3'. A throttle drum 7 is secured to one end of the valve shaft 6 and connects an actuating wire 9 connected to a throttle-actuating member (not shown), and a return spring 24 for biasing the throttle valve 5 in a closing direction is connected to the throttle drum 7. A rotor 8a of a throttle sensor 8 for detecting an opening degree of the throttle valve 5 is secured to the other end of the valve shaft 6. Reference character 44 is a bracket for supporting an outer wire for guiding the actuating wire 9. The bracket 44 is screwed to the throttle body 1.

[0023] As shown in Figs. 2 and 9, a housing 10 is integrally formed on one side of the throttle body 1. The other boss 3' protrudes on a bottom surface 10a of the housing 10, and the shaft bore 4' in the boss 3' and the bottom surface 10a are disposed to extend perpendicularly to each other. The bottom surface 10a of the housing 10 is a mounting surface, and a device block 11 accommodated in the housing 10 is secured to the mounting surface 10a by a plurality of bolts 12, 12. The device block 11 is integrally formed with a collar 11c for closing an open surface of the housing 10, and a seal member 13 is interposed between joint surfaces of the collar 11c and the housing 10 for sealing the inside of the housing 10 water-tightly.

[0024] A rotor-accommodating bore 14 is defined in a surface of the device block 11 opposed to the mounting surface 10a, and the other boss 3' and the rotor 8a are accommodated in the accommodating bore 14.

[0025] As shown in Figs.3 to 5, 7 and 8, a bypass passage 15 is defined to extend from the throttle body 1 to the device block 11. The bypass passage 15 is comprised of a bypass inlet bore 15i provided in the throttle body 1 to permit the intake passage 2 and the mounting surface 10a to communicate with each other at a location upstream of the throttle valve 5, a bypass outlet bore 15o provided in the throttle body 1 to permit the intake passage 2 and the mounting surface 10a to communicate with each other at a location downstream of the throttle valve 5, and a bypass intermediate portion 15m provided in the device block 11 to permit the bypass inlet bore 15i and the bypass outlet bore 15o to communicate with each other. Therefore, the bypass passage 15 is connected to the intake passage 2 around the throttle valve 5.

[0026] As best shown in Fig.5, the bypass intermediate portion 15m of the device block 11 is comprised of an upstream groove 16 and a downstream groove 17 defined in an inner surface of the device block 11 opposed to the mounting surface 10a, so that they communicate with the bypass inlet bore 15i and the bypass outlet bore 15o, respectively, a through-bore 18 connected to one end of the upstream groove 16, a valve guide bore 19 rising upwards from the through-bore 18, and a metering bore 20 permitting an intermediate portion of the valve guide bore 19 to communicate with the other end of the downstream groove 17. In this case, the upstream groove

16 is disposed inclined vertically, and the bypass inlet bore 15i opens into a lower end of the upstream groove 16 (see Fig.7), while the through-bore 18 opens into an upper end of the upstream groove 16. The downstream groove 17 is longer than the upstream groove 16 and defined so that it extends substantially horizontally from the side of the valve guide bore 19 and is bent downwards midway, and the bypass outlet bore 15o opens into a lower end of the downstream groove 17. In this manner, the metering bore 20 is disposed above the bypass inlet bore 15i and the outlet bore 15o and on the side of the inlet of the intake passage 2. Therefore, either when the intake passage 2 is disposed horizontally and when the intake passage 2 is disposed with its inlet turned upwards, as in the illustrated embodiment, the metering bore 20 occupies a position above the bypass inlet bore 15i and the bypass outlet bore 15o. In other words, the bypass passage 15 has a shape such that it extends downwards toward the bypass inlet bore 151 and the bypass outlet bore 15o from the metering bore 20 always serving as an apex.

[0027] As best shown in Figs.3 and 8, a boost vacuum take-out bore 21 for taking-out an intake vacuum, i.e., a boost vacuum from the intake passage 2 downstream from the throttle valve 5 is provided to extend in the throttle body 1 and the device block 11. The boost vacuum take-out bore 21 is comprised of a vacuum introducing bore 21a provided in the throttle body 1 to permit the intake passage 2 and the mounting surface 10a to communicate with each other at a location downstream of the throttle valve 5, and a vacuum guide bore 21b provided in the device block 11 bent from the vacuum introducing bore 21a to extend upwards, while communicating with the vacuum introducing bore 21a. A boost vacuum sensor 23 is mounted to the device block 11 with its sensing portion facing an upper end of the vacuum guide bore 21b.

[0028] All of the bypass inlet bore 15i, the bypass outlet bore 15o and the vacuum introducing bore 21a are disposed in parallel to the shaft bore 4'.

[0029] A seal member 22 is interposed between the mounting surface 10a of the housing 10 and the inner surface of the device block 11, which are bonded to each other, to surround various portions of the bypass passage 15 and the boost vacuum take-out bore 21.

[0030] Referring to Figs.3 to 6, a piston-type bypass valve 25 is slidably received in the valve guide bore 19. The bypass valve 25 has a hollow portion 25a with its lower surface opening toward the through-bore 18. A metering groove 26 is provided in a sidewall of the hollow portion 25a for controlling the flow rate of air in the bypass passage 15 by cooperation with the metering bore 20. The metering groove 26 comprises a wider section 26a which opens into a lower end of the bypass valve 25, and a narrower section 26b connected to an upper end of the wider section 26a. The metering groove 26 is capable of being moved upwards and downwards between a high-opening degree position where an upper portion of the wider section 26a faces the metering bore 20, and a low-opening degree position where only the narrower section 26b faces the metering bore 20. In this case, a positioning projection 27 is formed on the device block 11 to come into engagement the wider section 26a in order to prevent the rotation of the bypass valve 25.

[0031] A step motor 28 is disposed on the device block 11 above and coaxially with the bypass valve 25. The step motor 28 has a rotor 29 integrally provided with a threaded shaft 30 extending downwards. The threaded shaft 30 is threadedly engaged into a threaded bore 31 defined in the central portion of the bypass valve 25.

[0032] Further, a mounting recess 32 is defined in the device block 11 to adjoin the rotor-accommodating bore 14 and the upstream groove 16 with thin partition walls 11a and 11b respectively interposed therebetween, as shown in Fig.3, and a sensor holder 35 is inserted into the mounting recess 32. Retained on the sensor holder 35 are a pickup coil 8b opposed to the rotor 8a in the rotor-accommodating bore 14 with the partition wall 11a interposed therebetween, and an intake air temperature sensor 34 for detecting a temperature within the upstream groove 16 through the partition wall 11b. The pickup coil 8b forms a throttle sensor 8 for electrically detecting an opening degree of the throttle valve 5 by cooperation with the rotor 8a.

[0033] Information regarding operational conditions of the engine is input to an electronic control unit 36 connected to the step motor 28, such as a throttle valve opening degree θth, a boost vacuum Pb and a temperature of an intake air Ta detected respectively by the throttle sensor 8, the boost vacuum sensor 23 and the intake air temperature sensor 34 and an engine temperature Te detected by an engine cooling-water temperature sensor (not shown).

[0034] The sensor holder 35 is integrally provided with first and second retaining arms 35a and 35b to urge the step motor 28 and the boost vacuum sensor 23 against the housing 10 from the above to retain them. First and second locking claws 38a and 38b are formed on the first and second retaining arms 35a and 35b to come into resilient engagement in an engage recess 37a and an engage bore 37b in the device block 11. Therefore, the sensor holder 35 is detachably mounted to the device block 11 by the engagement of the first and second locking claws 38a and 38b in the engage recess 37a and the engage bore 37b, whereby the step motor 28, the boost vacuum sensor 23, the pickup coil 8b and the intake air temperature sensor 34 are retained all together in the device block 11.

[0035] Protruding pieces 40 and 41 are integrally formed on the device block 11 and the sensor holder 35 respectively to extend through the bottom of the housing 10, while defining a wire guide passage 39 by cooperation with each other, and various lead wires 42, 42 connected to the step motor 28, the pickup coil 8b, the boost vacuum sensor 23 and the intake air temperature sensor 34 are drawn out of the housing 10 through the wire guide pas-

sage 39.

[0036] A bypass valve/sensor assembly 43 is formed by mounting the bypass valve 25, the step motor 28, the pickup coil 8b, the boost vacuum sensor 23 and the intake air temperature sensor 34 to the device block 11 in the above-described manner.

[0037] The operation of this embodiment will be described below.

[0038] When the throttle valve 5 is closed fully, the electronic control unit 36 calculates an amount of current supplied to the step motor 28, carries out the supplying of current and rotates the rotor 29 in a normal or reverse direction along with the threaded shaft 30 in order to provide an optimal opening degree of the bypass valve 25 corresponding to the engine operational conditions during starting, first idling and usual idling operations of the engine, during operation of engine brake and the like, based on the information regarding the engine operational conditions such as the throttle valve opening degree θth, the boost vacuum Pb, the intake air temperature Ta and the engine temperature Te, input as described above. When the threaded shaft 30 is rotated or reversed, the non-rotatable bypass valve 25 is moved upwards or downwards along the valve guide bore 19.

[0039] When the bypass valve 25 is moved upwards to occupy a high-opening degree position, the wider portion 26a of the metering groove 26 in the bypass valve 25 is exposed to the metering bore 20 of the bypass passage 15. Therefore, the amount of the air flowing through the bypass passage 15 into the engine can be controlled to a relatively large amount in accordance with an area of wider portion 26a opening into the metering bore 20, thereby accommodating the starting or idling operation of the engine. When the bypass valve 25 is moved downwards to occupy a low-opening degree position, the narrower portion 26b of the metering groove 26 in the bypass valve 25 is exposed to the metering bore 20. Therefore, the amount of the intake air flowing through the bypass passage 15 can be controlled to a relatively small amount in accordance with an area of narrower portion 26b opening into the metering bore 20, thereby accommodating the usual idling operation of the engine or the engine brake.

[0040] If the throttle valve 5 is opened, an amount of the intake air corresponding to the opening degree is supplied through the intake passage 2 to the engine, and the operation of the engine is shifted to an output operational region.

[0041] In such air intake system, the bypass valve/sensor assembly 43 is formed by mounting the bypass valve 25, the step motor 28, the pickup coil 8b, the boost vacuum sensor 23 and the intake air temperature sensor 34 to the device block 11 detachably mounted to the housing 10 integral with the throttle body 1. Therefore, the number of working steps for the throttle body 1 can be reduced, and the bypass valve/sensor assembly 43 can be fabricated in parallel with the formation of the throttle body 1, leading an enhancement in productivity. Moreover, the maintenance of the bypass passage 15, the bypass valve 25, the throttle sensor 8 and the like can be carried out by removing the device block 11 from the throttle body 1. Furthermore, it is possible to simply provide an air intake system of an engine having a different specification while using the same throttle body 1 by changing the specifications of the bypass valve 25, the step motor 28 and the various sensors 8, 23 and 34 in the device block 11, thereby enhancing the mass-productivity of the throttle body 1.

[0042] In addition, the bypass passage 15 is comprised of the bypass inlet bore 15i and the bypass outlet bore 15o provided in the throttle body 1, and the bypass intermediate portion 15m defined in the device block 11 made of the synthetic resin and connected at its opposite ends to the bypass inlet bore 15i and the bypass outlet bore 15o. In this case, the bypass inlet bore 15i, the bypass outlet bore 15o and the vacuum introducing bore 21a are disposed in parallel to the shaft bore 4' carrying the valve shaft 6 of the throttle valve 5. Therefore, the shaft bore 4', the bypass inlet bore 15i, the bypass outlet bore 15o and the vacuum introducing bore 21a can be made at a stroke from the side of the mounting surface 10a by a multi-spindle drilling machine or by a plurality of parallel core pins in a casting process. Moreover, the bypass intermediate portion 15m can be made simultaneously with the formation of the device block 11 made of the synthetic resin and hence, the fabricating time can be shortened largely. Further, the weight of the entire intake system can be reduced by employing the lightweight device block 11 of the synthetic resin.

[0043] In the bypass passage 15, the metering bore 20 is disposed above the bypass inlet bore 15i and the bypass outlet bore 15o and on the side of the inlet of the intake passage 2. Therefore, not only when the throttle body 1 is used as a side-draft type with the intake passage 2 disposed horizontally, as in the illustrated embodiment, but also when the throttle body 1 is used as a down-draft type with the inlet of the intake passage 2 turned upwards, the metering bore 20 occupies a position above the bypass inlet bore 15i and the bypass outlet bore 15o, and the bypass passage 15 extends downwards toward the bypass inlet bore 15i and the bypass outlet bore 15o with the metering bore 20 always serving as the apex. Therefore, even if a fluid foreign matter such as oil and water in a blow-by gas or an EGR gas supplied from the inlet of the intake passage 2 enters the bypass passage during operation of the engine, the foreign matter naturally flows down toward the bypass inlet bore 151 and the bypass outlet bore 15o into the intake passage 2 after stoppage of the operation of the engine and hence, cannot remain deposited on the peripheral edge of the metering bore 20. Therefore, it is possible to previously avoid the failure of the operation and the deviation of the opening degree of the bypass valve 25 due to the freezing or accumulation of the foreign matter on the peripheral edge of the metering bore 20.

[0044] In addition, the intake system has general-pur-

pose properties as described above and hence, the degree of freedom of the layout thereof can be increased, and moreover, the mass-productivity can be enhanced to provide a reduction in cost.

[0045] Further, the device block 11 coupled to the mounting surface 10a of the housing 10 by the bolts 12, 12 is integrally formed with the collar 11c closing the open surface of the housing 10. Therefore, the open surface of the housing 10 can be closed simultaneously with the mounting of the device block 11 to the mounting surface 10a and thus, an exclusive lid for closing the open surface is not required, which can contribute to the simplification of the construction.

[0046] The present invention is not limited to the above-described embodiment, and various modifications in design may be made without departing from the spirit and scope of the invention defined in claims.

Claims

1. An air intake system in an engine, comprising a bypass passage (15) bypassing a throttle valve (5) and connected to an intake passage (2) in a throttle body (1), and an actuator (28) which is connected to a bypass valve (25) for opening and closing said bypass passage (15) and is operable to open and close said bypass valve (25), said bypass passage (15) being comprised of a bypass inlet bore (15i) and bypass outlet bore (15o) which are provided in said throttle body (1) and open into an upstream portion and a downstream portion of the intake passage (2) respectively with said throttle valve (5) interposed therebetween,
   said bypass passage (15) is further comprised of a bypass intermediate portion (15m) which is provided in a device block (11) detachably secured to a mounting surface (10a) formed on said throttle body (1) and is connected at opposite ends thereof to said bypass inlet bore (15i) and said bypass outlet bore (15o), respectively; a metering bore (20) for controlling the flow rate of intake air in said bypass passage (15) by cooperation with said bypass valve (25) is disposed in the midway of said bypass intermediate portion (15m); and **characterised in that** said bypass valve (25), said actuator (28) and an output portion (8b) of a throttle sensor (8) for detecting an opening degree of said throttle valve (5) are mounted to said device block (11) to form a bypass valve/sensor assembly (43).

2. An air intake system in an engine according to claim 1, wherein
   said bypass inlet bore (15i) and said bypass outlet bore (15o) are disposed in parallel to each other.

3. An air intake system in an engine according to claim 1,
   wherein
   said bypass inlet bore (15i) and said bypass outlet bore (15o) are disposed in parallel to a shaft bore (4') for a valve shaft (6) of said throttle valve (5).

4. An air intake system in an engine according to any of claims 1 to 3, wherein
   a bottom surface of a housing (10) integrally formed on said throttle body (1) is said mounting surface (10a), and said device block (11) accommodated in said housing (10) is integrally formed with a collar (11c) which water-tightly closes an open surface of said housing (10).

5. An air intake system in an engine according to any of claims 1 to 4, wherein
   said device block (11) is made of synthetic resin.

6. An air intake system in an engine as claimed in any preceding claim wherein said metering bore (20) is disposed so as to be located above the bypass inlet bore (15i) and the bypass outlet bore (15o) of said bypass passage (15), either when said intake passage (2) is disposed horizontally, or when said intake passage (2) is disposed with an inlet thereof turned upwards.

Patentansprüche

1. Lufteinlasssystem in einem Motor, umfassend:

   eine Umgehungspassage (15), die ein Drosselventil (5) umgeht und mit einer Einlasspassage (2) in einem Drosselkörper (1) verbunden ist, und ein Stellglied (28), das mit einem Umgehungsventil (25) zum Öffnen und Schließen der Umgehungspassage (15) verbunden ist und zum Öffnen und Schließen des Umgehungsventils (25) betreibbar ist, wobei die Umgehungspassage (15) eine Umgehungseinlassborung (15i) und eine Umgehungsauslassborung (15o) umfasst, die im Drosselkörper (1) vorgesehen sind und sich in einen strömungsaufwärts gelegenen Abschnitt bzw. einen strömungsabwärts gelegenen Abschnitt der Einlasspassage (2) öffnen, wobei das Drosselventil (5) dazwischen angeordnet ist, wobei die Umgehungspassage (15) weiter einen Umgehungszwischenabschnitt (15m) umfasst, der in einem Geräteblock (11) vorgesehen ist, der an einer am Drosselkörper (1) gebildeten Anbringfläche (10a) lösbar gesichert ist und bei seinen entgegengesetzten Enden mit der Umgehungseinlassbohrung (15i) bzw. der Umgehungsauslassbohrung (15o) verbunden ist; wobei eine Messbohrung (20) zum Steuern/Regeln der Strömungsrate der Einlassluft in der Umgehungspassage (15) durch Zu-

sammenwirken mit dem Umgehungsventil (25) in der Mitte des Umgehungszwischenabschnitts (15m) angeordnet ist,

dadurch gekennzeichnet, dass das Umgehungsventil (25), das Stellglied (28) und ein Ausgabeabschnitt (8b) eines Drosselsensors (8) zum Erfassen eines Öffnungsgrads des Drosselventils (5) am Geräteblock (11) angebracht sind, um eine Umgehungsventil/Sensoranordnung (43) zu bilden.

2. Lufteinlasssystem in einem Motor nach Anspruch 1, wobei die Umgehungseinlassbohrung (15i) und die Umgehungsauslassbohrung (15o) parallel zueinander angeordnet sind.

3. Lufteinlasssystem in einem Motor nach Anspruch 1, wobei die Umgehungseinlassbohrung (15i) und die Umgehungsauslassbohrung (15o) parallel zu einer Wellenbohrung (4') für eine Ventilwelle (6) des Drosselventils (5) angeordnet sind.

4. Lufteinlasssystem in einem Motor nach einem der Ansprüche 1 bis 3, wobei eine Bodenfläche eines integral am Drosselkörper (1) gebildeten Gehäuses (10) die Anbringfläche (10a) ist und der im Gehäuse (10) aufgenommene Geräteblock (11) integral mit einem Kragen (11c) gebildet ist, der eine offene Fläche des Gehäuses (10) wasserdicht abschließt.

5. Lufteinlasssystem in einem Motor nach einem der Ansprüche 1 bis 4, wobei der Geräteblock (11) aus synthetischem Harz hergestellt ist.

6. Lufteinlasssystem in einem Motor nach einem der vorhergehenden Ansprüche, wobei die Messbohrung (20) derart angeordnet ist, dass sie sich über der Umgehungseinlassbohrung (15i) und der Umgehungsauslassbohrung (15o) der Umgehungspassage (15) befindet, und zwar entweder wenn die Einlasspassage (2) horizontal angeordnet ist oder wenn die Einlasspassage (2) mit einem Einlass von ihr aufwärts abbiegend angeordnet ist.

Revendications

1. Un système d' admission d'air dans un moteur thermique, comprenant un passage de dérivation (15), formant une dérivation d'un papillon des gaz (5) et relié à un passage d'admission (2) dans un corps d'étranglement (1), et un actionneur (28), relié à une valve de dérivation (25), pour ouvrir et fermer ledit passage de dérivation (15), et susceptible d'être actionné pour ouvrir et fermer ladite valve de dérivation (25), ledit passage de dérivation (15) étant composé d'un perçage d'entrée de dérivation (15i) et d'un perçage de sortie de dérivation (15o), ménagés dans ledit corps d'étranglement (1) et débouchant en une partie amont et une partie aval du passage d'admission (2), respectivement, ledit papillon des gaz (5) étant interposé entre eux,

ledit passage de dérivation (15) est en outre composé d'une partie intermédiaire de dérivation (15m) prévue dans un bloc de dispositif (11), fixé de façon détachable à une surface de montage (10a) formée sur ledit corps d'étranglement (1) et connecté à ses extrémités opposées audit perçage d'entrée de dérivation (15i) et audit perçage de sortie de dérivation (15o), respectivement ; un perçage de dosage (20), pour commander le débit d'air d'admission dans ledit passage de dérivation (15), par une coopération avec ladite valve de dérivation (25), est disposé à mi-longueur de ladite partie intermédiaire de dérivation (15m) ; et **caractérisé en ce que** ladite valve de dérivation (25), ledit actionneur (28) et une partie de sortie (8b) d'un capteur d'étranglement (8), pour détecter un degré d'ouverture dudit papillon des gaz (5), sont montés sur ledit bloc de dispositif (11) pour former un ensemble valve de dérivation/capteur (43).

2. Un système d'admission d'air dans un moteur thermique selon la revendication 1, dans lequel :

ledit perçage d'entrée de dérivation (15i) et ledit perçage de sortie de dérivation (15o) sont disposés parallèlement à chaque autre.

3. Un système d'admission d'air dans un moteur thermique selon la revendication 1, dans lequel :

ledit perçage d'entrée de dérivation (15i) et ledit perçage de sortie de dérivation (15o) sont disposés parallèlement à un perçage pour arbre (4'), pour un arbre de clapet (6) dudit papillon des gaz (5).

4. Un système d'admission d'air dans un moteur thermique selon l'une quelconque des revendications 1 à 3, dans lequel :

une surface inférieure d'un boîtier (10), formé d'une seule pièce sur ledit corps d'étranglement (1), est ladite surface de montage (10a), et ledit bloc de dispositif (11) logé dans ledit boîtier (10) est formé d'une seule pièce avec une collerette (11c), qui ferme de façon étanche à l'eau une surface ouverte dudit boîtier (10).

5. Un système d'admission d'air dans un moteur thermique selon l'une quelconque des revendications 1 à 4, dans lequel :

ledit bloc de dispositif (11) est formé de résine synthétique.

6. Un système d'admission d'air dans un moteur thermique selon l'une quelconque des revendications précédentes, dans lequel ledit perçage de dosage (20) est disposé de manière à être positionné au-dessus du perçage d'entrée de dérivation (15i) et du perçage de sortie de dérivation (15o) dudit passage de dérivation (15), soit lorsque ledit passage d'admission (2) est disposé horizontalement, soit lorsque ledit passage d'admission (2) est disposé avec une entrée de celui-ci tournée vers le haut.

FIG.1

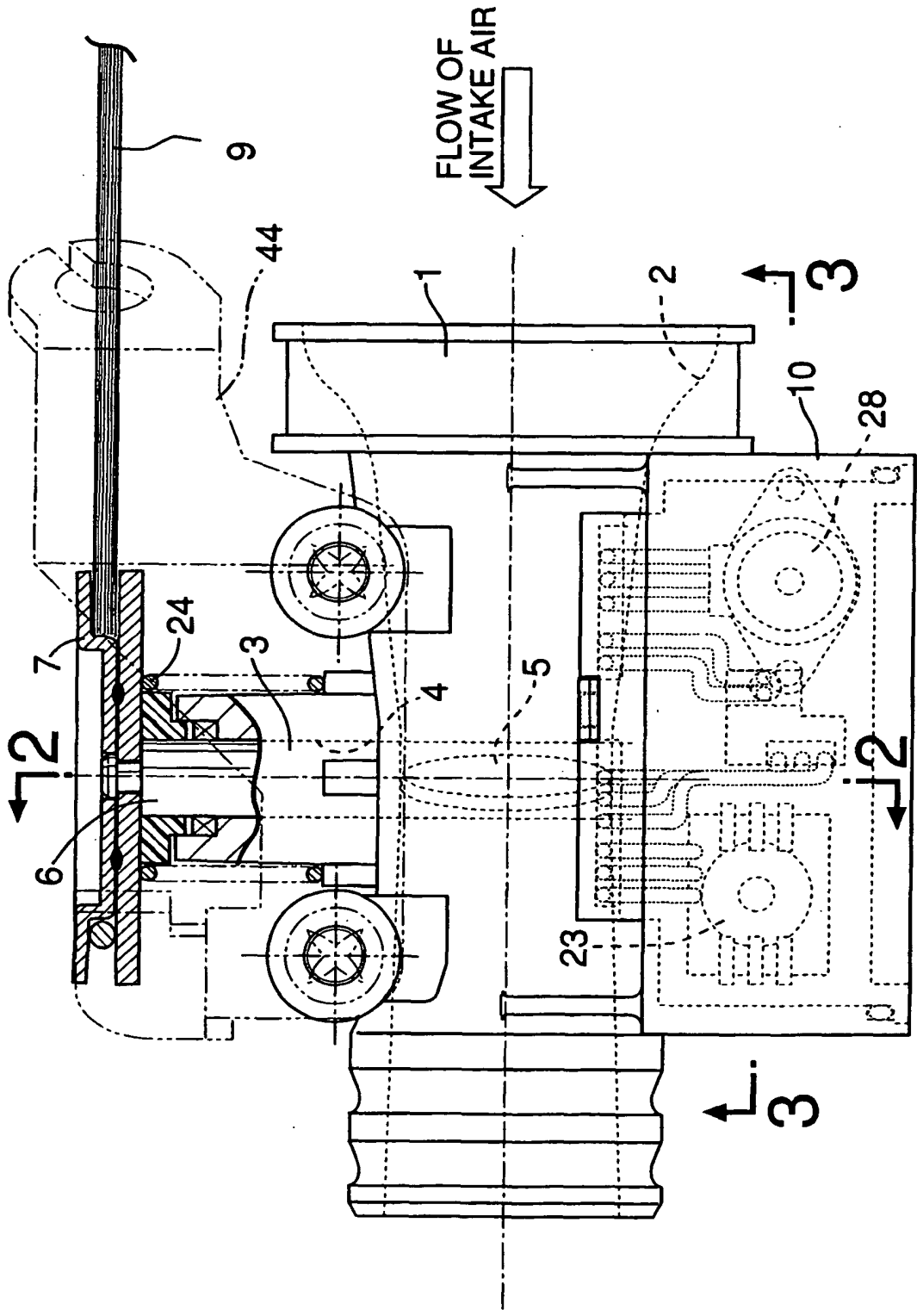


FIG.2

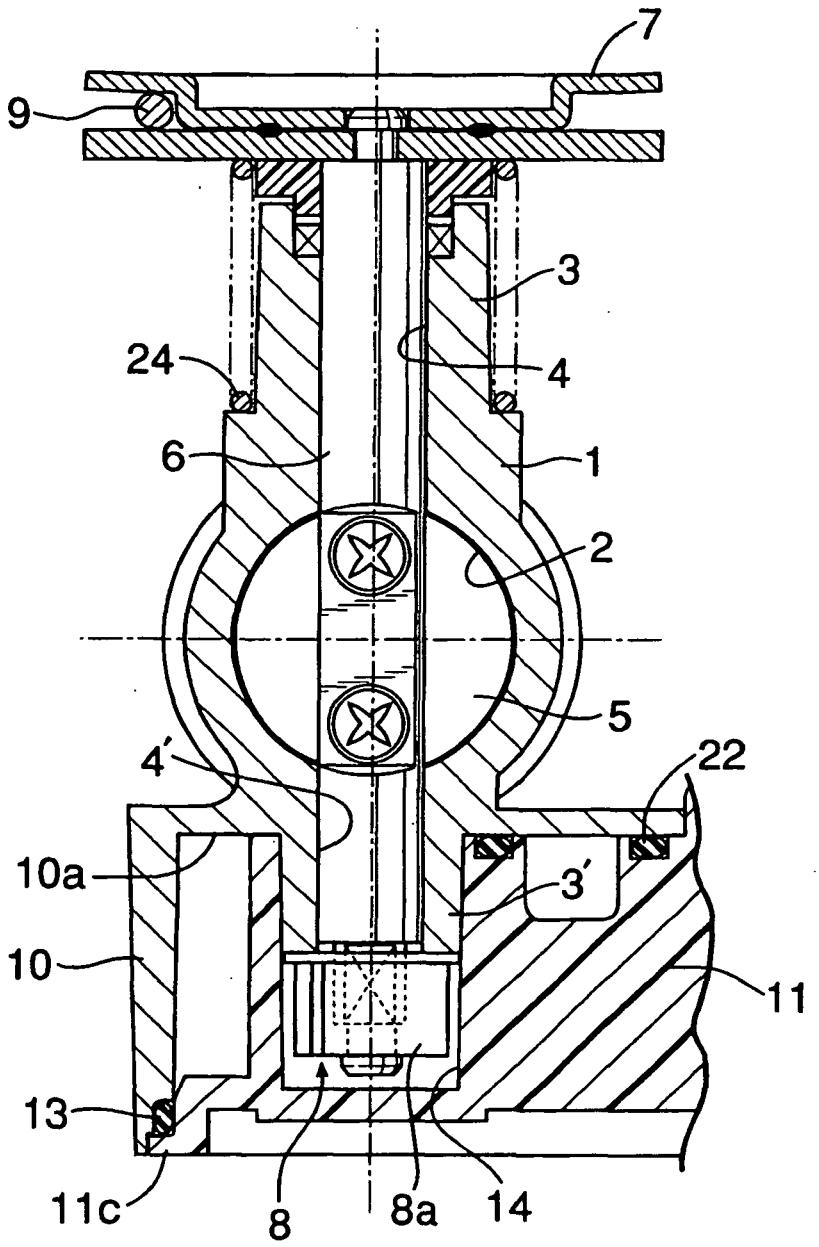


FIG.3

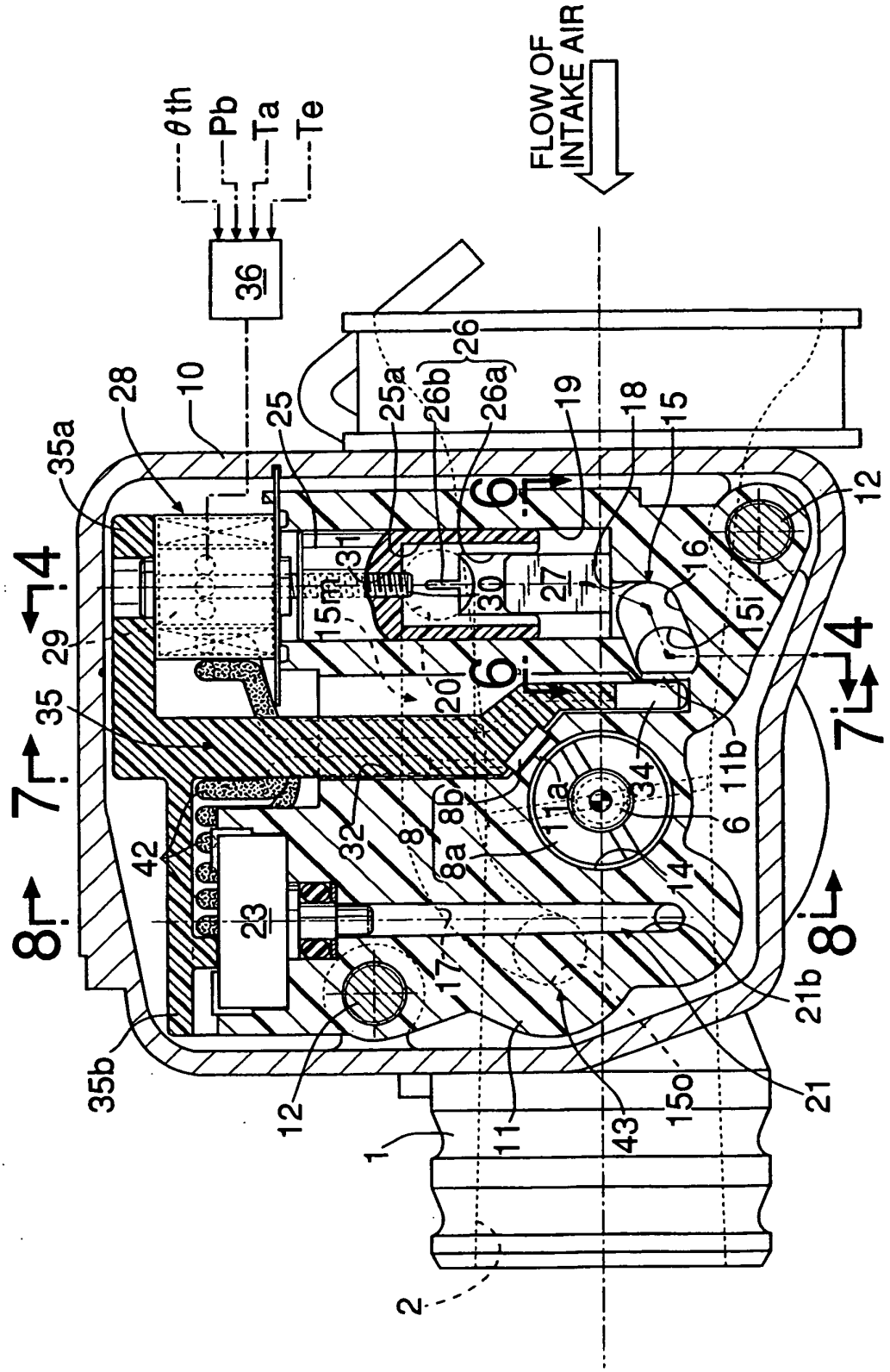

θth
Pb
Ta
Te
36
FLOW OF INTAKE AIR
28
10
25
25a
26b
26a
26
19
18
15
35a
12
6r
6i
4
4
7r
7i
8r
8i
29
35
31
15m
30
27
16
15i
20
34
11b
11a
6
8b
8a
8
32
42
23
14
17
21b
35b
12
1
11
43
15o
21
2

FIG.4

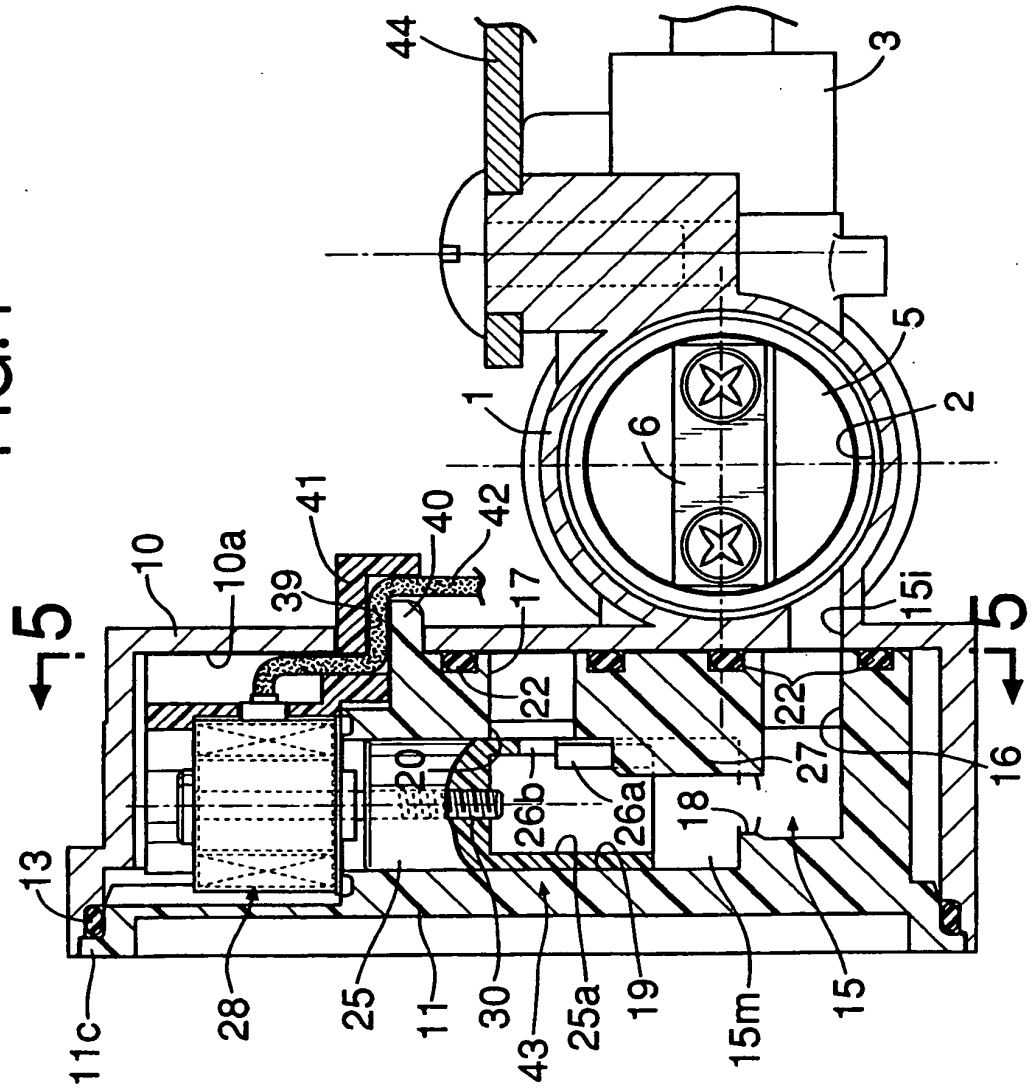

44
3
5
2
1
6
41
40
42
10
10a
39
17
15i
5
5
22
22
27
16
20
26b
26a
18
13
11c
28
25
11
30
43
25a
19
15m
15

FIG.5

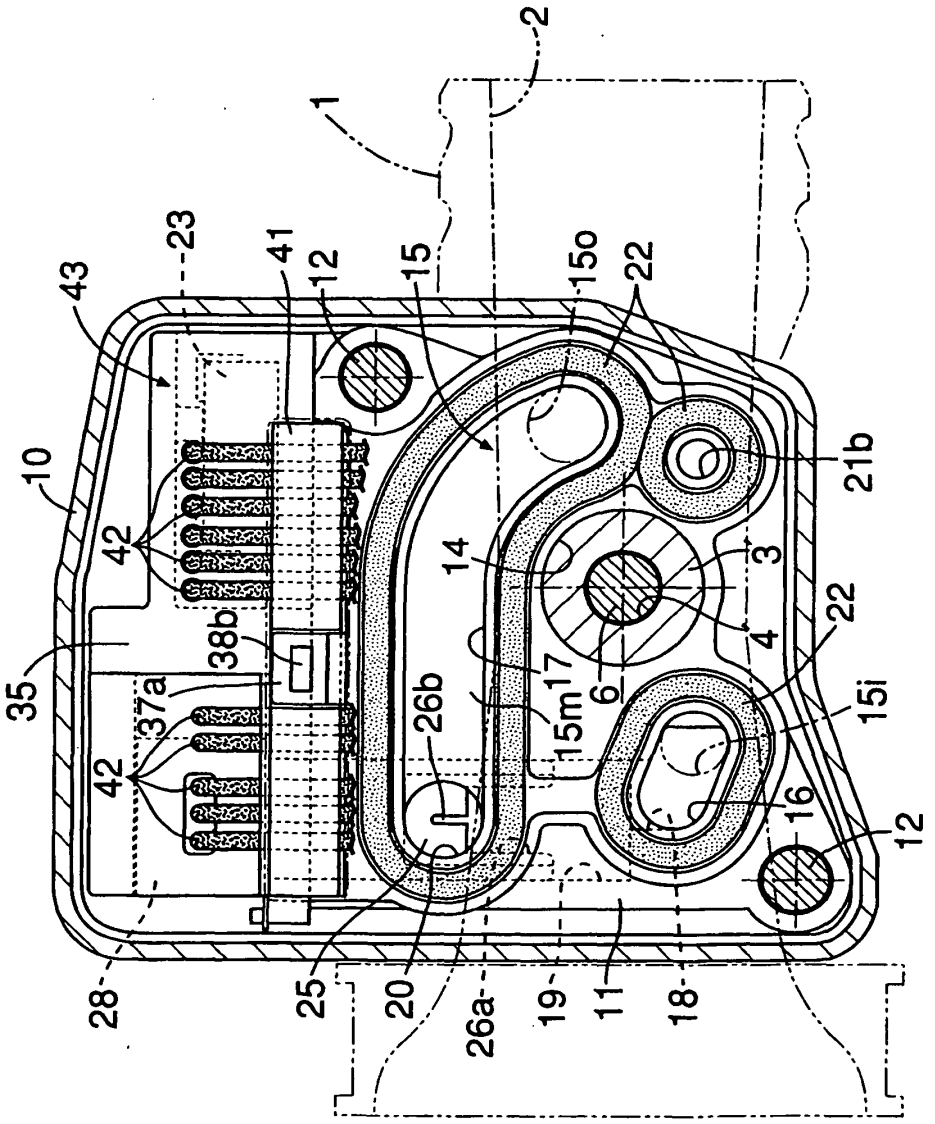

2
1
23
41
12
15
15o
22
43
10
21b
42
14
3
38b
4
22
35
37a
17
6
15i
26b
15m
42
16
12
28
25
20
26a
19
11
18

FIG.6

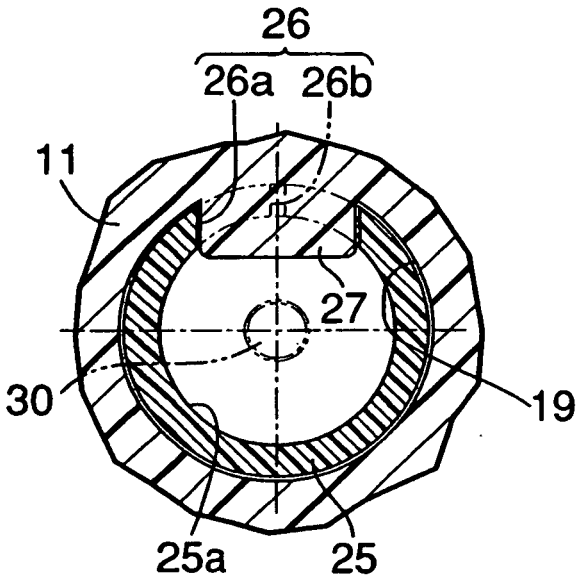


FIG.7

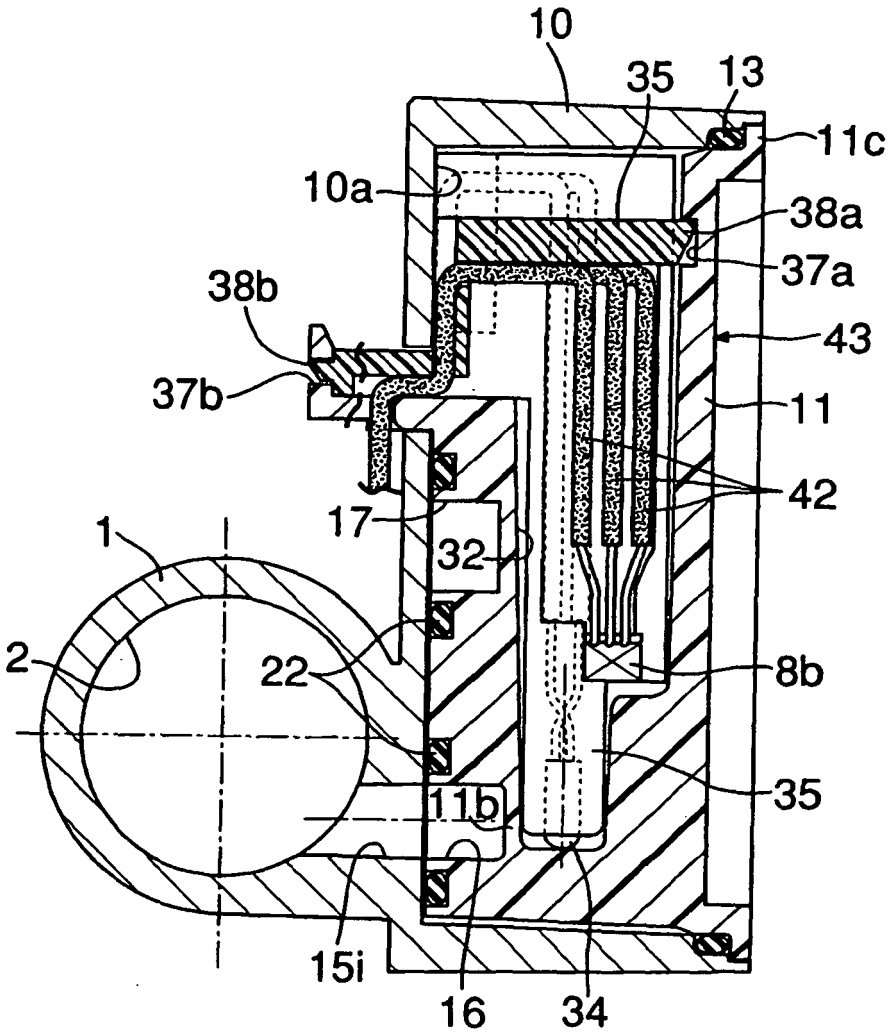

10
35
13
11c
10a
38a
37a
38b
43
37b
11
42
17
32
1
2
22
8b
35
11b
15i
16
34

FIG.8

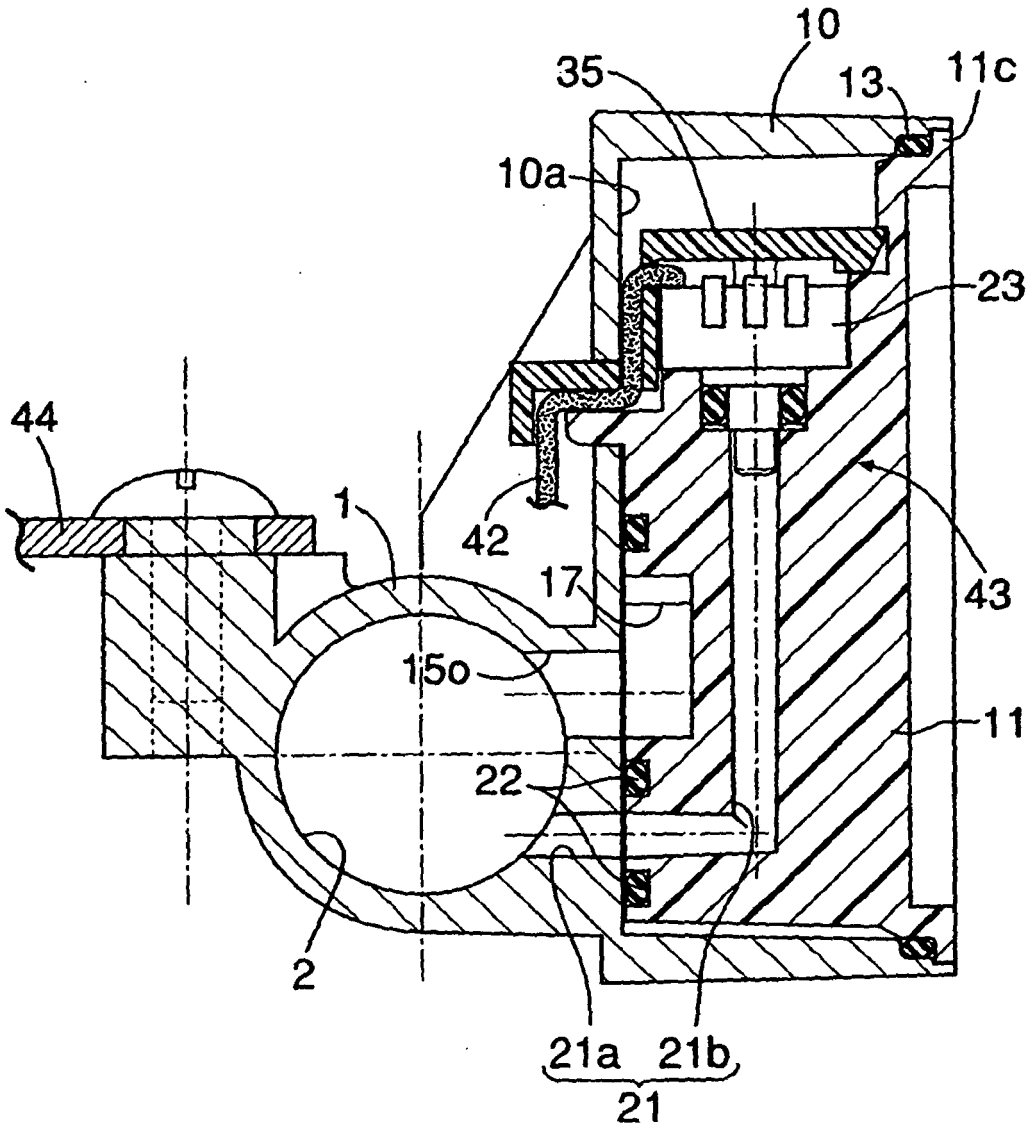
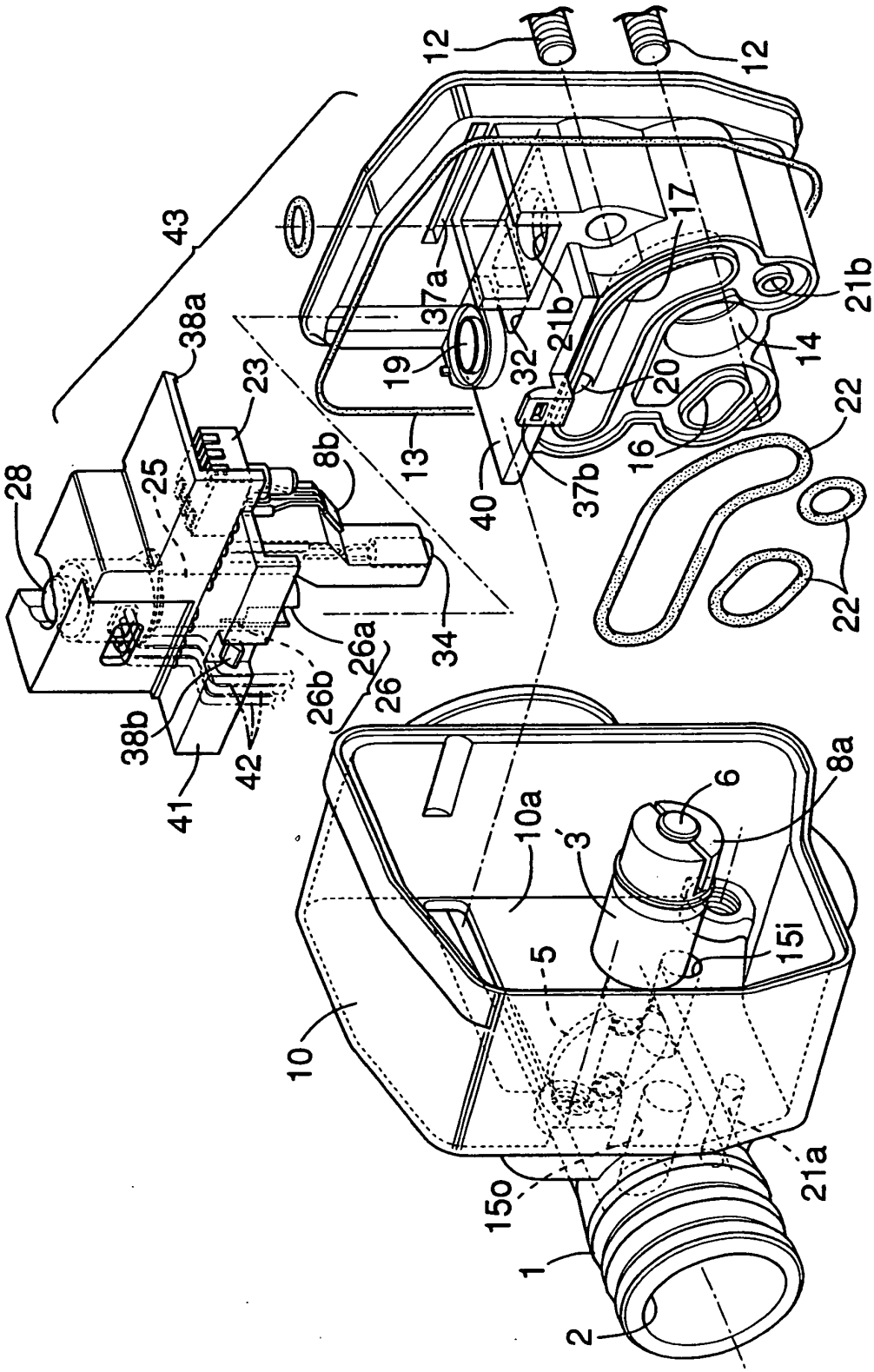


FIG.9


12
12
43
38a
23
28
25
8b
13
19
37a
21b
32
21b
17
14
20
16
22
22
22
40
37b
34
26a
26b
26
38b
42
41
10a
3
6
8a
15i
5
10
15o
1
2
21a

REFERENCES CITED IN THE DESCRIPTION

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