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[Continued on next page]

(54) Title: CIRCULAR GRILL FOR AN AIR CIRCULATOR UNIT

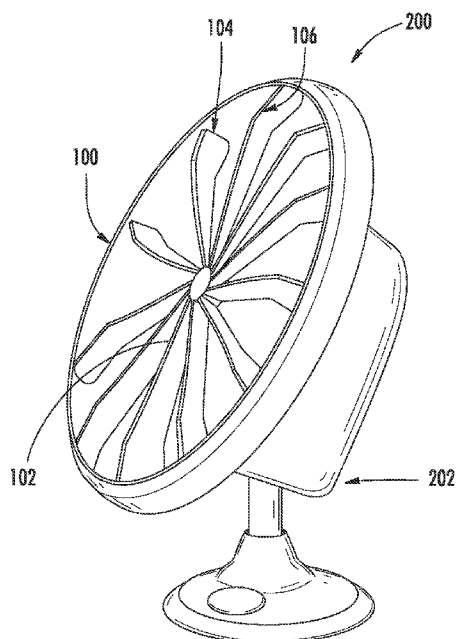


FIG. 3

(57) Abstract: The present disclosure relates to a grill for an air circulator. The grill is configured to divert airflow from an airflow source. The air circulator includes a center hub with a plurality of arcuate ribs coupled to and extending outwardly from the center hub. The arcuate ribs extend outwardly to an outer perimeter of the circular grill.



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A. CLASSIFICATION OF SUBJECT MATTER***F04D 29/54(2006.01)i, F04D 25/08(2006.01)i, F24F 13/08(2006.01)i***

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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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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eKOMPASS(KIPO internal) & Keywords: circular grill, rib, angle

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 05577888 A (CAPDEVILA; HUGO et al.) 26 November 1996 See column 4 lines 18-47, figures 1-4.	1-12
A	US 6503060 B1 (KAMADA; MASASHI et al.) 07 January 2003 See column 20 lines 44-61, figures 3-4, 11-12.	1-12
A	US 04548548 A (GRAY, III; LESLIE M.) 22 October 1985 See column 3 lines 13-44, figures 1-3a.	1-12
A	EP 0709576 A1 (XEROX CORPORATION) 01 May 1996 See abstract, page 2 lines 52-58, figures 2,2a.	1-12



Further documents are listed in the continuation of Box C.



See patent family annex.

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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 05577888 A	26.11.1996	CA 2224204 C	02.10.2001
		CN 1066247 C	23.05.2001
		CN 1189880 A	05.08.1998
		CN 1189880 C0	05.08.1998
		EP 0834022 A1	08.04.1998
		EP 0834022 A1	22.07.1998
		EP 0834022 B1	03.11.1999
		EP 0834022 B2	24.09.2003
		JP 2000-501808 A	15.02.2000
		KR 10-0250165 B1	01.04.2000
		US 05577888 A	26.11.1996
		WO 97-01040 A1	09.01.1997
US 6503060 B1	07.01.2003	AU 2000-63207 A1	05.03.2001
		CN 1125245 C0	22.10.2003
		CN 1319165 A0	24.10.2001
		EP 1120571 A1	01.08.2001
		EP 1120571 A4	23.09.2009
		JP 04-380105 B2	02.10.2009
		KR 10-0408781 B1	06.12.2003
		TW 461937 A	01.11.2001
		TW 461937 B	01.11.2001
		WO 01-11241 A1	15.02.2001
US 04548548 A	22.10.1985	EP 0183787 A1	11.06.1986
		EP 0183787 A4	22.11.1988
		EP 0183787 B1	14.08.1991
		WO 85-05408 A1	05.12.1985
EP 0709576 A1	01.05.1996	JP 08-211820 A	20.08.1996