May 26, 1970 A. N. ANGONESE ET AL 3,513,634

STRUCTURE FOR HOLDING ELECTRICALLY CHARGED MEMBER

Filed Aug. 7, 1968 2 Sheets-Sheet 1

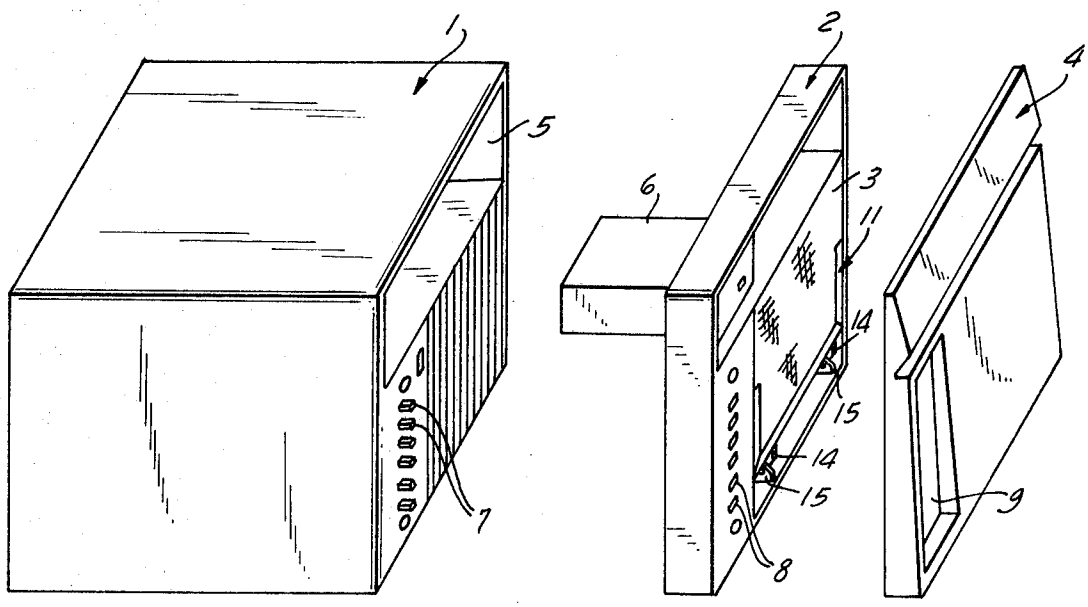


FIG. 1

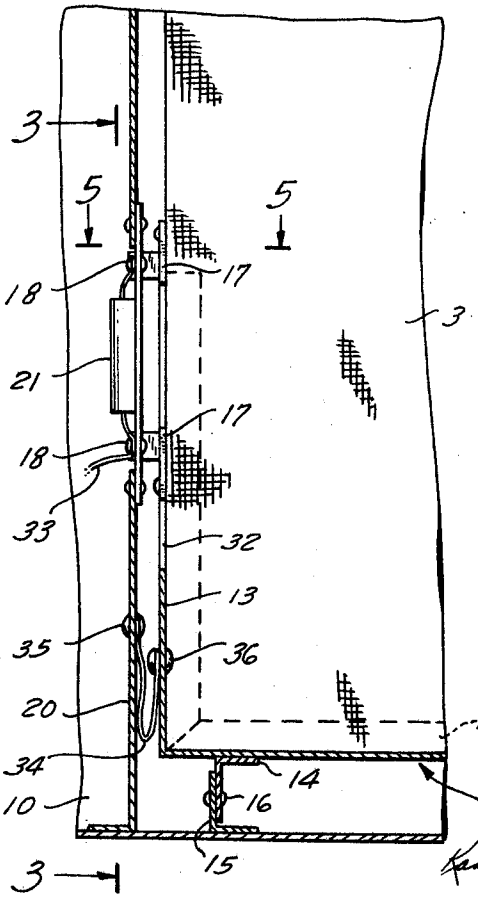


FIG. 2

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FIG. 3

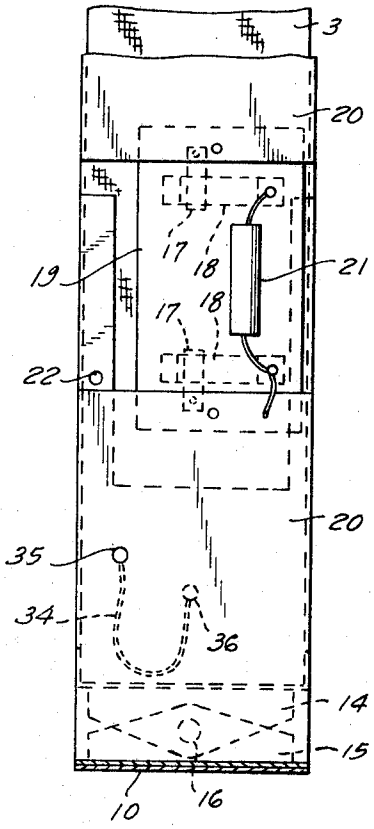
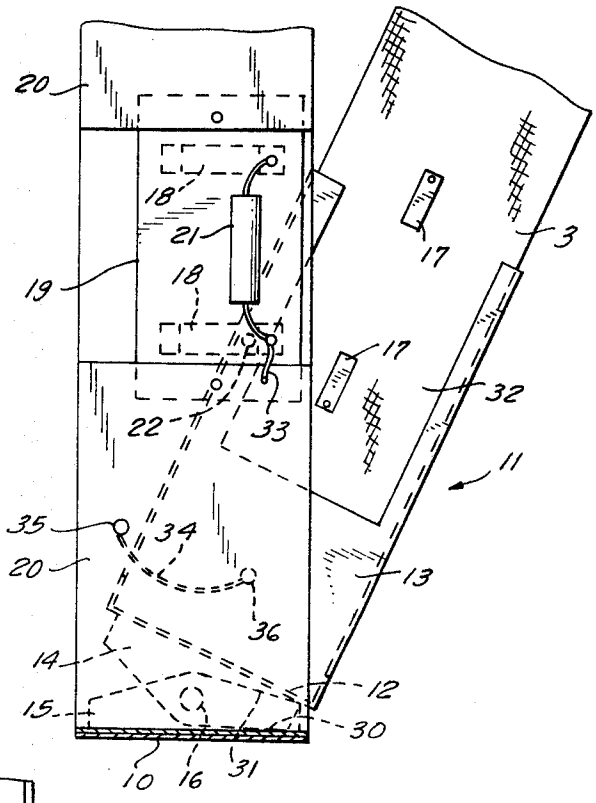


FIG. 4



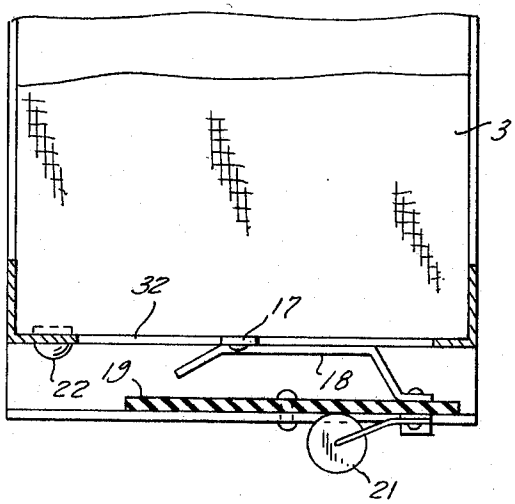


FIG. 5

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United States Patent Office 3,513,634 Patented May 26, 1970

3,513,634
STRUCTURE FOR HOLDING ELECTRICALLY CHARGED MEMBER

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Filed Aug. 7, 1968, Ser. No. 750,811
Int. Cl. B03c 3/02
U.S. Cl. 55—139 8 Claims

ABSTRACT OF THE DISCLOSURE

An electrically charged member is supported in a tiltable support and the support is provided with means to connect the member and support to ground when the support is in position for removal of the electrically charged member.

BACKGROUND OF THE INVENTION

Electrically charged members, such as electrostatic air filters, are known in the art. Electrostatic filters have been described, previously, in conjunction with room air conditioners. An example of a patent showing such a structure is U.S. Pat. No. 2,990,911—Lippincott which shows the electrostatic filter placed between the decorative front of a window mounted air conditioner and the chassis of that air conditioner.

Many electrically charged members, particularly electrostatic filters, are provided with electrical power at a relatively high voltage for operation. During operation, the system is, of course, grounded to prevent transmission of an electrical shock to a person in the vicinity of the unit. In order to remove accumulated dust particles, and other foreign materials, from an electrostatic filter, the filter must be washed, in some manner, and it is often preferable for the filter to be removed from the unit in which it is employed in order to accomplish this washing. In these circumstances, the user of the apparatus must grasp the previously charged filter in order to remove it from the unit.

While there is generally little problem of a charge being retained on the filter once the power supply is disconnected, the possibility of charge retention always exists and it is important to provide means for electrically connecting the system, i.e., the electrically charged member and support, to ground while the member is being removed and for grounding the support after the member has been removed from the support.

SUMMARY OF THE INVENTION

In accordance with the present invention an electrically charged member, such as an electrostatic filter, is placed in a support, such as an open ended bracket, which pivots for tilting within a fixed frame member. The electrical terminals, which are electrically connected to the power unit for this filter, are mounted to a terminal board which is affixed to the stationary portion of the frame adjacent the pivoting bracket.

A metal contact, such as a rivet, is placed on a portion of this support. In normal operation, the support and the filter held within it, are flush with the permanent frame member. In this position, the electrical contacts on the filter are adjacent the terminals on the terminal board so that power can be supplied to the filter member.

When the filter and support are tilted forward, and the power supply is shut off, so as to allow for removal of the filter from the support, the metal contact on the support is adjacent one of the terminals on the terminal board. This connects the bracket, and through it the filter, to ground through the connections normally employed

for grounding the filter during operation. In this manner, the possibility of accidental electrical shocks to persons in the vicinity of the unit is ameliorated.

It is thus an object of this invention to provide a structure for an electrically charged member which will provide a grounding circuit for the filter and its support when the filter is in position for removal or for the support when the filter is actually removed.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

FIG. 1 is a perspective, exploded view of an air conditioner including a frame for holding an electrically charged filter in accordance with the present invention,

FIG. 2 is a partial front view, partially in section, of the filter frame and tiltable support for the electrically charged filter;

FIG. 3 is a side view of the filter frame along the line 3—3 of FIG. 2;

FIG. 4 is a view similar to FIG. 3, showing the tiltable support in its pivoted position; and

FIG. 5 is a partial top view of the terminal board and tiltable support along the line 5—5 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the accompanying drawings, an air conditioner chassis 1 is shown in FIG. 1, along with a frame 2 for holding an electrically charged filter 3, and a decorative front 4 for the air conditioner. The air conditioner chassis is provided with a space 5 into which the power unit 6, which powers the electrically charged filter, can be inserted when frame 2 is placed adjacent chassis 1. As shown, the power unit 6 is mounted to frame member 2.

Means for operating various parts and controls within the chassis are provided, as at 7, and these are actuated by pushbuttons 8 inserted through frame member 2. The pushbuttons are accessible for operation through opening 9 formed in decorative front 4.

The frame member 2 includes a stationary portion 10. A tiltable support 11 is formed as a bracket from bottom channel member 12 and side channel members 13. Bracket mountings 14 are affixed to the bottom of channel member 12 and bracket mountings 15 are affixed to stationary portion 10 of frame member 2. Bracket mountings 14 and 15 are so placed that one of each type of bracket mounting is joined by a pivot pin 16 to allow for tilting of tiltable support 11. As can be seen from the drawings, forward tilting of tiltable support 11 about pivot pins 16 is limited by abutment of surface 30 of bracket mounting 14 on stationary portion 10 and the abutment of surface 31 of bracket mounting 15 on channel member 12 of tiltable support 11. Relative movement of the bracket mountings in pivoting is thus in a scissors fashion.

One of the side channels 13 of tiltable frame 11 is provided with a cutout portion 32. This cutout portion accommodates electrical contacts 17 formed on the filter member. When tiltable support 11 is in an upright position these contacts 17 abut terminals 18 attached to terminal board 19, which is affixed to wall 20 of the stationary portion 10, but electrically insulated from it. As seen in the drawings, the terminals 18 are electrically connected through a resistor 21. It should, of course, be understood that such an arrangement is not required in accordance with the present invention. Lower terminal 18 is connected via lead 33 to power unit 6.

The side 13 of the tiltable support which is provided with the cutout 32 is also provided with a contact means 22, which can be in the form of a rivet. The contact means 22 is so mounted to the side 13 of tiltable support 11 as to provide for metal to metal contact. This contact means

22 is positioned such that when the tiltable support is moved forward it contacts one of the terminals 18 as shown in FIG. 4. Wall 20 of stationary portion 10 and one side 13 of tiltable support 11 are electrically connected via lead 34 which is attached for electrical contact as at 35 and 36. The attachment means can be rivets. This lead also provides for grounding of filter 3 during operation. Thus, the power unit 6 and the tiltable support 11, and through it, the filter 3 are grounded when the tiltable support is in the forward position. In this manner, the possibility of electrical shocks is ameliorated.

Of course, in employing filters of the type indicated, other means are generally also provided to prevent electrical shocks. For example, means can be provided in the structure as shown in FIG. 1 such that when the decorative front 4 is removed the power supply to power unit 6 is disconnected. Even in such a situation, it is possible for the electrostatic filter to retain a certain charge, so that the grounding means of the present invention are desirable for safety in operation.

In operation, the decorative front is removed and the tiltable support 11 is placed in its forward position as shown in FIG. 4. Lead 34 has sufficient slack to allow movement to this position. The electrostatic filter is inserted into the support and is held in place by channel members 12 and 13. The electrical contacts on the filter project through opening 32 in side member 13. The filter and tiltable support are then put into their upright position, shown in FIGS. 2 and 3, by pivoting the tiltable support about pivot pin 16. When the filter unit and tiltable frame are thus placed in their upright position, contacts 17 on filter 3 are electrically connected to terminals 18 on terminal board 19. The unit can thus be operated for removing dirt and other foreign materials from an air stream which is circulated through the elastostatic filter.

When it is desired to clean the electrostatic filter, the power supply is shut off, and the tiltable support is pivoted so as to be placed in the forward position shown in FIG. 4. The filter unit can then be removed by sliding it out of the tiltable support. When the tiltable support is in the position shown in FIG. 4, contact means 22 on side member 13 is in electrical connection with one terminal 18 on the terminal board. Thus, the tiltable support and filter are grounded through the frame 2, via lead 34.

The invention has been described in detail with particular reference made to a preferred embodiment thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinabove and as defined in the appended claims.

We claim:

1. A support for an electrically charged member having means to allow supplying of electrical power to the member when the support is in a first position and means to provide for grounding when the support is in a second position comprising:

(a) a stationary frame portion;

(b) a tiltable support pivotably mounted to said stationary frame portion;

(c) electrical terminals on said stationary frame and electrically connected to a source of power;

(d) means on said electrically charged member contacting said electrical terminals when said tiltable support is in a first position; and

(e) contact means on said tiltable support contacting one of said electrical terminals when said tiltable support is in a second position, whereby to ground the support and electrically charged member through said terminal and frame.

2. A support for an electrostatic filter having a first position wherein said electrostatic filter is electrically connected to a source of power and a second position wherein the support is connected to ground comprising:

(a) a stationary frame portion;

(b) a tiltable support pivotably mounted to said stationary frame portion;

(c) electrical terminals connected to a power supply and mounted on said stationary frame portion;

(d) electrical contacts on said electrostatic filter electrically connected to said terminals when said tiltable support is in a first position; and

(e) a contact member on said tiltable support which makes contact with one of said terminals when said tiltable support is in a second position whereby to ground the tiltable support and, through it, the electrostatic filter.

3. The structure of claim 1 wherein said tiltable support comprises an open ended, U-shaped bracket.

4. The structure of claim 3 wherein said bracket is formed of channel members.

5. The structure of claim 3 wherein said bracket is provided with means to allow for electrical contacts on said electrostatic filter to project so as to make contact with said terminals when said bracket is in a first position.

6. The structure of claim 3 wherein said electrical contact means is a rivet having metal to metal contact with said bracket.

7. The structure of claim 2 wherein said tiltable support is pivoted to said stationary frame by bracket mountings having a scissors action during pivoting.

8. The structure of claim 7 wherein interaction of the bracket mountings, tiltable support, and stationary frame portion limits tilting movement of the tiltable support.

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U.S. Cl. X.R.

55—149, 267, 493; 62—262