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(54) **TENNIS SCORING AND DISPLAY SYSTEMS AND METHODS**

(57) **ABSTRACT**

(71) Applicant: **John James ROWSEY**, SARASOTA, FL (US)

(72) Inventor: **John James ROWSEY**, SARASOTA, FL (US)

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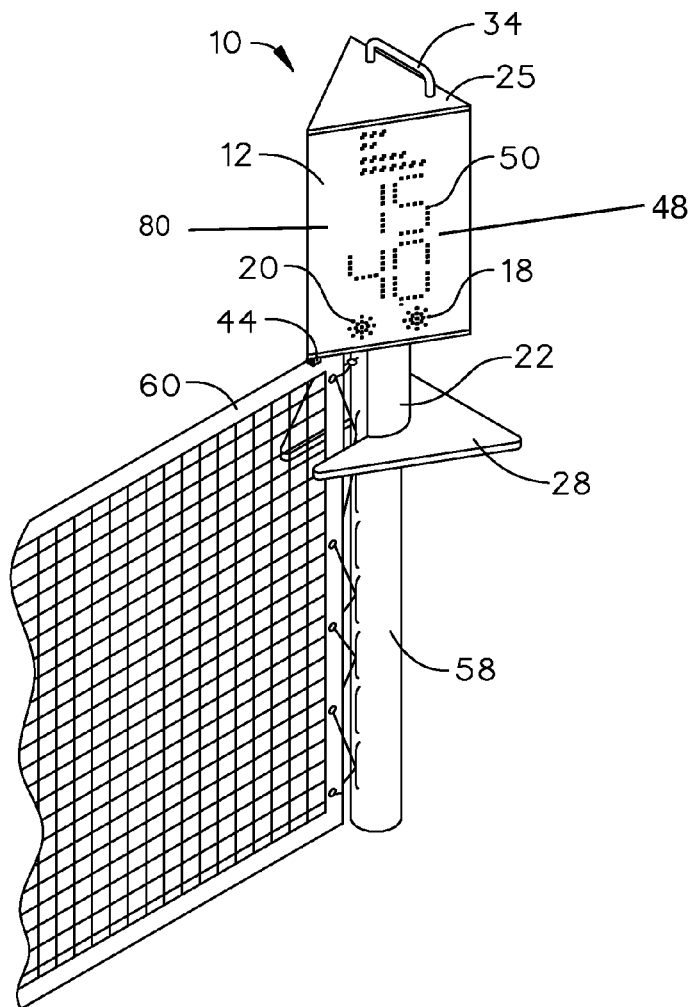
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A scoring and display system is provided. The scoring and display system may include a weather and waterproof display housing providing a plurality of display screens electronically interconnected to a sound system, a power source and a control circuitry. The control circuitry may be configured to store and recognize a voice imprint of at least one predetermined game player. The control circuitry may be configured to store and recognize a plurality of scoring nomenclature, voice instructions and game commands of the at least one predetermined game player. The control circuitry may be configured to make the plurality of display screens and the sound system voice operable by and interactive to only the at least one predetermined game player. The plurality of display screens may be designed to represent the plurality of scoring nomenclature, voice instructions and game commands electronically through the plurality of display screens and audibly through the sound system. The scoring and display system is adaptable of a plurality of athletic competitions, including tennis.



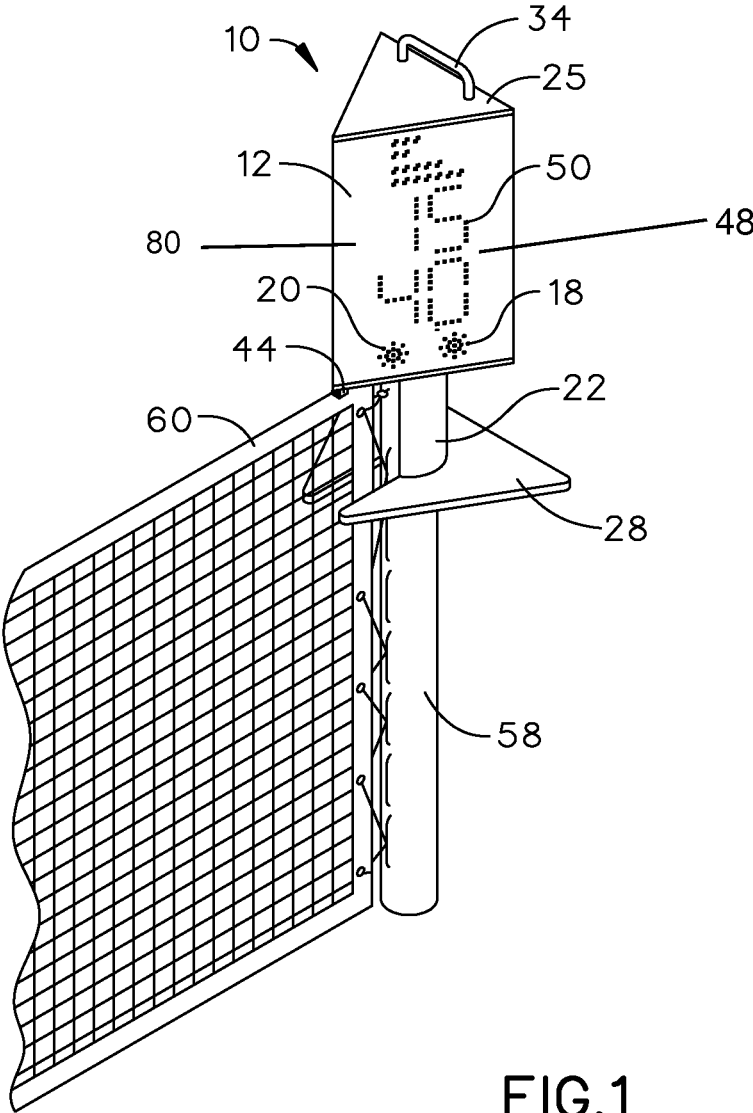


FIG. 1

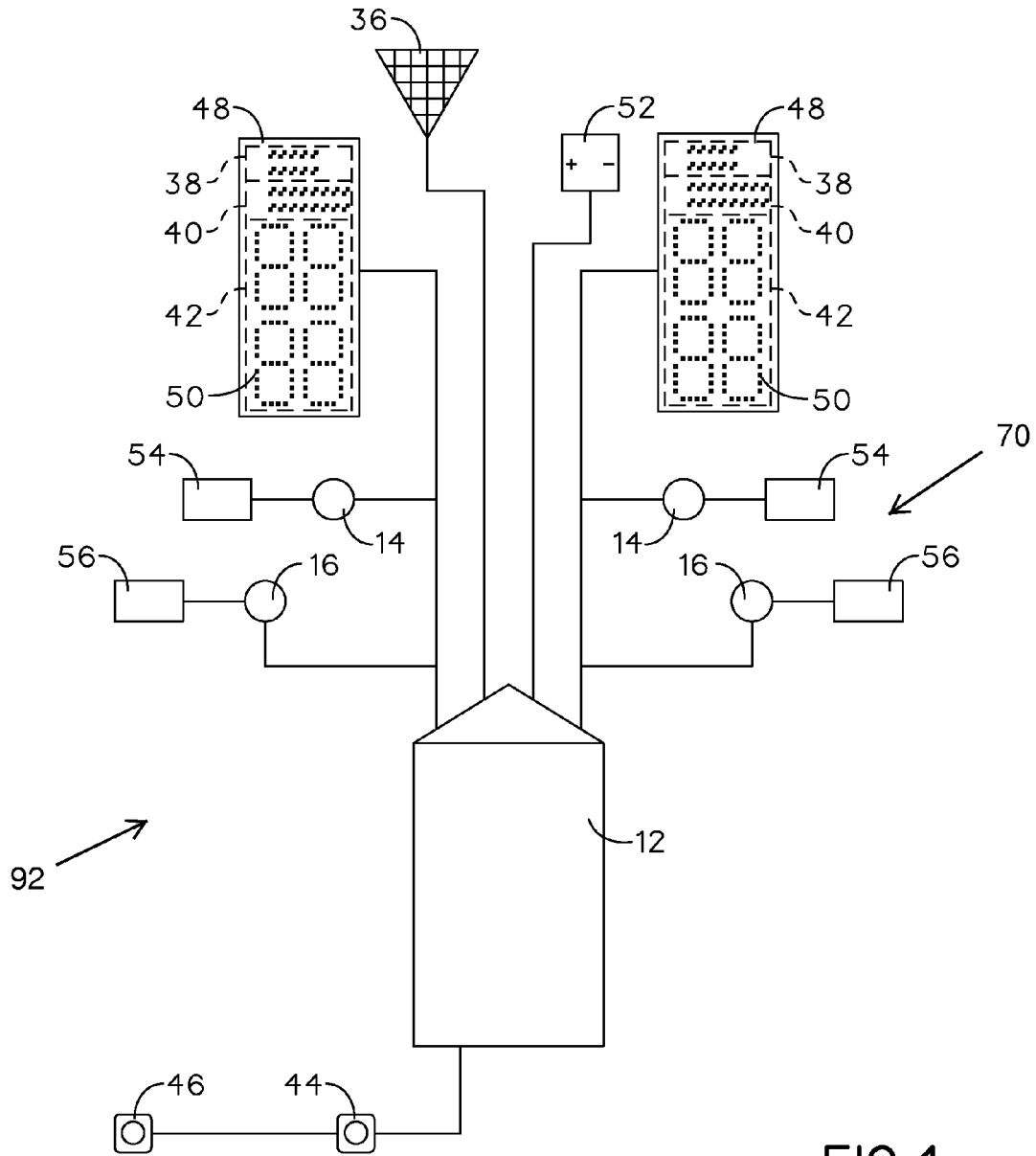


FIG. 4

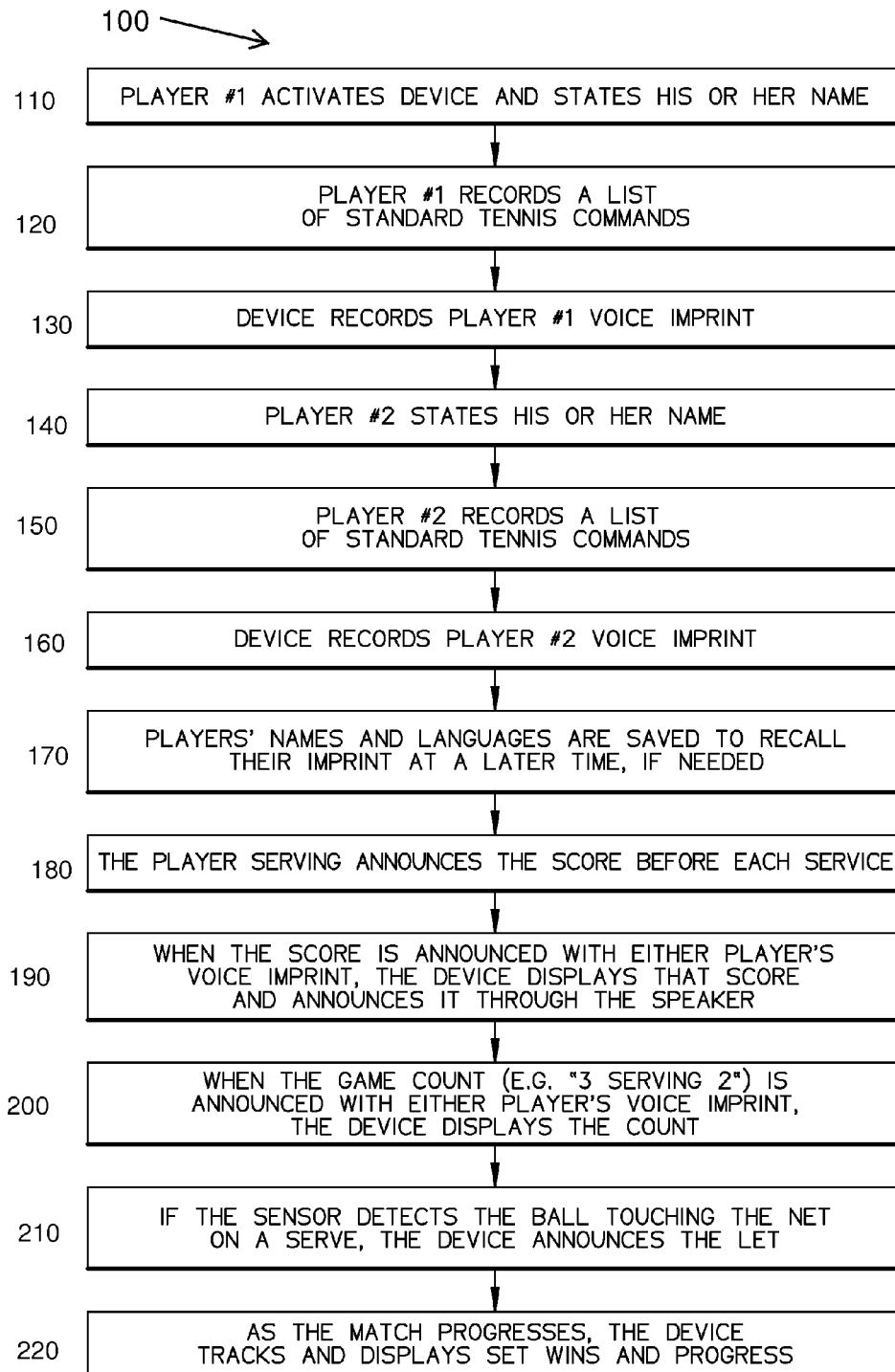


FIG.5

TENNIS SCORING AND DISPLAY SYSTEMS AND METHODS

BACKGROUND OF THE INVENTION

[0001] The present invention relates to scoring systems and, more particularly, to tennis scoring and display systems and methods.

[0002] Tennis players frequently forget the game score during the match and so must agree on the last score they remember. Pursuant to the official rules, the score must be spoken before the next serve is legal. As a result, the use of a scoreboard which presents and announces the score is helpful.

[0003] However, current scoreboards require that the participant or judge touch the scoreboard to change the score, or otherwise manually input a new score via a handheld device, interfering with the run of play of the participants, and otherwise adding a manual step to the scoring process. And in the case of the handheld device, adding equipment that can malfunction, can break or can be misplaced.

[0004] As can be seen, there is a need for tennis scoring and display systems and methods that are voice operable.

SUMMARY OF THE INVENTION

[0005] In one aspect of the present invention, a scoring and display system for an athletic competition comprises: a display housing have a plurality of display faces defining a compartment space; a display screen provided by at least one display face, wherein each display screen includes at least one electromechanical display, electromagnetic display, dot matrix display, e-ink, light-emitting diode array, liquid crystal display, and plasma display; a sound system configured for recording audible signals, wherein the sound system provides at least one directional microphone for receiving audible signals; and a control circuitry electronically interconnecting each display screen and the sound system, wherein the control circuitry is configured to identify a plurality of game commands received through the at least one directional microphone so as to produce responsive electronic representations on each display screen.

[0006] In another aspect of the present invention, a scoring and display system for an athletic competition, comprises: a display housing have a plurality of display faces defining a compartment space; a display screen provided by at least one display face, wherein each display screen includes at least one electromechanical display, electromagnetic display, dot matrix display, e-ink, light-emitting diode array, liquid crystal display, and plasma display; a sound system configured for recording audible signals, wherein the sound system comprising: at least one directional microphone for receiving audible signals; and at least one speaker for producing audible signals; a control circuitry electronically interconnecting each display screen and the sound system, wherein the control circuitry is configured for voice recognition by identifying at least one voice imprint; and a program product comprising machine-readable program code for causing, when executed, the control circuitry to perform the following process steps: prompting at least one game player to record the at least one voice imprint via the at least one directional microphone; prompting the at least one game player to record on the at least one directional microphone a plurality of scoring command for the athletic competition comprising at least one scoring system based on acquiring points; storing each recognized voice imprint; receiving via the at least one directional micro-

phone audible signals comprising at least one scoring command found within the plurality of scoring commands; rewarding the at least one game player at least one acquired point based at least in part on the scoring system and the at least one scoring command comprising the at least one recognized voice imprint; and producing on each display screen an electronic representation of the acquired points of the at least one game player.

[0007] In another aspect of the present invention, method of scoring and displaying an athletic completion, comprises: providing a scoring and display system comprising: a display housing have a plurality of display faces defining a compartment space; a display screen provided by each display face, wherein each display screen includes at least one electromechanical display, electromagnetic display, dot matrix display, light-emitting diode array, liquid crystal display, and plasma display; a sound system configured for recording audible sounds, wherein the sound system comprising: at least one directional microphone for receiving audible signals; and at least one speaker for producing audible signals; a net sensor configured to detect motion of an adjacent net and a speed of a nearby ball; and a control circuitry electronically interconnecting each display screen, the sound system and the net sensor, wherein the control circuitry is configured to receive audible signals from the at least one directional microphone so as to convert voice instructions therein to responsive electronic representations via each display screen, and wherein the control circuitry is configured for individual voice recognition and voice operability; prompting at least one game player to record a voice imprint via the microphone; prompting the at least one game player to record a set of scoring commands for the athletic competition comprising at least one scoring system based on acquiring points; storing each recognized voice imprint; receiving audible sounds containing at least one scoring command found within the set of scoring commands; rewarding the at least one game player at least one acquired point based at least in part on the scoring system and the at least one scoring command having a recognized voice imprint; and producing on at least one display screen an electronic representation of the acquired points of the at least one game player.

[0008] These and other features, aspects and advantages of the present invention will become better understood with reference to the following drawings, description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a perspective view of an exemplary embodiment of the present invention, shown in use;

[0010] FIG. 2 is a perspective view of an exemplary embodiment of the present invention;

[0011] FIG. 3 is a partial exploded view of an exemplary embodiment of the present invention;

[0012] FIG. 4 is a schematic view of an exemplary embodiment of the present invention; and

[0013] FIG. 5 is a flow chart of an exemplary embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0014] The following detailed description is of the best currently contemplated modes of carrying out exemplary embodiments of the invention. The description is not to be taken in a limiting sense, but is made merely for the purpose

of illustrating the general principles of the invention, since the scope of the invention is best defined by the appended claims.

[0015] Broadly, an embodiment of the present invention provides a scoring and display system. The scoring and display system may include a weather and waterproof display housing providing a plurality of display screens electronically interconnected to a sound system, a power source and a control circuitry. The control circuitry may be configured to store and recognize a voice imprint of at least one predetermined game player. The control circuitry may be configured to store and recognize a plurality of scoring nomenclature, voice instructions and game commands of the at least one predetermined game player. The control circuitry may be configured to make the plurality of display screens and the sound system voice operable by and interactive to only the at least one predetermined game player. The plurality of display screens may be designed to represent the plurality of scoring nomenclature, voice instructions and game commands electronically through the plurality of display screens and audibly through the sound system. The scoring and display system is adaptable of a plurality of athletic competitions, including tennis.

[0016] Referring to FIGS. 1 through 4, the present invention may include a scoring and display system 10. The scoring and display system 10 may include a display housing 12, a plurality of display screens 48, a sound system 70, a power source 52 and a control circuitry 92.

[0017] The display housing 12 may be made of any material that is weather and waterproof so as to define a compartment space encasing components therein so as to make said compartment space weather and waterproof. The display housing 12 may include a top plate 25 and a plurality of display faces 80 defining the compartment space. The display housing 12 may have a generally triangular prism configuration with three display faces 80. The display housing 12 can be substantially cylindrical, conical or other geometric shapes with a plurality of display faces 80 so long as the scoring and display system 10 functions in accordance with the present invention as described herein. The plurality of display faces 80 may include the plurality of display screens 48, a plurality of speaker holes 18 and a plurality of microphone holes 20. Each display face 80 may each have one display screen 48, one speaker hole 18 and one microphone hole 20.

[0018] The top plate 25 may provide a handle 34 for manually transporting the scoring and display system 10. The display housing 12 may provide at least one hook 32 for removably mounting the scoring and display system 10.

[0019] In certain embodiments, the scoring and display system 10 may include a net post fastener 90. The net post fastener 90 may include a bottom plate 26 configured to enclose the compartment space opposite of the top plate 25. The bottom plate 26 may be fixed to a support post 22 forming a post notch 24. In certain embodiments, the support post 22 may terminate in a base plate 28, wherein the base plate 28 forms a complementary base notch 30. Each notch 24, 30 may be configured to removably mount to a net post 58.

[0020] The power source 52, as illustrated in FIG. 4, may include any type of power or battery source including rechargeable or disposable batteries as well as common AC power. The power source 52 may be recharged and/or supplemented by solar cells 36.

[0021] Each display screen 48 may include a set score display area 38, a game score display area 40 and a point set score display area 42. Each display screen 48 may include

translucent material such as a translucent glass or plastic material combined with a light source 50. The light source 50 may include at least one electromechanical display, electro-magnetic display, e-ink, dot matrix display, light-emitting diode array, liquid crystal display, and/or plasma display. In certain embodiments, the light source 50 may include a plurality of printed circuit boards providing light-emitting diode (LED) numeric arrays. The light source 50 may be configured to electronically represent numbers, characters and letters. The power source 52 may be electrically connected to the light source 50 for providing electrical power thereto.

[0022] The sound system 70 may be designed for recording and playing back audible signals such as the scores tallied during a tennis match, a plurality of voice instructions, game commands and the like. The sound system 70 may include a plurality of directional microphones 16 for receiving audible signals. Each directional microphone 16 of the sound system 70 may be provided adjacent to the exterior side surface of the display housing 12 near the complementary microphone holes 20. Each directional microphone 16 may be electronically connected to a voice receiver 56 and the light source 50.

[0023] The sound system 70 may include a plurality of speakers 14 for projecting audible signals, such as the English-language scores tallied during a tennis match, a plurality of voice instructions, game commands, and the like. In certain embodiments, the projected audible signals are provided in a plurality of pre-programmed languages, as chosen by the users. Each speaker 14 of the sound system 70 may be provided adjacent to the exterior side surface of the display housing 12 near the complementary speaker holes 18. Each speaker 14 may be electronically connected to an amplifier 54 and the light source 50.

[0024] In certain embodiments, the sound system 70 may be adapted to record a voice imprint of at least one user. The voice imprint may allow the scoring system and method 10 to recognize the voice and the voice modulations of each of the plurality of users so as to avoid non-participants (e.g. players from adjacent courts) from interfering with the scoring system and method 10. In certain embodiments, the sound system 70 may be adapted to record a plurality of game commands and a plurality of voice instructions associated with the voice imprint of at least one user.

[0025] The sound system 70 preferably has a recording switch provided on the exterior side surface of the display housing 12 for controlling the volume of the sound system 70.

[0026] In certain embodiments, the scoring and display system 10 may provide a net sensor 44 configured to detect movement of, among other things, a ball, a net 60, and the like. The net sensor 44 may be electronically interconnected to a net sensor receiver 46 and the control circuitry 92.

[0027] The control circuitry 92 may be provided within the compartment space. The control circuitry 92 may include at least one processing element, such as a micro processor, and a form of memory. The control circuitry 92 may be designed for individual voice recognition and voice operability. The control circuitry 92 may be configured to receive audible signals so as to filter out audible signals not having the voice imprint of the at least one predetermined game player. The control circuitry 92 may be configured to filter audible signals so as to identify the plurality of recorded game commands and voice instructions of the at least one predetermined game player. The control circuitry 92 may be electronically connected to the light source 50 on each display screen 48 so as to produce electronic representations of the plurality of game

commands and voice instructions thereon. The control circuitry 92 may be electronically connected to the sound system 70 so as to project through the plurality of speakers 14 audible representations of the plurality of game commands and voice instructions of the at least one predetermined game player.

[0028] The control circuitry 92 may be configured to receive electronic representations of the output of the net sensor 44 and/or the net sensor receiver 46. In certain embodiments, the ball speed as the ball crosses the net 60 may be electronically represented by the light source 50 through the game score display area 40 and may be projected through the plurality of speakers 14 as an audible representation. Likewise, movement of the net 60 detected by the net sensor 44 may be represented by the light source 50 and the plurality of speakers 14.

[0029] The control circuitry 92 may include at least one computer with a user interface. The computer may include any computer including, but not limited to, a desktop, laptop, and smart device, such as, a tablet and smart phone. The computer includes a program product including a machine-readable program code for causing, when executed, the computer to perform steps. The program product may include software which may either be loaded onto the computer or accessed by the computer. The loaded software may include an application on a smart device. The software may be accessed by the computer using a web browser. The computer may access the software via the web browser using the internet, extranet, intranet, host server, internet cloud and the like.

[0030] Referring to FIG. 5, a method of using 100 the present invention may include the following. The scoring and display system 10 disclosed above may be provided and mounted near a playing area. A user may activate (turn on) the scoring and display system 10 and, in step 110 and in step 140, each game player may state his or her name. The method 100 may include the scoring and display system 10 prompting each game player to speak so as to record a voice imprint of the at least one game player, in step 130 and step 160. The scoring and display system 10 may prompt each game player to speak so as to record a plurality of standard game (e.g. tennis) commands, scoring nomenclature and voice instructions, in step 120 and step 150. In certain embodiments, the recordation may require each game player to repeat themselves for confirmatory purposes.

[0031] In step 170, the scoring and display system 10 records and saves for recall the voice imprints for the at least one game player. When playing the contest, the game player serving may announce a predetermined score before each service, in step 180. When the predetermined score is announced with a recognized voice imprint, the scoring and display system 10 displays the predetermined score and announces the predetermined score through the plurality of speakers 14, in step 190. When the game count (e.g., “3 serving 2”) is announced with either game player’s recognized voice imprint, the scoring and display system 10 displays the predetermined count (here “3 serving 2”) in step 200. If the net sensor 44 detects the ball touching the net 60 on a service, the scoring and display system 10 may announce a ‘let’, in step 210. As the match progresses, the scoring and display system 10 may track and represent game, set and match wins, in step 220, as well as display earlier scoring.

[0032] In an alternative embodiment, the voice activation could be replaced by a key fob, similar to a remote key chain with one or more keys. With three keys, score up, score down,

reset are anticipated. The key chain could be removably attached to at least one game player’s apparel so as to allow for remote score changing during the match, by touching the appropriate keys. Voice activation of individual keys is anticipated. This alternative would still have the predetermined score announced by the scoring and display system 10.

[0033] Though most examples provided herein relate to the sport of tennis, it should be understood that the scoring and display system 10 may be applicable to a wide array of other athletic endeavors, such as pickle ball, baseball, football, basketball, soccer, racket ball, squash, volley ball and the like.

[0034] The computer-based data processing system and method described above is for purposes of example only, and may be implemented in any type of computer system or programming or processing environment, or in a computer program, alone or in conjunction with hardware. The present invention may also be implemented in software stored on a computer-readable medium and executed as a computer program on a general purpose or special purpose computer. For clarity, only those aspects of the system germane to the invention are described, and product details well known in the art are omitted. For the same reason, the computer hardware is not described in further detail. It should thus be understood that the invention is not limited to any specific computer language, program, or computer. It is further contemplated that the present invention may be run on a stand-alone computer system, or may be run from a server computer system that can be accessed by a plurality of client computer systems interconnected over an intranet network, or that is accessible to clients over the Internet. In addition, many embodiments of the present invention have application to a wide range of industries. To the extent the present application discloses a system, the method implemented by that system, as well as software stored on a computer-readable medium and executed as a computer program to perform the method on a general purpose or special purpose computer, are within the scope of the present invention. Further, to the extent the present application discloses a method, a system of apparatuses configured to implement the method are within the scope of the present invention.

[0035] It should be understood, of course, that the foregoing relates to exemplary embodiments of the invention and that modifications may be made without departing from the spirit and scope of the invention as set forth in the following claims.

What is claimed is:

1. A scoring and display system for an athletic competition comprising:

- a display housing have a plurality of display faces defining a compartment space;
- a display screen provided by at least one display face, wherein each display screen includes at least one electromechanical display, electromagnetic display, dot matrix display, e-ink, light-emitting diode array, liquid crystal display, and plasma display;
- a sound system configured for recording audible signals, wherein the sound system provides at least one directional microphone for receiving audible signals; and
- a control circuitry electronically interconnecting each display screen and the sound system, wherein the control circuitry is configured to identify a plurality of game commands received through the at least one directional microphone so as to produce responsive electronic representations on each display screen.

2. The scoring and display system of claim 1, further including at least one speaker electronically connected to the sound system.

3. The scoring and display system of claim 2, wherein the control circuitry is configured to produce responsive audible representations of the plurality of game commands through the at least one speaker.

4. The scoring and display system of claim 3, wherein the control circuitry is configured for voice recognition by identifying at least one voice imprint, and wherein the representation of the plurality of game commands comprises the audible signal having the at least one voice imprint.

5. The scoring and display system of claim 1, further providing a net sensor disposed along at least one display face, wherein the net sensor is electronically connected to the control circuitry, and wherein the net sensor is configured to determine the movement and speed of at least one adjacent net and nearby ball.

6. The scoring and display system of claim 5, further providing a net post fastener comprising:

a bottom plate removably connected to at least one display face, wherein the bottom plate has a top surface and a bottom surface, wherein the top surface encloses the compartment space;

a post connected normal to the bottom surface, wherein the opposing end of the post terminates in a base plate generally parallel with the bottom plate; and

a post notch formed in the base plate and the post.

7. A scoring and display system for an athletic competition, comprising:

a display housing have a plurality of display faces defining a compartment space;

a display screen provided by at least one display face, wherein each display screen includes at least one electromechanical display, electromagnetic display, dot matrix display, e-ink, light-emitting diode array, liquid crystal display, and plasma display;

a sound system configured for recording audible signals, wherein the sound system comprising:

at least one directional microphone for receiving audible signals; and

at least one speaker for producing audible signals;

a control circuitry electronically interconnecting each display screen and the sound system, wherein the control circuitry is configured for voice recognition by identifying at least one voice imprint; and

a program product comprising machine-readable program code for causing, when executed, the control circuitry to perform the following process steps:

prompting at least one game player to record the at least one voice imprint via the at least one directional microphone;

prompting the at least one game player to record on the at least one directional microphone a plurality of scoring command for the athletic competition comprising at least one scoring system based on acquiring points;

storing each recognized voice imprint;

receiving via the at least one directional microphone audible signals comprising at least one scoring command found within the plurality of scoring commands;

rewarding the at least one game player at least one acquired point based at least in part on the scoring

system and the at least one scoring command comprising the at least one recognized voice imprint; and producing on each display screen an electronic representation of the acquired points of the at least one game player.

8. The scoring and display system of claim 7, further providing producing through the at least one speaker an audible representation of the acquired points of the at least one game player.

9. A method of scoring and displaying an athletic competition, comprising:

providing a scoring and display system comprising: a display housing have a plurality of display faces defining a compartment space; a display screen provided by each display face, wherein each display screen includes at least one electromechanical display, e-ink, electromagnetic display, dot matrix display, light-emitting diode array, liquid crystal display, and plasma display; a sound system configured for recording audible sounds, wherein the sound system comprising: at least one directional microphone for receiving audible signals; and at least one speaker for producing audible signals; a net sensor configured to detect motion of an adjacent net and a speed of a nearby ball; and a control circuitry electronically interconnecting each display screen, the sound system and the net sensor, wherein the control circuitry is configured to receive audible signals from the at least one directional microphone so as to convert voice instructions therein to responsive electronic representations via each display screen, and wherein the control circuitry is configured for individual voice recognition and voice operability; prompting at least one game player to record a voice imprint via the microphone;

prompting the at least one game player to record a set of scoring commands for the athletic competition comprising at least one scoring system based on acquiring points;

storing each recognized voice imprint;

receiving audible sounds containing at least one scoring command found within the set of scoring commands;

rewarding the at least one game player at least one acquired point based at least in part on the scoring system and the at least one scoring command having a recognized voice imprint; and

producing on at least one display screen an electronic representation of the acquired points of the at least one game player.

10. The method of claim 9, further providing producing on the at least one speaker an audible representation of the acquired points of the at least one game player.

11. The method of claim 10, further providing the audible representation of the acquired points simultaneously with the electronic representation of the acquired points.

12. The method of claim 11, wherein the audible representation of the acquired points is provided in a variety of programmed languages.

13. The method of claim 9, further including producing on at least one display screen an electronic representation of a let when the net sensor detects motion of the adjacent net during a let serve.

14. The method of claim 13, further providing on at least one speaker the audible representation of the let.

15. The method of claim **13**, further providing producing on at least one display screen an electronic representation of the speed of the nearby ball as determined by the net sensor.

16. The method of claim **15**, further providing on at least one speaker the audible representation of the speed of the nearby ball as determined by the net sensor.

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