

HEXAGONAL HEATSINK

DESCRIPTION OF THE INVENTION:

Technical Field of the Invention

5 **[0001]** The present invention relates to a system and method for enabling a heatsink. More specifically, the invention relates to methods and systems for enabling a hexagonal heatsink.

Background of the Invention

10 **[0002]** Existing heatsinks are limited in dimension and shape. For example, a heatsink that is square or rectangular in shape may transfer heat from a limited area restricted to their respective shapes and dimensions. Further, magnitude of heat transferred is also limited by dimension and shape. For example, amount of heat transferred (in Joules) in an area specified by a specific shape (i.e. square) on an electronic board is limited. Hence, there is a need to have a heatsink that may transfer higher magnitude of heat in
15 a specific shape.

Object of the invention

[0003] The principal object of the invention is to enable a hexagonal heatsink.

[0004] Another object of the invention relates to methods and systems for enabling economical and compact heatsink.

20 **[0005]** These and other objects and characteristics of the present invention will become apparent from the further disclosure to be made in the detailed description given below.

Summary of the invention

[0006] This summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This summary is not intended
25 to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

[0007] The problem of limited heat ~~absorption~~ transfer in regular hexagon shaped source by a heatsink of specific shape (i.e. square and rectangle) and dimension is solved by a

hexagonal heatsink. The hexagonal heatsink comprises a hexagonal baseplate and trapezoidal fins, that may be placed on an electronic circuitry, especially processors.

[0008] To the accomplishment of the foregoing and related ends, the one or more aspects comprise the features hereinafter fully described and particularly pointed out in the claims.

5 The following description and the drawings set forth in detail certain illustrative features of the one or more aspects. These features are indicative, however, of but a few of the various ways in which the principles of various aspects may be employed, and this description is intended to include all such aspects and their equivalents.

Brief Description of Drawings

10 **[0009]** The foregoing and other features of embodiments will become more apparent from the following detailed description of embodiments when read in conjunction with the accompanying drawings. In the drawings, like reference numerals refer to like elements.

[0010] In the following description, for the purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the embodiments of the invention. It is apparent, however, to one skilled in the art that the embodiments of the invention may be practiced without these specific details or with an equivalent arrangement. In other instances, well-known structures and devices are shown in block diagram form in order to avoid unnecessarily obscuring the embodiments of the invention. Throughout the disclosure the system and the foot tracing system may interchangeably
15
20 be used.

[0011] FIG. 1 illustrates network environment 100, for enabling a hexagonal heatsink, according to one embodiment of the invention.

[0012] FIG 2 illustrates a electronic circuit board 101, according to one embodiment of the invention.

25 **[0013] FIG. 3A** illustrates an example scenario, for enabling the hexagonal heatsink, according to one embodiment of the invention.

[0014] FIG. 3B illustrates a heatsink, for enabling firm placement on the electronic circuit board 101, according to one embodiment of the invention

[0015] FIG. 4 illustrates an example scenario, for operation of the hexagonal heatsink,
30 according to one embodiment of the invention. .

Detailed Description of the Invention

[0016] Reference will now be made in detail to the description of the present subject matter, one or more examples of which are shown in figures. Each example is provided to explain the subject matter and not a limitation. Various changes and modifications
5 obvious to one skilled in the art to which the invention pertains are deemed to be within the spirit, scope and contemplation of the invention.

[0017] As used in the application, the term 'circuitry' or 'circuit' refers to all of the following: (a) hardware-only circuit implementations (such as implementations in only analog and/or digital circuitry) and (b) to combinations of circuits and software (and/or firmware), such
10 as (as applicable): (i) to a combination of processor(s) or (ii) to portions of processor(s)/software (including digital signal processor(s)), software, and memory(ies) that work together to cause an apparatus, such as a mobile phone or server, to perform various functions) and (c) to circuits, such as a microprocessor(s) or a portion of a microprocessor(s), that require software or firmware for operation, even if the software or
15 firmware is not physically present.

[0018] This definition of 'circuitry' applies to all uses of this term in this application, including in any claims. As a further example, as used in this application, the term "circuitry" would also cover an implementation of merely a processor (or multiple processors) or portion of a processor and its (or their) accompanying software and/or
20 firmware. The term "circuitry" would also cover, for example and if applicable to the particular claim element, a baseband integrated circuit or applications processor integrated circuit for a mobile phone or a similar integrated circuit in server, a cellular network device, or other network device.

[0019] The word "exemplary" is used herein to mean "serving as an example, instance, or illustration." Any aspect described herein as "exemplary" is not necessarily to be
25 construed as preferred or advantageous over other aspects.

[0020] In this description, the term "application" may also include files having executable content, such as: object code, scripts, byte code, markup language files, and patches. In addition, an "application" referred to herein, may also include files that are not executable
30 in nature, such as documents that may need to be opened or other data files that need to be accessed.

[0021] The term “content” may also include files having executable content, such as: object code, scripts, byte code, markup language files, and patches. In addition, “content” referred to herein, may also include files that are not executable in nature, such as documents that may need to be opened or other data files that need to be accessed.

5 **[0022]** As used in this description, the terms “component,” “database,” “module,” “system,” and the like are intended to refer to a computer-related entity, either hardware, firmware, a combination of hardware and software, software, or software in execution. For example, a component may be, but is not limited to being, a process running on a processor, a processor, an object, an executable, a thread of execution, a program,
 10 and/or a computer. By way of illustration, both an application running on a computing device and the computing device may be a component. One or more components may reside within a process and/or thread of execution, and a component may be localized on one computer and/or distributed between two or more computers. In addition, these components may execute from various computer readable media having various data
 15 structures stored thereon. The components may communicate by way of local and/or remote processes such as in accordance with a signal having one or more data packets (e.g., data from one component interacting with another component in a local system, distributed system, and/or across a network such as the Internet with other systems by way of the signal).

20 **[0023]** In this description, the terms “communication device,” “wireless device,” “wireless telephone,” “wireless communication device,” and “wireless handset” are used interchangeably. With the advent of third generation (“3G”) wireless technology and four generation (“4G”), greater bandwidth availability has enabled more portable computing devices with a greater variety of wireless capabilities. Therefore, a portable computing
 25 device may include a cellular telephone, a pager, a PDA, a smartphone, a navigation device, a microcontroller, or a hand-held computer with a wireless connection or link.

[0024] FIG. 1 illustrates network environment 100, for enabling a hexagonal heatsink, according to one embodiment of the invention. The hexagonal heatsink comprises an electronic circuit board 101 and a plurality of heatsink components 103. The plurality of
 30 heat sink components of heatsink is further explained in the **FIGs. 2-3**.

[0025] FIG 2 illustrates an electronic circuit board 101. The electronic circuit board 101 comprises a plurality of processors. In some example embodiments the processor may be represented FPGAs, a first FPGA 105 and a second FPGA 107 placed on the

electronic circuit board 101 .In accordance with an embodiment, the processor may be of any type of processor, such as 32-bit processors using a flat address space, such as a Hitachi SH1, an Intel 80386, an Intel 960, a Motorola 68020 (or other processors having similar or greater addressing space). Processor types other than these, as well as
5 processors that may be developed in the future, are also suitable. The processor may include general processor, Digital Signal Processing (DSP) chip, an Application Specific Integrated Circuit (ASIC), Field Programmable Gate Arrays (FPGAs), AT89S52 microcontroller firmware or a combination thereof.

[0026] Processors suitable for the execution of a computer program include, by way of
10 example, both general and special purpose microprocessors, and anyone or more processors of any kind of digital computer. Generally, a processor receives instructions and data from a read only memory or a random-access memory or both. The essential elements of a computer are a processor for performing instructions and one or more memory devices for storing instructions and data. Generally, a computer also includes,
15 or be operatively coupled to receive data from or transfer data to, or both, one or more mass storage devices for storing data, e.g., magnetic, magneto optical disks, or optical disks. However, a computer need not have such devices. Moreover, a computer can be embedded in another device, e.g., a mobile telephone, a personal digital assistant (PDA), a mobile audio player, a GPS receiver, to name just a few. Computer readable media
20 suitable for storing computer program instructions and data include all forms of non-volatile memory, media, and memory devices, including by way of example semiconductor memory devices, e.g., EPROM, EEPROM, and flash memory devices; magnetic disks, e.g., internal hard disks or removable disks; magneto optical disks; and CD ROM and DVD-ROM disks. The memory may be a non-transitory medium such as a
25 ROM, RAM, flash memory, etc. The processor and the memory can be supplemented by, or incorporated in, special purpose logic circuitry.

[0027] The processes and logic flows described in the specification can be performed by one or more programmable processors executing one or more computer programs to perform functions by operating on input data and generating output. The processes and
30 logic flows can also be performed by, and apparatus can also be implemented as, special purpose logic circuitry, e.g., an FPGA (field programmable gate array) or an ASIC (application specific integrated circuit).In accordance with an embodiment, there may

exist a memory includes both dynamic memory (e.g., RAM, magnetic disk, writable optical disk, etc.) and static memory (e.g., ROM, CD-ROM, etc.).

5 [0028] The processor may be connected to a network. In accordance with an embodiment, network includes one or more networks such as a data network, a wireless network, a telephony network, or any combination thereof. It is contemplated that the data network may be any local area network (LAN), metropolitan area network (MAN), wide area network (WAN), a public data network (e.g., the Internet), short range wireless network, or any other suitable packet-switched network, such as a commercially owned, proprietary packet-switched network, e.g., a proprietary cable or fiber-optic network, and 10 the like, or any combination thereof. In addition, the wireless network may be, for example, a cellular network and may employ various technologies including enhanced data rates for global evolution (EDGE), general packet radio service (GPRS), global system for mobile communications (GSM), Internet protocol multimedia subsystem (IMS), universal mobile telecommunications system (UMTS), etc., as well as any other suitable 15 wireless medium, e.g., worldwide interoperability for microwave access (WiMAX), Long Term Evolution (LTE) networks, code division multiple access (CDMA), wideband code division multiple access (WCDMA), wireless fidelity (Wi-Fi), wireless LAN (WLAN), Bluetooth®, Internet Protocol (IP) data casting, ZigBee satellite, mobile ad-hoc network (MANET), and the like, or any combination thereof.

20 [0029] Although the present specification describes components and functions that may be implemented in particular embodiments with reference to particular standards and protocols, the invention is not limited to such standards and protocols. For example, The ZigBee or ZigBee/IEEE 802.15.4 protocol is a specification created for wireless networking. It includes hardware and software standard design for WSN (Wireless sensor 25 network) requiring high reliability, low cost, low power, scalability and low data rate. Accordingly, replacement standards and protocols having the same or similar functions as those disclosed herein are considered equivalents thereof.

[0030] In an example embodiment, there may exist a communication interface may include but not limited to traditional interfaces which include no intelligence in the 30 interface, only physical connection which could include changes in voltage levels and transformation from balanced to unbalanced signal, communication protocols which may use preprogrammed modules etc. Further, the communication interface may include

Modern interfaces, which have a high level of intelligence in the interface where a high level of intelligence in the interface is employed to execute operations.

[0031] FIG. 3A illustrates an example scenario, for enabling a hexagonal heatsink. In some example embodiments, The heatsink 103 comprises plurality of heatsink components. The plurality of heatsink components include a hexagonal baseplate 109, a plurality of vertical fins (111a to 111n), a plurality of horizontal fins (113).

[0032] The hexagonal base plate 109 enabled by a plurality of vertical fins (111a to 111n) and a plurality of horizontal fins 113. The plurality of horizontal fins 113 include a first horizontal fin 113a, a second horizontal fin 113b and a third horizontal fin 113c. Each of the horizontal fins 113 has a slot to removably be attached to any electronic circuit board. The plurality of vertical fins (111a to 111n) may also be called as trapezoidal fins. **FIG. 3B** illustrates a heatsink, for enabling firm placement on the electronic circuit board 101, according to one embodiment of the invention. Number of horizontal fins are increased to enable firm placement of heatsink on the electronic board 101. Firm placement enable protection from distortion caused by increase in heat and mechanical distortions.

[0033] FIG. 4 illustrates an example scenario for operation of the hexagonal heatsink, according to one embodiment of the invention. The plurality of components of a heatsink 103 is attached to an electronic circuit board 101. Throughout the disclosure 'heatsink' and the plurality of components of the heatsink' may interchangeably be used. The heatsink 103 is attached on the electronic circuit board 101 such that the heatsink 103 transfers the heat generated from the processors.

[0034] In an example embodiment, consider a heatsink 103 that is of rectangular shape having a certain volume. Such rectangular heatsink 103 may absorb 'X' joules of heat. Next consider a hexagonal heatsink having the same volume as the rectangular heatsink, absorbs 'X1' joules of heat, wherein magnitude of X1 is greater than X. Such advancement in heat absorption is enabled by the hexagonal shape of the heatsink 103. In some example embodiments, use of non-regular shape provides more edge surface for improved input output connections.