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(71) Applicant: **Tatsuno Corporation**
Tokyo 108-0073 (JP)

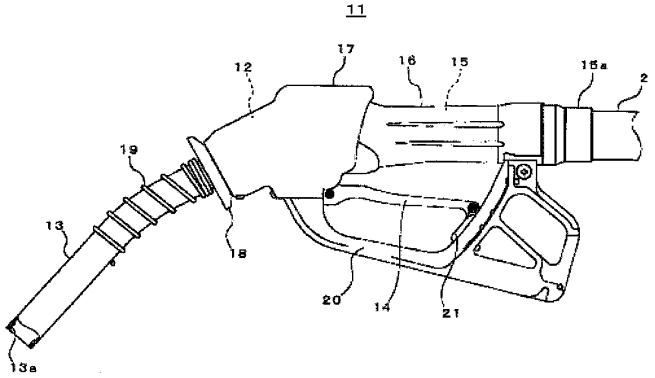
(72) Inventors:
- **XIA, Jianyong**
Tokyo 108-0073 (JP)
- **KIM, Chunsik**
Pucheon-city
Kyounggi-do (KR)
- **HONG, Sadoo**
Pucheon-city
Kyounggi-do (KR)

(74) Representative: **Sauvage de Brantes, Petra**
Korejzová Legal v.o.s
Korunni 810/104 E
101 00 Prague 10 (CZ)

(54) REFUELING NOZZLE

(57) [OBJECT] To provide a safety fueling nozzle capable of certainly removing static electricity generated while the fueling nozzle is used. [MEANS OF REALIZING THE OBJECT] A fueling nozzle 11 including: a main valve 12a opening though operation of a valve opening lever 14 to allow fuel oil to flow; an automatic valve closing mechanism 12b releasing engagement between the main valve and the valve opening lever to terminate fueling when sealed with a liquid surface in a tank to which the fuel oil is supplied; a main body 12 having the main valve and the automatic valve closing mechanism; a grip 15 made of conductive metal, the grip being held together with the valve opening lever when the valve opening lever is operated; a fueling hose 2 connected to the grip, the fueling hose suppling the fuel oil to the main body; a discharge pipe 13 discharging fuel oil that has passed though the main valve; a ground wire mounted to the fueling hose and connected to the grip; and a conductive cover 16 covering the grip.

[Fig. 2]



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Description

TECHNICAL FIELD

[0001] The present invention relates to a fueling nozzle used for suppling fuel oil to a fueling tank of a vehicle (hereinafter referred to as "in-vehicle tank") or the like in a gas station and others.

BACKGROUND ART

[0002] A fueling nozzle is mounted at an end of a fueling hose lead from a fueling apparatus of a gas station, and is hooked on a nozzle hook of the fueling apparatus when fueling is not carried out. Then, after an operator detaches the fueling nozzle from the nozzle hook to insert it into inside of the in-vehicle tank or the like, a fueling mechanism of the fueling apparatus is driven to perform fuel oil supply.

[0003] In recent years, in order to reduce manpower cost, self-service gas station that customers perform the above fueling operation by themselves increase, and a risk that sparks are generated by static electricity charged to a customer's body and gasoline vapor stating in a fueling area ignites can be denied. Therefore, the applicant proposed, in Patent document 1, a fueling apparatus including a static electricity removal panel that removes static electricity charged to a customer by touching it before fueling operation.

PRIOR ART DOCUMENTS

PATENT DOCUMENTS

[0004] PATENT DOCUMENT 1: Japanese Patent Publication 2004-189246 gazette

OUTLINE OF THE INVENTION

PRBLEMS TO BE SOLVED BY THE INENTION

[0005] The invention described in the above Patent document 1 is effective, and the static electricity removal panel can remove static electricity charged to a customer's body while the customer touches it, but there is a possibility that static electricity charges to the customer's body during operation of the fueling nozzle after the customer's hand moves away from the static electricity removal panel, so that there is room for improvement on the fueling nozzle.

[0006] Then, the present invention has been made in consideration of the above problems in the conventional technique, and the object of the present invention is to provide a safety fueling nozzle capable of certainly removing static electricity generated at fueling, that is, while the fueling nozzle is used.

MEANS OF SOLVING THE PROBLEMS

[0007] In order to attain the above object, the present invention relates to a fueling nozzle, and the fueling nozzle is characterized by including: a main valve opening though operation of a valve opening lever to allow fuel oil to flow; an automatic valve closing mechanism releasing engagement between the main valve and the valve opening lever to terminate fueling when sealed with a liquid surface in a tank to which the fuel oil is supplied; a main body having the main valve and the automatic valve closing mechanism; a grip made of conductive metal, the grip being held together with the valve opening lever when the valve opening lever is operated; a fueling hose connected to the grip, the fueling hose suppling the fuel oil to the main body; a discharge pipe discharging fuel oil that has passed though the main valve; a ground wire mounted to the fueling hose and connected to the grip; and a conductive cover covering the grip.

[0008] In the fueling nozzle according to the present inventio, the grip and the cover for covering the grip are made of conductive metal, and to the grip is connected the ground wire, so that static electricity charged to a customer's body during fueling operation can be removed though the grip, which enables safety fueling operation.

[0009] In the fueling nozzle, fixing the conductive cover to an end portion of the grip on the fueling hose side or the main body side prevents the cover made of conductive metal from being removed from the grip. Further, fixing the conductive cover to an end portion of the grip on the fueling hose side and an end portion of the grip on the main body side prevents the cover made of conductive metal from rotating around the axis of the grip besides the prevention of detachment from the grip.

[0010] The conductive cover may include a cutout extending in an axial direction of the grip. With the cutout, the conductive cover can easily be removed from the grip.

[0011] The fueling nozzle may further includes an oil receiving portion fitted to a portion where the discharge pipe is attached to the main body, the oil receiving portion receiving fuel oil dropping from the discharge pipe toward the main body, wherein a plurality of ribs forming valley portions for storing dropped fuel oil is continuously mounted on a face of the oil receiving portion on the discharge pipe side. With this, it can be prevented that fuel oil dropped along the discharge pipe enters the main body.

[0012] In the oil receiving portion of the fueling nozzle, the ribs can stand to form concentric-graphic-shaped outlines with the discharge pipe viewed from the discharge pipe side, and an outer rib can extend on the discharge pipe side compared to an inner rib. With this, storage of the fuel oil dropped along the discharge pipe can be performed gradually from a central portion to a peripheral portion, which prevents fuel oil from entering into the main body further effectively.

[0013] In the oil receiving portion, a plurality of rein-

forcing members for connecting the ribs can be mounted to prevent deformation of the oil receiving portion.

[0014] In the fueling nozzle, it is possible to construct that the oil receiving portion includes: a sealing portion surrounding the discharge pipe to fit the oil receiving portion to the discharge pipe, and preventing the fuel oil from entering therein; and a guard portion surrounding the discharge pipe to fit the oil receiving portion to the discharge pipe together with the sealing portion, and preventing the oil receiving portion from inclining toward the discharge pipe. With this, the oil receiving portion can stably be mounted to the discharge pipe.

EFFECTS OF THE INVENTION

[0015] As described above, with the present invention, it becomes possible to provide a safety fueling nozzle that can remove static electricity charged to a customer's body during fueling operation and so on.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

[Figure 1] A schematic view showing a fueling apparatus having a fueling nozzle according to the present invention.

[Figure 2] A partially sectional schematic view showing an embodiment of the fueling nozzle according to the present invention.

[Figure 3] A schematically sectional view of a main body, a grip and others of the fueling nozzle shown in Fig. 2.

[Figure 4] A perspective view showing an oil guard of the fueling nozzle shown in Fig. 2.

[Figure 5] A sectional view taken along the line A-A of Fig. 4.

[Figure 6] A circuit diagram of a lamp circuit for executing control of turning on or off a destaticization confirming lamp of the fueling apparatus shown in Fig. 1.

[Figure 7] A longitudinally sectional view showing a grip and its vicinity in another embodiment of the fueling nozzle according to the present invention.

MODE FOR CARRYING OUT THE INVENTION

[0017] Next, embodiments of the present invention will be explained in detail with reference to the drawings.

[0018] Figure 1 shows an example of a fueling apparatus having a fueling nozzle according to the present invention. The fueling apparatus 1 is capable of suppling various fuel oils, and includes: a plurality of fueling hoses 2 separately connected to incorporated fueling pipes for the various fuel oils; fueling nozzles 11 according to the present invention, the nozzles 11 being separately mounted at ends of the fueling hoses 2; a display 3 for displaying fueling amount and others; a touch panel 4 for setting the fueling amount and others; a card reader 5 for reading a card or the like inserted therein to pay fueling fee and others; a printer 6 for printing a receipt or the like; a static electricity removal pad 7 for removing static electricity charged to an operator before fueling operation; a destaticization confirming lamp 8; and so on. The fueling hose 2, the display 3, the touch panel 4, the card reader 5, the printer 6 and the static electricity removal pad 7 are installed in general fueling apparatuses, and detailed explanations thereof will be omitted.

[0019] The fueling nozzle 11 is, as shown in Fig. 2, constituted by a main body 12, a discharge pipe 13, a grip 15 projecting from the main body 12 for handling a valve opening lever 14 and so on.

[0020] In the main body 12 is, as shown in Fig. 3, formed a fuel oil passage, and the main body 12 includes a main valve 12a that opens to flow fuel oil therein when a valve opening lever 14 (refer to Fig. 2) is operated, and an automatic valve closing mechanism 12b that releases the engagement between the main valve 12a and the valve opening lever 14 to terminate fueling when sealed with a liquid surface in a tank to which fuel is supplied. In addition, the discharge pipe 13 (refer to Fig. 2) incorporates a liquid level detecting pipe (not shown) extending from the automatic valve closing mechanism 12b, and the liquid level detecting pipe is arranged so as to open on its discharge end side.

[0021] With the above construction, as shown in Figs. 2 and 3, at fueling operation, grasping the valve opening lever 14 allows the main valve 12a to open, which rises liquid level in an in-vehicle tank. When the liquid level detecting pipe in the discharge pipe 13 detects fuel oil, it is judged that the in-vehicle tank is filled, and the automatic valve closing mechanism 12b closes the main valve 12a to forcibly terminate the fueling operation regardless of a condition of the valve opening lever 14.

[0022] Returning to Fig. 2, the discharge pipe 13 is made of aluminum alloy for example, and includes: a reinforcing ring 13a incorporated in a discharge end thereof; an oil guard (oil receiving portion) 18 mounted to an end portion on the main body 12 side; and an anchor spring 19 whose one end is fixed near the oil guard 18 and another end extends on the discharge end side. In addition, in Fig. 3 is omitted illustration of the oil guard 18.

[0023] The reinforcing ring 13a is mounted to avoid a condition that fueling cannot be carried out due to deformation of the discharge end of the discharge pipe 13 when a fueling operator accidentally drops the fueling nozzle 11. The oil guard 18 will be described below. The anchor spring 19 is mounted to avoid that an end portion of the anchor spring 19 on the reinforcing ring 13a side contacts the in-vehicle tank and the oil guard 18 collides with the in-vehicle tank to break when the discharge pipe 13 is inserted into the in-vehicle tank.

[0024] The oil guard 18 is mounted to prevent that fuel oil adhering to the discharge pipe 13 enters through the discharge pipe 13 in the main body 12 after fueling when the fueling nozzle 11 is inclined to direct the discharge

pipe 13 upward.

[0025] The oil guard 18 is, as shown in Figs. 4 and 5, constituted by a cylindrical portion 18a and an extending portion 18b radially extending from one end of the cylindrical portion 18a, and inside the cylindrical portion 18a, sealing portions 18c and guard portions 18d which cover an outer periphery of the discharge pipe 13 are separately mounted in two stages. In the extending portion 18b are mounted ribs 18e (18e1-18e3) formed in multi stages and reinforcing members 18f reinforcing the extending portion 18b to prevent it from deforming.

[0026] In the cylindrical portion 18a, the sealing portion 18c is, in order to prevent fuel oil from entering therein, attached to the discharge pipe 13 such that no clearance generates between them. The guard portion 18d is mounted to prevent the oil guard 18 from inclining and to fix the oil guard 18 to the discharge pipe 13 together with the sealing portion 18c, and has a clearances 18g to incline toward the discharge end of the discharge pipe 13.

[0027] In the extending portion 18b, the ribs 18e are formed from inside to outside in three stages, and heights thereof gradually increase from the inside rib 18e1 to the outside rib 18e3. Between these ribs 18e are formed valley portions 18h (18h1-18h3) where fuel oils are stored, and capacities thereof gradually increase from inside to outside.

[0028] The reinforcing members 18f are arranged to divide the ribs 18e into four at 90° intervals. The number and arrangement of the reinforcing members 18f are just exemplified, the more the number of the reinforcing members 18f becomes, the less the capacities of the valley portions 18h2, 18h3 become, so that the number of the reinforcing members 18f is preferably suppressed while minimum strength of the oil guard 18 is secured.

[0029] The grip 15 shown in Figs. 2 and 3 is made of metal with conductivity, and a flow passage communicating with a flow passage of the main body 12 is formed therein, and the grip 15 includes a connecting portion 15a to which the fueling hose 2 is connected. In addition, the grip 15 is covered and protected by a conductive cover 16 made of conductive resin or the like.

[0030] Here, in the fueling hose 2 is incorporated a conducting wire 32 (refer to Fig. 6) communicating with a lamp circuit described below, and the grip 15 and the conductive cover 16 have conductivity as described above, so that static electricity charged to an operator who holds the conductive cover 16 of the grip 15 flows through the conducting wire into the lamp circuit.

[0031] As shown in Fig. 3, the conductive cover 16 is formed along outlines of the main body 12 and the grip 15, and includes a cutout 16a extending in an axial direction of the grip 15. Enlarging the conductive cover 16 through the cutout 16a allows it to easily be attached to or detached from the grip 15. In addition, in the main body 12 and the grip 15, portions to which both ends 16b, 16c of the conductive cover 16 are attached are not formed to be cylindrical or columnar, and making outer diameters thereof uneven prevents the conductive cover 16 from rotating around the axis thereof also when the conductive cover 16 is fixed to the main body 12 and the grip 15 through the both ends 16b, 16c.

[0032] It is preferable that manufacture date is described on a surface of the conductive cover 16 as rough indication of time for exchange (for example about three years), and in order to deal with customers who prefer cleanliness, the surface of the conductive cover 16 is preferably be antibacterially formed.

[0033] In addition, on the main body 12 side of the conductive cover 16 can be attached a cover scarf 17 as shown in Fig. 2. With the cover scarf 17, the main body 12 can be protected, and color coding based on kinds of oil allows a worker to confirm which fueling nozzle 11 corresponds to which kind of oil at first sight. In addition, in Fig. 3 is omitted the indication of the cover scarf 17.

[0034] A guard 20 is mounted to protect a valve opening lever 14, and the guard 20 is provided with a latch 21 for allowing an end of the valve opening lever 14 to slide, which enables operation of the valve opening lever 14.

[0035] Next, the lamp circuit, which removes static electricity charged to a body of a worker operating the fueling nozzle 11 shown in Fig. 2 and others, and executes control of turning on or off a destaticization confirming lamp 8 shown in Fig. 1, will be explained with reference to Fig. 6.

[0036] The lamp circuit 31 connects the grip 15 of the fueling nozzle 11 and the destaticization confirming lamp 8 with a conducting wire 32; between them are disposed a comparator 33 for detecting static electricity of the fueling nozzle 11; between the fueling nozzle 11 and the holding circuit 34 are parallelly connected destaticizing circuits 36 through a conducting wire 35; and to the holding circuit 34 is connected a reset circuit 38 through a conducting wire 37.

[0037] The comparator 33 compares a voltage inputted from the input portion 33a with a reference voltage. When the input voltage is higher than the reference voltage, the comparator 33 outputs HIGH voltage, and when the input voltage is lower than the reference voltage, the comparator 33 outputs LOW voltage. Here, outputting HIGH voltage from the output portion 33b indicates that static electricity flows through the fueling nozzle 11, which turns on the destaticization confirming lamp 8.

[0038] The holding circuit 34 is disposed to sustain lighting of the destaticization confirming lamp 8 when HIGH voltage has not outputted from the output portion 33b after HIGH voltage had been outputted from the output portion 33b of the comparator 33. This is because static electricity flows through the comparator 33 for an instant, and it is difficult for a worker to visually recognize lighting even through the destaticization confirming lamp 8 lights for the moment only.

[0039] The destaticizing circuit 36 is a relay circuit, and is mounted to connect contacts to release static electricity flowing through the fueling nozzle 11 to the ground when HIGH voltage is outputted from the output portion 33b of

the comparator 33. When LOW voltage is outputted from the output portion 33b of the comparator 33, the destaticizing circuit 36 releases the connection of the contacts.

[0040] The reset circuit 38 is mounted to prevent the destaticization confirming lamp 8 from continuously lighting by releasing sustainment of the holding circuit 34 to turn off the destaticization confirming lamp 8 when a predetermined time has passed after the holding circuit 34 starts sustainment of a circuit.

[0041] With the fueling nozzle 11 with the above construction, after a fueling operator removes static electricity charged to the operator by attaching the static electricity removal pad 7, even if static electricity is charged to the operator, since the grip 15 and the conductive cover 16 have conductivity and to the grip 15 is connected the lamp circuit 31, it is possible to remove static electricity inputted from the conductive cover 16 through the grip 15, the conducting wire 32 and the destaticizing circuit 36. In addition, even if the operator forgets to touch the static electricity removal pad 7, fueling operation can be performed in safety.

[0042] In addition, when the condition that fueling becomes possible by the fueling mechanism of the fueling apparatus 1 is set to be a case that both of ON signal of the nozzle switch that is generated when the fueling nozzle 11 is detached from a nozzle hook (not shown) and a signal indicating the contacts are not connected with each other, that is, static electricity does not flow, from the destaticizing circuit 36 are inputted, after the operator detached from the static electricity removal pad 7, fuel oil is not supplied unless the operator is not electrified, so that it is safety.

[0043] In addition, after fueling operation is finished, even if the operator tilts the fueling nozzle 11 in such a manner that the discharge pipe 13 turns upward while the operator takes out the discharge pipe 13 from an in-vehicle tank and returns the fueling nozzle 11 to a nozzle hook, with the oil guard 18 can be stored fuel oil attached to the discharge pipe 13 in the valley portion18h, which prevents the fuel oil from being guided along the discharge pipe 13 and dropping toward the main body 12. Further, the oil guard 18 has a small diameter, so that a state inside fueling spout of the in-vehicle tank can be recognized during fueling operation, which enables safety fueling operation without leakage of fuel oil from fueling spout.

[0044] Next, a fueling nozzle according to another embodiment of the present invention will be explained with reference to Fig. 7. This fueling nozzle 41 is provided with a main body 42, a grip 43 and a conductive cover 44 whose shapes are different from those of the main body 12, the grip 15 and the conductive cover 16 of the fueling nozzle 11 shown in Fig. 2, and other components of the fueling nozzle 41 are the same as those of the fueling nozzle 11.

[0045] The conductive cover 44 of the embodiment is not attached to the main body 42 but is attached to the grip 43 only. In the same manner as the conductive cover 16, a cutout 44a extends in an axial direction of the grip 43 to easily perform attachment and detachment to the grip 43. In addition, a connecting side (right side of the figure) of the grip 43 is not formed to be cylindrical, and outer diameter of the grip 43 is not uniform, so that the conductive cover 44 is fixed to the grip 43 at an end 44a and the rotation of the grip 43 around the axis thereof can be prevented also.

[0046] In addition, in the fueling nozzle 11 shown in Fig. 1, on the main body 12 side of the conductive cover 16 is attached the cover scarf 17. In this embodiment, since the conductive cover 44 is not attached to the main body 42, the cover scarf can directly be attached to the main body 42.

[0047] In addition, shapes and connecting constructions of the components explained in the embodiments are mere examples, and they are variously changeable without departing from the scope of the present invention.

DESCRIPTION OF THE REFERENCE NUMERALS

[0048]

1	fueling apparatus
2	fueling hose
3	display
4	touch panel
5	card reader
6	printer
7	static electricity removal pad
8	destaticization confirming lamp
11	fueling nozzle
12	main body
12a	main valve
12b	automatic valve closing mechanism
13	discharge pipe
13a	reinforcing ring
14	valve opening lever
15	grip
15a	connecting portion
16	conductive cover
16a	cutout
16b, 16c	end portions
17	cover scarf
18	oil guard
18a	cylindrical portion
18b	extending portion
18c	sealing portion
18d	guard portion
18e	(18e1-18e3) ribs
18f	reinforcing member
18g	clearance
18h	(18h1-18h3) valley portions
19	anchor spring
20	guard
21	latch
31	lamp circuit
32	conducting wire

33	comparator
33a	input portion
33b	output portion
34	holding circuit
35	conducting wire
36	destaticizing circuit
37	conducting wire
38	reset circuit
41	fueling nozzle
42	main body
43	grip
44	conductive cover
44a	cutout
44b	end portion

Claims

1. A fueling nozzle comprising:

a main valve opening though operation of a valve opening lever to allow fuel oil to flow;
an automatic valve closing mechanism releasing engagement between the main valve and the valve opening lever to terminate fueling when sealed with a liquid surface in a tank to which the fuel oil is supplied;
a main body having the main valve and the automatic valve closing mechanism;
a grip made of conductive metal, said grip being held together with the valve opening lever when the valve opening lever is operated;
a fueling hose connected to the grip, said fueling hose suppling the fuel oil to the main body;
a discharge pipe discharging fuel oil that has passed though the main valve;
a ground wire mounted to the fueling hose and connected to the grip; and
a conductive cover covering the grip.

2. The fueling nozzle as claimed in claim 1, wherein said conductive cover is fixed to an end portion of the grip on the fueling hose side.

3. The fueling nozzle as claimed in claim 1, wherein said conductive cover is fixed to an end portion of the grip on the main body side.

4. The fueling nozzle as claimed in claim 1, wherein said conductive cover is fixed to an end portion of the grip on the fueling hose side and an end portion of the grip on the main body side.

5. The fueling nozzle as claimed in one of claims 2, 3 or 4, wherein said conductive cover includes a cutout extending in an axial direction of the grip.

6. The fueling nozzle as claimed in one of claims 1 to 5, further comprising an oil receiving portion fitted to a portion where the discharge pipe is attached to the main body, said oil receiving portion receiving fuel oil dropping from the discharge pipe toward the main body,
wherein a plurality of ribs forming valley portions for storing dropped fuel oil is continuously mounted on a face of the oil receiving portion on the discharge pipe side.

7. The fueling nozzle as claimed in claim 6, wherein the ribs stand to form concentric-graphic-shaped outlines with the discharge pipe viewed from the discharge pipe side, and
an outer rib extends on the discharge pipe side compared to an inner rib.

8. The fueling nozzle as claimed in claim 6 or 7, wherein a plurality of reinforcing members for connecting the ribs is mounted to the oil receiving portion.

9. The fueling nozzle as claimed in claim 6, 7 or 8, wherein said oil receiving portion includes:

a sealing portion surrounding the discharge pipe to fit the oil receiving portion to the discharge pipe, and preventing the fuel oil from entering therein; and
a guard portion surrounding the discharge pipe to fit the oil receiving portion to the discharge pipe together with the sealing portion, and preventing the oil receiving portion from inclining toward the discharge pipe.

Amended claims under Art. 19.1 PCT

1. (amended) A fueling nozzle comprising:

a main valve opening though operation of a valve opening lever to allow fuel oil to flow;
an automatic valve closing mechanism releasing engagement between the main valve and the valve opening lever to terminate fueling when sealed with a liquid surface in a tank to which the fuel oil is supplied;
a main body having the main valve and the automatic valve closing mechanism;
a grip made of conductive metal, said grip being held together with the valve opening lever when the valve opening lever is operated;
a fueling hose connected to the grip, said fueling hose suppling the fuel oil to the main body;
a discharge pipe discharging fuel oil that has passed though the main valve;
a ground wire mounted to the fueling hose and connected to the grip;
a conductive cover covering the grip; and

an oil receiving portion fitted to a portion where the discharge pipe is attached to the main body, said oil receiving portion receiving fuel oil dropping from the discharge pipe toward the main body,
wherein a plurality of ribs forming valley portions for storing dropped fuel oil is continuously mounted on a face of the oil receiving portion on the discharge pipe side, and a plurality of reinforcing members for connecting the ribs is mounted to the oil receiving portion.

2. The fueling nozzle as claimed in claim 1, wherein said conductive cover is fixed to an end portion of the grip on the fueling hose side.

3. The fueling nozzle as claimed in claim 1, wherein said conductive cover is fixed to an end portion of the grip on the main body side.

4. The fueling nozzle as claimed in claim 1, wherein said conductive cover is fixed to an end portion of the grip on the fueling hose side and an end portion of the grip on the main body side.

5. The fueling nozzle as claimed in one of claims 2, 3 or 4, wherein said conductive cover includes a cutout extending in an axial direction of the grip.

6. (cancelled)

7. (amended) The fueling nozzle as claimed in claim 1, wherein the ribs stand to form concentric-graphic-shaped outlines with the discharge pipe viewed from the discharge pipe side, and
an outer rib extends on the discharge pipe side compared to an inner rib.

8. (cancelled)

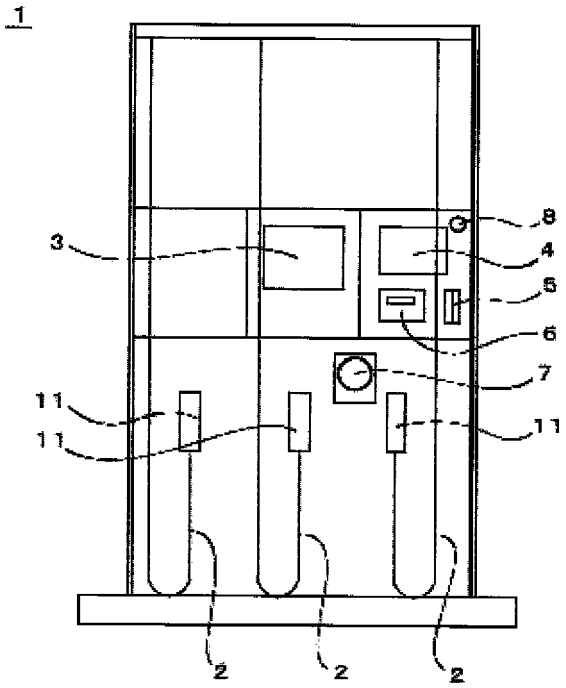
9. (amended) The fueling nozzle as claimed in claim 1 or 7, wherein said oil receiving portion includes:

a sealing portion surrounding the discharge pipe to fit the oil receiving portion to the discharge pipe, and preventing the fuel oil from entering therein; and
a guard portion surrounding the discharge pipe to fit the oil receiving portion to the discharge pipe together with the sealing portion, and preventing the oil receiving portion from inclining toward the discharge pipe.

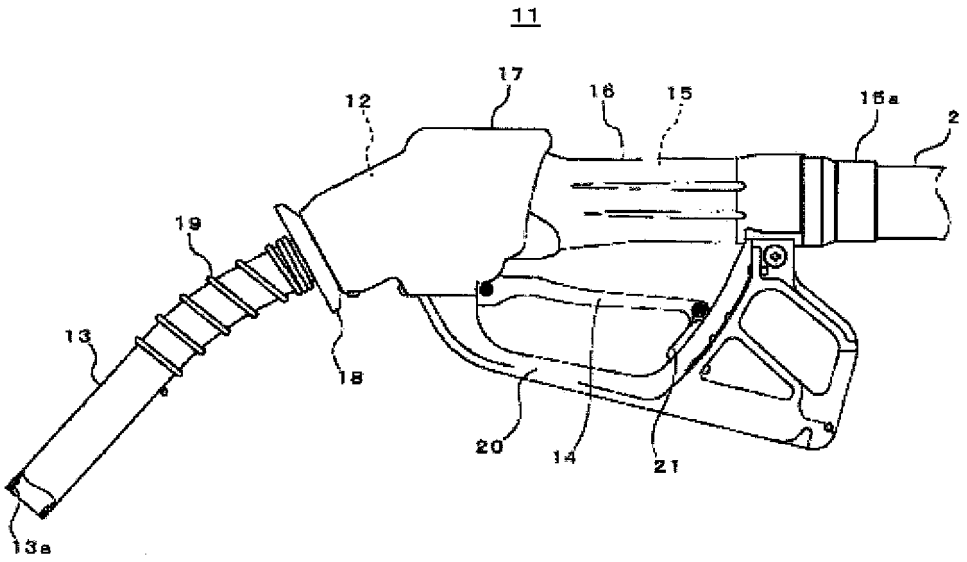
Statement under Art. 19.1 PCT

Claims 1, 6 and 8 are combined, and in new Claim 1, it is specified that an oil receiving portion fitted to a portion where the discharge pipe is attached to the main body, said oil receiving portion receiving fuel oil dropping from the discharge pipe toward the main body, wherein a plurality of ribs forming valley portions for storing dropped fuel oil is continuously mounted on a face of the oil receiving portion on the discharge pipe side, and a plurality of reinforcing members for connecting the ribs is mounted to the oil receiving portion. The fueling nozzle with the construction is not disclosed nor suggested in the document 1 and others. In this connection, in accordance with the above amendment, original claims 6 and 8 are cancelled, and claims on which original claims 7 and 9 depend are changed to claim 1 and claims 1 and 7 respectively.

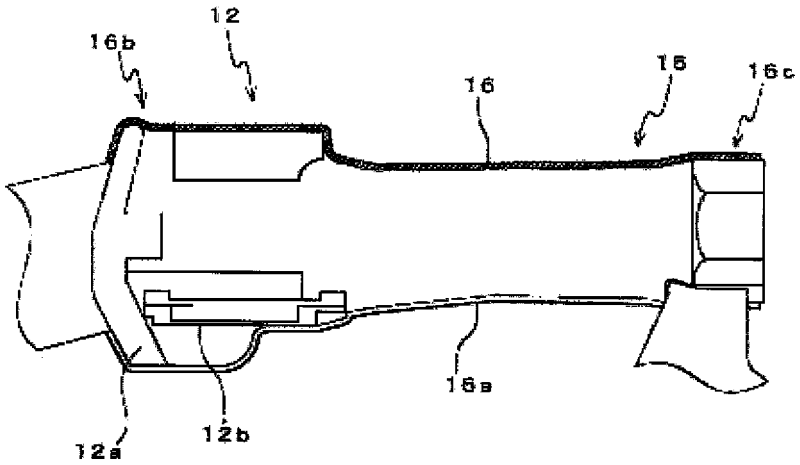
[Fig. 1]



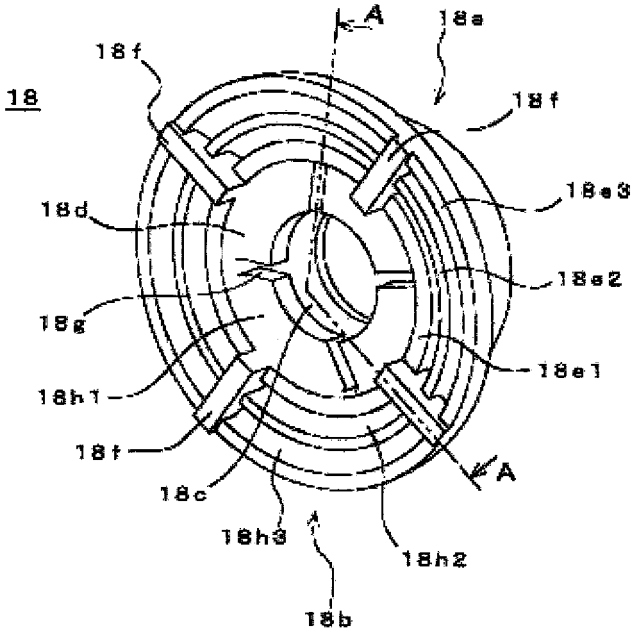
[Fig. 2]



[Fig. 3]



[Fig. 4]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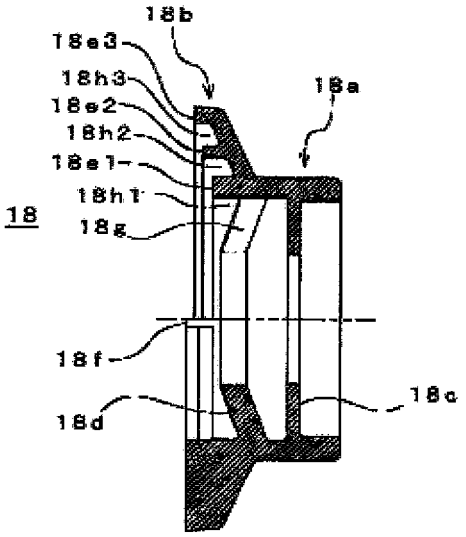
[Fig. 5]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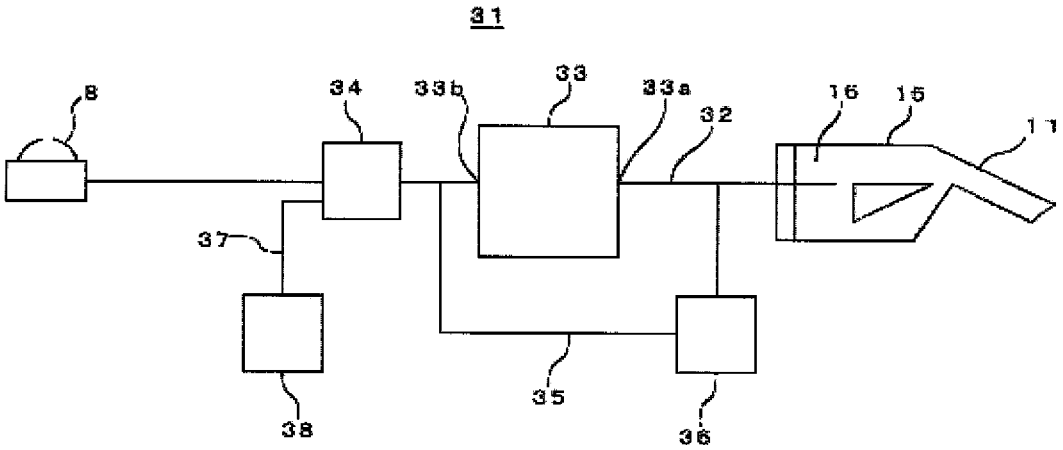
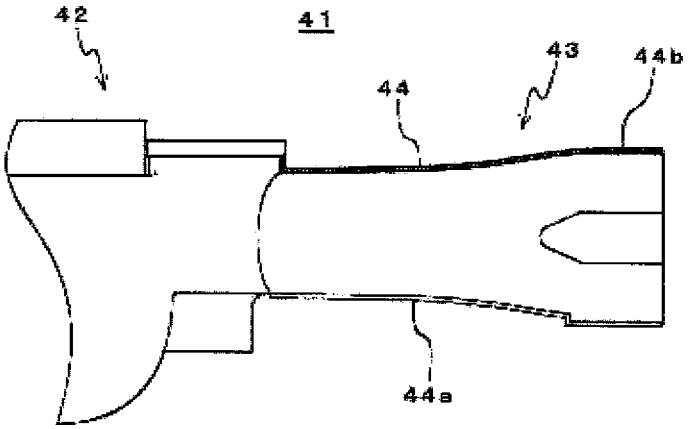
[Fig. 6]



[Fig. 7]



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2017/008062

A. CLASSIFICATION OF SUBJECT MATTER
B67D7/42(2010.01)i, *B67D7/32*(2010.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B67D7/00-7/86

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

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2017
Kokai Jitsuyo Shinan Koho	1971-2017	Toroku Jitsuyo Shinan Koho	1994-2017

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 2005/0133113 A1 (CARDER, Mervin, L., Sr.), 23 June 2005 (23.06.2005), paragraphs [0026] to [0033]; fig. 1 to 6 & WO 2005/062822 A2	1-5 6-9
X Y A	JP 2009-12833 A (Tokico Technology Ltd.), 22 January 2009 (22.01.2009), paragraphs [0012], [0020] to [0024]; fig. 1 (Family: none)	1-4 5-7 8-9
Y	JP 2007-153429 A (Tatsuno Corp.), 21 June 2007 (21.06.2007), paragraphs [0007], [0014] to [0018]; fig. 1, 4 (Family: none)	5-7

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 March 2017 (22.03.17)	04 April 2017 (04.04.17)

Name and mailing address of the ISA/	Authorized officer
Japan Patent Office 3-4-3,Kasumigaseki,Chiyoda-ku, Tokyo 100-8915,Japan	Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2017/008062

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2012-91838 A (Tatsuno Corp.), 17 May 2012 (17.05.2012), paragraphs [0007], [0018] to [0019]; fig. 1 to 2 (Family: none)	6-7

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2004189246 A **[0004]**