

**TITLE: GAS STOVE SWITCHING ASSEMBLY HAVING A
CONNECTING SLEEVE TO AVOID GAS LEAKAGE ✓**

The invention relates to a gas stove switching
assembly, more particularly to a gas stove switching
5 assembly which includes a connecting sleeve employed
therein to avoid gas leakage due to improper mounting
of an operating knob.

Referring to Figures 1 and 2, a conventional gas
stove switch assembly is shown to include a switch body
10 (1), a block member (2), a hollow tubular member (3),
a spring-biased valve member (5), an operating knob
(4), and a biasing member (6). The switch body (1)
defines an accommodation space (13) that has an open
end and that extends in a longitudinal direction of
15 the switch body (1). The switch body (1) has a gas
inlet (11) in fluid communication with the
accommodation space (13) and adapted to be connected
fluidly to a gas supply (not shown), and a gas outlet
(12) in fluid communication with the accommodation
20 space (13) and adapted to be connected fluidly to a
burning chamber (not shown). The block member (2)
closes the open end of the accommodation space (13).
The tubular member (3) is disposed rotatably in the
accommodation space (13) about a rotating axis which
25 is oriented in the longitudinal direction. The
tubular member (3) has a gas duct (301) therein to make
or break fluid communication between the gas inlet (11)

and the gas outlet (12) when the tubular member (3) is rotated axially in the accommodation space between a non-ignition position and an ignition position. The tubular member (3) further has a front end portion spaced from the block member (2) and provided with an axially extending keyway (3a) in the form of a slot. The spring-biased valve member (5) is disposed coaxially within the tubular member (3) to close the gas duct (301) when the tubular member (3) is at the non-ignition position. The operating knob (4) is mounted rotatably on the block member (2) and is operable to rotate the tubular member (3) between the non-ignition position and the ignition position. The operating knob (4) has an actuating shaft portion (4a) coupled to the tubular member (3) in such a manner that an actuating shaft portion (4a) is disposed inwardly of the block member (2) along the longitudinal direction and engages the keyway (3a) when the actuating shaft portion (4a) is forced inwardly of the block member (2). The biasing member (6) prevents untimely engagement of the actuating shaft portion (4a) in the keyway (3a) of the tubular member (3).

During ignition, the actuating shaft portion (4a) is forced inwardly of the block member (2) against the biasing action of the biasing member (6) to engage the keyway (3a) of the tubular member (3), thereby moving the valve member (5) to open the gas duct (301). By

rotating the operating knob (4), engagement between the tubular member (3) can move the latter to the ignition position so as to permit gas flow through the outlet (12).

5 Note that during the assembly or mounting of the actuating shaft portion (4a) on the block member (2), the shaft portion (4a) may deviate from the rotating axis to lateral sides of the keyway (3a), as shown in Figs. 3 and 4, thereby biasing the sides of the
10 operating knob (4) to result in gas leakage. The gas leakage may become more serious in case the shaft portion (4a) deviates from the rotating axis upwardly or downwardly, because there is no element to restrict movement of the shaft portion (4a) in the radial
15 direction relative to the rotating axis.

 The object of this invention is to provide a gas stove switching assembly with a connecting sleeve employed therein and coupled to an actuating shaft portion of an operating knob. The connecting sleeve
20 can restrict the deviation movement of the actuating shaft portion relative to a rotating axis thereof so as to avoid gas leakage from the stove.

 Accordingly, the gas stove switching assembly of this invention includes a switch body, a block member,
25 a hollow tubular member, a spring-biased valve member, an operating knob, a cylindrical connecting sleeve, and a biasing member. The switch body defines an

accommodation space that has an open end and that extends in a longitudinal direction of the switch body. The switch body has a gas inlet in fluid communication with the accommodation space and adapted to be connected fluidly to a gas supply, and a gas outlet in fluid communication with the accommodation space and is adapted to be connected to a burning chamber. The block member closes the open end of the accommodation space. The tubular member is disposed rotatably in the accommodation space about a rotating axis oriented in the longitudinal direction, and has a gas duct therein to make or break fluid communication between the inlet and outlet when the tubular member is rotated axially in the accommodation space between a non-ignition position and an ignition position. The tubular member further has a front end portion spaced from the block member and provided with an axially extending keyway. The valve member is disposed coaxially within the tubular member to close the gas duct when the tubular member is at the non-ignition position. The operating knob is mounted rotatably in the block member for rotating the tubular member between the non-ignition and ignition positions, and has an actuating shaft portion disposed inwardly of the block member along the longitudinal direction. The connecting sleeve is disposed inwardly of the block member and is inserted coaxially into the tubular

member such that an annular clearance is defined between the tubular member and the connecting sleeve. The connecting sleeve has a key formed on an outer wall surface thereof, and an axial hole of a cross section to the actuating shaft portion for receiving the actuating shaft portion fittingly therein when the actuating shaft portion is forced inwardly of the block member along the longitudinal direction so as to engage the key in the keyway and consequently urge the connecting sleeve to move the valve member to open the gas duct. The biasing member prevents untimely engagement of the actuating shaft portion with the axial hole of the connecting sleeve.

After assembly of the gas stove switching assembly, any possible deviation movement of the actuating shaft portion relative to the rotating axis thereof will be restricted by a limited movement of the connecting sleeve inside the tubular member in a radial direction relative to the rotating axis.

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

Figure 1 is a sectional view of a conventional gas stove switching assembly;

Figure 2 is a cross sectional view taken along line

A-A of the conventional gas stove switching assembly;

Figures 3 and 4 illustrate how an actuating shaft portion deviates from a rotating axis so as to abut against a tubular member employed in the conventional gas stove switching assembly;

Figure 5 is a sectional view of a preferred embodiment of a gas stove switching assembly according to this invention;

Figure 6 is a perspective view of a connecting sleeve employed in the preferred embodiment; and

Figure 7 is a cross sectional view of the preferred embodiment taken along line B-B in Figure 5.

Referring to Figures 5 and 6, the first preferred embodiment of a gas stove switching assembly of this invention is shown to include a switch body (10), a block member (20), a hollow tubular member (30), a spring-biased valve member (40), an operating knob (50), a cylindrical connecting sleeve (70), and a biasing member (60).

The switch body (10) defines an accommodation space (101) that has an open end and that extends in a longitudinal direction of the switch body (10). The switch body (10) has a gas inlet (102) in fluid communication with the accommodation space (101) and adapted to be connected fluidly to a gas supply (not shown), and a gas outlet (103) in fluid communication with the accommodation space (102) and adapted to be

connected fluidly to a burning chamber (not shown).

The block member (20) is mounted on the switch body (10) to close the open end of the accommodation space (101).

5 The tubular member (30) is disposed rotatably in the accommodation space (101) about a rotating axis oriented in the longitudinal direction, and has a gas duct (301) therein to make or break fluid communication between the inlet and outlet (102), (103) when the
10 tubular member (30) is rotated axially in the accommodation space (101) between a non-ignition position to an ignition position. The tubular member (30) further has a front end portion (30A) spaced from the block member (20) and provided with a pair of
15 diametrically opposed keyways (31) in the form of slots that are in fluid communication with the gas duct (301).

 The spring-biased valve member (40) is disposed coaxially within the tubular member (30) to close the
20 gas duct (301) when the tubular member (30) is at the non-ignition position.

 The operating knob (50) is mounted rotatably in the block member (20) for rotating the tubular member (30) between the non-ignition and ignition positions.
25 The operating knob (50) has an actuating shaft portion (51) disposed inwardly of the block member (20) along the longitudinal direction.

The connecting sleeve (70) is disposed inwardly of the block member (20) and is inserted coaxially against biasing action of the spring-biased valve member (40) into the tubular member (30) such that an annular clearance (74) is defined between the tubular member (30) and the connecting sleeve (70). The connecting sleeve (70) has two diametrically opposed keys (72) formed on an outer wall surface, and an axial hole (71) of a cross section corresponding the actuating shaft portion (51) for receiving the actuating shaft portion (51) fittingly therein when the latter is forced inwardly of the block member (20) along the longitudinal direction so as to engage the keys (72) in the keyways (31) and correspondingly urge the connecting sleeve (70) to move the valve member (40) to open the gas duct (301).

The biasing member (60), such as a coil spring, is disposed to prevent untimely engagement of the actuating shaft portion (51) with the axial hole (71) of the connecting sleeve (70) when the tubular member (30) is at the non-ignition position.

As shown in Figure 7, during ignition, the actuating shaft portion (51) is forced inwardly of the block member (20) so as to engage the actuating shaft portion (51) in the axial hole (71) of the connecting sleeve (70). After assembly of the gas stove switching assembly of this invention, any

possible deviation movement of the actuating shaft portion (51) relative to the rotating axis will be restricted by a limited movement of the connecting sleeve (70) in a radial direction relative to the rotating axis. The gas leakage between the tubular member (30) and the switching body (10) is thus avoided.

In the preferred embodiment, the key (72) is slightly narrower than the keyway (31). The axial hole (70) is generally rectangular in cross section and is defined by upper and lower curved surfaces (711) which extend transverse to the longitudinal direction and two parallel surfaces (712) interconnected to the upper and lower curved surfaces (711). The valve member (40) has a valve head (41) with a constricted portion. The axial hole (71) has an enlarged annular end portion (73) to receive the constricted portion of the valve head (41).

**CLAIMS****1. A gas stove switching assembly including**

- 5 a switch body defining an accommodation space
that has an open end and that extends in a
longitudinal direction of the switch body, the
switch body having a gas inlet in fluid
communication with the accommodation space and
adapted to be connected fluidly to a gas supply, and
a gas outlet in fluid communication with the
10 accommodation space and adapted to be connected
fluidly to a burning chamber,
- a block member for sealingly closing the open
end of the accommodation space,
- 15 a hollow tubular member disposed rotatably in
the accommodation space about a rotating axis
oriented in the longitudinal direction, the tubular
member having a gas duct therein to make or break
fluid communication between the inlet and outlet
when the tubular member is rotated axially in the
20 accommodation space between a non-ignition position
and an ignition position, the tubular member further
having a front end portion spaced from the block
member and provided with an axially extending
keyway,
- 25 a spring-biased valve member disposed coaxially
within the tubular member to close the gas duct when
the tubular member is at the non-ignition position,



an operating knob mounted rotatably on the block member for rotating the tubular member between the non-ignition and ignition positions, the operating knob having an actuating shaft portion for coupling
5 with the tubular member and disposed inwardly of the block member along the longitudinal direction, and biasing means for preventing untimely engagement of the actuating shaft portion with the tubular member,

10 characterized by:

a cylindrical connecting sleeve disposed inwardly of the block member and inserted coaxially into the tubular member such that an annular clearance is defined between the tubular member and
15 the connecting sleeve, the connecting sleeve having a key formed on an outer wall surface thereof, and an axial hole of a cross section corresponding to the actuating shaft portion for receiving the actuating shaft portion fittingly therein when the
20 actuating shaft portion is forced inwardly of the block member along the longitudinal direction so as to engage the key in the keyway and consequently urge the connecting sleeve to move the valve member to open the gas duct.

25 2. The gas stove switching assembly as defined in Claim 1, wherein the key is slightly narrower than the keyway.



3. The gas stove assembly as defined in Claim 1, wherein the axial hole is generally rectangular in cross section and is defined by upper and lower curved surfaces extending transverse to the longitudinal direction and two parallel surfaces interconnected to the upper and lower curved surfaces.
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4. The gas stove as defined in Claim 3, wherein the axial hole has an enlarged end portion to receive one end of the valve member therein.
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