

112/AUG 2002



162162

200 2048288 -

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
23 August 2001 (23.08.2001)

PCT

(10) International Publication Number
WO 01/61751 A3(51) International Patent Classification⁷: **H01L 23/367**,
23/467(74) Agents: **MCCRACKIN, Ann et al.**; Schwegman, Lund-
berg, Woessner & Kluth, P.A., P.O. Box 2938, Minneapo-
lis, MN 55402 (US).

(21) International Application Number: PCT/US01/04087

(22) International Filing Date: 7 February 2001 (07.02.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/504,019 18 February 2000 (18.02.2000) US(71) Applicant (for all designated States except US): **INTEL
CORPORATION** [US/US]; 2200 Mission College Boule-
vard, Santa Clara, CA 95052 (US).

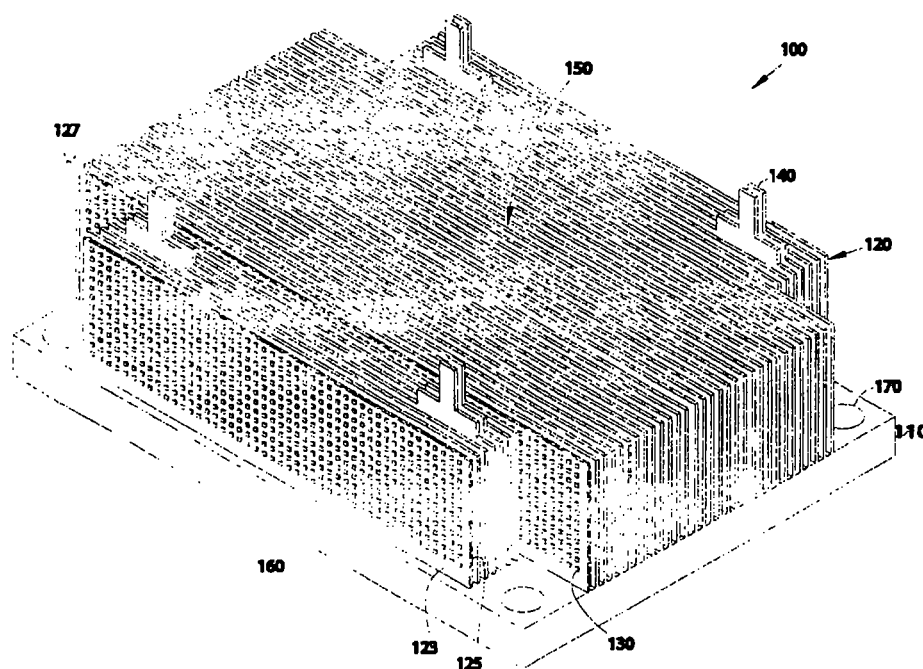
(72) Inventor; and

(75) Inventor/Applicant (for US only): **KABADI, Ashok, N.**
[IN/US]; 17490 NW Gilbert Lane, Portland, OR 97229
(US).(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ,
DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM,
TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian
patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European
patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,
IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF,
CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

[Continued on next page]

(54) Title: PARALLEL-PLATE/PIN-FIN HYBRID COPPER HEAT SINK FOR COOLING HIGH-POWERED MICROPROCES-
SOR

(57) Abstract: A heat sink for a microprocessor includes a thermally conductive base having a plurality of fin structures upwardly extending from the thermally conductive base. The plurality of fin structures having a first surface comprising a plurality of surface area enhancer structures to increase a convection surface area of the heat sink for a given volume of a heat sink to enhance heat dissipation from the heat sink.

WO 01/61751 A3



ACTION

WO 01/61751 A3

(88) Date of publication of the international search report:
7 March 2002

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.