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(54) **Title:** AN AIR CONDITIONER UNIT

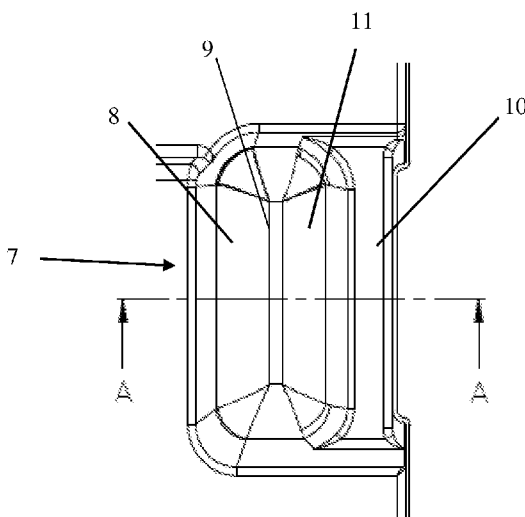


Figure 2

(57) **Abstract:** An air conditioner unit is provided with handle optimum for conveying the unit. The air conditioner unit includes a housing that comprises a top panel (1); side panels (2); and a bottom panel (6) formed with a recess (7) including a depression and a flat plane (10) extending from the depression towards one end. The recess (7) can receive finger, palm or combination thereof of a person moving the unit.



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AN AIR CONDITIONER UNIT

FIELD OF INVENTION

5 The present invention relates to a unit for an air-conditioning apparatus, in particular, a handle structure for conveying the unit.

BACKGROUND OF THE INVENTION

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An air conditioner unit, although portable, tends to be relatively heavy. The housing containing the components is usually made of light-weight plastic or metal and thus tends to be relatively weak. Thus, a handle is necessary for conveying the unit when in transport.

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Example of such handle can be found in US 2945357 A which discloses a conventional air conditioner unit that comprises a compression refrigeration system including a carrying handle adapted to be secured to the top of the air conditioning unit. Handles that are attached to the housing can easily fail at the point of attachment. Often the weight of the components stored within the housing is unequally distributed with relation to the handle. As a result, the unit becomes unbalanced when lifted by the handle. This unbalanced condition makes the unit difficult to carry from one place to another and under certain conditions, can pose a hazard to the person attempting to lift or carry the unit. It is therefore an object of this invention to provide a solution to overcome the aforementioned inadequacy of the prior art.

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The present invention is to provide an improved handle for moving or lifting an air conditioner unit from one place to another.

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Another object of the present invention is to provide a handle formed integrally with a metal part of an air conditioner unit without any additional material to manufacture the handle.

These objects of the present invention are attainable by the use of a handle incorporated to a housing of an air conditioner unit.

5 **SUMMARY OF THE INVENTION**

10 The present invention provides an air conditioner unit including a housing that comprises a top panel; side panels; and a bottom panel formed with a recess including a depression and a flat plane extending from the depression towards one end. The recess can receive finger, palm or combination thereof of a person moving the unit. Further, the unit can comprise a second recess towards top end of the side panel opposite the recess of the bottom panel. Moreover, the bottom panel can be made of metal. The recess of the bottom panel can be located at the end of the unit at which a compressor is placed.

15 The present invention consists of features and a combination of parts that are fully described and illustrated in the accompanying drawings. It is understood that various changes in the details may be made without departing from the scope of the invention or sacrificing any of the advantages of the present invention.

20 **BRIEF DESCRIPTION OF THE DRAWINGS**

25 To further clarify various aspects of some embodiments of the present invention, a more particular description of the invention will be rendered by references to specific embodiments thereof, which are illustrated in the appended drawings. It is appreciated that these drawings depict only typical embodiments of the invention and are therefore not to be considered limiting its scope. The invention will be described and explained with additional specificity and detail through the accompanying drawings in which:

30 Figure 1 is a perspective view of an air conditioner unit;

 Figure 2 is a bottom view of a handle at a bottom panel of the air conditioner unit; and

Figure 3 is a cross-sectional view of the handle of the air conditioner unit along line A-A in Figure 2.

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DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to a unit for an air-conditioning apparatus, in particular, a handle structure for conveying the unit.

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Referring to Figure 1, the air conditioner unit includes a unit housing formed in a box shape. The unit housing includes a bottom panel (6) having a leg portion (5), four side panels (2), and a top panel (1). The front panel has an air outlet (4) for air blown out from a cross-flow fan.

15

The interior of the housing can be partitioned into a heat exchange room side and a machine room side. At the heat exchange room side, an outdoor heat exchange, a fan, a motor and etc. are disposed, while at the machine room side, a compressor, a control box and an outdoor-side device are disposed (not shown). However, the construction of the unit for air conditioner is not restricted to only this case. It is possible to employ various construction of unit other than the construction as described.

20

Now, a handle provided at the bottom panel (6) will be further described with reference to Figure 2 and Figure 3.

25

As illustrated in Figure 2, the bottom panel (6) that has a substantially rectangle shape covers the lower surface of the unit. The bottom panel (6) is preferably made of metal or any suitable material. A recess (7) is provided at an end portion of the bottom panel (6). The recess (7) can be integrally stamped or moulded upwardly from the bottom panel (6).

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The recess (7) includes a generally C-shaped finger or hand engageable depression, having a curved side wall (8) which extends upwardly to form a peak surface (9) from

the bottom view as illustrated in Figure 2. The peak surface (9) extends downwardly to an inclined surface (11) and horizontally at a generally flat plane (10) which joins with the side panel. The flat plane (10) is provided for a person's fingers to be inserted to the C-shape depression such that there is a gripping portion provided between the C-shape depression and the side panel (2).

The height of the peak surface (9) is preferably up to about 22 millimeter or more from a plane (12) of the bottom panel (6). It should be understood that the dimension selected for the recess (7) must allow hands to be inserted comfortably for moving the unit.

To accommodate a person's hand in the recess (7), it shall be noted that the fingers will be received inside the C-shaped depression and the palm of the hand will be placed along the grip portion. By this arrangement, the hand grip assembly physically suits the natural grip of a person's hand. Thus, a firm grip is achieved by having the recess (7) including the C-shape depression for the fingers to fit in, and the flat plane (10) defining a gripping portion for the palm to grip on. As a result, this creates a holding point to push or pull the unit.

A second recess (3) can be disposed at the connection between the side panels (2) and the top panel (1) of the housing. The second recess (3) can be integrally formed when an inwardly curvature is provided on the top end of the side panel (2) that corporates with the top panel (1). The second recess (3) allows the fingers of the person to be inserted and contacted or hooked on the top panel (1).

There is a cooperative relationship between the recess (7) of the bottom panel (6) and the second recess (3) to accommodate a person's fingers of both left and right hands when lifting or conveying the unit. It shall be noted that fingers of one hand will be received in the recess (7) of the bottom panel (6) and the other hand will be received in the second recess (3) towards the top end of the side panel opposite the recess (7) of the bottom panel (6). Then, the accommodation of the both hands on the unit can be achieved for ease of moving or lifting the unit.

The recess (7) of the bottom panel (6) is preferably located at end of the unit at which the compressor is placed. The end where the compressor is placed is heavier than the other end. In this configuration, when lifting or conveying the unit, fingers of one hand will be in contact with the bottom plate (6) at the heavy end while fingers of the other hand will be in contact with the edge of the top panel (1) on the light end, pressure load of the unit applied on the finger or damage can be lessened. As a result, the unit can be conveyed easily.

In the second embodiment of the present invention, two recesses (7) of the bottom panel (6) are provided. This embodiment permits both hands of a person to be accommodated in the recesses (7) at the bottom panel (6).

Although the unit with the recess (7) of the bottom panel (6) with the design shown in Figure 2 and 3 has been described, it is possible to employ the unit with the recess of the bottom panel (6) of other configuration.

Overall, the present invention advances the art of an air conditioner unit by providing one handle which does not cause effects on the internal structure of the unit. A sufficient space is maintained so that the fingers of a person can be inserted for moving the unit with ease. Moreover, recesses (3, 7) are provided for preventing load exerted to the fingers of the hand, preventing damage, and keeping strength of the handles for ease of gripping. Also, the recesses (3, 7) are formed from only those material originated from the unit which reduces the cost.

The present invention may be embodied in other specific forms without departing from its essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore indicated by the appended claims rather than by the foregoing description. All changes, which come within the meaning and range of equivalency of the claims, are to be embraced within their scope.

CLAIMS

1. An air conditioner unit including a housing comprising:
a top panel (1);
side panels (2); and
5 a bottom panel (6) formed with a recess (7) including a depression and a flat plane (10)
extending from the depression towards one end;
wherein the recess (7) can receive finger, palm or combination thereof of a person
moving the unit.
- 10 2. An air conditioner unit according to claim 1 further comprising a second recess (3)
towards top end of the side panel (2) opposite the recess (7) of the bottom panel (6).
3. An air conditioner unit according to claim 1 or 2, wherein the bottom panel (6) is made
of metal.
- 15 4. An air conditioner unit according to any one of claims 1 to 3, wherein the recess (7) of
the bottom panel (6) is located at end of the unit at which a compressor is placed.

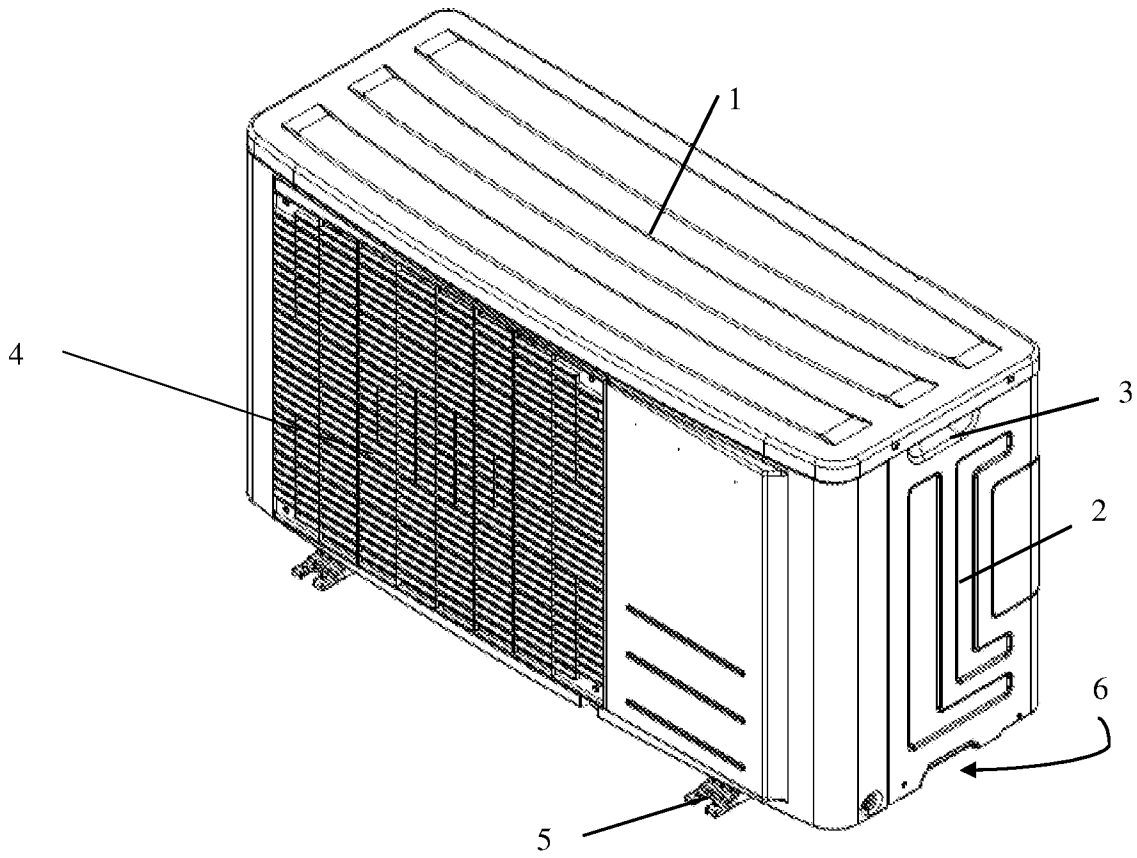


Figure 1

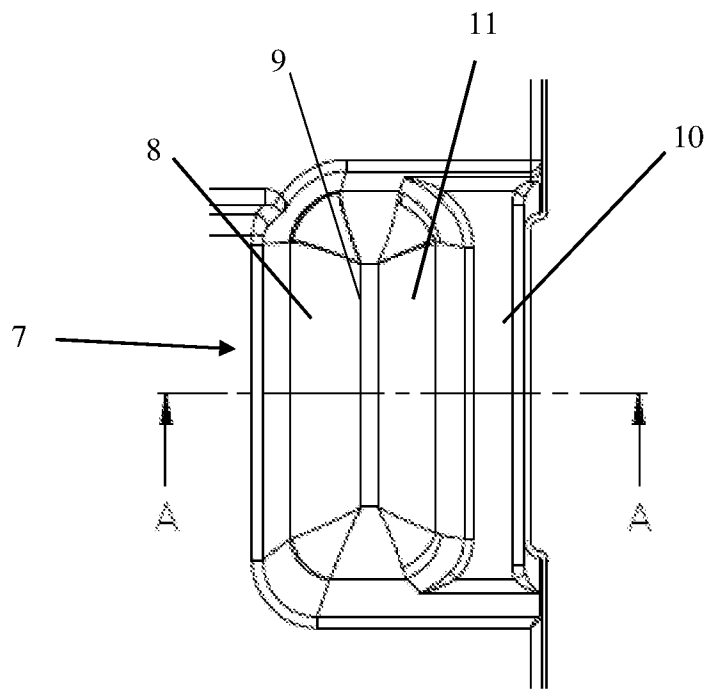


Figure 2

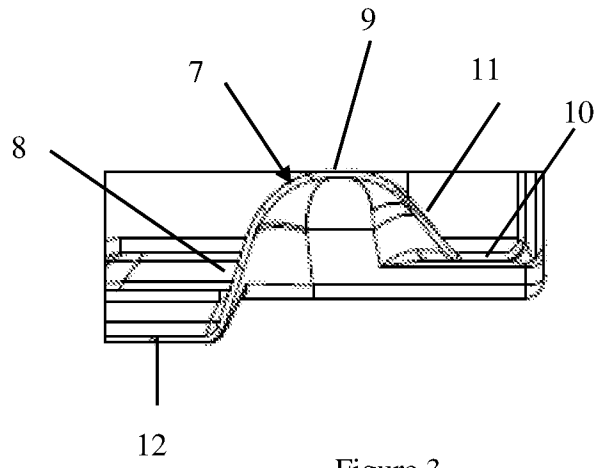


Figure 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/MY2017/050035

A. CLASSIFICATION OF SUBJECT MATTER

F24F 1/56 (2011.01) F24F 13/20 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PATENW-All English language databases; WPIAP, EPODOC- All English language abstracts: IPC/CPC Marks- F24F1/56, F24F13/20, F24F1/04, F24F1/025, F24F1/0003, F24F2001/004, F24F2001/0051 with Key Words- RECESS+, DEPRESS+, CUT-OUT?, GRIP+, HOLD+, CATCH+, FINGER+, PALM?, HAND+, GRAB+, LIFT+, CARRY+

GOOGLE PATENTS, ESPACENET: Search with IPC Mark F24F and Air Conditioner, Outdoor, Unit, Base, Recess

PAJ: IPC Mark F24F1/56 AND Outdoor, Recess

Applicant(s)/Inventor(s) name search in ESPACENET, AUSPAT and internal databases provided by IP Australia

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

 Further documents are listed in the continuation of Box C See patent family annex

* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search
15 September 2017Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

International application No.

C (Continuation).

DOCUMENTS CONSIDERED TO BE RELEVANT

PCT/MY2017/050035

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	EP 2792956 A1 (MITSUBISHI ELECTRIC CORPORATION) 22 October 2014 See abstract; figs 1, 4, 5	1-4
Y	EP 5417401 A (THOMPSON et al.) 23 May 1995 See column 5, lines 7-10; figs 4, 8, 9	1-4
A	EP 3040630 A1 (LG ELECTRONICS INC.) 06 July 2016 See paragraphs [0056], [0083]; figs 1, 5	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/MY2017/050035

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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End of Annex