

Closing Unit for Air Port of Integrated Machine of Cooking Fume

Exhauster and Range

Field of the Invention

The present invention relates to a closing unit for an air port of an integrated machine of cooking fume exhauster and range.

Background of the Invention

The effect of a cooking fume exhauster is related to the distance between suction ports and a cooking fume generating source, so the cooking fume exhauster is the top-drainage type in general and is mounted above the range, the distance between the suction ports and the cooking fume generating source is 50-100cm generally, which is liable to lead to the dissipation of cooking fume to further cause a bad influence on health of human body and environmental hygiene.

An integrated machine of the cooking fume exhauster and range is disclosed in the China Patent ZL02234971.5. As a combination of the cooking fume exhauster and the range, the integrated machine of the cooking fume exhauster and range is characterized in that the suction ports are arranged in the vicinity of the cooking fume generating source of the range, in the wall of a range hole cylinder in general, thus reducing the free

dissipation distance of the cooking fume and enhancing the exhaustion rate of the cooking fume. Nonetheless, the suction ports disclosed in the comparative document have a deficiency of being not closed. The range hole cylinder is in need of frequent cleaning, as a result of that, water, oil and other impurities can easily enter the air flue from the suction ports to contaminate the interior of the machine and breed bacteria, and a large amount of time and manpower is required to disassembly the machine so as to clean the interior of the air flue. Furthermore, as the air flue is finally communicated with the outdoor, the suction port, which is just as the air passage between inside and outside, is liable to cause the backflow of outdoor air when the cooking fume exhauster in an unused state.

An integrated machine of the cooking fume exhauster and range with a lifting ring-mounted cooking fume exhausting device is disclosed in the China Patent 200620113337.4, the suction ports are arranged on the lifting ring surrounding the range, the lifting ring is connected with a semicircular guide post and is connected with an electric motor via rack and gear, and the lifting ring can move vertically along with the rack. The technique solves the problem of closing the suction port, however, the movement mechanism thereof is huge and complex and the reliability is not high. The lifting ring, in fact, is the wall of the range hole and covers range disk to achieve the lifting therewith, hence, two problems are present: first, the airtight problem of the combined face between the lifting ring and a gas-collecting tank; and second, the range arranged on the range

disk is changed from static state to dynamic state, the lifting of the range moves gas pipes which are connected to the range, so as to impact the reliability of the junctions of the gas pipes. In addition, each lifting ring requires one electric motor when the range has multiple ports, which increases the cost.

Summary of the Invention

In order to solve the above deficiencies in the prior art, the present invention provides Air port closing device for cooking fume exhauster being unitary with range, which has simple structure and no influence on the gas-collecting tank and the gas pipes.

Air port closing device for cooking fume exhauster being unitary with range according to the invention comprises a lifting ring which can cover suction ports in a wall of a range hole cylinder, the lifting ring is connected to a driving mechanism and can be slid on an outer surface of the wall of the range hole cylinder by the driving mechanism.

The driving mechanism comprises a pull rod that is capable of horizontal movement, the pull rod is connected to a horizontal traction mechanism, and the pull rod and the lifting ring are interconnected via a horizontal/vertical movement conversion mechanism.

The horizontal/vertical movement conversion mechanism comprises that: the pull rod is connected with a chute, a pin on the lifting ring is put in the chute; or the lifting ring is provided with a chute, a pin connected to the pull rod is

put in the chute.

Further, the lifting ring is provided with a second chute, a convex post in the wall of the range hole cylinder is in the second chute.

The horizontal/vertical movement conversion mechanism comprise that bottoms of the pull rod and the lifting ring are provided with slopes matched with each other.

The traction mechanism comprises an electric motor, a gear and a rack, the electric motor is connected with the gear which is engaged with the rack fixed on the pull rod.

Otherwise, the driving mechanism is a screw rod and a nut, the screw rod is connected with a electric motor and the nut is connected to the lifting ring.

The electric motor is equipped with a position switch corresponding to the position of the pull rod.

A contact of a switch relay of the electric motor is connected with an ignition switch of the range.

When the suction ports are about to be closed, the pull rod conducts horizontal movement under the traction of the traction mechanism to drive the chute to move horizontally, the lifting ring, under the limitation of the chute and the pins, is converted from the horizontal movement to the vertical movement, namely, the lifting ring slides along the wall of the range hole cylinder until the suction ports are covered.

When the suction ports are required to be opened, the pull rod conducts reversed horizontal movement to drive the chute to conduct the reversed horizontal movement, the lifting ring,

under the limitation of the chute and the pins, is converted from the horizontal movement to the vertical movement, namely, the lifting ring slides along the wall of the range hole cylinder until the lifting ring moves away from the suction ports.

The invention has the advantages of: simple structure, few movement components, low cost, no influence on the range as well as the sealing between the range hole and the gas-collecting tank, and high safety and reliability.

Brief Description of the Drawings

FIG.1 is a globe view according to the invention

FIG.2 is a structural schematic view according to the invention

FIG.3 is a schematic view of a closing mechanism for horizontal pull rod-type suction ports according to the invention.

FIG.4 is a structural schematic view of a lifting driving mechanism using rack according to the invention.

Detail Description of the Invention

Embodiment 1

In reference to FIG.1, 2, 3:

Air port closing device for cooking fume exhauster being unitary with range according to the invention comprises a lifting ring 4 which can cover suction ports 8 in the wall of a range hole cylinder 2, the lifting ring 4 is connected to a driving mechanism and can be slid on an outer surface of the wall of the range hole cylinder 2 by the driving mechanism.

The integrated machine of the cooking fume exhauster and range used by Air port closing device for cooking fume exhauster being unitary with range according to the invention comprises a cabinet-type body, a panel 1 on the body is provided with a downwards-concave range hole cylinder 2 the bottom plate of which is provided with the range, the upper part of the wall of the range hole cylinder is provided with major arc-shaped suction ports 8, the range hole cylinder 2 is provided with a handle hole 3 at one side thereof facing towards people, the suction ports 8 are communicated with the interior of a gas-collecting tank 5, an air inlet of a blower 6 is arranged inside the gas-collecting tank 5 and the blower 6 is connected with an exhaust pipe 7.

Inside the gas-collecting tank 5, the lifting ring 4 which can cover the suction ports 8 in the wall of the range hole cylinder can be slidably connected to the outer surface of the wall of the range hole cylinder, and the lifting ring is connected to a driving mechanism.

The lifting driving mechanism comprises a pull rod 9 that is capable of horizontal movement, the pull rod 9 is connected to a horizontal traction mechanism, and the pull rod 9 and the lifting ring 4 are interconnected via a horizontal/vertical movement conversion mechanism.

The horizontal/vertical movement conversion mechanism comprises that the pull rod 9 is connected with a chute 10, a pin 11 on the lifting ring 4 is put in the chute 10.

The lifting ring 4 is provided with a second chute 12, a convex

post 13 in the wall of the range hole cylinder is in the second chute, therefore, the lifting ring has a movement guide rail.

The traction mechanism comprises an electric motor, a gear 15 and a rack 14, wherein the electric motor is connected with the gear 15 which is engaged with the rack 14 fixed on the pull rod 9.

The panel 1 on the body is provided with a plurality of downwards-concave range hole cylinders 2, the lifting ring outside the wall of each range hole cylinder is connected to the same pull rod.

Otherwise, the lifting driving mechanism can be a rack 16, and the rack 16 is engaged with the gear which is driven by an electric motor 17.

Otherwise, the lifting driving mechanism can be a screw rod and a nut, the screw rod is connected with a electric motor and the nut is connected with the lifting ring.

The electric motor is equipped with a position switch.

A contact of a switch relay of the electric motor is connected with an ignition switch of the range.

The upper part of the range hole cylinder 2 is provided with a positive pressure blowing port which is opposite to the suction ports, and the blowing port which obliquely descends is connected with a positive pressure air source via a gas conveyance pipe.

When the suction ports are about to be closed, the pull rod conducts horizontal movement under the traction of the traction mechanism to drive the chute to move horizontally, the lifting ring, under the limitation of the chute and the pins, is converted

from the horizontal movement to the vertical movement, namely, the lifting ring slides along the wall of the range hole cylinder until the suction ports are covered.

When the suction ports are required to be opened, the pull rod conducts reversed horizontal movement to drive the chute to conduct the reversed horizontal movement, the lifting ring, under the limitation of the chute and the pins, is converted from the horizontal movement to the vertical movement, namely, the lifting ring slides along the wall of the range hole cylinder until the lifting ring moves away from the suction ports.

Embodiment 2

In reference to FIG.1, 2, 3:

The difference between this embodiment and Embodiment 1 lies in the connection way of the lifting ring and the pull rod, in the embodiment, the lifting ring 4 is provided with the chute 10 ,a pin 11 connected to the pull rod 9 is put in the chute.

The remaining part of this embodiment is the same as Embodiment 1.

Embodiment 3

In reference to FIG.1, 2, 3:

The difference between this embodiment and Embodiment 1 lies in the horizontal/vertical movement conversion mechanism, in this embodiment, the horizontal/vertical movement conversion mechanism comprises that bottoms of the pull rod 9 and the lifting ring 4 are provided with slopes matched with each other. When

the pull rod conducts horizontal movement, the lifting ring forms vertical movement with the help of the slopes, thus reaching the effect of covering or opening the suction ports. The remaining part of this embodiment is the same as Embodiment 1.

Embodiment 4

In reference to FIG.1, 2, 3, 4:

The difference between this embodiment and Embodiment 1 lies in the fact that: the lifting driving mechanism can be the rack 16, the rack 16 is engaged with the gear which is driven by the electric motor 17. The lifting driving mechanism can also push the lifting ring to move vertically.

The remaining part of this embodiment is the same as Embodiment 1.

Embodiment 5

In reference to FIG.1, 2, 3, 4:

The difference between this embodiment and Embodiment 1 lies in the fact that: the lifting driving mechanism can be the screw rod and the nut, the screw rod is connected with a electric motor and the nut is connected with the lifting ring. The lifting driving mechanism can also push the lifting ring to move vertically.

The remaining part of this embodiment is the same as Embodiment 1.

The contents described in the embodiments of the description

are only the examples of implementations of the concept according to the present invention, the protection scope of the present invention shouldn't be considered to be merely limited by specific forms of the embodiments and means to cover the equivalent technical means that those skilled in the prior art could imagine in accordance with the concept of the present invention.

What is claimed is

1. Air port closing device for cooking fume exhauster being unitary with range comprising:

a lifting ring which can cover suction ports in a wall of a range hole cylinder; and

the lifting ring is connected to a driving mechanism and can be slid on an outer surface of the wall of the range hole cylinder by the driving mechanism.

2. Air port closing device for cooking fume exhauster being unitary with range according to claim 1, wherein the driving mechanism comprises a pull rod that is capable of horizontal movement, the pull rod is connected to a horizontal traction mechanism, and the pull rod and the lifting ring are interconnected via a horizontal/vertical movement conversion mechanism.

3. Air port closing device for cooking fume exhauster being unitary with range according to claim 2, wherein the horizontal/vertical movement conversion mechanism comprises that the pull rod is connected with a chute, a pin on the lifting ring is put in the chute; or the lifting ring is provided with a chute, a pin connected to the pull rod is put in the chute.

4. Air port closing device for cooking fume exhauster being unitary with range according to claim 2, wherein the

horizontal/vertical movement conversion mechanism comprises that bottoms of the pull rod and the lifting ring are provided with slopes matched with each other.

5. Air port closing device for cooking fume exhauster being unitary with range according to claim 3, wherein the lifting ring is provided with a second chute, a convex post in the wall of the range hole cylinder is in the second chute.

6. Air port closing device for cooking fume exhauster being unitary with range according to claim 1, wherein the driving mechanism is a screw rod and a nut, wherein the screw rod is connected with a electric motor and the nut is connected to the lifting ring.

7. Air port closing device for cooking fume exhauster being unitary with range according to claim 5, wherein the traction mechanism comprises an electric motor, a gear and a rack, the electric motor is connected with the gear which is engaged with the rack fixed to the pull rod.

8. Air port closing device for cooking fume exhauster being unitary with range according to claim 7, wherein the electric motor is equipped with a position switch corresponding to the travel position of the pull rod.

9. Air port closing device for cooking fume exhauster being

unitary with range according to claim 8, wherein a switch of the electric motor is synchronous in through or cut off with an ignition switch of the range.