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(54) **DARTBOARD STRUCTURE AND ELECTRONIC DEVICE FOR THE SAME**

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(57) **ABSTRACT**

An electronic device for a dartboard structure is disclosed. The dartboard structure comprises a body with a board-surface, a sensing module, a body processing module and a first wireless communication interface. The electronic device comprises a second wireless communication interface, a central processing module and a display module. The sensing module is configured to generate a sensing signal according to the location of at least one dart being thrown to the body. The body processing module converts the sensing signal to a position signal. The location signal is transmitted from the first wireless communication interface to the second wireless communication interface of the electronic device. The central processing module of the electronic device calculates a score according to the location signal so that the display module of the electronic device can display the score.

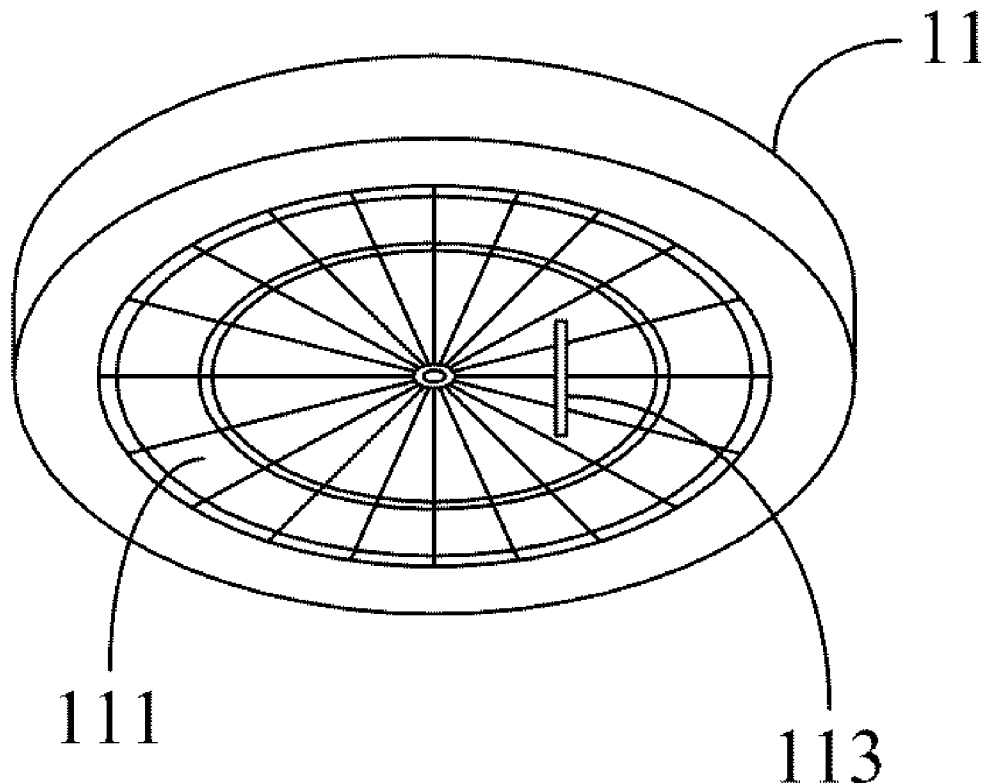
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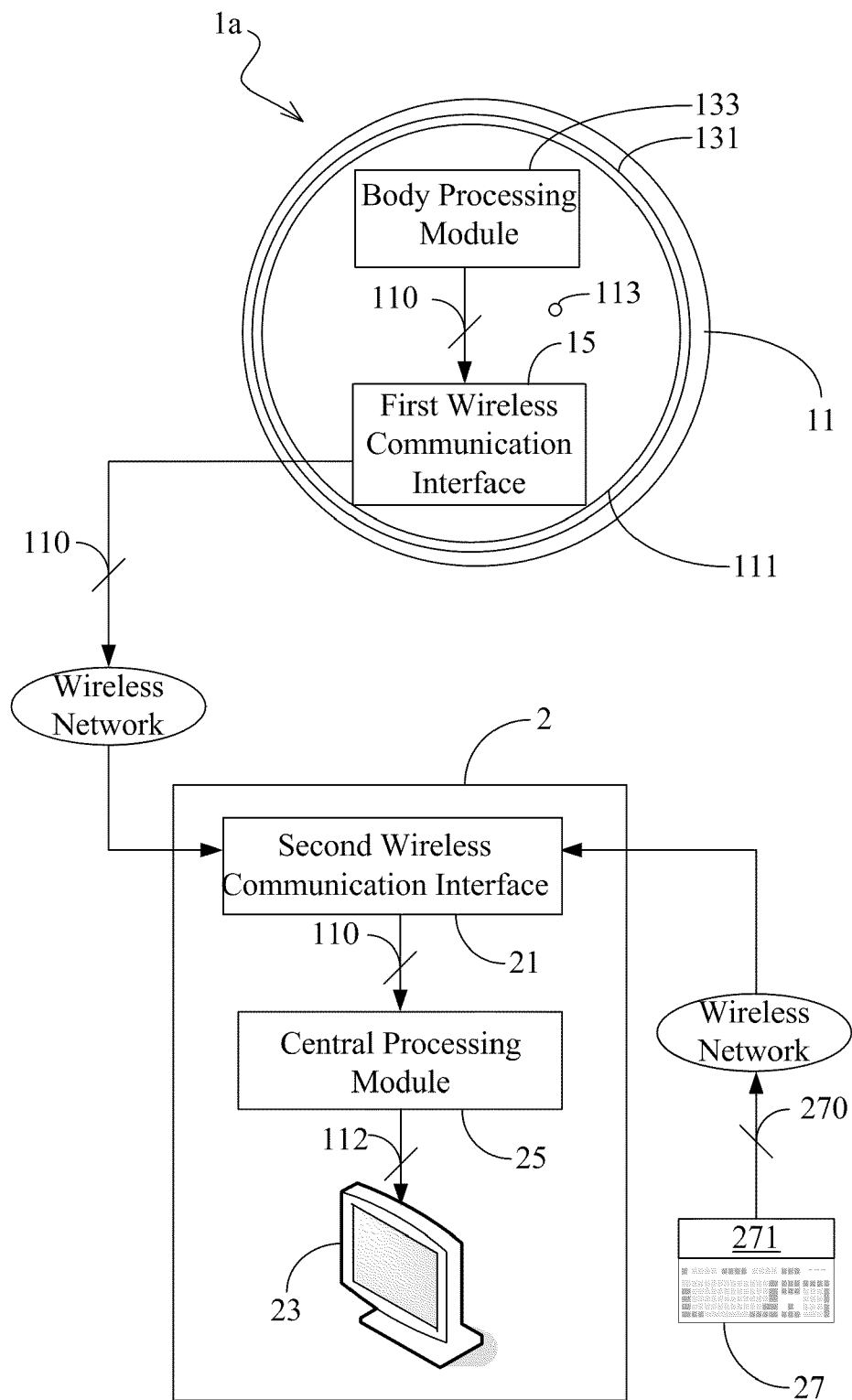


FIG. 1A

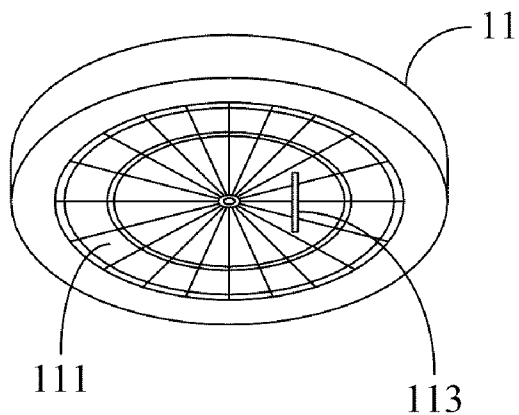


FIG. 1B

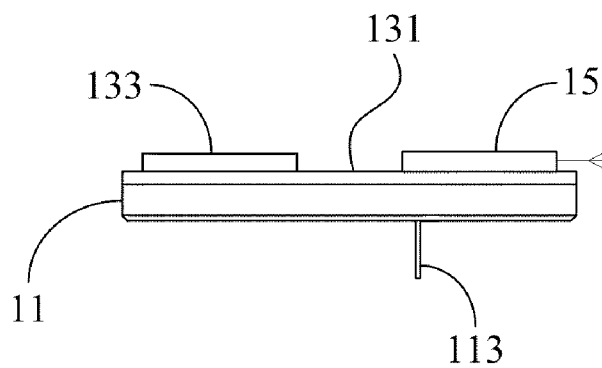


FIG. 1C

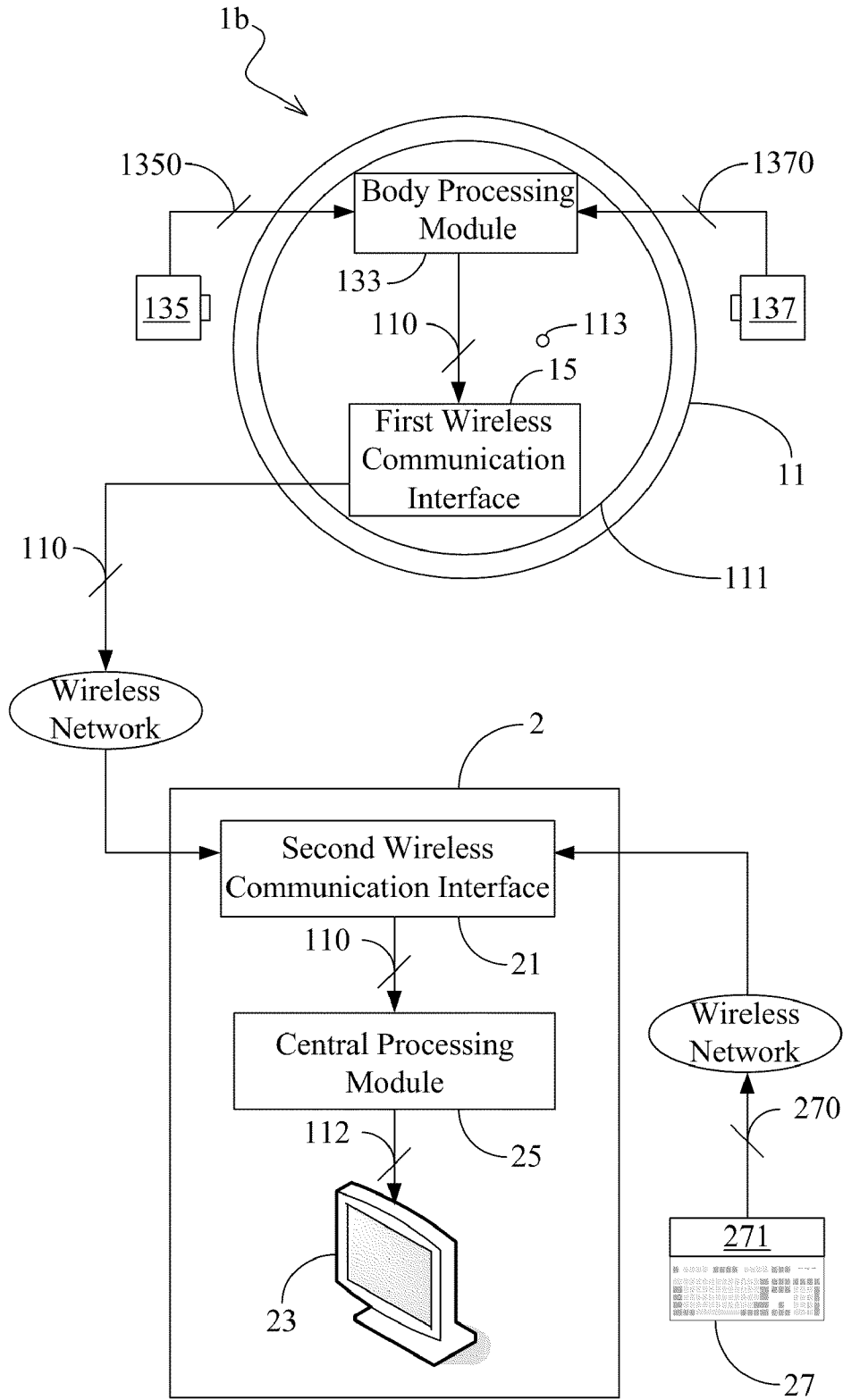


FIG. 2A

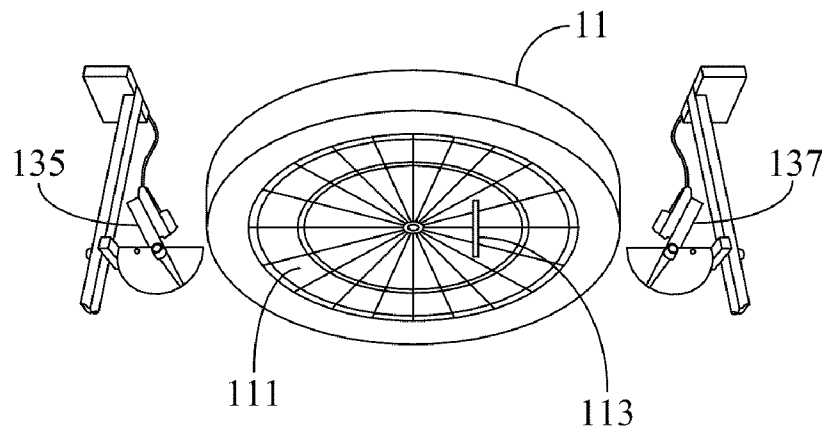


FIG. 2B

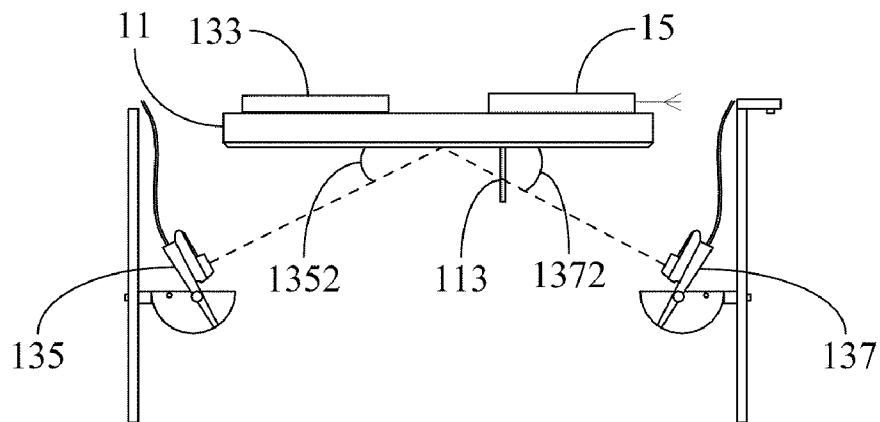


FIG. 2C

DARTBOARD STRUCTURE AND ELECTRONIC DEVICE FOR THE SAME

[0001] This application claims priority to China Patent Application No. 200920268037.7 filed on Nov. 6, 2009, the disclosures of which are incorporated by reference herein in their entirety.

CROSS-REFERENCES TO RELATED APPLICATIONS

[0002] Not applicable.

BACKGROUND OF THE INVENTION

[0003] 1. Field of the Invention

[0004] The present invention relates to an improved dartboard structure and an electronic device for the improved dartboard structure. More specifically, the present invention relates to an electronic device, which has wireless communication interfaces, for an improved dartboard structure.

[0005] 2. Descriptions of the Related Art

[0006] Dartboard competitions are played globally and have become popular due to its simple game rules and low entry requirements. The winner of the game is determined by the number of points that correspond to the area where the darts hit the board.

[0007] Following the popularity of the dartboard competitions, many types of dartboards have been developed, with the most popular being the electronic dartboard due to its automatic scoring and operation convenience. Electronic dartboards that are commonly found in the market have display modules, operation modules or other electronic hardware etc. that are mounted on the lower section of the dartboard. Thus, a user could obtain the competition information from the display module. At the same time, related operation settings can be inputted in the dartboard during the competitions.

[0008] However, when the display modules, operation modules or the electronic hardwares are mounted on the dartboard, the user may accidentally hit the hardware components with the dart, which may damage the dartboard. In addition, if the user needs to reset the dartboard during the competitions, he or she would need to walk back and forth between the throwing position and the position of the dartboard. As a result, the inconvenience can disrupt the flow of a dart throwing competition.

[0009] In view of the above shortcomings, it is important to improve the existing electronic dartboard and to develop a dartboard which is convenient to use, safe and durable.

SUMMARY OF THE INVENTION

[0010] To solve the above mentioned drawbacks, the present invention provides an improved dartboard structure and an electronic device for the dartboard structure, wherein a wireless communication method is used to transmit the set parameters and the information between the body of the dartboard and the electronic device.

[0011] To achieve the above objective, the present invention provides an improved dartboard structure and an electronic device for the improved dartboard structure.

[0012] The primary objective of this invention is to provide an improved dartboard structure and an electronic device for the improved dartboard structure. The dartboard structure comprises a body with a board-surface, a first wireless communication interface, a sensing module that is configured to generate a sensing signal according to a location of at least one dart thrown onto the body, and a body processing module that is configured to generate a location signal according to the sensing signal; wherein the location signal is transmitted from the first wireless communication interface to a second wireless communication interface of an electronic device. A central processing module of the electronic device calculates a score according to the location signal so that a display module of the electronic device displays the score.

[0013] Another objective of this invention is to provide an electronic device for a dartboard structure which comprises a body with a board-surface, a body processing module, a sensing module and a first wireless communication interface. The electronic device comprises: a central processing module, a second wireless communication interface, and a display module; wherein the sensing module generates a sensing signal according to a location of at least one dart being thrown to the body. The body processing module generates a location signal according to the sensing signal, and the location signal is transmitted from the first wireless communication interface to the second wireless communication interface. The central processing module calculates a score according to the location signal so that the display module displays the score.

[0014] The electronic device as mentioned above includes a personal computer, laptop computer, notebook computer, palmtop computer, etc and other devices which can transmit information via wireless communication.

[0015] The advantage of the present invention is that each of the electronic hardwares can be individually and independently mounted onto the electronic dartboard via the electronic device and the body that has a wireless communication interface by means of wireless transmission of the information and the set parameters, so that the electronic hardware can be protected and the flow of dart competition is smooth. Furthermore, in accordance with the present invention, the body can be connected to the electronic device with a wireless communication interface in dart competition activities, wherein the display region and the setting region of the dart body can be selectively omitted, which could greatly reduce the cost of damages of the board body. At the same time, the weight of the board body is reduced, allowing it to be portable and convenient to use.

[0016] The detailed technology and preferred embodiments implemented for the subject invention are described in the following paragraphs accompanying the appended drawings for people skilled in this field to well appreciate the features of the claimed invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] FIG. 1A is a schematic view of a first embodiment in accordance with the present invention;

[0018] FIG. 1B is a schematic perspective view of a dartboard structure of the first embodiment in accordance with the present invention.

[0019] FIG. 1C is a top view of the dartboard structure of the first embodiment in accordance with the present invention.

[0020] FIG. 2A is a schematic view of a second embodiment in accordance with the present invention;

[0021] FIG. 2B is a schematic perspective view of the dartboard structure of the second embodiment in accordance with the present invention; and

[0022] FIG. 2C is a top view of the dartboard structure of the second embodiment in accordance with the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0023] The following preferred embodiments are used to describe an improved dartboard structure and an electronic device of the dartboard structure. It should be noted that the descriptions of the preferred embodiments are used to construct the objects of the present invention and is not a limitation of the claims thereof. Those non-directly related elements of the present invention have been omitted from the drawings, and the specific dimensions of the elements shown in the drawings are meant for the construction of the invention and are not a limitation of the actual size of the elements.

[0024] FIG. 1A schematically illustrates a first embodiment of a dartboard structure 1a and an electronic device 2. FIG. 1B and FIG. 1C respectively show a perspective view and a top view of the dartboard structure of the first embodiment of the present invention. The dartboard structure 1a comprises a body 11 with a board-surface 111, a sensing module 131, a body processing module 133 and a first wireless communication interface 15. The electronic device 2 comprises a second wireless communication interface 21, a display module 23 and a central processing module 25. The sensing module 131 is a pressure sensing module.

[0025] Particularly, in the first embodiment, the sensing module 131 and the body processing module 133 are mounted on the rear of the body 11, and the body processing module 133 electrically connects to the sensing module 131. Thus, when a dart 113 is thrown onto the board-surface 111, the sensing module 131 generates a pressure signal (not shown) in accordance with the pressure caused by the dart 113 being thrown onto the board-surface 111. After that, the body processing module 133 determines the location of the dart 113 according to the pressure signal generated by the sensing module 131, and generates a location signal 110.

[0026] The body processing module 133 actively and continuously detects the sensing module 131 whether or not a pressure signal is generated. Once a pressure signal is detected, the location of the dart 113 can be determined and generates a location signal. It should be noted that the sensing module 131 can be mounted, in a plate-like manner, on the rear of the body 11, or can be mounted on different locations on the body 11 in various regions. The objective is to correctly sense the pressure not to limit the disposition of the sensing module 131.

[0027] After the body processing module 133 generates the location signal 110 according to the location of the dart 113, the body processing module 133 transmits the location signal 110 to the first wireless communication interface 15. Then, the first wireless communication interface 15 transmits the location signal 110 to the second wireless communication interface 21 of the electronic device 2 by way of wireless communication. After the second wireless communication interface 21 receives the location signal 110, the central processing module 25 of the electronic device 2 calculates a score 112 according to the location signal 110 based on a set of scoring rules, and the display module 23 will display the score 112 represented by the location of the dart 113 thrown onto the board-surface 111. It should be appreciated that other than displaying the score represented by the location of the dart 113 thrown onto the surface 111, the display module 23

of the electronic device 2 also displays other various information (not shown) of the dart competition. The information of the dart competition includes user reference number, a thrown dart number and an accumulation score, etc.

[0028] Furthermore, to facilitate the operation by the user in the first embodiment, an input module 27 is also incorporated, and the input module 27 includes a third wireless communication interface 271. When the input module 27 receives a user configuration 270 inputted by a user, the user configuration 270 is then transmitted to the second wireless communication interface 21 of the electronic device 2 via the third wireless communication interface 271. Thus, the user can complete the operation of the electronic device 2. The operation of the electronic device 2 is via wireless communication, hence, the user does not need to walk back and forth between the body 11 and the electronic device 2 to operate the electronic device 2, which might have otherwise interfered with the flow of competition. The user can stand at the dart 113 throwing position only to complete the operations of the electronic device 2 via the input module 27 which is with the wireless communication function. The structure of the dart board 1a can be mounted with a plurality of buttons (not shown). When the user has removed the dart 113, the user can press the button at the same time to send a signal of switching users or a signal of ending the scoring of the competition. The transmission of the signals above is similar to that of the location signal and accordingly, further explanation is omitted.

[0029] In the course of throwing the dart, the sensing module 131 cannot determine whether the user has completed the throwing action. For instance, if the user misses a throw onto the board-surface 111, the user can use the input module 27 with the wireless transmission function to set the completion of the throw for the electronic device 2 such that the dart competition can be fairly continued. It should be noted that the input module 27 is not restricted to only the input module with a wireless transmission function. The input module 27 can also be wired to the electronic device 2. In the first embodiment, the input module 27 is a keyboard. However, this is not restricted to the present invention, any type of similar device with a wireless transmission function which could achieve the transmission of user configuration 270 can also be used as an input module 27, for instance, a mouse or a remote controller which are normally seen in the market.

[0030] It is noted that the best communication method for the first wireless communication interface 15, the second wireless communication interface 21 and the third wireless communication interface 271 is bidirectional multiple frequency protocol. The bidirectional protocol is used to ensure that two wireless communication interfaces have received mutual signals from each other so that the information transmission is affirmed. The multiple frequency protocols are used to prevent interferences from other users in the same frequency. However, the method of transmission is not limited, and among the first wireless communication interface 15, the second wireless communication interface 21 and the third wireless communication interface 271, the same frequency can be used to proceed with respective signal transmission. A first frequency transmission can also be used between the first wireless communication interface 15 and the second wireless communication interface 21, while a second frequency which is different from the first frequency is used between the second wireless communication interface 21 and the third wireless communication interface 271.

[0031] FIG. 2A illustrates a second embodiment of the dartboard structure **1b** and the electronic device **2**. FIG. 2B and FIG. 2C show the perspective view and top view of the dartboard structure **1b** of the second embodiment respectively. In the second embodiment, the operation and configuration of the individual components are similar to that of the first embodiment. The components with the same reference numbers have the same functions and, hence, further explanations are omitted. Unlike the first embodiment, the sensing modules of the second embodiment are a first image capturing module **135** and a second image capturing module **137**. The images captured by the image capturing modules **135**, **137** are the sensing signals of the sensing modules.

[0032] Specifically, in the second embodiment, the first image capturing module **135** and the second image capturing module **137** are electrically connected to the body processing module **133**. Thus, when a dart **113** is thrown to the board-surface **111**, the image capturing module **135** captures the first image **1350** of the board-surface **111** at a first angle **1352** in response to the change of the image of the board-surface **111**. The second image capturing module **137** captures a second image **1370** of the board-surface **111** at a second angle **1372** in response to the change of the image of the board-surface **111**. Then, after the body processing module **133** receives the first image **1350** and the second image **1370**, the body processing module **133** analyses the image changes of the board-surface **111** and generates a location signal **110**. Similarly, the body processing module **133** actively and continuously determines whether an image is produced by the first image capturing module **135** and the second image capturing module **137**. Upon detection of the generated image, the images are signally processed to generate a location signal **110**.

[0033] Like the first embodiment, after the body processing module **133** generates the location signal **110** according to the location of the dart **113**, the body processing module **133** of the second embodiment transmits the location signal **110** to the first wireless communication interface **15**. Then, the first wireless communication interface **15** transmits the location signal **110** to the second wireless communication interface **21** by means of wireless communication. After the second wireless communication interface **21** receives the location signal **110**, the electronic device **2** triggers the central processing module **25** to calculate the location signal **110** based on the regulated scoring rules to obtain a score **112**. After that, the display module displays the score **112** represented by the location of the dart **113** thrown onto the board-surface **111**.

[0034] It should be noted that in the second embodiment, the number of image capturing modules is not restricted to two, but can be increased, for instance, to three or four, to achieve a more complete function.

[0035] In view of the description of the embodiments, the dartboard structure and the electronic device for the dartboard structure can communicate through wireless communication. Thus, the individual hardware components can be independently mounted to reduce damages to the device of the prior art due to darts hitting the dartboard in the wrong areas. In addition, the user can make various related configuration at the throwing location in the course of the competition via wireless input devices to enhance the smooth flow of the competition.

[0036] The above disclosure is related to the detailed technical contents and inventive features thereof. People skilled in this field may proceed with a variety of modifications and

replacements based on the disclosures and suggestions of the invention as described without departing from the characteristics thereof. Nevertheless, although such modifications and replacements are not fully disclosed in the above descriptions, they have substantially been covered in the following claims as appended.

What is claimed is:

1. An electronic device for a dartboard structure, the dartboard structure comprising a body with a board-surface, a body processing module, a sensing module and a first wireless communication interface, the electronic device comprising:

- a central processing module;
- a second wireless communication interface; and
- a display module;

wherein the sensing module generates a sensing signal according to a location of at least one dart being thrown to the body, the body processing module generates a location signal according to the sensing signal, and the location signal is transmitted from the first wireless communication interface to the second wireless communication interface, the central processing module calculates a score according to the location signal so that the display module displays the score.

2. The electronic device as claimed in claim 1, wherein a user transmits a user configuration to the electronic device via an input module for manipulating the electronic device.

3. The electronic device as claimed in claim 2, wherein the input module further comprises a third wireless communication interface, the user configuration is transmitted from the third wireless communication interface to the second wireless communication interface for manipulating the electronic device.

4. The electronic device as claimed in claim 3, wherein the input module is a mouse.

5. The electronic device as claimed in claim 3, wherein the input module is a keyboard.

6. The electronic device as claimed in claim 3, wherein the input module is a remote control device.

7. The electronic device as claimed in claim 1, wherein the display module is further configured to display competition information.

8. The electronic device as claimed in claim 7, wherein the competition information comprises a user identification, a thrown dart number and an accumulation score.

9. A dartboard structure, comprising:

- a body having a board-surface;
- a first wireless communication interface;
- a sensing module being configured to generate a sensing signal according to a location of at least one dart being thrown to the body; and

a body processing module being configured to generate a location signal according to the sensing signal; wherein the location signal is transmitted from the first wireless communication interface to a second wireless communication interface of an electronic device, a central processing module of the electronic device calculates a score according to the location signal so that a display module of the electronic device displays the score.

10. The dartboard structure as claimed in claim 9, wherein the sensing module comprises a first image capturing module and a second image capturing module, the body processing module is electrically connected to the first and second image capturing modules, the first image capturing module captures

a first image of the board-surface at a first angle and the second image capturing module captures a second image of the board-surface at a second angle while the at least one dart is thrown to the body, and the body processing module generates the location signal according to the first image and the second image.

11. The dartboard structure as claimed in claim 9, wherein the sensing module is a pressure sensing module, the body

processing module is electrically connected to the pressure sensing module, the pressure sensing module senses a pressure caused by the at least one dart and generates a pressure signal while the at least one dart is thrown to the body, and the body processing module generates the location signal according to the pressure signal.

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