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[Continued on nextpage]

(54) Title: CONTROL UNIT FOR BRUSHLESS MOTOR IN A POWER TOOL

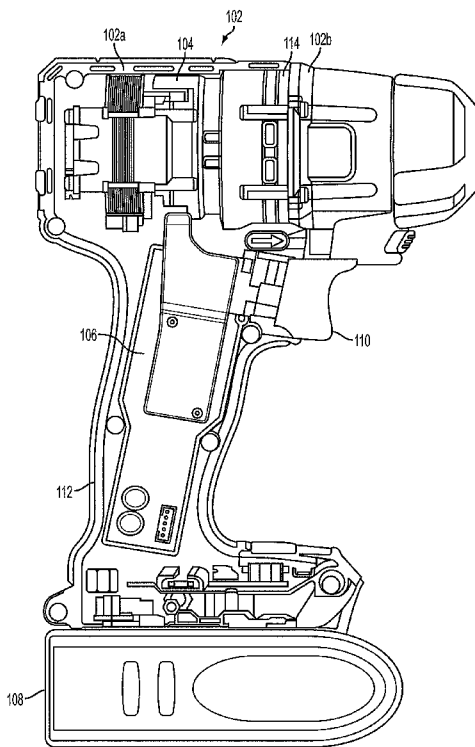
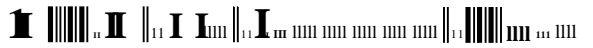


FIG. 1

(57) Abstract: A power tool includes a brushless DC motor housed inside an upper body of the tool housing and a control unit housed inside a handle of the housing, the control unit including a micro-controller mounted on a control circuit board, a power unit electronically coupled to the micro-controller and mounted on a power circuit board arranged substantially parallel the control circuit board inside the handle, and a heat sink in thermal contact with the power unit. An input unit may be mounted directly on the control circuit board. An upper portion of the heat sink extending towards the upper body of the housing may include a tab protruding underneath a fan assembly of the motor to transfer heat from the power unit to the airflow created by the fan.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H02K 7/14 (2012.01)
USPC - 310/50
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(8): H02K 7/14 (2012.01)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
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USPC: 310/43, 45, 47, 50, 68B, 152, 177, 180, 184, 261 .1; 173/2, 217

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWEST; PGPB, USPT, EPAB, JPAB; Google Scholar; Google Patent; Search Terms: DLDC brush-less ECM DC motor heat sink battery portable tool drill hand clam-shell housing handle circuit board PCB driver potting epoxy thermal clip clamp snap hook controller micro-controller program

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/0128505 A9 (Yaknker et al.) 07 June 2007 (07.06.2007) para. [0051] through [0085], Fig. 1-19	11 and 12
Y		1-10, 13 and 14
Y	US 2006/0222930 A1 (Aradachi et al.) 05 October 2006 (05.10.2006) para. [0034] through [0098], Fig. 1-9D	1-10 and 13-19
Y	US 2008/0265695 A1 (Yoshida et al.) 30 October 2008 (30.10.2008) para. [0031] through [0073], Fig. 1-19	15-19
Y	US 2007/0079980 A1 (Kononenko et al.) 12 April 2007 (12.04.2007) para. [0044] through [0082], Fig. 3-5, 9A, 9B	9, 10 and 14
A	US 2003/0222516 A1 (Cleanthous et al.) 04 December 2003 (04.12.2003) entire document	1-19

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