

The present invention provides a cyclonic separating apparatus comprising: a cyclone body including a cyclone chamber and a dust-collecting chamber; a cover unit connected to an upper portion of the cyclone body; an openable door unit mounted to a lower portion of the cyclone body; and a plurality of noise-reducing ribs formed in an air discharge pipe of the cyclone chamber, the noise-reducing ribs being provided at predetermined intervals on the inner wall of the air discharge pipe; wherein each noise-reducing rib has a width substantially 0.1 to 0.4 times as large as the inner diameter of the air discharge pipe; wherein each noise-reducing rib protrudes from an inner wall of the air discharge pipe towards the centre thereof, and comprises a curved portion and a straight portion.

10 Preferably, the curved portion of each noise-reducing rib is disposed at an inlet of the air discharge pipe, and the straight portion thereof is disposed at an outlet of the air discharge pipe. The curved portion of each noise-reducing rib may include a free end, the free end being rounded to avoid accumulation of dust.

15 The invention also provides a vacuum cleaner comprising: a cleaner body having a drive motor; a nozzle unit connected to the cleaner body to draw in dust from a surface to be cleaned; and a cyclonic separating apparatus detachably mounted to the cleaner body to separate the dust from dust-carrying air drawn in through the nozzle unit; wherein the cyclonic separating apparatus comprises a cyclone body including a cyclone chamber and a dust-collecting chamber, a cover unit connected to an upper portion of the cyclone body, an openable door unit mounted to a lower portion of the cyclone body, and a plurality of noise-reducing ribs formed in an air discharge pipe of the cyclone chamber, the noise-reducing ribs being provided at predetermined intervals on the inner wall of the air discharge pipe; wherein each noise-reducing rib has a width substantially 0.1 to 0.4 times as large as the inner

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diameter of the air discharge pipe; wherein each noise-reducing rib protrudes from an inner wall of the air discharge pipe towards the centre thereof, and comprises a curved portion and a straight portion.

- 5 The invention will now be described in greater detail, by way of example, with reference to the drawings, in which:

Figure 1 is a schematic perspective view showing a vacuum cleaner having a cyclonic separating apparatus constructed according to the invention;

Claims

1. A cyclonic separating apparatus comprising:
 - a cyclone body including a cyclone chamber and a dust-collecting chamber;
 - 5 a cover unit connected to an upper portion of the cyclone body;
 - an openable door unit mounted to a lower portion of the cyclone body; and
 - a plurality of noise-reducing ribs formed in an air discharge pipe of the cyclone chamber, the noise-reducing ribs being provided at predetermined intervals on the inner wall of the air discharge pipe;
 - 10 wherein each noise-reducing rib has a width substantially 0.1 to 0.4 times as large as the inner diameter of the air discharge pipe; wherein each noise-reducing rib protrudes from an inner wall of the air discharge pipe towards the centre thereof, and comprises a curved portion and a straight portion.
- 15 2. Apparatus as claimed in claim 1, wherein the curved portion of each noise-reducing rib is disposed at an inlet of the air discharge pipe, and the straight portion thereof is disposed at an outlet of the air discharge pipe.
3. Apparatus as claimed in claim 2, wherein the curved portion of each noise-reducing rib includes a free end, the free end being rounded to avoid accumulation of dust.
- 20 4. A vacuum cleaner comprising:
 - a cleaner body having a drive motor;

a nozzle unit connected to the cleaner body to draw in dust from a surface to be cleaned; and

a cyclonic separating apparatus detachably mounted to the cleaner body to separate the dust from dust-carrying air drawn in through the nozzle unit;

5 wherein the cyclonic separating apparatus comprises a cyclone body including a cyclone chamber and a dust-collecting chamber, a cover unit connected to an upper portion of the cyclone body, an openable door unit mounted to a lower portion of the cyclone body, and a plurality of noise-reducing ribs formed in an air discharge pipe of the cyclone chamber, the noise-reducing ribs being provided at predetermined intervals on the inner
10 wall of the air discharge pipe; wherein each noise-reducing rib has a width substantially 0.1 to 0.4 times as large as the inner diameter of the air discharge pipe; and

 wherein each noise-reducing rib protrudes from the inner wall of the air discharge pipe towards the centre thereof, and comprises a curved portion and a straight portion.

15 5. A cyclonic separating apparatus substantially as hereinbefore described with reference to, and as illustrated by, Figures 1 to 4 or Figures 1 to 3 as modified by Figure 7 of the drawings.

20 6. A vacuum cleaner substantially as hereinbefore described with reference to, and as illustrated by, Figures 1 to 4 or Figures 1 to 3 as modified by Figure 7 of the drawings.

The present invention provides a cyclonic separating apparatus comprising: a cyclone body including a cyclone chamber and a dust-collecting chamber; a cover unit connected to an upper portion of the cyclone body; an openable door unit mounted to a lower portion of the cyclone body; and a plurality of noise-reducing ribs formed in an air discharge pipe of the cyclone chamber, the noise-reducing ribs being provided at predetermined intervals on the inner wall of the air discharge pipe; wherein each noise-reducing rib has a width substantially 0.1 to 0.4 times as large as the inner diameter of the air discharge pipe.

Advantageously, wherein each noise-reducing rib protrudes from an inner wall of the air discharge pipe towards the centre thereof, and comprises a curved portion and a straight portion.

Preferably, the curved portion of each noise-reducing rib is disposed at an inlet of the air discharge pipe, and the straight portion thereof is disposed at an outlet of the air discharge pipe. The curved portion of each noise-reducing rib may include a free end, the free end being rounded to avoid accumulation of dust.

~~Alternatively, each noise-reducing rib extends from a predetermined distance from the top of the air discharge pipe, and has a predetermined dimension towards the centre of the air discharge pipe so as not to reach the centre of the air discharge pipe.~~

~~In a preferred embodiment, there are four noise-reducing ribs.~~

~~Where the ribs extend from a position spaced from the top of the air discharge pipe, that pipe may~~

~~have a substantially circular section, and the noise-reducing ribs may be formed on X and Y axes crossing the central longitudinal axis of the air discharge pipe.~~

The invention also provides a vacuum cleaner comprising: a cleaner body having a drive motor; a nozzle unit connected to the cleaner body to draw in dust from a surface to be cleaned; and a cyclonic separating apparatus detachably mounted to the cleaner body to separate the dust from dust-carrying air drawn in through the nozzle unit; wherein the cyclonic separating apparatus comprises a cyclone body including a cyclone chamber and a dust-collecting chamber, a cover unit connected to an upper portion of the cyclone body, an openable door unit mounted to a lower portion of the cyclone body, and a plurality of noise-reducing ribs formed in an air discharge pipe of the cyclone chamber, the noise-reducing ribs being provided at predetermined intervals on the inner wall of the air discharge pipe; wherein each noise-reducing rib has a width substantially 0.1 to 0.4 times as large as the inner diameter of the air discharge pipe.

~~Each noise-reducing rib may protrude from an inner wall of the air discharge pipe towards the centre thereof, and may comprise a curved portion and a straight portion.~~

~~Each noise-reducing rib may extend from a predetermined distance from the top of the air discharge pipe, and may have a predetermined dimension towards the centre of the air discharge pipe so as not to reach the centre of the air discharge pipe.~~

The invention will now be described in greater detail, by way of example, with reference to the drawings, in which:

Figure 1 is a schematic perspective view showing a vacuum cleaner having a cyclonic separating apparatus constructed according to the invention;

Claims

1. A cyclonic separating apparatus comprising:

a cyclone body including a cyclone chamber and a dust-collecting chamber;

5 a cover unit connected to an upper portion of the cyclone body;

an openable door unit mounted to a lower portion of the cyclone body; and

a plurality of noise-reducing ribs formed in an air discharge pipe of the cyclone chamber, the noise-reducing ribs being provided at predetermined intervals on the inner wall of the air discharge pipe; wherein each noise-reducing rib has a width substantially 0.1 to
10 0.4 times as large as the inner diameter of the air discharge pipe.

~~Apparatus as claimed in claim 1, wherein each noise-reducing rib protrudes from an inner wall of the air discharge pipe towards the centre thereof, and comprises a curved portion and a straight portion.~~

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2. Apparatus as claimed in claim 1~~2~~, wherein the curved portion of each noise-reducing rib is disposed at an inlet of the air discharge pipe, and the straight portion thereof is disposed at an outlet of the air discharge pipe.

20 3. Apparatus as claimed in claim 2~~3~~, wherein the curved portion of each noise-reducing rib includes a free end, the free end being rounded to avoid accumulation of dust.

~~4. Apparatus as claimed in claim 1, wherein each noise-reducing rib extends from a~~

~~predetermined distance from the top of the air discharge pipe, and has a predetermined dimension towards the centre of the air discharge pipe so as not to reach the centre of the air discharge pipe.~~

5 ~~5. Apparatus as claimed in claim 5, wherein the air discharge pipe has a substantially circular section, and the noise-reducing ribs are formed on X and Y axes crossing the central longitudinal axis of the air discharge pipe.~~

10 ~~7. Apparatus as claimed in any one of claims 1 to 6, wherein there are four noise-reducing ribs.~~

48. A vacuum cleaner comprising:

a cleaner body having a drive motor;

15 a nozzle unit connected to the cleaner body to draw in dust from a surface to be cleaned; and

a cyclonic separating apparatus detachably mounted to the cleaner body to separate the dust from dust-carrying air drawn in through the nozzle unit;

20 wherein the cyclonic separating apparatus comprises a cyclone body including a cyclone chamber and a dust-collecting chamber, a cover unit connected to an upper portion of the cyclone body, an openable door unit mounted to a lower portion of the cyclone body, and a plurality of noise-reducing ribs formed in an air discharge pipe of the cyclone chamber, the noise-reducing ribs being provided at predetermined intervals on the inner wall of the air discharge pipe; wherein each noise-reducing rib

has a width substantially 0.1 to 0.4 times as large as the inner diameter of the air discharge pipe and:

5 | ~~9. A vacuum cleaner as claimed in claim 8, wherein each noise-reducing rib protrudes from~~
the inner wall of the air discharge pipe towards the centre thereof, and comprises a curved
portion and a straight portion.

10 | ~~10. A vacuum cleaner as claimed in claim 8, wherein each noise-reducing rib extends from~~
predetermined distance from the top of the air discharge pipe, and has a predetermined
dimension towards the centre of the air discharge pipe so as not to reach the centre of the
air discharge pipe.

15 | ~~511. A cyclonic separating apparatus substantially as hereinbefore described with reference to,~~
and as illustrated by, Figures 1 to 4 or Figures 1 to 3 as modified by Figure 7 of the
drawings.

20 | ~~612. A vacuum cleaner substantially as hereinbefore described with reference to, and as~~
illustrated by, Figures 1 to 4 or Figures 1 to 3 as modified by Figure 7 of the drawings.