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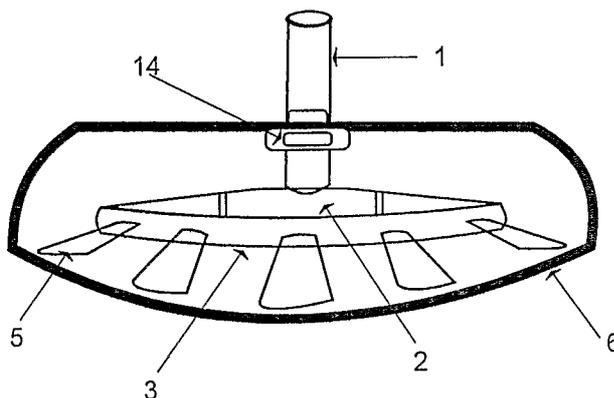
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Fig 1



(57) **Abstract:** The invention is an improved ceiling fan for cleaning polluted air. A fan rod (1) has upper clamp for roof and a lower motor (2). The motor has a ring (3) supported on radial arms (4) fixed to the motor (2). The ring has multiple smaller blades (5) for more air sweeping. A woven or nonwoven washable filter fabric (6) with needed pores mounted on radial rods (7) fixed to a clamp (8) on the fan rod (1) forms air purifying canopy above the motor and blades. The motor is modified with a lower weight plastic casing with heat radiating holes (18). More number of blades with lower weight motor gives more air for same power. Ionizer (14) is fixed to fan rod (1). Water bottle (15) with wick (16) spreading water on an evaporating sponge (17) spread above the filter cools air in hot summer for cool healthy air.



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## AN IMPROVED CEILING FAN

### Technical Field

This invention in general relates to electric fans. More particularly this invention relates to a pollution decreasing electric fans with no extra power saving on pollution diseases and energy.

### State of Art

Existing electric fans are ceiling fans hung from roof or table/wall/pedestal/exhaust fans- all having a motor to turn blades for air throw. Ceiling fans have the largest sweep and largest air flow for lowest power. The ceiling fans have a rotating motor with 3-5 blades and suspended on a fan rod hung from the roof. The blades sweep & circulate air with dust all over room. With increasing pollution of industrialization there is a large dust build up with a lot of pollutants, pathogens causing asthma, TB, cancer of lung, pneumonias & fetal death too. Existing fans are decades old and not meant for polluted air of our cities. Eliminating dust and pathogens saves health and money. There are no simple fans to decrease pollution till date.

Ideal modern fans should be: 1.give more breeze for same energy. 2. Trap and decrease dust and pollutants for healthy air. 3. Long life with minimal wear and tear of use. 4. Easy to fix, run and use. 5. Safe and reliable. 6. Save on energy. There is no effective pollution decreasing fans as of now.

The following description gives critical examination of the ceiling fans known in the art. It also discusses the shortcomings of the conventional methods. Further in order to overcome the problem associated with fans, the invention offers the solution to overcome the impediments in the construction and the process of using the same.

Constraints in all existing ceiling fans are as follows:

1. None has effective pollution decreasing attachments.
2. Only the outer half of the blades sweep air, not the whole length of blades.

3. Filters are now attached to top of blades, stressing the blades with difficult cleaning.
4. The number of blades attached to the motor is few- three to six.
5. There is no economic, efficient use of energy.
6. There is no cooling but air circulation wellness. Actually, the air is hotter in summer & colder in cooler months.

Accordingly the object of the invention is to identify the problem associated with the conventional ceiling fans. An extensive search has been carried out using the Internet and related patent specifications were studied for fans with air filtering. The present invention is radically different, with better air flow, dust decrease and cooling too US4840650 of Matherene Elmer has a box with filter attached to top of blades by a clamp. Rotating this blade attached box stresses the blades & is inefficient U.S. Pat. No. 3,126,263 of L. Schwab titled "Gas Deflecting and Filtering" discloses a fan having filter material which is rotated and through which air passes. As shown in figures, the filter material not only covers the rotating vanes, but also the space between them thereby presenting the appearance of a rotating disc. It would be impractical to cover the multiple blades of a ceiling fan with one large circular disc as described.

U.S. Patent No. 3,347,025 of M. Wiley titled "Air Circulation System" and U.S. Pat. No. 3,577,710 of E. I. Feldman titled "Air-Treatment Apparatus" both disclose fans having their air passages covered by stationary filter elements. Again, for the reasons cited above, to place a stationary filter material either above or below the rotating blades would not only be cumbersome, but would also significantly reduce the circulating effect. U.S. Patent No. 4,422,824 issued to C. A. Eisenhardt, Jr. titled "Germicidal Ceiling Fan Blade" discloses a ceiling fan blade having a hollow chamber into which a germicidal light is placed. Filtering pads 2.8 thereof are installed along the leading and trailing edges of each blade enabling air and air-borne micro-organisms to pass into the chamber. Once in the chamber, the germicidal light destroys any micro-organisms contained in the passing air. This adds weight to the blades for a higher weight motor. U.S. Patent No. 4,596,585 of D. W. Moeller, et al. titled "Method and Apparatus for Reduction of Radon Decay Product Exposure" is an ion-generator suspended just below

the rotating blades to create special distribution of air-borne charged ions. These ions are used to reduce the amount of the radon decay products suspended in the air.

U.S. Patent No. 4,676,721 of S. D. Hardee titled "Room Air Cleaner" and EP 196-337-A both disclose a fan whose blade surface is covered by an enveloping filter material. As the covered vanes rotate, the filter material traps air-borne particles. The foam blocks of the patent need to be accurately cut so as to maintain the critical balance of the rotating blades while the vane sock of Hardee 721 must be tailored for each blade.

It is thus an object of this invention to provide a practical ceiling fan filter that does not have the shortcomings mentioned hereinabove, It is a further object of this invention to provide a ceiling fan with a filter that is lightweight, compact, unobtrusive, and functional.

The invention is directed to a novel type of electric ceiling fans with a larger number of blades sweeping the effective sweep area, with fixed filters above the motor, a water evaporative cooling in tropics, an ionizer. For same energy, more air flow with healthy air is a new invention.

Accordingly it is the primary object of the invention to invent a novel pollution decreasing efficient ceiling fan, which is unique in design and construction, working and use. Further objects of the invention will be clear from the ensuing description.

#### **Summary of the invention:**

The device comprises of fan rod with a rotating motor. The motor has radial arms with a ring (circular) frame. The ring has larger number of smaller blades in the effective sweep area with low resistance but easy air cutting margins for a larger air flow. There is a washable, detachable filter spread over the motor and blades and fixed on the fan rod, not on the blades. The filter of woven or nonwoven mesh traps the dust pollens, pathogens for healthy air. Added ioniser may be placed on the fan rods for health ions with needed electrical connections. The motor may be modified with a lower weight but same rotor and stator by using a plastic enclosure instead of metal. The fan has more air

cutting blades with a lighter motor body with same rotor stator weight for same power. A water bottle with a wick connected to a spongy fabric placed above the filter fabric cools in summer.

### **Statement of Drawings:**

These and other objects and features of the invention will become more apparent upon perusal of following description taken in conjunction with accompanying drawings wherein:

Figure 1 shows in elevation the details of the new fan.

Figure 2 shows the various components.

Figure 3 shows modification with water evaporating cooling.

Figure 4 shows a normal fan

### **DESCRIPTION OF PREFERRED EMBODIMENTS**

The following specification describes salient features of invention, the method of construction, the method of use and the advantages of the novel invention.

Existing ceiling fans in Fig 4 has a fan rod (1) with a motor (2) with 3-4 blades (5) attached at the center. As the fan motor rotates the blades rotate spreading air with dust all over the room. There are no filters too for clean air. The air delivered is determined by the speed of rotation and air cutting area of blades. Only the outer half of fan produces the entire air sweep.

The new device has a fan rod with an upper clamp for the roof hook. At the lower end is the motor. The motor has a ring with a larger number of blades with a higher air cutting area. A filtering fabric is attached to the fan rod as a canopy above the blades. An added ionizer may be clamped to the rod. As the blades rotate the air is sucked through the filter, the dust particles are trapped in the fabric for cleaner air. The fabric is removed to clean and destroy the dust for reuse. There is no extra power as the filter is stationery and not fitted to blades.

The device comprises of a fan rod (1) with a top clamp for the roof hook. The lower end has a motor (2). The motor has a ring (3) with radial arms (4) fixed to the motor. The ring carries a number of plastic/ aluminum blades (5) of smaller size with easy air cutting edges. The air delivered is more as the blades are more in number. A filter fabric (6) is spread on supporting radial rods (7) which are fixed at the central end on the fan rod by a clamp (8). The filter assembly forms a canopy over the blades. The fabric may be woven or nonwoven plastic meshed fabric for reuse. The large pores may be used for non asthmatics, smaller for severe asthmatics to trap all the dust, pollens or pathogens. The filter may decrease air flow but the added blades give more air for same power & efficiency.

The motor may be modified. The motor has an upper (9) and lower (10) plastic not metal casing with a central stator (11) and a peripheral rotor (12). The stator has a central hollow rod (13) fixed to lower end of fan rod (1). The stator and rotor of same weight of existing technology may be used. Plastic casing instead of heavy metal casing helps for energy saving. A few holes (18) in the casing dissipate motor heat.

Added ionizer (14) may be fixed to the fan rod or at the center of fan motor rod (13). This is connected to the fan main circuit for releasing ions when in use.

Added cooling can be made with a plastic water bottle (15) fitted to the lower end of stator hollow rod (13). A wick (16) lifts water to a spongy fabric (17) spread over the top of filter and evaporates producing the cooling. Alternately a mini pump (extra electric power) may be used to pump water on the spongy fabric for fast evaporation. The bottle may be screwed to lower end of stator rod (13).

To use, the fan rod is hung on the roof hook. The filter fabric clamp (8) is fixed to the fan rod (1). The clamp has a bolt and nut or a tensioning mechanism for attaching to the fan rod firmly. The radial rods of fabric, fabric are fitted to form an air filtering canopy. The motor is fixed to lower end of fan rod. The blade radial arms (4), ring (3), blades (5) are fixed. The electrical fittings are connected to switches. Ionizer (14) may be fixed to fan rod. When switched on, the motor rotates, the ring with the blades suck air trapping dust and pollutants in air filter fabric and circulates air with no dust. The ionizer adds healthy ions. The clean air saves us from diseases. The filter is undamped washed and refitted for years of use.

The device may be modified. Two layers of filters may also be used supported on two radial arms on the same clamp. The fabric can carry decorative colored figures. Lights may be fixed for decoration too on the fan rod (1) or stator rod (13). In the cooling model, the water is filled in the plastic bottle (15) and fixed to the stator rod (13). The wick (16) or mini pump lifts water to the spongy evaporative fabric (17) for cooling in summer. The filter fabric may be in two halves for easy removal or reattaching by Velcro, zips or fasteners. The blades, ring may be made of plastics for lower weight. Ionizers, cooling bottle may be optional attachments. The radial rods with ring and blades are screwed to the motor casing firmly. The blades are attached to ring by snapping on or by screws or moulding. Two blade rings may be used for stronger blade support too. The blades (made of plastics) are made of needed length and air cutting margins. Plastic parts may be injection moulded, metals cast as needed. Since fans come in different size, the ring size, blades shape and number, the filter size may vary for size.

It will be apparent to those skilled in the art that modifications to the invention described herein can readily be made without departing from the spirit of the invention. Protection is sought for all the subject matter described herein including any such modifications.

#### **Advantages of the new invention:**

1. The filter fabric is above the blades as a canopy and traps dust allergens, pathogens.
2. The ring has more number of blades with more air sweeping, air flow.
3. The motor plastic encasing reduces motor weight for same rotor stator weight!
4. Electrical Energy conversion to air circulation is more with more air (increased blade numbers, lower motor casing weight).
5. Life of device is more, as there are few moving parts.
6. Evaporative cooling with water helps in summer for no extra power.
7. Reusable washable filter fabric helps for low cost long years of use.
8. Millions Of fans can trap tons of dust helping a cleaning of outside air too.
9. Filter cloth can be decorated for pleasing looks.

**We Claim:**

1. An improved electric ceiling fan with a fan rod(1) having an upper roof clamp and a lower motor(2); the said motor has radial arms(4) with a ring(3), the said ring(3) having larger number of smaller blades (5) fixed, the said fan rod has a washable filter fabric (6) mounted on rods(7) of the clamp(8) fixed to the fan rod(1) above the said blades and motor, the said filter fabric trapping dust for a clean air.

2. An improved electric ceiling fan as claimed in claim 1, wherein the filter fabric(6) is a woven or nonwoven washable plastic mesh with needed small pores to filter the dust with clean air flow, the said fabric is fitted on supporting radial rods (7) for easy removal and refitting for years of use.

3. An improved electric ceiling fan as claimed in claim 1, wherein the said ring (3) has two or more radial arms (4) to fix to the said motor casing by screws at the inner end, the said ring having many blades(5) fixed firmly for air circulation.

4. An improved electric ceiling fan as claimed in claim 1, wherein the blades (5) of chosen size and air cutting edges are fixed to the ring firmly for years of air circulation.

5. An improved electric ceiling fan as claimed in claim 1, wherein a water bottle (15) with a wick(16), is fixed to stator rod bottom(13), the said wick lifts water by capillary to an evaporating sponge(17) for real cooling, the said sponge being spread above the said filter cloth(6).

6. An improved electric ceiling fan as claimed in claim 1 wherein the said ionizer(14) is attached to the fan rod(1) or the lower end of stator rod(13) and connected to electrical circuit for healthy negative ions.

7. An improved electric ceiling fan as claimed in claim 1 wherein the motor(2) has an upper(9) and lower (10) plastic (lower weight) casing with the inner stator and rotor, the said casing has threaded holes for radial arms (4) screws, the said casing having holes (18) for motor cooling.

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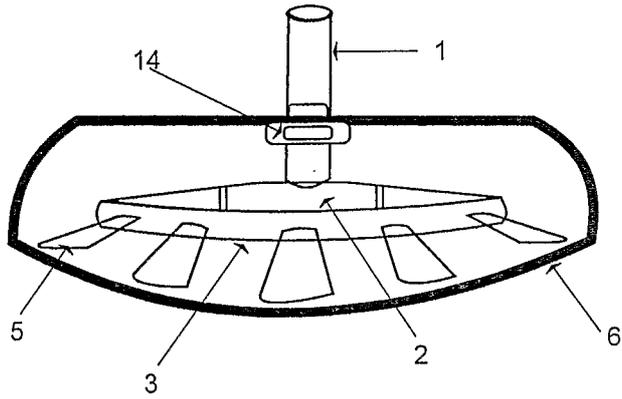


Fig 1

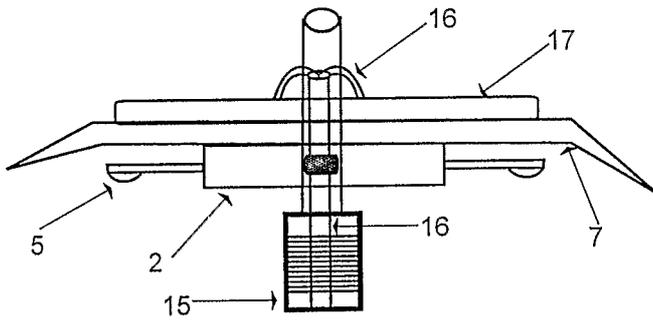
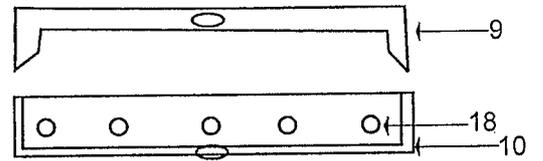
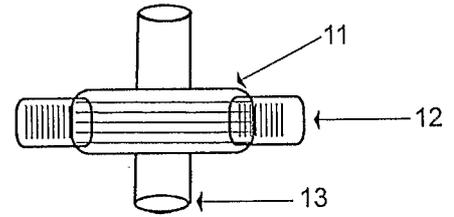
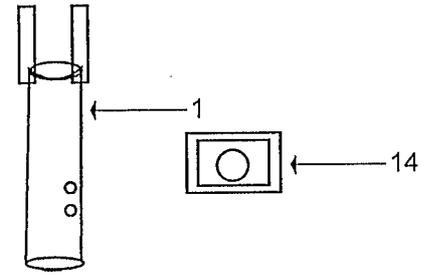


Fig 3

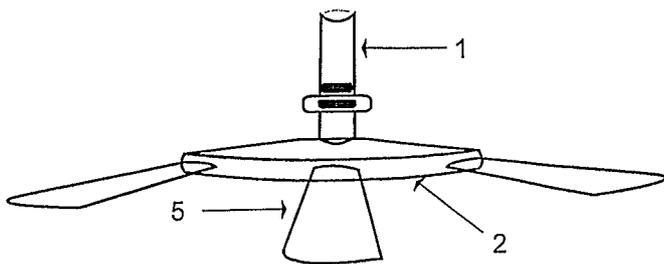
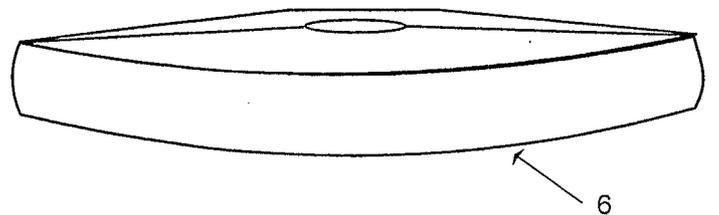
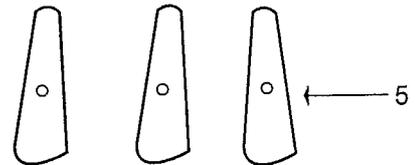
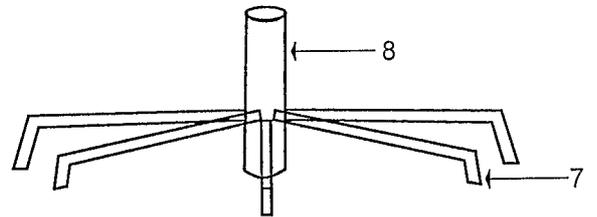


Fig 4

Fig 2

