A twin-nozzle gas switch includes a unitary switch base, a pair of nozzles, a pair of valve members, a pair of cover members, and a pair of control rods. The switch base includes a pair of valve seats, each having a gas regulating section and a gas outlet section, and a tubular conduit connected integrally to the valve seats. Each nozzle is mounted at a respective gas outlet section. Each valve member is mounted rotatably in a respective gas regulating section. Each cover member is mounted at a respective gas regulating section. Each control rod extends through a respective cover member, and is connected to a respective valve member.
FIG. 1
PRIOR ART
TWIN-NOZZLE GAS SWITCH FOR A BARBECUE GRILL

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The invention relates to a gas switch, more particularly to a twin-nozzle gas switch for a barbecue grill.

[0003] 2. Description of the Related Art

[0004] As shown in FIGS. 1 and 2, a conventional twin-nozzle gas switch 1 is shown to include a pair of valve seats 11, a tubular conduit 12 connected to the valve seats 11, a pair of valve members (not visible) mounted rotatably in the valve seats 11, and a pair of control rods 13 connected to the valve members. Each of the valve seats 11 has a lateral side formed with a threaded section 111. The tubular conduit 12 has a pair of connecting sections 121 and an intermediate section 122 between the connecting sections 121. Each of the connecting sections 121 is connected to the threaded section 111 of a respective one of the valve seats 11. The intermediate section 122 is formed with a gas inlet 123 for connecting to a gas source (not shown). Each of the control rods 13 is operable to rotate the respective valve member so as to regulate gas flow through the corresponding valve seat 11.

[0005] In the conventional twin-nozzle gas switch 1, the valve seats 11 and the tubular conduit 12 are manufactured as three separate components that are to be coupled together through the threaded sections 111 and the connecting sections 121. The following are some of the disadvantages of the aforesaid twin-nozzle gas switch 1:

[0006] 1. Manufacturing costs are relatively high due to the need to fabricate and assemble three separate components.

[0007] 2. In view of the threaded engagement between the sections 111, 121, it is difficult to control the valve seats 111 to have a uniform distance with the gas inlet 123, which can affect even distribution of gas to the valve seats 11. As shown in FIG. 1, in case the distances (W1, W2) between each valve seat 111 and the gas inlet 123 are unequal, gas distribution to the valve seats 11 will be uneven.

[0008] 3. The air seal effect at the sections 111, 121 is not satisfactory and is liable to deteriorate upon loosening of the threaded connections at the sections 111, 121, which leads to undesired gas leakage that exposes users to danger.

[0009] 4. In view of the threaded engagement between the sections 111, 121, it is difficult to control the valve seats 111 such that the axes (L1, L2) thereof lie on a desired plane, which can obstruct proper installation of the gas switch 1 in a barbecue grill.

SUMMARY OF THE INVENTION

[0010] Therefore, the object of the present invention is to provide a twin-nozzle gas switch that can overcome the aforesaid drawbacks of the prior art.

[0011] According to this invention, a twin-nozzle gas switch comprises a unitary switch base, a plug, a pair of nozzles, a pair of valve members, a pair of cover members, and a pair of control rods.

[0012] The switch base includes a pair of spaced apart valve seats and a tubular conduit. Each of the valve seats has a gas regulating section and a gas outlet section extending from the gas regulating section. The gas regulating section is formed with a valve hole that defines a first axis. The gas outlet section is formed with a gas outlet that defines a second axis. The first axes of the valve holes of the valve seats are parallel to each other. The second axes of the gas outlets of the valve seats are parallel to each other. The tubular conduit is connected integrally to the valve seats, defines a central axis that is transverse the first axes, and has a connecting portion that is in fluid communication with the gas regulating sections of the valve seats, and an extension portion that is in fluid communication with the gas regulating section of one of the valve seats and that extends outwardly from said one of the valve seats. The connecting portion is formed with a gas inlet that is transverse to the central axis. The extension portion has one end remote from said one of the valve seats and formed with an opening that is closed by the plug.

[0013] Each of the nozzles is mounted at one end of the gas outlet of a respective one of the valve seats that is remote from the gas regulating section of the respective one of the valve seats.

[0014] Each of the valve members is mounted rotatably in the valve hole of a respective one of the valve seats, and is formed with a regulating hole to be registered with the tubular conduit, and a flow hole extending along the first axis of the valve hole of the respective one of the valve seats and in fluid communication with the regulating hole and the gas outlet of the respective one of the valve seats.

[0015] Each of the cover members is mounted at one end of the gas regulating section of a respective one of the valve seats that is remote from the gas outlet section of the respective one of the valve seats, and is formed with a rod hole along the first axis of the valve hole of the respective one of the valve seats.

[0016] Each of the control rods extends through the rod hole in a respective one of the cover members, and is connected to a respective one of the valve members.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiment with reference to the accompanying drawings, of which:

[0018] FIG. 1 is a top view of a conventional twin-nozzle gas switch;

[0019] FIG. 2 is a side view of the gas switch of FIG. 1;

[0020] FIG. 3 is a top view of a barbecue grill that incorporates the preferred embodiment of a twin-nozzle gas switch according to the present invention;

[0021] FIG. 4 is a side view of the barbecue grill of FIG. 3;

[0022] FIG. 5 is an exploded perspective view of the preferred embodiment of a twin-nozzle gas switch according to the present invention;

[0023] FIG. 6 is a sectional view of a switch base of the preferred embodiment;
FIG. 7 is an end view of the switch base of FIG. 6;

FIG. 8 is a sectional view of the preferred embodiment; and

FIG. 9 is a top view of the preferred embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 3 and 4, the preferred embodiment of a twin-nozzle gas switch according to the present invention is shown to be adapted for use in a barbecue grill 2 that includes a lower grill body 21, an upper grill cover 22 for covering the grill body 21, a burner 23 disposed on the grill body 21, a pair of parallel burner pipes 24 connected to the burner 23, a pair of barriers 25 disposed proximate to the burner 23, and a grill plate 26 mounted above the burner 23.

With further reference to FIG. 5, the twin-nozzle gas switch is disposed on one side of the grill body 21, and includes a unitary switch base 30, a plug 33, an adaptor 34, a pair of nozzles 40, a pair of valve members 50, a pair of cover members 60, a pair of control rods 70, a pair of mounting panels 80, and a pair of ignition units 90.

The switch base 30 includes a pair of spaced apart valve seats 31 and a tubular conduit 32 that are integrally formed by casting.

Referring to FIGS. 6, 7 and 8, each of the valve seats 31, which are parallel to each other, has a gas regulating section 311 and a gas outlet section 312 extending from the gas regulating section 311. The gas regulating section 311 is formed with a valve hole 313 that defines a first axis (Z1). The gas outlet section 312 is formed with a gas outlet 314 that defines a second axis (Z2). The first axes (Z1) of the valve holes 313 of the valve seats 31 are parallel to each other. The second axes (Z2) of the gas outlets 314 of the valve seats 31 are parallel to each other. Moreover, the first and second axes (Z1, Z2) of each of the valve seats 31 form an obtuse angle therebetween. The tubular conduit 32 is connected integrally to the valve seats 31, defines a central axis (Z3) that is transverse to the first axes (Z1), and has a connecting portion 321 that is disposed between and that is in fluid communication with the gas regulating sections 311 of the valve seats 31, and an extension portion 322 that is in fluid communication with the gas regulating section 311 of one of the valve seats 31 and that extends laterally and outwardly from said one of the valve seats 31. The connecting portion 321 is formed with a gas inlet 323 that is transverse to the central axis (Z3). The extension portion 322 has one end remote from said one of the valve seats 31 and formed with an opening 324. During the manufacture of the switch base 30, a cutting tool (not shown) is extended into the valve holes 313 of the valve seats 31 via the opening 324. The opening 324 is to be closed by means of the plug 33, as best shown in FIG. 9.

With reference to FIGS. 5 and 9, the adaptor 34 is connected threadedly to the gas inlet 323, and can be adjusted to a suitable angle for coupling with a gas supply tube (not shown).

Referring to FIGS. 5, 8, and 9, each of the nozzles 40 is mounted at one end of the gas outlet 314 of a respective one of the valve seats 31 that is remote from the gas regulating section 311 of the respective valve seat 31. The nozzles 40 are used to connect the burner pipes 24 (see FIGS. 3 and 4) to the valve seats 31 such that gas flowing out of the gas outlets 314 of the valve seats 31 can be supplied to the burner 23 (see FIGS. 3 and 4).

Each of the valve members 50 is mounted rotatably in the valve hole 313 of a respective one of the valve seats 31, and is formed with a regulating hole 51 to be registered with the tubular conduit 32, and a flow hole 52 extending along the first axis (Z1) of the valve hole 313 of the respective one of the valve seats 31 and in fluid communication with the regulating hole 51 and the gas outlet 314 of the respective one of the valve seats 31.

Each of the cover members 60 is mounted at one end of the gas regulating section 311 of a respective one of the valve seats 31 that is remote from the gas outlet section 312 of the respective valve seat 31, and is formed with a rod hole 61 along the first axis (Z1) of the valve hole 313 of the respective valve seat 31.

Each of the control rods 70 extends through the rod hole 61 in a respective one of the cover members 60, and is connected to a respective one of the valve members 50.

Each of the mounting panels 80 is mounted to a respective one of the cover members 60, and is formed with a mounting hole 81 that extends in a transverse direction with respect to a respective one of the control rods 70 and that permits extension of the respective one of the control rods 70 therethrough, and a tab 82 that extends in the transverse direction into the mounting hole 81 and that is disposed at one end of the mounting hole 81. The mounting hole 81 in each of the mounting panels 80 has a periphery formed with a set 83 of retaining elements that are spaced apart from the tab 82 in the transverse direction. In this embodiment, the set 83 of retaining elements include two pairs of notches 831 formed in upper and lower peripheral edges of the mounting hole 81.

Each of the ignition units 90 is mounted on a respective one of the mounting panels 80, and includes an actuator 91, a plunger member 92, a biasing member 93, an igniter 94 and a resilient plate 95. The actuator 91 is sleeved on a respective one of the control rods 70. The plunger member 92 is mounted slidably in the mounting hole 81 of the respective one of the mounting panels 80, and is actuated upon by the actuator 91. In this embodiment, the plunger member 92 is frustoconical in shape, and includes a plunger body 921 that is formed with a pair of slide grooves 922 to permit slidable retention of the plunger body 921 in the respective mounting hole 81. The plunger body 921 is further formed with a striker portion 923 (see FIG. 9). The biasing member 93, which is a coiled compression spring in this embodiment, has one end connected to the tab 82 of the respective one of the mounting panels 80, and an opposite end abutting against one end of the plunger member 92 opposite to the striker portion 923. In this embodiment, the igniter 94 has a casing portion 941 that is retained in one end of the mounting hole 81 of the respective one of the mounting panels 80 opposite to the tab 82, an actuated part 942 extending through the casing portion 941 and disposed to confront the striker portion 923 of the plunger member 92, and two sets of stop blocks 943 formed on the casing portion 941 to engage the respective mounting panel 80, thereby enhancing retention of the igniter 94 in the respective
mounting hole 81. The resilient plate 95 is retained in the mounting hole 81 of the respective one of the mounting panels 80 by virtue of engagement with the notches 831, and serves to fix the igniter 94 in the respective mounting hole 81.

[0038] Referring to FIG. 9, when one of the control rods 70 is rotated by the user, the corresponding one of the valve members 50 rotates to permit the flow of gas to the burner 23. At the same time, one of the actuators 91 rotates so as to drive the corresponding plunger member 92 to compress the corresponding biasing member 93. At the instant the actuator 91 rotates to an extent that it ceases to engage the corresponding plunger member 92, due to the stored force of the corresponding biasing member 93, the striker portion 923 of the plunger member 92 is able to apply a striking force on the actuated part 942 of the igniter 94, thereby triggering the igniter 94 to generate an ignition voltage. In practice, the ignition voltage is discharged proximate to the burner 23 at one of the barriers 25 so as to ignite the gas that is supplied to the burner 23. Thereafter, through the control of the control rod 70, the corresponding valve member 50 is adjusted to regulate the strength of the flame output at the burner 23 to suit actual cooking requirements.

[0039] Referring to FIGS. 6, 7 and 8, since the switch base 30 of the twin-nozzle gas switch of this invention is integrally formed, the distances (W) between each valve seat 31 and the gas inlet 323 are maintained equal, and the nozzles 40 do not deviate from desired installation positions. Therefore, when the gas switch of this invention is in use, gas leakage through the switch base 30 is avoided due to the use of a unitary component, even gas distribution to the valve seats 31 is ensured, and installation of the gas switch in the barbecue grill 2 is fast and easy to conduct.

[0040] While the present invention has been described in connection with what is considered the most practical and preferred embodiment, it is understood that this invention is not limited to the disclosed embodiment but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.

1 claim:
1. A twin-nozzle gas switch, comprising:
a unitary switch base including
a pair of spaced apart valve seats, each of which has a gas regulating section and a gas outlet section extending from said gas regulating section, said gas regulating section being formed with a valve hole that defines a first axis, said gas outlet section being formed with a gas outlet that defines a second axis, said first axes of said valve holes of said valve seats being parallel to each other, said second axes of said gas outlets of said valve seats being parallel to each other, and
a tubular conduit connected integrally to said valve seats, said tubular conduit defining a central axis that is transverse said first axes, and having a connecting portion that is in fluid communication with said gas regulating sections of said valve seats, and an extension portion that is in fluid communication with said gas regulating section of one of said valve seats and that extends outwardly from said one of said valve seats, said connecting portion being formed with a gas inlet that is transverse to said central axis, said extension portion having one end remote from said one of said valve seats and formed with an opening;
a plug for closing said opening;
a pair of nozzles, each of which is mounted at one end of said gas outlet of a respective one of said valve seats that is remote from said gas regulating section of the respective one of said valve seats;
a pair of valve members, each of which is mounted rotatably in said valve hole of a respective one of said valve seats, each of said valve members being formed with a regulating hole to be registered with said tubular conduit, and a flow hole extending along said first axis of said valve hole of the respective one of said valve seats and in fluid communication with said regulating hole and said gas outlet of the respective one of said valve seats;
a pair of cover members, each of which is mounted at one end of said gas regulating section of a respective one of said valve seats that is remote from said gas outlet section of the respective one of said valve seats, each of said cover members being formed with a rod hole along said first axis of said valve hole of the respective one of said valve seats; and
a pair of control rods, each of which extends through said rod hole in a respective one of said cover members and is connected to a respective one of said valve members.
2. The twin-nozzle gas switch as claimed in claim 1, further comprising:
a pair of mounting panels, each of which is mounted to a respective one of said cover members; and
a pair of ignition units, each of which is mounted on a respective one of said mounting panels.
3. The twin-nozzle gas switch as claimed in claim 2, wherein each of said mounting panels is formed with a mounting hole that extends in a transverse direction with respect to a respective one of said control rods and that permits extension of the respective one of said control rods therethrough, and a tab that extends in the transverse direction into said mounting hole and that is disposed at one end of said mounting hole.
4. The twin-nozzle gas switch as claimed in claim 3, wherein each of said ignition units includes:
an actuator sleeved on a respective one of said control rods;
a plunger member mounted slidably in said mounting hole of the respective one of said mounting panels and acted upon by said actuator;
a biasing member having one end connected to said tab of the respective one of said mounting panels, and an opposite end abutting against said plunger member; and
an igniter retained on the respective one of said mounting panels and associated operably with said plunger member.

5. The twin-nozzle gas switch as claimed in claim 1, further comprising an adaptor connected threadedly to said gas inlet.

6. The twin-nozzle gas switch as claimed in claim 1, wherein said first and second axes of each of said valve seats form an obtuse angle therebetween.

7. The twin-nozzle gas switch as claimed in claim 1, wherein said switch base is formed integrally by casting.

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