

A NEGATIVE-PRESSURE DOWNFLOW WEIGHING BOOTH

Utility Model Patent — English Translation

English translation prepared for reference only. In case of any discrepancy, the original Chinese patent publication (CN 210051420 U) shall prevail.

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(57) ABSTRACT

The present utility model provides a negative-pressure downflow weighing booth, comprising a booth body, an interior of which is divided into a working chamber, a first filter chamber, a fan working chamber and a second filter chamber; the first filter chamber is provided with an air inlet, a fan is in communication with the first filter chamber through an inlet air duct and in communication with the second filter chamber through an outlet air duct, the second filter chamber is provided with an air outlet A and an air outlet B, the air outlet A is in communication with the working chamber, and the air outlet B is in communication with an external space of the booth body; the working chamber is provided with a dust-isolating curtain; the booth body is assembled from a plurality of horizontal plates and a plurality of vertical plates, and each horizontal plate and each vertical plate is composed of an outer plate and an inner plate, a hollow interlayer, a sound-insulating cotton layer and a glass fiber board layer being included between the outer plate and the inner plate; a servo motor screw sliding table is fixedly installed on a partition plate, a slider is arranged on the servo motor screw sliding table, and a worktable surface is fixedly arranged on the slider. On the one hand, the structure of the plate bodies of the weighing booth is adjusted to improve the sound insulation function of the weighing booth, and on the other hand, the worktable can be adjusted in height according to the height of the operating personnel.

CLAIMS

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1. A negative-pressure downflow weighing booth, comprising a booth body (10), an interior of the booth body (10) being divided by partition plates (34) into a working chamber (21), a first filter chamber (16), a fan working chamber (35) and a second filter chamber (15); the first filter chamber (16) being provided with a HEPA filter (11), and the first filter chamber (16) being provided with an air inlet (29) communicating with the working chamber (21); a fan (13) being installed in the fan working chamber (35), the fan (13) being in communication with the first filter chamber (16) through an inlet air duct (12), and the fan (13) being in communication with the second filter chamber (15) through an outlet air duct (14); the second filter chamber (15) being provided with an air outlet A (30) and an air outlet B (28), the second filter chamber (15) being provided with a HEPA filter (11) at the position of the air outlet A (30), the air outlet A (30) being in communication with the working chamber (21), the air outlet B (28) being in communication with an external space of the booth body (10), and a primary filter (17) being provided at the position of the air outlet B (28); the working chamber (21) being provided with a dust-isolating curtain;
characterized in that the booth body (10) is assembled from a plurality of horizontal plates (32) and a plurality of vertical plates (31), each horizontal plate (32) and each vertical plate (31) being composed of an outer plate (23) and an inner plate (27), and a hollow interlayer (22), a sound-insulating cotton layer (26) and a glass fiber board layer (25) being successively included between the outer plate (23) and the inner plate (27) from outside to inside; and
a servo motor screw sliding table (19) is fixedly installed in a vertical direction at the position of a partition plate (34) inside the working chamber (21), a slider being arranged on the servo motor screw sliding table (19), and a worktable surface (20) being fixedly arranged on the slider.
 2. The negative-pressure downflow weighing booth according to claim 1, characterized in that the outer plate (23) and the inner plate (27) are both provided as metal plates.
 3. The negative-pressure downflow weighing booth according to any one of claims 1-2, characterized in that outer surfaces of the outer plates (23) are each coated with a radiation absorbing layer (24).
 4. The negative-pressure downflow weighing booth according to claim 3, characterized in that the radiation absorbing layer (24) is provided as a wave-absorbing thin film layer.
 5. The negative-pressure downflow weighing booth according to claim 1, characterized in that a control panel (33) is provided on a side of the partition plate (34) facing the working chamber (21) and at a position beside the worktable surface (20).
 6. The negative-pressure downflow weighing booth according to claim 1, characterized in that a flow-equalizing plate (18) is installed on a lower surface of the air outlet A (30).

DESCRIPTION

A Negative-Pressure Downflow Weighing Booth

TECHNICAL FIELD

[0001] The present utility model relates to the technical field of weighing booths, and in particular to a negative-pressure downflow weighing booth.

BACKGROUND ART

[0002] A weighing booth is a dedicated local purification device used in places such as pharmaceutical production, microbiological research and scientific experiments. It provides a vertical unidirectional airflow; part of the clean air circulates in the working area and part is discharged to a nearby area, so that a negative pressure is generated in the working area to prevent cross-contamination, ensuring a high-cleanliness environment in the working area. Weighing and sub-packaging of dust and reagents can be performed in the device, which can control overflow and upward flying of the dust and reagents, prevent the harm caused by inhalation of the dust and reagents by the human body, and also avoid cross-contamination of the dust and reagents, protecting the external environment and the safety of indoor personnel.

[0003] In the prior art, the fan and some other equipment inside the weighing booth will generate a certain amount of noise during operation, affecting the external working environment; in addition, the worktable surface in the working chamber is generally of a fixed height, and for operating personnel of different heights, they have to make do with the height of the worktable; if the height of the worktable does not match the habitual working height of the operating personnel, their working comfort will be affected, thereby affecting the quality of work. In view of this situation, improvement is urgently needed.

SUMMARY OF THE UTILITY MODEL

[0004] Based on this, an object of the present utility model is to provide a negative-pressure downflow weighing booth, in which on the one hand the structure of the plate bodies of the weighing booth is adjusted to improve the sound insulation function of the weighing booth, and on the other hand a lifting worktable is provided, the height of which can be adjusted according to the height of the operating personnel.

[0005] The present utility model provides a negative-pressure downflow weighing booth, comprising a booth body, an interior of which is divided by partition plates into a working chamber, a first filter chamber, a fan working chamber and a second filter chamber; the first filter chamber is provided with a HEPA filter and an air inlet communicating with the working chamber; a fan is installed in the fan working chamber, the fan is in communication with the first filter chamber through an inlet air duct and in communication with the second filter chamber through an outlet air duct; the second filter chamber is provided with an air outlet A and an air outlet B, a HEPA filter is installed in the second filter chamber at the position of the air outlet A, the air outlet A is in communication with the working chamber, the air outlet B is in communication with an external space of the booth body, and a primary filter is provided at the position of the air outlet B; the working chamber is provided with a dust-isolating curtain; the booth body is assembled from a plurality of horizontal plates and a plurality of vertical plates, each horizontal plate and each vertical plate is composed of an outer plate and an inner plate, and a hollow interlayer, a sound-insulating cotton layer and a glass fiber board layer are successively included between the outer plate and the inner plate from outside to inside; a servo motor screw sliding table is fixedly installed in a vertical direction at the position of a partition plate inside the working chamber, a slider is arranged on the servo motor screw sliding table, and a worktable surface is fixedly arranged on the slider.

[0006] As a preferred solution, the outer plate and the inner plate are both provided as metal plates.

[0007] As a preferred solution, outer surfaces of the outer plates are each coated with a radiation absorbing layer.

[0008] As a preferred solution, the radiation absorbing layer is provided as a wave-absorbing thin film layer.

[0009] As a preferred solution, a control panel is provided on a side of the partition plate facing the working chamber and at a position beside the worktable surface.

[0010] As a preferred solution, a flow-equalizing plate is installed on a lower surface of the air outlet A.

[0011] The present utility model has the following beneficial effects:

[0012] 1. The booth body is assembled from a plurality of horizontal plates and a plurality of vertical plates, wherein each horizontal plate and each vertical plate is composed of an outer plate and an inner plate, and a hollow interlayer, a sound-insulating cotton layer and a glass fiber board layer are successively included between the outer plate and the inner plate from outside to inside; by means of the physical properties of the sound-insulating cotton of the sound-insulating cotton layer and the glass fiber board of the glass fiber board layer, in combination with the hollow interlayer, the horizontal plates and the vertical plates have a good sound insulation function;

[0013] 2. A servo motor screw sliding table is fixedly installed in a vertical direction at the position of a partition plate inside the working chamber, a slider is arranged on the servo motor screw sliding table, and a worktable surface is fixedly arranged on the slider; starting of the servo motor screw sliding table is controlled by a PLC system, the servo motor screw sliding table outputs power and drives the worktable surface through the slider to perform up-and-down lifting movements, so that arbitrary height adjustment according to the height of the operating personnel is achieved, improving working comfort;

[0014] 3. Outer surfaces of the outer plates are each coated with a radiation absorbing layer, by means of which the booth body has an electromagnetic wave absorbing function.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. 1 is a structural view of the present utility model.

[0016] FIG. 2 is a front view of the present utility model.

[0017] FIG. 3 is a partial sectional view of the vertical plate and the horizontal plate.

[0018] FIG. 4 is a partial sectional view of the vertical plate and the horizontal plate (with a wave-absorbing thin film layer).

[0019] FIG. 5 is a perspective view of the booth body.

[0020] The reference signs are as follows: booth body 10; HEPA filter 11; inlet air duct 12; fan 13; outlet air duct 14; second filter chamber 15; first filter chamber 16; primary filter 17; flow-equalizing plate 18; servo motor screw sliding table 19; worktable surface 20; working chamber 21; hollow interlayer 22; outer plate 23; radiation absorbing layer 24; glass fiber board layer 25; sound-insulating cotton layer 26; inner plate 27; air outlet B 28; air inlet 29; air outlet A 30; vertical plate 31; horizontal plate 32; control panel 33; partition plate 34; fan working chamber 35; dust-isolating curtain 36; perforated baffle 37.

DETAILED DESCRIPTION OF EMBODIMENTS

[0021] For a further understanding of the features, technical means, and specific objects and functions achieved by the present utility model, the present utility model will be described in further detail below with reference to the accompanying drawings and specific embodiments.

[0022] Referring to FIGS. 1-5, a negative-pressure downflow weighing booth comprises a booth body 10; an interior of the booth body 10 is divided by partition plates 34 into a working chamber 21, a first filter chamber 16, a fan working chamber 35 and a second filter chamber 15; the first filter chamber 16 is provided with a HEPA filter 11, and the first filter chamber 16 is provided with an air inlet 29 communicating with the working chamber 21; a fan 13 is installed in the fan working chamber 35, the fan 13 is in communication with the first filter chamber 16 through an inlet air duct 12 and in communication with the second filter chamber 15 through an outlet air duct 14; the second filter chamber 15 is provided with an air outlet A 30 and an air outlet B 28, a HEPA filter 11 is installed in the second filter chamber 15 at the position of the air outlet A 30, the air outlet A 30 is in communication with the working chamber 21, the air outlet B 28 is in communication with an external space of the booth body 10, a primary filter 17 is provided at the position of the air outlet B 28, the working chamber 21 is provided with a dust-isolating curtain 36, and the dust-isolating curtain 36 is provided as a transparent rubber block.

[0023] The booth body 10 is assembled from a plurality of horizontal plates 32 and a plurality of vertical plates 31, and a perforated baffle 37 is provided at the position of the air outlet B 28. In this embodiment, the booth body 10 is assembled from three vertical plates 31 and two horizontal plates. Each horizontal plate 32 and each vertical plate 31 is composed of an outer plate 23 and an inner plate 27, and a hollow interlayer 22, a sound-insulating cotton layer 26 and a glass fiber board layer 25 are successively included between the outer plate 23 and the inner plate 27 from outside to inside. In this embodiment, by means of the physical properties of the sound-insulating cotton of the sound-insulating cotton layer and the glass fiber board of the glass fiber board layer, in combination with the hollow interlayer, the horizontal plates and the vertical plates have a good sound insulation function.

[0024] A servo motor screw sliding table 19 is fixedly installed in a vertical direction at the position of a partition plate 34 inside the working chamber 21, a slider is arranged on the servo motor screw sliding table 19, and a worktable surface 20 is fixedly arranged on the slider; a control panel 33 is provided on a side of the partition plate 34 facing the working chamber 21 and at a position beside the worktable surface 20; the fan 13 and the servo motor screw sliding table 19 are both connected to a PLC control system and are operated through the control panel; starting of the servo motor screw sliding table is controlled by the PLC system, the servo motor screw sliding table outputs power and drives the worktable surface through the slider to perform up-and-down lifting movements, so that arbitrary adjustment according to the height of the operating personnel can be achieved, improving working comfort.

[0025] As a preferred embodiment, the outer plate 23 and the inner plate 27 are both provided as metal plates.

[0026] As a preferred embodiment, outer surfaces of the outer plates 23 are each coated with a radiation absorbing layer 24, the radiation absorbing layer 24 is provided as a wave-absorbing thin film layer, and the booth body has an electromagnetic wave absorbing function through the radiation absorbing layer.

[0027] As a preferred embodiment, a flow-equalizing plate 18 is installed on a lower surface of the air outlet A 30.

[0028] The above embodiments merely express several embodiments 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 several modifications and improvements without departing from the

concept of the present utility model, and these shall all fall within the protection scope of the present utility model. Therefore, the protection scope of the present utility model patent shall be defined by the appended claims.

DRAWINGS

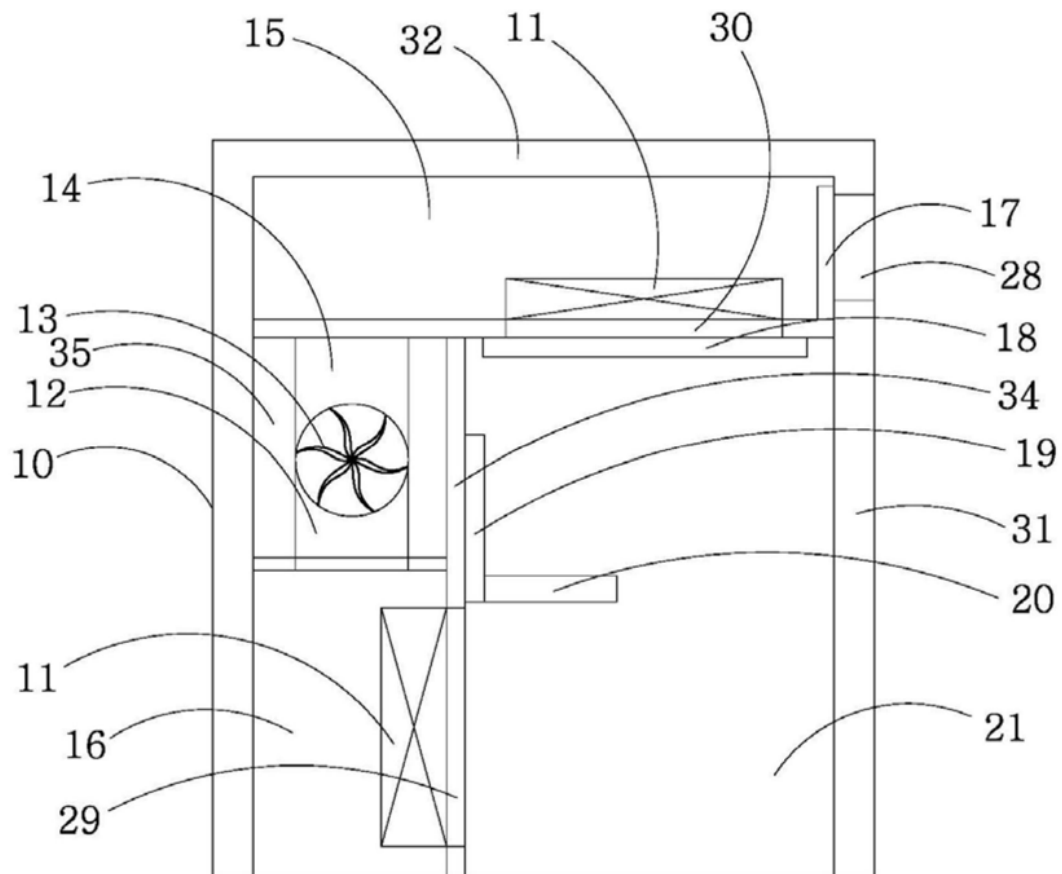


FIG. 1 — Structural view of the negative-pressure downflow weighing booth

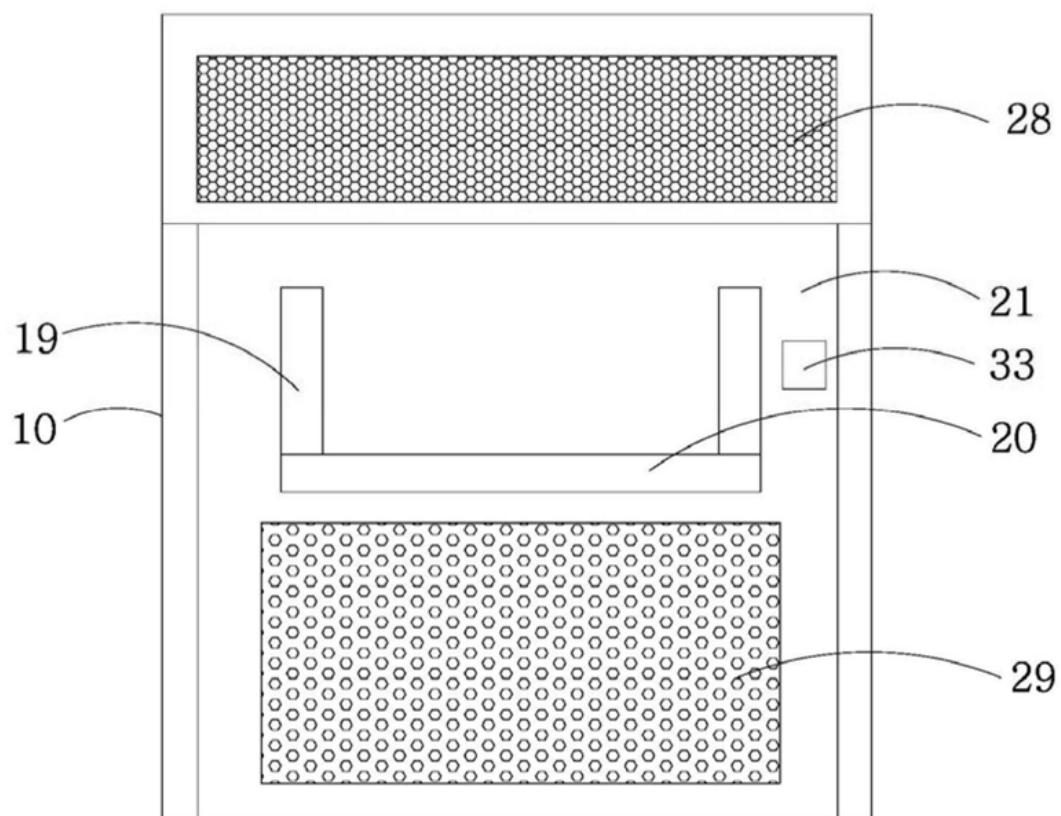


FIG. 2 — Front view of the negative-pressure downflow weighing booth

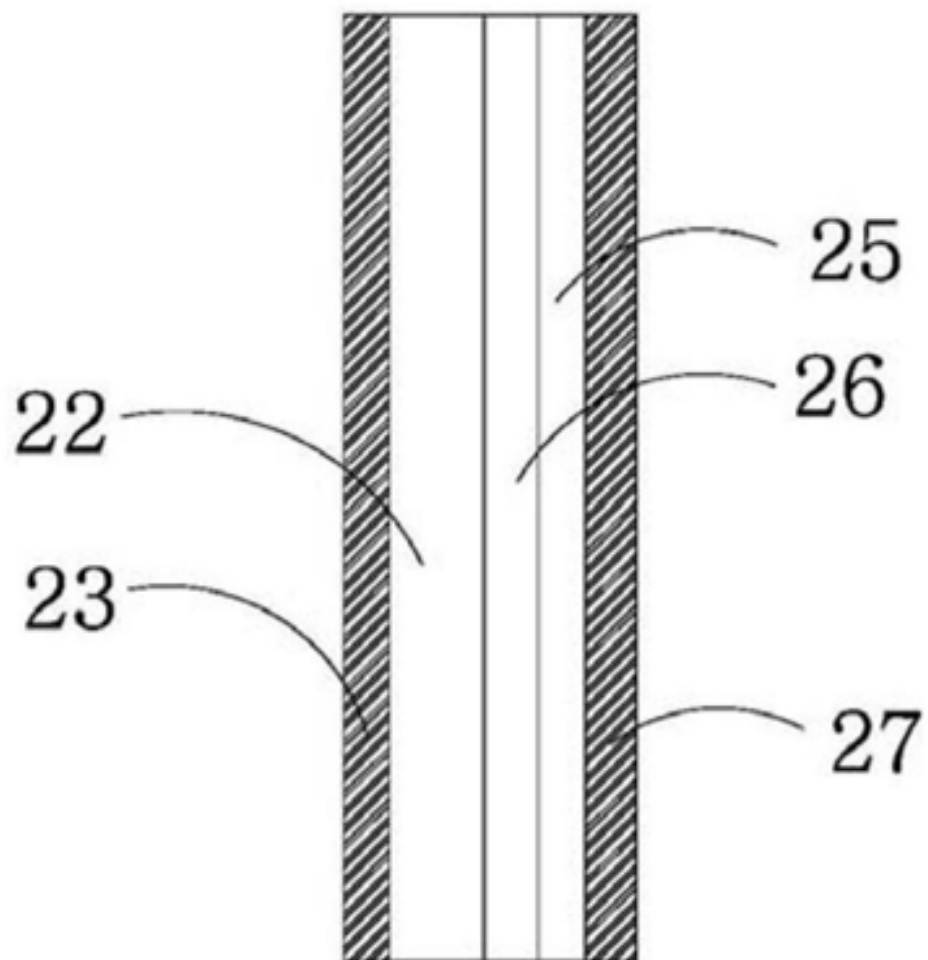


FIG. 3 — Partial sectional view of the vertical plate and the horizontal plate

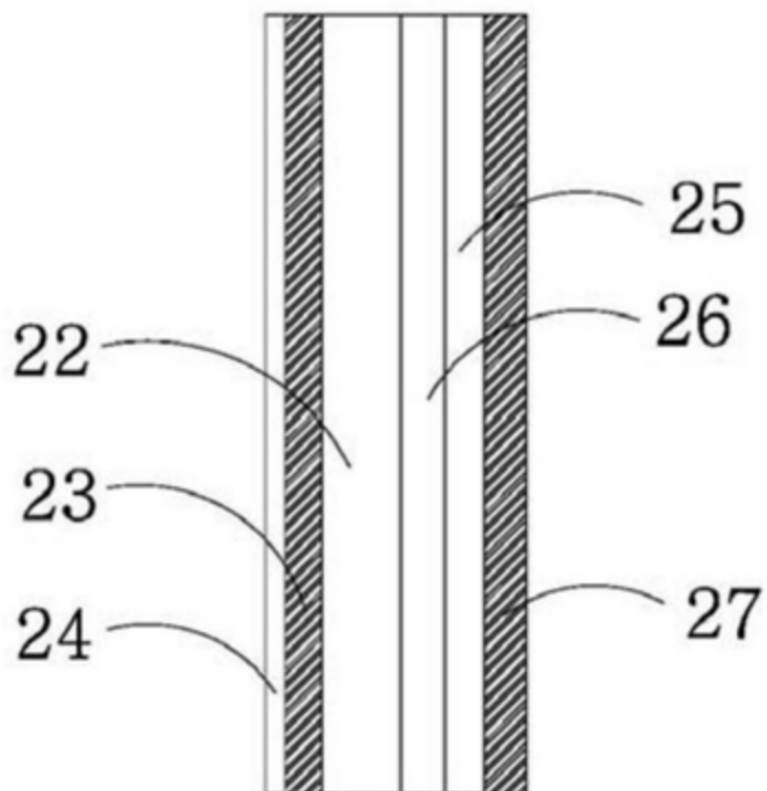


FIG. 4 — Partial sectional view of the vertical plate and the horizontal plate (with wave-absorbing thin film layer)

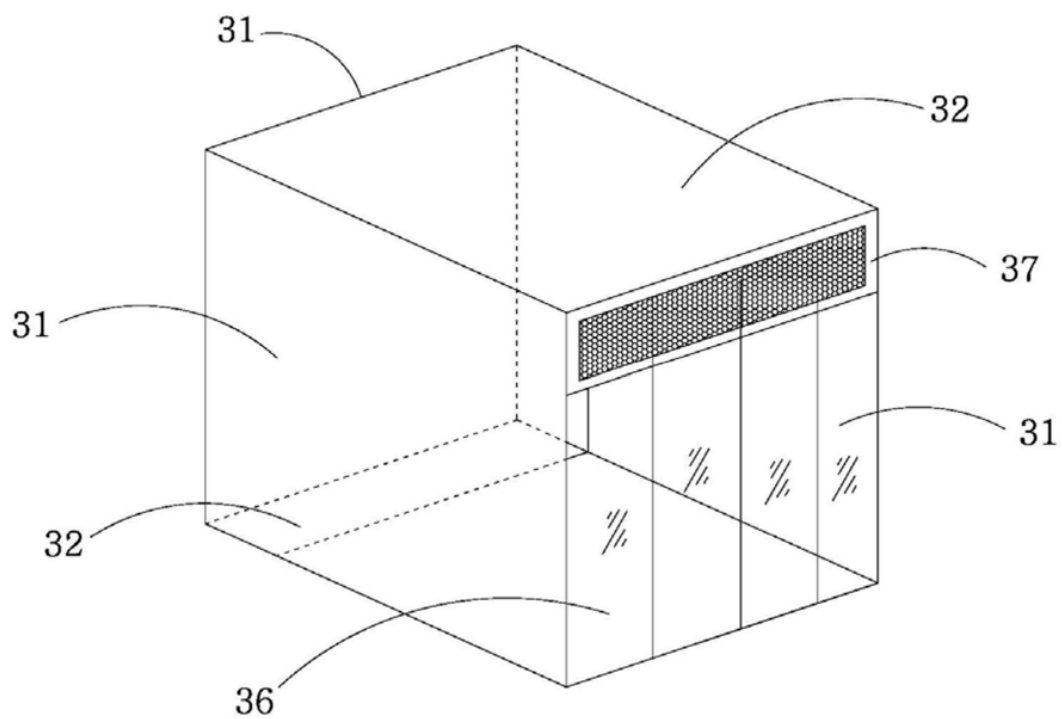


FIG. 5 — Perspective view of the booth body