Title: DETERMINING AND HANDLING BRAKE FAILURE IN OPEN LOOP VARIABLE FREQUENCY DRIVE MOTORS

Abstract: A controller for a variable frequency drive monitors electrical power from a variable frequency drive motor while a brake is maintaining a load driven or moved by the motor without requiring additional feedback components of a closed loop configuration. If excess electrical power is being generated by the motor, an undesirable condition in the brake is indicated. Support or maintenance of the load is assumed by the motor in that event. Appropriate alarms or indicators are also activated.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC: H02P 23/00(2006.01),23/14(2006.01),27/04(2006.01),3/18(2006.01),3/22(2006.01),3/26(2006.01)
USPC: 318/805,807,808,810,812,273,274,275,371,370,563;188/30;254/266
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)
U.S.: 318/805,807,808,810,812,273,274,275,371,370,563;188/30;254/266

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 practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tr>
<td>Y</td>
<td>US 5,343,134 (Wendt et al) column 8 lines 46-52, column 4, lines 18-50, column 9 lines 60-68, column 10 lines 1-8, column 4 lines 26-39, column 9 lines 46-55</td>
<td>1-4, 6, 11-13, 17-18</td>
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<td>US 6,614,198 (Väisänen) column 5 lines 51-67, column 6 lines 1-19, column 5, lines 36-45 and figure 1</td>
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<td>US 6,078,156 (Spurr) column 4 lines 45-59</td>
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</table>

Further documents are listed in the continuation of Box C.  See patent family annex.

Date of the actual completion of the international search
26 February 2006 (26.02.2006)

Date of mailing of the international search report
26 APR 2006

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Paula Bradley
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Form PCT/ISA/210 (second sheet) (April 2005)
<table>
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<td>Y</td>
<td>US 6,614,198 (Väisänen) figure 1 labels 1, 2, 7, 21, 24 column 5 lines 20-35, column 6 lines 1-19,</td>
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Form PCT/ISA/210 (continuation of second sheet) (April 2005)
INTERNATIONAL SEARCH REPORT

Box No. II  Observations where certain claims were found unsearchable (Continuation of item 2 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 No. III  Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

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

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 additional fees, this Authority did not invite payment of any additional fees.

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.: 1-21

Remark on Protest
☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet(2)) (April 2005)