Claims

1. A one-touch fitting device for a fan, into which is inserted a fan motor shaft that rotates the fan, and that can freely be mounted to or unmounted from the motor shaft, so as to connect the fan to, or disconnect the fan from, the motor shaft, with said device comprising:

a base that is fixed to the inside of a housing that is fixed to the fan, and that includes a motor-shaft-inserting hole into which the fan motor shaft is inserted;

an operating member that is movably mounted to the base and that has a guide portion and an operating portion;

an engaging part on which is formed an engagement portion that is able to engage with an engagement-target portion that is on the outer peripheral surface of the fan motor shaft, with the engaging part being provided to the base such that the engaging part sandwiches the guide portion so that the engaging part is able to move back and forth in the direction of the motor shaft;

a return spring that returns the operating member that has been moved by the operating portion to its original position;

an engaging mechanism that is provided at the position of the engaging part that sandwiches the guide portion and at the position of the guide portion corresponding to the position of the engaging part,

with the engaging mechanism causing the engaging part to move back and forth in the direction of the motor shaft

due to the contacting and moving away from each other of the engaging mechanism caused by the move of the guide portion;

wherein, due to the contacting and moving away from each other of the engaging mechanism, the engaging part moves forward and backward along the motor shaft, whereby the engagement portion of the engaging part engages with and disengages from the engagement-target portion of the motor shaft.

2. A one-touch fitting device for a fan according to Claim 1,

wherein the engaging mechanism is formed of

an inside-diameter-changing portion in which the inside diameter of the guide portion is changed in the direction in which the guide portion moves;

a supporting projecting portion that is formed on the external surface of the guide portion;

a first engaging projecting portion that is provided to one side of the engaging part, which sandwiches the guide portion, and that is able to contact the inside-diameter-changing portion; and

a second engaging projecting portion that is provided to the other side of the engaging part,

which sandwiches the guide portion, and that is able to contact the supporting projecting portion.

3. A one-touch fitting device for a fan according to either Claim 1 or Claim 2,
wherein the engaging part advances into the motor-shaft-inserting hole so as to engage with the engagement-target portion of the motor shaft,
and a holding mechanism is provided to the base, in which the holding mechanism prevents the engaging part from advancing into the motor-shaft-inserting hole, and
by inserting the motor shaft into the motor-shaft-inserting hole, allows the engaging part to advance.

4. A one-touch fitting device for a fan according to any of the preceding claims,
wherein the guide portion of the operating member is rotatable or linearly movable relative to the base.

5. A one-touch fitting device for a fan according to any of the preceding claims,
wherein the engaging part is formed by
an operating piece that contacts the guide portion while sandwiching the guide portion, and by an lock piece having an engagement portion that is able to engage with the engagement-target portion of the motor shaft, and in which the operating piece and lock piece contact each other via their respective surfaces, which are tapered and incline in the direction of preventing the lock piece from coming off the motor shaft.

6. A one-touch fitting device for a fan according to any of the preceding claims,
wherein the engaging part is provided to at least one of the two sides that sandwich the motor-shaft-inserting hole.

7. A one-touch fitting device for a fan according to any of the preceding claims,
wherein the engagement portion of the engaging part and the engagement-target portion of the motor shaft are threaded portions that engage with each other.

8. A one-touch fitting device for a fan according to Claim 7,
wherein the lock piece is provided to the base via an elastic body that allows the lock piece to move toward the motor shaft so as to cause the threaded portion of the lock piece to engage with the threaded portion of the motor shaft.

CLAIMS

1. A one-touch fitting device for a fan, into which is inserted a fan motor shaft that rotates the fan, and that can freely be mounted to or unmounted from the motor shaft, so as to connect the fan to, or disconnect the fan from, the motor shaft, with said device comprising:

a base that is fixed to the inside of a housing that is fixed to the fan, and that includes a motor-shaft-inserting hole into which the fan motor shaft is inserted;

an operating member that is movably mounted to the base and that has a guide portion and an operating portion;

an engaging part on which is formed an engagement portion that is able to engage with an engagement-target portion that is on the outer peripheral surface of the fan motor shaft, with the engaging part being provided to the base such that the engaging part sandwiches the guide portion so that the engaging part is able to move back and forth in the direction of the motor shaft;

a return spring that returns the operating member that has been moved by the operating portion to its original position;

an engaging mechanism that is provided at the position of the engaging part that sandwiches the guide portion and at the position of the guide portion corresponding to the position of the engaging part,

with the engaging mechanism causing the engaging part to move back and forth in the direction of the motor shaft

due to the contacting and moving away from each other of the engaging mechanism caused by the move of the guide portion;

wherein, due to the contacting and moving away from each other of the engaging mechanism, the engaging part moves forward and backward along the motor shaft, whereby the engagement portion of the engaging part engages with and disengages from the engagement-target portion of the motor shaft.

2. A one-touch fitting device for a fan according to Claim 1,
wherein the engaging mechanism is formed of
an inside-diameter-changing portion in which the inside diameter of the guide portion is changed in the direction in which the guide portion moves;
a supporting projecting portion that is formed on the external surface of the guide portion;
a first engaging projecting portion that is provided to one side of the engaging part, which sandwiches the guide portion, and that is able to contact the inside-diameter-changing portion; and
a second engaging projecting portion that is provided to the other side of the engaging part, which sandwiches the guide portion, and that is able to contact the supporting projecting portion.

3. A one-touch fitting device for a fan according to either Claim 1 or Claim 2,
wherein the engaging part advances into the motor-shaft-inserting hole so as to engage with the engagement-target portion of the motor shaft,
and a holding mechanism is provided to the base, in which the holding mechanism prevents the engaging part from advancing into the motor-shaft-inserting hole, and by inserting the motor shaft into the motor-shaft-inserting hole, allows the engaging part to advance.

4. A one-touch fitting device for a fan according to any of the Claims 1 to Claim 3,
wherein the guide portion of the operating member is rotatable or linearly movable relative to the base.

5. A one-touch fitting device for a fan according to any of the Claims 1 to Claim 4,
wherein the engaging part is formed by

an operating piece that contacts the guide portion while sandwiching the guide portion, and by an lock piece having an engagement portion that is able to engage with the engagement-target portion of the motor shaft, and in which the operating piece and lock piece contact each other via their respective surfaces, which are tapered and incline in the direction of preventing the lock piece from coming off the motor shaft.

6. A one-touch fitting device for a fan according to Claim 5,
wherein the lock piece is provided to the base via an elastic body that allows the lock piece to move toward the motor shaft so as to cause the engagement portion of the lock piece to engage with the engagement-target portion of the motor shaft.

7. A one-touch fitting device for a fan according to any of the Claims 1 to Claim 6,
wherein the engaging part is provided to at least one of the two sides that sandwich the motor-shaft-inserting hole.

8. A one-touch fitting device for a fan according to any of the Claims 1 to Claim 7,
wherein the engagement portion of the engaging part and the engagement-target portion of the motor shaft are threaded portions that engage with each other.