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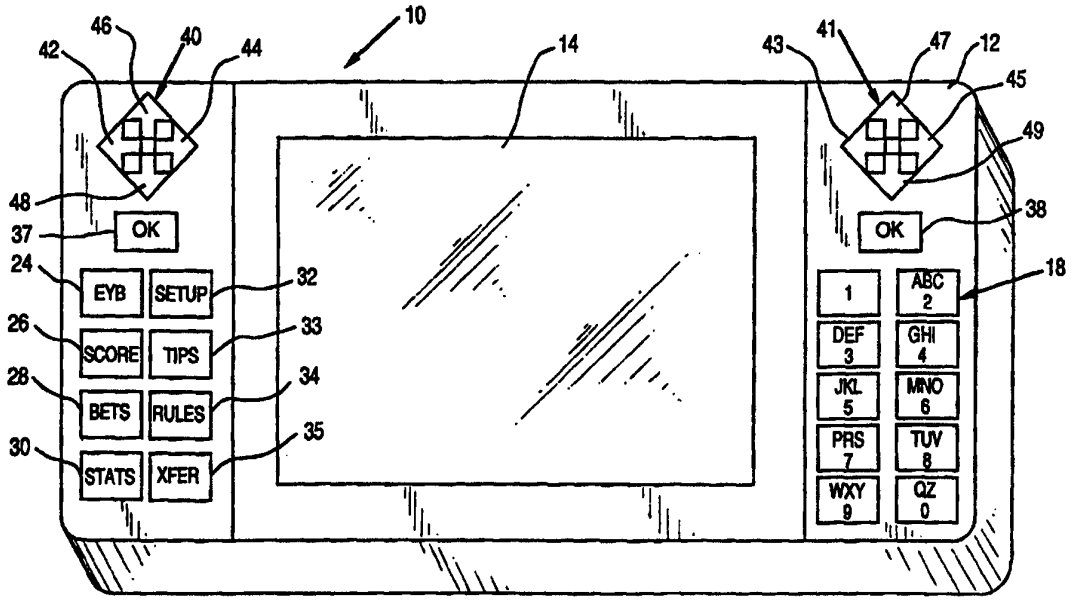

(57) Abstract

This invention is a hand held, portable golf computer device (10), including a housing (12), a display screen (14) disposed in the housing and computer circuitry for storing and retrieving golf information. Golf information includes at least one of the following: (i) golf course description data; (ii) golf shot data; (iii) golf scoring data; (iv) golf wagering data; (v) golf tips data; and (vi) golf rules. A "context intelligence" feature is provided that is based on the flow of a normal golf game, the historical choices that the golfer has made in similar circumstances, and golf shot information statistics compiled by the golfer in the memory of the device. An associated method for using the device is also disclosed.

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GOLF COMPUTER DEVICE AND AN ASSOCIATED METHOD

BACKGROUND OF THE INVENTION

This invention relates to a golf computer device and an associated method, and more particularly, to a golf computer device that is an interactive device which allows a golfer, during play, to record, analyze, review and access various information related to the game of golf.

The object of the game of golf is simple; put the ball into the hole with as few strokes as possible. However, achieving that objective involves consideration of many different variables. For example, many different clubs are used to play the game. These clubs can be used to hit the ball different distances. The golfer tends to rely on past experience in making judgments about which club to use in a certain situation. In almost all cases, however, the golfer's memory is imperfect and wrong decisions can be made. Furthermore, most golfers cannot calculate statistics of past performance without the aid of a computing device. In order to make correct decisions, precise information about past performance must be remembered and then used correctly in order to make the best decision regarding how to play a golf shot.

Touring golf professionals realize the value of this past performance data, and this is why a tour professional has a full time caddie that travels with him from tournament to tournament. A tour caddie's job is to maintain records of the tour professional's past performances in similar situations as well as maintain records related to the description of each hole of each golf course the touring golf professional plays, and then make suggestions with regard to the shots the tour professional must hit.

Ideally, every golfer, not just tour professionals, would like to have a tour caddie available for consultation. However, most golfers play without using a caddie. Golfers that use caddies often do not have the same caddie from round to round and thus the caddie is not familiar with that golfer's game. Even caddies that may have some familiarity with a particular golfer's game do not keep personal detailed records of each particular golfer's performance.

There have been several systems proposed for attempting to aid a golfer in shot selection, however, none of these systems can provide comprehensive and accurate advice about past performance in similar situations at the moment when that advice is most needed, i.e., before hitting the shot. For example, United States Patent No. 5,319,548 discloses a system in which a series of cards are provided which have a pictorial layout of each hole of a golf course. The golfer marks each shot on the cards and then takes the cards to a central computer. The cards are read by the computer and then statistical information is created. The patent also discloses that a hand held recording device can be used instead of the cards. Even with the hand held recording device, the recorded information (on a disc or magnetic card) still must be entered into a central computer for subsequent compilation of the statistical information. The obvious shortcoming of this system is that the statistical information is simply not available during play.

Thus, a golfer contemplating a golf shot does not get immediate help from the device regarding how to play the shot at hand. Only after the round can there be any analysis. This analysis, even if done, is likely to be forgotten the next time a golfer plays.

Another computerized golfer aid is shown in United States Patent No. 5,095,430. This system includes a computer installed in a golf cart which contains a display screen for showing graphically the details and features of each golf

hole. The ball position on each hole is tracked by a light pen, with the computer calculating and displaying selected distances. The computer also has a slot for a memory cartridge which can be transferred to a stationary printing station. Once again, this computer acts as merely a recording device, and does not provide information, except yardages, during play to a golfer in order to assist a golfer in improving his or her game or in making wagering decisions.

What is needed, therefore, is a device that provides information to support a golfer's decision making much the same way that a personal tour caddie provides information to support a tour professional's decision making. The device should be portable, easy to use and have other features, such as the ability to store and provide access to scoring and wagering information as well as playing tips and golf rules.

SUMMARY OF THE INVENTION

A hand-held, portable golf computer device is provided which includes a housing, a display screen disposed in the housing and means for storing and retrieving golf information. The golf information is at least one of the following: (i) golf course description information; (ii) golf shot information; (iii) scoring information; (iv) wagering information; (v) golf tip information; and (vi) golf rules information. The invention also includes a "context intelligence" feature that is based on the flow of a normal golf game, the historical choices that the golfer has made in similar circumstances and golf shot information statistics compiled by the golfer in the memory of the device. Context intelligence simplifies the data entry that must be done during a round of golf.

An associated method of assisting a golfer is also provided. The method comprises providing a hand-held, portable golf computer device having (i) a housing; (ii) a display screen disposed in the housing and (iii) storage and

retrieval means containing golf information. The method further comprises retrieving and displaying on the display screen the golf information from the storage and retrieval means in order to assist the golfer. The golf information is the same golf information as discussed above. The method also includes the "context intelligence" feature discussed above.

BRIEF DESCRIPTION OF THE DRAWINGS

A full understanding of the invention can be gained from the following detailed description of the invention when read in conjunction with the accompanying drawings in which:

Figure 1 is a perspective view of one embodiment of the golf computer device of the invention.

Figure 2 is a block schematic diagram of the invention.

Figure 3A is a detailed view of the display screen of the device showing a graphic representation of a golf hole and the display of information entry choices.

Figure 3B is a view similar to Figure 3A only showing the position indicating means and the display of additional information entry choices.

Figure 4 is a flow chart showing one aspect of the "context intelligence" feature of the invention.

Figure 5 is a flow chart showing the wagering service aspect of the invention.

Figure 6 is a diagram of a 4 x 4 matrix showing how the results of the calculations of the wagering service aspect of the invention could be displayed on the display screen.

Figure 7 is a flow chart that shows the golf course description aspect of the invention.

Figure 8 is a flow chart that shows how the data regarding golf course description is decoded and displayed on the display screen of the device.

DETAILED DESCRIPTION

Referring to Figure 1, the golf computer device 10 is shown. It will be appreciated that the golf computer device 10 is a hand-held, portable device that can be taken along with a golfer during a round of golf. The device is sized so that it can be carried by a golfer, such as by placing the device 10 in a pocket, or by placing the device 10 in the golfer's golf bag. The device 10 can also be attached to a golfer's pull cart or can be carried in the golfer's motorized golf cart. The device 10 is approximately the size of a golf scorecard.

The device 10 includes a housing 12, a display screen 14 and a plurality of keys. The keys consist of an alpha-numeric key pad 18 similar to a telephone key pad for entering information having letters, numbers or both numbers and letters. There is also a series of function keys 22, including an EYB (electronic yardage book) key 24; a Score key 26; a Bets key 28; a Stats key 30; a Setup key 32; a Tips key 33; a Rules key 34; and a Xfer (transfer) key 35. Along with the function keys there are two OK keys 37, 38 which are equivalent to enter keys on a standard computer keyboard. Finally, there are two sets of cursor movement keys 40, 41. Each set of cursor movement keys include a left movement key (reference character numbers 42, 43) and a right movement key (reference character numbers 44, 45) as well as an up movement key (reference character numbers 46, 47) and a down movement key (reference character numbers 48, 49).

Briefly, the function keys 22 control the interface between the golfer and the systems of the device 10. The EYB key 24 provides access to the electronic yardage book feature of the invention which will be described in detail below with respect to Figures 3A and 3B. The Score key 26 provides access to the scoring feature of the invention which allows the golfer to enter the golfer's score and number of

putts and other player's scores and number of putts onto an electronic scorecard that is displayed on the display screen 14 of the device 10. The Bets key 28 provides access to the wagering service feature of the invention which will be discussed in detail below with respect to Figures 5 and 6. The Stats key 30 provides access to the statistical analysis feature of the invention. The device cumulatively and automatically updates critical statistics (such as number of putts) and tendencies on a hole by hole, course by course basis. The Setup key 32 accesses the course design storage means described below. The Tips key 33 provides access to the tips feature of the invention wherein the golfer can retrieve and display on the display screen 14 instant information from the device 10 regarding how to play certain shots. Similarly, the Rules key 34 provides access to the rules of golf, which are stored in the device 10, so that a particular rule can be retrieved and displayed on the display screen 14 during play. The tips and rules are preferably accessed by using key words. For example, if a golfer wants advice on how to hit out of wet sand, the golfer merely enters the words "wet sand" into the device 10 and the device 10 retrieves and displays on the display screen 14 the tip on wet sand by a text searching algorithm well known to those skilled in the art. Similarly, for the rule on water hazards, the golfer merely enters the words "water hazard" into the device 10 and the device retrieves and displays on the display screen 14 the rule concerning water hazards. The Xfer key 35 accesses the ability of the device 10 to transfer information to another computer, such as a PC.

The device 10 includes computer circuitry contained therein which performs the functions of receiving, storing, calculating and transmitting display information to the display screen 14. Referring now to Figure 2, a block schematic diagram of the invention is shown. The control section 50 controls the operation of the device 10. The

device 10 can accept information from and transmit information to another computer 52, but most often accepts entered information from a user, who for the remainder of this description will be called a "golfer" 54. To accept the information from and transmit the information to another computer 52, a computer input/output interface 56 is provided. For example, if it is desired to accept information from another computer 52, the computer input/output interface 56 signals the control section 50 that such information is available. The control section 50 then directs that information to the appropriate storage device which may be any of the following which will be described in detail below: advice storage means 60; scoring storage means 62; course design storage means 64; statistics data storage means 66; wagering storage means 68; and/or rules storage means 70. It will be appreciated that the golfer input interface 72 also signals the control section regarding golfer input that is received by the golfer input interface 72 from a golfer 54.

The device 10 permits the golfer to store and selectively retrieve golf information, which is defined herein to include at least one of the following: (i) golf course description information; (ii) golf shot information; (iii) scoring information; (iv) wagering information; (v) golf tip information and (vi) golf rules information. The golf course description information includes at least one of the following: (i) the name of the golf course and hole number of the various golf holes on the course; (ii) the par of each of the golf holes (both men's and women's); (iii) the handicap of each of the golf holes (both men's and women's); and (iv) golf hole graphic representation information, as will be shown in Figures 3A and 3B. Golf hole graphic information further consists of at least one of the following: (i) a distance of the golf hole from a tee to a green; (ii) the shape and position of the tee, a fairway, a rough, a hazard and the green of the golf hole; and (iii) landscape objects on the

golf hole. Furthermore, the golf shot information includes at least one of the following items: (i) golf club selection information; (ii) golf shot distance information; (iii) golf ball lie information; (iv) golf shot directional information; (v) golf shot hit information; and (vi) golf shot ambient environmental conditions. Finally, the scoring information includes at least one of the following items: (i) the golfer's score and number of putts and (ii) other golfer's, such as playing partner's, scores and number of putts.

The golf course description information is stored and is retrievable from course design storage means 64. The golf shot information is stored in and retrievable from the statistics data storage means 66 and the scoring information is stored in and retrievable from scoring storage means 62. Furthermore, the wagering information is stored in and retrievable from wagering storage means 68 and the golf tip information is stored in and retrievable from the advice storage means 60. Finally, the golf rules information is stored in and retrievable from rules storage means 70. The process for entering golf information and selectively retrieving golf information will be discussed further below with respect to Figures 3A to Figure 8.

A removable auxiliary memory means can also be provided. This means consists of a removable auxiliary memory device 80, auxiliary memory sensor 82 and an auxiliary memory access unit 84. The presence or absence of a removable auxiliary memory device 80 is determined by control section 50 by examining the state of auxiliary memory sensor 82. The state of the auxiliary memory sensor 82 and the contents of the removable auxiliary memory device 80 are used by the control section 50 to carry out one of several actions. In particular, the control section 50 after examining the data recorded on or in recording medium on or in the removable auxiliary memory device 80 and obtaining information from the golfer 54 via the golfer input interface 72 may move data from

the removable auxiliary memory device 80 to any or all of the storage devices mentioned above. The success or failure of such operations are reported to the golfer 54 via the display screen 14. Auxiliary memory storage can be used, for example, for storing additional tips and rules as well as storing additional course description information.

Now that the device has been described, its use by a golfer during a round of golf will now be discussed. When the device 10 is first taken out on the golf course by a golfer during that golfer's round, the device 10 is turned on and the Setup key 32 is pressed. This will display on the display screen 14 a list of the courses that are stored in the course design storage means 64. The golfer uses the cursor movement keys 40, 41 to highlight the particular course that he is playing and enters his selection by pressing one of the OK keys 37 or 38. If the golfer normally keeps score during a round, he then presses the Score key 26 and the scorecard for the particular course selected is displayed on the display screen 14. The scorecard is created by retrieving a generic form scorecard template from the scoring storage means 62 and filling in information on that template, such as yardages, pars and handicaps (men's, women's and professionals') that are retrieved from the course design storage means 64 which, as discussed above, contains the golf course description information. The golfer enters his name and his playing partner's names on the electronic scorecard using the alphanumeric keys 18.

If the golfer normally has wagers with his playing partners, the Bets key 28 is depressed and the display screen lists the types of bets available (such as, for example, nassau). This list is retrieved from the wagering storage means 68. After entry of the type of bet, the amount of the bet is entered. The wagering feature also allows for team or individual betting. Further details on the wagering feature will be described below with respect to Figures 5 and 6.

All of the above actions are taken before the golfer starts his round of golf. Once the golfer is ready to tee-off on the first hole of his round, the EYB key 24 is pressed, thus retrieving from the course design storage means 64 golf hole graphic representation information. The golf hole graphic representation information is displayed on the display screen 14 in the form of the first hole of the golf course that the golfer selected in the initial setup. The display on the display screen 14 once the EYB key 24 is pressed is shown in Figure 3A. This figure shows a graphic representation of a golf hole 100, in this case, hole no. 1 of the Torrey Pines South Golf Course in San Diego, California. The graphic representation of the golf hole 100 includes a tee area 102, fairway area 104 and green area 106, surrounded by a rough area 108. Also provided on the graphic representation of the golf hole 100 are landscape objects, such as trees 110 and hazard areas, such as sand trap areas 112, 114 and 116. The tee area 102 includes the designations "BWR" (reference character number 120), which stands for Blue (professionals') tee, White (men's) tee and Red (women's) tee. The graphic representation also includes the yardage distances from each of the respective tees, represented by the designations 453 B (reference character number 122) for the blue tee yardage; 438 W (reference character number 124) for the white tee yardage and 424 R (reference character number 126) for the red tee yardage. In this case, the blue tee yardage (453 yards) is highlighted because, based on context intelligence, the golfer normally plays the blue tees at Torrey Pines South. Of course, if the golfer chooses to play any other tee, the golfer merely uses the cursor keys 40 or 41 to move the highlighted area to the desired tee designation. The graphic representation of the golf hole 100 also includes a plurality of yardage markers such as yardage marker 132, which indicates the distance from the tee 102 to that point, in this case 243 yards.

It will be appreciated that all holes of the particular golf course that the golfer is playing can be stored and retrieved by the device 10. Also, a plurality of different golf courses can be stored and retrieved, depending on the capacity of the memory in the course design storage means 64. As will be discussed below with respect to Figure 7, the golf course description data can be entered manually by the golfer. In this way, any golf course that a golfer plays can be entered into the course design storage and thus is available for use by the golfer during play of a round of golf at that particular golf course.

A club selection chart 140 is also provided. This club selection chart 140 includes a selected club 142, a first alternative club 144, a second alternative club 146 and an other club 148. Based on "context intelligence" (which will be discussed in greater detail below), the selected club is a driver, and this club is highlighted. Context intelligence in this case means that the device 10, based on the golfer's past club selections for hitting off the tee on hole no. 1 at Torrey Pines South, knows that this golfer uses a driver when teeing off on this hole. This knowledge is provided by an algorithm which searches the statistics data storage means 66 to determine what club has been used most often by the golfer when teeing off from hole no. 1 at Torrey Pines South. Context intelligence also lists the next most likely club as the first alternative club 144 and the subsequent next most likely club as the second alternative club 146. If, in this case, the golfer hits the driver off of hole no. 1, all the golfer needs to do is press one of the OK keys 37 or 38 and this club selection choice (part of golf shot information) is stored in the statistics data storage means 66. If the golfer hits the first alternative club 144, the 5-wood, the golfer uses the cursor movement keys 40, 41 to move the highlighted area to the first alternative club 144 and then presses one of the OK keys 37 or 38. If the golfer hits the second alterna-

tive club 146, the 3-iron, the golfer uses the cursor movement keys to move the highlighted area to the second alternative club and then presses one of the OK keys 37 or 38.

If the golfer hits a club other than the selected club, first alternative club and second alternative club, the highlighted area is moved to the other club 148 and one of the OK keys 37 or 38 is pressed. This will display on the display screen 14 all of the clubs in the golfer's bag. These clubs were entered by the golfer when he initially obtained the device 10. These club selections are stored in the statistics data storage means 66 and are retrieved when the other club 148 listing is entered into the device 10. The golfer simply highlights one of the listed clubs and presses one of the OK keys 37 or 38 to enter that club selection into the statistics data storage means 66.

After the golfer presses one of the OK keys 37 or 38 to make a club selection, the display of Figure 3B will appear on the display screen 14. The golfer then hits his golf ball with the selected club off of the first tee at Torrey Pines South and then locates his ball. The golfer then takes the device 10 and estimates the position of his ball on the graphic representation of the golf hole 100. This is accomplished by utilizing a position indicator means. This position indicator can be one of several position indicator means known to those skilled in the art such as a track-ball, a light pen or key pad information entry. Referring again to Figure 3B, the embodiment illustrated herein is a cross-hair means 160 including a vertical line 162 that is moved from side to side by cursor keys 42, 44 or 43,45 (Figure 1) and a horizontal line 164 that is moved up and down by cursor keys 46, 47 or 48, 49. The vertical line 162 and horizontal line 164 are moved so that the intersection thereof (reference character number 166) is the position of the golf ball on the graphic representation of the golf hole 100 which corresponds to the position of the golf ball on the golf course after the

golfer has hit the drive. Once the position is determined, the golfer presses one of the OK keys 37 or 38 and the device automatically calculates the length of the drive and stores this in the statistics data storage means 66. The length is calculated based on the yardage of the hole from the tee marker that the golfer has played from (here, the blue markers, 453 yards) and the position of the ball as indicated by the intersection point 166. In this example, the intersection point 166 is approximately one-half of the distance between the tee 102 and the green 106, thus the distance from the tee, indicated in box 170 is 226 yards and the distance to the green indicated in box 172 is 227 yards. The distance calculation based on the position of the cross-hair means can be accomplished by several different means well known to those skilled in the art.

Also displayed on display screen 14 are golf shot information charts for hit information 174, direction information 176, lie information 178 and club information 180. Club information 180 is similar to the club information displayed in Figure 3A. The hit information 174 concerns how the golfer hit the previous shot, in this case the driver off of hole no. 1 tee. The listed choices are sweet spot 174a, toe 174b, heel 174c and other 174d. Similar to the club selection discussed with respect to Figure 3A, the golfer uses the cursor keys to highlight the desired entry. Again, the choices are listed by context intelligence. If the golfer selects other 174d, the display screen 14 will list hit information other than listed at reference character numbers 174a, 174b and 174c that can be entered by highlighting the desired choice. The direction information 176 concerns the flight direction of the golfer's previous shot. In this case, since the intersection point 166 is in the middle of the fairway, context intelligence assumes that the shot was hit straight, and thus the listed choices begin with straight 176a. The other listed choices are slice 176b,

hook 176c and other 176d. Once again, if the golfer chooses other 176d, the display screen 14 will list directional information other than that listed at reference character numbers 176a, 176b and 176c, that can be entered by highlighting the desired choice.

It will be appreciated that the hit and direction information refer to the previous shot. This golf shot information, along with the distance that the previous shot traveled (in this case 226 yards) and the club used for the previous shot (driver) is stored in the statistics data storage means 66.

The lie information 178 and club information 180 relate to the golfer's next shot from position 166. Based on context intelligence, and the course design description stored in the course design storage 64, position 166 is assumed to be a flat lie, and thus lie information 178 first lists and highlights a flat lie 178a. The lie information 178 also includes an uphill lie 178b, a downhill lie 178c and an other lie 178d. The golfer enters the lie information similarly to the hit and direction information. Finally, the club information 180 is entered as was discussed above with respect to Figure 3A.

Figure 3B also shows ambient environment information 182. This information usually does not have to be entered for each shot. Included in this information is wind conditions (against, with, quartering and intensity) as well as information regarding precipitation and other environmental conditions. It is not necessary to enter this information for each shot.

Referring specifically to Figure 3B, if the golfer hit his drive on the sweet spot and the drive went straight and if the golf ball comes to rest after the drive on a flat lie and the golfer's next shot is hit with a 2-iron, all the golfer needs to do is press one of the OK keys 37 or 38 in order to enter into statistics data storage means 66 a wealth of information that can be used by the golfer when playing

this golf hole again or when it is desired to analyze past performance and tendencies. The distance information is calculated automatically by the device 10, and then stored in the statistics data storage means 66 so there is no need to enter this information. Thus, it will be appreciated that if all of the highlighted areas, which are based on context intelligence, are correct, all a golfer needs to do is enter the position of the golf ball on the graphic representation of the golf hole 100 using the cross-hair means 160 followed by pressing one of the OK keys 37 or 38.

Once the golfer hits the second shot from position 165, the same process as was set forth above is repeated, with the golfer indicating the position of the ball after the second shot has been hit on the graphic representation of the golf hole 100. For example, if the golfer hits his second shot into bunker 114, the device 10 knows, by the information stored in the course design storage means 64 that the golfer is in a bunker. Context intelligence would then list the data entry choices (hit and direction for the previously hit 2-iron shot and lie and club selection for the upcoming third shot from the bunker). In this case, since the golfer is in a greenside bunker to the left of the green, context intelligence would highlight a heel shot for the hit information 174 (assume the golfer is right handed) because these shots tend to go to the left and a hook for the direction information 176 as the golf shot information for the previously hit 2-iron. As for the lie information 178, since this is a bunker, context intelligence would (based on the course description data stored in the course design storage means 64) highlight a flat lie. The club information 180 would most likely highlight a sand wedge, as this is a greenside bunker. In this way, a multitude of valuable golf shot information can be easily and effectively compiled for later use.

Once the golfer reaches the green 106 a new display for the entry of putt information is displayed on the display screen 14.

Continuing with the golfer's game once the golfer holes out, the device 10 will switch modes from the EYB mode to the scoring mode. At this point, the electronic scorecard is retrieved from a combination of the scoring storage means 62 and the course design storage means 64, as was discussed above. Again, this switching of modes is based on context intelligence concerning the "flow of the game". That is, once the golfer and his playing partners holes out, the natural thing to do, based on the flow of the game of golf, is to mark down the scoring information of the golfer and the golfer's playing partners. This includes the number of strokes taken on the hole and the number of putts needed to hole out for the golfer's playing partners. It will be appreciated that the number of strokes for the golfer need not be entered because this is calculated by adding the number of strokes it took for the golfer to reach the green plus the number of putts entered. This scoring information is stored in the scoring storage means 62 and is used for calculating statistics and for the wagering service feature of the invention. Scoring information, along with information from the course design storage means 64 can also be used to calculate the golfer's handicap.

It will be appreciated that a wealth of information is now stored in the device 10, including golf shot information and scoring information. One way this information can be used is by accessing the statistics analysis feature of the invention by pressing the Stats key 30. The statistics analyzed and available for retrieval can be mean distance and standard deviation by club; mean dispersion and standard deviation by club; percentage of shots hooked, sliced, pushed, pulled; and many others. All these statistics can be analyzed based on a certain golf shot on a certain golf hole, such as

the percentage of times the drive on hole no. 1 at Torrey Pines South is hooked. It will also be appreciated that at any time during play, the golfer can switch from the EYB mode or scoring mode to the "analysis mode", whereby the statistics collected in the statistics data storage means 66 can be analyzed to assist the golfer. Also, golf tip information from the advice storage means 60 and/or golf rules information from the rules storage means 70 can be accessed by key word searching as was discussed above.

Referring back to the club selection aspect of the invention, if the golfer is using the device 10 for the first time, there are no statistics that have been compiled in the statistics data storage means 66 upon which to base club selection. The statistics data storage means 66 includes an initial database that has ranges of distances for each club based on a normal golfer. Of course, as more information is entered into this database, the device 10 becomes more personalized to the golfer and context intelligence is able to better predict the likely information entry choices the golfer desires to make.

Referring now to Figure 4, a flow chart showing one aspect of context intelligence is shown. This flow chart shows how context intelligence is applied to the club information 180 discussed above. The routine starts by first accepting the ball position determined by the cross-hair means in box 210. After this the system moves by line 212 to box 214 where the device 10 calculates the remaining distance to the green. After this, the system moves by line 216 to box 218 where statistics data from the statistics data storage means 66 are used to determine the selected club. The system then moves by line 220 to box 222 where the club choices of the first alternative club and the second alternative club are displayed in the order from most to least likely. Finally, the system moves by line 224 to box 226 where the club selection determined in box 218 is selected if no other club

selection is affirmatively made. The selected club from box 218 is accepted by merely pressing one of the OK keys 37 or 38 on the device 10 (see Figure 1).

Context intelligence also concerns the flow of a golf game and the past historical choices that a golfer makes during a round of golf. As was discussed above, what is meant by "golf game flow" is that the device 10 is in the EYB or play mode (which displays a graphic representation of the hole 100) during play of the hole and then switches to the scoring mode (which displays the scorecard) once the player reaches the green. In addition, context intelligence can be used in the initial setup of the device 10. For example, if a golfer after selecting the course always has a wager, context intelligence will move from the Setup mode to the wagering mode. If the golfer never has wagers, the device 10 will skip this step and the golfer would have to press the Bets key 28 to enter this mode. In this way, it is not necessary for the golfer to manually switch modes; the device 10 does this automatically. As for historical choices, the system "learns" how the golfer plays and can tell, for example, that the golfer always uses a 3-iron to tee-off on the no. 1 hole at Torrey Pines South. In this case, Figure 3A, instead of listing a driver first and highlighting it, the 3-iron would be listed first and highlighted.

Another aspect of the invention is the wagering feature. Figure 5 shows a flow chart for this feature. This feature is accessed by pressing the Bets key 28. In step 300 the choice is shown via the display screen 14 (Figure 1) that allows the golfer to either enter a new wager via line 302, or request the analysis and display of the results of a wager via line 304. If the golfer desires to enter a new wager, then the system in box 306 causes the different kinds of wagers to be displayed on the display screen 14 and the golfer is requested to make a selection and amount of bet. The golfer's selection and amount bet are entered via the golfer input

interface 72 and once accepted in box 308 via line 310 the system moves by line 312 to decision box 314 which asks the golfer to make selection of either a team wager or an individual wager. If the golfer selects individual wager the system by line 316 moves to box 318 where the device 10, using the display screen asks the golfer to select the name of the first player engaging in the wager and then the second player engaging in the wager and proceeds by line 320 to box 324 where the players names are accepted.

If a team wager is chosen the system moves from decision box 314 by line 330 to another decision box 332 where the golfer is asked whether the teams engaging in the wager have been defined. If the golfer indicates that they have been defined then the system moves by line 334 to the display team choices box 336 and by line 338 to the accept team selection box 340 and then by line 341 to the box 342 end of the routine. If the teams are not defined, then the system moves from decision box 332 by line 350 to a box 352 which displays the individual names and then by line 354 to a box 356 where the golfer indicates which individuals are on team no. 1. After this the system moves by line 358 to box 360 where the individual names are given, displayed and then by line 362 to box 364 where the golfer indicates which individuals are on team no. 2. The routine then terminates by line 366 to the stop box 342.

If the golfer decides at decision box 300 that no new wager is to be entered, the system moves by line 304 to box 370, where the system displays the results of the calculation of a wager, then in box 370 the existing wagers are presented to the golfer using the display screen 14. The system then moves by line 372 to box 374 to accept the wager analysis selection and then moves by line 376 to box 378 where the wager analysis is calculated. The system then moves by line 380 to box 382 where the wager analysis is displayed and then by line 384 to the end box 342.

Figure 6 shows a potential wager summary display in an easy to read 4 x 4 matrix. The matrix has the names of each of the players along both a vertical axis 390 and a horizontal axis 392, with a series of blocks (16 are shown in this 4 x 4 matrix) where numbers are displayed showing how each golfer stands with regard to each other golfer. For example, in block 394, Al is owed $15 by Fred. In block 396, Jim is owed $5 by Bob and in block 398 Fred owes $5 to Jim. In this way, the status of all bets can be easily and instantly reviewed at any time during the round. It will be appreciated that a 2 x 2 matrix will be used for two players and a 3 x 3 matrix will be used for three players.

The statistical analysis that can be accessed by pressing the Stats key 30 can also be used to assist the golfer in making wagering decisions both before and during play. "Side bets" of all kinds are possible, and the available statistics can assist the golfer in making side bets in which the golfer has a statistical advantage. For example, given the information that the golfer scores par on a particular hole on a specific course 26 percent of the time, a golfer has an advantage in any wager that offers four to one odds or better that he will not score a par on that hole. Similarly, "press" wagers, wherein a new wager is made for the remaining holes to be played, can be timed so that the golfer is more likely to score well or avoided when the statistics indicate that the golfer typically plays the remaining holes worse than his normal play.

The golfer can also compare average scores on a hole-by-hole basis with the average hole-by-hole scores of any opponent or opponents with which he has played in the past. The analysis of such information can predict the results of any set of wagers based upon the historical averages of the golfers. This information, when it is available, is invaluable, when: (i) considering any specific wager that involves wagering on the number of holes won or lost (called

"match play"); (ii) making decisions during play about offering or accepting side bets, presses, and the like; and (iii) making choices as to whether to offer or accept wagers regarding total strokes (for example the "dollar, dollar, dollar" wager in which the lowest total score on each nine holes and the total for all eighteen holes wins a dollar) or match play in which the total strokes do not matter, but only the number of holes won or lost.

The statistical analysis of historical data regarding other golfers which is stored in scoring storage means 62 can also assist the golfer when selecting team members for team competitions. The golfer, when playing "best ball" (where the best score among the team members on each hole is compared with the best score among the opposing team members to determine the winner of the hole) can use the statistics to select a team member who complements the golfer's play (typically scores well on holes on which the golfer typically scores poorly). Finally, a statistical analysis can also be performed on the wagering information contained in the wagering storage means 68.

As was explained above, the device 10 allows for easy entry of a golf hole description for courses that are not already stored in the device 10. Referring particularly to Figure 7, a flow chart of this portion of the device 10 embodied in a computer program or other electronic implementation of the illustrated logic to accept a course description is shown. The system starts at box 400 where the golfer is asked, via the display screen 14, to make a selection of a golf course from among those for which golf course design information is stored in the course design storage means 64. The golfer may either select one of the choices presented or indicate that he or she wishes to describe a new golf course and enter the number of holes and the slope rating for the golf course.

The system then moves from box 400 via line 402 to decision box 404 where the device 10 examines the golf course design information stored in the course design storage means 64 for the selected golf course to determine if there are undescribed holes for the selected golf course. If there are undescribed holes, then the system moves by line 406 to box 408 where the golfer enters his or her choice and the yardages for the selected hole, using the golfer input interface 72. The information entered by the golfer is encoded and stored in the course design storage means 64. Of course, if all holes are described, there is no need to use this routine.

Next, the system moves by line 410 to box 412 where the golfer enters the men's par and the women's par for the selected hole. The system then moves by line 414 to box 416 where the men's handicap rating and the women's handicap rating for the selected hole are entered. The system then moves by line 418 to box 420 where several optional tee box graphic representations are displayed and the golfer makes his or her selection and indicates the position of the selected tee box on the display screen 14 using the golfer input interface 72. All of the information entered by the golfer is encoded and stored in the course design storage means 64.

The system then moves by line 422 to box 424 where a choice is to be made among a straight hole and several optional dog leg graphic representations and the golfer makes his or her selection using the golfer input interface 72. This information is encoded and stored in course design storage means 64. The system then moves by line 426 to a decision box 428 to determine whether the golfer has selected a straight hole. If the golfer has not selected a straight hole then the system moves by line 430 to box 432 where the golfer is requested to enter the yardage distance to the bend in the dog leg. When this information is entered by the golfer the device calculates the remaining distance from the

bend in the dog leg to the center of the green and stores that result in the course design storage means 64. The system then moves by line 434 to box 436. If the hole is straight, the system moves from decision box 428 via line 438 also to box 436. In box 436 the device 10 presents the golfer with a choice among several optional graphic representations of greens. The system then moves from box 436 via line 440 to box 442. In box 442 the golfer enters his or her selection of a graphic representation of a green and the depth of the green.

The system then moves via line 444 to decision box 446 and asks the golfer whether or not the green is circular. If the golfer answers no, then the system moves by line 448 to box 450 where the golfer is asked to enter the width of the green. Once the width of the green is accepted, the system moves from box 450 via line 451 to decision box 454.

If the green is circular, the system moves by line 452 to decision box 454 where the golfer is asked whether there is an additional fairway section. If there are no additional fairway sections the method proceeds via line 455. Otherwise, the method proceeds via line 456 to box 458 where the golfer is asked to enter a first point on the boundary of the fairway section. The system then moves via line 460 to box 462 where the golfer is asked to enter another point on the boundary of the fairway section. The system then moves via line 464 to decision box 466 where the device 10 compares the last two points entered by the golfer to determine if they are, within a small margin of error, the same point. If so, then the golfer has completed the definition of a fairway section and the system then proceeds via line 468 back to box 454. If in decision box 466 the last two points entered by the golfer are not, within a small margin of error, the same point, then the method returns to box 462 via line 470.

The system then moves to box 480 where a number of landscape objects are displayed and requests that the golfer make a selection among those choices by using the golfer input interface 72. The selection made by the golfer is accepted as the system moves to box 482 via line 484 and the current design of the hole as it is stored in the course design storage means 64 is decoded as the system moves via line 486 to box 488 and the hole is displayed on the display screen 14. The golfer is requested to use the golfer input interface 72 to enter the location of the landscape object as the system moves via line 490 to box 492. The system then moves via line 494 to box 496 where the golfer is asked whether there are more landscape objects to be entered on the hole. The golfer using the golfer input interface 72 responds. If more landscape objects are to be entered the method returns to box 480 via line 497. If no more landscape objects are to be entered, the description of the hole has been encoded and stored in the course design storage means 64 and the routine proceeds by line 498 to the end 499.

Figure 8 shows a flow chart of that portion of the device embodied in a computer program or other electronic implementation of the illustrated logic to perform the course design display method in Figure 2 using the golfer input interface 72, display screen 14, and course design storage means 64.

The system is used to show the golfer the golf course and hole selection that is anticipated to be the golf course and hole that the golfer will choose to display in box 600. The system then moves via line 602 to box 604 where the golfer, using the golfer input interface 72, simply accepts the proposed selection of golf course and hole that was displayed in box 600 or may select among any of the holes on any of the golf courses for which the golf course design information is available in the course design storage means 64. Once the golfer has entered his or her choice of

golf course and hole, using the golfer input interface 72, the device 10 locates the golf course design information stored in the course design storage means 64, and the system proceeds via line 606 to box 608 to decode the information stored in the course design storage means 64, describing the tee box for the selected hole on the selected golf course and displays a graphic representation of the tee box, via the display screen 14. The system then moves via line 610 to box 612 in which the device 10 decodes the information stored in the course design storage means 64, describing the green for the selected golf course and displays a graphic representation of the green, via the display screen 14.

The system then moves via line 614 to box 616 where the device 10 decodes the information stored in the course design storage means 64, describing a fairway section for the selected hole on the selected golf course and displays a graphic representation of the fairway section, via the display screen 14. The system then moves via line 618 to box 620 where the device 10 decodes the information stored in course design storage means 64, describing a yardage distance associated with the fairway section displayed in box 616 and displays a graphic representation of the yardage distance associated with the fairway section, via the display screen 14. The system then moves via line 622 to a decision box 624 where the device 10 examines the information stored in the course design storage means 64 to determine if there is another fairway section for the selected hole on the selected golf course. If there is another section then the device 10 returns to box 616 via line 626 and displays a graphic representation of the fairway section via the display screen 14. If not, line 628 leads to decision box 630 where the device 10 examines the information stored in the course design storage means 64 to determine if there is another landscape object for the selected hole on the selected golf course. If there is another landscape object the system moves

via line 632 to box 634 where the device 10 decodes the information stored in the course design storage means 64 describing the landscape object identified in box 630 and displays a graphic representation of the landscape object, via display screen 14. The system then moves via line 636 to box 638 where the device 10 decodes the information stored in the course design storage means 64 describing yardage distance associated with the landscape object displayed in box 634 and displays a graphic representation of the yardage distance associated with the landscape object, via the display screen 14 and returns to box 630 via line 640.

The method of the invention involves assisting a golfer by providing a hand-held, portable golf computer device having (i) a housing; (ii) a display screen disposed in the housing; and (iii) storage and retrieval means containing golf information and selectively retrieving the golf information from the storage and retrieval means in order to assist the golfer. The golf information is at least one of the following: (i) a graphic representation of a golf hole including a green; (ii) golf shot information; (iii) scoring information; (iv) wagering information; (v) golf tip information; and (vi) golf rules information.

While specific embodiments of the invention have been disclosed, it will be appreciated by those skilled in the art that various modifications and alterations to those details could be developed in light of the overall teachings of the disclosure. Accordingly, the particular arrangements disclosed are meant to be illustrative only and not limiting as to the scope of the invention which is to be given the full breadth of the appended claims and any and all equivalents thereof.

WHAT IS CLAIMED IS:

1. A hand-held, portable golf computer device comprising:

a housing;

a display screen disposed in said housing; and

means for storing and retrieving golf information for display on said display screen.

2. The device of Claim 1, wherein

said golf information includes at least one of the following: (i) golf course description information; (ii) golf shot information; (iii) scoring information; (iv) wagering information; (v) golf tip information; and (vi) golf rules information.

3. The device of Claim 2, wherein

said golf course description information includes at least one of the following: (i) the name of a golf course and hole number of a golf hole; (ii) the par of said golf hole; (iii) the handicap of said golf hole; and (iv) golf hole graphic representation information.

4. The device of Claim 3, wherein

said golf hole graphic representation information includes at least one of the following: (i) a distance of said golf hole from a tee to a green; (ii) the shape and position of tee, a fairway, a rough, a hazard and said green of said golf hole; and (iii) landscape objects on said golf hole.

5. The device of Claim 4, including

means for indicating a position on said golf hole graphic representation, said position corresponding to a location of a golf ball on said golf hole of a golfer playing said golf hole.

6. The device of Claim 5, wherein

said indicating means is a cross-hair means including means for displaying and moving a horizontal line on said display screen and means for displaying and moving a vertical line on said display screen, said position being determined by the intersection of said horizontal line with said vertical line.

7. The device of Claim 2, wherein

said golf shot information includes at least one of the following items: (i) golf club selection information; (ii) golf shot distance information; (iii) golf ball lie information; (iv) golf shot directional information; (v) golf shot hit information; and (vi) golf shot ambient environmental conditions.

8. The device of Claim 2, wherein

said scoring information includes at least one of the following items: (i) said golfer's score and number of putts on said golf hole; and (ii) other golfer's scores and number of putts on said golf hole.

9. The device of Claim 2, including

means for performing a statistical analysis on at least one of the following: (i) said golf shot information; (ii) said scoring information and (iii) said wagering information.

10. The device of Claim 2, including

means for entering a selected wager and an amount bet into said storage and retrieval means;

means for entering scoring information of a golfer and at least one other golfer into said storage and retrieval means; and

means for calculating a result of said selected wager based on (i) said selected wager; (ii) said amount bet; and (iii) said scoring information of said golfer and said scoring information of said other golfer.

11. The device of Claim 10, including

means for entering a team wager;

means for entering a team of golfers involved in said team wager; and

means for entering said scoring information for a team.

12. The device of Claim 10, wherein

said display screen displays said result in a two-by-two matrix having four blocks, at least one of said blocks containing a number indicating said result of said wager, whereby said golfer can quickly and easily know the standing of said golfer relative to said other golfer with regard to said wager.

13. The device of Claim 1, wherein

said means for storage and retrieval of golf information includes means for storing and receiving golf game flow information and further means for retrieving and displaying on said display screen said golf game flow information, whereby said display screen shows an appropriate display for the point said golfer is at presently during a round of golf.

14. The device of Claim 1, wherein

said means for storage and retrieval of golf information includes means for receiving and storing data related to choices made by said golfer and further means for retrieving and displaying on said display screen said data related to choices made by said golfer, whereby said display screen shows an appropriate display for the point said golfer is at presently during a round of golf.

15. The device of Claim 1, including

said means for storage and retrieval of golf information includes means for storing and receiving golf shot information and further means for retrieving and displaying on said display screen said golf shot information, whereby said display screen shows an appropriate display for the point said golfer is at presently during a round of golf.

16. A method of assisting a golfer, said method comprising:

providing a hand-held, portable golf computer device having (i) a housing; (ii) a display screen disposed in said housing; and (iii) storage and retrieval means containing golf information; and

retrieving said golf information from said storage and retrieval means for display on said display screen in order to assist said golfer.

17. The method of Claim 16, including

employing as said golf information at least one of the following: (i) golf course description information; (ii) golf shot information; (iii) scoring information; (iv) wagering information; (v) golf tip information; and (vi) golf rules information.

18. The method of Claim 17, including

employing as said golf course description information at least one of the following: (i) the name of a golf course and hole number of a golf hole; (ii) a distance of said golf hole from a tee to a green; (iii) the par of said golf hole; (iv) the handicap of said golf hole; and (v) golf hole graphic representation information.

19. The method of Claim 18, including

employing as said golf hole graphic representation information at least one of the following: (i) the shape of said tee, a fairway, a rough, a hazard and said green of said golf hole; and (ii) landscape objects on said golf hole.

20. The method of Claim 19, including

entering a first position of a golf ball of said golfer on said display screen, said first position related to a first location of said golf ball on said golf hole;

hitting said golf ball with a golf club from said first position to a second position related to a second location of said golf ball after said golf shot is hit; and

entering said second position of said golf ball on said display screen.

21. The method of Claim 20, including

indicating said second position on said display screen by providing a horizontal line displayed on said display screen and a vertical line displayed on said display screen and moving said lines so that the intersection thereof indicates said second position.

22. The method of Claim 17, including

employing as said golf shot information at least one of the following: (i) golf club selection information; (ii) golf shot distance information; (iii) golf ball lie information related to the lie of said golf ball at said first location; (iv) golf shot directional information related to the flight of said golf shot; (v) golf shot hit information related to how said golfer hit said golf shot; and (vi) ambient environmental condition information related to ambient environmental conditions existing at the time said golf shot was hit.

23. The method of Claim 17, including

employing said device to perform a statistical analysis on at least one of the following: (i) said golf shot information; (ii) said scoring information; and (iii) said wagering information.

24. The method of Claim 16, including

recording a graphic representation of a golf hole including a tee and a green.

25. The method of Claim 16, including

employing as said scoring information at least one of the following items: (i) said golfer's score and number of putts on a golf hole; and (ii) other golfer's scores and number of putts on said golf hole.

26. The method of Claim 17, including

entering a selected wager and an amount bet into said storage and retrieval means;

entering said scoring information of said golfer and at least one other golfer into said storage and retrieval means;

calculating a result of said wager based on (i) said selected wager; (ii) said amount bet; and (iii) said scoring information of said golfer and said other golfer; and

selectively retrieving said result from said storage and retrieval means in order to assist said golfer in keeping track of said selected wager and making decisions regarding future wagers.

27. The method of Claim 26, wherein

entering scoring information of a plurality of golfers into said storage and retrieval means;

entering a team wager and an amount bet into said storage and retrieval means; and

calculating a result of said team wager based on (i) said team wager; (ii) said amount bet; and (iii) said scoring information of said plurality of golfers.

28. The method of Claim 26, including

displaying said result of said wager on said display screen.

29. The method of Claim 28, including

displaying said result as an at least two-by-two matrix having four blocks, at least one of said blocks containing a number indicating said result of said wager.

30. The method of Claim 16, including

storing in said means for storage and retrieval golf game flow information; and

retrieving from said means for storage and retrieval said golf game flow information and using said golf game flow information to determine said golf information to display on said display screen, whereby said display screen shows an appropriate display for the point said golfer is at presently during a round of golf.

31. The method of Claim 16, including

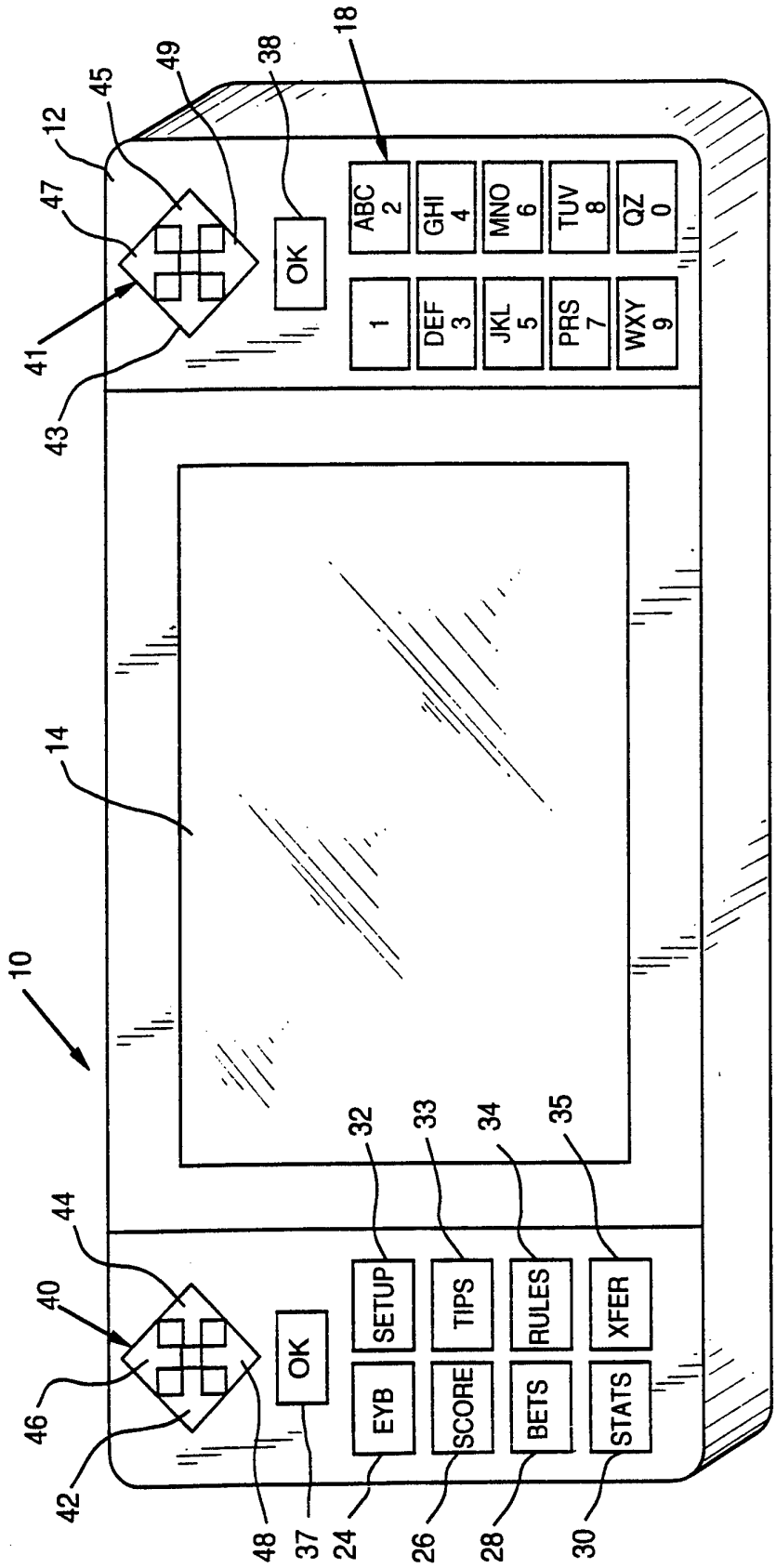
storing in said means for storage and retrieval information related to choices made previously by said golfer;

retrieving from said means for storage and retrieval said choices made previously by said golfer and using said choices made previously by said golfer to determine said golf information to display on said display screen, whereby said display screen shows an appropriate display depending on past choices made by said golfer in similar situations.

32. The method of Claim 17, including

storing in said means for storage and retrieval of said golf shot information; and

retrieving from said means for storage and retrieval said golf shot information and using said golf shot information to determine said golf shot information to display on said display screen, whereby said display screen shows an appropriate display for the point said golfer is at presently during a round of golf.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34
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37
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40
41
42
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44
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47
48
49
ABC 2
GHI 4
MNO 6
TUV 8
QZ 0
1
DEF 3
JKL 5
PRS 7
WXY 9
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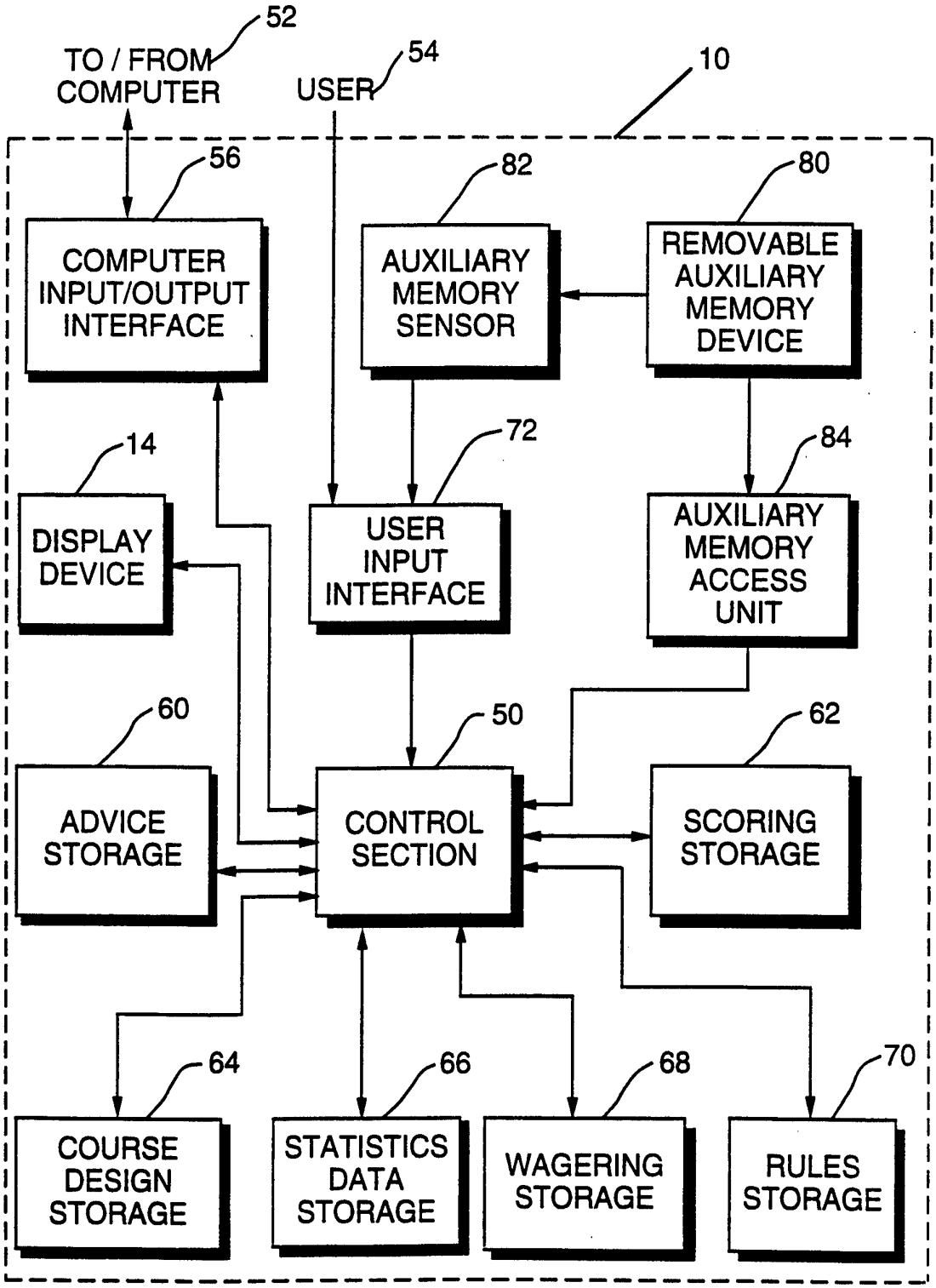
OK
SETUP
TIPS
RULES
XFER
EYB
SCORE
BETS
STATS

FIG. 1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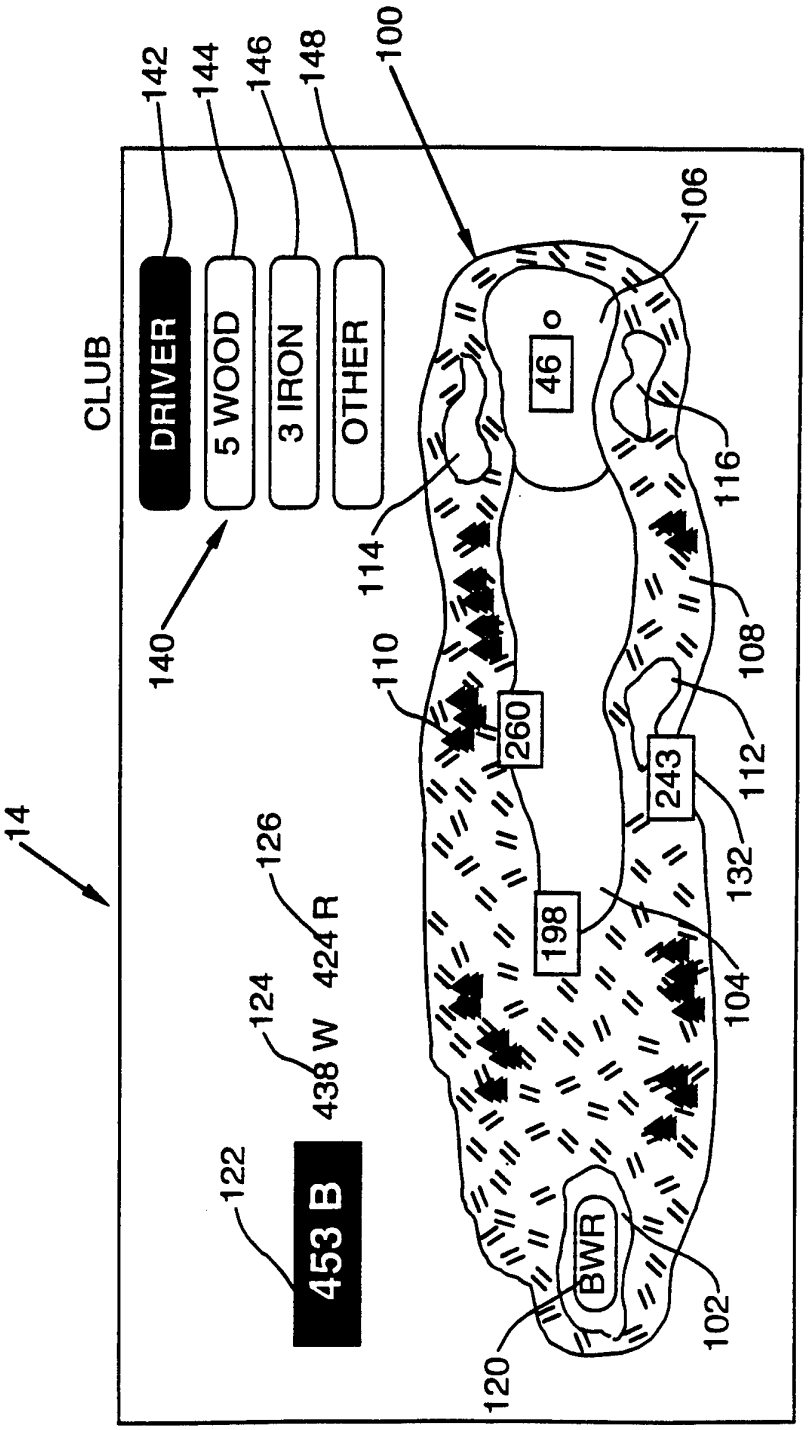
TO / FROM COMPUTER
54
USER
10
56
COMPUTER INPUT/OUTPUT INTERFACE
82
AUXILIARY MEMORY SENSOR
80
REMOVABLE AUXILIARY MEMORY DEVICE
14
DISPLAY DEVICE
72
USER INPUT INTERFACE
84
AUXILIARY MEMORY ACCESS UNIT
60
ADVICE STORAGE
50
CONTROL SECTION
62
SCORING STORAGE
64
COURSE DESIGN STORAGE
66
STATISTICS DATA STORAGE
68
WAGERING STORAGE
70
RULES STORAGE

FIG. 2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CLUB
DRIVER
5 WOOD
3 IRON
OTHER
140
142
144
146
148
100
106
46
116
114
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198
104
126
424 R
124
438 W
122
453 B
BWR
102
120

FIG. 3A

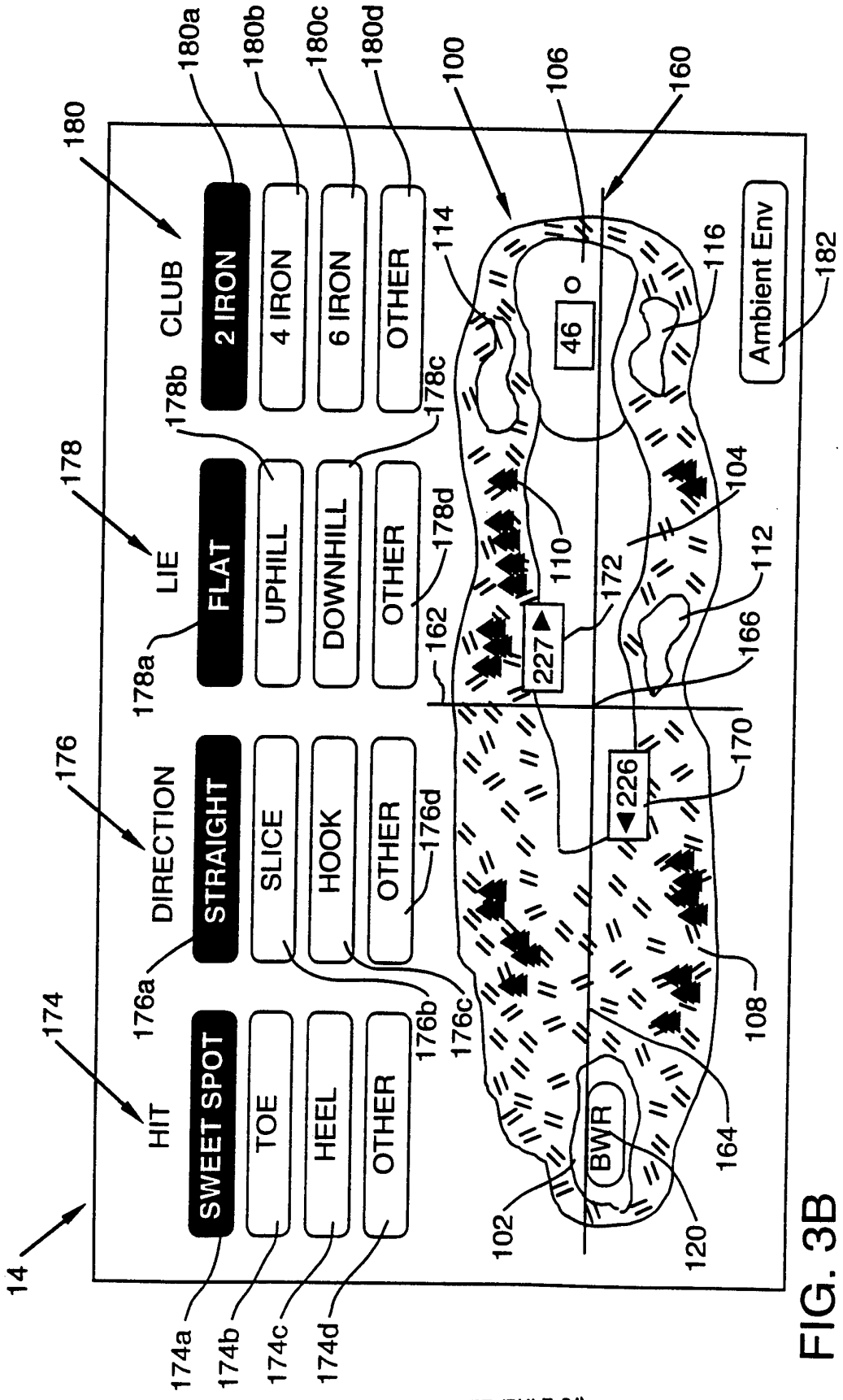

14
180
CLUB
2 IRON
4 IRON
6 IRON
OTHER
180a
180b
180c
180d
178
LIE
FLAT
UPHILL
DOWNHILL
OTHER
178a
178b
178c
178d
176
DIRECTION
STRAIGHT
SLICE
HOOK
OTHER
176a
176b
176c
176d
174
HIT
SWEET SPOT
TOE
HEEL
OTHER
174a
174b
174c
174d
100
102
104
106
108
110
112
114
116
120
160
162
164
166
170
172
182
Ambient Env
46
227
226
BWR

FIG. 3B

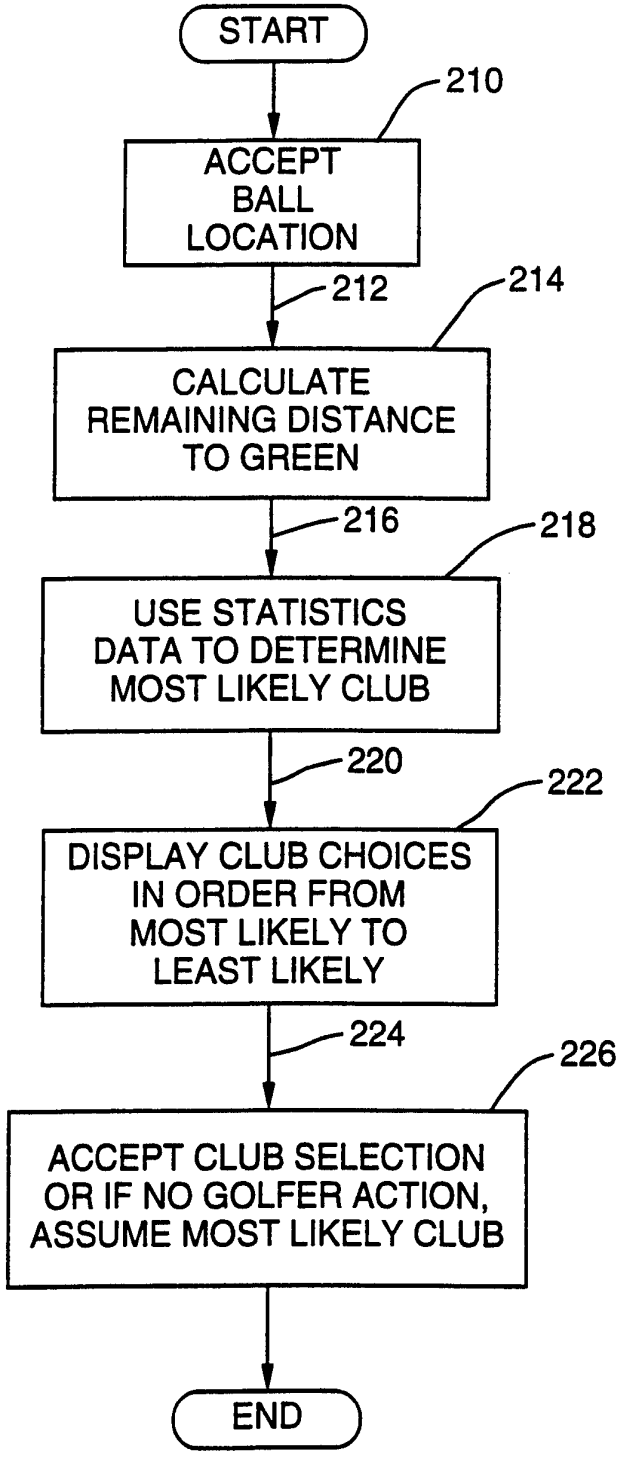

START
210
ACCEPT BALL LOCATION
212
214
CALCULATE REMAINING DISTANCE TO GREEN
216
218
USE STATISTICS DATA TO DETERMINE MOST LIKELY CLUB
220
222
DISPLAY CLUB CHOICES IN ORDER FROM MOST LIKELY TO LEAST LIKELY
224
226
ACCEPT CLUB SELECTION OR IF NO GOLFER ACTION, ASSUME MOST LIKELY CLUB
END

FIG. 4

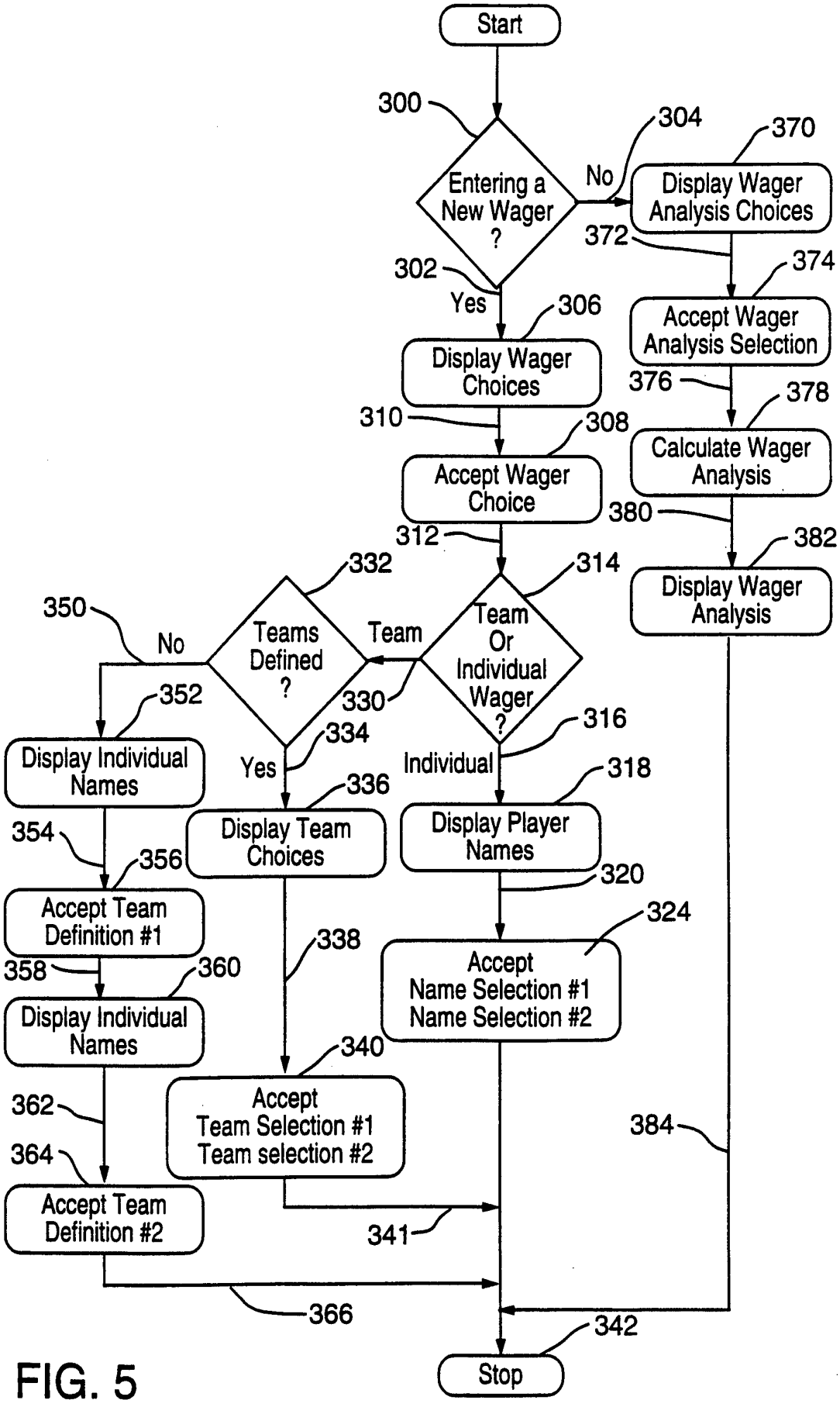
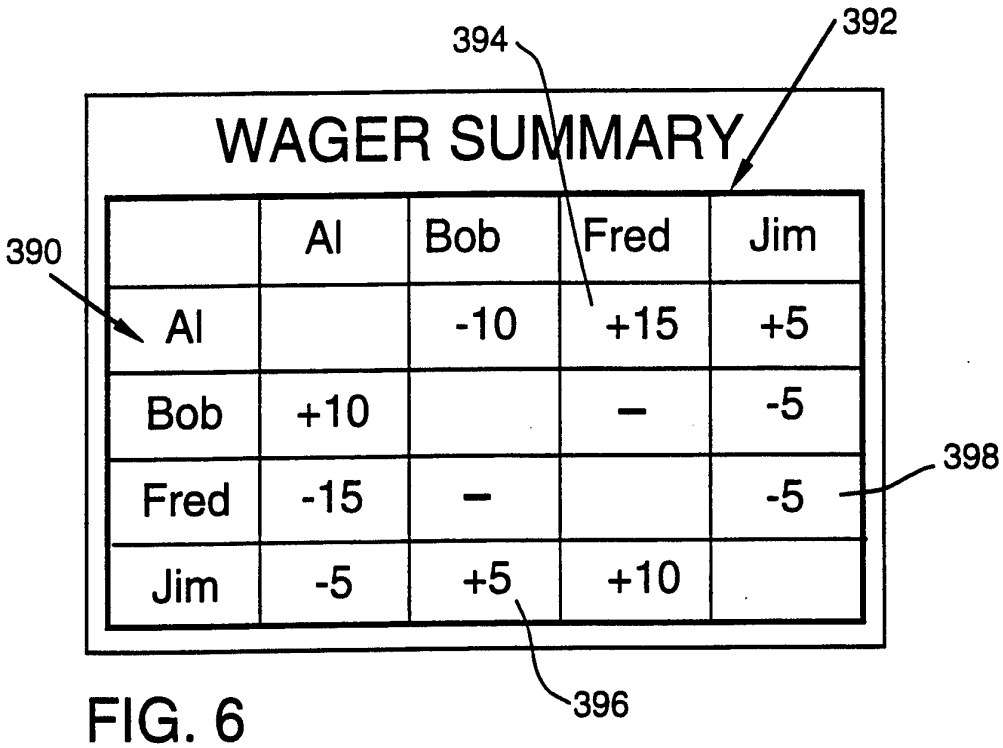

Start
300
Entering a New Wager ?
304
No
370
Display Wager Analysis Choices
372
374
Accept Wager Analysis Selection
376
378
Calculate Wager Analysis
380
382
Display Wager Analysis
302
Yes
306
Display Wager Choices
310
308
Accept Wager Choice
312
314
Team Or Individual Wager ?
316
Individual
318
Display Player Names
320
324
Accept Name Selection #1 Name Selection #2
330
Team
332
Teams Defined ?
350
No
352
Display Individual Names
354
356
Accept Team Definition #1
358
360
Display Individual Names
362
364
Accept Team Definition #2
366
Yes
334
336
Display Team Choices
338
340
Accept Team Selection #1 Team selection #2
341
384
342
Stop

FIG. 5



	Al	Bob	Fred	Jim
Al		-10	+15	+5
Bob	+10		–	-5
Fred	-15	–		-5
Jim	-5	+5	+10	

FIG. 6

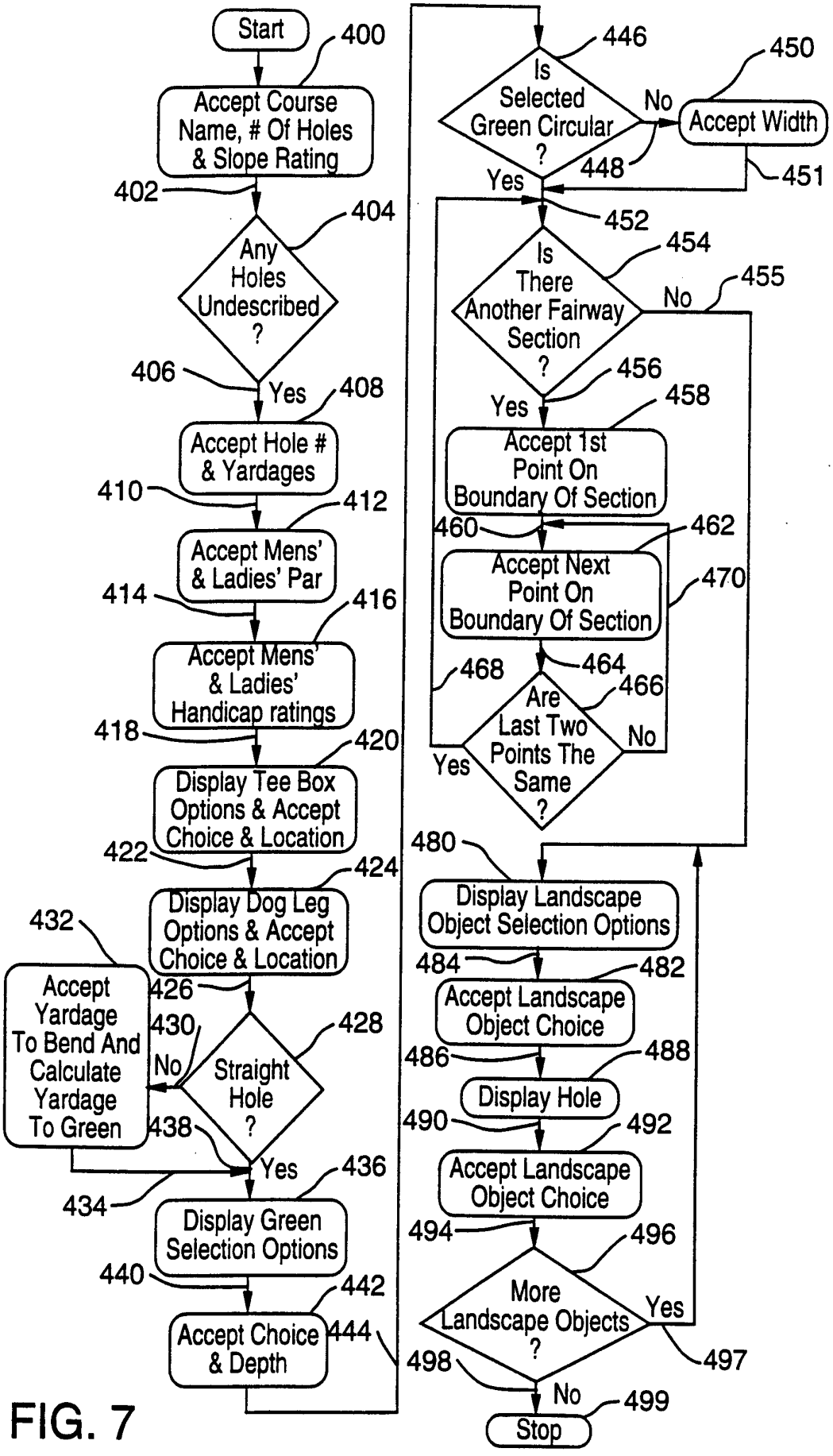

Start
400
Accept Course Name, # Of Holes & Slope Rating
402
Any Holes Undescribed ?
404
406
Yes
408
Accept Hole # & Yardages
410
412
Accept Mens' & Ladies' Par
414
416
Accept Mens' & Ladies' Handicap ratings
418
420
Display Tee Box Options & Accept Choice & Location
422
424
Display Dog Leg Options & Accept Choice & Location
432
Accept Yardage To Bend And Calculate Yardage To Green
426
430
No
Straight Hole ?
428
438
Yes
436
434
Display Green Selection Options
440
442
Accept Choice & Depth
444
446
Is Selected Green Circular ?
No
450
Accept Width
448
451
Yes
452
454
Is There Another Fairway Section ?
No
455
456
Yes
458
Accept 1st Point On Boundary Of Section
460
462
Accept Next Point On Boundary Of Section
470
468
464
466
Are Last Two Points The Same ?
No
Yes
480
Display Landscape Object Selection Options
484
482
Accept Landscape Object Choice
486
488
Display Hole
490
492
Accept Landscape Object Choice
494
496
More Landscape Objects ?
Yes
497
498
No
499
Stop

FIG. 7

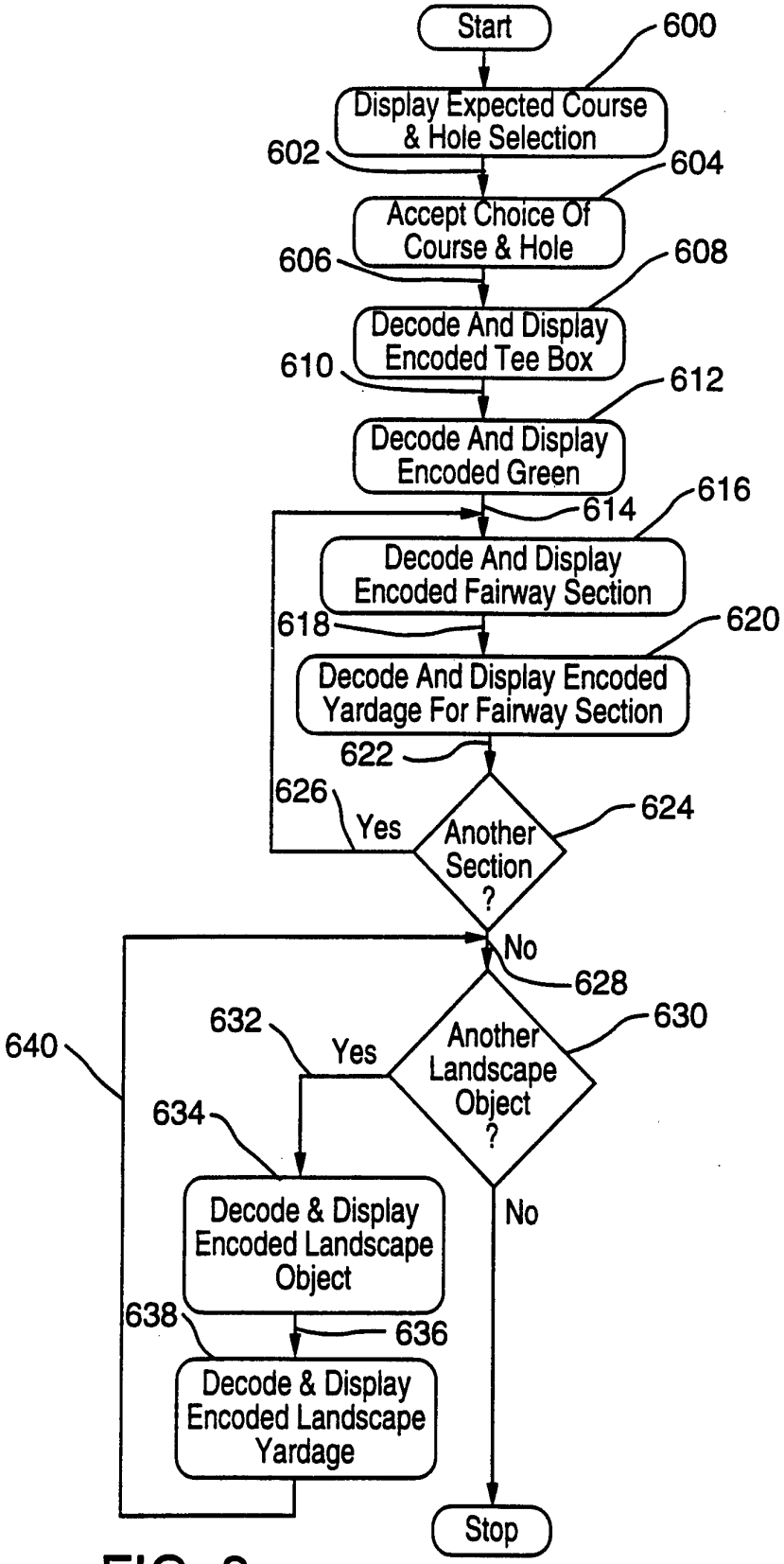


FIG. 8

RECTIFIED SHEET (RULE 91)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/09804

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :A63B 57/00
US CL :473/407

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)

U.S. : 342/357, 450, 451, 457, 458; 364/410, 412, 444, 449, 460, 561; 463/1, 16, 25, 29-31, 36, 37; 473/407, 409

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)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 4,367,526 (MCGEARY ET AL.) 04 January 1983, see column 2 line 53 to column 10 line 23, and Figs. 1-4.	1-3, 8, 10-11, 13-14, 16-18, 27-31.
X ---, P Y	US, A, 5,507,485 (FISHER) 16 April 1996, see column 5 line 52 to column 15 line 50, and Fig. 23.	1-5, 7-11, 13-20, 22-28, 30-32 ---------- 6, 12, 21, 29.

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

*	Special categories of cited documents:	"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
"A"	document defining the general state of the art which is not considered to be part of particular relevance	"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
"E"	earlier document published on or after the international filing date	"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
"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)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"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 27 JULY 1996	Date of mailing of the international search report 27 AUG 1996
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3590	Authorized officer MARK A. SAGER Telephone No. (703) 308-0785

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/09804

B. FIELDS SEARCHED
Electronic data bases consulted (Name of data base and where practicable terms used):

APS

Search Terms: golf, distance or location, betting or wagering, bitmap or landscape or course description, statistics