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APPARATUS FOR REMOVING POLLEN FROM AIR

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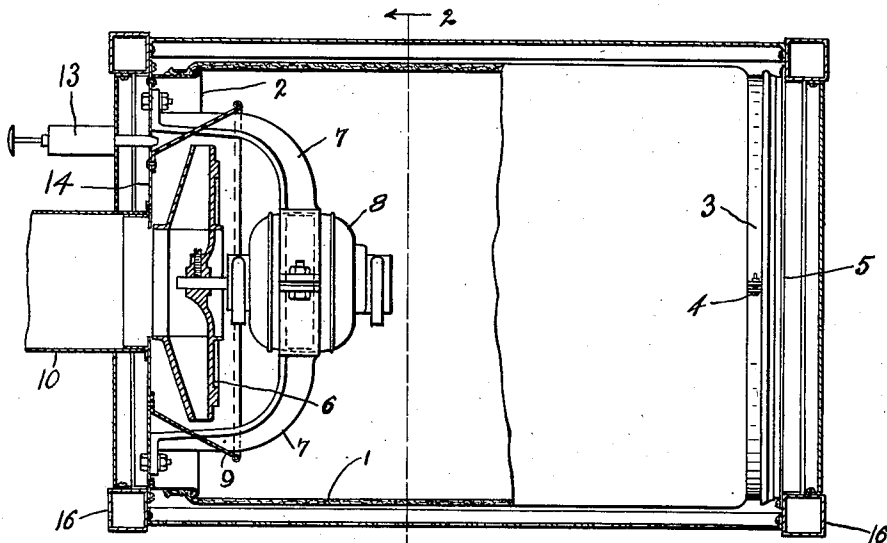


Fig. 1

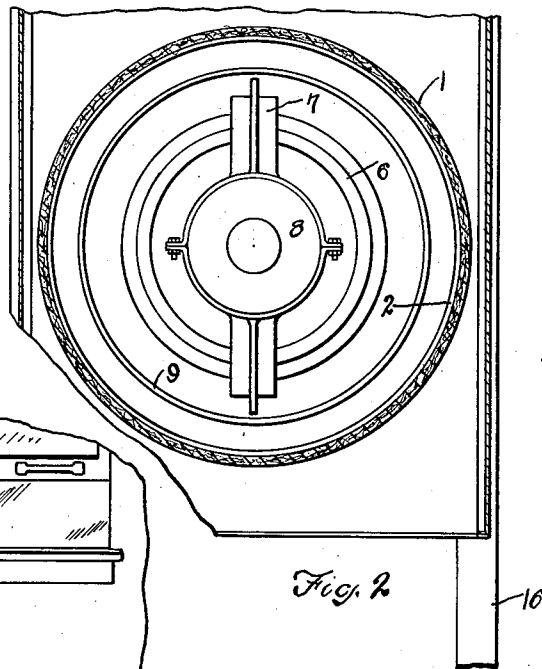


Fig. 2

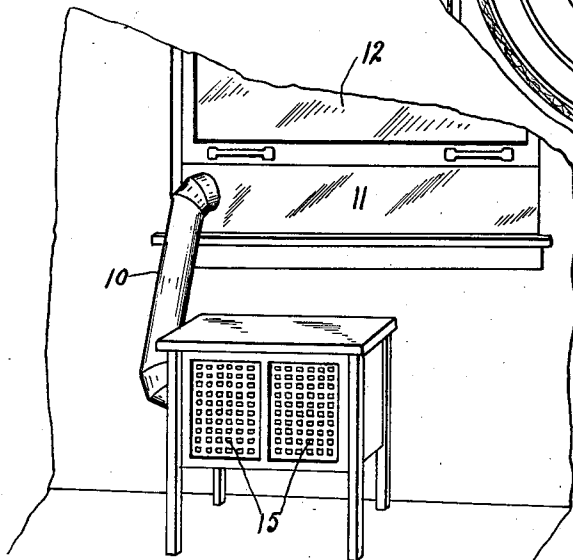


Fig. 3

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APPARATUS FOR REMOVING POLLEN FROM AIR

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This invention relates to gas and liquid contact apparatus, and more particularly apparatus for the removal of pollen from air. It has been demonstrated that hay fever and certain types of asthma are occasioned by specific irritations from the air-borne pollen of certain plants, and as a part of the treatment for such conditions, it has become quite customary for persons with such affliction to seek regions in which these pollen-producing plants are absent, in order to find relief during the summer season. While this is correspondingly effective, it is manifestly impracticable for a large number of those subject to the infection, and readily-available means for protecting such irrespective of their general environment is accordingly of fundamental importance and highly desirable.

To the accomplishment of the foregoing and related ends, the invention, then, consists of the features hereinafter fully described, and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail certain structure embodying the invention, such being illustrative however of but one of various ways in which the principle of the invention may be employed.

In said annexed drawings:—

Fig. 1 is a longitudinal horizontal section, in part on a higher plane, illustrating one embodiment of the invention; Fig. 2 is a section taken on a plane indicated by the line II—II, Fig. 1; and Fig. 3 is a perspective view of the device as set up for use.

Referring more particularly to the drawings, there is shown a means for supplying air, and a discharge, with a pollen-separating septum therebetween. This septum 1 is air-pervious, of suitably fine capillarity, and advantageously is of fibrous material, preferably a felted fabric of vegetable or animal fiber, or proportions of both. It may be made up of a single layer, or of a plurality of layers as convenient, and it is carried by suitable supporting means, as for instance in the form shown, annular support-members 2. These being spaced apart allow of the securing of each end of the septum, preferably in cylindrical

form as indicated, and suitable clamp means, as clamp bands 3 with bolt take-ups 4 serve to firmly hold the septum in place. One end of the septum, as at 5, is closed off by a wall, for instance of sheet metal, and at the other end is the air inlet. At this point, a motor-driven fan 6 is shown in a position to supply air within the septum compartment, arms 7 extending within the compartment serving to support the motor 8 and the fan 6 carried thereby. With a centrifugal type of fan, and this is generally most advantageous, a deflector 9 is desirably arranged thereabout, and an adequate air supply may be provided over the entire acting surface of the septum. Intake may be had directly through a suitable opening in the wall to the outside or another room or by extension connection 10, conveniently of joint sections as desired, and optionally with a sash-board or the like placeable in a window 12 for example.

As a means of furthering the effective entrapment of the air-borne pollen grains, the pervious septum is desirably rendered slightly adhesive. While moistening with water may be, if carefully done, feasible to some extent, the tendency with this is to choke off a considerable part of the capillary spaces. I preferably provide as an adhesive-affording means, an atomized or nebulized spray of a liquid such for example as glycerin thinned down with alcohol. In this manner, the capillarity of the liquid is sufficiently adequately matched to the capillary spaces as not to obstruct off an undesirable proportion thereof, but on the contrary afford a very thin film on the fibrous elements without engendering obstructive closing off of the capillary spaces therebetween. Such spray is most advantageously introduced from within, as thereby the air current may be availed of to assist in an even distribution. A convenient means to this end, may accordingly comprise a nebulizer or atomizer 13 insertible to communicate through an opening provided into the septum-chamber, for instance through the metallic end partition 14 in the neighborhood of the fan.

For protective purposes, it is desirable that the septum be surrounded by a casing, preferably

erably a sheet metal boxing having air outlet openings 15 on one, or more, sides as desired. The entire structure may be supported by corner channel-members 16, which may be of sheet metal forming entirely closed channels or partly open angle sections as preferred, the wall sections being suitably secured, as by bolts, riveting, welding, etc., to the support channel-members, and embodying a general surrounding protective and supportive casing.

In use, with the drive motor connected to a suitable current-supply, and the intake 10 adjusted to communicate with the outside atmosphere, the fan being set into operation, air is drawn in from the outside through the feed connection 10, and passes through the pervious septum, pollen grains being arrested thereby, and the air thus freed is finally discharged through the discharge outlet openings into the room. On account of the positive balance of pressure attained by an air supply means of the motor driven type, the room thus equipped is provided with depollinated air, and in a manner to overcome the ordinary tendencies of leakage about doors and windows, without requirement of special sealing or battening. Such equipment may be employed for residence or office air supply usage, and in practice it is found that the number of hours protection thus afforded may be adapted to the needs of any particular case in accordance with the extent of irritation. Many cases for instance are found to make the entire season in comfort by the use of the device for a portion only of each twenty-four hour period. Moreover, the extent of dissemination of air-borne pollen is often accentuated by certain air conditions and directions of wind, and correspondingly the usage of the device may be scheduled in this respect. In all cases however, it is found that the relief thus had by protection from the specific irritant substance is such as to very markedly contribute in the upbuilding of the general resistance, thereby enabling the patient to go through the entire season with relative comfort.

The effectiveness of the depollinating action may be enhanced by providing the fibers of the septum with a thin film coating of a slightly adhesive character, and with the use preferably of such material as glycerin thinned for instance with alcohol in the proportion of about 50 parts of glycerin and 50 parts of alcohol, an occasional spraying by the nebulizer 13 is sufficient.

Other modes of applying the principle of the invention may be employed, change being made as regards the details disclosed, provided the means or steps stated in any of the following claims or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. Apparatus for removing pollen from air, which comprises a cylindrical air-pervious capillary septum closed at one end, and a motor-driven intake fan mounted internally of the other end of the septum.

2. Apparatus for removing pollen from air, which comprises a hollow air-pervious capillary septum closed at one end, a motor-driven intake fan mounted inside of said septum at the other end, and a perforated casing enclosing the whole.

3. Apparatus for removing pollen from air, which comprises spaced annular support-members, a fibrous cylindrical capillary septum clamped at each end to said members, means for closing off one end of the septum, and a motor-driven intake fan in the other end.

4. Apparatus for removing pollen from air, which comprises spaced annular support-members, a fibrous cylindrical capillary septum clamped at each end to said members, means for closing off one end of the septum, a motor-driven intake fan at the other end, and a casing surrounding said septum and having air outlets.

5. Apparatus for removing pollen from air, which comprises spaced annular support-members, a fibrous cylindrical capillary septum clamped at each end to said members, means for closing off one end of the septum, arms extending within the other end, a motor and fan carried by said arms, a deflector surrounding said fan, an air-inlet thereto, a casing surrounding said septum and having air outlets, and metallic channel members for supporting said casing.

6. Apparatus for removing pollen from air, which comprises spaced annular support-members, a fibrous cylindrical septum clamped at each end to said members, means for closing off one end of the septum, arms extending within the other end, a motor and fan carried by said arms, a deflector surrounding said fan, an air-inlet thereto, a casing surrounding said septum and having air outlets, metallic channel corner support members for said casing, and liquid-atomizing means communicating with the interior of said septum.

7. Apparatus for removing pollen from air, which comprises a cylindrical air-pervious capillary septum closed at one end, means for rendering the surfaces in said septum slightly adhesive without filling the capillary spaces, means for introducing air therinto at the other end, and a casing spaced about said septum and having an air outlet.

Signed by me this 2nd day of April, 1928.

GEORGE A. GIESELER.