

A THREE-DOOR INTERLOCKING AIR SHOWER

Utility Model Patent — English Translation

English translation prepared for reference only. In case of any discrepancy, the original Chinese patent publication (CN 210304871 U) shall prevail.

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(57) ABSTRACT

The present utility model provides a three-door interlocking air shower, comprising an air shower box. A front door panel, a left door panel and a right door panel are respectively provided at the front end, the left end and the right end of the air shower box. A first electronic interlocking device, a second electronic interlocking device and a third electronic interlocking device are provided on the air shower box. A plurality of fans are provided at the top end of the air shower box, a primary filter is provided at a lower side of each fan, and a breathable dust-isolating plate is provided at a lower side of the primary filter. A first air-outlet assembly and a second air-outlet assembly are respectively provided on left and right sides below the breathable dust-isolating plate. An infrared emitter is fixed to one side of the first air-outlet assembly, and an infrared receiver opposite to the infrared emitter is fixed to one side of the second air-outlet assembly. The three-door interlocking air shower provided by the present utility model has a good cleaning effect and high dust-removal efficiency.

CLAIMS

1. A three-door interlocking air shower, comprising an air shower box (1), wherein a front door panel (11), a left door panel (12) and a right door panel (13) are respectively provided at the front end, the left end and the right end of the air shower box (1);
a first electronic interlocking device (14), a second electronic interlocking device (15) and a third electronic interlocking device are provided on the air shower box (1);
a first lock groove cooperating with the first electronic interlocking device (14) is provided on the front door panel (11), a second lock groove cooperating with the second electronic interlocking device (15) is provided on the left door panel (12), and a third lock groove cooperating with the third electronic interlocking device is provided on the right door panel (13);
a plurality of fans (2) are provided at the top end of the air shower box (1), a primary filter (3) is provided at a lower side of each fan (2), and a breathable dust-isolating plate (4) is provided at a lower side of the primary filter (3);
a first air-outlet assembly (5) and a second air-outlet assembly (6) are respectively provided on left and right sides below the breathable dust-isolating plate (4);
an infrared emitter (7) is fixed to one side of the first air-outlet assembly (5), and an infrared receiver (8) opposite to the infrared emitter (7) is fixed to one side of the second air-outlet assembly (6).
2. The three-door interlocking air shower according to claim 1, characterized in that a glass viewing window (91) and a handle (92) are provided on each of the front door panel (11), the left door panel (12) and the right door panel (13).
3. The three-door interlocking air shower according to claim 1, characterized in that each of the first electronic interlocking device (14), the second electronic interlocking device (15) and the third electronic interlocking device consists of a control panel and an electromagnetic lock, an indicator lamp is provided on the control panel, and the first electronic interlocking device (14), the second electronic interlocking device (15) and the third electronic interlocking device are interlocked under the control of an integrated circuit.
4. The three-door interlocking air shower according to claim 1, characterized in that the primary filter (3) comprises an outer frame (31), and a first metal mesh (32), a porous sponge filter element (33) and a second metal mesh (34) fixed to an inner side of the outer frame.
5. The three-door interlocking air shower according to claim 1, characterized in that a plurality of truncated-cone-shaped through holes (41) are provided on the breathable dust-isolating plate (4), the diameter of a lower end of each truncated-cone-shaped through hole (41) is greater than the diameter of an upper end thereof, and a plurality of arc-shaped grooves (42) are further provided at an upper end of the breathable dust-isolating plate (4).
6. The three-door interlocking air shower according to claim 1, characterized in that the first air-outlet assembly (5) comprises a first blower (51), a first air pipe (52) connected to an air outlet of the first blower (51), and a plurality of first nozzles (53) connected to the first air pipe (52).
7. The three-door interlocking air shower according to claim 1, characterized in that the second air-outlet assembly (6) comprises a second blower (61), a second air pipe (62) connected to an air outlet of the second blower (61), and a plurality of second nozzles (63) connected to the second air pipe (62).

DESCRIPTION

A Three-Door Interlocking Air Shower

TECHNICAL FIELD

[0001] The present utility model relates to the field of air showers, and in particular to a three-door interlocking air shower.

BACKGROUND ART

[0002] An air shower is a highly versatile local purification device installed between a clean room and a non-clean room. When people and goods are to enter a clean area, they need to be blown and showered by the air shower, and the clean air blown out therefrom can remove dust carried by the people and the goods and can effectively block or reduce dust sources from entering the clean area. Air showers in the prior art generally suffer from poor cleaning effects, and dust accumulated at the air-outlet positions is difficult to clean.

SUMMARY OF THE UTILITY MODEL

[0003] In view of the above problems, the present utility model provides a three-door interlocking air shower, which has a good cleaning effect and high dust-removal efficiency.

[0004] To achieve the above object, the present utility model solves the above problem through the following technical solutions:

[0005] A three-door interlocking air shower comprises an air shower box. A front door panel, a left door panel and a right door panel are respectively provided at the front end, the left end and the right end of the air shower box. A first electronic interlocking device, a second electronic interlocking device and a third electronic interlocking device are provided on the air shower box. A first lock groove cooperating with the first electronic interlocking device is provided on the front door panel, a second lock groove cooperating with the second electronic interlocking device is provided on the left door panel, and a third lock groove cooperating with the third electronic interlocking device is provided on the right door panel. A plurality of fans are provided at the top end of the air shower box, a primary filter is provided at a lower side of each fan, and a breathable dust-isolating plate is provided at a lower side of the primary filter. A first air-outlet assembly and a second air-outlet assembly are respectively provided on left and right sides below the breathable dust-isolating plate. An infrared emitter is fixed to one side of the first air-outlet assembly, and an infrared receiver opposite to the infrared emitter is fixed to one side of the second air-outlet assembly.

[0006] Specifically, a glass viewing window and a handle are provided on each of the front door panel, the left door panel and the right door panel.

[0007] Specifically, each of the first electronic interlocking device, the second electronic interlocking device and the third electronic interlocking device consists of a control panel and an electromagnetic lock, an indicator lamp is provided on the control panel, and the first electronic interlocking device, the second electronic interlocking device and the third electronic interlocking device are interlocked under the control of an integrated circuit.

[0008] Specifically, the primary filter comprises an outer frame, and a first metal mesh, a porous sponge filter element and a second metal mesh fixed to an inner side of the outer frame.

[0009] Specifically, a plurality of truncated-cone-shaped through holes are provided on the breathable dust-isolating plate, the diameter of a lower end of each truncated-cone-shaped through hole is greater than the diameter of an upper end thereof, and a plurality of arc-shaped grooves are further provided at an upper end of the breathable dust-isolating plate.

[0010] Specifically, the first air-outlet assembly comprises a first blower, a first air pipe connected to an air outlet of the first blower, and a plurality of first nozzles connected to the first air pipe.

[0011] Specifically, the second air-outlet assembly comprises a second blower, a second air pipe connected to an air outlet of the second blower, and a plurality of second nozzles connected to the second air pipe.

[0012] The beneficial effects of the present utility model are as follows:

[0013] First, the air shower provided by the present utility model is additionally provided with a breathable dust-isolating plate and a primary filter. When the fans operate, the primary filter can block dust; after the fans stop operating, most of the large-particle-size dust can be collected in the arc-shaped grooves at the upper end of the breathable dust-isolating plate, preventing the dust from falling into the air shower and keeping the air shower clean;

[0014] Second, with three door panels, transfer among a non-clean area, a clean area and another clean area can be realized. The opening and closing of the door panels are jointly controlled by the electronic interlocking devices, so that only one of the three door panels can be opened at the same time, thereby minimizing contamination of the clean areas.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. 1 is a structural schematic view of a three-door interlocking air shower according to the present utility model.

[0016] FIG. 2 is a cross-sectional view taken along plane A-A in FIG. 1.

[0017] FIG. 3 is an enlarged view of part B in FIG. 2.

[0018] The reference numerals are as follows: air shower box 1; front door panel 11; left door panel 12; right door panel 13; first electronic interlocking device 14; second electronic interlocking device 15; fans 2; primary filter 3; outer frame 31; first metal mesh 32; porous sponge filter element 33; second metal mesh 34; breathable dust-isolating plate 4; truncated-cone-shaped through holes 41; arc-shaped grooves 42; first air-outlet assembly 5; first blower 51; first air pipe 52; first nozzles 53; second air-outlet assembly 6; second blower 61; second air pipe 62; second nozzles 63; infrared emitter 7; infrared receiver 8; glass viewing window 91; handle 92.

DETAILED DESCRIPTION OF EMBODIMENTS

[0019] The present utility model will be described in further detail below in conjunction with the embodiments and the accompanying drawings, but the embodiments of the present utility model are not limited thereto.

[0020] As shown in FIGS. 1-3:

[0021] A three-door interlocking air shower comprises an air shower box 1. A front door panel 11, a left door panel 12 and a right door panel 13 are respectively provided at the front end, the left end and the right end of the air shower box 1. A first electronic interlocking device 14, a second electronic interlocking device 15 and a third electronic interlocking device are provided on the air shower box 1. A first lock groove cooperating with the first electronic interlocking device 14 is provided on the front door panel 11, a second lock groove cooperating with the second electronic interlocking device 15 is provided on the left door panel 12, and a third lock groove cooperating with the third electronic interlocking device is provided on the right door panel 13. A plurality of fans 2 are provided at the top end of the air shower box 1, a primary filter 3 is provided at a lower side of each fan 2, a breathable dust-isolating plate 4 is provided at a lower side of the primary filter 3, and a first air-outlet assembly 5 and a second air-outlet

assembly 6 are respectively provided on left and right sides below the breathable dust-isolating plate 4. An infrared emitter 7 is fixed to one side of the first air-outlet assembly 5, and an infrared receiver 8 opposite to the infrared emitter 7 is fixed to one side of the second air-outlet assembly 6. The infrared emitter 7 and the infrared receiver 8 cooperate to sense whether a person or an article passes therebetween. The infrared emitter 7 continuously emits infrared rays; when there is no obstruction between the infrared emitter 7 and the infrared receiver 8, the infrared receiver 8 can receive the optical signal; when a person or an article obstructs between the infrared emitter 7 and the infrared receiver 8, the infrared receiver 8 cannot receive the optical signal, whereby the infrared receiver 8 feeds the signal back to a corresponding control system, and the control system instructs the fan 2, the first blower 51 and the second blower 61 at corresponding positions to operate.

[0022] Preferably, a glass viewing window 91 and a handle 92 are provided on each of the front door panel 11, the left door panel 12 and the right door panel 13.

[0023] Preferably, each of the first electronic interlocking device 14, the second electronic interlocking device 15 and the third electronic interlocking device consists of a control panel and an electromagnetic lock, an indicator lamp is provided on the control panel, and the first electronic interlocking device 14, the second electronic interlocking device 15 and the third electronic interlocking device are interlocked under the control of an integrated circuit. The interlocking principle is as follows: when one of the door panels is opened, the indicator lamps on the control panels corresponding to the other two door panels are off, indicating that these door panels cannot be opened, and the electromagnetic locks act to realize interlocking. When this door panel is closed, the electromagnetic locks on the control panels corresponding to the other two door panels start to operate, while the indicator lamps on the corresponding control panels light up, indicating that the other two door panels can be opened.

[0024] Preferably, the primary filter 3 comprises an outer frame 31, and a first metal mesh 32, a porous sponge filter element 33 and a second metal mesh 34 fixed to an inner side of the outer frame, and the porous sponge filter element 33 can adsorb most of the dust in the gas.

[0025] Preferably, a plurality of truncated-cone-shaped through holes 41 are provided on the breathable dust-isolating plate 4, and a plurality of arc-shaped grooves 42 are further provided at an upper end of the breathable dust-isolating plate 4. When the fans 2 operate, gas passes through the truncated-cone-shaped through holes 41; when the gas passes through the primary filter 3, the primary filter 3 can adsorb most small-particle-size dust, while large-particle dust remains on a lower end face of the primary filter 3 under the action of wind pressure. When the fans 2 stop operating, the large-particle dust falls; since the diameter of the lower end of each truncated-cone-shaped through hole 41 is greater than that of the upper end, only a very small amount of large-particle dust returns to the air shower through the truncated-cone-shaped through holes 41, and a large amount of large-particle dust falls into the arc-shaped grooves 42 and is collected. Edges of the breathable dust-isolating plate 4 are fixed to an inner top end of the air shower box 1 by screws, facilitating disassembly and cleaning.

[0026] Preferably, the first air-outlet assembly 5 comprises a first blower 51, a first air pipe 52 connected to an air outlet of the first blower 51, and a plurality of first nozzles 53 connected to the first air pipe 52.

[0027] Preferably, the second air-outlet assembly 6 comprises a second blower 61, a second air pipe 62 connected to an air outlet of the second blower 61, and a plurality of second nozzles 63 connected to the second air pipe 62.

[0028] The above embodiments only illustrate one embodiment of the present utility model, and the description thereof is relatively specific and detailed, but it should not be construed as limiting the patent scope of the present utility model. It should be noted that those of ordinary skill in the art may make various modifications and improvements without departing from the concept of the present utility model, and these all fall within the protection scope of the present utility model. Therefore, the patent protection scope of the present utility model shall be subject to the appended claims.

DRAWINGS

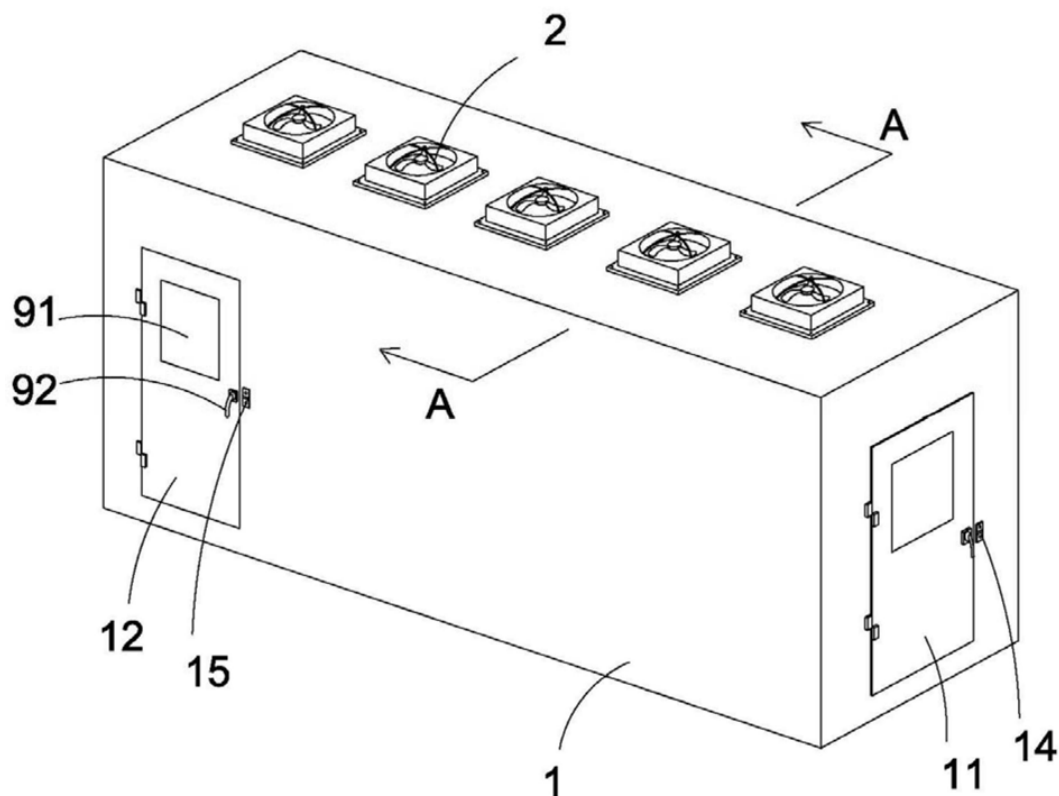


FIG. 1 — Structural schematic view of the three-door interlocking air shower

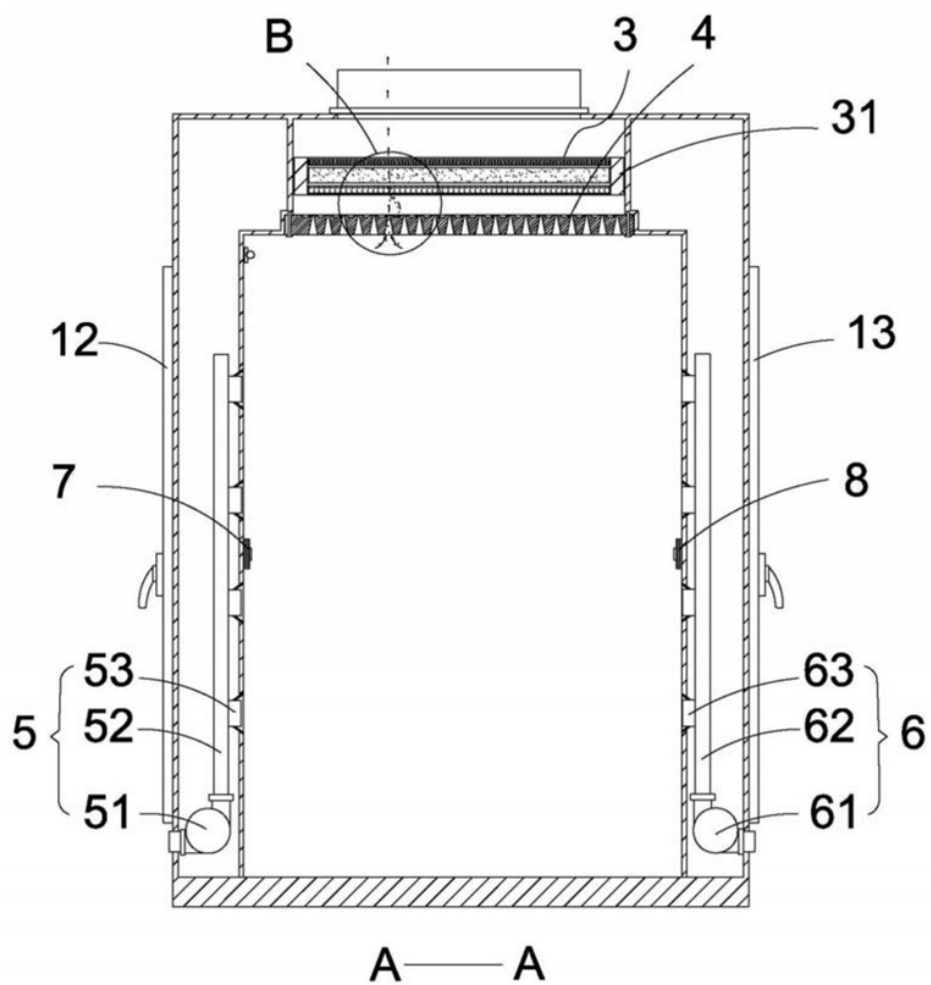


FIG. 2 — Cross-sectional view taken along plane A-A in FIG. 1

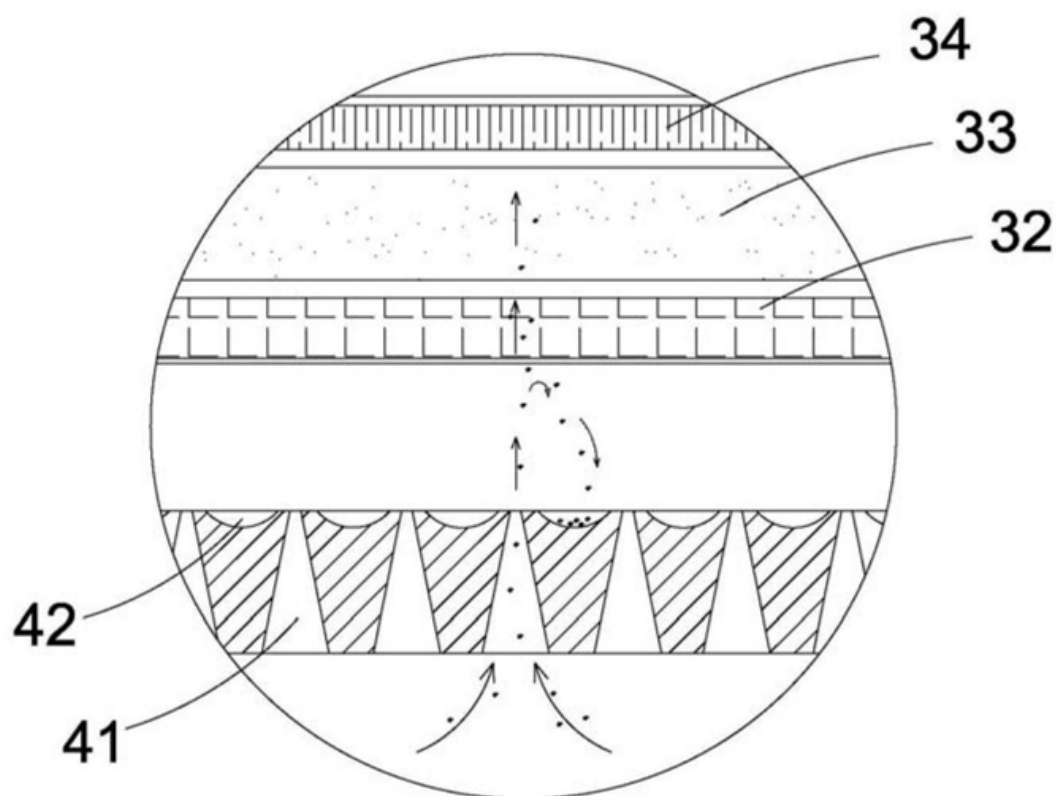


FIG. 3 — Enlarged view of part B in FIG. 2