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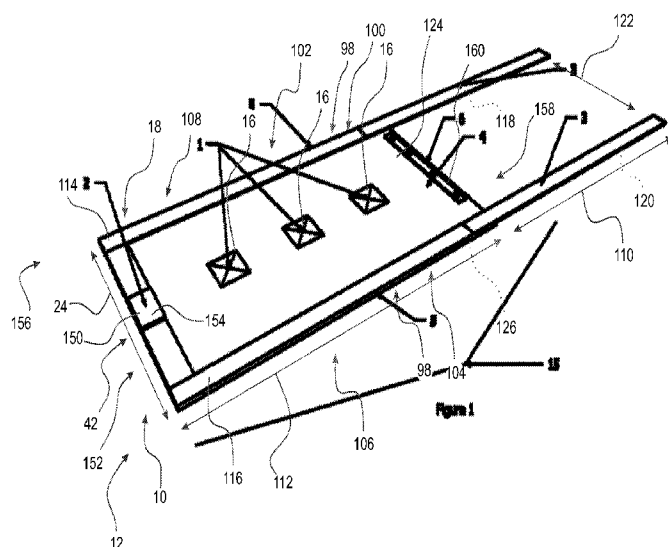
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(54) **Title:** PUNCHING BAG SYSTEMS, ACCESSORIES & METHODS

**Fig. 1**



(57) **Abstract:** In one preferred form of the present invention, there is provided a strike measurement system (44) for a punching bag (14). The measurement system (44) includes an accessory (10) for being installed on the punching bag (14). The accessory (10) has a number of sensors (16) for receiving strike data, and a communications facility (42) for use in transmitting strike information to a computing device (50); wherein the system (44) is adapted for utilising an intermediate computing device (46) between the computing device (50) and the communications facility (42). In the system (44) the intermediate computing device (46) configured for assisting with the transmission of the strike information to the computing device (50).

## **PUNCHING BAG SYSTEMS, ACCESSORIES & METHODS**

### **FIELD OF THE INVENTION**

In preferred forms the present invention relates to punching bag systems, accessories and methods.

### **5 BACKGROUND TO THE INVENTION**

Punching bags typically comprise an outer shell surrounding a cushioning material for resisting a number of punches during a training session.

Punching bags are typically used in sports involving arm and leg strikes including conventional boxing, kickboxing and various martial arts.

- 10 It would be advantageous if the public could be provided with an improved punching bag system, accessory or method, or at least be provided with a useful choice

It is against this background and the problems and difficulties associated therewith that the present invention has been developed.

### **SUMMARY OF THE INVENTION**

- 15 According to a first aspect of preferred embodiments herein described there is provided a strike measurement system for a punching bag comprising: an accessory for being installed on the punching bag, the accessory having a number of sensors for receiving strike data, and a communications facility for use in transmitting strike information to a computing device; wherein the system is adapted for utilising a intermediate computing  
20 device between the computing device and the communications facility, the intermediate computing device for assisting with the transmission of the strike information to the computing device.

- Preferably the system is adapted for utilising the intermediate computing device between the computing device and the communications facility for assisting with the transmission  
25 of the strike information to the computing device on a relatively consistent basis.

Preferably the strike measurement system includes an application for providing computer instructions for causing the computing device to query the intermediate computing device on a relatively consistent basis.

Preferably computer instructions are provided for causing the computing device to query the smart phone at regular intervals.

According to a second aspect of preferred embodiments herein described there is provided a computer implemented strike measurement method including: providing an accessory; providing a intermediate computing device and a computing device; and  
5 querying the intermediate computing device using the computing device to receive strike information transmitted from the accessory; and displaying the strike information on the computing device.

According to a third aspect of preferred embodiments herein described there is provided a  
10 computer implemented system comprising: a data access for facility for querying a smart phone to receive strike information transmitted from a communications facility of a punching bag accessory.

According to a fourth aspect of preferred embodiments herein described there is provided an accessory for a punching bag comprising: an accessory body adapted to wrap around  
15 the body of the punching bag, the accessory body including a number of sensors to measure the performance of a user with respect to the accessory; the accessory being of a width wherein a single accessory is able to be positioned by a user to be suitable for measuring the performance of selected one from the group comprising leg directed strikes, torso directed strikes and head directed strikes; the user requiring multiple  
20 accessories to be positioned on a full length punching bag to concurrently measure the performance of leg, torso and head directed strikes.

Preferably the accessory can be positioned at a lower position on the punching bag to measure and categorise, left, right and central leg strikes.

Preferably the accessory can be positioned at a middle position on the punching bag to  
25 measure and categorise left, right and central torso strikes.

Preferably the accessory can be positioned at an upper position on the punching bag to measure and categorise left, right and central head strikes.

Preferably the user requires 3 such accessories to be positioned on a full length punching bag to concurrently measure the performance of leg, torso and head directed strikes.

Preferably the accessory includes a computing device to concurrently measure strike information from at least three accessories.

Preferably the accessory includes three groupings of sensors to respectively measure left, central and right strikes.

- 5    Preferably the accessory includes at least two spaced apart fastening portions of length at least one quarter of the circumference of the punching bag.

Preferably the fastening portions comprise Velcro strips of a configuration shown in the drawings attached hereto.

- 10   Preferably the accessory includes at least two spaced apart fastening portions of length at least one quarter of the circumference of the punching bag.

Preferably the fastening portions comprise Velcro strips of a configuration shown in the drawings attached hereto.

Preferably a user can assess their performance in their overall, power, speed, accuracy of strikes.

- 15   Preferably the accessory includes a number of gripping portions comprised of a special gripping material in the rearward surface of the accessory body for gripping the punching bag when suitably positioned for measuring the performance of one or more strikes.

- 20   According to a fifth aspect of preferred embodiments herein described there is provided a computer readable medium having stored thereon computer executable instructions for performing a computer implemented method as per any of the above method aspects.

According to a sixth aspect of preferred embodiments herein described there is provided a computer readable medium having stored thereon computer executable instructions encoding a computer implemented system as per any of the above system aspects.

- 25   Preferably the computer-readable medium encoded with one or more facilities configured to run an application configured to carry out a number of operations to provide any one of the preceding method or system claims.

According to a seventh aspect of preferred embodiments herein described there is provided computer implemented exercise system comprising a statistical component having cartesian functionality and radial-type functionality; and a display component for

displaying training data using either the cartesian functionality or radial-type functionality.

Preferred embodiments of the present invention preferably provide systems and methods that:

- 5 (i) Provide the user with an accessory for a punching bag that can be readily installed in various positions on the punching bag and which allows for multiple accessory installations.;
- (ii) Provide the user with an accessory for a punching bag that provides advantageous strike data to a computing device selected from the group  
10 comprising a personal computer, a smart phone and a tablet.
- (iii) Provide for the advantageous updating of a computing device such as a personal computer by using a smart phone as a mule located between the punching accessory and the personal computer.

It is to be recognised that other aspects, preferred forms and advantages of the present  
15 invention will be apparent from the present specification including the detailed description, drawings and claims.

## **BRIEF DESCRIPTION OF DRAWINGS**

In order to facilitate a better understanding of the present invention, several preferred  
20 embodiments will now be described with reference to the accompanying drawings, in which:

Figure 1 provides a perspective view of an accessory according to a first preferred embodiment of the present invention;

Figure 2 provides an illustration of the accessory shown in Figure 1, the accessory  
25 being used in a strike measurement system according to a further preferred embodiment of the present invention;

Figure 3 provides an exploded view of the accessory shown in Figure 1;

Figure 4 provides an illustration of the accessory shown in Figure 1, the accessory  
being used in a strike measurement system according to a further preferred embodiment  
of the present invention;

Figure 5 provides an illustration of a strike measurement system according to yet another embodiment of the present invention;

Figures 6 to 8 provides several screen layout images provided by the system shown in Figure 5;

5 Figure 9 provides a schematic view of another system according to a preferred embodiment;

Figures 10 to 17 provide several screen layout images provided by the system shown in Figure 9;

Figures 18 to 23 show various display features of the system;

10 Figures 24 and 25 show two interfaces that may form part of the system;

Figure 26 provides a schematic view of a method according to another preferred embodiment of the present invention; and

Figure 27 provides a schematic view of a computer system according to yet a further preferred embodiment of the present invention.

## 15 DETAILED DESCRIPTION OF THE EMBODIMENTS

It is to be appreciated that each of the embodiments is specifically described and that the present invention is not to be construed as being limited to any specific feature or element of any one of the embodiments. Neither is the present invention to be construed as being limited to any feature of a number of the embodiments or variations described in relation  
20 to the embodiments.

Referring to Figures 1 and 2 there is shown a device 10 in the form of an accessory 12 for a punching bag 14. The accessory 12 includes a number of sensors 16 for measuring the performance of a user. The accessory 12 is considered to provide a number advantages relating to the use of the accessory 12 on the punching bag 14.

25 As shown the accessory 12 comprises an accessory body 18 that is adapted to be wrapped around the body 20 of the punching bag 14. The accessory 12 can be advantageously positioned at various heights 22 to allow the user to focus on leg strikes, torso strikes, and head strikes.

In this regard, the accessory 18 is of a height 24 allowing the accessory 12 to be  
30 positioned at various heights 22 on the punching bag 14 suitable for measuring the

performance of the user in connection with a selected one of: (i) leg directed strikes; (ii) torso directed strikes and (iii) head directed strikes.

If the user requires his or her performance to be concurrently measured in terms of two or three of: (i) leg directed strikes; (ii) torso directed strikes; and (iii) head directed strikes; then multiple accessories 12 are able to be advantageously used. As shown in Figure 4, three accessories can be positioned at spaced apart locations 26 on the punching bag 14 as shown in Figure 4. Multiple accessories 12 can be advantageously connected together to allow the user to measure performance statistics and readily strike the accessories with his or her hands, elbows, knees, feet or legs.

10 In the case of the arrangement shown in Figure 2, the accessory 12 forms part of a strike measurement system 28. In the case of arrangement shown in Figure 4, the accessories 12 form part of a strike measurement system 30.

The strike measurement system 28 includes a measurement arrangement 32 that includes the sensors 16 and a computing device 34. In the embodiment the computing device 34 is selected from the group comprising: a personal computer 36; a smart phone 38; and a tablet 40. The accessory 12 advantageously includes a communications facility 42 having wireless functionality for communicating with the computing device 34.

A further strike measurement system 44 is illustrated in Figure 5. The strike measurement system 44 includes the accessory 12, and the punching bag 14. The communications facility 42 is adapted to advantageously communicate with a smart phone 46. The smart phone 46 is adapted to update a display 48 on a personal computer 50. The communications facility 42 is advantageously adapted to provide a wireless or bluetooth signal 52. In this embodiment the smart phone 46 is coupled to the personal computer 50 by a USB cable. In other embodiments a wireless channel is provided between the smart phone 46 and the personal computer 50.

The personal computer 50 is adapted to present the user with a primary interface 54 shown in Figure 6. The primary interface 54 includes a login component 56, a quick start component 58 and a settings component 60. The login component 56 forms part of a login facility 62 that advantageously requires a login identifier 64 and a password 66 as shown in Figure 7. The login facility 62 is able to advantageously connect to a remote

system 68 to retrieve login information and is adapted to provide a login interface 70 on the display 48. By communicating between the smart phone 46 and the personal computer 50 the user is advantageously provided a relatively large display 48.

Figure 8 illustrates a data access configuration interface 72 provided by a data access facility 74 of the strike measurement system 44. The data access facility, in this embodiment forms part of the personal computer 50. Advantageously using the data access configuration interface 72, the user can select the smart phone 46 using a selector 76, connect to the smart phone 46 and define a data communication interval 78. Advantageously the smart phone 46 is adapted to operate in the system as a mule between the personal computer 50 and the accessory 12. This provides the advantage that the personal computer 50 does not have to be provided with any form of communications dongle requiring separate configuration. Rather a primary application 80 is installed on the personal computer 50 which communicates with the smart phone 46. This is advantageous to the user who is, as a result, able to use the relatively large display 48.

In this embodiment the user's data is stored both locally on the personal computer 50 and in a database structure 82 of the remote system 68. The personal computer 50 is provided with a synchronisation facility 84 for synchronising historical user data stored in a store facility 86 and the database structure 82 of the remote system 68.

The user data can be accessed by using the data access facility 74 of the computing device 34. The data access facility 74 is able to provide the user with performance statistics from either the store facility 86 or the remote system 68. A data statistics interface 88 provided by the data access facility 74 is provided in Figure 11. Advantageously using the computing device 34 all previous performance data can be presented to the user in the form of various tables and graphs. The tables and graphs include average force of punches, the average number of hits during a five minute round and so forth.

The communications facility 42 is adapted to transmit data 90 based on strike force data from the sensors 16 via the wireless channel 92 to a recording facility 94 provided on the personal computer 34, for subsequent visualisation and interpretation on the display 48.

The recording facility 94 receives the strike force data and a processing facility 96 calculates the number of successful and partial hits and their force during a specified time



interval or program. The processing facility 96 advantageously calculates the user's average striking speed over a specific time and various other related results.

The sensors 16 of the strike measurement system 44 communicate strike information to the communications facility 42 which then communicates with the smart phone 46. The strike measurement system 44 advantageously allows the user or trainer to monitor the user's performance in terms of: (i) the number of strikes connected; (ii) the force of the strikes; and (iii) the average speed and accuracy.

When using the system, the user aims to accurately strike the marked locations 144 to improve his or her measured performance. Advantageously partially hit sensors only represent a partial amount of the actual force of the strike. The performance is characterised as performance within a specific time period. Performance can also be characterised in terms of a continuous duration until the user terminates the training session.

In order to position the accessory 12, the user wraps the accessory body 18 around the punching bag 14. Fastening portions 98 of the accessory 12 are used to secure the accessory 12 in position. Referring to Figure 1, a first fastening portion 100 is provided at an upper end 102 of the accessory body 18. A second fastening portion 104 is provided at a lower end 106 of the accessory body 18.

The accessory body 18 is of a rectangular elongated shape 108. Both the fastening portions 100, 104 advantageously extend beyond the accessory body 18 by a distance 110 that is greater than one quarter the length 112 of the accessory body 18 as shown in Figure 1. The first fastening portion 100 provides a forward facing fastening surface 114 that extends across the upper end 102 of the accessory body 18. The second fastening portion 104 provides a forward facing fastening surface 116 that extends across the lower end 106 of the accessory body 18.

The first fastening portion 100 provides a rearward facing fastening surface 118, as part of the extension away from the accessory body 18. The rearward fastening surface 118 is provided for engaging the forward fastening surface 114. The second fastening portion 104 provides a rearward facing fastening surface 120, as part of the extension away from the accessory body 18. The rearward fastening surface 120 is provided for engaging the

forward fastening surface 116. The corresponding surfaces 114, 116, 118 and 120 are provided with mating material such as a hook and loop material.

In this manner, the first fastening portion 100 and the second fastening portion 104 are adapted to advantageously secure the accessory 12 around what is considered to be just about any conventionally sized punching bag. By fastening along the front of the upper  
5 end 102 and the front of the lower end 106 an advantageously securing arrangement is provided. A relatively large separation distance 122 is provided between the first and second fastening portions 100 and 104. The separation distance 122 is at least 5/7 of the height 24.

10 Referring to Figure 3, the forward facing surface 124 of the accessory body 18 is arranged for cushioning strikes by the user. The rearward facing surface 126 of the accessory body 18 is provided for gripping the outer surface of the punching bag 14.

The rearward facing surface 126 advantageously includes a number of gripping portions 128 for gripping the punching bag 14 when positioned thereon. The gripping portions  
15 128 are positioned underneath the first fastening portion 100 and the second fastening portion 104. This provides an advantageous compressive force to the gripping portions 128 when the fastening portions 98, 104 are fastened around the punching bag 14, due to the first and second portions 100, 104 being relatively tightly wrapped in position.

In this arrangement the first fastening portion 98 and the second fastening portion 104  
20 provide the accessory 12 with two large VELCRO(TM) straps 130 for fixing the accessory 12 on a just about any punching bag. The gripping portions 128 are provide on the back surface of the accessory 12 below the VELCRO material in the form of at least two rubber or similar type material strips to ensure that the accessory 12 is held in a substantially fixed position during use.

25 In some embodiments there may be more than 2 or less than 2 Velcro straps depending on the model of the device. On some there might be a fastening belt as well.

Referring to Figure 3 it can be seen that the accessory comprises: (i) gripping portions 128 that are provided in the form of two strips 132 for gripping engagement with the punching bag 14; (ii) a rearward backing layer 134; (iii) an intermediate layer 136; (iv) a  
30 front layer 138; and (v) two fastening strips 140.

The fastening strips 140 form a wrapping member as a hook-and-loop fastener, such as fasteners sold under the trade mark VELCRO. The loop or hook portion of the fastening strips 140 are wrapped around and secured to the front surface of the accessory 12 to a complementary hook or loop portion. The backing layer 134 includes friction members in the form of the gripping members 128 for reducing movement of the device during workouts. The gripping members 128 are placed in two separated locations on the rearward backing layer 134. In other embodiments the friction members may form the entire back surface.

The intermediate layer 136 provides the sensors 16 at various locations. In this embodiment three spaced apart sensors 16 are provided along the longitudinal axis of the accessory 12. This allows for central, left and right strikes. The sensors 16 comprise flat flexible force sensors 142 at marked locations 144 to measure strike force data.

The front of the accessory provides a striking surface including a number of markings 146 indicative of a number of optimum striking regions 148. The markings 146 advantageously allow the user to focus targeting their striking and accuracy. The optimum striking regions 148 are marked on the striking surface 182.

The number and size of the markings 146 can be varied based on desirable requirements and different models of accessories produced. The variations allow for advantageous tailoring of accessories such that they have different striking sizes and patterns to satisfy the end user. As would be apparent, the backing layer 134 and the sensors 16 are not visible to the user during use, as they are covered with an aesthetically pleasing and a suitably durable front layer 138.

The communications facility 42 is adapted to communicate with any computing device 34 selected from the group comprising a personal computer 36, a smart phone 38 and a tablet 40. The communications facility 42 is battery operated by a battery facility 150. The communications facility 42 is adapted to operate wirelessly. The battery facility 150 is rechargeable. When being recharged a wired connection is preferably used to connect the battery to a power source.

Referring to Figure 1, the communications facility 42 is provided in the form of a transmitter unit 152 for the sensors 16. The transmitter unit 152 is located in a small

pouch 154 at an end 156 of the accessory 12. At the other end 158 of the accessory there is a provided a security screw strip 160 that assists with locking in the backing and sensors in the device securely.

Figure 9 illustrates a further strike measurement system 162 according to another preferred embodiment of the present invention. The computing device 34 comprises a smart phone 164. The smart phone 164 is adapted to provide the primary interface 54. The smart phone 164 provides a similar function to the personal computer 50. In the Figures similar numerals are used to indicate similar parts and facilities.

As such the smart phone 164 includes an application 80 providing a recording facility 94, a processing facility 96, a store facility 86, a synchronisation facility 84, a data access facility 74 and a login facility 62. The smart phone 164 is adapted to communicate with a remote system 68.

The remote system 68 comprises a database structure 82 containing login details, user program details, and historical data. The login facility 62 communicates with the remote system 68 to verify that supplied login details correspond with an existing user. If this is not the case then an error message 166 is displayed to the user (on the display 48) and the user is directed back to the login interface 70.

The user is then able to re-enter his or her login details or create a new account by activating a new account component 168. Activation of the new account component that provides a new user interface 170 shown in Figure 11. On the new user interface 170 the user is asked to supply the user specific information as shown. The login system then stores the login information locally and communicates with the remote system 68 to advise of the login time and date. As would apparent, various possible embodiments do not include a remote system 68 and store data only locally.

Once the user has been authorised by the login facility 62 on the smart phone 164, the user is able to verify that the smart phone 164 is in communication with the sensors 16 provided in the accessory 12.

Advantageously using the smart phone 164 all previous performance data can be presented to the user via a data interface 88, in the form of various tables and graphs. The

tables and graphs include average force of punches, the average number of hits during a five minute round and so forth.

In addition to the performance statistics the smart phone 164 provides the user with access to their progress in specific programs 172 as highlighted in Figure 14. These programs are displayed with use of the data access facility 74 by a program interface 174. The programs 172 are advantageously able to be manually configured by the user or may be preinstalled or downloaded. The ability to download programs from the remote server 68 using a download facility 176 is considered to be advantageous. The programs 172 can be configured to target specific purposes for the user such as but not limited to conditioning, strength, speed or a combination of these. The advantageous nature of such a combination of measuring statistics as presented to the user is discussed in further detail below.

In the embodiment, a program configuration interface 178 provided by the system is shown in Figure 15. The program configuration interface 178 provides a name component 180, a round number component 182, a round time component 183, a rest time component 184, an end of round component 186, and an end of rest component 188. The predetermined time interval durations set by the components 182 to 188, are considered to advantageously allow for standardisation of an individual's training program and to allow for improvement in the individual's performance to be monitored. The durations can be manually or automatically set to allow the user to tailor desirable exercise routines based on the individual's requirements. The rest time in between rounds and the end of round notification can be visual and/or sound related and end of rest period notification can also be visual and/or sound related.

As shown in Figure 16, the smart phone 164 /computing device 34 is further adapted to provide a historical view component 190, a statistics component 192 and a training component 194. Activating the training component 194 allows for free training of the user where average hits and strike forces are shown. More particularly once the user begins their training session three individual graphs are used to display their current, most recent and best performance for that particular program. On their display they will also have how much time is left for that interval, how many intervals they have left and any other associated data pertaining to that specific program.

It is also possible to run a program that causes the computing device 34 to display a round interface 196 shown in Figure 17. The round interface displays the round number 198, an average 200, a force average 202, a hits average 204, and the time 206 remaining in the round.

- 5 Referring to Figures 18 and 19 there is shown an advantageous chart system 250 provided by the system. The chart system 250 illustrates speed, power and punches over time with respect to a specific individual. Advantageously the interface 196 provides an option for transforming a cartesian speed power punch display 252 to provide a radial-type display 254. The radial type display 254 provides a visual indication of the performance of the  
10 person using the system.

As shown there are three areas 256 wherein each boundary thereof illustrates performance. By visualising performance the operator can alter his or her training. Various transforms can be applied to the data gathered and displayed by the chart 252 and the chart 254. The feedback provided to the operator is considered to be advantageous.

- 15 Figures 20 and 21 show an advantageous chart system 258 provide by a multiplayer component of the system. The multiplayer component provides an option allowing the display a line type chart 260 or a radial chart 262. By providing a radial chart where time is wrapped in position it is readily possible to compare the performance of each multiplayer in the multiplayer game. Various transparency area colours are preferably  
20 used.

- Figure 22 shows an advantageous system 264 in which the direction of punches is presented to user. This information is gathered by the system. The system advantageously layers percentage type charts in a radial direction over time. Percentages of left, centre and right punches are shown over time. Various percentages are shown for  
25 a slice of time in Figure 23.

More particularly the percentages of left, right and centre directed punches are advantageously displayed with time increasing in the radial direction 265 (and looping over time). Left and right punches oppose one another along a line 266.

- Whilst the systems described are preferably dynamic during training and are also used  
30 various historical statistic pages. Each user statistics page will have various factors that

the user can select to specify how they would like to compare their results. Individual categories are provided including speed, power, stamina and so forth. The process will be the same where users select which factors they would like to compare their results against; this includes people in certain age groups, sex, weight, height, geographical location and so forth or a specific individual.

Figure 24 illustrates an interface 268 of the system. The interface 268 advantageously provides general performance data. Data based on geographical location of other players is advantageously shown in a map component 270. The map component 270 allows users to focus in on the performance of members in particular regions, in particular, a country, state, city and a fine location basis. As would be apparent the system allows for multiplayer training and competition with globally distributed players.

Once the user has logged in, his or her homepage will display multiple widgets with a number providing specific feedback about a particular aspect of heir or her work out i.e. heart rate, speed, power, accuracy, stamina and so forth. As shown several widgets are provided below allowing the user to add new programs, check the statistics on their current programs any trophies that they might have attained or compare their results against friends, specific people or groups such as in their own age group, weight, gender, location and so forth. As the amount of users builds up the comparison factors will also increase and provide users with an even more in depth analysis of their performance.

The middle section of the user's homepage has customized comparative results against their friends or groups. Popular updates and programs. The system also accommodates the display of results of someone they are following e.g.. Manny Pacquiao.

The comparisons provided are based on predetermined criteria. The number of rounds, length of the rounds, rest time and various other factors will differ. Various parameter based algorithms are used to determine comparative statistics.

The map component 270 can be used to focus on a global, national, state, city or gym basis, where the user can have a rating based on the comparison with others in the specified territory. The user is accordingly provided with specific and customized feedback that represents the user's ultimate achievement goals. Figure 25 illustrates a similar user interface.

Advantageously users can assess their performance in their overall, power, speed, accuracy of strikes as well as their stamina, fitness and recovery

Returning to the accessory 12, it will be apparent that the accessory utilises a number of VELCRO straps that are attached at the top and bottom of the accessory. The loop or  
5 hook portion of the straps is advantageously wrapped around and secured to the front surface of the accessory to a complementary hook or loop portion. The middle layer of the accessory 12 includes the sensors 16 fixed onto the backing 134 and connected to the transmitter device 152. The bottom surface of the backing layer 134 has attached to it resistive strips.

10 The accessory 12 can be connected to a display and data storage medium and is wrapped around just about any boxing bag 14. The device is connected to the user's compatible input medium. The user can strike the accessory 12 attempting to connect with the marked areas as accurately as possible. The accessory 12 provides sensors at the centre and both left and right side of the boxing bag for the user to strike at. Multiple devices  
15 can be advantageously connected to any several and data storage mediums include a portable computer, tablet and mobile phone. Mule device arrangements illustrate a more comprehensive method of feedback for the user. The multiple devices allow for high, mid and low level strikes providing the user with substantially total body workouts.

The various programmed computing devices and applications are considered to provide  
20 measurement systems in their own right. As would be apparent programs are for use by a user that connects to the device according to the other aspects aspect of the invention. Various display interfaces can be displayed and operated on a number of input mediums such as a computer, smart phone, tablet or any other similar medium. The input medium will show the users previously recorded statistics and use computation to further enhance  
25 the relevant feedback to the user.

Referring to Figure 26, there is shown a computer implemented strike measurement method 208 according to a further preferred embodiment of the present invention. At block 210 the method includes providing an accessory 212 for a punching bag 214. At block 216 the method 208 includes providing an intermediate computing device 218 and  
30 a computing device 220. At block 222 the method 208 includes querying the intermediate computing device 218 using the computing device 220. As a result the



computing device 220 receives strike information 224 transmitted from the accessory; 10. The strike information is processed and displayed on the computing device 220 at block 226 of the method 208.

The method provides a strike measurement system 228 for the punching bag 214. The system 228 comprises the accessory 212 for being installed on the punching bag 214. A number of sensors 230 are provided for receiving strike data. A communications facility 232 is provided for use in transmitting strike information (strike data) to the computing device 220. The system 228 is accordingly configured for utilising the intermediate computing device 218 between the computing device 220 and the communications facility 232. In the method 208, the intermediate computing device 218 assists with the transmission of the strike information to the computing device 220. More particularly the intermediate computing device 220 provides the strike information on a relatively consistent basis. In the embodiment the information is provided on a sufficient regular basis for the user to be aware of his performance on a reasonably substantially real time basis for the workout. In some embodiments the intermediate computing device 218 performs some processing of the strike information collated by the accessory 10.

Referring to Figure 27 there is shown a schematic diagram of a computer system 234 that is configured to provide at least a portion of preferred arrangements of systems and methods described herein. The computer system 234 is provided as a distributed computer environment containing a number of individual computer systems 236 (computers/computing devices) that cooperate to provide the preferred arrangements. In other embodiments the computer system 234 is provided as a single computer or another computing device.

As shown, a first one of the computing devices 236 includes a memory facility 238. The memory facility 238 includes both 'general memory' and other forms of memory such as virtual memory. The memory facility 238 is operatively connected to a processing facility 240 including at least one processor. The memory facility 238 includes computer information in the form of executable instructions and/or computer data. The memory facility 238 is accessible by the processing facility 240 in implementing the preferred arrangements.

As shown each of the computing devices 236 includes a system bus facility 242, a data store facility 244, an input interface facility 246 and an output interface facility 248. The data store facility 244 includes computer information in form of executable instructions and/or computer data. The data store facility 244 is operatively connected to the processing facility 240. The data store facility 244 is operatively connected to the memory facility 238. The data store facility 244 is accessible by the processing facility 240 in implementing the preferred arrangements.

Computer information may be located across a number of devices and be provided in a number of forms. For example the data store facility 244 may include computer information in the form of executable instructions and/or computer data. The computer data information may be provided in the form of encoded data instructions, data signals, data structures, program logic for server side operation, program logic for client side operation, stored webpages and so forth that are accessible by the processing facility 240.

On one level, input interfaces allow computer data to be received by the computing devices 236. On another level, input interfaces allow computer data to be received from individuals operating one or more computer devices. Output interfaces, on one level, allow for instructions to be sent to computing devices. On another level, output interfaces allow computer data to be sent to individuals. The input and output interface facilities 246, 248 provide input and output interfaces that are operatively associated with the processing facility 240. The input and output facilities 246, 248 allow for communication between the computing devices 236 and individuals.

The computing devices 236 provide a distributed system in which several devices are in communication over network and other interfaces to collectively provide the preferred arrangements. Preferably there is provided at least one client device in the system of computing devices 236 where the system is interconnected by a data network.

The client device may be provided with a client side software product for use in the system which, when used, provides systems and methods where the client device and other computer devices 236 communicate over a public data network. Preferably the software product contains computer information in the form of executable instructions and/or computer data for providing the preferred arrangements.

Input interfaces associated with keyboards, mice, trackballs, touchpad's, scanners, video cards, audio cards, network cards and the like are known. Output interfaces associated with monitors, printers, speakers, facsimiles, projectors and the like are known. Network interfaces in the form of wired or wireless interfaces for various forms of LANs, WANs and so forth are known. Storage facilities in the form of floppy disks, hard disks, disk cartridges, CD-ROMS, smart card, RAID systems are known. Volatile and non-volatile memory types including RAM, ROM, EEPROM and other data storage types are known. Various transmission facilities such as circuit board material, coaxial cable, fibre optics, wireless facilities and so forth are known.

10 It is to be appreciated that systems, components, facilities, interfaces and so forth can be provided in several forms. Systems, components, facilities, interfaces and so forth may be provided as hardware, software or a combination thereof. The present invention may be embodied as computer readable memory, a personal computer and distributed computing environments.

15 In addition the present invention may be embodied as: a number of computer executable operations; a number of computer executable components; a set of process operations; a set of systems, facilities or components; a computer readable medium having stored thereon computer executable instructions for performing computer implemented methods and/or providing computer implemented systems; and so forth. In the case of computer  
20 executable instructions they preferably encode the systems, components and facilities described herein. For example a computer-readable medium may be encoded with one or more facilities configured to run an application configured to carry out a number of operations forming at least part of the present arrangements. Computer readable mediums preferably participate in the provision of computer executable instructions to  
25 one or more processors of one or more computing devices.

Computer executable instructions are preferably executed by one or more computing devices to cause the one or more computing devices to operate as desired. Preferred data structures are preferably stored on a computer readable medium. The computer executable instructions may form part of an operating system of a computer device for  
30 performing at least part of the preferred arrangements. One or more computing devices may preferably implement the preferred arrangements. The computer readable medium is

preferably operatively associated with computer based transmission facilities for the transfer of computer data. Computer readable mediums may provide data signals.

Components, systems and tasks may comprise a process involving the provision of executable instructions to perform a process or the execution of executable instructions within say a processor. Applications or other executable instructions may perform method operations in different orders to achieve similar results. It is to be appreciated that the blocks of systems and methods described may be embodied in any suitable arrangement and in any suited order of operation. Computing facilities, modules, interfaces and the like may be provided in distinct, separate, joined, nested or other forms arrangement. Methods will be apparent from systems described herein and systems will be apparent from methods described herein.

It is to be recognised that various alterations and equivalent forms may be provided without departing from the spirit and scope of the present invention. This includes modifications within the scope of the appended claims along with all modifications, alternative constructions and equivalents. There is no intention to limit the present invention to the specific embodiments shown in the drawings. The present invention is to be construed beneficially to the applicant and the invention given its full scope.

In the present specification, the presence of particular features does not preclude the existence of further features. The words 'comprising', 'including' and 'having' are to be construed in an inclusive rather than an exclusive sense.

**THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:**

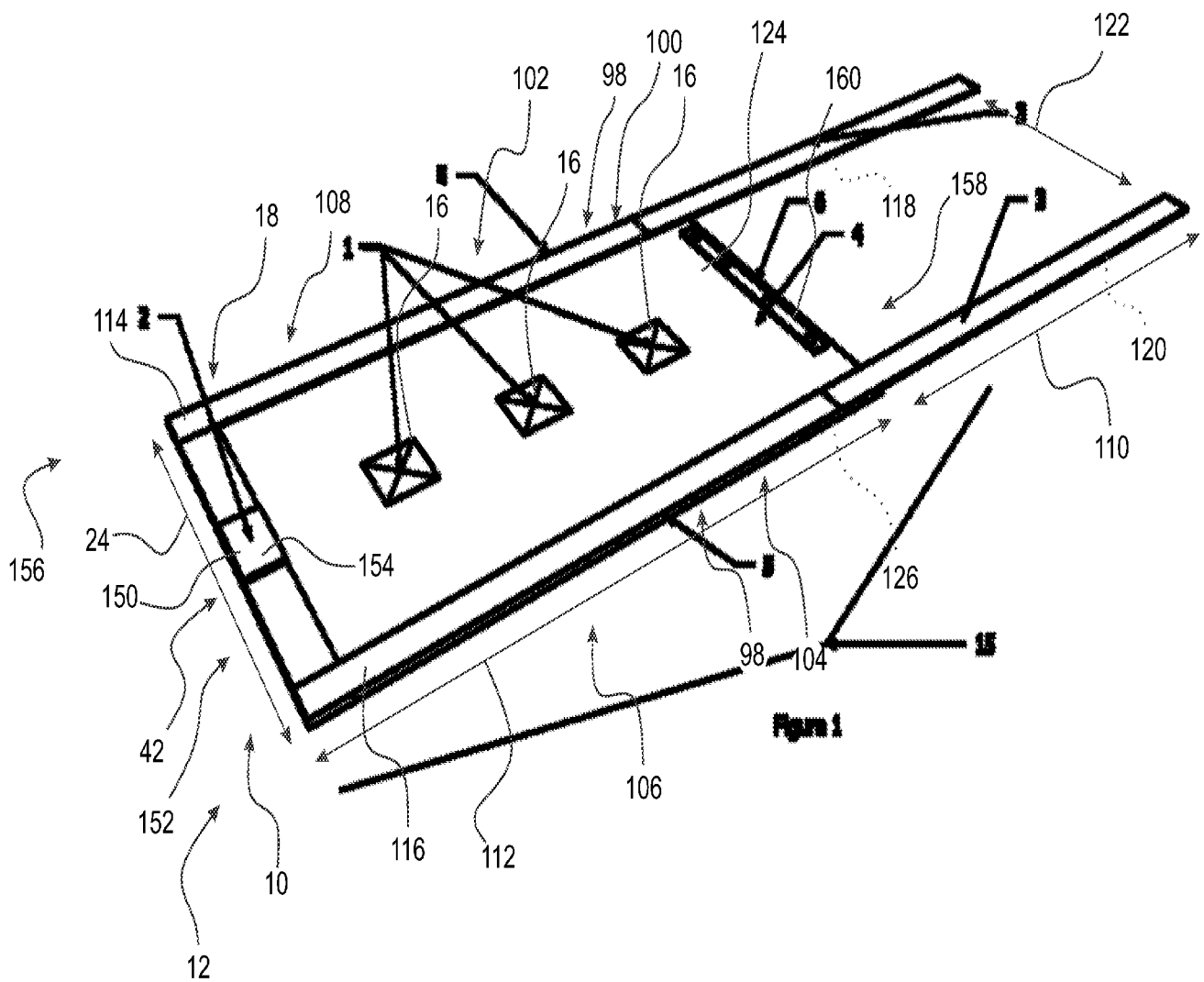
1. An accessory for a punching bag comprising: an accessory body adapted to wrap around the body of the punching bag, the accessory body including a number of sensors to measure the performance of a user with respect to the accessory; the accessory being of a width wherein a single accessory is able to be positioned by a user to be suitable for measuring the performance of selected one from the group comprising leg directed strikes, torso directed strikes and head directed strikes; the user requiring multiple accessories to be positioned on a full length punching bag to concurrently measure the performance of leg, torso and head directed strikes.
2. An accessory as claimed in claim 2 where the accessory can be positioned at a lower position on the punching bag to measure and categorise, left, right and central leg strikes.
3. An accessory as claimed in claim 2 or 3 wherein the accessory can be positioned at a middle position on the punching bag to measure and categorise left, right and central torso strikes.
4. An accessory as claimed in claim 2, 3 or 4 wherein the accessory can be positioned at a upper position on the punching bag to measure and categorise left, right and central head strikes.
5. An accessory as claimed in any one of claims 1 to 5 where the user requires 3 such accessories to be positioned on a full length punching bag to concurrently measure the performance of leg, torso and head directed strikes.
6. An accessory as claimed in claim 6 including a computing device to concurrently measure strike information from at least three accessories.

7. An accessory as claimed in any one of claims 1 to 6 wherein the accessory includes three groupings of sensors to respectively measure left, central and right strikes.
- 5 8. An accessory as claimed in any one of claims 1 to 7 wherein the accessory includes a number of gripping portions comprised of a special gripping material in the rearward surface of the accessory body for gripping the punching bag when suitably positioned for measuring the performance of one or more strikes.
- 10 9. An accessory as claimed in any one of claims 1 to 8 including at least two spaced apart fastening portions of length at least one quarter of the circumference of the punching bag.
10. An accessory as claimed in claim 9 wherein the fastening portions comprise Velcro strips of a configuration shown in the drawings attached hereto.
- 15 11. An accessory as claimed in any one of claims 1 to 10 wherein a user can assess their performance in their overall, power, speed, accuracy of strikes.
- 20 12. A strike measurement system for a punching bag comprising: an accessory for being installed on the punching bag, the accessory having a number of sensors for receiving strike data, and a communications facility for use in transmitting strike information to a computing device; wherein the system is adapted for utilising a intermediate computing device between the computing device and the communications facility, the intermediate computing device for assisting with the transmission of the strike information to the computing device.
- 25 13. A strike measurement system as claimed in claim 12 wherein the system is adapted for utilising the intermediate computing device between the computing device and the communications facility for assisting with the transmission of the strike information to the computing device on a relatively consistent basis.

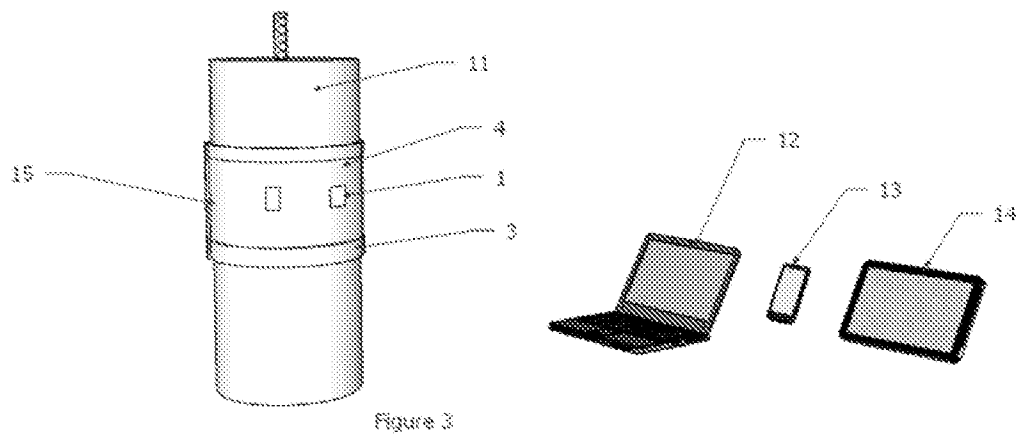
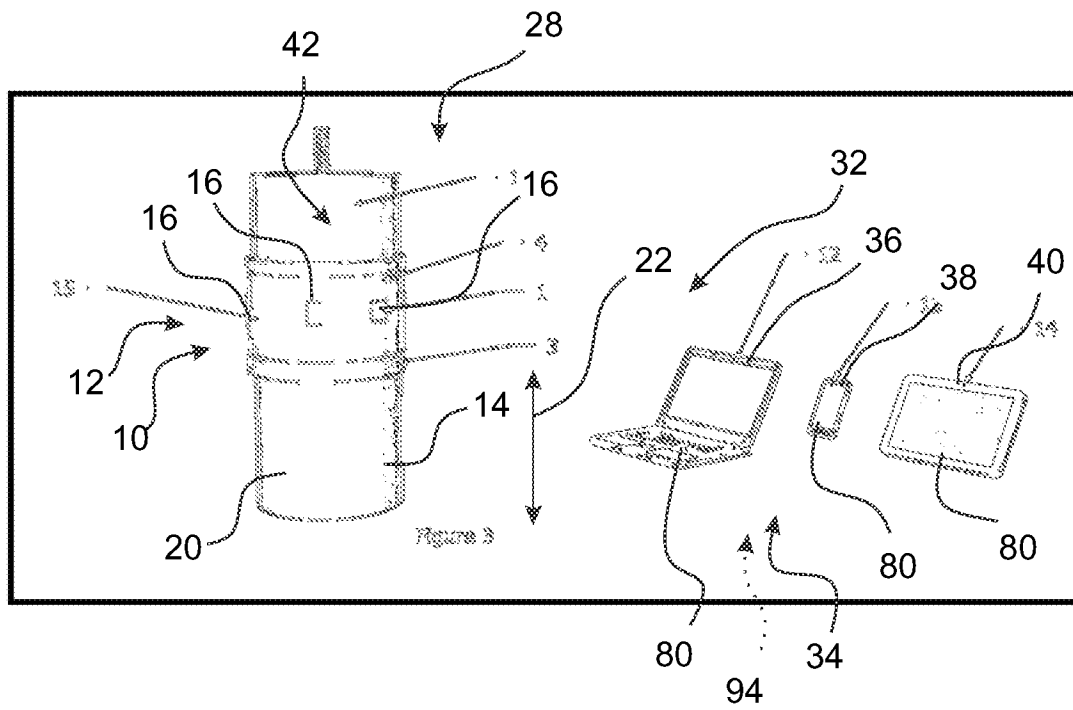
14. A strike measurement system as claimed in claim 12 or 13 including an application for providing computer instructions for causing the computing device to query the intermediate computing device on a relatively consistent basis.
- 5 15. A strike measurement system as claimed in claim 14 wherein computer instructions are provided for causing the computing device to query the smart phone at regular intervals.
- 10 16. A computer implemented strike measurement method including: providing an accessory; providing a intermediate computing device and a computing device; and querying the intermediate computing device using the computing device to receive strike information transmitted from the accessory; and displaying the strike information on the computing device.
- 15 17. A computer implemented system comprising: a data access for facility for querying a smart phone to receive strike information transmitted from a communications facility of a punching bag accessory.
18. A computer implemented exercise system comprising a statistical component having cartesian functionality and radial-type functionality; and a display component for displaying training data using either the cartesian functionality or radial-type functionality.
- 20 19. A computer readable medium having stored thereon computer executable instructions for performing a computer implemented method as claimed in any one of the preceding method claims.
- 25 20. A computer readable medium having stored thereon computer executable instructions encoding a computer implemented system as claimed in any one of the preceding system claims.

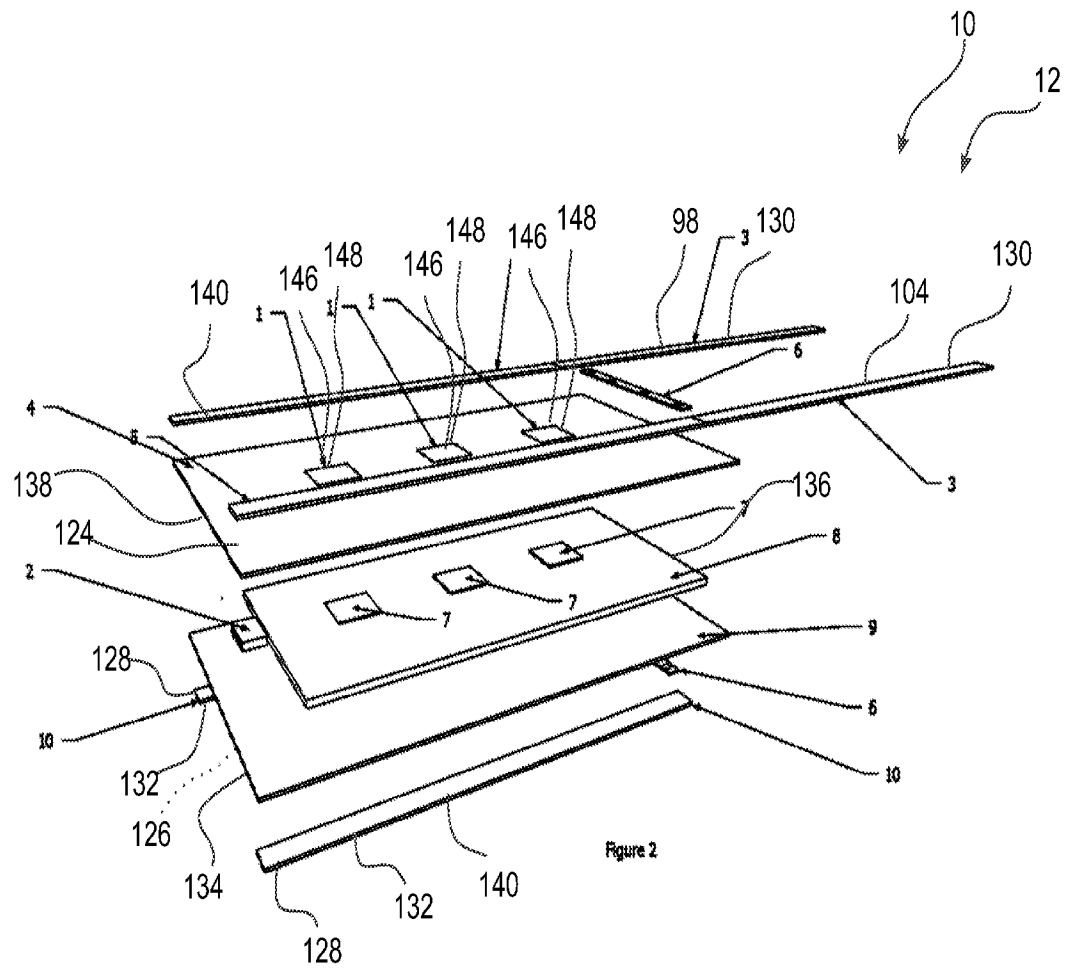
21. A computer-readable medium encoded with one or more facilities configured to run an application configured to carry out a number of operations to provide any one of the preceding method or system claims
22. A system substantially as herein described with reference to the accompanying  
5 drawings.
23. A method substantially as herein described with reference to the accompanying drawings.



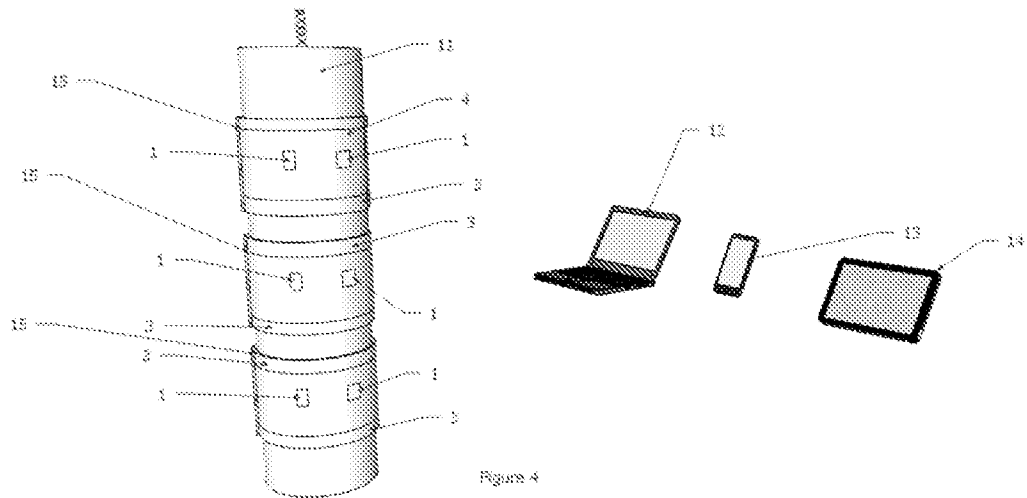
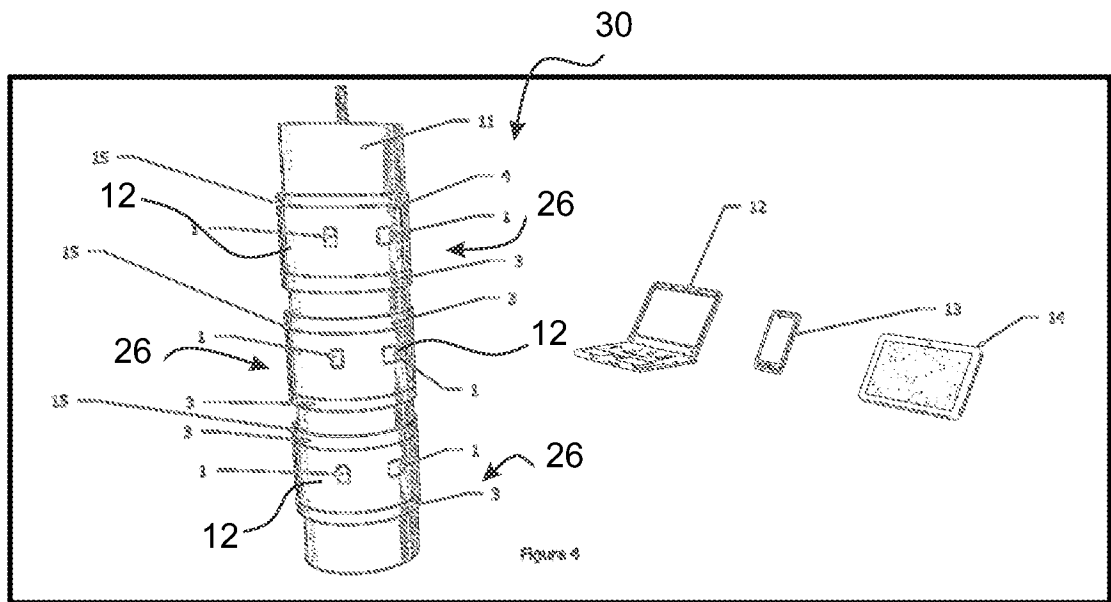
**Fig. 1**

**Fig. 2**

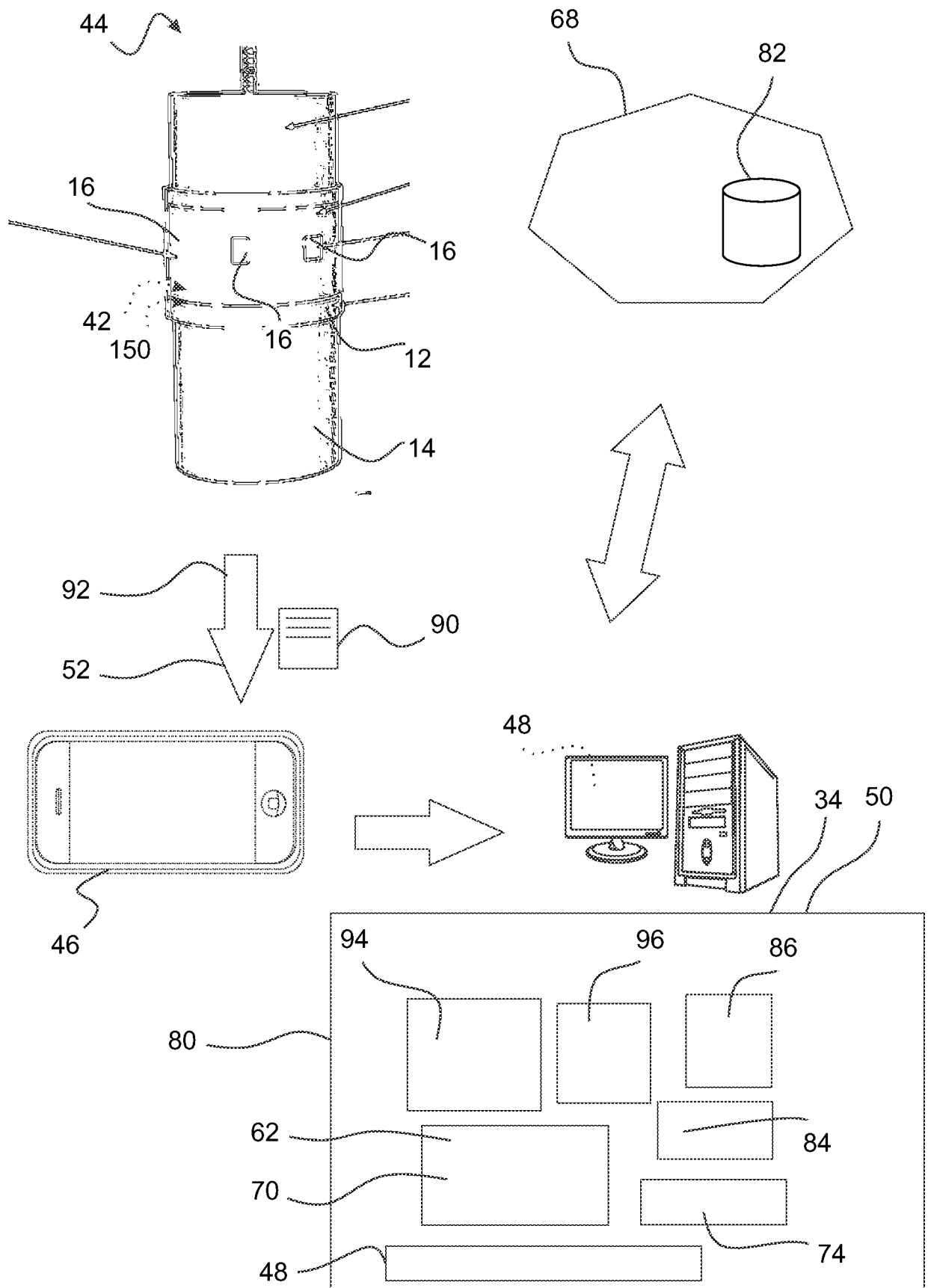


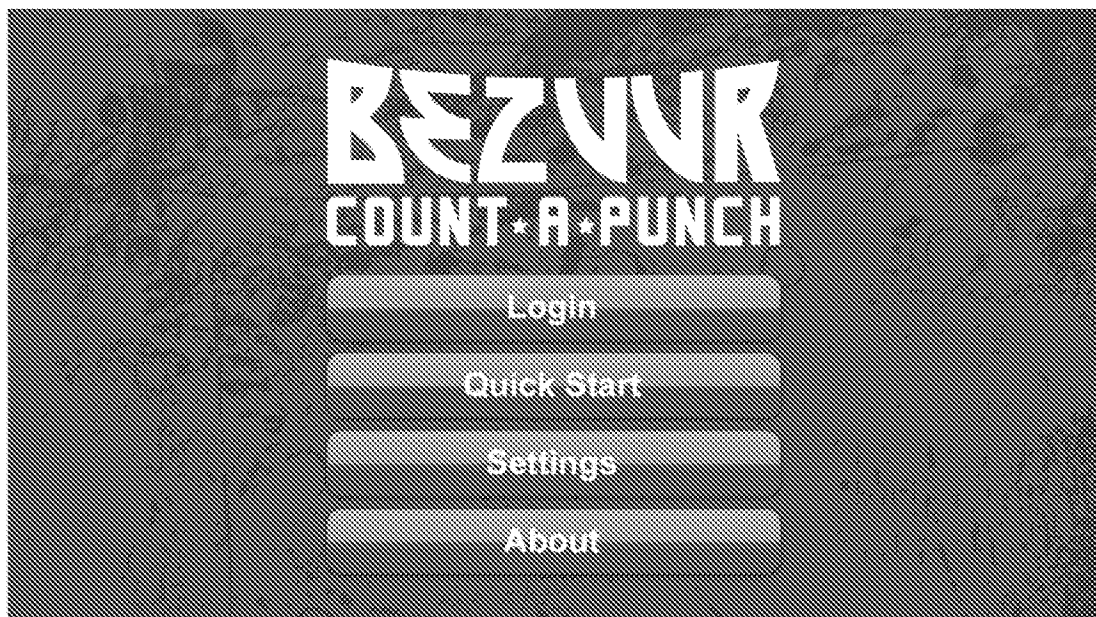
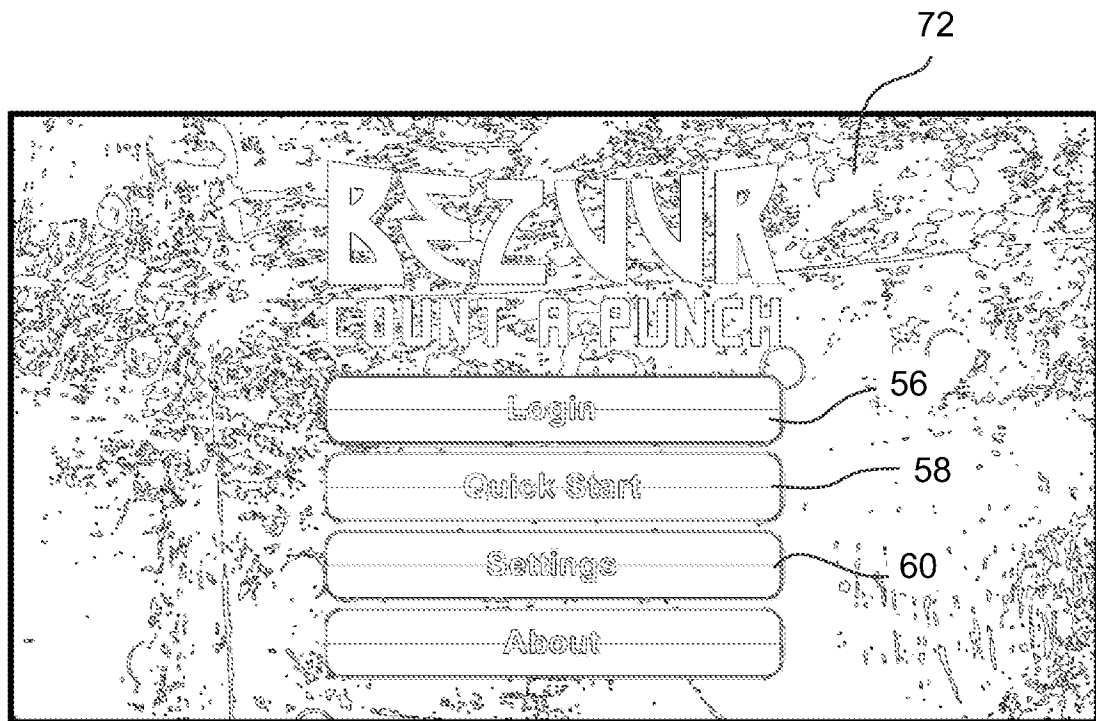
**Fig. 3**

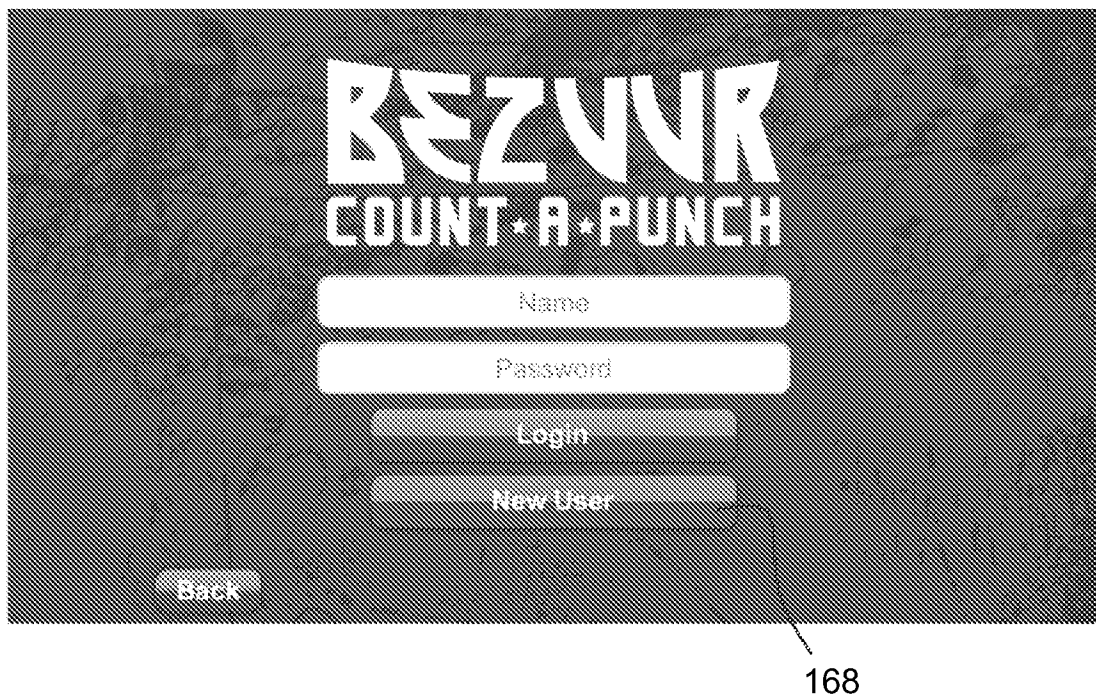
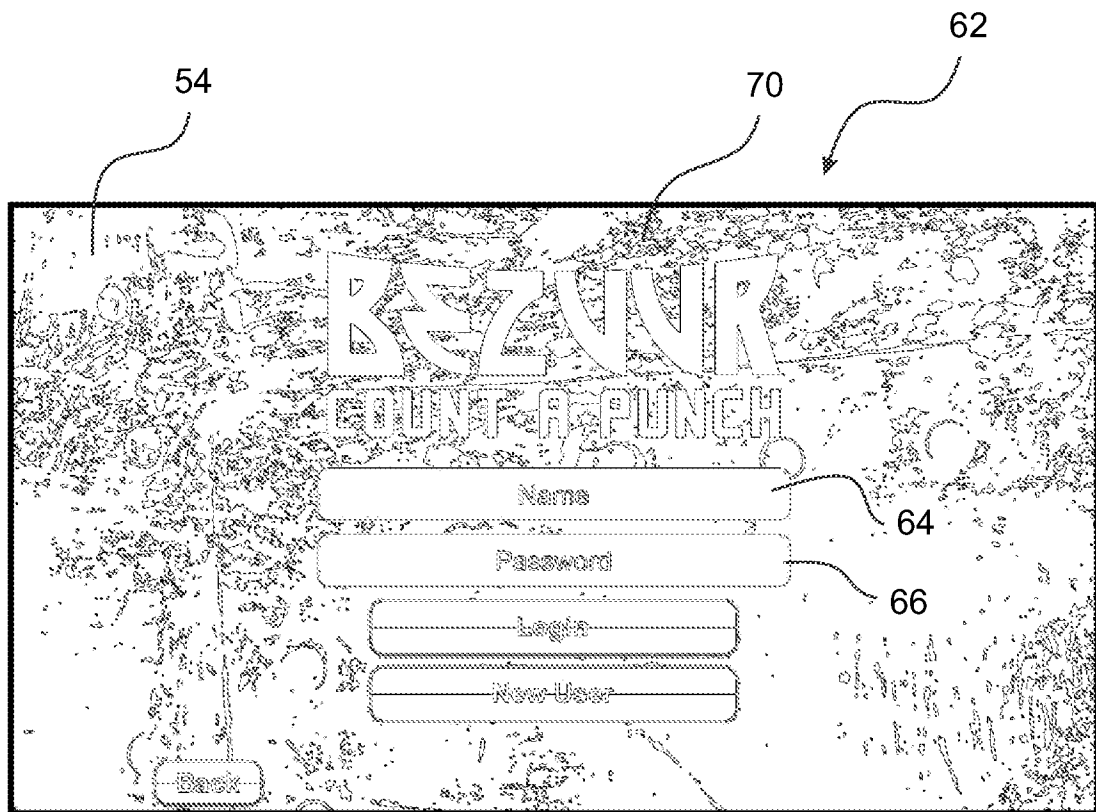
**Fig. 4**

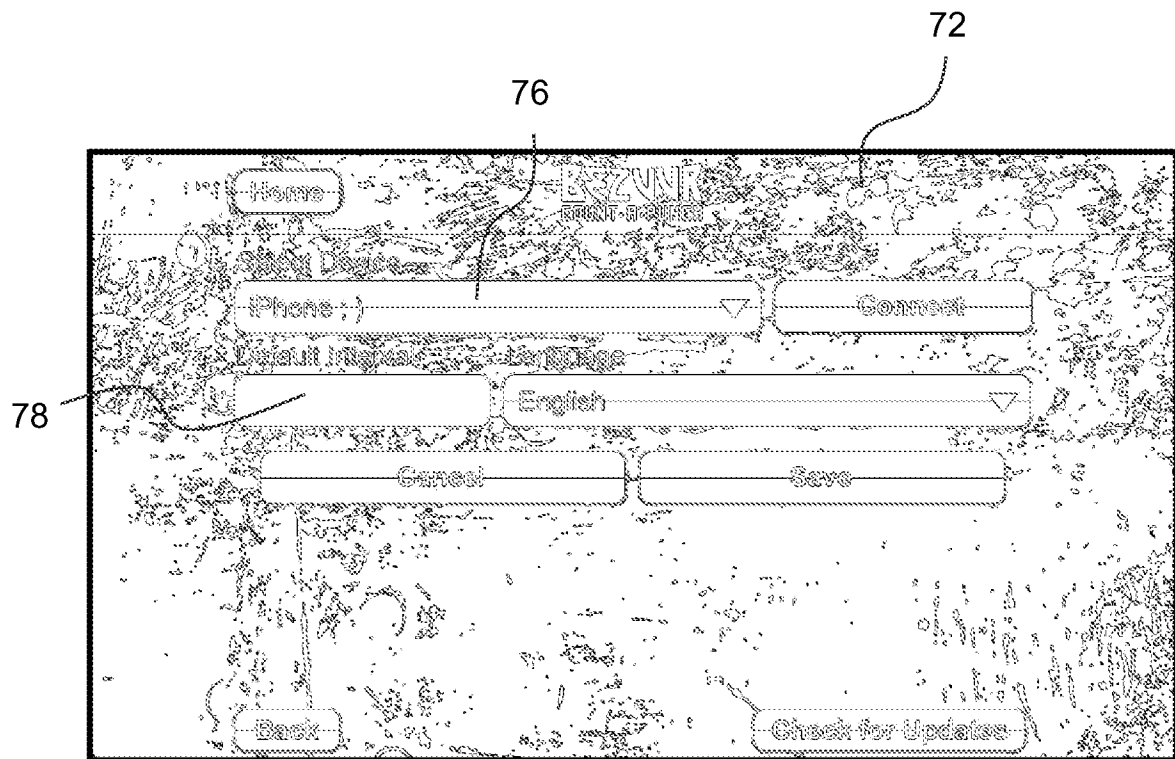


**Fig. 5**

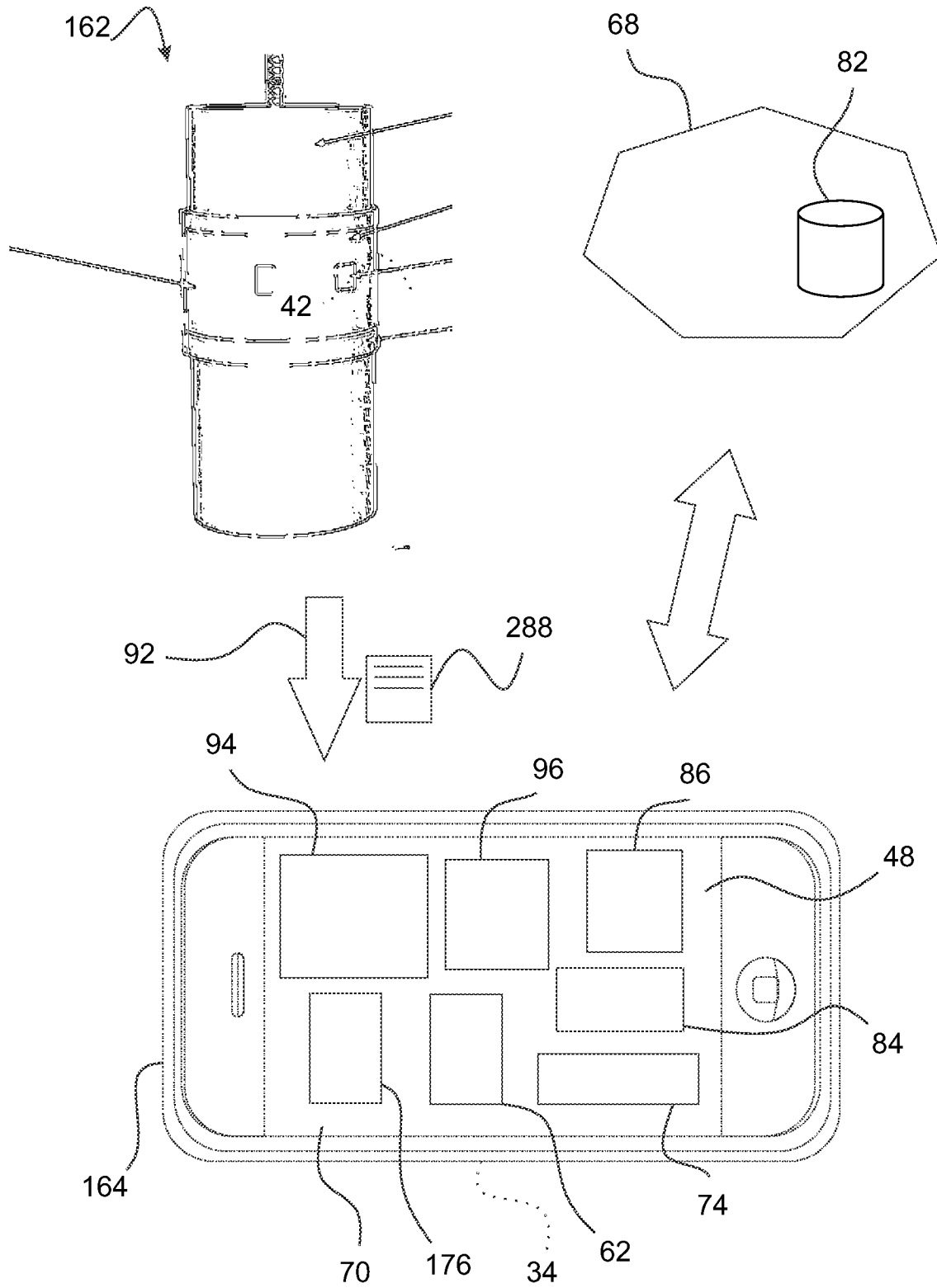


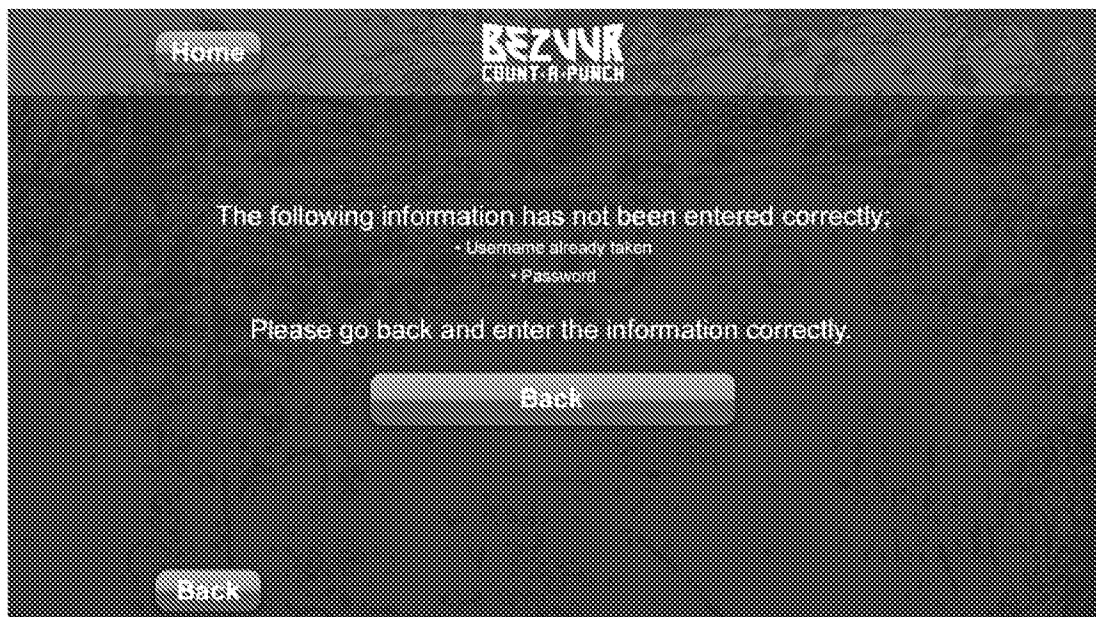
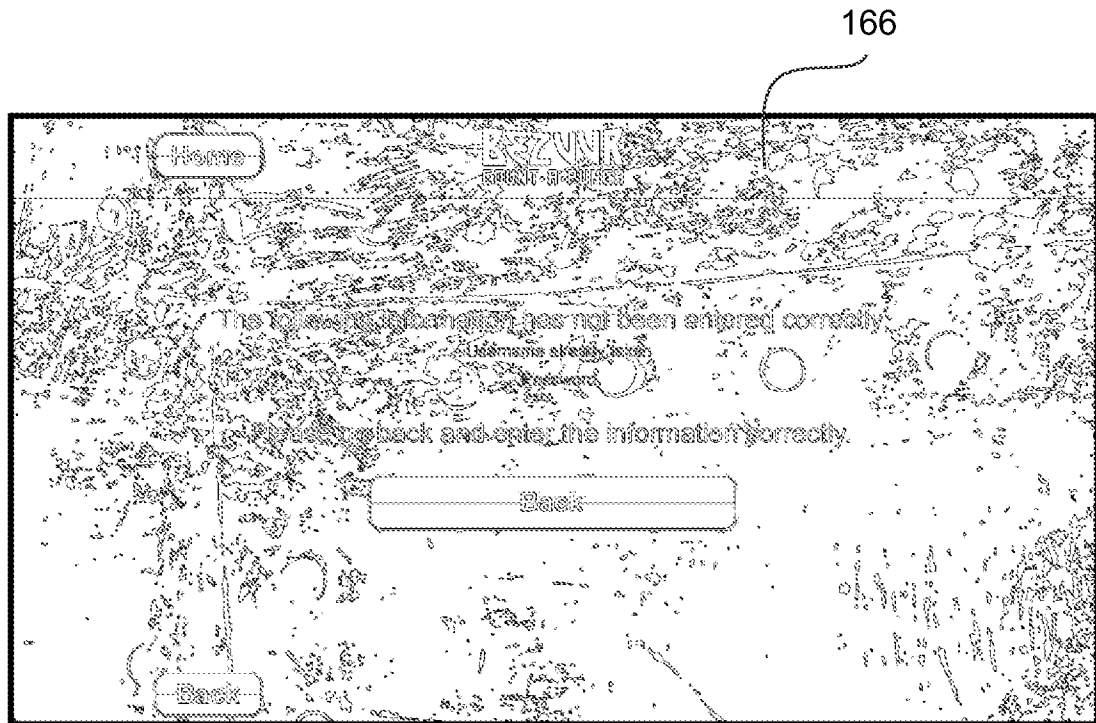
**Fig. 6**

**Fig. 7**

**Fig. 8**



**Fig. 9**

**Fig. 10**

**Fig. 11**

170

Home BEZUNK  
COUNT & PUNCH

Desired Username

DD MM YYYY

First Name Gender Height (cm) Weight (kg)

Given Name Email Address

Password Retype Password

Cancel Create

Back

Home BEZUNK  
COUNT & PUNCH

Desired Username

DD MM YYYY

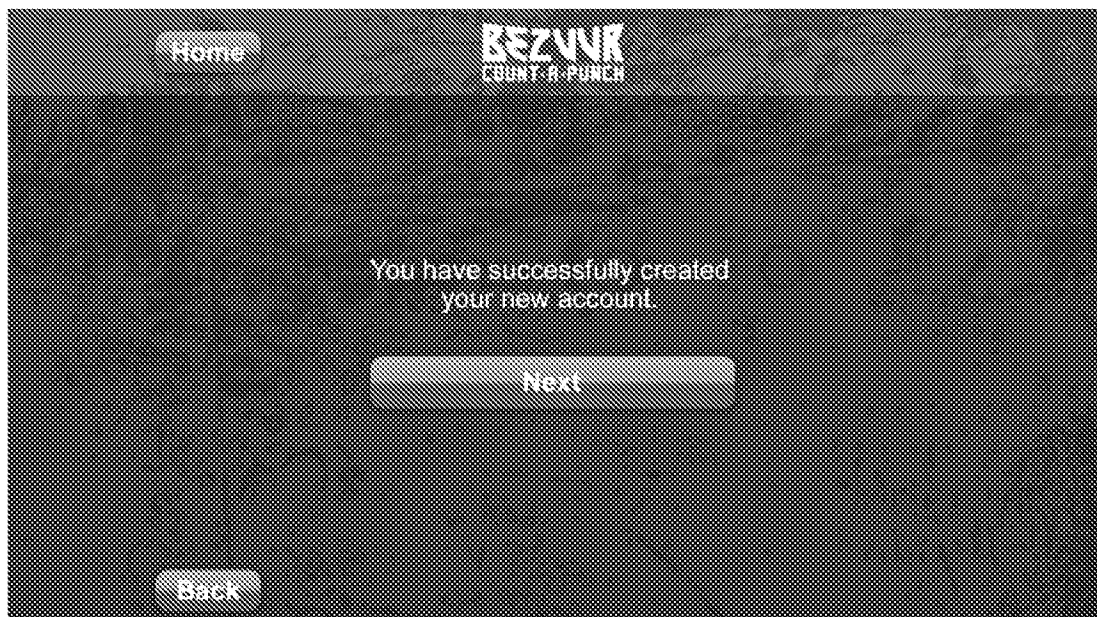
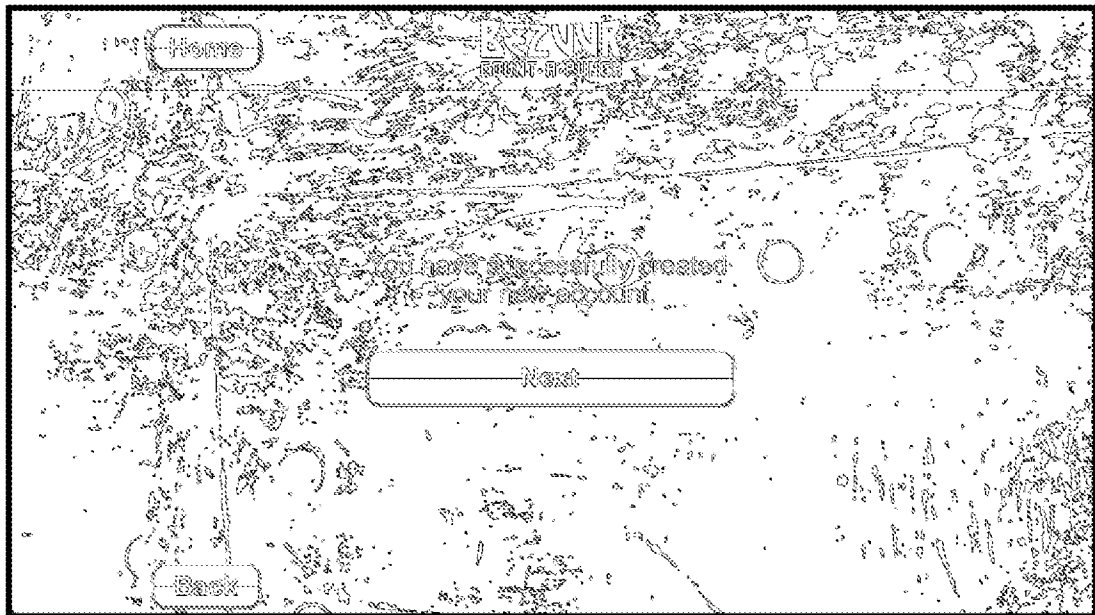
First Name Gender Height (cm) Weight (kg)

Given Name Email Address

Password Retype Password

Cancel Create

Back

**Fig. 12**

**Fig. 13**

88

Home

BEZVUK  
COUNT & PUNCH

User Name

25.11.2011

User Stats

Period

Any

Program

Any

☐ Compare Global Stat

☐ Age

☒ Gender

☒ Weight

☐ Height

Full Stats

Train

Back

Home

BEZVUK  
COUNT & PUNCH

User Name

25.11.2011

User Stats

Period

Any

Program

Any

☐ Compare Global Stat

☐ Age

☒ Gender

☒ Weight

☐ Height

Full Stats

Train

Back

**Fig. 14**

174

Home

BEZVUK  
COUNT & PUNCH

User Name 25.11.2011

Program

Program Name

Program Name

Program Name

Program Name

Program Name

Program Name

Program Name

Program Name

Round Time: 50 seconds

Round Number: 3

Rest Time: 10 seconds

Attempt Number: 3

172

New Program

Download Program

Back

Ready

Home

BEZVUK  
COUNT & PUNCH

User Name 25.11.2011

Program

Program Name

Program Name

Program Name

Program Name

Program Name

Program Name

Program Name

Program Name

Round Time: 50 seconds

Round Number: 3

Rest Time: 10 seconds

Attempt Number: 3

New Program

Download Program

Back

Ready

**Fig. 15**

178

182 180 186 188 184

Home

BEZVUR  
COUNT-A-PUNCH

Program Name

Round Number Round Time Rest Time

End of Round Not. End of Rest Not.

Use Save

Back

Home

BEZVUR  
COUNT-A-PUNCH

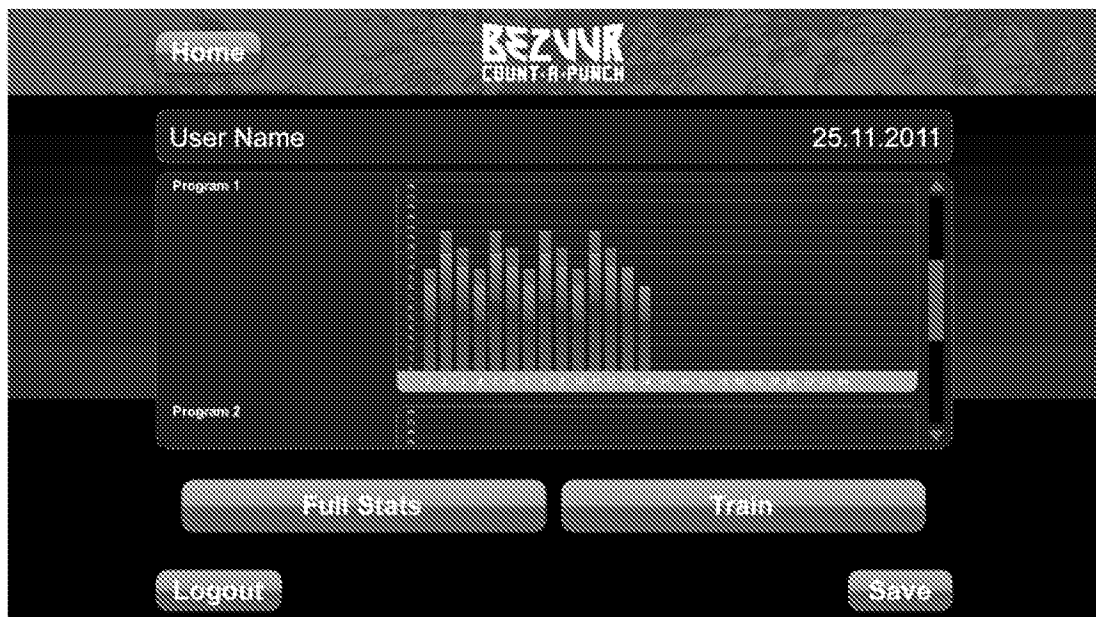
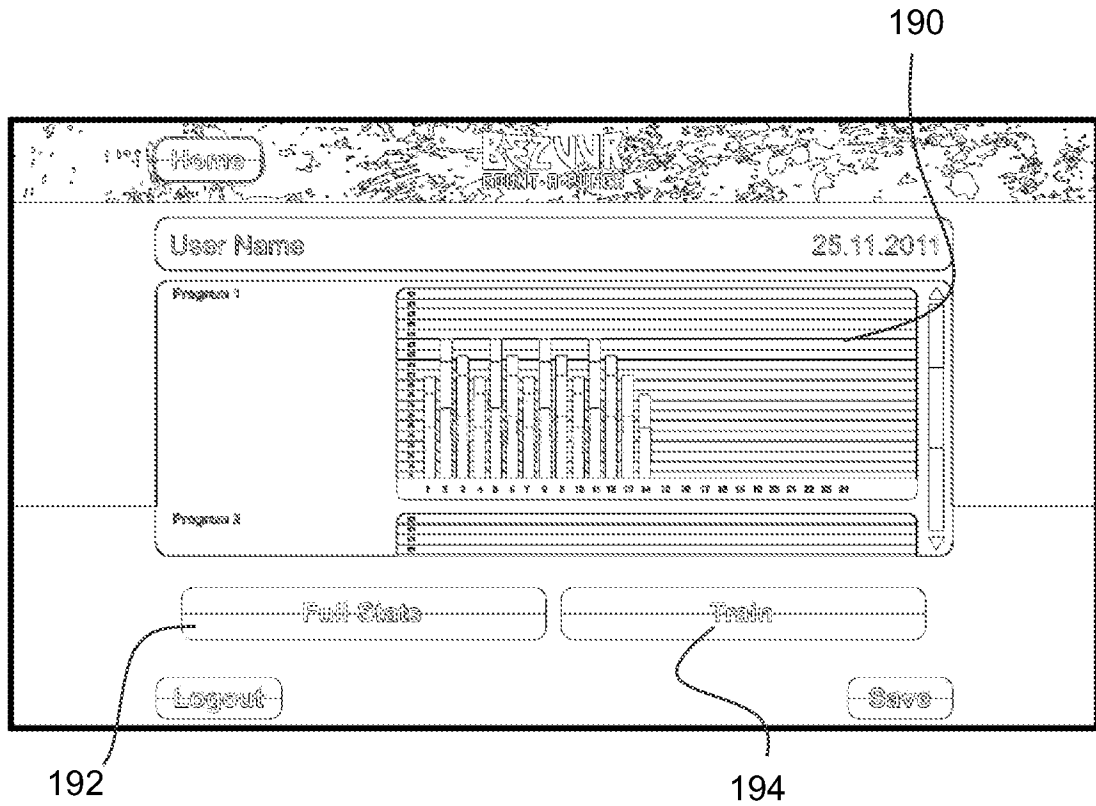
Program Name

Round Number Round Time Rest Time

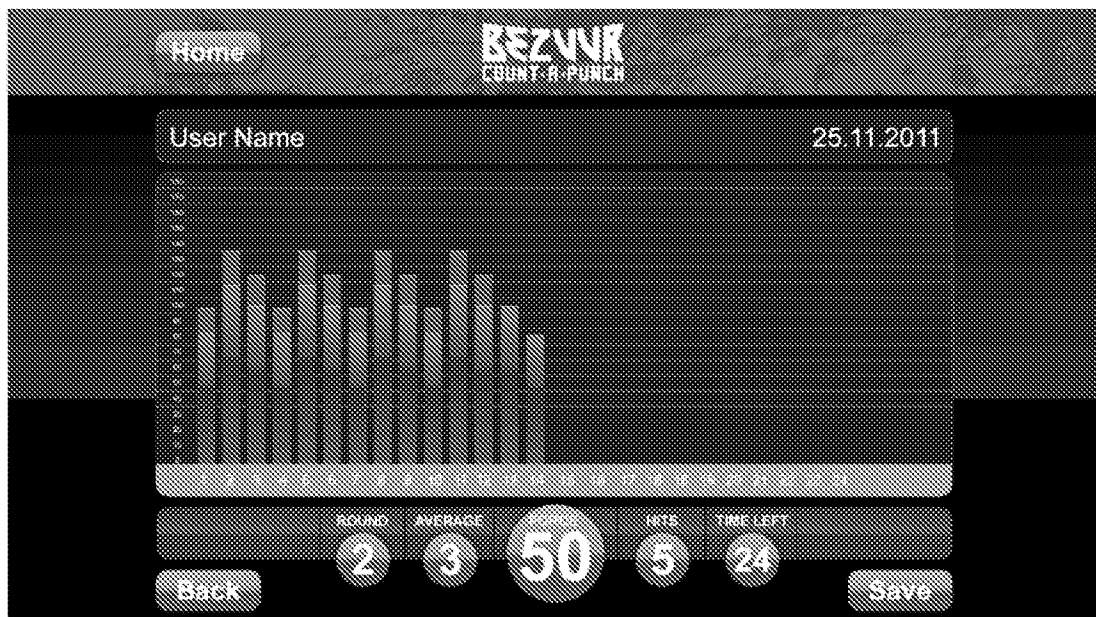
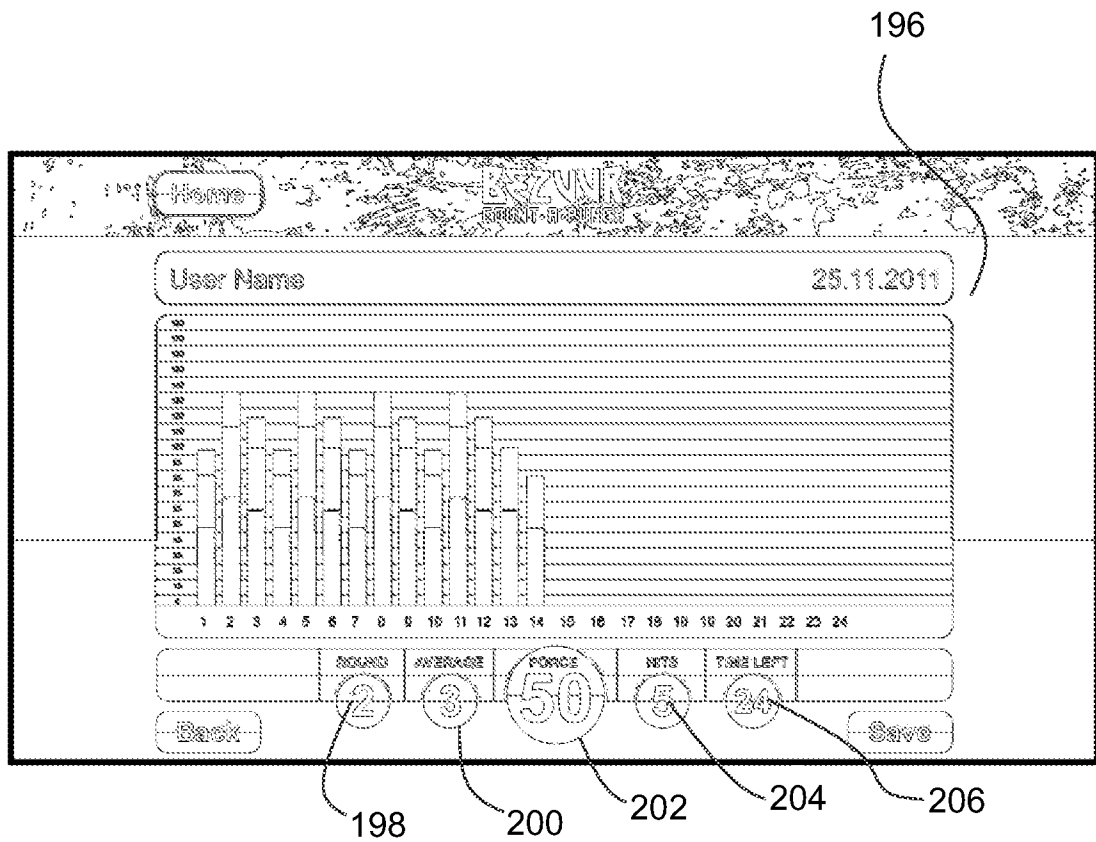
End of Round Not. End of Rest Not.

Use Save

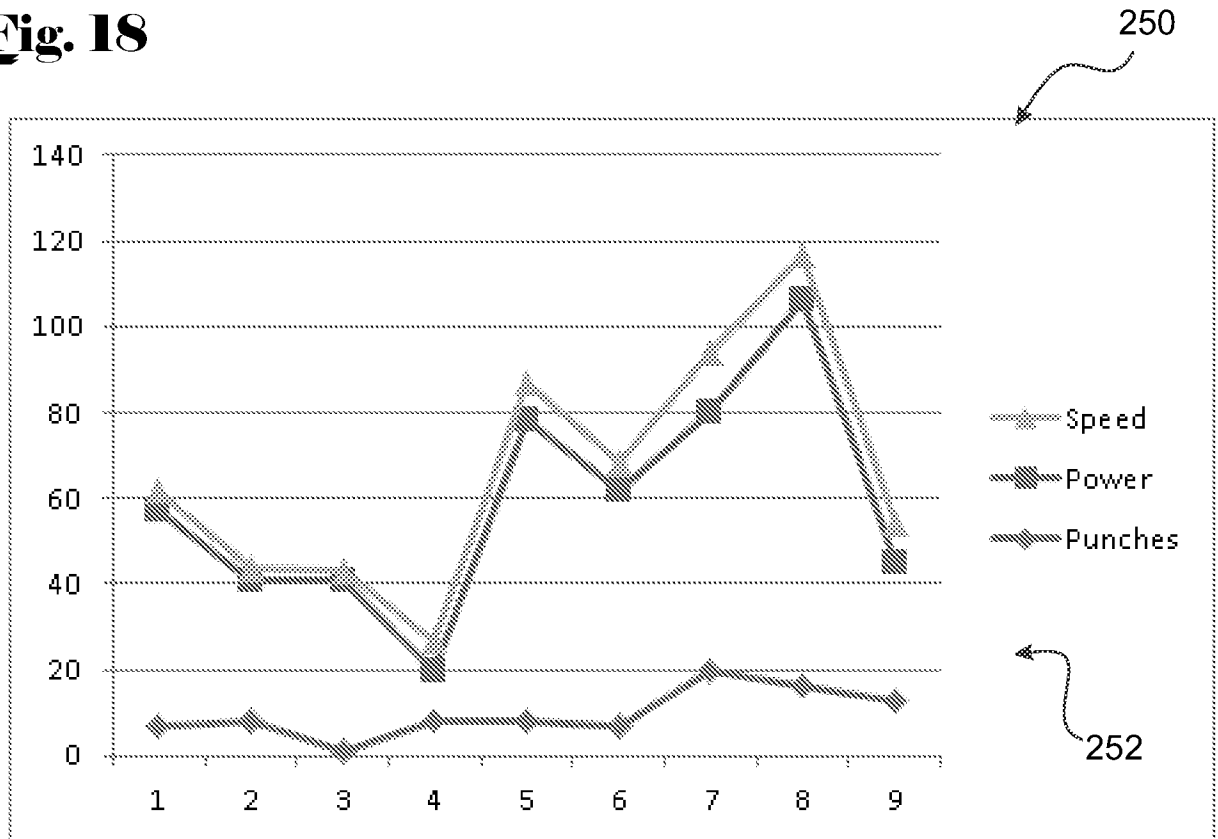
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**Fig. 16**

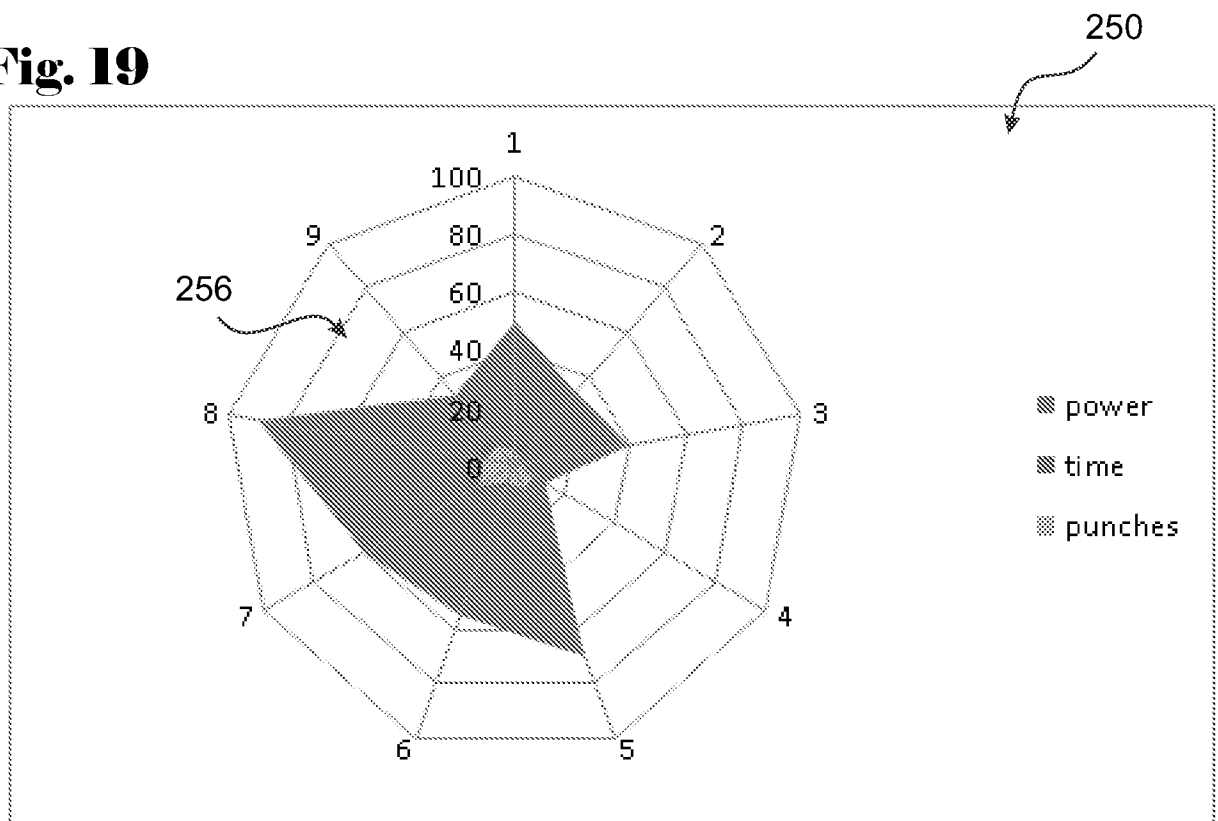


**Fig. 17**

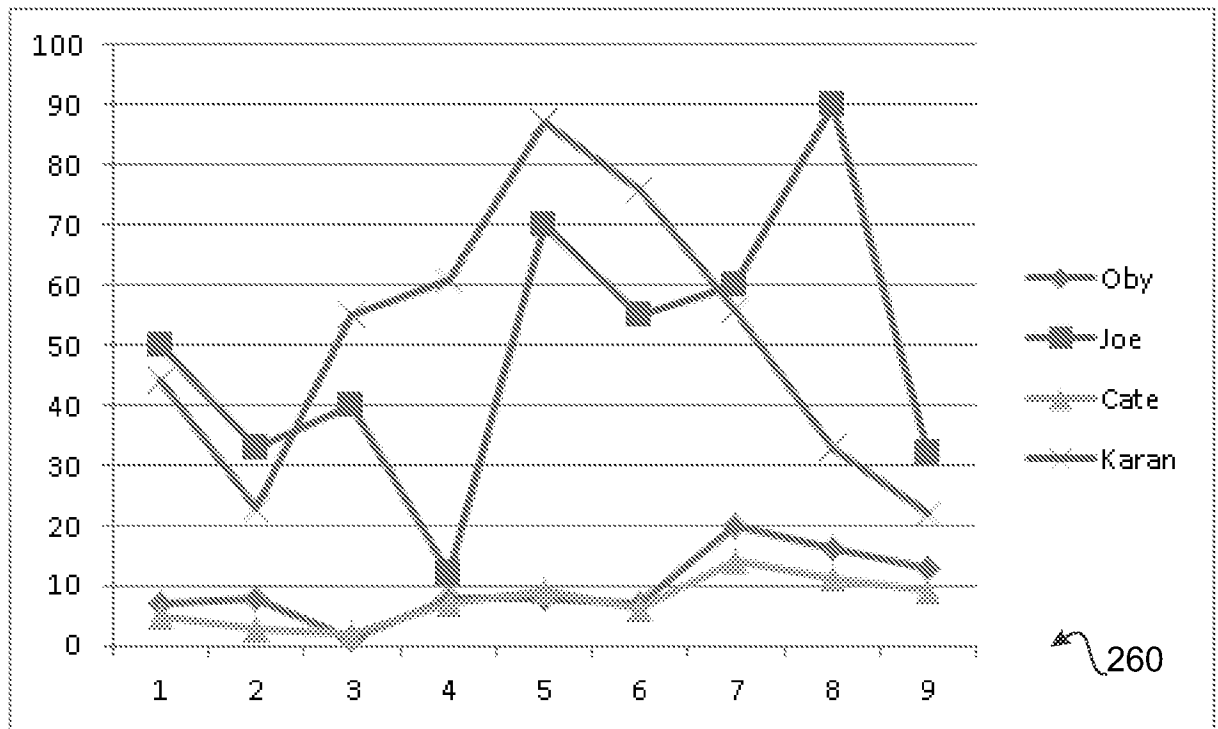
**Fig. 18**



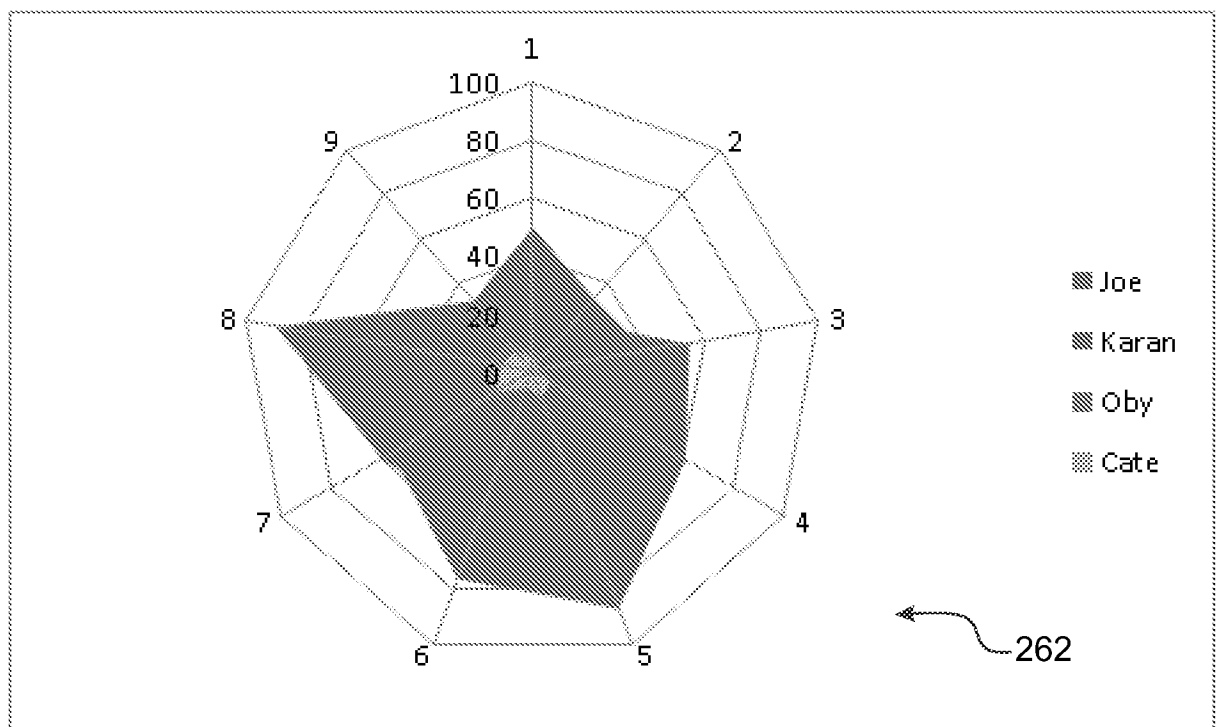
**Fig. 19**

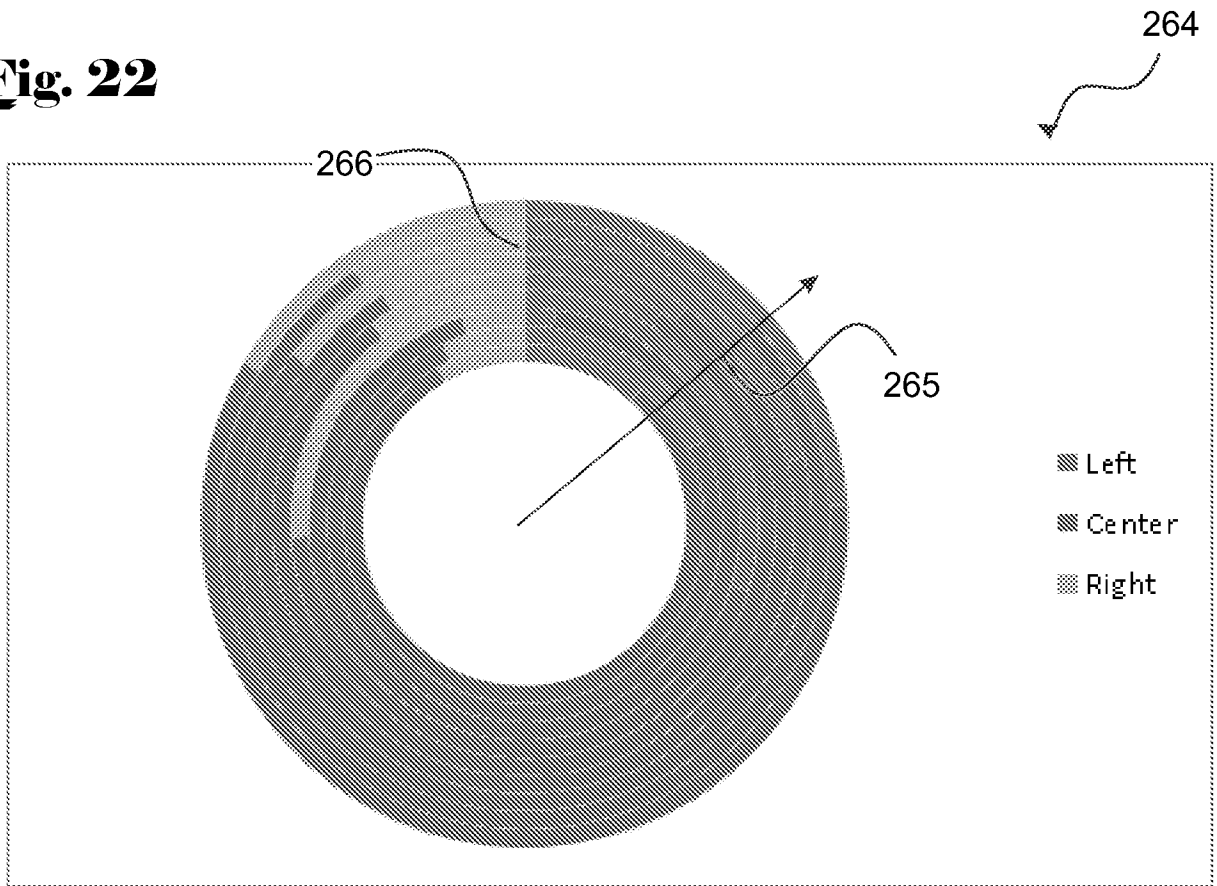
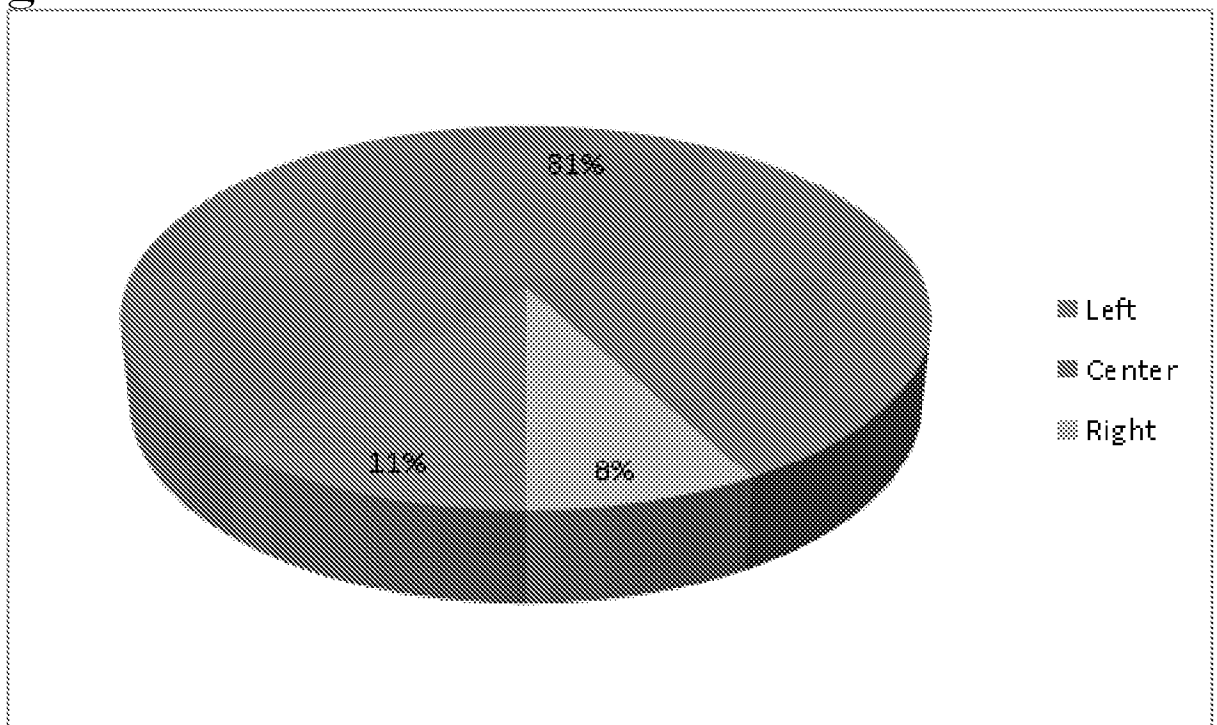


**Fig. 20**



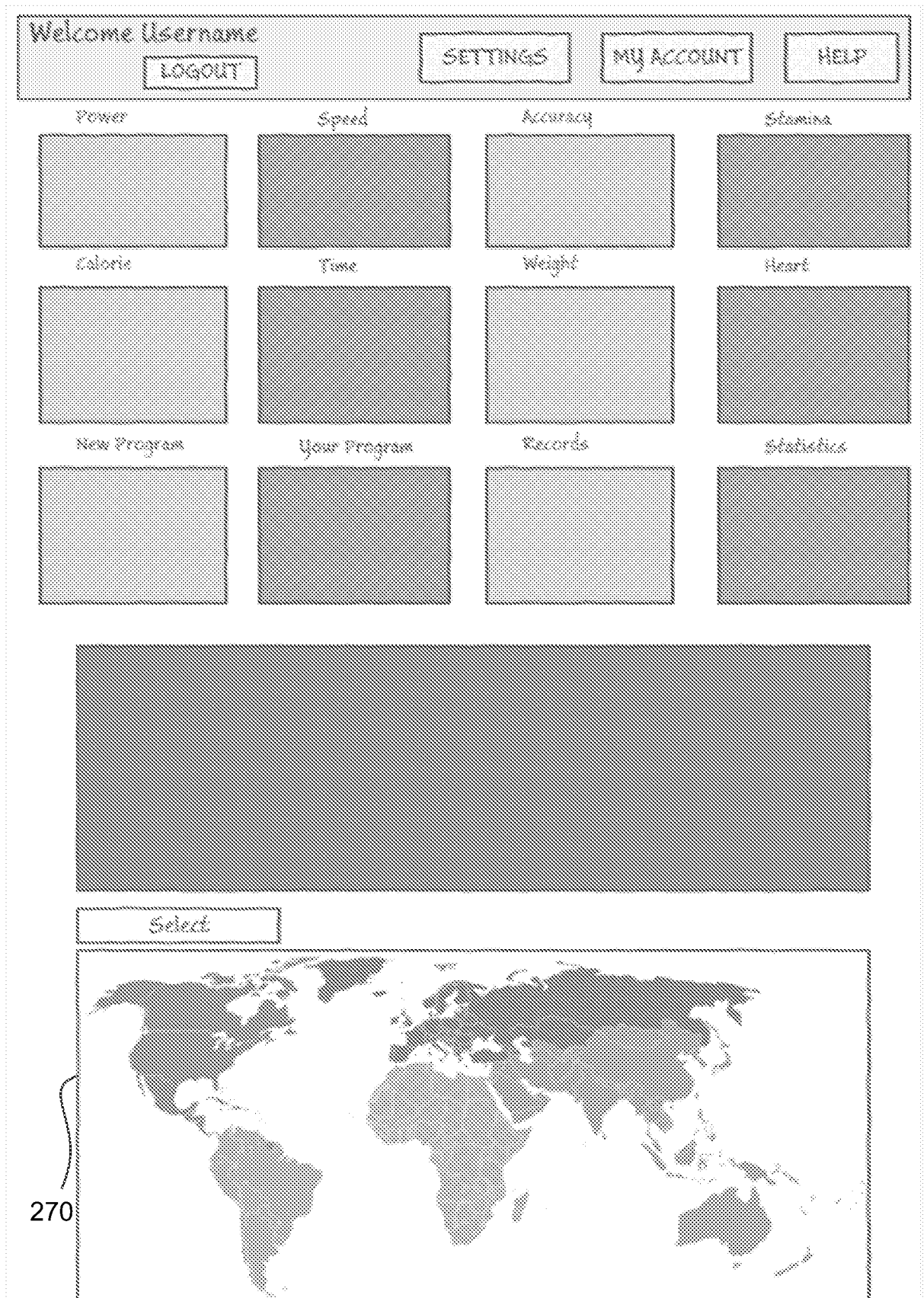
**Fig. 21**

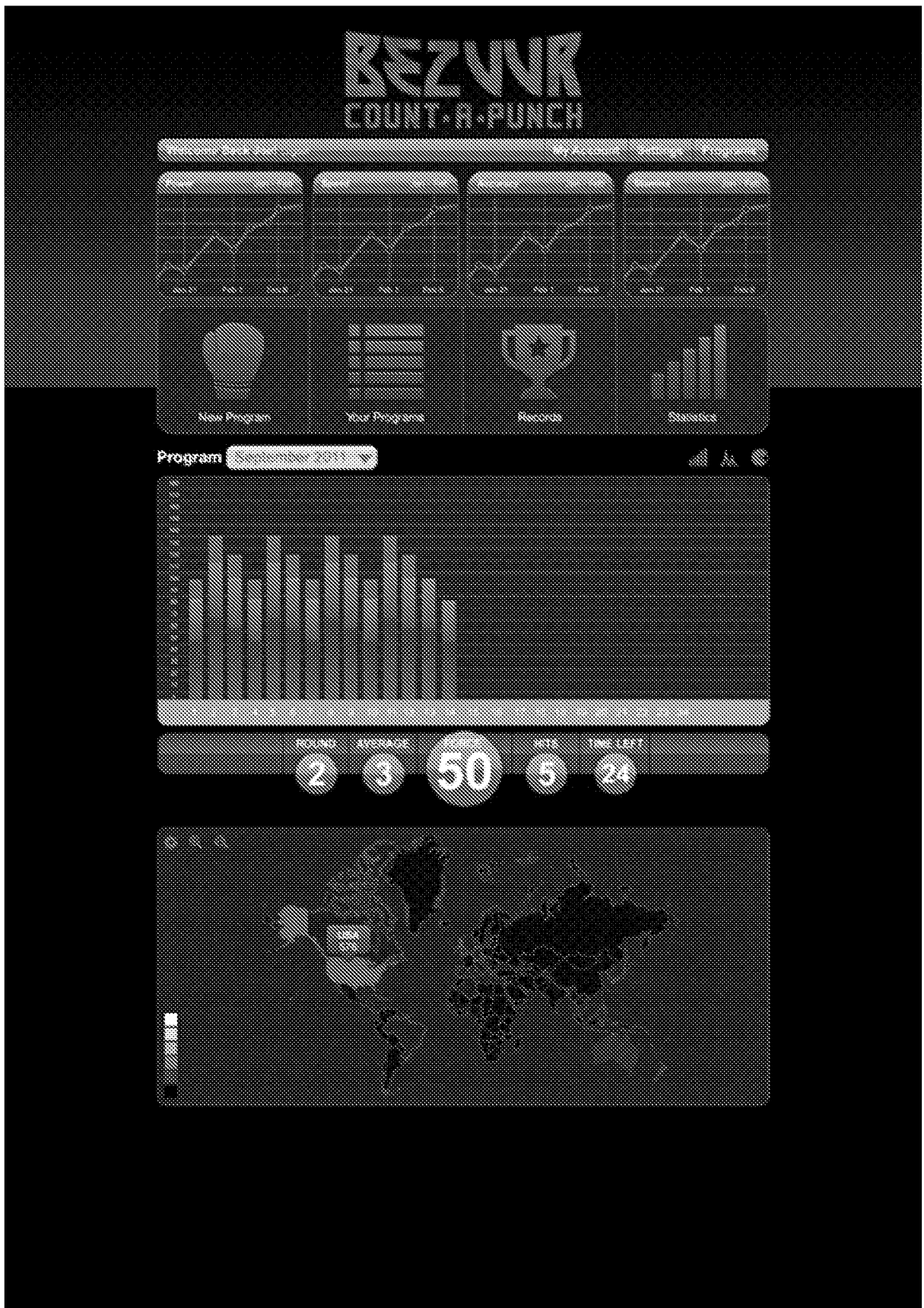


**Fig. 22****Fig. 23**

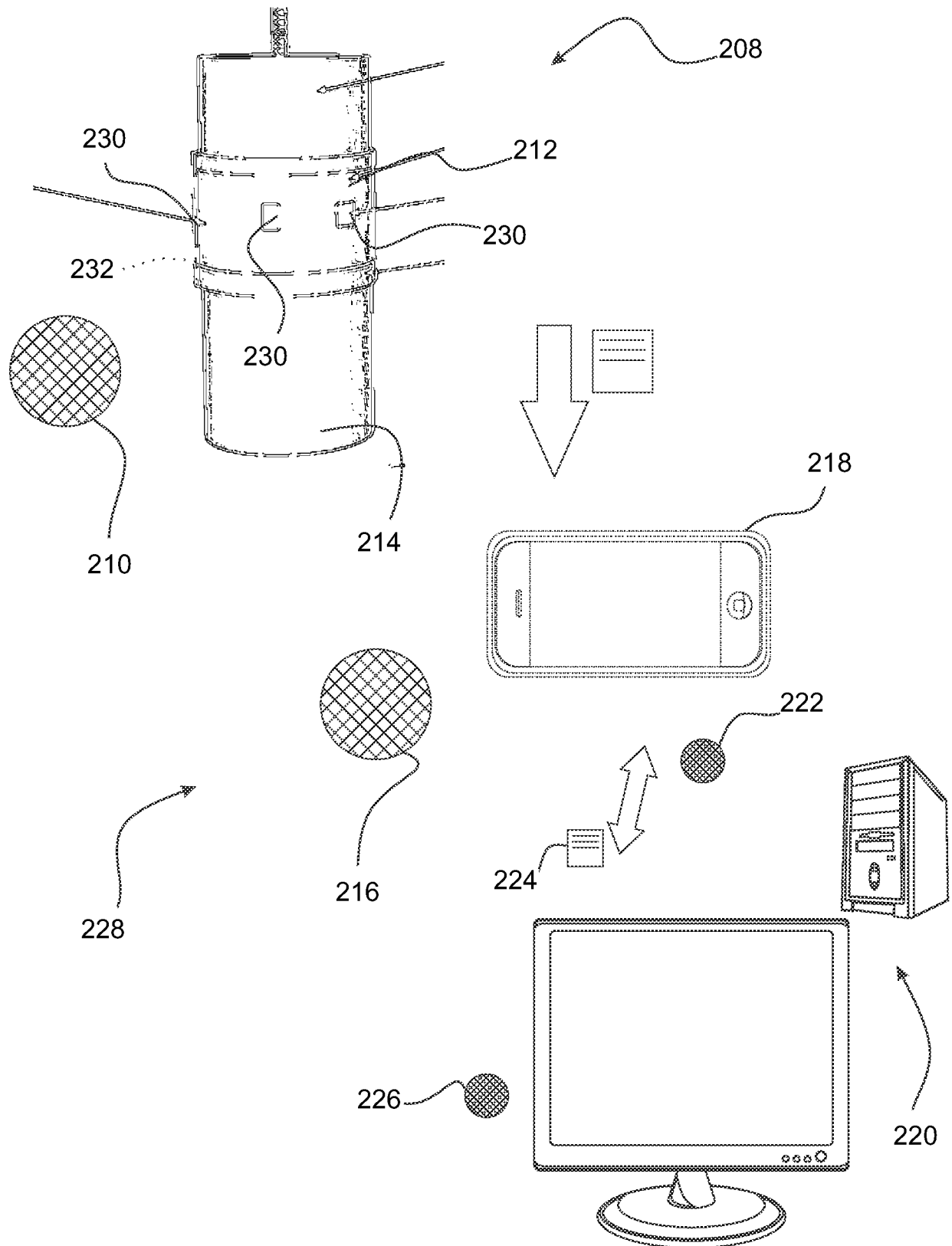
**Fig. 24**

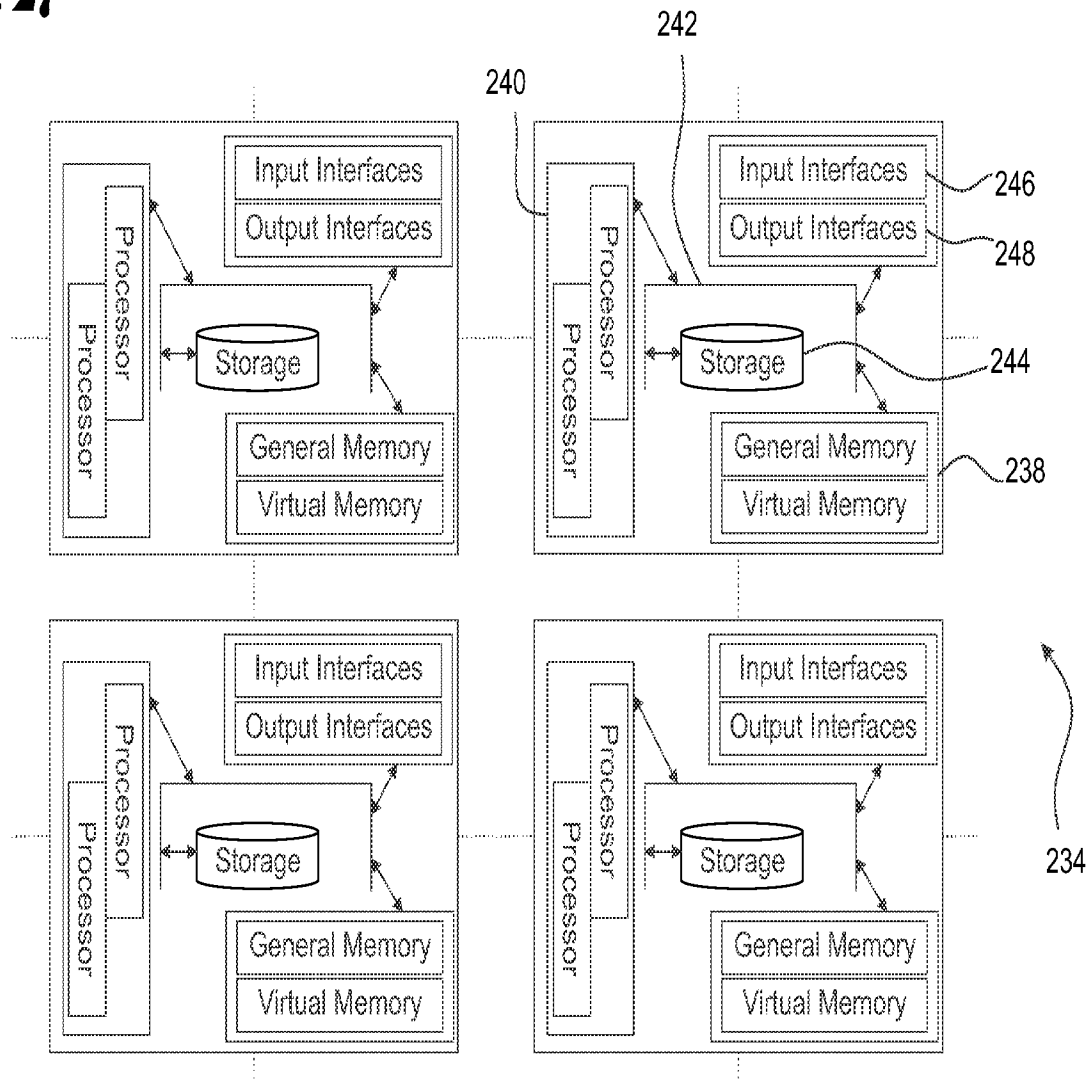
268



**Fig. 25**

**Fig. 26**



**Fig. 27**



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2012/001084

## A. CLASSIFICATION OF SUBJECT MATTER

A63B 23/00 (2006.01) A63B 71/00 (2006.01)

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)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC, WPI, Google Patent &amp; keywords (Box+, Bag, Sensor) &amp; similar terms

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

☒ Further documents are listed in the continuation of Box C☒ See patent family annex

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search  
25 October 2012Date of mailing of the international search report  
25 October 2012

## Name and mailing address of the ISA/AU

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Facsimile No.: +61 2 6283 7999

## Authorised officer

Kanwal Pahwa  
AUSTRALIAN PATENT OFFICE  
(ISO 9001 Quality Certified Service)  
Telephone No. 0262832644

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2012/001084

## Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 18  
because they relate to subject matter not required to be searched by this Authority, namely:  
**See supplemental Box**
2. ☒ Claims Nos.: 10, 22-23  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:  
The claims do not comply with Rule 6.2(a) because they rely on references to the description and/or drawings.
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

## Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT		International application No.
C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		PCT/AU2012/001084
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011/0172060 A1 (MORALES et al.) 14 July 2011 Abstract, Para 0039-0040, 0067, 0073	1-9, 11-17, 19-21
X	US 7909749 B2 (SHEEDY) 22 March 2011 Abstract, Fig 3A, Col 2	1-9, 11, 19-21

**INTERNATIONAL SEARCH REPORT**

International application No.

**PCT/AU2012/001084****Supplemental Box**

Continuation of Box II

The claim 18 do not satisfy PCT Rule 67.1 because the subject matter of this claim relates to mere presentation of information.

<b>INTERNATIONAL SEARCH REPORT</b> Information on patent family members		International application No. <b>PCT/AU2012/001084</b>	
This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.			
<b>Patent Document/s Cited in Search Report</b>		<b>Patent Family Member/s</b>	
<b>Publication Number</b>	<b>Publication Date</b>	<b>Publication Number</b>	<b>Publication Date</b>
US 2011/0172060 A1	14 Jul 2011	US 2011172060 A1	14 Jul 2011
US 7909749 B2	22 Mar 2011	US 2009048069 A1	19 Feb 2009
		US 7909749 B2	22 Mar 2011
<b>End of Annex</b>			
<div> <p>Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.</p> <p>Form PCT/ISA/210 (Family Annex)(July 2009)</p> </div>			