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(54) **Title**: BLADE FOR A ROTOR OF A WIND TURBINE PROVIDED WITH BARRIER GENERATING MEANS

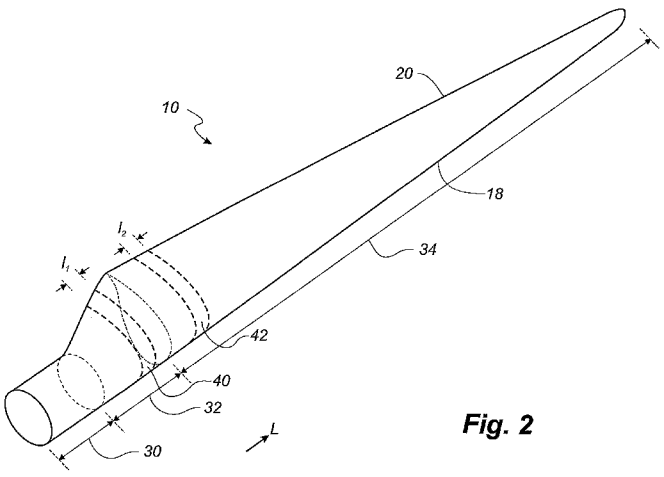

Fig. 2

(57) **Abstract**: A blade (10) for a rotor of a wind turbine (2) has a substantially horizontal rotor shaft, the rotor comprising a hub (8), from which the blade (10) extends substantially in a radial direction when mounted to the hub (8). The blade comprises a profiled contour including a leading edge (18) and a trailing edge (20) as well as a pressure side and a suction side, the profiled contour when being impacted by an incident airflow generating a lift. The profiled contour is divided into a root region (30) with a substantially circular profile closest to the hub, an airfoil region (34) with a lift generating profile furthest away from the hub, and a transition region (32) between the root region (30) and the airfoil region (34). The profile of the transition region (32) gradually changes in the radial direction from the circular profile of the root region to the lift generating profile of the airfoil region. The suction side comprises at least a first zone (40, 42), which extends substantially in the direction of the incident airflow, and which is positioned in a zone of a cross-flow. The first zone (40, 42) comprises a first barrier generating means (xO6) adapted to generating a barrier of airflow, which extends essentially in the direction of the incident airflow, the barrier of airflow being of sufficient strength and length so as to effectively reduce the cross-flow.

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B. FIELDS SEARCHED

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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	WO 2005/035978 A (REPOWER SYSTEMS AG [DE]; QUELL PETER [DE]; PETSCHE MARC [DE]) 21 April 2005 (2005-04-21) abstract; figure 1	1-17
X	WO 02/08600 A (STICHTING ENERGIE [NL]; CORTEN GUSTAVE PAUL [NL]) 31 January 2002 (2002-01-31) abstract; figures 1,2	1-17
X	WO 00/15961 A (LM GLASFIBER AS [DK]; GRABAU PETER [DK]) 23 March 2000 (2000-03-23) the whole document	1-17

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WETZEL K K ET AL: "INFLUENCE OF VORTEX GENERATORS ON NREL S807 AIRFOIL AERODYNAMIC CHARACTERISTICS AND WIND TURBINE PERFORMANCE" WIND ENGINEERING, MULTI-SCIENCE PUBLISHING CO., BRENTWOOD, ESSEX, GB, vol. 19, no. 3, 1 January 1995 (1995-01-01), pages 157-165, XP000516437 ISSN: 0309-524X the whole document	1-17
X	WO 03/016713 A (KANKI KENZOU [JP]; NISHIDA HAREYUKI [JP]) 27 February 2003 (2003-02-27) abstract; figures 14-18	1-17
X	WO 2007/065434 A (LM GLASFIBER AS [DK]; GRABAU PETER [DK]) 14 June 2007 (2007-06-14) abstract; figures 2,4	1-17
X	GB 885 449 A (RAYMOND ALAN WALLIS) 28 December 1961 (1961-12-28) the whole document	1-17

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/DK2008/000311

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005035978 A	21-04-2005	CN 1867771 A	22-11-2006
		DE 10347802 B3	19-05-2005
		EP 1671030 A1	21-06-2006
		US 2006280614 A1	14-12-2006
WO 0208600 A	31-01-2002	AT 348263 T	15-01-2007
		AU 6961501 A	05-02-2002
		AU 2001269615 B2	02-12-2004
		CA 2415087 A1	31-01-2002
		DE 60125172 T2	08-11-2007
		DK 1295032 T3	10-04-2007
		EP 1295032 A1	26-03-2003
		ES 2277928 T3	01-08-2007
		NL 1015558 C2	08-01-2002
		US 2004013512 A1	22-01-2004
WO 0015961 A	23-03-2000	AU 5618099 A	03-04-2000
WO 03016713 A	27-02-2003	JP 2003056452 A	26-02-2003
WO 2007065434 A	14-06-2007	AU 2006322446 A1	14-06-2007
		CA 2631416 A1	14-06-2007
		CN 101321949 A	10-12-2008
		EP 1963671 A1	03-09-2008
GB 885449 A	28-12-1961	NONE	