A casing apparatus for an air pump has a body and a cap. The body has a housing and a combined portion. The housing is composed of a first semi-housing and a second semi-housing. The combined portion is axially formed on and is protruded from a front end of the housing. The cap is rotatably connected with the body and has an inwall a rotating connector. The rotating connector protrudes from the inwall and rotatably engages with the combined portion of the body. The cap is mounted on the front end of the housing and combines the first semi-housing with the second semi-housing without any separate securing device such as screws. To form screw holes in the housing is unnecessary. Therefore, the casing apparatus is easy to install and has a low cost.
FIG. 2
CASING APPARATUS FOR AN AIR PUMP

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The invention relates to a casing apparatus for an air pump, and more particularly to a casing apparatus for an air pump to reduce noise and provide ease in assembly.

[0003] 2. Description of Related Art

[0004] An air pump for inflating tires or airbeds generally comprises a casing apparatus and a driving assembly mounted in the casing apparatus. The casing apparatus has a first semi-housing, a second semi-housing and multiple screws. The first semi-housing has multiple screw holes. The second semi-housing is combined with the first semi-housing and has multiple through holes. Each through hole of the second semi-housing aligns with one of the first screw holes of the first semi-housing. Each screw is mounted through one of the through holes and screwed into one of the first screw holes to fixedly combine the first semi-housing with the second semi-housing. The conventional casing apparatus has the following disadvantages:

[0005] 1. The first semi-housing is combined with the second semi-housing with screws, but the screws are easily loosened due to the vibration of the casing apparatus generated during the operation of driving assembly. Consequently, the screws clash against the first semi-housing and the second semi-housing and then cause a noise.

[0006] 2. The first semi-housing and the second semi-housing have to be formed with screw holes and to be combined by the screws, so the casing apparatus is complex in manufacture, inconvenient in assembly, and has a high cost.

[0007] To overcome the shortcomings, the present invention provides a casing apparatus for an air pump to obviate the aforementioned problems.

SUMMARY OF THE INVENTION

[0008] An objective of the invention is to provide a casing apparatus for an air pump being easy to assemble, having a low cost and secure engagement among the components.

[0009] The casing apparatus for an air pump has a body and a cap. The body has a housing, a sleeve portion and a combined portion. The housing is composed of a first semi-housing and a second semi-housing and has a chamber defined between the first semi-housing and the second semi-housing. The sleeve portion is axially formed on and is protruded from a front end of the housing and has an air outlet. The air outlet is defined through the sleeve portion and in communication with the chamber. The combined portion is axially formed on and is protruded from a front end of the sleeve portion. The cap is rotatably connected with the body and has a rear end, an inwall, a chamber, an opening and a rotating connector. The chamber is formed in the rear end of the cap and is enclosed by the inwall. The rotating connector protrudes from the inwall at the rear end of the cap and rotatably engages the combined portion of the body.

[0010] The casing apparatus for an air pump as described has the following advantages:

[0011] 1. The cap is rotatably mounted on the front end of the housing and is combined the first semi-housing with the second semi-housing without a screw. Thus, the noise problem of the screw of the prior art is prevented.

[0012] 2. The structures of the housing and the cap are simple and the casing apparatus for an air pump is convenient in assembly. To form screw holes in the housing is unnecessary, and the casing apparatus for an air pump has a low cost. Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. 1 is a perspective view of a casing apparatus for an air pump in accordance with the present invention;

[0015] FIG. 2 is an exploded perspective view of the casing apparatus for an air pump in FIG. 1;

[0016] FIG. 3 is another exploded perspective view of the casing apparatus for an air pump in FIG. 1;

[0017] FIG. 4 is a cross sectional side view of the casing apparatus for an air pump in FIG. 1;

[0018] FIG. 5 is an enlarged cross sectional side view of the casing apparatus for an air pump in FIG. 1; and

[0019] FIG. 6 is an operational cross sectional top view of the casing apparatus for an air pump in FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0020] With reference to FIGS. 1 to 4, a casing apparatus for an air pump in accordance with the present invention comprises a body 10 and a cap 20.

[0021] With reference to FIGS. 1 and 2, the body 10 has a housing, a sleeve portion 14 and a combined portion 15. The housing is composed of a first semi-housing 11 and a second semi-housing 12. A chamber 13 is defined between the first semi-housing 11 and the second semi-housing 12. A driving assembly is mounted on the casing apparatus and protrudes into the chamber 13 of the housing. The sleeve portion 14 is a hollow cylinder and is formed on and axially protrudes from a front end of the housing. The sleeve portion 14 has an air outlet 141 defined through the sleeve portion 14 and in communication with the chamber. The combined portion 15 is axially formed on and protrudes from a front end of the sleeve portion 14. The combined portion 15 has an outer surface, multiple engaging blocks 151, multiple engaging recesses 153 and multiple notches 152. The engaging blocks 151 are spacedly mounted on the outer surface and have an arm being connected to the front end of the sleeve portion 14. Each engaging recess 153 is defined between one of the engaging blocks 151 and the front end of the sleeve portion 14. The notches 152 are formed on an outer surface of the combined portion 15. Each notch 152 is adjacent to one of the engaging blocks 151 and in communication with one of the engaging recesses 153.

[0022] With reference to FIGS. 3 and 4, the first semi-housing 11 has a bottom, a connecting hole 111 and a through hole 112. The connecting hole 111 and the through hole 112 are defined through the bottom of the first semi-housing 11 and in communication with the chamber 13. A motor is installed into the connecting hole 111 of the first semi-housing 11. A cam is installed into the through hole 112. With further reference to FIGS. 4 and 5, the body 10 has a connecting portion 113 and two keys 121. The connecting portion 113 is mounted on a rear end of the first semi-housing 11 and has two keyways 114. The keys 121 are mounted on and protrude from a rear end of the second semi-housing 12 and are respectively inserted into the keyways 114 of the connecting portion 113.
With reference to FIGS. 1 and 2, the cap 20 is rotatably connected with the combined portion 15 of the body 10 and has a front end, a rear end, a rear surface, an outlet tube 21, a column 22, an inwall, a chamber 201 and a rotating connector 23. The outlet tube 21 is mounted on the front end of the cap 20. The column 22 is hollow and is mounted on and protrudes from the rear surface of the cap 20. The column 22 is inserted into the air outlet 141 of the sleeve portion 14. The inwall is formed on the interior surface of the cap and faces an outer surface of the column 22. The chamber 201 is enclosed by the interior surface of the cap 20 and in communication with the outlet tube 21. The chamber 201 is defined between the inwall and the column 22. The rotating connector 23 is protruded from the inwall at the rear end of the cap 20 and rotatably engages the combined portion 15 of the body 10. The rotating connector 23 has multiple engaging protrusions 24 protruding from the inwall at the rear end of the cap 20. Then, the engaging protrusions 24 are slipped into the engaging recesses 153 of the combined portion 15 respectively and are engaged the engaging blocks 151 of the combined portion 150 respectively when the cap 20 is rotated relative to the body 10.

With reference to FIGS. 2 and 5, the cap 20 is combined with the first semi-housing 11 and the second semi-housing 12, and the keys on the first semi-housing 11 are engaged the keyways 114. Thus, the combination of the first semi-housing 11 and the second semi-housing 12 is steady.

With reference to FIG. 6, to combine the body 10 and the cap 20, the column 22 of the cap 20 is inserted into the air outlet 141 of the body 10 and the cap 20 is rotated. Consequently, the engaging protrusions 24 pass the notches 152 of the combined portion 15 respectively and are slipped into the engaging recesses 153 of the combined portion 15 respectively to make the engaging protrusions 24 engage the engaging blocks 151 of the combined portion 15. Thus, the cap 20 is securely installed on the combined portion 15 of the body 10.

The cap 20 is installed on and is buckled with the combined portion 15 of the body 10, so the cap 20 is rotatably mounted on the front end of the housing and is combined the first semi-housing 11 with the second semi-housing 12 without the need for any separate securing means such as a screw. Thus, the noise problem of the screw of the prior art is prevented. Furthermore, the structures of the body 10 and the cap 20 are simple and the casing apparatus for an air pump is convenient in assembly. To form screw holes in the body 10 is unnecessary, and the casing apparatus for an air pump has a low cost.

Alternatively, the body 10 and the cap 20 can be formed with threads to combine each other.

Even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only. Changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A casing apparatus for an air pump comprising:
   a body having:
   a housing being composed of a first semi-housing and a second semi-housing and having a chamber defined between the first semi-housing and the second semi-housing;
   a sleeve portion axially formed on and protruded from a front end of the housing and having an air outlet defined through the sleeve portion and in communication with the chamber; and
   a combined portion axially formed on and protruded from a front end of the sleeve portion; and
   a cap rotatably connected with the body and having a rear end;
   an inwall;
   a chamber formed in the rear end of the cap and enclosed by the inwall; and
   a rotating connector protruding from the inwall at the rear end of the cap and rotatably engaged the combined portion of the body.

2. The casing apparatus for an air pump as claimed in claim 1, wherein the combined portion has:
   an outer surface;
   multiple engaging blocks spacedly mounted on the outer surface and each engaging block having an arm connected to the front end of the sleeve portion;
   multiple engaging recesses defined between each engaging block and the front end of the sleeve portion respectively; and
   multiple notches formed on the engaging blocks respectively and in communication with the engaging recesses respectively; and
   the rotating connector has multiple engaging protrusions and the engaging protrusions slipped into the engaging recesses of the combined portion respectively and engaged the engaging blocks of the combined portion respectively.

3. The casing apparatus for an air pump as claimed in claim 2, wherein the cap has a column, and the column is hollow and is mounted on a rear surface of the cap and is inserted into the air outlet of the sleeve portion.

4. The casing apparatus for an air pump as claimed in claim 3, wherein the body has:
   a connecting portion mounted on the rear end of the first semi-housing and having a keyway; and
   a key mounted on and protruded from the rear end of the second semi-housing and inserted into the keyway of the connecting portion.

5. The casing apparatus for an air pump as claimed in claim 1, wherein the body has:
   a connecting portion mounted on the rear end of the first semi-housing and having multiple keyways; and
   multiple keys mounted on and protruded from the rear end of the second semi-housing and respectively inserted into the keyways of the connecting portion.

6. The casing apparatus for an air pump as claimed in claim 2, wherein the body has:
   a connecting portion mounted on the rear end of the first semi-housing and having multiple keyways; and
   multiple keys mounted on and protruded from the rear end of the second semi-housing and respectively inserted into the keyways of the connecting portion.
7. The casing apparatus for an air pump as claimed in claim 3, wherein the body has:
   a connecting portion mounted on the rear end of the first semi-housing and having multiple keyways; and
   multiple keys mounted on and protruded from the rear end of the second semi-housing and respectively inserted into the keyways of the connecting portion.

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