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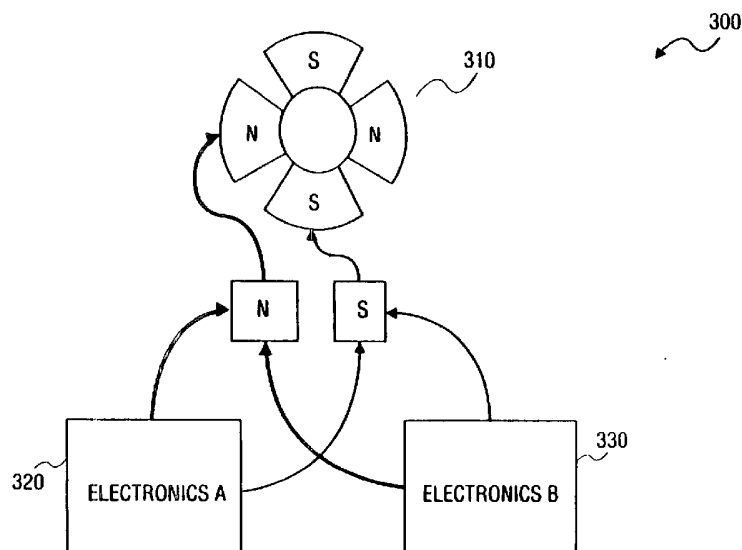
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- Published:  
— with international search report

[Continued on next page]

(54) Title: MULTIPLE FAULT REDUNDANT MOTOR



(57) Abstract: A device is presented having a first and a second motor control device. The first and the second motor control devices control rotation speed of a motor. The first or the second motor control devices continue to control rotation speed of the motor upon failure of either the first or the second motor control device. Also presented is a device having at least one motor. The at least one motor having at least one pair of bifilar windings. A further device is presented having at least one motor. The at least one motor having at least eight magnetic lobes. Another device is presented having a first motor connected to a shaft. A second motor is connected to the shaft. A fan hub is connected to the shaft. A fan blade is connected to the fan hub.



WO 03/058806 A3



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20 November 2003

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 02/41553

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H02P6/12 H01L23/34 G06F1/20

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H02P H01L G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 434 389 A (LANGLEY LAWRENCE W ET AL) 28 February 1984 (1984-02-28) column 5, line 21-36; figure 1 column 3, line 66 -column 4, line 13	1
X	column 2, line 17-25; figures 1,2 column 5, line 61-66 column 8, line 1-16	2-4
X	column 2, line 3-9; figure 2	10
X	column 4, line 2,44	13,14
A	column 5, line 21-24,38-47 ---	18,24
X	WO 94 14226 A (HONEYWELL INC) 23 June 1994 (1994-06-23) page 5, line 1-17; figures 1,2	1
Y	page 5, line 2-17 --- -/--	7-9

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## ° Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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- \*P\* document published prior to the international filing date but later than the priority date claimed

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\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*&\* document member of the same patent family

Date of the actual completion of the international search

4 August 2003

Date of mailing of the international search report

20.08.03

Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 02/41553

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 618 806 A (GROUSE ALAN) 21 October 1986 (1986-10-21) column 5, line 59-67; figures 1,2	5
X	figure 1	6
Y	column 1, line 34-41	7-9
X	US 5 572 403 A (MILLS R STEVEN) 5 November 1996 (1996-11-05) column 8, line 54-67; figure 4	15
X	column 7, line 44-52; figure 4	16,22
X	column 8, line 30-41	17,23
X	column 8, line 56-65; figure 4	18,24
X	column 7, line 60-65	19,20,
X	column 11, line 4-25	25,26
X	column 2, line 40-47	
X	column 8, line 54-67; figures 3,4	21
A	US 5 258 676 A (REINHARDT WILHELM ET AL) 2 November 1993 (1993-11-02) column 3, line 42-51; figures 1,2	15-26

**INTERNATIONAL SEARCH REPORT**  
information on patent family members

International Application No  
PCT/US 02/41553

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4434389	A	28-02-1984	CA 1184596 A1	26-03-1985
			DE 3140034 A1	06-05-1982
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			FR 2676256 A1	13-11-1992
			GB 2255859 A ,B	18-11-1992

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-4

Motor with two speed control devices

2. Claims: 5-9

Motor with bifilar windings

3. Claims: 10-14

Motor with magnetic lobes

4. Claims: 15-26

Fan with two motors and a fan hub

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 02/41553

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.