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(54) **CONSTRUCTION MACHINE**

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(57) **ABSTRACT**

A hollow first accommodating case (**28**) is provided on a front part of a revolving frame (**5**) at a position on a front side of a fuel tank (**23**), and a fuel supply pump (**34**) for supplying a fuel stored in an external fuel storage source to the fuel tank (**23**) is provided on the fuel tank (**23**) by being connected. A fuel suction port (**35**) for sucking the fuel toward the fuel supply pump (**34**) is provided in the first accommodating case (**28**) by being opened to an outside, and a urea water tank (**25**) is provided by being accommodated in the first accommodating case (**28**). A water supply port (**25**G) of a urea water is provided in the urea water tank (**25**) by being opened to the outside, and the fuel suction port (**35**) and the water supply port (**25**G) of the urea water are juxtaposed and arranged in the first accommodating case (**28**).

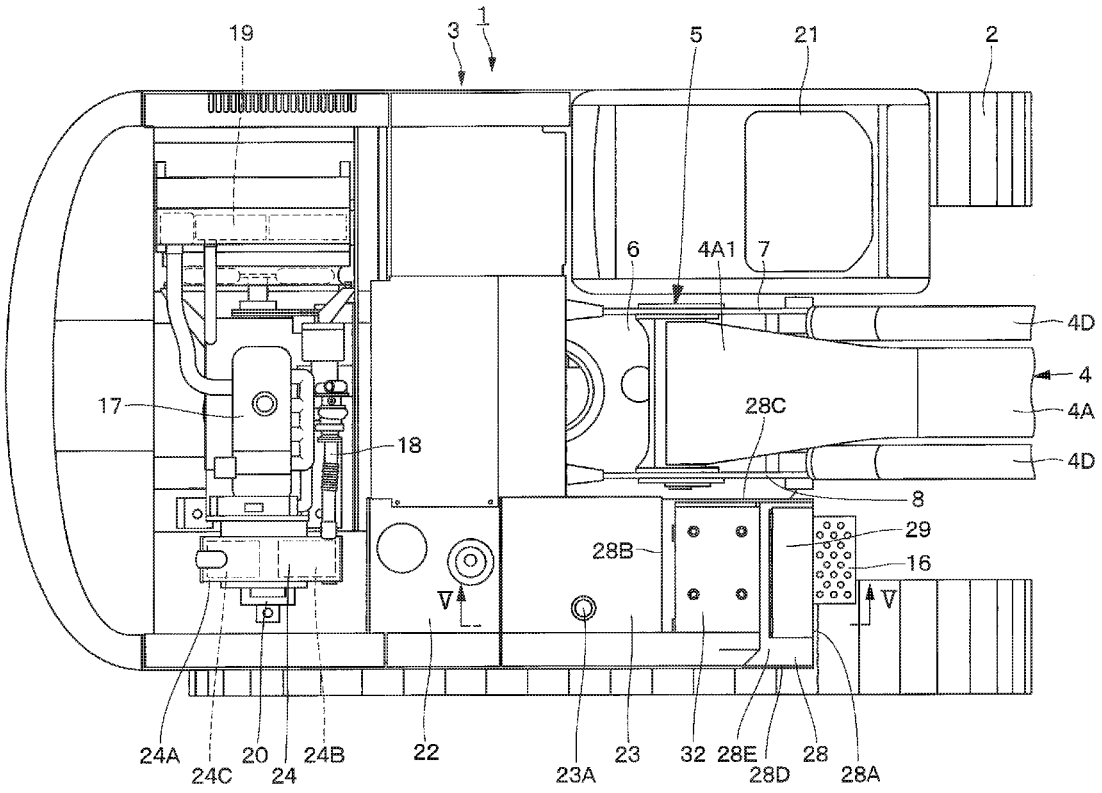


Fig. 1

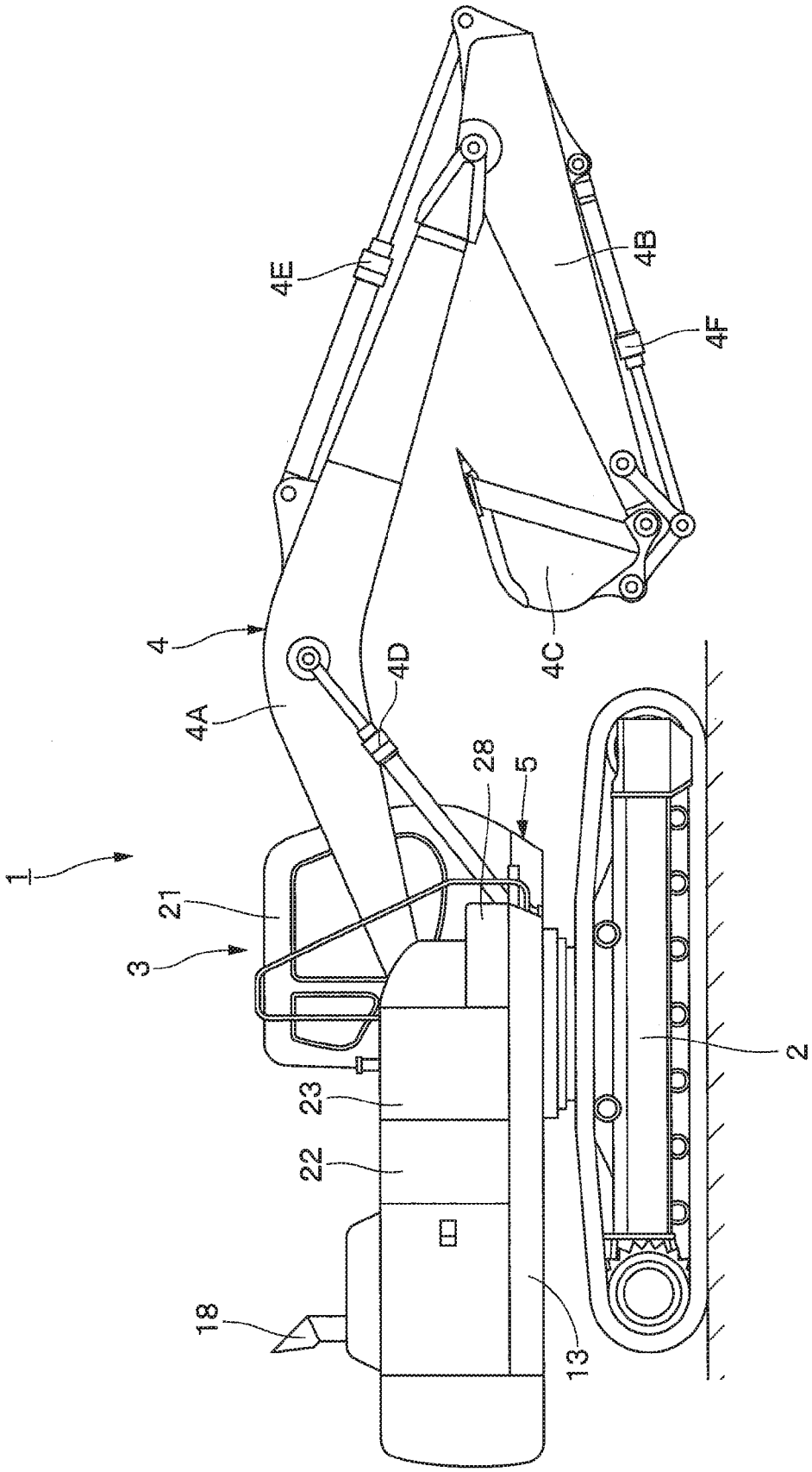


Fig.2

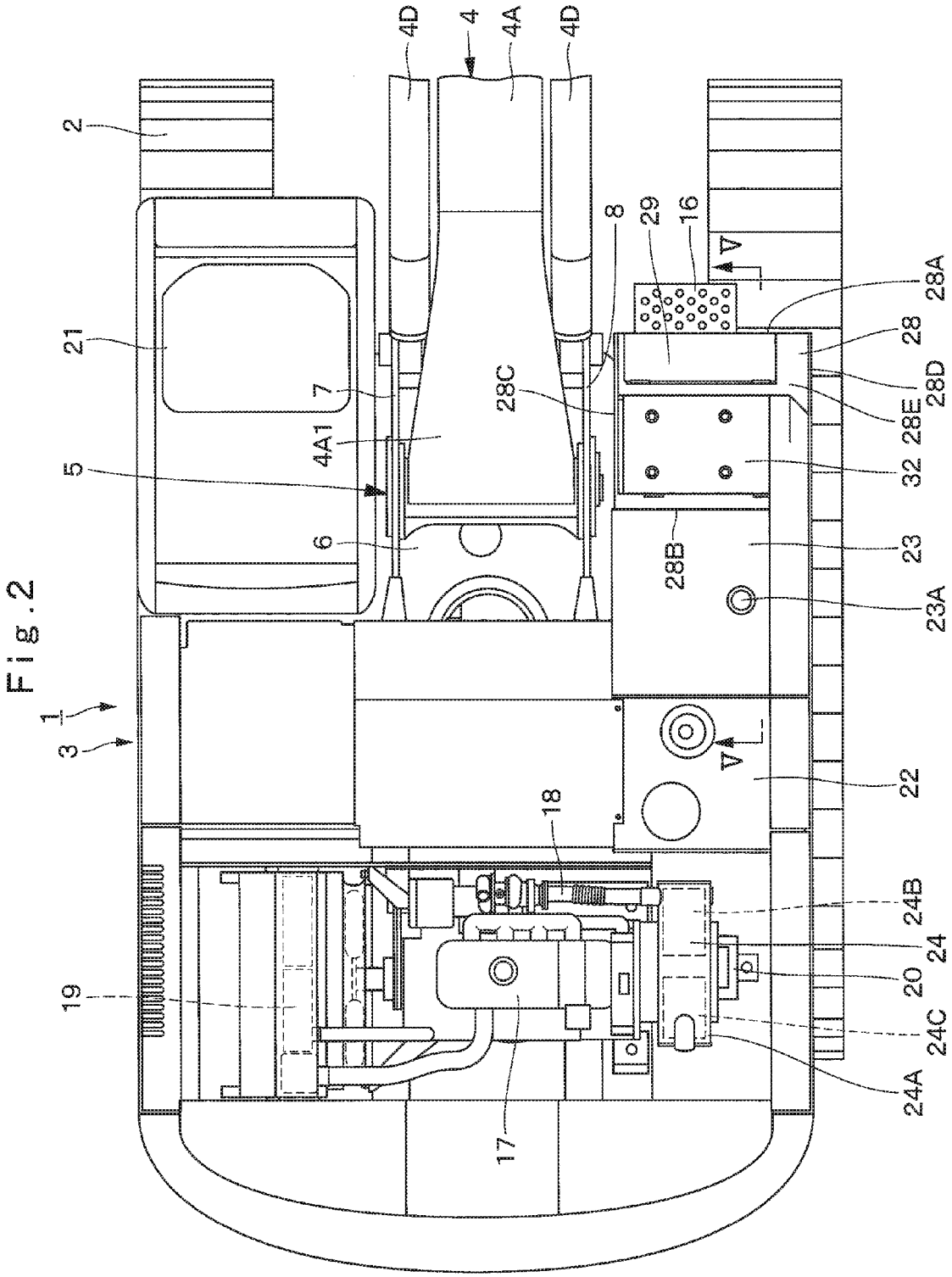

4D
4
4A
4D
2
8
29
16
A
28A
21
28
7
28C
28D
28E
4A1
32
5
6
28B
23
23A
1
3
A
22
18
24B
24
19
20
24C
24A
17

Fig. 3

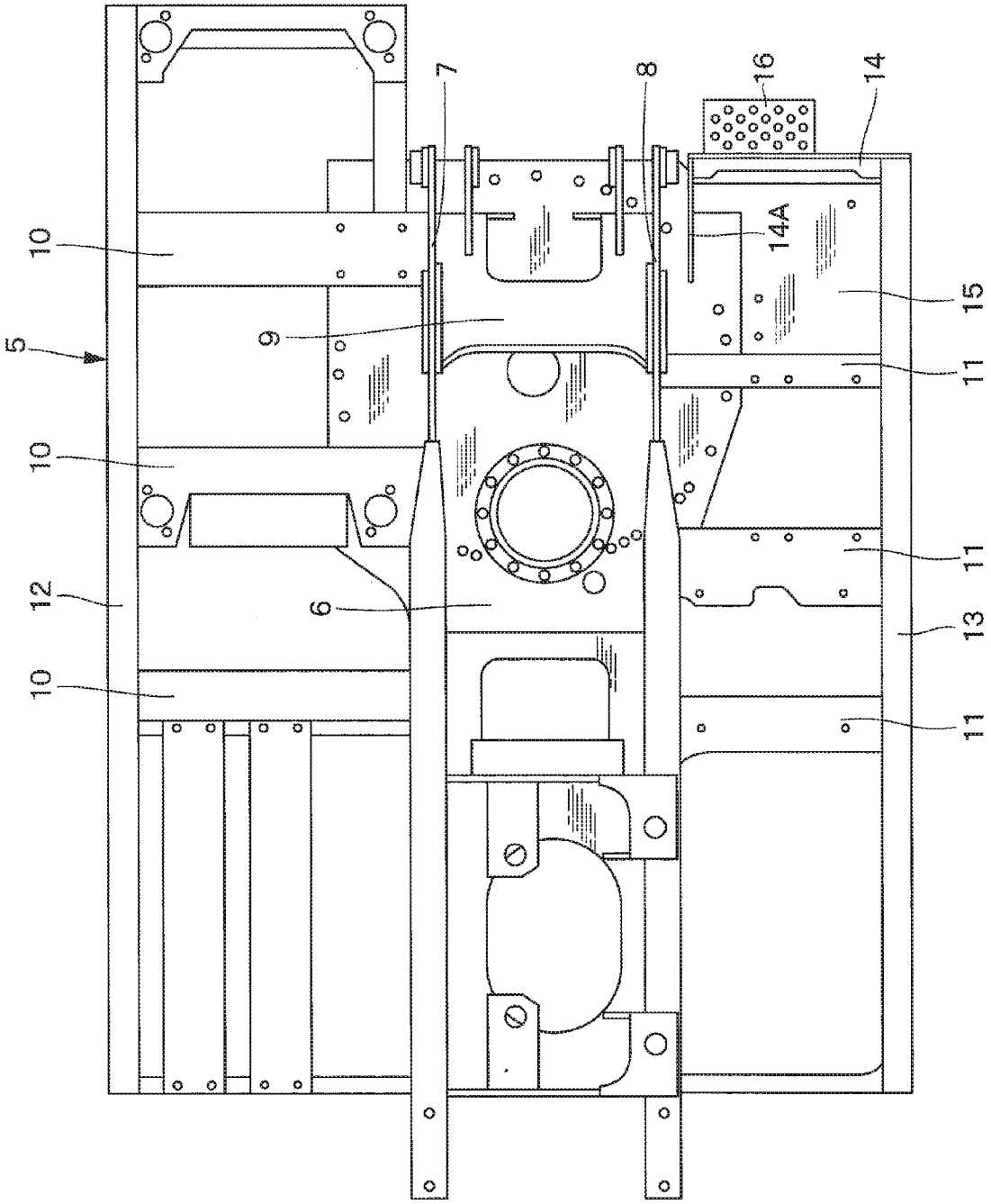


Fig. 4

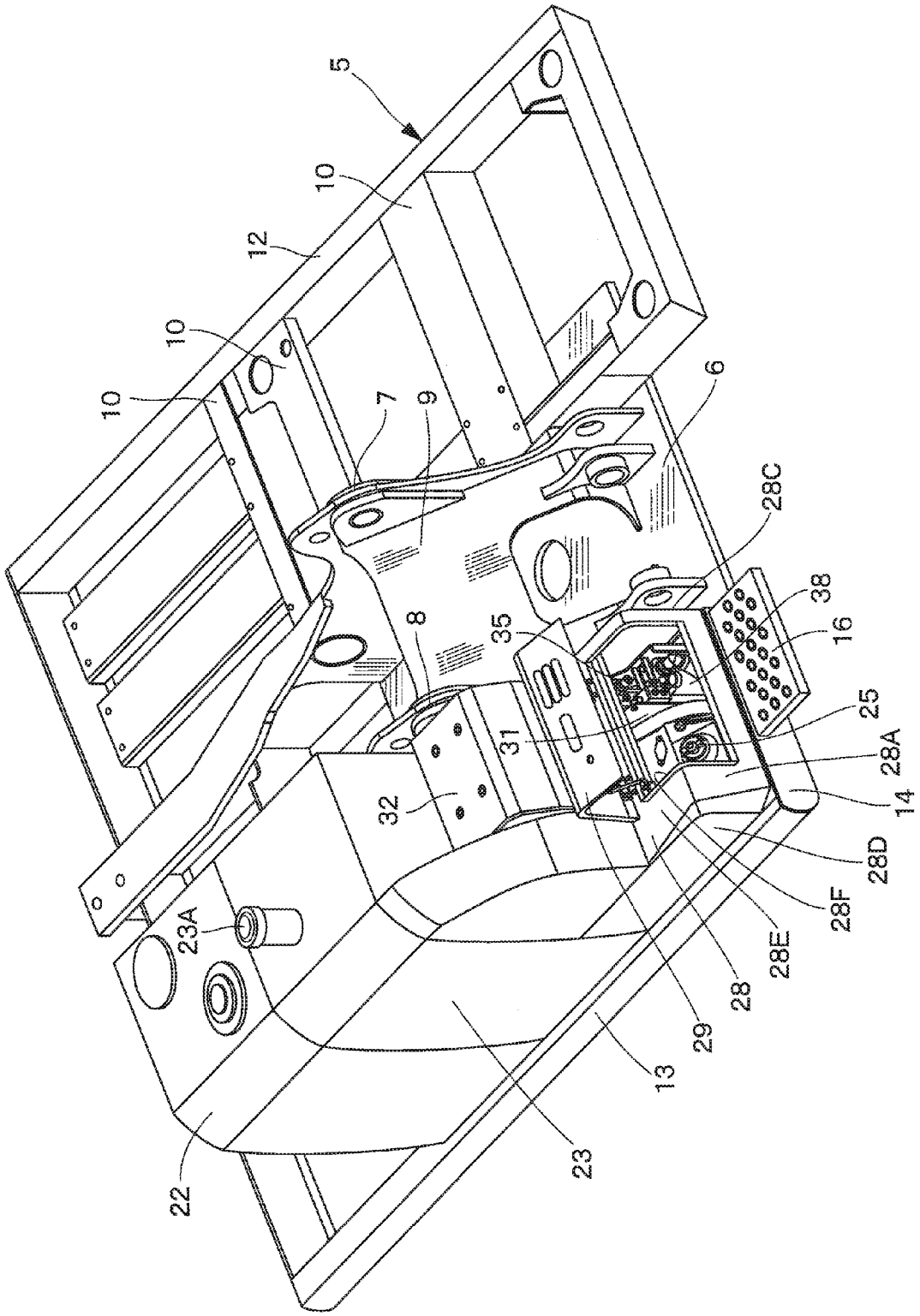

5
10
12
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38
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28E
28
29
13
23
22
23A

Fig. 5

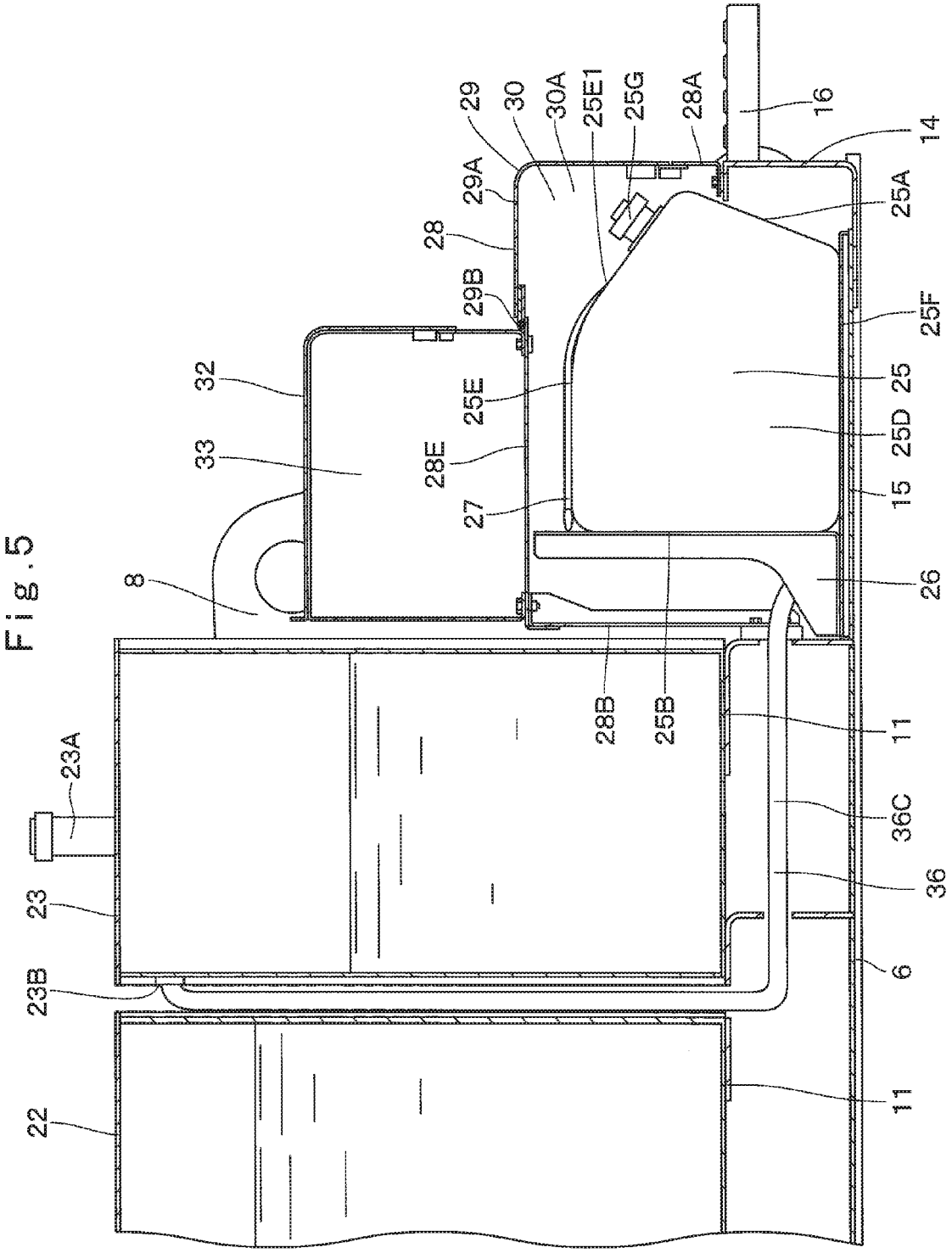

29
30
30A
25E1
25G
28A
16
14
29A
25A
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29B
25F
32
25E
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33
28E
25D
27
15
8
26
28B
25B
11
23A
36C
23
36
23B
6
22
11

Fig.6

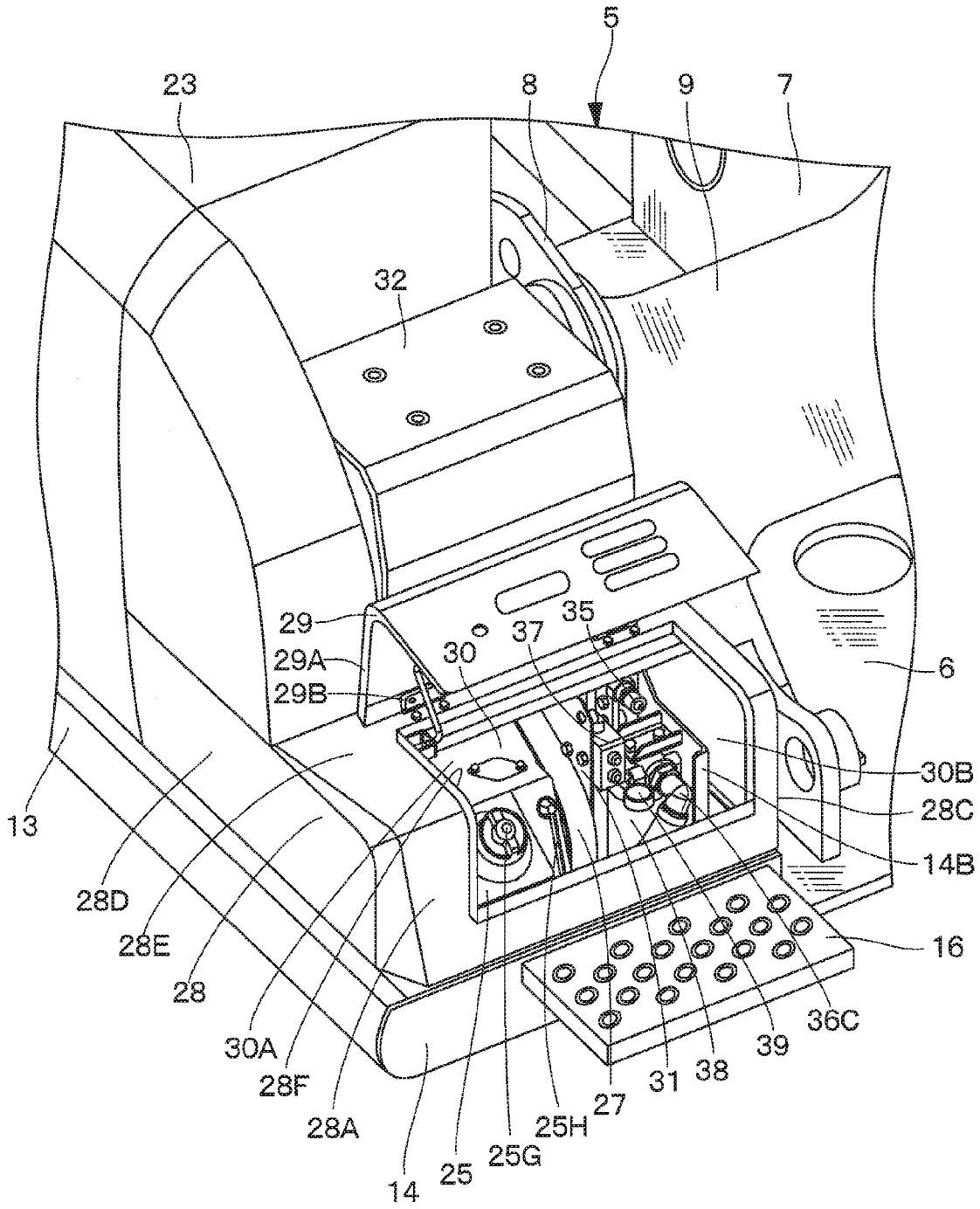

5
23
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32
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29A
29B
30
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30B
28C
14B
16
13
28D
28E
28
30A
28F
28A
14
25
25G
25H
27
31
38
39
36C

Fig. 7

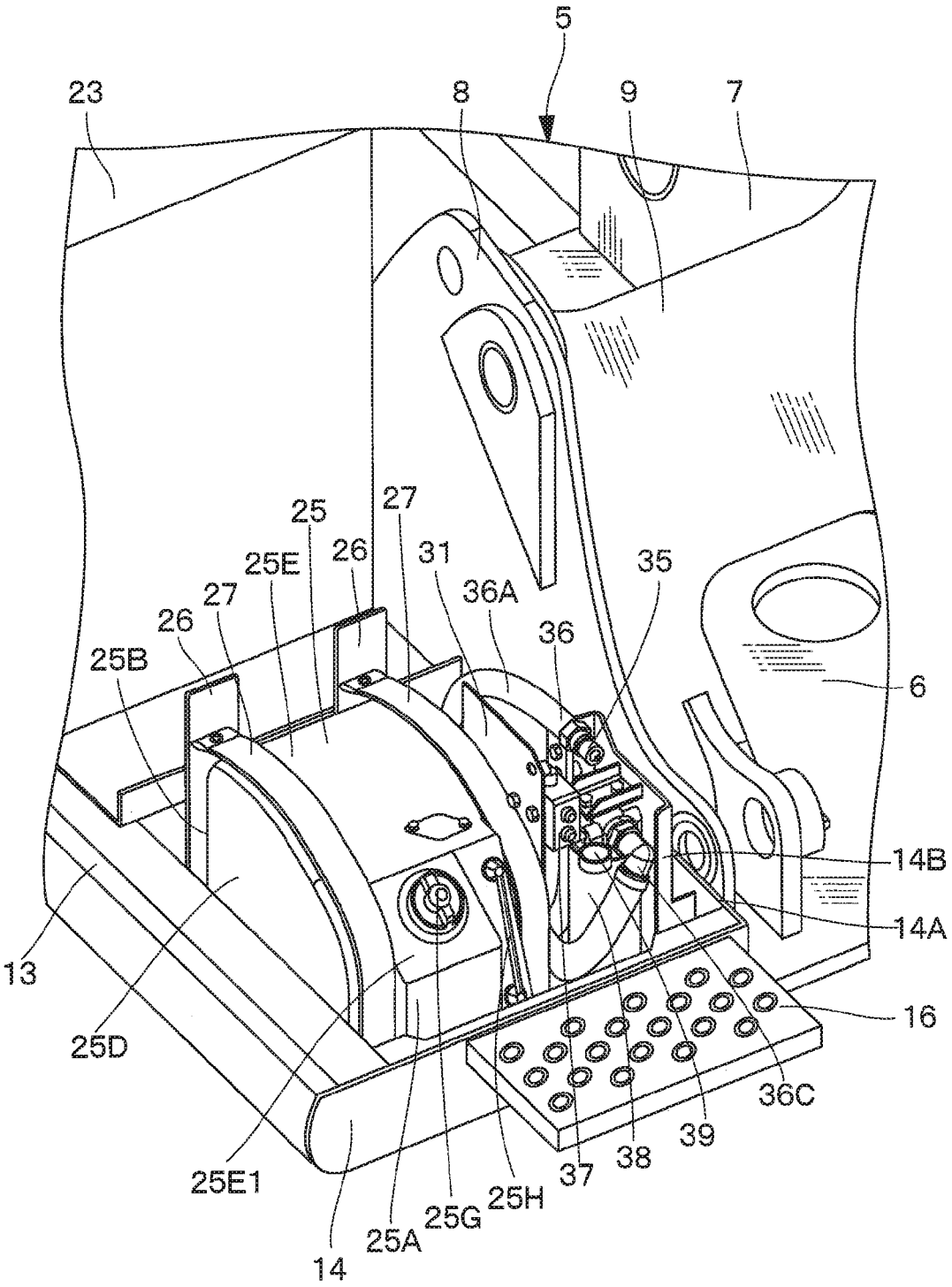

5
23
8
9
7
25
27
26
25E
31
35
36A
27
26
36
25B
6
14B
14A
13
16
25D
36C
39
38
37
25E1
25H
25G
25A
14

Fig.8

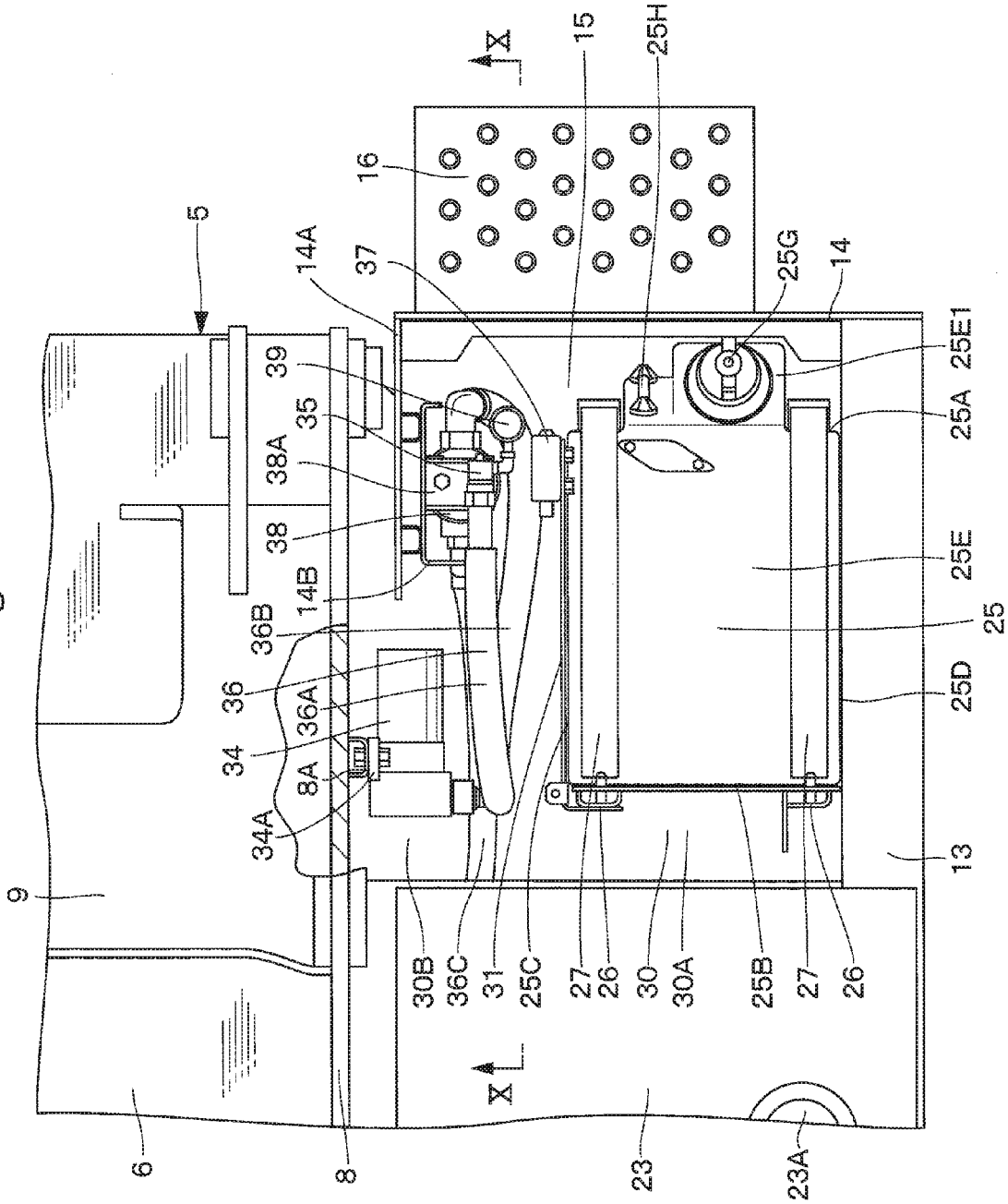

X
15
25H
16
5
14A
37
25G
14
39
25E1
35
25A
38A
38
25E
14B
36B
25
36
36A
25D
34
8A
34A
13
9
30B
36C
31
25C
27
26
30
30A
25B
27
26
X
6
8
23
23A

Fig. 9

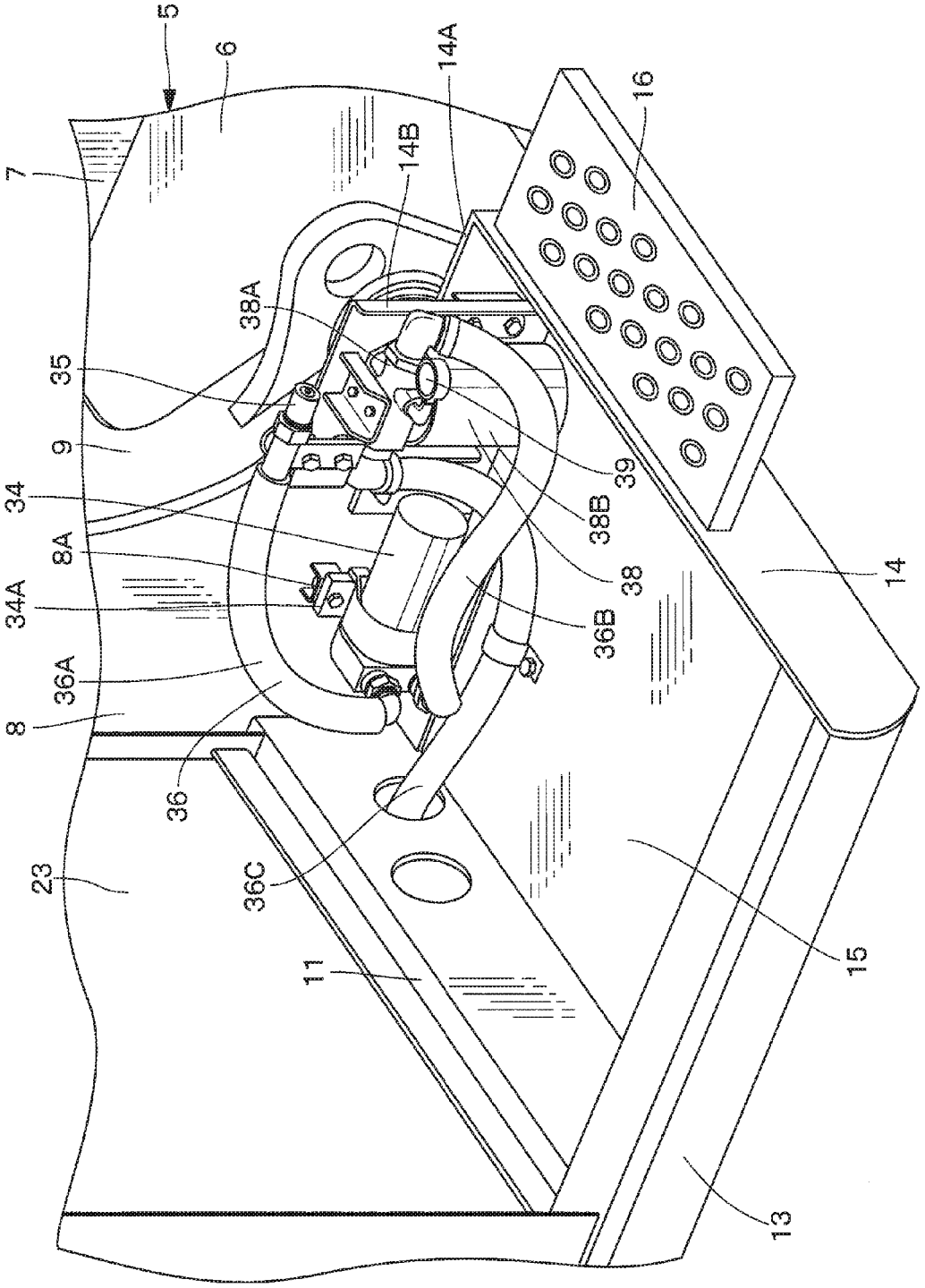
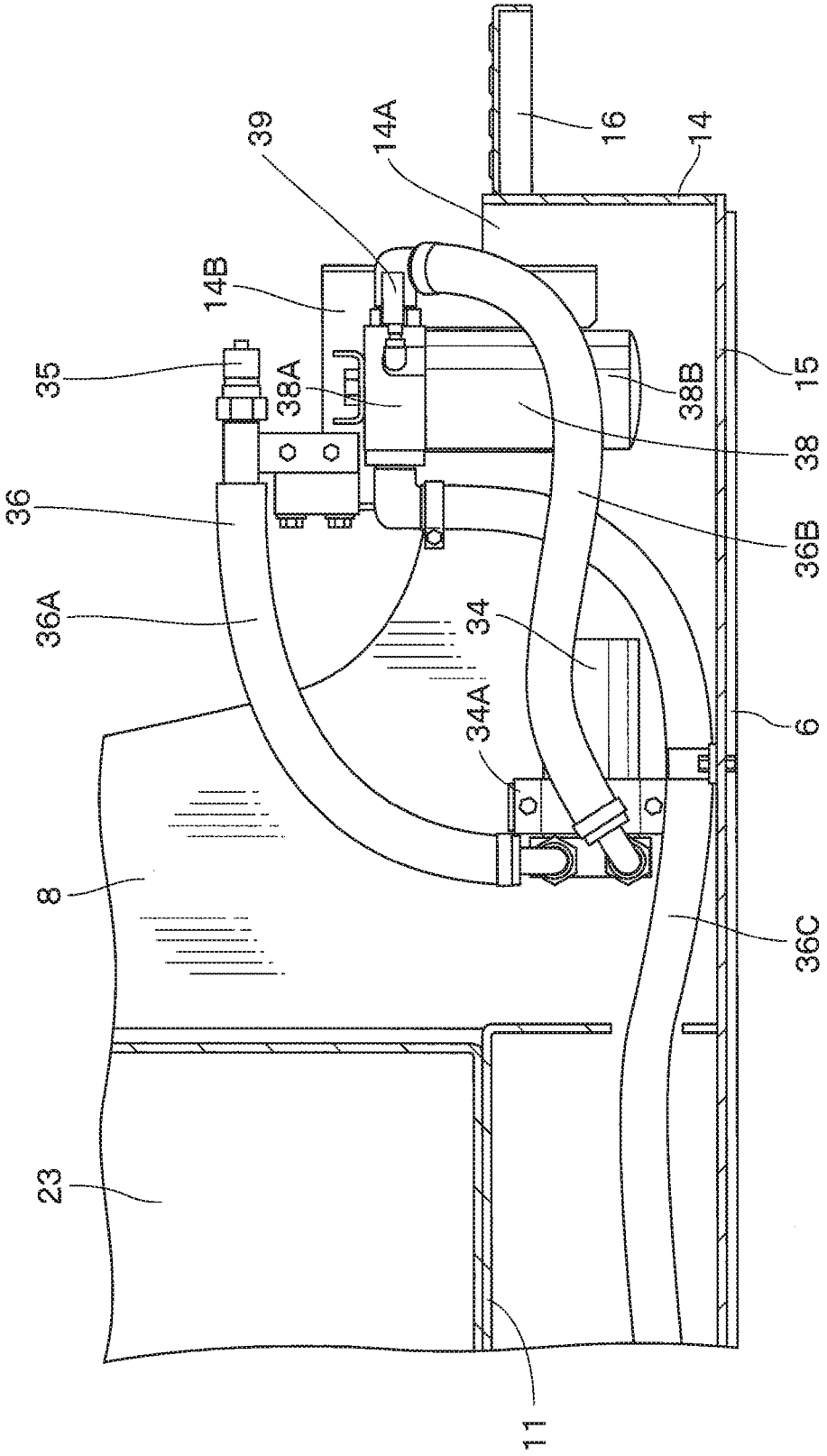

5
6
14A
16
7
14B
38A
35
9
34
8A
34A
36A
8
36
23
36C
11
39
38B
38
36B
14
15
13

Fig. 10



CONSTRUCTION MACHINE

TECHNICAL FIELD

[0001] The present invention relates to a construction machine on which a urea water tank storing urea water as a liquid reducing agent is mounted, for example.

BACKGROUND ART

[0002] In general, a hydraulic excavator as a typical example of a construction machine is constituted by a lower traveling structure, an upper revolving structure rotatably mounted on the lower traveling structure, and a working mechanism tiltably provided on a front part of the upper revolving structure.

[0003] The upper revolving structure includes a revolving frame constituting a support structural body, an engine mounted on a rear side of the revolving frame and driving a hydraulic pump, a hydraulic oil tank provided on the revolving frame at a position on a front side of the engine and storing a hydraulic oil to be supplied to the hydraulic pump, a fuel tank provided on the revolving frame, adjacent to the front side of the hydraulic oil tank, and storing a fuel to be supplied to the engine, a NOx purifying device provided by being connected to an exhaust pipe of the engine and removing nitrogen oxides (hereinafter referred to as NOx) contained in an exhaust gas, and a urea water tank storing urea water to be supplied to the NOx purifying device.

[0004] Here, in a case where the urea water tank is to be provided on a hydraulic excavator, such constitution is known that the urea water tank is installed by using a tool box provided on the front side of the fuel tank, and a supply work of the urea water is performed from front of the tool box (see Patent Document 1, for example).

PRIOR ART DOCUMENT

Patent Document

[0005] Patent Document 1: Japanese Patent Laid-Open No. 2011-12661 A

SUMMARY OF THE INVENTION

[0006] In the constitution according to Patent Document 1, a fuel filling opening for supplying a fuel is provided on an upper surface position of the fuel tank. Thus, when the fuel is to be supplied to the fuel tank, a worker needs to ride on an upper surface portion of the tool box as a step and to make an access to the fuel filing opening of the fuel tank.

[0007] However, according to the constitution of Patent Document 1, during the supply work of the urea water, a cover for opening/closing an opening of the tool box is opened upward. Thus, since the worker cannot use the upper surface portion of the tool box as a step, a water supply work of the urea water and a fuel filling work of the fuel tank cannot be performed at the same time, which leads to a problem that workability of the supply works is lowered.

[0008] The present invention was made in view of the aforementioned problem of the prior art, and an object of the present invention is to provide a construction machine which can improve the workability during the supply work by performing supply works to the urea water tank and to the fuel tank at the same time.

[0009] A construction machine according to the present invention is constituted by a lower traveling structure, an upper revolving structure rotatably mounted on the lower traveling structure, and a working mechanism tiltably provided on a front part of the upper revolving structure, wherein the upper revolving structure includes; a revolving frame constituting a support structural body, an engine mounted on a rear side of the revolving frame and driving a hydraulic pump, a hydraulic oil tank provided on the revolving frame at a position on a front side of the engine and storing a hydraulic oil to be supplied to the hydraulic pump, a fuel tank provided on the revolving frame, adjacent to the front side of the hydraulic oil tank, and storing a fuel to be supplied to the engine, a NOx purifying device provided by being connected to an exhaust pipe of the engine and removing nitrogen oxides contained in an exhaust gas, and a urea water tank storing urea water to be supplied to the NOx purifying device.

[0010] In order to solve the aforementioned problem, a characteristic of the constitution adopted by the present invention is that, a hollow accommodating case is provided on a front part of the revolving frame at a position on a front side of the fuel tank; a fuel supply pump for supplying the fuel stored in an external fuel storage source to the fuel tank is provided by being connected in the fuel tank; a fuel suction port for sucking the fuel toward the fuel supply pump is provided in the accommodating case by being opened to an outside; the urea water tank is provided by being accommodated in the accommodating case; a water supply port of the urea water is provided in the urea water tank by being opened to the outside; and the fuel suction port and the water supply port of the urea water are juxtaposed and arranged in the accommodating case.

[0011] According to the construction machine of the present invention, the supply work can be performed to the urea water tank and the fuel tank at the same time, which can improve workability during the supply works.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. **1** is a front view showing a hydraulic excavator that is applied to the embodiment of the present invention.

[0013] FIG. **2** is a plan view showing the hydraulic excavator in a state where a part of a working mechanism and a housing cover is omitted.

[0014] FIG. **3** is a plan view showing a revolving frame as a single body.

[0015] FIG. **4** is a perspective view showing a state where a hydraulic oil tank, a fuel tank, a urea water tank, each of accommodating cases, a fuel suction port and the like are mounted on the revolving frame.

[0016] FIG. **5** is a sectional view of the revolving frame, the fuel tank, the urea water tank, each of the accommodating cases and the like showing from an arrow V-V direction in FIG. **2**.

[0017] FIG. **6** is a perspective view showing a front side portion of the revolving frame in a state where the urea water tank and the fuel suction port are exposed by opening an opening/closing cover of a first accommodating case.

[0018] FIG. **7** is a perspective view showing the front side portion of the revolving frame from which each of the accommodating cases is omitted when seen from a position similar to that in FIG. **6**.

[0019] FIG. **8** is a partially broken plan view showing the front side portion of the revolving frame from which each of the accommodating cases is omitted.

[0020] FIG. **9** is a perspective view showing the front side portion of the revolving frame, a fuel supply pump, a fuel suction port and the like while a partition plate, a urea water tank and the like are omitted.

[0021] FIG. **10** is a sectional view of the front side portion of the revolving frame, the fuel supply pump, the fuel suction port and the like showing from an arrow X-X direction in FIG. **8**.

MODE FOR CARRYING OUT THE INVENTION

[0022] Hereinafter, the embodiment of a construction machine according to the present invention will be explained in detail with reference to FIG. **1** to FIG. **10** by taking a case where the construction machine is applied to a crawler-type hydraulic excavator as an example.

[0023] In FIG. **1**, the hydraulic excavator **1** as a construction machine used in an excavating work of earth and sand or the like is constituted by an automotive crawler-type lower traveling structure **2**, an upper revolving structure **3** rotatably mounted on the lower traveling structure **2**, and a working mechanism **4** tiltably provided on a front side of the upper revolving structure **3**.

[0024] The working mechanism **4** includes a boom **4**A, an arm **4**B, and a bucket **4**C, and they are rotated by a boom cylinder **4**D, an arm cylinder **4**E, and a bucket cylinder **4**F. Here, as shown in FIG. **2**, a foot part **4A1** of the boom **4**A constituting the working mechanism **4** is rotatably pin-connected to left and right boom mounting portions located on upper parts of left and right vertical plates **7** and **8**.

[0025] As shown in FIG. **2**, the upper revolving structure **3** is constituted by a revolving frame **5**, an engine **17**, a hydraulic oil tank **22**, a fuel tank **23**, a NOx purifying device **24**, a urea water tank **25**, a first accommodating case **28**, a fuel supply pump **34**, a fuel suction port **35** and the like which will be described later.

[0026] As shown in FIG. **3**, the revolving frame **5** is to constitute a support structural body of the upper revolving structure **3**. This revolving frame **5** is constituted by including a thick bottom plate **6** extending in a front-rear direction, a left vertical plate **7** and a right vertical plate **8** installed upright on the bottom plate **6** and extending in the front-rear direction with a predetermined interval in a left-right direction, a front plate **9** connecting front side portions of the left and right vertical plates **7** and **8** in the left-right direction, a plurality of left extension beams **10** extending from the bottom plate **6** and the left vertical plate **7** to the left side, a plurality of right extension beams **11** extending from the bottom plate **6** and the right vertical plate **8** to the right side, a left side frame **12** joined to a distal end portion of each of the left extension beams **10** and extending on the left side of the bottom plate **6** in the front-rear direction, and a right side frame **13** joined to a distal end portion of each of the right extension beams **11** and extending on the right side of the bottom plate **6** in the front-rear direction.

[0027] As shown in FIG. **9**, a screw seat **8**A is provided on a right surface of the right vertical plate **8** at a position in the vicinity of a rear side of a mounting plate **14**A of a front side beam **14** which will be described later. The fuel supply pump **34** which will be described later is mounted on this screw seat **8**A.

[0028] The front side beam **14** is provided on a front right side of the revolving frame **5** by extending in the left-right direction between a front part of the right vertical plate **8** and a front part of the right side frame **13**. The mounting plate **14**A is installed upright on a left end of this front side beam **14** so as to extend to a rear side. A mounting bracket **14**B extending in a vertical direction is provided on a right surface of this mounting plate **14**A. A fuel filter **38** and the like which will be described later are provided on this mounting bracket **14**B.

[0029] The front side beam **14**, the right extension beam **11** faced with the front side beam **14**, and a front part of the right side frame **13** constitute the support structural body surrounding to support the first accommodating case **28** which will be described later. An undercover **15** is provided at a position on the bottom part side on an inner side surrounded by the bottom plate **6**, the right extension beam **11**, the right side frame **13**, and the front side beam **14** (see FIG. **3**). Moreover, a footstep plate **16** is provided on the front part of the front side beam **14** by protruding to the front side, and the footstep plate **16** constitutes a step on which a foot is first stepped when riding on the upper revolving structure **3**.

[0030] The engine **17** is mounted on a laterally placed state on a rear side of the revolving frame **5**. This engine **17** is constituted as a diesel engine, and an exhaust pipe **18** for exhausting an exhaust gas is provided on its exhaust side.

[0031] A heat exchanger **19** is provided on the revolving frame **5** at a position on the left side of the engine **17**. This heat exchanger **19** is constituted by a radiator for cooling an engine cooling water, an oil cooler for cooling a hydraulic oil, an intercooler for cooling air suctioned by the engine **17** from a suction side and the like.

[0032] A hydraulic pump **20** is provided on the right side of the engine **17**. This hydraulic pump **20** delivers the hydraulic oil from the hydraulic oil tank **22** as a pressurized oil by being driven by the engine **17**.

[0033] A cab **21** is provided on a front left side of the revolving frame **5** or more specifically, on the left side of the foot part **4A1** of the boom **4**A constituting the working mechanism **4**. This cab **21** is on which an operator gets onboard in order to operate the hydraulic excavator **1** and has an operator's seat on which the operator is seated, levers and pedals for various operations and the like (none of them is shown) disposed therein.

[0034] The hydraulic oil tank **22** is provided on the right side of the revolving frame **5** at a position on a front side of the engine **17**. This hydraulic oil tank **22** is to store the hydraulic oil to be supplied to the hydraulic pump **20** and is formed as a cuboid-shaped pressure-resistant tank extending in the vertical direction, for example.

[0035] The fuel tank **23** is provided on the right side of the revolving frame **5** so as to be adjacent to the front side of the hydraulic oil tank **22**. This fuel tank **23** is to store a fuel to be supplied to the engine **17** and is formed as a cuboid-shaped hollow container, for example. A fuel filling opening **23**A for filling the fuel is provided on an upper surface of the fuel tank **23** by protruding upward. This fuel filling opening **23**A is used when the fuel is to be filled from a fuel filling vehicle. Moreover, a connecting port **23**B is provided at a position on the upper side on a rear surface of the fuel tank **23**. A supply hose **36**C of an oil supply line **36** which will be described later is connected to this connecting port **23**B.

[0036] The NOx purifying device **24** is connected to the exhaust pipe **18** at a position on the right side of the engine **17** (see FIG. **2**). This NOx purifying device **24** is to remove nitrogen oxides (NOx) in the exhaust gas by using a urea water solution (hereinafter referred to as a urea water) which

is a reducing agent. The NOx purifying device **24** is constituted by an accommodating tubular body **24**A connected to the exhaust pipe **18**, a urea selective reduction catalyst **24**B accommodated on an upstream side in the accommodating tubular body **24**A, an oxidation catalyst **24**C arranged on a downstream side of the urea selective reduction catalyst **24**B, and a urea water injection valve (not shown) provided on an upstream side of the urea selective reduction catalyst **24**B or in the exhaust pipe **18**, for example. The urea water injection valve is connected to the urea water tank **25** through a supply pump and a supply pipeline (none of them is shown).

[0037] Here, the NOx purifying device **24** injects the urea water into the exhaust gas by the urea water injection valve, causes a reduction reaction of NOx in the exhaust gas by using ammonia generated from the urea water by the urea selective reduction catalyst **24**B and decomposes it to water and nitrogen. Then, ammonia in the exhaust gas is decreased by the oxidation catalyst **24**C.

[0038] The urea water tank **25** is provided by being accommodated in an accommodating space **30** of the first accommodating case **28** which will be described later. This urea water tank **25** is to store the urea water to be supplied to the NOx purifying device **24**. The urea water tank **25** is fixed to a tank bracket **26** installed upright on the undercover **15** at a position in the vicinity on the front side of the fuel tank **23** by using a fixing belt **27** in a state placed on the undercover **15** of the revolving frame **5**, for example.

[0039] Specifically, as shown in FIG. **7**, the urea water tank **25** is formed as a sealed container having an outside dimension contained within a range of an approximately right half of the accommodating space **30**. The urea water tank **25** is constituted by a front surface part **25**A, a rear surface part **25**B, a left side surface part **25**C, a right side surface part **25**D, a top surface part **25**E, and a bottom surface part **25**F.

[0040] The top surface part **25**E of the urea water tank **25** has its front side portion **25**E**1** inclined downward. A water supply port **25**G for supplying the urea water is provided on this front side portion **25**E**1** toward a diagonally upper side and opened to the outside. Specifically, the water supply port **25**G is arranged at a position where an opening/closing cover **29** of the first accommodating case **28** which will be described later is opened, and a supply work can be performed from the front in a state where an opening **28**F is left open. Moreover, a gauge **25**H is provided on the front side portion **25**E**1** of the top surface part **25**E at a position on a left side of the water supply port **25**G. This gauge **25**H is for inspection of a water amount, a deterioration state and the like of the urea water in the urea water tank **25**.

[0041] The first accommodating case **28** is provided on a front side from the fuel tank **23**, that is, at a position on a front right part of the revolving frame **5**. As shown in FIG. **5** and FIG. **7**, the first accommodating case **28** uses a space on the undercover **15** surrounded by the right extension beam **11** of the revolving frame **5**, a front part of the right side frame **13**, and a front side beam **14**. Thereby, the first accommodating case **28** can define the accommodating space **30** having a large capacity inside thereof.

[0042] The first accommodating case **28** is formed as a case having a hollow structure made of a cuboid. Specifically, the first accommodating case **28** is formed having a length dimension in the front-rear direction from a front end of the fuel tank **23** to a front end of the front side beam **14** of the revolving frame **5**, a width dimension in the left-right direction equal to a width dimension of the fuel tank **23**, and a height dimension in the vertical direction covering the urea water tank **25** and the like, for example. As shown in FIG. **5**, the first accommodating case **28** is constituted by a front surface part **28**A formed by standing upright from the front end of the front side beam **14** of the revolving frame **5**, a rear surface part **28**B installed upright at a position close to the front end of the fuel tank **23**, a left side surface part **28**C and aright side surface part **28**D installed upright so as to stand between the front surface part **28**A and the rear surface part **28**B, and a top surface part **28**E having a substantially regular square shape closing an upper side of each of the surface parts **28**A to **28**D.

[0043] Here, the rear surface part **28**B is formed as a square frame-shaped plate body having a center part largely opened. However, since the rear surface part **28**B is faced with and close to the front end of the fuel tank **23**, the rear surface part **28**B is substantially in a closed state. Thereby, as shown in FIG. **5**, the first accommodating case **28** has a bottom-out structure and by being bolted to the front side of the revolving frame **5**, the accommodating case **28** defines the large accommodating space **30** together with the undercover **15** of the revolving frame **5** on the lower side.

[0044] The opening **28**F having a large width in the left-right direction over the front surface part **28**A and the top surface part **28**E is provided with the first accommodating case **28**. The water supply port **25**G of the urea water tank **25**, the fuel suction port **35** and the like are arranged in this opening **28**F.

[0045] The opening/closing cover **29** constitutes a part of the first accommodating case **28** and is mounted on the first accommodating case **28** so as to cover the opening **28**F. A rear part of an upper plate **29**A which becomes a second step subsequent to the footstep plate **16** is mounted on the rear part of the top surface part **28**E capable of being opened/closed through a hinge **29**B working as a fulcrum of the opening/closing cover **29**. Thereby, the opening/closing cover **29** can prevent entry of earth and sand or dusts by locking in a state closed and covering the opening **28**F or can prevent tampering or the like. On the other hand, by opening the opening/closing cover **29**, the opening **28**F can be opened, and the water supply port **25**G, the fuel suction port **35** and the like can be exposed to the outside.

[0046] As shown in FIG. **6**, the accommodating space **30** is defined in the first accommodating case **28** at a position on the front right portion of the revolving frame **5**. Thereby, the accommodating space **30** is formed having a large capacity within a range from the top surface part **28**E to the undercover **15** of the revolving frame **5**. In this accommodating space **30**, the urea water tank **25**, the fuel supply pump **34** to fill the fuel tank **23**, the fuel suction port **35** and the like are accommodated by being juxtaposed in the left-right direction.

[0047] The accommodating space **30** is divided by a partition plate **31** installed upright on the undercover **15** at a position in the middle of the left-right direction into a tank space part **30**A and a pump space part **30**B. The urea water tank **25** is accommodated in the tank space part **30**A located on the right side (right side frame **13** side) in the left-right direction. Moreover, the fuel supply pump **34**, the fuel suction port **35**, an operation switch **37**, the fuel filter **38**, a clogging indicator **39** and the like which will be described later are accommodated in the pump space part **30**B.

[0048] A second accommodating case **32** is provided on a rear side above the first accommodating case **28**. A length dimension of this second accommodating case **32** in the front-rear direction is set to approximately a half of the length dimension of the first accommodating case **28** in the front-rear direction, for example. A width dimension of the second accommodating case **32** in the left-right direction is set to a dimension shorter than that of the first accommodating case **28**, for example. The second accommodating case **32** is mounted on the top surface part **28**E of the first accommodating case **28**, and its inside is an article accommodating space **33** (see FIG. **5**). Various consumables such as a tool box, a spare bottle of urea water and the like (not shown) can be accommodated in this article accommodating space **33**.

[0049] Next, constitution of the fuel supply pump **34**, the fuel suction port **35**, the operation switch **37**, the fuel filter **38**, and the clogging indicator **39**, which is a characteristic part of the present invention provided for supplying the fuel to the fuel tank **23** will be described.

[0050] The fuel supply pump **34** is provided in the first accommodating case **28**, that is, at a left depth portion of the pump space part **30**B of the accommodating space **30**. This fuel supply pump **34** is to supply the fuel stored in a container (not shown) which is an external fuel storage source to the fuel tank **23**. The fuel supply pump **34** is constituted by a main body part including a plunger pump, a gear pump, a trochoid pump, a vane pump or the like and the fuel supply pump **34** is driven by an electric motor, for example. Here, as shown in FIG. **8**, FIG. **9**, and FIG. **10**, the fuel supply pump **34** is fixed to a side surface of the right vertical plate **8** by bolting a mounting bracket **34**A to a screw seat **8**A provided on the right vertical plate **8** of the revolving frame **5**. A suction hose **36**A which will be described later is connected to the suction side of the fuel supply pump **34**, and a delivery hose **36**B is connected to the delivery side.

[0051] The fuel suction port **35** is provided at a distal end of the suction hose **36**A and suctions the fuel into the fuel supply pump **34**. This fuel suction port **35** is used by one side joint of one-touch joints called a quick coupling. The fuel suction port **35** formed as the joint has a check valve (not shown) for preventing outflow (backflow) of the fuel other than in the fuel filling work is provided therein. The fuel suction port **35** is arranged in the accommodating space **30** in the first accommodating case **28** and is provided opened to an outside from the opening **28**F. Moreover, the fuel suction port **35** is arranged by being juxtaposed with the water supply port **25**G of the urea water tank **25** in the left-right direction. That is, the fuel suction port **35** is arranged at a position where the fuel filling work can be performed from the front in a state where the opening/closing cover **29** of the first accommodating case **28** is opened similarly to the water supply port **25**G of the urea water tank **25**. Further, the fuel suction port **35** is arranged at an interval from the water supply port **25**G so that the water supply work of the urea water and the fuel filling work can be performed at the same time.

[0052] The fuel suction port **35** is bolted to the mounting bracket **14**B provided on the front side beam **14** of the revolving frame **5**. Thereby, the fuel suction port **35** is arranged closer to the left side (the right vertical plate **8** side) in the pump space part **30**B of the accommodating space **30** and fixed toward the front side so that the fuel filling hose of the external fuel storage source can be easily connected.

[0053] The oil supply line **36** is to supply the fuel suctioned through the fuel suction port **35** to the fuel tank **23**. As this oil supply line **36**, a pressure-resistant hose having flexibility is used. It should be noted that a pipe member made of metal can be used as a part of the oil supply line **36**.

[0054] The oil supply line **36** is constituted by the suction hose **36**A connecting the fuel suction port **35** and the suction side of the fuel supply pump **34** to each other, a delivery hose **36**B connecting the delivery side of the fuel supply pump **34** and an inflow side of the fuel filter **38** which will be described later to each other, and the supply hose **36**C connecting an outflow side of the fuel filter **38** and the connecting port **23**B of the fuel tank **23** to each other.

[0055] As shown in FIG. **7**, the operation switch **37** is provided in the vicinity of the fuel suction port **35** in the first accommodating case **28**. The operation switch **37** is located in the pump space part **30**B of the accommodating space **30** and is mounted on the front side of the partition plate **31**, adjacent to the fuel suction port **35**. This operation switch **37** can drive and stop the fuel supply pump **34** by being operated with a button by a worker. In this case, since the operation switch **37** is close to the fuel suction port **35**, a connecting work of the hose for fuel filling and the fuel filling work by the fuel supply pump **34** can be performed smoothly.

[0056] The fuel filter **38** is mounted on the mounting bracket **14**B of the front side beam **14** at a position below the fuel suction port **35**. The fuel filter **38** is constituted by a connecting part **38**A on an upper side and a filter part **38**B on a lower side. The delivery hose **36**B is connected to an inflow side of the connecting part **38**A, and the supply hose **36**C is connected to an outflow side. Thereby, the fuel filter **38** can catch foreign substances such as dusts and the like contained in the fuel delivered from the fuel supply pump **34** and can supply a clean fuel to the fuel tank **23**.

[0057] The clogging indicator **39** is provided by being connected to the connecting part **38**A of the fuel filter **38**. The clogging indicator **39** is to display a clogged state of the fuel filter **38**, and a differential pressure gauge or the like is used as the clogging indicator **39**, for example. Since this clogging indicator **39** is arranged in the vicinity of the fuel suction port **35** and the operation switch **37**, inspection can be easily performed during the fuel filling work.

[0058] The hydraulic excavator **1** according to this embodiment has the constitution as above and its operation will be described next.

[0059] The operator who got onboard on the cab **21** drives the hydraulic pump **20** by starting the engine **17**. By operating a travel lever or the like in this state, the lower traveling structure **2** can be advanced or retreated. On the other hand, by operating a work lever, the working mechanism **4** can be tiltably moved so as to perform an excavating work of earth and sand or the like.

[0060] During the operation of the engine **17**, nitrogen oxides (NOx) which are harmful substances are exhausted from its exhaust pipe **18**. At this time, the urea water in the urea water tank **25** is supplied to the urea water injection valve of the NOx purifying device **24**. At this time, the NOx purifying device **24** generates ammonia by injecting the urea water into the exhaust gas from the urea water injection valve. Thereby, the nitrogen oxides are reduced to water and nitrogen and are ejected to an outside via the oxidation catalyst **24**C in the urea selective reduction catalyst **24**B, whereby an emission of the nitrogen oxides can be reduced.

[0061] Here, a case where the urea water is supplied to the urea water tank **25** will be described. First, the worker stands on the front right side of the upper revolving structure **3** and opens the opening/closing cover **29** of the first accommodating case **28** upward. Thereby, the water supply port **25**G of the urea water tank **25** accommodated in the accommodating space **30** can be exposed to the outside through the opening **28**F, and the urea water can be supplied from the water supply port **25**G in this state.

[0062] Subsequently, a case where the fuel is supplied from the external fuel storage source to the fuel tank **23** will be described. In this case, similarly to the case of supplying the urea water to the urea water tank **25**, the worker stands on the front right side of the upper revolving structure **3** and opens the opening/closing cover **29**. Thereby, the fuel suction port **35**, the operation switch **37** and the like accommodated in the accommodating space **30** can be exposed to the outside through the opening **28**F of the first accommodating case **28**. As described above, after the fuel suction port **35**, the operation switch **37** and the like are exposed to the outside, a hose (not shown) connected to the external fuel storage source is connected to the fuel suction port **35**. Subsequently, the operation switch **37** is operated so as to drive the fuel supply pump **34**. Thereby, the fuel suctioned from the external fuel storage source through the hose can be supplied (replenished) to the fuel tank **23** through the oil supply line **36**.

[0063] During supply of this fuel, by passing the fuel through the fuel filter **38**, foreign substances in the fuel can be removed, and a clean fuel is supplied to the fuel tank **23**. Moreover, by visually checking the clogging indicator **39** through the opening **28**F during the fuel filling work, the clogged state of the fuel filter **38** can be inspected.

[0064] Thus, according to this embodiment, the water supply port **25**G of the urea water tank **25** and the fuel suction port **35** are provided by being juxtaposed so as to open to the outside in the first accommodating case **28** arranged on the front part of the revolving frame **5**. Accordingly, the fuel filling work can be performed from on the ground without getting on the upper revolving structure **3**. As a result, the water supply work of the urea water into the urea water tank **25** and the fuel filling work into the fuel tank **23** can be performed at the same time. Thereby, since the works required for supply of the fuel and the urea water can be performed easily and in a shorter time, workability during the supply works can be improved.

[0065] Since the first accommodating case **28** can close the opening **28**F by closing the opening/closing cover **29**, entry of earth and sand or dusts into the first accommodating case **28** can be prevented by this opening/closing cover **29**. Moreover, the urea water tank **25**, the operation switch **37** and the like in the first accommodating case **28** can be protected by the opening/closing cover **29** from tampering.

[0066] Moreover, since the operation switch **37** of the fuel supply pump **34** is provided at a position in the vicinity of the fuel suction port **35**, the operation of the operation switch **37** can be easily performed during the fuel filling. Thereby, workability when the fuel is filled can be improved.

[0067] Moreover, since the clogging indicator **39** displaying the clogged state of the fuel filter **38** is provided in the first accommodating case **28**, the clogging indicator **39** can be visually recognized easily during the fuel filling, and the clogged state of the fuel filter **38** can be easily checked.

[0068] Further, the water supply port **25**G and the gauge **25**H of the urea water tank **25** are provided adjacent to each other. Thereby, when the urea water is to be supplied through the water supply port **25**G, supply can be performed while checking the gauge **25**H, and the supply work of the urea water can be performed easily.

[0069] It should be noted that in this embodiment, it is so constituted that the urea water tank **25** is provided on the right side frame **13** side in the first accommodating case **28**, and the fuel suction port **35** is provided on the right vertical plate **8** side in the first accommodating case **28**. However, the present invention is not limited thereto, but it may be so constituted that the urea water tank is provided on the right vertical plate side, and the fuel suction port is provided on the right side frame side.

[0070] Moreover, in this embodiment, it is so constituted that the fuel filter **38** is provided in the middle of the delivery hose **36**B of the oil supply line **36**, but it may be provided in the middle of the suction hose between the fuel suction port and the fuel tank.

[0071] Further, in this embodiment, as a construction machine, a crawler-type hydraulic excavator **1** is described as an example. However, the present invention is not limited thereto, but it may be also applied to a wheel-type hydraulic excavator. Other than that, it may be also widely applied to other construction machines such as a hydraulic crane and the like.

DESCRIPTION OF REFERENCE NUMERALS

[0072] **1**: Hydraulic excavator (Construction machine)
[0073] **2**: Lower traveling structure
[0074] **3**: Upper revolving structure
[0075] **4**: Working mechanism
[0076] **5**: Revolving frame
[0077] **17**: Engine
[0078] **18**: Exhaust pipe
[0079] **20**: Hydraulic pump
[0080] **22**: Hydraulic oil tank
[0081] **23**: Fuel tank
[0082] **24**: NOx purifying device
[0083] **25**: Urea water tank
[0084] **25**G: Water supply port
[0085] **28**: First accommodating case (Accommodating case)
[0086] **29**: Opening/closing cover
[0087] **34**: Fuel supply pump
[0088] **35**: Fuel suction port
[0089] **37**: Operation switch
[0090] **38**: Fuel filter
[0091] **39**: Clogging indicator

1. A construction machine comprising:
a lower traveling structure, an upper revolving structure rotatably mounted on said lower traveling structure, and a working mechanism tiltably provided on a front part of said upper revolving structure, wherein
said upper revolving structure includes;
a revolving frame constituting a support structural body,
an engine mounted on a rear side of said revolving frame and driving a hydraulic pump,
a hydraulic oil tank provided on said revolving frame at a position on a front side of said engine and storing a hydraulic oil to be supplied to said hydraulic pump,

a fuel tank provided on said revolving frame, adjacent to the front side of said hydraulic oil tank, and storing a fuel to be supplied to said engine,

a NOx purifying device provided by being connected to an exhaust pipe of said engine and removing nitrogen oxides contained in an exhaust gas, and

a urea water tank storing urea water to be supplied to said NOx purifying device, characterized in that:

a hollow accommodating case is provided on a front part of said revolving frame at a position on a front side of said fuel tank;

a fuel supply pump for supplying the fuel stored in an external fuel storage source to said fuel tank is provided by being connected in said fuel tank;

a fuel suction port for sucking the fuel toward said fuel supply pump is provided in said accommodating case by being opened to an outside;

said urea water tank is provided by being accommodated in said accommodating case;

a water supply port of the urea water is provided in said urea water tank by being opened to the outside; and

said fuel suction port and said water supply port of the urea water are juxtaposed and arranged in said accommodating case.

2. The construction machine according to claim **1**, wherein

an opening/closing cover for opening and closing by using a rear side as a fulcrum is provided on said accommodating case; and

said fuel suction port and said water supply port of the urea water are arranged at positions where supply works can be performed from a front in a state where said opening/closing cover is opened.

3. The construction machine according to claim **1**, wherein

an operation switch of said fuel supply pump is provided in said accommodating case at a position in the vicinity of said fuel suction port.

4. The construction machine according to claim **1**, wherein

a fuel filter for removing foreign substances in the fuel is provided in the middle of a passage from said fuel suction port to said fuel tank; and

a clogging indicator for displaying a clogged state of said fuel filter is provided in said accommodating case.

5. The construction machine according to claim **1**, wherein

said fuel supply pump is provided in said accommodating case.

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