

April 1, 1952

H. W. DIETERT ET AL
DESICCATOR USING AN ABSORBENT

2,591,055

Filed May 2, 1949

3 Sheets-Sheet 1

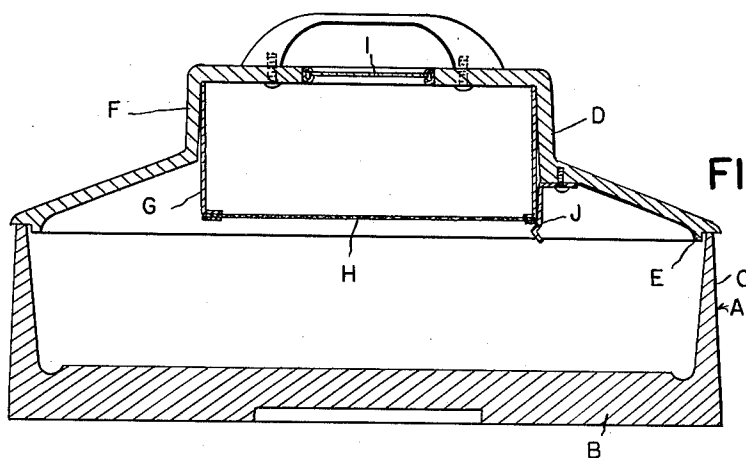


FIG. 1.

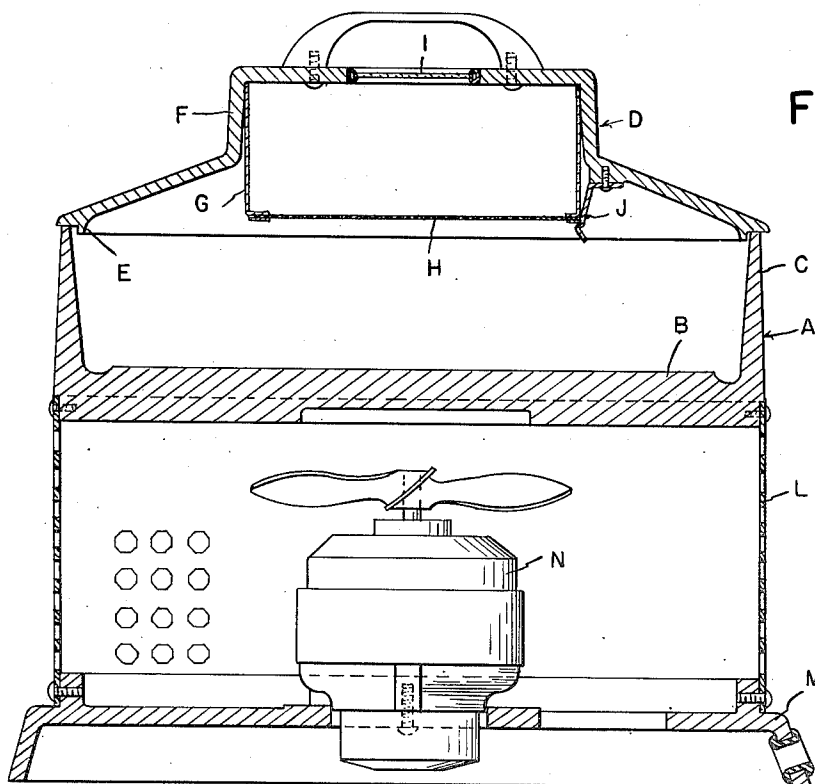


FIG. 2.

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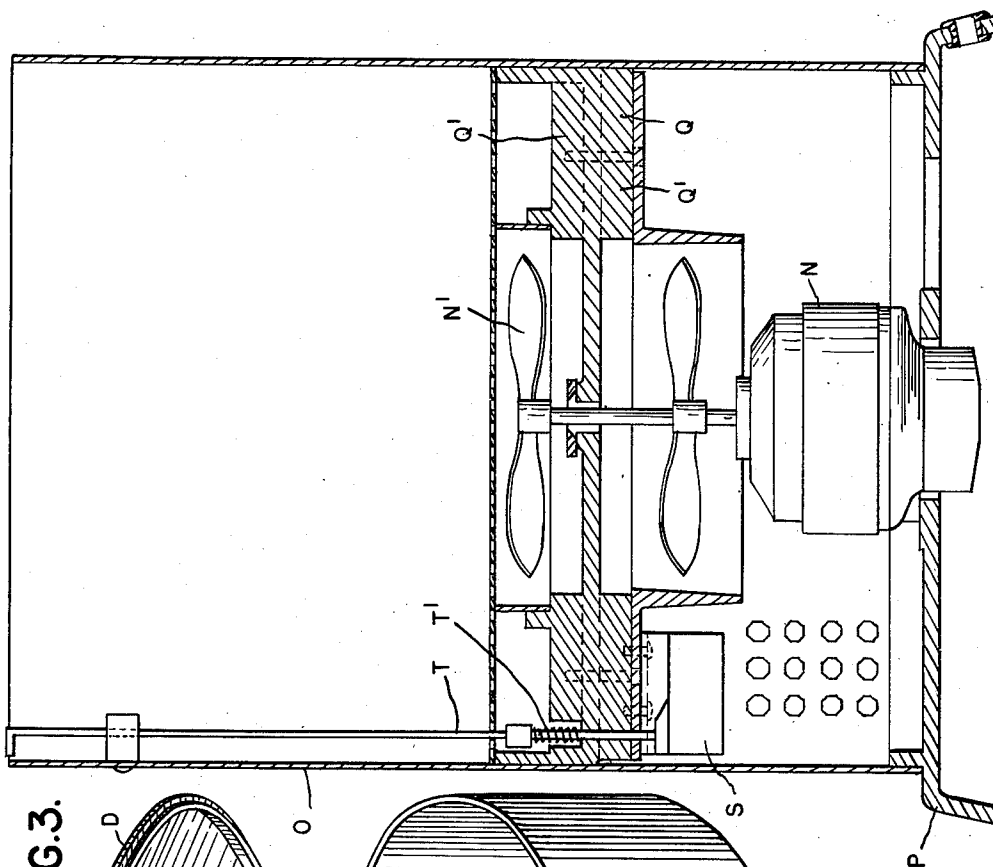


FIG. 3.

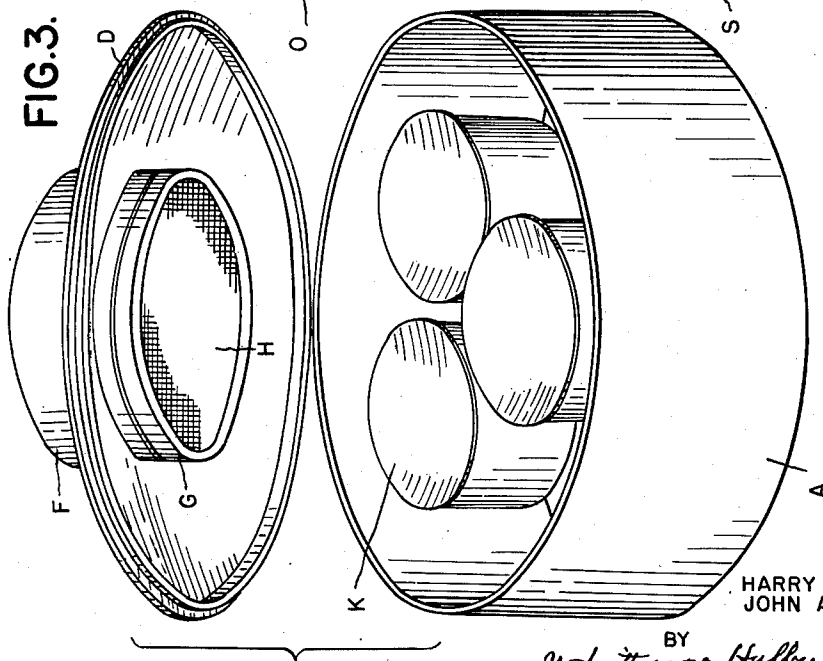


FIG. 4.

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FIG. 5.

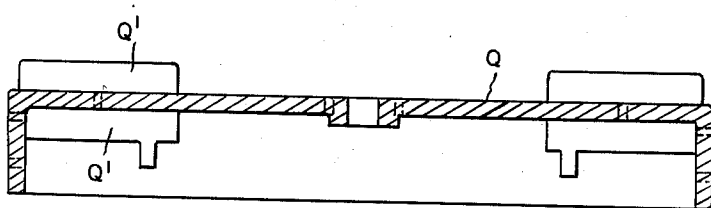
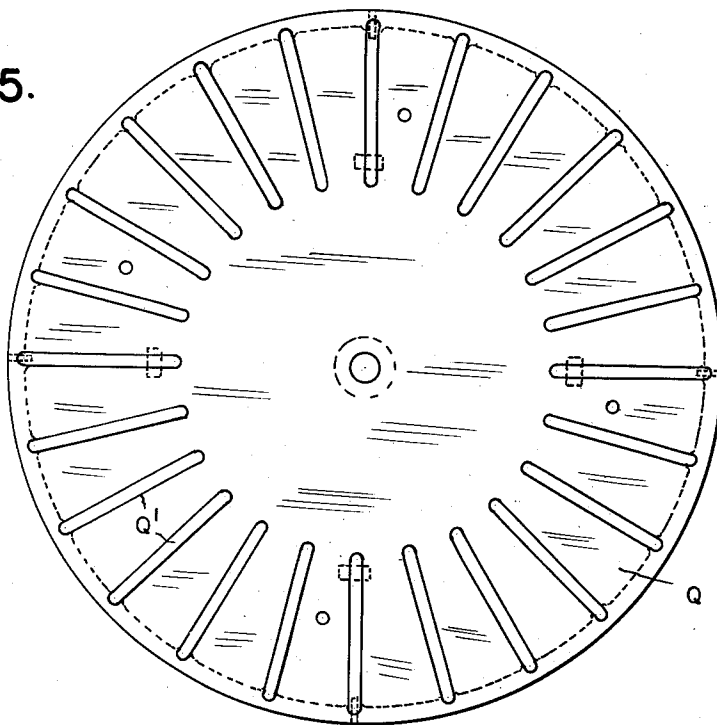


FIG. 6.

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DESICCATOR USING AN ABSORBENT

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3 Claims. (Cl. 34—81)

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The invention relates to apparatus for desiccating material by the application of heat thereto and by absorption of the liberated moisture.

It is the object of the invention to obtain a construction in which the material after desiccation is protected from reabsorption of moisture and is also rapidly reduced to normal temperature.

To this end the invention consists first in a construction in which the heat of the material is rapidly dissipated by conduction through the walls of the desiccating container.

The invention further consists in a construction in which still more rapid dissipation of the heat is effected by external convection.

Still further the invention consists in the construction where the heat is dissipated by both external and internal convection.

The invention further consists in other features of construction as hereinafter set forth.

In the drawings:

Figure 1 is a vertical central section through a desiccator in which the heat is dissipated through the walls thereof;

Figure 2 is a similar view through a construction in which dissipation of heat is accelerated by external convection;

Figure 3 is a similar view of a construction in which dissipation of heat is effected by both external and internal convection;

Figure 4 is a perspective view showing the desiccator with the cover removed and disclosing therewith the separate trays for the desiccated material;

Figure 5 is a plan view; and

Figure 6 is a cross section through the partition between the external and internal air circulating fans.

As illustrated in Figure 1, A is a casing preferably of cylindrical form with a relatively heavy base portion B and tapering walls C extending upward therefrom. The casing is preferably formed of material having a relatively high rate of thermal conductivity and specific heat as, for instance, the metal aluminum. D is a cover for the container resting upon the upper edge of the wall C and having a downturned inner flange E for holding it from displacement. The cover is formed with an upwardly extending central cylindrical portion F for receiving a tray or container G holding the desiccant. This tray is provided with a screen or perforated bottom H through which vapor from the material within the casing A can pass to be absorbed by the desiccant. A central window I is placed in the top of

the portion F through which the desiccant can be observed. There is also a catch J for engaging the bottom of the tray G to hold it within the portion F. The material to be desiccated may be placed either directly in the casing A on the bottom thereof, or as shown in Figure 4 it may be placed in separate trays K resting upon the bottom within the casing. On account of the high thermal conductivity of the walls of the casing, heat can be rapidly communicated to the material therewithin to effect the desiccation while the liberated vapors pass upward through the screen H and will be absorbed by the desiccant in the tray G. Any suitable material such as silica-gel may be used as the desiccant, and as this material changes in color from blue to pink upon absorption of moisture its condition can be readily detected by observation through the window. To seal the container a viscous material such as vaseline may be placed around the cover outside of the depending flange E and this by engaging the wall C will effectively prevent the passage of air.

After the material has been desiccated, it is desirable to cool it as rapidly as possible to place it in condition for use and without any danger of reabsorption of moisture. This cooling is necessary particularly with material to be weighed in small quantities. While it is true that heat in the material neither adds to or diminishes its weight, it is equally true that normal temperature is required for extreme accuracy in weight measurement. This is for the reason that if the material is either higher or lower than normal temperature when placed upon the weighing pan it will induce a thermal circulation of air currents which will affect the balance. Also for many other tests it is desirable to have the desiccated material at normal temperature. With the construction illustrated in Figure 1, the heat from the individual containers first passes by conduction into the base B and then is dissipated from the external surface. If, however, this cooling is not sufficiently rapid it may be accelerated by use of the construction shown in Figure 2. Here the receptacle A is placed above a perforated casing L mounted on a base M within which is mounted an electric motor driven fan N. Air is thus propelled upward centrally against the base B and outward therefrom to dissipate the heat by convection.

Certain materials to be desiccated such, for instance as cloth, leather, etc., are relatively low in thermal conductivity. Where these are placed within the desiccator, the dissipation of heat by

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conduction from the interior of the mass will be relatively slow. To accelerate cooling, a second fan is placed within the casing containing the desiccated material to produce an internal circulation of air therewithin and to convey heat from the center to the walls where it can be dissipated by conduction. Such construction is illustrated in Figure 3 in which a cylindrical casing O is supported upon a base P and is divided by a head or partition Q into a lower and upper chamber. Within the lower chamber is the motor fan N for circulating air beneath the partition Q and dissipating heat therefrom. The shaft of the motor fan extends upward through a central aperture in the partition Q and a second fan N' is arranged thereabove. Between this upper fan and the upper chamber within the casing O is arranged a perforated partition R on which the material to be desiccated is supported and it will be understood that the casing O is provided with a cover similar to the cover D previously described, which carries the desiccant. With such construction when the fans are in operation air is internally circulated within the chamber in the upper portion of the casing O to carry the heat to the side wall and downward to the partition Q. After passing through this partition, the heat is dissipated by convection caused by the lower fan N. To render the operation automatic, a switch S controlling the operation of the motor fan is actuated by a vertical rod T extending upward within the casing O to be depressed whenever the cover D is placed on said casing. This will energize the fan motor and whenever the cover is removed a spring T' will lift the rod T and open the switch. To still further increase the rate of heat dissipation, the partition Q is preferably formed with radial fins Q' above and below the same, which present greater surface areas to the convection air currents.

What we claim as our invention is:

1. A desiccator comprising a casing having its walls and bottom formed of material of relatively high thermal conductivity and specific heat, said casing being adapted to receive the material to be desiccated, a cover for said casing, means for supporting desiccant material by said cover, a

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base having an upwardly extending perforated side wall on which said casing is supported, and a motor driven fan on said base for blowing air in contact with the bottom of said casing to dissipate heat therefrom by convection.

2. A desiccator comprising a casing for receiving material to be desiccated, a partition within said casing on which said material is supported a cover for said casing, means for supporting desiccant material within said casing, a base for supporting said casing, a motor supported on said base, and fans driven by said motor respectively below and above said partition for producing external and internal convection currents to accelerate dissipation of heat.

3. A desiccator comprising a casing for receiving material to be desiccated, a partition within said casing on which said material is supported a cover for said casing, means for supporting desiccant material within said casing, a base for supporting said casing, a motor supported on said base, fans driven by said motor respectively below and above said partition for producing external and internal convection currents to accelerate dissipation of heat, and a switch controlling said motor adapted to be closed by the placing of said cover on said casing and to be opened by the removal of said cover.

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