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WO 2007/017658 A1 **WO 2006/135952 A1**
US 5263305 A **US 3877206 A**

(71) Applicant(s):
Miles Roland William Bozeat
Bozeat Palmer Contracts Ltd, The Cottages,
Oak Street, LECHLADE, Gloucestershire, GL7 3AX,
United Kingdom

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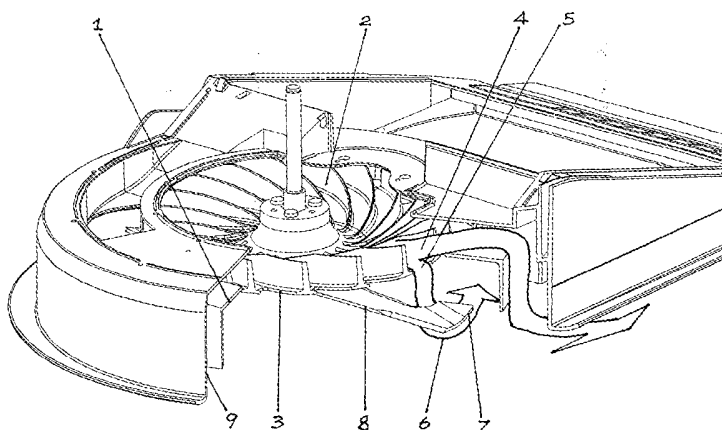
(72) Inventor(s):
Miles Roland William Bozeat

(74) Agent and/or Address for Service:
Miles Roland William Bozeat
Bozeat Palmer Contracts Ltd, The Cottages,
Oak Street, LECHLADE, Gloucestershire, GL7 3AX,
United Kingdom

(54) Abstract Title: **Pressure balancing cutting chamber for a hover mower**

(57) The mower includes a cutting chamber 1 and a fan 2 which co-exist with an airflow constraining close running tolerance. The fan has cut-outs 3 disposed around the perimeter thereof. High pressure air flows 4 generated by the fan provide a hover effect to the mower. Part of the high pressure airflows are diverted into the cutting chamber through gaps 5 created by the cut-outs as a result of being drawn into low pressure airflows 6 generated by the rotational action beneath upturns 7 of cutter blades 8. The arrangement ensures that the high pressure air generated by the fan balances the low pressure air generated in the cutting chamber to ensure that the mower is not drawn down into a lawn.

FIGURE 1



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FIGURE 1

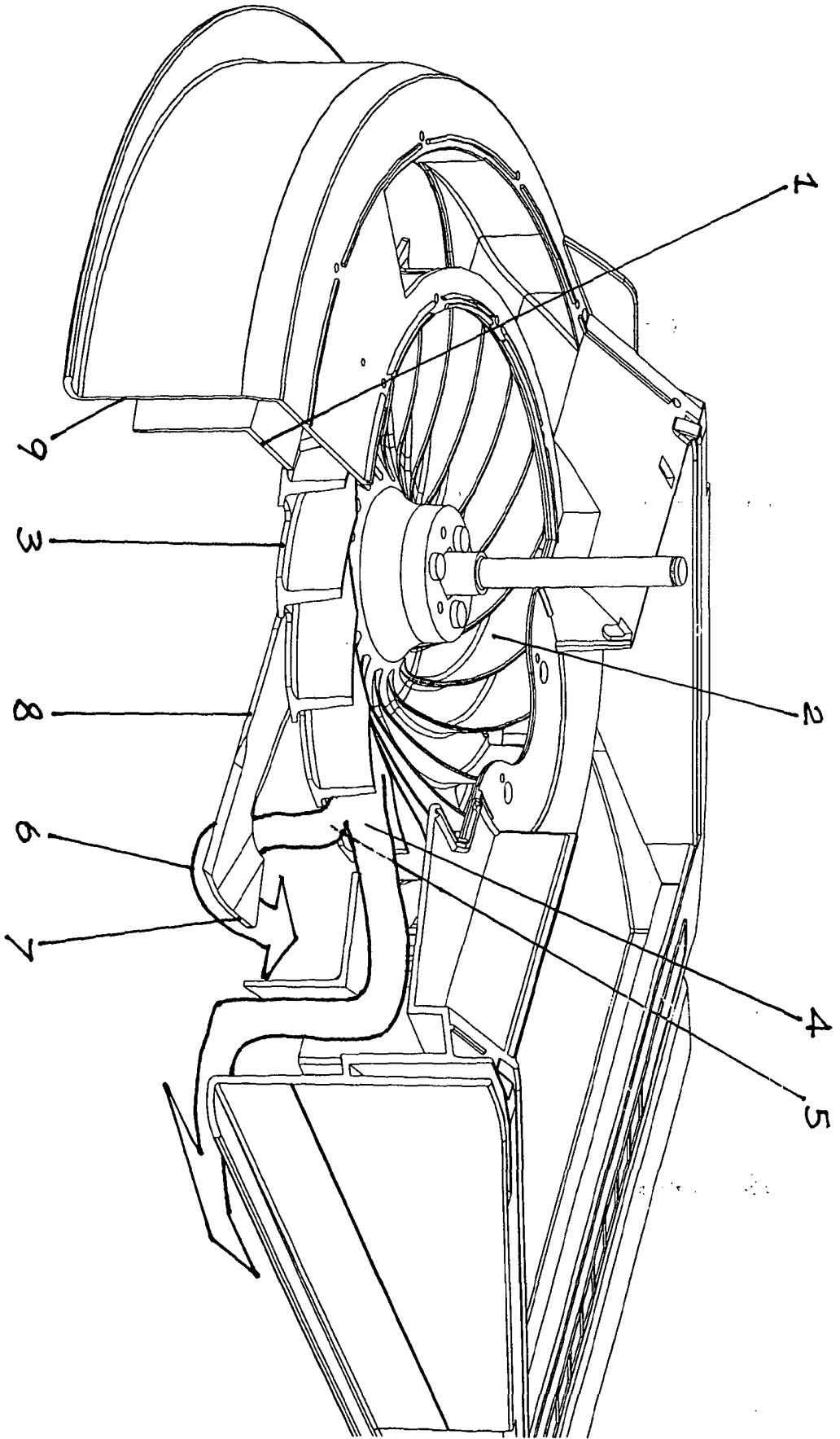
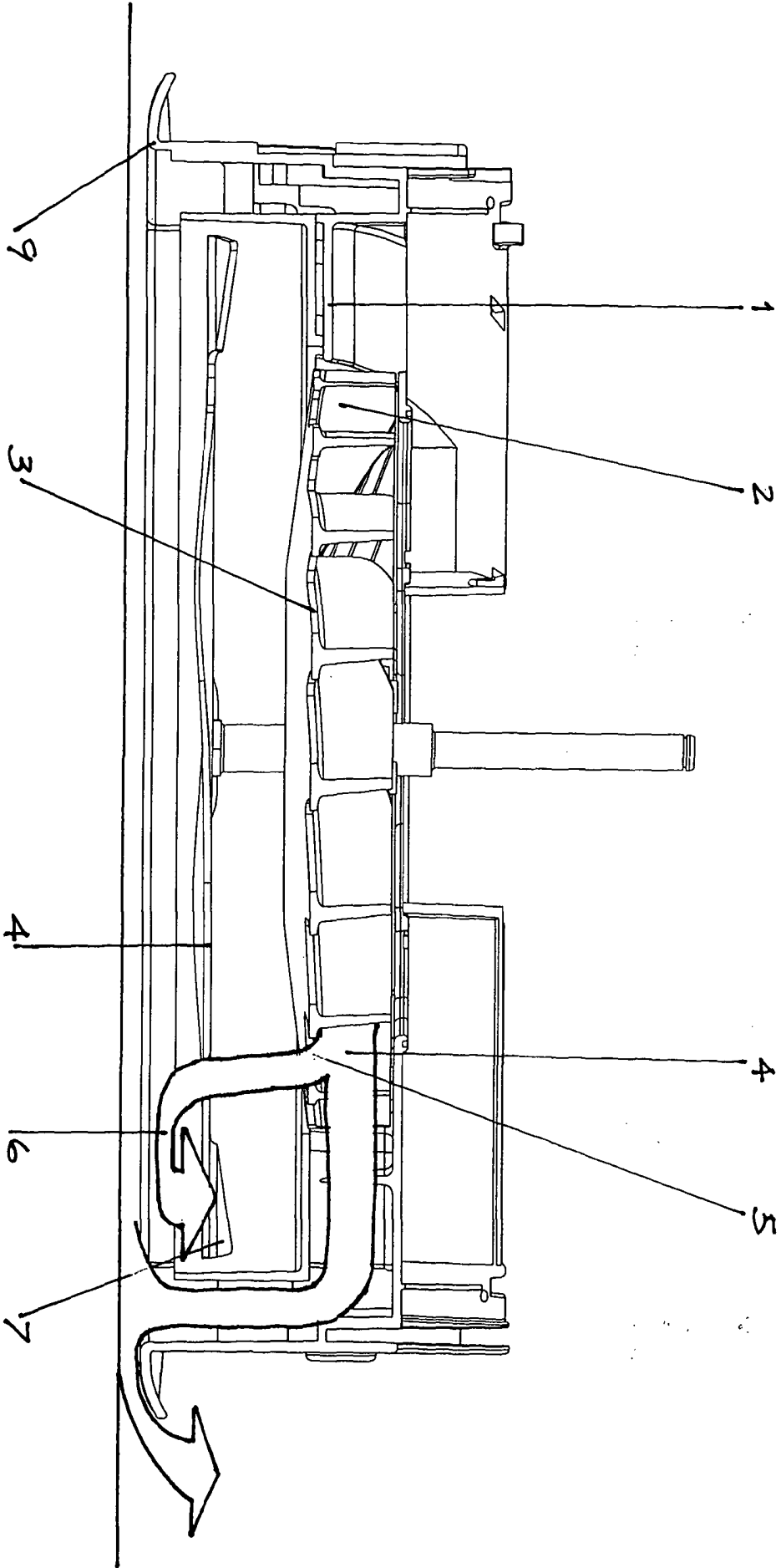


FIGURE 2



Improvements to Hover mowers- Pressure Balancing Cutting Chamber

This invention is an improvement to grass collecting hover mowers that exercise the inventions embodied within either or both of patents Nos GB 2284736 Cut grass collecting hover mower / GB 2298775 Grass Cuttings collection.

Currently all Hover mowers that exercise the inventions embodied within Patent Nos Nos GB 2284736 Cut grass collecting hover mower / GB 2298775 Grass Cuttings collection are characterised by a cutting chamber and a hover generating fan with close running tolerances to the cutting chamber that effectively isolate the high pressure airflow providing the hover outside the cutting chamber from the low pressure airflows within the cutting chamber except at the perimeter junction of the cutting chamber with the lawn where a balancing and equalising of pressures becomes possible.

Whilst normally this is a satisfactory arrangement under conditions where the grass to be cut is lush or long an effective seal may be created at the perimeter junction of the cutting chamber with the lawn so preventing any pressure balancing or equalising of the low pressure airflows within the cutting chamber with the high pressure airflow providing the hover outside the cutting chamber.

Under the above conditions the unbalanced and unequalised low pressure in the cutting chamber creates a partial vacuum overpowering the high pressure hover air flows so drawing the mower down into the lawn and inhibiting its progress.

It is to this undesirable condition that the present invention provides a solution.

According to the present improving Pressure Balancing Cutting Chamber invention means are provided wherein high pressure air generated by the fan and providing the hover to a mower is allowed passage into the cutting chamber wherein it balances or equalizes the low pressure air generated within the cutting chamber by the high speed passage of the upturn on the cutter blades. The means provided consist of gaps or penetrations being configured into the fan or cutting chamber and /or a partial or complete wide running tolerance between the perimeter of the hover generating fan and the inner cutting chamber roof and / or a non circular configuration of the either of the perimeters of the fan and /or cutting chamber or combination of same. The extent of the gaps or penetrations required for effective operation of the mower is determined by experiment within a given machine.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawing in which

Figure 1 shows in sectional perspective the operative elements of a mower.

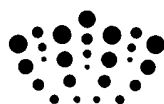
Figure 2 shows in section the operative airflows and pressure areas of a mower.

In this example and referring to the drawings the present improving Pressure Balancing Cutting Chamber invention subsists within a hover mower exercising both and /or either of the inventions as described in patent Nos Nos GB 2284736 Cut grass collecting hover mower / GB 2298775 Grass Cuttings collection. A cutting chamber 1 and a fan 2 co-exist with an airflow constraining close running tolerance. The said fan 2 has cut-outs 3 disposed around the perimeter. High pressure air flows 4 generated by the said fan 2 to provide the hover to the mower. Part of said high pressure airflows 4 are diverted into the said cutting chamber 1 through gaps 5 created by said cut-outs 3 as a factor of being drawn in by the low pressure airflows 6 generated by the rotational action beneath the upturns 7 of the cutter blades 8. The extent of the said gaps 5 required for effective operation of the mower is determined by experiment within a given mower.

The said gaps 5 may be supplemented or replaced by a non air flow constraining running tolerance between said cutting chamber 1 and said fan 2 and / or through penetrations in either or both of the said fan 2 or the said cutting chamber 1 [for clarity not illustrated in this example].

CLAIMS

1. The present improving Pressure Balancing Cutting Chamber invention subsists within a hover mower exercising both and /or either of the inventions as described in patent Nos A Nos GB 2284736 Cut grass collecting hover mower / GB 2298775 Grass Cuttings collection. A cutting chamber 1 and a fan 2 co-exist with a airflow constraining close running tolerance. The said fan 2 has cut-outs 3 disposed around the perimeter. High pressure air flows 4 generated by the said fan 2 to provide the hover to the mower. Part of said high pressure airflows 4 are diverted into the said cutting chamber 1 through gaps 5 created by said cut-outs 3 as a factor of being drawn in by the low pressure airflows 6 generated by the rotational action beneath the upturns 7 of the cutter blades 8. The extent of the said gaps 5 required for effective operation of the mower is determined by experiment within a given mower.
2. An improving Pressure Balancing Cutting Chamber as claimed in 1 above wherein the said gaps 5 may be supplemented or replaced by a non air flow constraining running tolerance between cutting chamber 1 and fan 2
3. An improving Pressure Balancing Cutting Chamber as claimed in 1 above wherein and the said gaps 5 may be supplemented or replaced by through penetrations in either or both of the said fan 2 or the said cutting chamber 1.



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Examiner: Mr Gary Williams

Claims searched: 1-3

Date of search: 29 December 2008

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
A	1	US5263305 A (FASSAUER) See Fig.1, col.6 lines 12-44
A	1	WO2007/017658 A1 (GMCA PTY) See Fig.1, page 11 lines 15-21
A	1	US3877206 A (McNEILLY) See Figs.3&4, col.5 line 6 - col.6 line 42
A	1	WO2006/135952 A1 (ABERNETHY) See Figs.3&11, page 7 lines 17-21, page 8 lines 5-12

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X :

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Worldwide search of patent documents classified in the following areas of the IPC

A01D

The following online and other databases have been used in the preparation of this search report

Online:EPODOC,WPI

International Classification:

Subclass	Subgroup	Valid From
A01D	0034/695	01/01/2006