AIR INTAKE SWITCHING DEVICE FOR PORTABLE AIR CONDITIONER

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ABSTRACT

An air intake switching device for a portable air conditioner has a housing with multiple grid holes, at least one switching panel being mounted on the housing and at least one switching assembly being slidably mounted between the housing and the switching panel. The switching assembly drives the switching panel to slide relative to the housing to selectively allow the airflow passing through the housing. Therefore, the portable air conditioner is switched to perform an interflow air cycle or an independent air cycle between indoors and outdoors. A heat dissipating effect of the interflow air cycle and a cooling effect of the independent air cycle between indoor air and outdoor air are ensured.
BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to an air intake switching device, especially to an air intake switching device for a portable air conditioner to open or close an air intake of the portable air conditioner and to change air cycle ways of the portable air conditioner.

[0003] 2. Description of the Prior Arts

[0004] An air conditioner has a compressor, a radiator, a rotary fan and the like being mounted in a housing to cool, heat, dehumidify or filter indoor air for thermal comfort. Unlike a stationary air conditioner such as window-type air conditioner or split-type air conditioner that is fixed high on a window or a wall, a portable air conditioner is placed on a ground without causing damage to the window or the wall and is moved and stored conveniently. Therefore, the portable air conditioner becomes popular.

[0005] One of the conventional portable air conditioners has a housing and an exhaust pipe. The housing has an exhaust hole being formed through the housing and multiple grid holes being separately formed through the housing. The exhaust pipe is mounted through the exhaust hole of the housing, communicates with the housing and has a distal end being put and communicating with outdoors.

[0006] The conventional portable air conditioner with single exhaust pipe draws cool air indoors through the grid holes of the housing to allow the cool air to cool down the compressor and the radiator in the housing. Then the cool air becomes warm air and is exhausted outdoors through the exhaust hole of the housing and the exhaust pipe. Therefore, the indoor air and the outdoor air interflow through the conventional portable air conditioner and the heat of the compressor and the radiator dissipate. However, since the cool air indoors flows away, hot air outdoors flows to indoors, the conventional portable air conditioner with single exhaust pipe has inefficient cooling effect.

[0007] Another conventional portable air conditioner has a housing and two exhaust pipes. The housing has two exhaust holes being separately formed through the housing. The exhaust pipes are respectively mounted through the exhaust holes of the housing, communicate with the housing. Each exhaust pipe has a distal end being put and communicating with outdoors.

[0008] The conventional portable air conditioner with double exhaust pipes draws cool air outdoors through one of the exhaust pipe to allow the cool air to cool down the compressor and the radiator in the housing. Then the cool air becomes warm air and is exhausted outdoors through the other exhaust pipe. Therefore, the heat of the compressor and the radiator dissipate to the outdoor air and the indoor air and the outdoor air circulate independently. Consequently, the conventional portable air conditioner with double exhaust pipes has better cooling effect. However, since the outdoor air is warmer than the indoor air, the conventional portable air conditioner with double exhaust pipes has worse heat dissipating effect.

[0009] Afterwards, a housing with two exhaust holes and multiple grid holes that is suitable for the two conventional portable air conditioners as described is made for the convenience of molding and for the economy of manufacturing.

[0010] When the housing with two exhaust holes and multiple grid holes is used to perform an interflow air cycle between the indoor air and the outdoor air, the air indoors is drawn through the grid holes of the housing and is exhausted outdoors through the exhaust holes of the housing. However, when the housing is used to perform an independent air cycle with the outdoor air, the grid holes are still opened and the cool air indoors flows to outdoors causing inefficient of the cooling effect.

[0011] To overcome the shortcomings, the present invention provides an air intake switching device for a portable air conditioner to mitigate or obviate the aforementioned problems.

SUMMARY OF THE INVENTION

[0012] The main objective of the present invention is to provide an air intake switching device for a portable air conditioner. The air intake switching device has a housing with multiple grid holes, at least one switching panel being mounted on the housing and at least one switching assembly being slidably mounted between the housing and the switching panel. The switching assembly drives the switching panel to slide relative to the housing to selectively allow the airflow passing through the housing.

[0013] Therefore, the portable air conditioner is switched to perform an interflow air cycle or an independent air cycle between indoors and outdoors. A heat dissipating effect of the interflow air cycle and a cooling effect of the independent air cycle between indoor air and outdoor air are ensured.

[0014] Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. 1 is a front perspective view of an air intake switching device for a portable air conditioner in accordance with the present invention;

[0016] FIG. 2 is a rear perspective view of the air intake switching device in FIG. 1;

[0017] FIG. 3 is an exploded perspective view of the air intake switching device in FIG. 1;

[0018] FIG. 4 is an operational enlarged rear view of the air intake switching device in FIG. 1, shown closed;

[0019] FIG. 5 is an operational enlarged rear view of the air intake switching device in FIG. 1, shown opened;

[0020] FIG. 6 is an operational enlarged side view in partial section of the air intake switching device in FIG. 1, shown closed; and

[0021] FIG. 7 is an operational enlarged side view in partial section of the air intake switching device in FIG. 1, shown closed.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] With reference to FIGS. 1 and 2, an air intake switching device for a portable air conditioner in accordance with the present invention comprises a housing (10), at least one switching panel (20) and at least one switching assembly (30).

[0023] With further reference to FIG. 3, the housing (10) is mounted on a back of a portable air conditioner, has a mounting surface, two exhaust holes (11) and multiple grid holes
(12) and may have multiple additional guiding parts (13). The exhaust holes (11) are separately formed through the housing (10). The grid holes (12) are separately formed through the mounting surface of the housing (10). The additional guiding parts (13) are separately formed on the mounting surface of the housing (10) and are adjacent to the grid holes (12) of the housing (10). Each additional guiding part (13) of the housing (10) may be a guiding protrusion. The guiding protrusion of the housing (10) protrudes from the mounting surface of the housing (10).

[0024] The at least one switching panel (20) is mounted on the mounting surface of the housing (10). Each switching panel (20) has a mounting surface, multiple grid holes (21), at least one main guiding part (24) and may have at least one mounting hole (23) and multiple additional guiding parts (22).

[0025] The mounting surface of the switching panel (20) faces the mounting surface of the housing (10). The grid holes (21) of the switching panel (20) are separately formed through the mounting surface of the switching panel (20) and corresponds to the grid holes (12) of the housing (10). Each grid hole (21) of the switching panel (20) alternatively aligns and misaligns with a corresponding grid hole (12) of the housing (10). The at least one mounting hole (23) is formed through the switching panel (20).

[0026] With further reference to FIG. 4, the at least one main guiding part (24) is formed on the mounting surface of the switching panel (20) and may be adjacent to a corresponding mounting hole (23) of the switching panel (20). Each main guiding part (24) of the switching panel (20) may be a guiding protrusion. The guiding protrusion of the switching panel (20) protrudes from the mounting surface of the switching panel (20).

[0027] The additional guiding parts (22) are separately formed on the mounting surface of the switching panel (20), are adjacent to the grid holes (21) of the switching panel (20) and respectively correspond to and are connected to the additional guiding part (13) of the housing (10) to allow the switching panel (20) to slide relative to the housing (10). Each additional part (22) of the switching panel (20) may be a guiding track. The guiding track of the switching panel (20) is mounted around a corresponding guiding protrusion of the housing (10) to allow the switching panel (20) to slide along the guiding tracks of the switching panel (20).

[0028] With further reference to FIG. 7, the at least one switching assembly (30) is mounted between the housing (10) and the switching panel (20). Each switching assembly (30) has a guiding panel (31) and a driver (32).

[0029] The guiding panel (31) is mounted between the housing (10) and the switching panel (20), corresponds to the main guiding part (24) of the switching panel (20), may correspond to the mounting hole (23) of the switching panel (20), has a main guiding part (311) and may have at least one connecting slot (314). The main guiding part (311) of the guiding panel (31) is formed on the guiding panel (31), corresponds to and is connected to a corresponding main guiding part (24) of the switching panel (20) to allow the guiding panel (31) to slide relative to the switching panel (20) and may be a guiding track. The guiding track of the guiding panel (31) is mounted around a corresponding guiding protrusion of the switching panel (20) to allow the guiding panel (31) to slide along the guiding track of the guiding panel (31) and may have a first end (312) and a second end (313). The at least one connecting slot (314) is formed through the guiding panel (31) and corresponds to the mounting hole (23) of the switching panel (20).

[0030] The driver (32) is slidable mounted through the grid hole (12) of the housing (10), is attached to the guiding panel (31) and may have at least one leaf (321). The at least one leaf (321) is slidable mounted through one grid hole (12) of the housing (10) and the mounting hole (23) of the switching panel (20) and is securely mounted in the connecting slot (314) of the guiding panel (31) to allow the guiding panel (31) to slide along the grid hole (12) of the housing (10) and the mounting hole (23) of the switching panel (20).

[0031] With further reference to FIG. 6, when pushing the driver (32) and the guiding panel (31) to slide transversely along the housing (10), the guiding protrusion of the switching panel (20) is moved to the first end (312) of the guiding track of the guiding panel (31). Then, the grid holes (21) of the switching panel (20) misalign with the grid holes (12) of the housing (10). Thus, the airflow through the housing (10) is blocked by the misalignment between the grid holes (12, 21) of the housing (10) and the switching panel (20).

[0032] With further reference to FIG. 5, when reversely pushing the driver (32) and the guiding panel (31) to slide transversely along the housing (10), the guiding protrusion of the switching panel (20) is moved to the second end (313) of the guiding track of the guiding panel (31). Then, the grid holes (21) of the switching panel (20) align with the grid holes (12) of the housing (10). Thus, the airflow freely passes through the housing (10).

[0033] The air intake switching device for a portable air conditioner as described has the following advantages. As pushing the switching assembly (30) to allow the airflow passing through the housing (10), the portable air conditioner is switched to perform an interflow air cycle between indoors and outdoors. Furthermore, as pushing the switching assembly (30) to block the airflow through the housing (10), the portable air conditioner is switched to perform an independent air cycle between indoors and outdoors. Consequently, a heat dissipating effect of the interflow air cycle and a cooling effect of the independent air cycle between indoor air and outdoor air are ensured.

[0034] Even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and features of the invention, the disclosure is illustrative only. Changes may be made in the details, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. An air intake switching device comprising a housing having
   a mounting surface;
   two exhaust holes being separately formed through the housing; and
   multiple grid holes being separately formed through the mounting surface of the housing;
   at least one switching panel being mounted on the mounting surface of the housing, and each switching panel having
   a mounting surface facing the mounting surface of the housing; and
multiple grid holes being formed on the switching panel and corresponding to the grid holes of the housing, and each grid hole of the switching panel alternatively aligning and misaligning with a corresponding grid hole of the housing; and at least one main guiding part being formed on the mounting surface of the switching panel; and at least one switching assembly being mounted between the housing and the switching panel, and each switching assembly having a guiding panel being mounted between the housing and the switching panel, corresponding to the main guiding part of the switching panel and having a main guiding part being formed on the guiding panel, corresponding to and being connected to a corresponding main guiding part of the switching panel; and a driver being slidably mounted through the grid hole of the housing and being attached to the guiding panel.

2. The air intake switching device as claimed in claim 1, wherein each main guiding part of the switching panel is a guiding protrusion protruding from the mounting surface of the switching panel; and the main guiding part of the guiding panel of the switching assembly is a guiding track being mounted around a corresponding guiding protrusion of the switching panel.

3. The air intake switching device as claimed in claim 1, wherein the housing further has multiple additional guiding parts being separately formed on the mounting surface of the housing and being adjacent to the grid holes of the housing; and each switching panel further has multiple additional guiding parts being separately formed on the mounting surface of the switching panel, being adjacent to the grid holes of the switching panel and respectively corresponding to and being connected to the additional guiding part of the housing.

4. The air intake switching device as claimed in claim 2, wherein the housing further has multiple additional guiding parts being separately formed on the mounting surface of the housing and being adjacent to the grid holes of the housing; and each switching panel further has multiple additional guiding parts being separately formed on the mounting surface of the switching panel, being adjacent to the grid holes of the switching panel and respectively corresponding to and being connected to the additional guiding part of the housing.

5. The air intake switching device as claimed in claim 3, wherein each additional guiding part of the housing is a guiding protrusion protruding from the mounting surface of the housing; and each additional part of the switching panel is a guiding track being mounted around a corresponding guiding protrusion of the housing.

6. The air intake switching device as claimed in claim 4, wherein each additional guiding part of the housing is a guiding protrusion protruding from the mounting surface of the housing; and each additional part of the switching panel is a guiding track being mounted around a corresponding guiding protrusion of the housing.

7. The air intake switching device as claimed in claim 1, wherein each switching panel further has at least one mounting hole being formed through the switching panel and being adjacent to a corresponding main guiding part of the switching panel; the guiding panel of each switching assembly corresponds to the mounting hole of the switching panel and further has at least one connecting slot being formed through the guiding panel and corresponding to the mounting hole of the switching panel; the driver of each switching assembly further has at least one leaf being slidably mounted through one grid hole of the housing and the mounting hole of the switching panel and being securely mounted in the connecting slot of the guiding panel.

8. The air intake switching device as claimed in claim 2, wherein each switching panel further has at least one mounting hole being formed through the switching panel and being adjacent to a corresponding guiding protrusion of the switching panel; the guiding panel of each switching assembly corresponds to the mounting hole of the switching panel and further has at least one connecting slot being formed through the guiding panel and corresponding to the mounting hole of the switching panel; the driver of each switching assembly further has at least one leaf being slidably mounted through one grid hole of the housing and the mounting hole of the switching panel and being securely mounted in the connecting slot of the guiding panel.

9. The air intake switching device as claimed in claim 3, wherein each switching panel further has at least one mounting hole being formed through the switching panel and being adjacent to a corresponding main guiding part of the switching panel; the guiding panel of each switching assembly corresponds to the mounting hole of the switching panel and further has at least one connecting slot being formed through the guiding panel and corresponding to the mounting hole of the switching panel; the driver of each switching assembly further has at least one leaf being slidably mounted through one grid hole of the housing and the mounting hole of the switching panel and being securely mounted in the connecting slot of the guiding panel.

10. The air intake switching device as claimed in claim 4, wherein each switching panel further has at least one mounting hole being formed through the switching panel and being adjacent to a corresponding guiding protrusion of the switching panel; the guiding panel of each switching assembly corresponds to the mounting hole of the switching panel and further has at least one connecting slot being formed through the guiding panel and corresponding to the mounting hole of the switching panel; the driver of each switching assembly further has at least one leaf being slidably mounted through one grid hole of
the housing and the mounting hole of the switching panel and being securely mounted in the connecting slot of the guiding panel.

11. The air intake switching device as claimed in claim 5, wherein:

- each switching panel further has at least one mounting hole being formed through the switching panel and being adjacent to a corresponding main guiding part of the switching panel;
- the guiding panel of each switching assembly corresponds to the mounting hole of the switching panel and further has at least one connecting slot being formed through the guiding panel and corresponding to the mounting hole of the switching panel;
- the driver of each switching assembly further has at least one leaf being slidably mounted through one grid hole of the housing and the mounting hole of the switching panel and being securely mounted in the connecting slot of the guiding panel.

12. The air intake switching device as claimed in claim 6, wherein:

- each switching panel further has at least one mounting hole being formed through the switching panel and being adjacent to a corresponding guiding protrusion of the switching panel;
- the guiding panel of each switching assembly corresponds to the mounting hole of the switching panel and further has at least one connecting slot being formed through the guiding panel and corresponding to the mounting hole of the switching panel;
- the driver of each switching assembly further has at least one leaf being slidably mounted through one grid hole of the housing and the mounting hole of the switching panel and being securely mounted in the connecting slot of the guiding panel.

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