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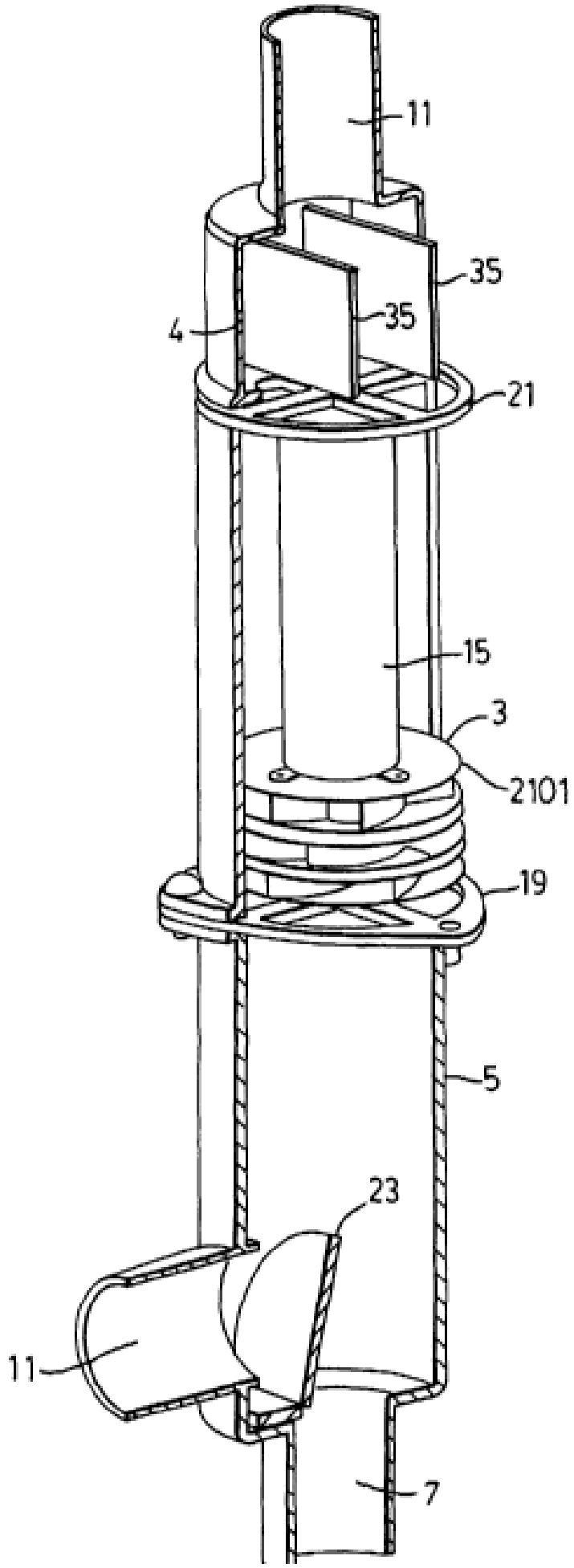
Patent Summary

(12) Patent Application:	(11) **CA 2478295**
(54) English Title:	SUCTION MOTOR FOR VACUUM CLEANER
(54) French Title:	MOTEUR D'ASPIRATION POUR ASPIRATEUR

Representative Drawing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Abstracts

English Abstract

A cleaner (1) has a DC brushless motor (15) with stator (203) and rotor (212). Stator is mounted on a shaft and rotor is mounted inside and to a tubular body (207) about stator (203). Impeller (17) is mounted to and outside tubular body (207). The motor (15) and impeller (17) are mounted in a housing having an intake (17) and an exhaust (9). Operation of the motor and rotation of the impeller causes a partial vacuum at the intake (7) to draw air. The air is exhausted through the exhaust (9). A filter (61) prevents particles from entering the motor (15). Particles are collected in a receptacle (5) prior to the filter (61). The impeller (17) may be a squirrel cage fan, bladed fan, or centrifugal fan. A secondary exhaust (11) expels particles from the filter (61) and/or receptacle (5) by rotation of the impeller (17) in an opposite direction or by the use of a secondary DC motor and impeller. The housing (2) can fit in a cavity between conventional wall studs.

French Abstract

Selon cette invention, un aspirateur (1) comprend un moteur (15) à courant continu sans balai comportant un stator (203) et un rotor (212). Le stator est monté sur un arbre et le rotor est monté sur un corps tubulaire (207), à l'intérieur de celui-ci, autour du stator (203). Une roue (17) est montée sur le corps tubulaire (207), à l'extérieur de celui-ci. Le moteur (15) et la roue (17) sont montés dans un logement pourvu d'un orifice d'admission (7) et d'un orifice d'évacuation (9). Le fonctionnement du moteur et la rotation de la roue génèrent un vide partiel au niveau de l'orifice d'admission (7) de sorte que de l'air soit aspiré. L'air est ensuite évacué par l'orifice d'évacuation (9). Un filtre (61) empêche les particules de pénétrer dans le moteur (15). Ces particules sont recueillies dans un compartiment (5) situé en amont du filtre (61). La roue (17) peut être un ventilateur à cage d'écureuil, un ventilateur à ailettes ou un ventilateur centrifuge. Un deuxième orifice d'évacuation (11) expulse les particules du filtre (61) et/ou du compartiment (5) par la rotation de la roue (17) dans le sens inverse ou au moyen d'un second moteur à courant continu et d'une seconde roue. Le logement (2) peut être placé dans une cavité située entre des montants de cloisons classiques.

Patent Details

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Claims	Claims	144	4
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What is claimed is:

1. A suction device for use in a cleaning apparatus that moves air, the device comprising:

a) A casing defining a substantially cylindrical cavity, the casing having first and end opposing ends and a first axis, the first end having an intake, and the second end having an exhaust,

b) A DC brushless motor contained within the cavity, the motor having a stator mounted to a shaft and the motor having a substantially cylindrical rotor mounted for rotation about the shaft, the shaft having a second axis and the shaft being fixedly mounted within the casing with the first and second axes aligned, and

c) An impeller fixedly mounted for rotation with the rotor, wherein rotation of the impeller in a first direction causes air to be drawn through the intake and expelled through the exhaust.

2. The suction device on claim 1, wherein the impeller is mounted between the rotor and the casing.

3. The suction device of claim 1, wherein the impeller is mounted about a reduced diameter portion of the rotor.

4. The suction device of claim 1, wherein the rotor has an adaptor extending from one end, and the adaptor has a reduced diameter from the remainder of the rotor.

5. The suction device of claim 3, wherein the reduced diameter portion is an adaptor that is mounted at one end of the rotor.

6. The suction device of claim 5, wherein the one end of the rotor at which the adapter is mounted is closer to the intake than the other end of the rotor.

7. The suction device of claim 3, wherein the impeller comprises a centrifugal fan.

8. The suction device of claim 3, wherein the impeller comprises a multi-stage centrifugal fan.

9. The suction device of claim 1, wherein the casing has a diameter less than the depth of a wall stud of a conventionally framed structure.

10. The suction device of claim 1, wherein the casing has a diameter of 5 and 1/2 inches or less.

11. The suction device of claim 1, wherein the casing has a diameter of 3 and 1/2 inches or less.

12. A central vacuum cleaning system comprising the suction device of claim 1 and an air delivery apparatus, wherein the casing has a diameter less than the depth of a wall stud of a conventionally framed structure, and the device is mounted within a wall cavity between wall studs of a conventionally framed house, and air connection is provided between the intake and the air delivery apparatus.

13. The system of claim 12, further comprising a filter between the intake and the air delivery apparatus, wherein the filter prevents particles from entering the intake.

14. The system of claim 13, further comprising a particle receptacle between the filter and the air delivery apparatus, wherein a substantial portion of the particles are released into the receptacle from the air entering the intake before the air reaches the filter.

15. The system of claim 14, further comprising a first valve between the filter and the air delivery apparatus and a secondary exhaust between the filter and the first valve, the first valve having an open position to prevent air from passing through the first valve toward the air delivery apparatus and a closed position to permit air to pass through the first valve from the air delivery apparatus, the secondary exhaust for exhausting trapped particles from the filter when the first valve is closed.

16. The system of claim 15, wherein the rotation of the impeller in a second direction causes air to be drawn from the exhaust and to be exhausted through the secondary exhaust.

AMENDED CLAIMS
[received by the International Bureau on 10 September 2003 (10.09.2003)
Claims 23-28 have been added

17. The system of claim 16, wherein closing of the first valve and opening of the secondary exhaust causes air drawn from the exhaust to be exhausted through the secondary exhaust.

18. The device of claim 1, wherein the impeller is a set of fan blades substantially spaced equally about the rotor in an arc perpendicular to the first and second axes.

19. The device of claim 1, wherein the impeller is a plurality of sets of fan blades, each set of fan blades substantially spaced equally about the rotor in an arc perpendicular to the first and second axes, the sets positioned from one another along the first and second axes.

20. The device of claim 1, wherein the impeller is a plurality of centrifugal fans.

21. The device of claim 1, wherein the impeller is a squirrel cage fan.

22. A cleaning system comprising an upright vacuum cleaner with the suction device of claim 1 as a means for moving air through the cleaner.

23. A central vacuum cleaning system comprising the suction device of claim 1 and an air delivery apparatus, and air connection is provided between the intake and the air delivery apparatus.

24. The system of claim 23, further comprising a filter between the intake and the air delivery apparatus, wherein the filter prevents particles from entering the intake.

25. The system of claim 24, further comprising a particle receptacle between the filter and the air delivery apparatus, wherein a substantial portion of the particles are released into the receptacle from the air entering the intake before the air reaches the filter.

26. The system of claim 25, further comprising a first valve between the filter and the air delivery apparatus and a secondary exhaust between the filter and the first valve, the first valve having an open position to prevent air from passing through the first valve toward the air delivery apparatus and a closed position to permit air to pass through the first valve from the air delivery apparatus, the secondary exhaust for exhausting trapped particles from the filter when the first valve is closed.

27. The system of claim 26, wherein the rotation of the impeller in a second direction causes air to be drawn from the exhaust and to be exhausted through the secondary exhaust.

28. The system of claim 27, wherein closing of the first valve and opening of the secondary exhaust causes air drawn from the exhaust to be exhausted through the secondary exhaust.