

DESCRIPTION

Title of the Invention: BLOWING APPARATUS

Technical Field

[0001] The present invention relates to a blowing apparatus provided with an insect-trap sheet for catching insects.

Background Art

[0002] A conventional blowing apparatus is disclosed in Patent Document 1. This blowing apparatus has a housing in which an inlet port and an outlet port for the air are open on its rear face and top face respectively. The housing is installed, for example, on the floor in a room and houses a fan. A filter for collecting dust in the air is arranged in the inlet port. A cover member that covers the inlet port is fitted to the rear face of the housing so as to be removable from the housing. A plurality of suction ports for the air are open on the cover member.

[0003] In the blowing apparatus structured as described above, when operation is started, the fan is driven and the air is sucked in through the suction port. The air sucked in through the suction port flows into the inlet port. Dust in the air is collected by the filter and the air is sent outside through the outlet port. The air in a room is thus cleaned. The cover member can be removed from the housing to replace the filter.

[0004] The blowing apparatus in Patent Document 1 collects dust in the air to reduce health damage caused by dust and the like. A recent rise in health consciousness has led to increased demand for blowing apparatuses having an insect-trap function to prevent infective diseases transmitted through insects such as mosquitoes.

[0005] An insect-trapping device according to Patent Document 2 includes a housing that is at its front face opened and closed with a door and that has an opening in its side face, an attracting light source that emits attracting light for attracting insects into the housing, and an adhesive insect-trap sheet that is arranged on the rear face of the door and that catches insects.

[0006] When the door is closed and the attracting light source is turned on, the attracting light is emitted toward the outside of the housing through the opening on the side face.

Insects enter the housing through the opening on the side face and are caught on the insect-trap sheet. The used insect-trap sheet with insects attached to it is removed from the door, and an unused insect-trap sheet is fitted to a predetermined position on the door. The insect-trap sheet can thus be replaced.

List of Citations

Patent Literature

- [0007] Patent Document 1: JP-A-2009-66466
Patent Document 2: JP-A-2006-230258

Summary of the Invention

Technical Problem

- [0008] With the insect-trap sheet described above, it is possible to provide a blowing apparatus with an insect-trapping function. However, providing the insect-trap sheet has a problem that, during replacement of the insect-trap sheet, a user sees and touches an adhesive face with insects attached to it and which causes discomfort to the user.
- [0009] It is therefore an object of the present invention to provide a blowing apparatus that can prevent discomfort during replacement of the insect-trap sheet.

Means for Solving the Problem

- [0010] To achieve the above object, according to one aspect of the present invention, there are provided a housing in which an inlet port and an outlet port for the air are open and which houses a fan, a cover member which is fitted to the housing to cover the inlet port and in which a suction port for the air is open, an insect-trap sheet which is removably fitted in a space between the housing and the cover member and which has an adhesive face on one side for catching insects, and a winder which is provided on the housing or the cover member and which rotatably supports one end of the insect-trap sheet to wind up the insect-trap sheet.
- [0011] According to another aspect of the present invention, in the blowing apparatus structured as described above, preferably, the insect-trap sheet includes, in its one end part in the winding direction, a first core member that extends in the direction perpendicular to the winding direction, and the winder includes a pair of first supports

that supports opposite ends of the first core member, with at least one of the supports rotatably arranged, and a driver that rotates one of the first supports.

[0012] According to another aspect of the present invention, in the blowing apparatus structured as described above, preferably, the driver includes a handle that is provided integrally with one of the first supports, and the handle is arranged outside the cover member.

[0013] According to another aspect of the present invention, in the blowing apparatus structured as described above, preferably, the driver includes a motor that is coupled with the first support.

[0014] According to another aspect of the present invention, in the blowing apparatus structured as described above, preferably, the motor is arranged on the housing, and the first supports are arranged on the cover member, and there are provided a shaft which protrudes from the housing and which rotates when the motor is driven, a first bevel gear which is provided on the first support, and a second bevel gear which is arranged on the cover member and which has a locking hole for the shaft to be fitted in to be locked while meshing with the first bevel gear.

[0015] According to another aspect of the present invention, in the blowing apparatus structured as described above, preferably, the insect-trap sheet has a hole in an end part opposite to the first core member, and a lock for locking the insect-trap sheet by being inserted in the hole is provided, and a side of the hole opposite to the winding direction is open.

[0016] According to another aspect of the present invention, in the blowing apparatus structured as described above, preferably, there is provided a rib protruding from the housing to touch the insect-trap sheet.

[0017] According to another aspect of the present invention, in the blowing apparatus structured as described above, preferably, both of the first supports are rotatably arranged with the opposite ends of the first core member locked by the first support, and there is provided a spring for biasing the first support on the side opposite to the motor in the direction to press the first core member.

[0018] According to another aspect of the present invention, in the blowing apparatus structured as described above, preferably, the insect-trap sheet has, in the other end part in the winding direction, a second core member which extends in the direction

perpendicular to the winding direction, and the winder has a pair of second supports which support opposite ends of the second core member, and the insect-trap sheet is, by the driver, wound up to the first core member while being fed out from the second core member.

[0019] According to another aspect of the present invention, in the blowing apparatus structured as described above, preferably, both of the second supports are rotatably arranged with the opposite ends of the second core member locked by the second support, and there is provided a spring to bias one of the second supports in the direction to press the second core member.

[0020] According to another aspect of the present invention, in the blowing apparatus structured as described above, preferably, the motor is driven at predetermined time intervals.

[0021] According to another aspect of the present invention, in the blowing apparatus structured as described above, preferably, there is provided a trapped-insect sensor that senses the amount of trapped insects on the insect-trap sheet, and once the amount of trapped insects has reached a predetermined amount, the motor is driven.

Advantageous Effects of the Invention

[0022] According to the present invention, there is provided an insect-trap sheet which has on one side an adhesive face for catching insects, and a winder which rotatably supports one end of the insect-trap sheet to wind up the insect-trap sheet. The used insect-trap sheet with insects attached to it can be thus wound up and replaced. When the insect-trap sheet is removed for replacement, a user does not see the adhesive face to which insects are attached, and the user does not touch the adhesive face. Discomfort during replacement of the insect-trap sheet in a blowing apparatus can thus be avoided.

Brief Description of Drawings

[0023] [Fig. 1] A perspective view showing a blowing apparatus according to a first embodiment of the present invention.

[Fig. 2] A side sectional view showing the blowing apparatus according to the first embodiment of the present invention.

[Fig. 3] A cross-sectional rear view showing the blowing apparatus according to the first embodiment of the present invention.

[Fig. 4] A perspective view showing a cover member in the blowing apparatus of the first embodiment according to the present invention.

[Fig. 5] A perspective view showing a cover member in a blowing apparatus according to a second embodiment of the present invention.

[Fig. 6] A side sectional view showing an insect-trap sheet in the blowing apparatus according to the second embodiment of the present invention.

[Fig. 7] A side sectional view showing a blowing apparatus of a third embodiment according to the present invention.

Description of Embodiments

[0024] <A first embodiment>

With reference to the accompanying drawings, embodiments of the present invention will be described below. Fig. 1 and Fig. 2 are a perspective view and a side sectional view, respectively, of a blowing apparatus according to a first embodiment. Hollow arrows in Fig. 1 and Fig. 2 show the flow of air. A blowing apparatus 1 has a housing 2 that is installed, for example, on the floor in a room and that has a substantially oval horizontal cross-sectional shape. On the rear face of the housing 2, a removable cover member 3 is fitted.

[0025] At a peripheral portion of the top face of the housing 2, a sleeve 12 made of transparent resin is arranged. In a front portion of the top face of the housing 2, an operation panel 6 is provided. The operation panel 6 has a plurality of buttons (unillustrated), and a user operates it to configure the operation of the blowing apparatus 1. Operating different buttons allows, among others, the turning on/off of the driving of the blowing apparatus 1, the changing of air volume from a fan 10, and the turning on/off of an ion generation device 11, which will be described later.

[0026] On the rear face and the top face of the housing 2, an inlet port 20 and an outlet port 5 are open respectively. In a central part of the outlet port 5, there is provided a protruding plate 13, which protrudes upward. In the cover member 3, a plurality of suction ports 4 are open, and between the cover member 3 and the rear face of the housing 2, there is formed an insect-trap space 25, through which the suction port 4

and the inlet port 20 communicate with each other. The rear face of the housing 2 facing the insect-trap space 25 is made black.

[0027] Inside the housing 2, there is provided an air passage 7 through which the inlet port 20 and the outlet port 5 are connected together. Inside the air passage 7, there are arranged, from the inlet port 20 to the outlet port 5 (from upstream to downstream of airflow), a prefilter 8, a HEPA filter 9, the fan 10, and the ion generation device 11 in the order named.

[0028] The fan 10 is formed with a sirocco fan driven by a motor 10a, and sucks in air in the axial direction and discharges air in the circumferential direction. The prefilter 8 is formed by welding a mesh 8b of polypropylene onto a rectangular frame 8a of synthetic resin such as ABS having windows in a plurality of rows and of columns. The mesh 8b is formed to have a mesh size too small for insects such as mosquitoes and flies to pass through. The prefilter 8 can collect large dust in the air.

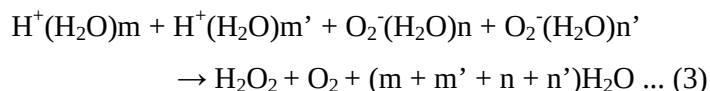
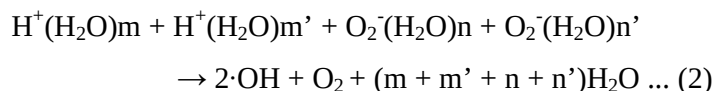
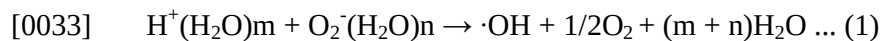
[0029] The HEPA filter 9 has a frame member 9b welded to a filter medium 9a with hot melt so as to cover the filter medium 9a. The HEPA filter 9 can collect fine dust in the air including ultrafine particulate matter such as PM 2.5 with particle diameters smaller than a predetermined particle diameter (e.g., 3 μm).

[0030] A deodorizing filter with an adsorbent such as activated carbon may be arranged between the prefilter 8 and the HEPA filter 9. This makes it possible to adsorb odor components in the air and deodorize the air.

[0031] The ion generation device 11 has an electrode (unillustrated) that generates ions when a high voltage is applied to it. The electrode faces into the air passage 7. A voltage having an alternating-current waveform or an impulse waveform is applied to the electrode. When a positive voltage is applied to the electrode, positive ions mainly containing $\text{H}^+(\text{H}_2\text{O})_m$ are generated. When a negative voltage is applied, negative ions mainly containing $\text{O}_2^-(\text{H}_2\text{O})_n$ are generated. Here m and n are integers. Ions $\text{H}^+(\text{H}_2\text{O})_m$ and $\text{O}_2^-(\text{H}_2\text{O})_n$ aggregate on the surfaces of floating bacteria and odor components in the air and surround them.

[0032] Then, according to formulae (1) to (3), through collision, the ions aggregate and generate $[\cdot\text{OH}]$ (hydroxyl radical) and H_2O_2 (hydrogen peroxide) as active species on the surfaces of microorganisms and the like, so that the floating bacteria and the like are killed. Here m' and n' are integers. In this way, the ion generation device 11 can

remove germs and odors in a room by generating positive ions and negative ions and discharging them through the outlet port 5.



[0034] When positive ions and negative ions touch the skin of a user, hydroxyl group (OH group) attaches to the skin, making the skin surface hydrophilic. With this, water molecules attach to the skin surface more easily and this allows moisturizing the skin.

[0035] Fig. 3 is a cross-sectional rear view of an upper part of the housing 2 of the blowing apparatus 1. In the upper part of the rear face of the housing 2, a projection 28 which protrudes outward (toward the cover member 3) relative to the inlet port 20 is provided. The projection 28 is formed to extend in the left-right direction, and in a middle part of the bottom face of the projection 28 in the left-right direction, a recess 28a is provided.

[0036] At left and right end parts inside the recess 28a, attracting light sources 21 are provided with their light emitting faces (unillustrated) facing obliquely downward. The attracting light sources 21 are arranged above the suction ports 4 in the cover member 3 to face an upper part of the insect-trap space 25. The attracting light sources 21 have ultraviolet light emitting diodes (unillustrated) which emit ultraviolet light of approximately 365 nm in wavelength for attracting insects such as mosquitoes.

[0037] In a middle part of the recess 28a in the left-right direction, a plate-like reflector 61 having reflective faces 61a formed on both sides is vertically arranged. The reflective faces 61a are embossed so that the light P1 emitted from the light emitting faces of the attracting light sources 21 is diffused and reflected on the reflective faces 61a. The light P2 diffused and reflected at the reflective faces 61a travels toward the suction port 4. This prevents the user from directly seeing the attracting light sources 21. The attracting light sources 21 and the reflector 61 may be arranged on the inner face of the cover member 3 instead of on the housing 2, or may be arranged on the housing 2 and on the cover member 3.

[0038] Fig. 4 is a perspective view of the cover member 3 as seen from the inside

(housing 2 side). The cover member 3 has an engaging claw (unillustrated) that engages with an engaging hole (unillustrated) provided in the housing 2. With this, the cover member 3 is removably fitted to the housing 2. The cover member 3 is curved convexly rearward, and in each of left and right end parts of it, a plurality of suction ports 4 (five of them in this embodiment) are provided one above another. The number of suction ports may be one.

[0039] On the inner face of the cover member 3, there is arranged an odor generator 70 which generates an odor substance for attracting insects. There is no particular limitation on the odor substance; lactic acid, for example, can be used. With lactic acid, insects such as mosquitoes can be attracted to the insect-trap space 25 with ease. The odor generator 70 can be arranged anywhere, else than on the inner face of the cover member 3, inside the insect-trap space 25; it can be arranged on the rear face of the housing 2.

[0040] In the insect-trap space 25, an insect-trap sheet 51 that is fitted to the inner face of the cover member 3 is arranged. The insect-trap sheet 51 is colored black, and has an adhesive face 51c on the side facing the housing 2. The adhesive face 51c has acrylic-based or other adhesive (unillustrated).

[0041] The insect-trap sheet 51 has, at one end, a cylindrical core member 41 (a first core member) which extends in the left-right direction. At each of opposite end faces of the core member 41, there is arranged a groove (unillustrated) formed by cutting off part of the core member 41 in the axial direction.

[0042] In an upper part of the cover member 3, there is arranged a winder 40 which supports the core member 41 and winds up the insect-trap sheet 51 in the winding direction A1. The winder 40 has a pair of supports 45 (first supports) which are rotatably arranged on the cover member 3. Each of the supports 45 is fitted in the core member 41, and has a projection (unillustrated) which fits in the groove in the core member 41. With this, the supports 45 lock and support the opposite ends of the core member 41 which extends in the direction perpendicular to the winding direction A1.

[0043] One of the supports 45 that is arranged on the right in Fig. 4 is coupled to a handle 43 (driver). The handle 43 is, through an opening 3a, arranged outside the cover member 3. The other of the supports 45 that is arranged on the left in Fig. 4 is, with a spring 47 fitted to a rib 57 provided on the cover member 3, biased in the direction to

press the core member 41.

[0044] With this, as the core member 41 is driven to rotate by the handle 43, the winder 40 can wind up the insect-trap sheet 51 with the adhesive face 51c in. A regulation member which permits the handle 43 to rotate only in one direction may be provided. This prevents the insect-trap sheet 51 from being wound up with the adhesive face 51c out.

[0045] In an end part (lower end part in Fig. 4) of the insect-trap sheet 51 opposite from the core member 41, a pair of left and right holes 51a is provided. The holes 51a are formed in an L shape. On the cover member 3, there is formed a pair of left and right locks 56 which protrudes toward the housing 2 and locks the insect-trap sheet 51 by being inserted in the holes 51a. The locks 56 are formed in an L shape like the holes 51a. This allows the insect-trap sheet 51 to stay upright. The locks 56 and the holes 51a may be formed in any matching shape other than an L shape, such as a rectangular or other shape.

[0046] At a lower end of the insect-trap sheet 51, there are provided slits 51b which extend in the up-down direction. The slits 51b are continuous with the lower end of the holes 51a. The sides of the holes 51a opposite to the winding direction A1 are thus released. With this, when the handle 43 is turned, the insect-trap sheet 51 disengages from the locks 56 through the slits 51b, and the insect-trap sheet 51 can thus be wound up to the core member 41.

[0047] In the blowing apparatus 1 structured as described above, when the operation panel 6 is so operated as to instruct the blowing apparatus 1 to run, the fan 10 is driven and the attracting light sources 21 are turned on. The fan 10 is driven to allow the air in a room to flow into the insect-trap space 25 through the suction ports 4. The light emitted from the attracting light sources 21 diffuses and reflects on the reflective face 61a toward the suction ports 4. This allows insects to be attracted to the insect-trap space 25 through the suction ports 4. This also prevents the user from directly seeing the attracting light sources 21, reducing the influence of ultraviolet light from the attracting light sources 21 on the user's health.

[0048] Insects such as mosquitoes are known to like the black color. The rear face (region facing the insect-trap space 25) of the housing 2 is made black, and thus insects attracted to near the cover member 3 can be easily attracted to the insect-trap space 25

through the suction port 4. The insect-trap sheet 51 is also made black, and thus insects having entered the insect-trap space 25 are easily attracted to the insect-trap sheet 51 and captured on the adhesive face 51c.

[0049] The insect-trap sheet 51 is arranged facing the prefilter 8, inside the cover member 3. When insects having entered the insect-trap space 25 through the suction port 4 are carried toward the inlet port 20 by a suction airflow, insects are trapped by the insect-trap sheet 51 opposite the inlet port 20. This helps make the prefilter 8 less prone to be clogged with insects. This also helps make the insect-trap sheet 51 less prone to be soiled with dust in the suction air flow.

[0050] The air having flowed into the insect-trap space 25 flows into the air passage 7 through the inlet port 20 in the housing 2. Here, the prefilter 8 collects large dust in the air. The HEPA filter 9 collects fine dust in the air including PM 2.5. The air circulating inside the air passage 7 on an air-discharging side in the fan 10 includes ions generated by the ion generation device 11. The air having dust removed and including ions is discharged through the outlet port 5. The air in the room is thus cleaned.

[0051] As the handle 43 is turned, the insect-trap sheet 51 to which insects have attached on its adhesive face 51c through the use of the blowing apparatus 1 disengages from the lock 56, and is wound up to the core member 41. When the insect-trap sheet 51 has been wound up completely, the cover member 3 is removed from the housing 2, and by pressing the core member 41 against the biasing force of the spring 47, the core member 41 is removed.

[0052] The user thus does not see the adhesive face 51c of the used insect-trap sheet 51 and the user does not touch the adhesive face 51c. The core member 41 of a new insect-trap sheet 51 is fitted to the supports 45, the insect-trap sheet 51 is stretched out from the core member 41, and the lower end of the insect-trap sheet 51 is locked with the locks 56. The insect-trap sheet 51 is thus replaced, and the cover member 3 is attached.

[0053] In this embodiment, there are provided the insect-trap sheet 51 which has on one side the adhesive face 51c for catching insects, and the winder 40 which rotatably supports one end of the insect-trap sheet 51 to wind up the insect-trap sheet 51. The used insect-trap sheet 51 with insects attached to it can thus be wound up and replaced.

When the insect-trap sheet 51 is removed for replacement, the user does not see the adhesive face 51c to which insects are attached, and the user does not touch the adhesive face 51c. Discomfort during the changing of the insect-trap sheet 51 in the blowing apparatus 1 can thus be avoided.

[0054] The insect-trap sheet 51 has, on one end in the winding direction A1, the core member 41 (first core member) which extends in the direction perpendicular to the winding direction A1. The winder 40 provided on the cover member 3 has a pair of supports 45 for supporting the opposite ends of the core member 41, with at least one of them rotatably arranged, and a handle 43 (driver) for rotating one of the supports 45. The winder 40 for winding up the insect-trap sheet 51 by turning the handle 43 can thus be built easily.

[0055] The handle 43 provided integrally with one of the supports 45 is arranged outside the cover member 3, so the insect-trap sheet 51 can be wound up without removing the cover member 3. When the insect-trap sheet 51 is wound up, the user thus does not see the adhesive face 51c, which further reduces discomfort during the changing of the insect-trap sheet 51.

[0056] The insect-trap sheet 51 has the holes 51a in the end part of the side opposite to the core member 41, and the sides of the holes 51a opposite to the winding direction A1 are open, with the slits 51b formed there. On the cover member 3, there are provided the locks 56 inserted in the holes 51a to lock the insect-trap sheet 51. The locking by the locks 56 allows the insect-trap sheet 51 to stay upright, and permits the winder 40 to easily wind up the insect-trap sheet 51.

[0057] The holes 51a and the locks 56 may be omitted and the insect-trap sheet 51 may be hung down inside the insect-trap space 25. In this case, to prevent the insect-trap sheet 51 from blocking the inlet port 20 due to the suction airflow, it is preferable to provide a rib that protrudes from the rear face of the housing 2 and touches the insect-trap sheet 51.

[0058] A pair of supports 45 are both rotatably arranged and the opposite ends of the core member 41 are locked by the supports 45. The support 45 on the side opposite to the handle 43 is biased with the spring 47 in the direction to press the core member 41. Thus, the core member 41 can be rotated easily and the insect-trap sheet 51 can be attached and detached easily.

[0059] The support 45 (left support in Fig. 4) on the side opposite to the handle 43 may be arranged so as not to be rotatable. In this case, the core member 41 slides on the support 45 on the left and rotates integrally with the support 45 on the right.

[0060] <A second embodiment>

Next, a second embodiment of the present invention will be described. Figs. 5 and 6 are a perspective view of a cover member 3 and a longitudinal sectional view of an insect-trap sheet 51, respectively, in a blowing apparatus 1 according to the second embodiment. For convenience of explanation, portions similar to those in the first embodiment are assigned the same reference signs as in Fig. 1 to Fig. 4 referred to above. In this embodiment, the structures of a winder 40 and an insect-trap sheet 51 are different from those in the first embodiment, and a trapped-insect sensor (unillustrated) is provided. Other parts are similar to those in the first embodiment.

[0061] The insect-trap sheet 51 has, at its opposite ends in its winding direction A1, a core member 41 (first core member) and a core member 42 (second core member) which extend in the left-right direction and are in a cylindrical shape. The insect-trap sheet 51 is, in an unused state, wound on the core member 42. In opposite end faces of the core member 41 and the core member 42, there are arranged grooves (unillustrated) formed by cutting off parts of the core members 41 and 42 in the axial direction.

[0062] The winder 40 has a pair of supports 45 (first supports) that support the core member 41, and a pair of supports 46 (second supports) that support the core member 42. The supports 45 are both rotatably arranged on an upper part of the cover member 3, and the supports 46 are both rotatably arranged on a lower part of the cover member 3.

[0063] The supports 45 are both fitted in the core member 41, and have projections (unillustrated) which fit in the grooves in the core member 41. With this, the supports 45 lock and support the opposite ends of the core member 41 that extends in the direction perpendicular to the winding direction A1. Similarly, the supports 46 are both fitted in the core member 42, and have projections (unillustrated) which fit in the grooves in the core member 42. With this, the supports 46 lock and support the opposite ends of the core member 42 which extends in the direction perpendicular to the winding direction A1.

[0064] The support 45 arranged on the left in Fig. 5 is, with a spring 47 fitted to a rib 57

provided on the cover member 3, biased in the direction to press the core member 41. The support 45 arranged on the right in Fig. 5 is coupled with a motor 44 (driver) arranged on a housing 2.

[0065] To the support 45 arranged on the right in Fig. 5, a gear 48a (first bevel gear) comprising a bevel gear is fitted. A gear 48b (second bevel gear) comprising a bevel gear pivoted, with its axial direction aligned with the front-back direction, on the cover member 3 meshes with the gear 48a. A shaft 49 that forms the rotary axis of the motor 44 extends in the front-back direction, and on the circumferential face of the tip end of the shaft 49, a flat face is formed. In the gear 48b, there is provided a locking hole 48c in which the tip end of the shaft 49 fits to stop the rotation with its flat face. By fitting the cover member 3 to the housing 2, the shaft 49 fits in the locking hole 48c and is locked, and the rotation of the motor 44 is transmitted to one of the supports 45 through the gears 48a and 48b.

[0066] In the housing 2, there is provided the trapped-insect sensor (unillustrated), which senses the amount of insects trapped. The trapped-insect sensor, for example, projects light to the insect-trap sheet 51 to monitor the quantity of reflected or transmitted light, and senses the amount of trapped insects based on the decrease in the light quantity due to the attachment of insects.

[0067] Once the insect-trap sheet 51 has reached a predetermined insect-trap amount, the motor 44 is driven. With this, the insect-trap sheet 51 is wound to the core member 41 while being fed out from the core member 42. In this way, as in the first embodiment, the used insect-trap sheet 51 with insects attached to it can be wound up to be replaced. It is also possible to drive the motor 44 every predetermined period (e.g., every two weeks) instead of providing the trapped-insect sensor.

[0068] According to this embodiment, the same effect as in the first embodiment can be obtained. One of the supports 45 is driven to rotate by the motor 44, so a winder 40 to wind up the insect-trap sheet 51 can be built easily.

[0069] The insect-trap sheet 51 has, at its opposite ends in the winding direction A1, the core member 41 (first core member) and the core member 42 (second core member) which extend in the direction perpendicular to the winding direction A1. The insect-trap sheet 51 is also provided with a pair of supports 46 (the second supports) which support the opposite ends of the core member 42. As the motor 44 is driven, the

insect-trap sheet 51 is wound to the core member 41 while being fed out from the core member 42. With this, once insects are attached to an adhesive face 51c of the insect-trap sheet 51, an adhesive face 51c to which insects are not attached is exposed to maintain the insect-trapping ability, allowing the use of the insect-trap sheet 51 for a long period. This reduces the replacement frequency of the insect-trap sheet 51 and improves the user-friendliness of the blowing apparatus 1.

[0070] A pair of supports 46 are both rotatably arranged and the opposite ends of the core member 42 are locked by the supports 46. One of the supports 46 is biased with the spring 47 in the direction to press the core member 42. Thus, the core member 42 can thus be rotated easily and the insect-trap sheet 51 can be attached and detached easily.

[0071] One or both of the supports 46 may be arranged so as not to rotate. In this case, the core member 42 rotates while sliding on the supports 46 which do not rotate.

[0072] The motor 44 is driven at predetermined time intervals, so the insect-trap sheet 51 is automatically wound up. This helps easily maintain the insect-trapping ability of the insect-trap sheet 51.

[0073] There is provided the trapped-insect sensor that senses the amount of trapped insects on the insect-trap sheet 51, and once the amount of trapped insects has reached a predetermined amount, the motor 44 is driven. In this way, when the amount of insects attached on the adhesive face 51c is small, the insect-trap sheet 51 is not wound up, and the insect-trap sheet 51 is prevented from being wasted.

[0074] The motor 44 is arranged in the housing 2, and the supports 45, the gear 48a (first bevel gear), and the gear 48b (second bevel gear) are arranged in the cover member 3. The locking hole 48c in which the shaft 49 of the motor 44 fits to be locked is provided on the gear 48b. With this, the motor 44 to which electrical wiring is connected is arranged in the housing 2, and the supports 45 arranged on the removable cover member 3 and the motor 44 arranged in the housing 2 can be coupled together easily.

[0075] In this embodiment, as in the first embodiment, the core member 42 of the insect-trap sheet 51 may be omitted, and the holes 51a in the insect-trap sheet 51 and the locks 56 on the cover member 3 may be provided. With this, the winding with the motor 44 is done only once, but the same effect as in the first embodiment can be obtained. It is also possible to provide the handle 43 in the first embodiment instead of

the motor 44.

[0076] It is also possible to arrange the motor 44 and the supports 45 below and the supports 46 above. Then, the weight of the motor 44 helps install the blowing apparatus 1 stably.

[0077] It is also possible to provide the operation panel 6 with a button for driving the motor 44 and to wind up the insect-trap sheet 51 through operation of the button by a user.

[0078] <A third embodiment>

Next, a third embodiment of the present invention will be described. Fig. 7 is a side sectional view of a blowing apparatus 1 according to a third embodiment. For convenience of explanation, portions similar to those in the first embodiment are assigned the same reference signs as in Fig. 1 to Fig. 4 referred to above. In this embodiment, the installation location of a winder 40 is different from that in the first embodiment. Other portions are similar to those in the first embodiment.

[0079] The winder 40 is provided in a housing 2, and has a pair of supports 45 which is rotatably arranged while supporting the opposite ends of a core member 41. Locks 56 that are inserted in holes 51a in an insect-trap sheet 51 are provided so as to protrude toward the rear face side of the housing 2 and lock the insect-trap sheet 51. With this, the same effect as in the first embodiment can be obtained.

[0080] The holes 51a and the locks 56 may be omitted and the insect-trap sheet 51 may be hung down inside the insect-trap space 25. In this case, to prevent the insect-trap sheet 51 from blocking the inlet port 20 due to the suction airflow, it is preferable to provide a rib that protrudes from the rear face of the housing 2 and touches the insect-trap sheet 51.

Industrial Applicability

[0081] The present invention is applicable to blowing apparatuses provided with an insect-trap sheet for catching insects.

List of Reference Signs

[0082]	1	blowing apparatus
	2	housing

3	cover member
3a	opening
4	suction port
5	outlet port
6	operation panel
7	air passage
8	prefilter
9	HEPA filter
9a	filter medium
9b	frame member
10	fan
10a	motor
10b	impeller
11	ion generation device
12	sleeve
13	protruding plate
20	inlet port
21	attracting light source
28	projection
28a	recess
31	rib
32	sash bar
40	winder
41	core member (first core member)
42	core member (second core member)
43	handle (driver)
44	motor (driver)
45	support (first support)
46	support (second support)
47	spring
48a	gear (first bevel gear)
48b	gear (second bevel gear)

48c	locking hole
49	shaft
51	insect-trap sheet
51a	hole
51b	slit
51c	adhesive face
52	base sheet
54	cut
55	mounting plate
55a	engaging hole
55b	support
56	lock
57	rib
60	spray
61	reflector
61a	reflective face
A1	winding direction

CLAIMS

- [Claim 1] A blowing apparatus comprising:
a housing in which an inlet port and an outlet port for air are open and which houses a fan;
a cover member which is removably fitted to the housing to cover the inlet port and in which a suction port for air is open;
an insect-trap sheet which is removably fitted in a space between the housing and the cover member and which has an adhesive face on one side for catching insects; and
a winder which is provided on the housing or the cover member and which rotatably supports one end of the insect-trap sheet to wind up the insect-trap sheet.
- [Claim 2] The blowing apparatus according to claim 1, wherein
the insect-trap sheet includes, in one end part thereof in a winding direction, a first core member extending in a direction perpendicular to the winding direction, and
the winder includes:
a pair of first supports which supports opposite ends of the first core member, at least one of the supports being rotatably arranged, and
a driver for rotating the one of the first supports.
- [Claim 3] A blowing apparatus according to claim 2, wherein
the driver includes a handle provided integrally with the one of the first supports, and
the handle is arranged outside the cover member.
- [Claim 4] The blowing apparatus according to claim 2, wherein
the driver includes a motor coupled with the one of the first supports.
- [Claim 5] The blowing apparatus according to claim 4, wherein
the motor is arranged on the housing,
the first supports are arranged on the cover member, and
the blowing apparatus further comprises:
a shaft which protrudes from the housing and which rotates when the

motor is driven;

a first bevel gear provided on the first support; and

a second bevel gear arranged on the cover member and having a locking hole in which the shaft is fitted to be locked, the second bevel gear meshing with the first bevel gear.

[Claim 6] The blowing apparatus according to any one of claims 2 to 5, wherein the insect-trap sheet has a hole in an end part opposite to the first core member, a lock for locking the insect-trap sheet by being inserted in the hole is provided, and
a side of the hole opposite to the winding direction is open.

[Claim 7] The blowing apparatus according to any one of claims 2 to 5, wherein the insect-trap sheet has, in another end part in the winding direction, a second core member which extends in the direction perpendicular to the winding direction, the winder has a pair of second supports which support opposite ends of the second core member, and
the insect-trap sheet is, by the driver, wound up to the first core member while being fed out from the first core member.