

[54] **CONTAINER FOR AIR TREATING AGENT**
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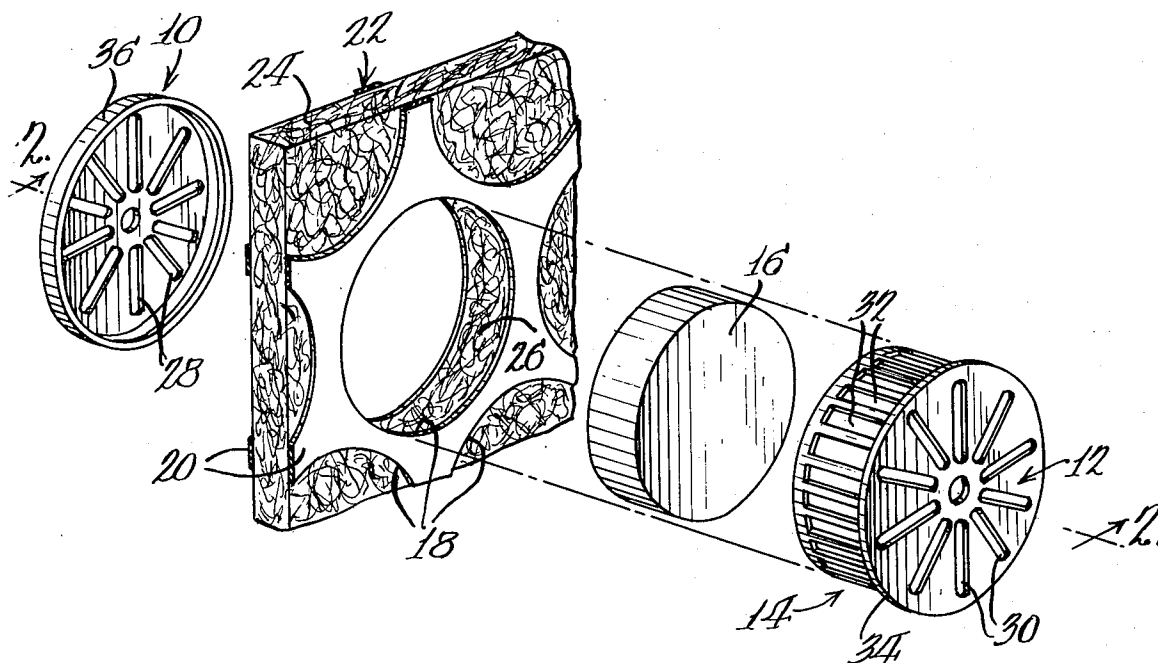
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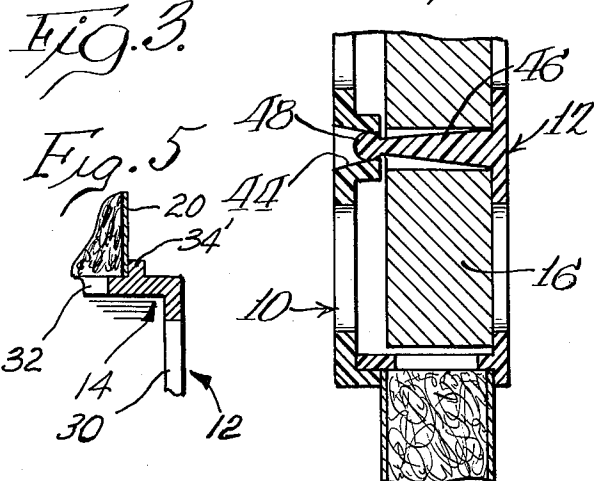
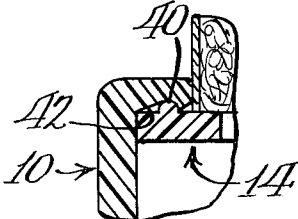
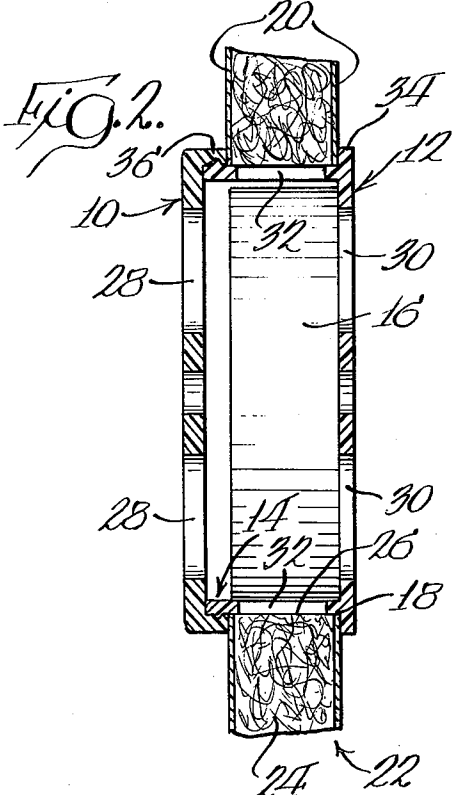
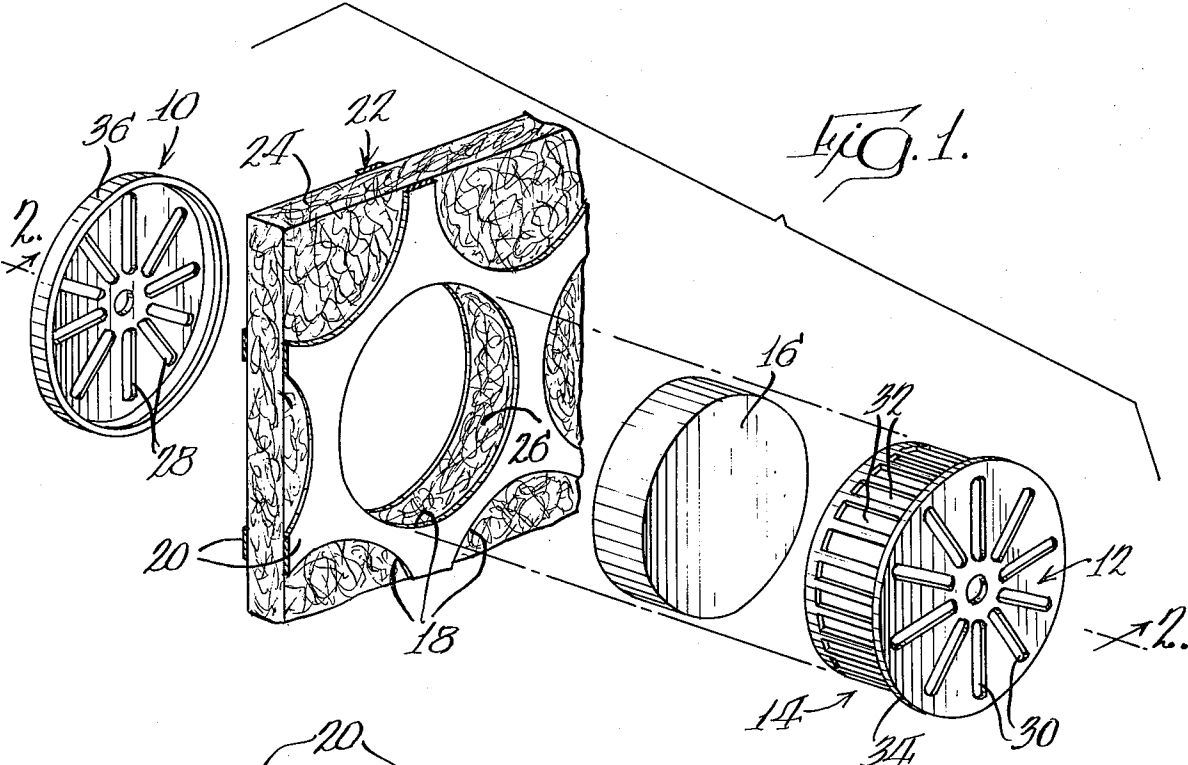
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[57] **ABSTRACT**

A container for an air treating agent such as an air freshener, deodorizer, or antibacterial agent, which may be easily placed in an air circulation system, as by attachment to an air filter customarily employed in such systems. The container includes a top and a bottom with the bottom having an upstanding peripheral wall. The top, bottom and peripheral wall are perforated to allow air flow therethrough and the bottom and the top are provided with outwardly extending portions which are adapted to embrace and sandwich opposite sides of an air filter to hold the container in place. Interengaging snap-fit connectors are provided on opposed elements to allow the same to be assembled on an air filter. Preferably the distance between the outwardly extending portions is no greater than, and preferably somewhat less, than the thickness of the air filter so that the container may be firmly mounted in place.

5 Claims, 5 Drawing Figures





CONTAINER FOR AIR TREATING AGENT

BACKGROUND OF THE INVENTION

This invention relates to air treatment and air circulation systems and, more particularly, to a container which may be easily fitted in place on an air filter customarily used in air circulation systems, which container may contain any one of a variety of different types of air treating agents.

Increasingly, particularly in residential structures, there has been resort to forced air heating and cooling systems, including window air conditioning units. While residential structures housing such units typically are closed during winter to preclude heat loss, the ever-increasing use of air conditioning has resulted in such residential structures being closed during the summer months.

As a result, while there is some leakage from the interior to the exterior of virtually every structure, the turnover of air from the interior to the exterior is minimized. Consequently, the air within a structure that is air conditioned frequently becomes stale. This problem is compounded when, particularly in residential structures, cooking takes place which, of course, generates odors which cannot be completely exhausted to the exterior even when range hoods are employed.

Finally, the desirability of providing an antibacterial action in residences has long been recognized, particularly where the residence is heated and/or cooled with a forced air system. For example, for some years, there has been commercially available, treated air filters for use in such systems, which air filters are treated with an antibacterial agent as, for example, hexachlorophene. In this respect, reference may be made to U.S. Pat. No. 3,116,969 issued to Coleman.

While air freshening materials or deodorants could be used in lieu of, or in addition to, antibacterial agents, one substantial difficulty presents itself. Because, according to Coleman, such materials are coated on the air filter itself, any unused material remaining on the filter when it is discarded is wasted. Alternately, the air treatment agent coated on the filter may exhaust itself before the filter is discarded. In this situation, the desired air treatment action is provided for only a fraction of the life of the filter.

Moreover, because the type and nature of the air treating agent is determined by the manufacturer of the filter, the individual purchaser cannot determine what type of agent he would wish to employ in his own residence or structure and is left to those made available by the manufacturer of the filters.

SUMMARY OF THE INVENTION

It is the principal object of the invention to provide new and improved means whereby forced air circulation systems may be easily equipped for air treatment, by chemical means, which air treatment is not dependent upon the life of an air filter, does not promote wastage of air treating material, and which permits the individual user to select, according to his own needs, the type of air treatment to be employed.

More specifically, it is an object of the invention to provide a container for an air treating material which may be easily affixed to an air filter employed in a forced air system and which may be periodically reloaded with any desired type of air treating agent as necessary.

The exemplary embodiment achieves the foregoing objects through the use of a container which is adapted to receive any desired air treating agent. The container includes a top and a bottom, with the latter having a peripheral upstanding wall to define an air treating agent receiving cavity.

Both the top and one of the bottom and the side wall have portions extending outwardly from their respective peripheries which are adapted to engage and embrace opposite sides of an air filter to which the container may be attached. Preferably, the side wall has a shape complementary to the perforations in the backing in a standard air filter and just slightly smaller than such perforations so that, after the filter material is parted, the container may be fitted through aligned perforations in the opposed backing members on the filter. Once a top is placed on the container, the outwardly extending portions serve to hold the container in place.

In this respect, the upstanding side wall is so related to the outwardly extending portions as far as height is concerned such that the distance between facing edges of the outwardly extending portions will be equal to or slightly less than the thickness of the air filter.

The top and one of the bottom or upstanding side walls are provided with complementary releasable securing formations so as to provide for rigid assembly once applied to an air filter, as well as removability to allow replenishment and initial insertion of the air treating agent into the cavity.

Each of the top, bottom and side wall is provided with a plurality of apertures so that, as air circulates through the filter, it will also circulate through the container so that an air treating agent in the cavity will sublime and be carried through the circulation system to be distributed throughout the structure housing the same.

According to one embodiment of the invention, a post is provided within the cavity and is secured to either the top or the bottom. The post may impale a cake of an air treating agent to maintain the same in a predetermined position within the cavity so as to insure uniform air flow thereabout.

In another embodiment, the post includes a snap-fit connector on one end while the top or the bottom to which the post is not secured includes a complementary and alignable snap-fit connector which define the complementary releasable securing formations.

If desired, the side wall may be substantially larger than the perforations in the backing of the air filter, in which case, the air filter may be punched to form a somewhat larger size aperture to receive the container.

In still another embodiment, the outwardly extending portion on either the bottom or the side wall may serve as a base for a plurality of upstanding side walls, each defining a respective air treating agent receiving cavity, which cavities are so oriented on the base as to be alignable with the pattern of perforations on the backing of an air filter.

Other objects and advantages of the invention will become apparent from the following specification taken in conjunction with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded, perspective view of a container made according to the invention, illustrating its application to an air filter;

FIG. 2 is a sectional view of the container applied to an air filter;

FIG. 3 is an enlarged, fragmentary section showing one form of releasable connecting formations by which the top may be secured to the container defined by the bottom and the side wall;

FIG. 4 is an enlarged, fragmentary sectional view illustrating a modified releasable securing formation by which the parts may be secured together; and

FIG. 5 is a fragmentary, sectional view illustrating a modified embodiment of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

An exemplary embodiment of the invention is illustrated in FIG. 1 and is seen to include a top or cover, generally designated 10; a bottom, generally designated 12; the bottom 12 having an upstanding peripheral side wall, generally designated 14. The upstanding side wall 14 and the bottom 12 define a cavity for receipt of an air treating agent such as a cake 16 of air treating agent, although a granular material could be used if desired.

As illustrated, the side wall 14 has a circular periphery and, preferably is dimensioned to be just slightly smaller than the apertures 18 in the backing 20 of an air filter, generally designated 22.

The filter 22 will typically have opposed ones of the backing members 20 having the apertures therein in alignment across the fibrous filter material 24 sandwiched between the backing members 20. The fibrous filter material 24 typically will be glass fibers and, therefore, can be parted, as illustrated, to permit insertion of the bottom 12 and side wall 14 through a resulting opening, generally designated 26, to receive the top or cover 10 on the opposite side.

The top 10 includes a plurality of apertures 28 which may be in the form of radially extending slots, as illustrated, while similar apertures 30 are provided in the bottom 12. Apertures 32 are provided in the side wall 14. As a result, when the container is installed in a forced air circulation system, including the filter 22, air may pass through the apertures 28, 30 and 32 about the air treating agent causing the same to sublime with the vapors being carried throughout the structure housing the system.

With reference now to FIGS. 1 and 2, the bottom 12 includes a radially outwardly extending peripheral lip 34. While the lip 34 is shown as an extension of the bottom 12, those skilled in the art will immediately recognize that the same could be formed on the side wall 14, such as is illustrated in FIG. 5 at 34'.

A radially outwardly extending portion is also provided on the cover 10 in the form of a peripheral ring 36. As seen in FIG. 2, the purpose of the radially outwardly extending portions 34 and 36 is to overlie the backing 20 of the filter 22 about the periphery of the opening 18 therein so as to retain the container in place. To this end, the height of the side wall 14 is selected in connection with the location of the outwardly extending portions 34 and 36 and the width of the filter 22 such that the distance between facing surfaces of the radially extending portions 34 and 36 is equal to or slightly less than the width of the filter 22, including the backing 20. As a result, a solid connection is formed so that the container will not rattle when subjected to vibration as, for example, typically generated by a fur-

nace fan in operation. Preferably, this distance is made just slightly less than the width of the filter so that the inherent resilience of the latter will exert a small degree of force on opposite sides of the container to firmly affix it in place.

For purposes of firmly but releasably affixing the cover 10 to the remainder of the container defined by the bottom 12 and the side wall 14, releasable connecting elements are provided on both the cover 10 and one or the other of the bottom 12 and the side wall 14. FIG. 3 illustrates one embodiment of the invention wherein the releasable connecting elements are formed on the top 10 and the side wall 14.

Near the end of the side wall 14, opposite from the bottom 12, a peripheral, radially outwardly directed tongue 40 is provided, while on the inner surface of the lip 36, a peripheral groove 42 is provided. As a result, a releasable snap-fit connection is defined.

FIG. 4 illustrates an alternate embodiment wherein the center of the top 10 includes a central opening 44 that is frusto-conical in shape and has its narrow end on the side of the top 10 adjacent the bottom 12. The bottom 12, in turn includes a post 46 extending inwardly into the cavity for receiving the air treating agent 16. The end of the post 46 remote from the bottom 12, includes a bulb-like formation 48 a maximum circumference just slightly greater than the smallest dimension of the opening 44 so as to be capable of being forced therethrough, as illustrated in FIG. 4, to again establish a snap-fit connection. In the embodiment illustrated in FIG. 4, the post 46 serves an additional function in terms of impaling a cake 16 of air treating agent so as to locate the same within the cavity at a predetermined central position. Thus, as the cake 16 diminishes in size, it will be maintained centrally located within the cavity for uniform air flow thereabout to maximum uniformity of air treatment.

It should be appreciated that the post 46 need not be secured to the bottom 12. Rather, the same could be secured to the top 10 and the bottom 12 provided with an aligned opening similar to the opening 44.

To facilitate economy of construction, it is preferred that the various parts of the container be made of plastic.

In some instances, it may be desired to form the container and, specifically, the size of the side wall 14, to be greater than the size of the apertures 18 normally provided in the backing members 20 in a typical air filter 22. When such is the case, the air filter may be preformed or punched with an enlarged opening just slightly greater in size than the circumference of the side wall 32. Alternately, the radially extending lip 34 may take on the form of a web and, in turn, mount a plurality of the side walls 14, each defining an individual chamber. In such a case, the location of the plural side walls 32 will be on the web in the same pattern as the apertures 18 are located in the backing 20 of the air filter 22 so as to be capable of simultaneous insertion through a plurality of adjacent ones of such openings. Of course, in such a case, an additional number of the tops 10 corresponding to the number of the side walls 32 will be provided.

From the foregoing, it will be appreciated that the invention provides economically used means for incorporating air treating agents in forced air circulation systems installed in residences or the like. It will also be appreciated that the container can be reused even

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though a filter on which it was once installed has been consumed and must be discarded. It will also appreciated that in the event the filter on which the container is installed has not been exhausted, when required, the air treating agent can be replenished simply by removing the top 10 and inserting a new cake 16 or the like.

Finally, it will be appreciated that the invention allows the user thereof to select any particular type of air treating agent he wishes to employ, as desired.

I claim:

1. For use in a ventilation system, the combination comprising: an air filter including a layer of filtering material sandwiched between a pair of perforated backing members; and a container adapted to receive an air treating agent, said container including a top and a bottom, a peripheral upstanding side wall secured to said bottom to define therewith an air treating agent receiving cavity, said top and said bottom or said upstanding side wall having portions extending outwardly from the periphery of said upstanding side wall and embracing opposite sides of said air filter, said upstanding side wall having a height such that the respective outwardly extending portion on said top and said bottom or said side wall are spaced a distance corresponding to the thickness of said air filter; a releasable securing formation on said top, a complementary releasable securing formation on said upstanding side wall or said bottom for coacting with said releasable securing formation on said top to hold said top, bottom and upstanding side wall in assembled relation while allowing access to said cavity whereby an air treating agent may be placed therein; and a plurality of apertures extending through each of said top, said bottom and said upstanding side wall so that vapor from an air treating agent in said cavity may exit said container into the ventilation system which said device is employed to be circulated thereby; said container extending through said layer and said backing members with said outwardly extending portions on said container sandwiching said backing members to secure said container to said filter.

2. The combination of claim 1 further including a

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post within said cavity and secured to said containers for impaling a cake of an air treating agents and maintaining the same in a predetermined position within said cavity.

3. The combination of claim 1 wherein said releasable securing formation and said complementary releasable securing formation comprises interengaging snap fit connectors.

4. The combination of claim 3 further including a post within said cavity and secured to one part of said container for impaling a cake of an air treating agent and maintaining the same in a predetermined position within said cavity; one of said snap fit connectors being located on the end of said post opposite its point of securement to said one part of said container, the other of said snap fit connectors being located on another part of said container and aligned with said post.

5. An air treating device for use in treating air circulating in a forced air circulation system, comprising:

an air filter including a layer of filtering material sandwiched between a pair of perforated backing members;

an air-pervious container having an interior cavity adapted to receive an air treating agent and a selectively openable cover whereby access to said cavity may be achieved to initially place or subsequently replenish an air treating agent in said cavity; and means releasably securing said container to said air filter whereby said container may be removed from said air filter to replenish the air treating agent to be contained in said cavity and/or to permit said air filter to be disposed of without disposing of said container thereby permitting said container to be reused;

said means releasably securing said container to said air filter includes at least one element engaging one of said perforated backing members;

said element being on said selectively openable cover.

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