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(54) **IN-RUNNING WAGERING SYSTEM**

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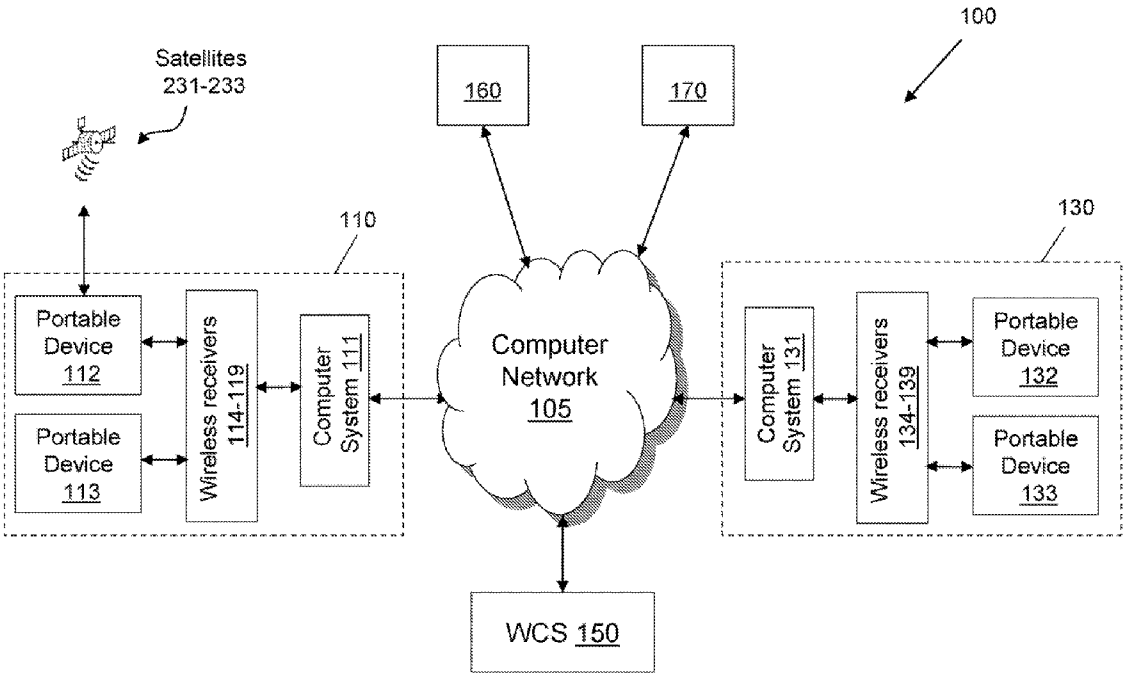
(57) **ABSTRACT**

A system for providing in-running wagering includes a communication system that can receive a plurality of wagers placed on racing animals competing in a race and a computer system in communication with the communication system. The plurality of wagers can be placed during the race. The computer processor can compute winning odds for the plurality of wagers in accordance with the plurality of wagers received by the communication system.



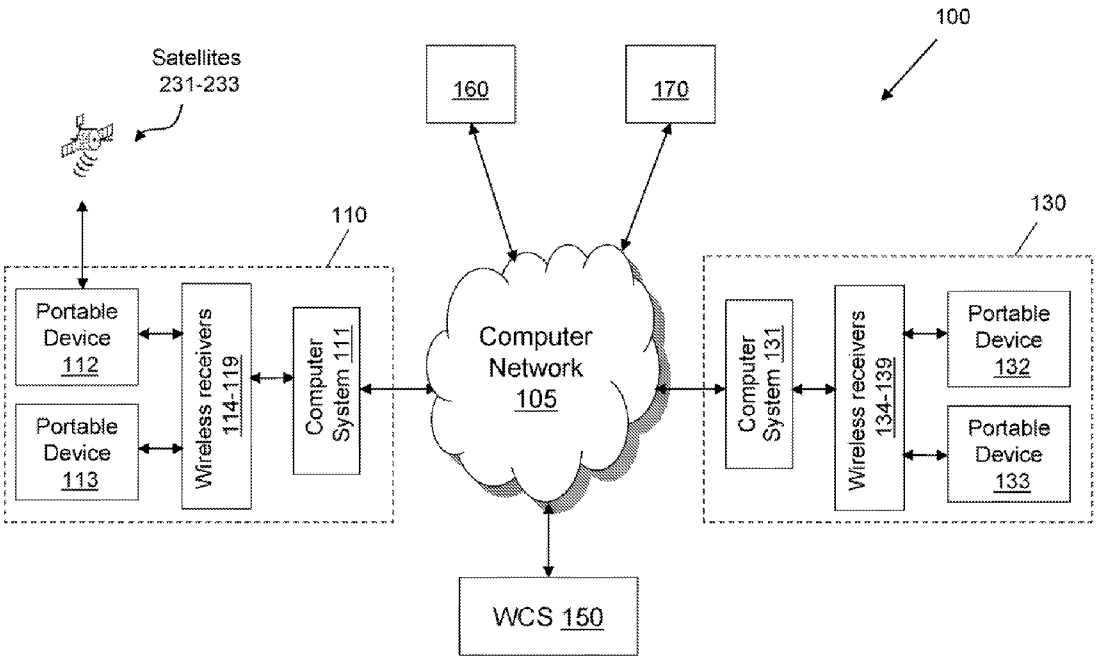

100
Satellites
231-233
160
170
110
130
Portable
Device
112
Portable
Device
113
Wireless receivers
114-119
Computer
System 111
Computer
Network
105
Computer
System 131
Wireless receivers
134-139
Portable
Device
132
Portable
Device
133
WCS 150

Figure 1

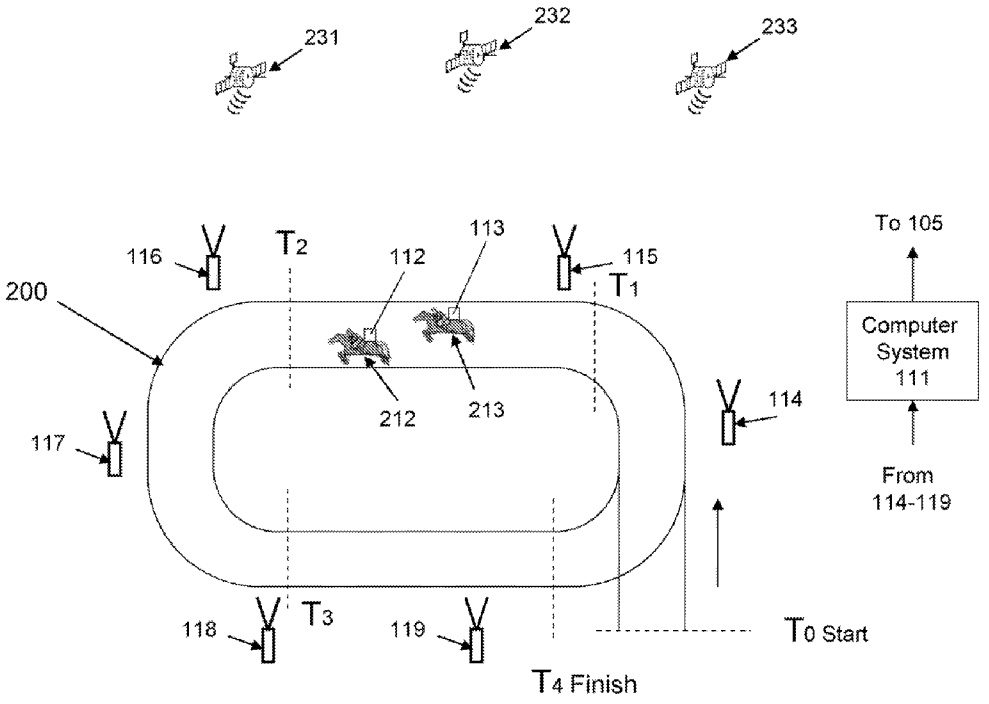

231
232
233
116
T2
112
113
115
T1
200
To 105
Computer System 111
114
117
212
213
From 114-119
118
T3
119
T0 Start
T4 Finish

Figure 2

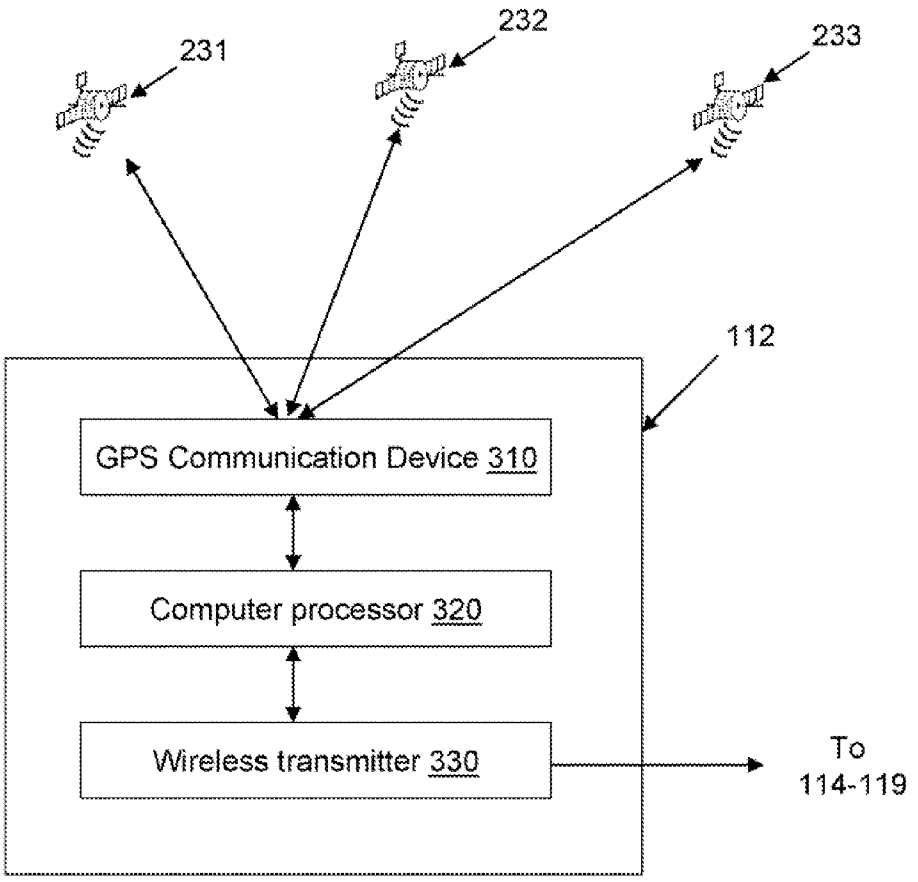

231
232
233
112
GPS Communication Device 310
Computer processor 320
Wireless transmitter 330
To
114-119

Figure 3

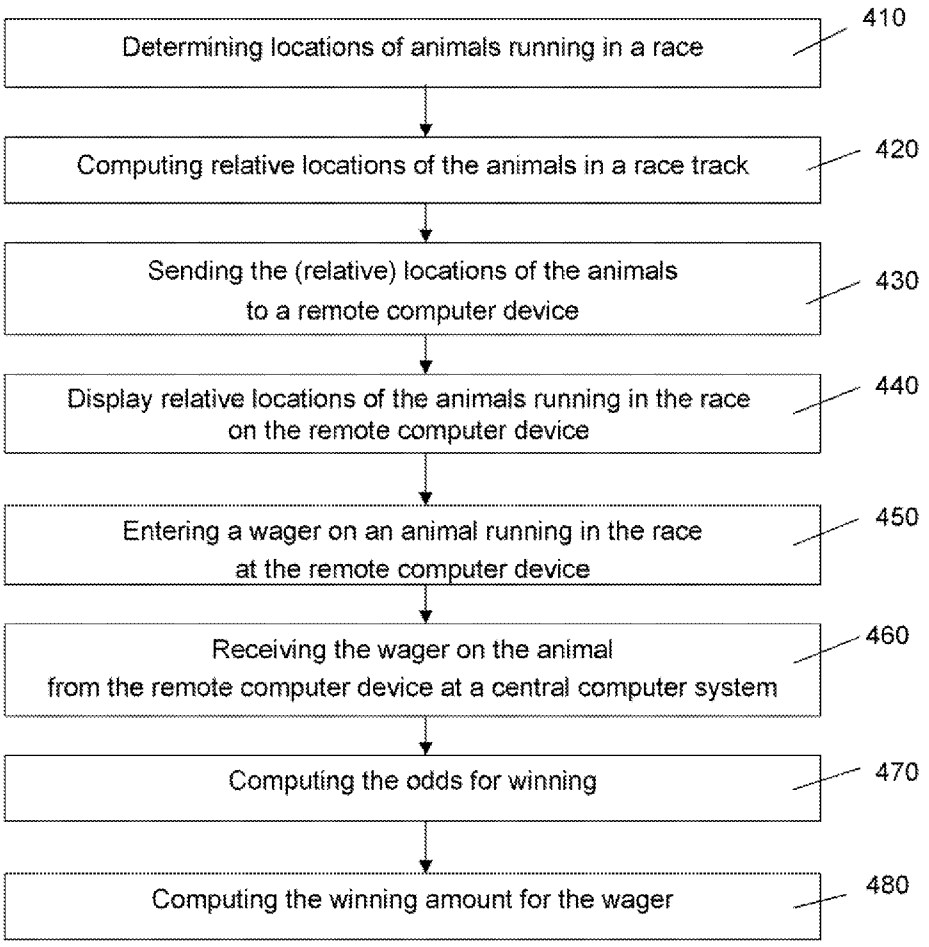

Determining locations of animals running in a race
410
Computing relative locations of the animals in a race track
420
Sending the (relative) locations of the animals to a remote computer device
430
Display relative locations of the animals running in the race on the remote computer device
440
Entering a wager on an animal running in the race at the remote computer device
450
Receiving the wager on the animal from the remote computer device at a central computer system
460
Computing the odds for winning
470
Computing the winning amount for the wager
480

Figure 4

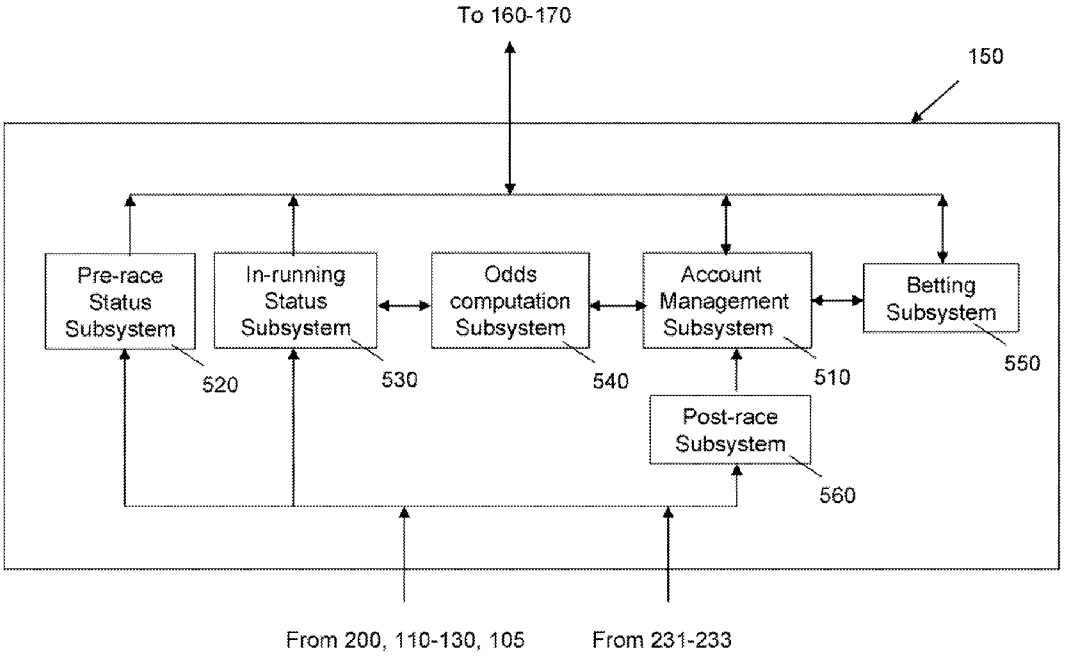

To 160-170
150
Pre-race Status Subsystem
520
In-running Status Subsystem
530
Odds computation Subsystem
540
Account Management Subsystem
510
Betting Subsystem
550
Post-race Subsystem
560
From 200, 110-130, 105
From 231-233

Figure 5

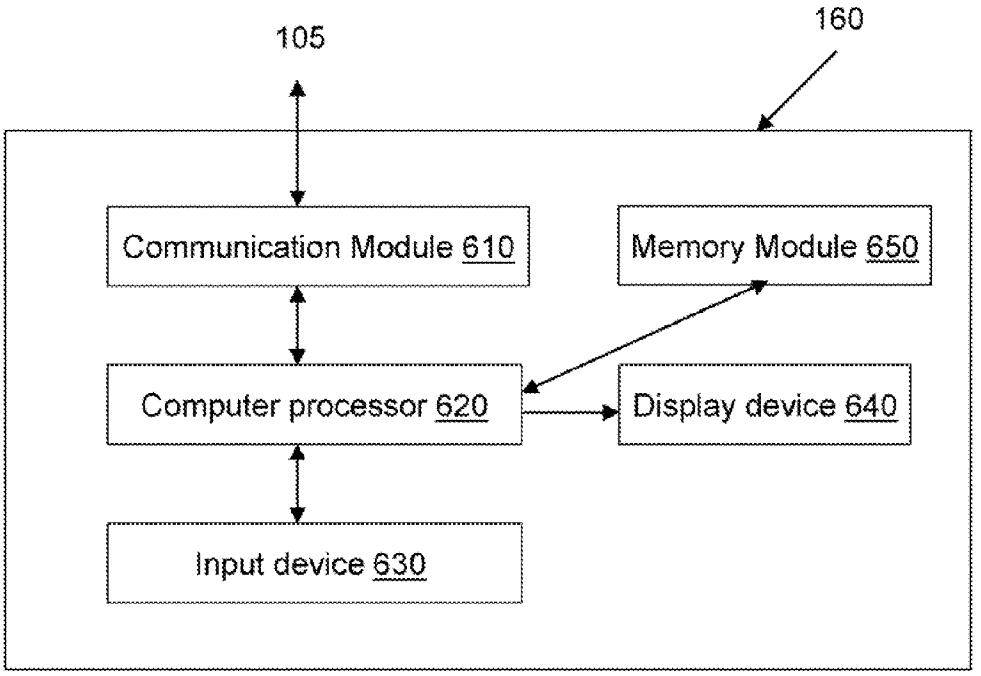

105
160
Communication Module 610
Memory Module 650
Computer processor 620
Display device 640
Input device 630

Figure 6

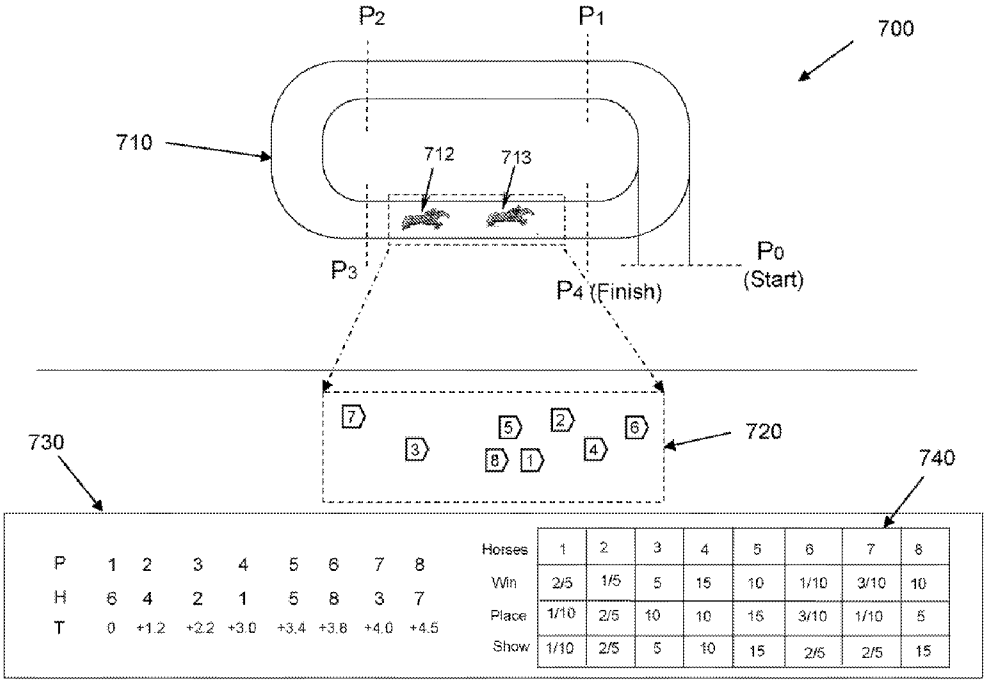

P2
P1
700
710
712
713
P3
P4 (Finish)
P0
(Start)
720
730
740
P 1 2 3 4 5 6 7 8
H 6 4 2 1 5 8 3 7
T 0 +1.2 +2.2 +3.0 +3.4 +3.8 +4.0 +4.5
Horses 1 2 3 4 5 6 7 8
Win 2/5 1/5 5 15 10 1/10 3/10 10
Place 1/10 2/5 10 10 15 3/10 1/10 5
Show 1/10 2/5 5 10 15 2/5 2/5 15

Figure 7A

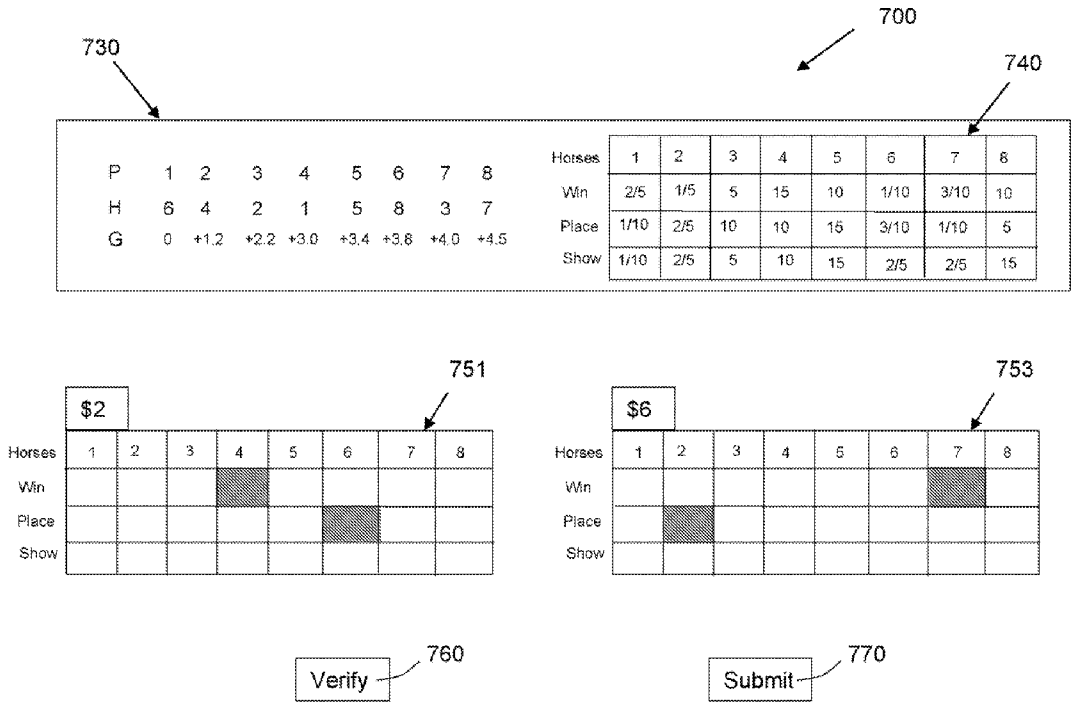

700
730
740
P 1 2 3 4 5 6 7 8
H 6 4 2 1 5 8 3 7
G 0 +1.2 +2.2 +3.0 +3.4 +3.8 +4.0 +4.5
Horses 1 2 3 4 5 6 7 8
Win 2/5 1/5 5 15 10 1/10 3/10 10
Place 1/10 2/5 10 10 15 3/10 1/10 5
Show 1/10 2/5 5 10 15 2/5 2/5 15
751
753
$2
$6
Horses 1 2 3 4 5 6 7 8
Win
Place
Show
Verify
760
Submit
770

Figure 7B

IN-RUNNING WAGERING SYSTEM

BACKGROUND

[0001] This application related to an off-track wagering system.

[0002] Wagering on races, such as a horse or greyhound races, were traditionally made in the race tracks. In recent years, the advancement of telecommunication technologies has transformed the wagering industry. Off-track wagering has become a popular form of betting. A wagering system can now facilitate data communication between race tracks and user terminals to allow users to view information on upcoming races and place wagers on races. The wagering system includes a computer system for receiving the information from the racetracks and sending the information to the user terminals via a network. In a current off-track wagering system, the information sent to the user terminals include odds, horses and jockeys' past statistics, track conditions etc. Streaming video images can be transmitted. Streaming video, however, requires high network bandwidth, which can strain the network to result in lost or delayed data. Thus, the user may not have the most up-to-date information from the racetracks needed to place an educated wager.

SUMMARY

[0003] In one aspect, the present invention relates to a system for providing in-running wagering. The system includes a communication system configured to receive a plurality of wagers placed on racing animals competing in a race, wherein the plurality of wagers are placed during the race; and a computer system in communication with the communication system, wherein the computer processor is configured to compute winning odds for the plurality of wagers in accordance with the plurality of wagers received by the communication system.

[0004] In another aspect, the present invention relates to a method for enabling in-running wagering. The method includes receiving a plurality of wagers placed on racing animals competing in a race, wherein the plurality of wagers are placed during the race; and computing winning odds for the plurality of wagers in accordance with the plurality of wagers.

[0005] In another aspect, the present invention relates to a system for providing off-track wagering. The system includes a location sensor configured to be carried by a racing animal in a race track and to determine the location of the racing animal, a transmitter configured to receive the location of the racing animal from the location sensor and transmit a first wireless signal comprising location of the racing animal, and a computer system configured to compute the position of the racing animal in the race track in response to the first wireless signal.

[0006] In another aspect, the present invention relates to a method for providing off-track wagering. The method includes carrying a location sensor by a racing animal in a race track, determining the location of the racing animal using the location sensor, transmitting a first wireless signal comprising location of the racing animal, and computing the position of the racing animal in the race track in response to the first wireless signal.

[0007] In another aspect, the present invention relates to a system for off-track wagering on races. The system includes a transmitter configured to be carried by a racing animal in a race track, wherein the transmitter is configured to transmit a first wireless signal; a plurality of sensors configured to receive the first wireless signal and to produce one or more measurement signals in response to the first wireless signal; and a computer system configured to determine the position of the racing animal in the race track in response to the one or more measurement signals.

[0008] In another aspect, the present invention relates to a method for off-track wagering on races. The method includes carrying a transmitter by a racing animal in a race track; transmitting a first wireless signal by the transmitter; receiving the first wireless signal by a plurality of sensors; producing one or more measurement signals in response to the first wireless signal; and determining the position of the racing animal in the race track in response to the one or more measurement signals.

[0009] In another aspect, the present invention relates to a computer device for off-track wagering. The computer device includes a communication device configured to receive a location of a racing animal in a race track from a remote computer system; a computer memory configured to store a representation of the race track; and a display device configured to display the representation of the race track and a symbol representing the racing animal in the representation of the race track in accordance with the location in the racing animal in the race track.

[0010] In another aspect, the present invention relates to a method for off-track wagering. The method includes receiving a location of a racing animal in a race track by a computer device; storing a representation of the race track in the computer device; and displaying on the computer device the representation of the race track and a symbol representing the racing animal in the representation of the race track in accordance with the location of the racing animal in the race track.

[0011] Implementations of the system may include one or more of the following. The communication system can receive the plurality of wagers in wireless signals from a plurality of computer devices. The communication system can send the winning odds to a plurality of computer devices. The winning odds can be sent to a plurality of computer devices by the communication system in wireless signals. The computer system can store the plurality of wagers in user accounts associated with a plurality of players that placed the wagers. The system can further include a measurement system configured to measure positions of the racing animals during the race and to communicate the positions of the racing animals to a remote computer device or the communication system. The measurement system can include a location sensor to be carried by a racing animal in a race track, wherein the location sensor is configured to determine a location of the racing animal. The measurement system can further include a transmitter coupled to the location sensor. The transmitter can transmit a first wireless signal comprising the location of the racing animal to the remote computer device or the communication system. The measurement system or the computer system can compute a position of the racing animal in the race track in response to the location of the racing animal. The location sensor can receive one or more second wireless signals from a geo position system (GPS) and to determine the location of the racing animal in response to the one or more second wireless signals. The computer processor can separate the race into a plurality of time segments and the communication system is configured to receive the plurality of wagers in the plurality of time segments during a race, and wherein

the computer processor is configured to compute the winning odds for the one of the plurality of time segments using wagers placed in the one of the plurality of time segments. The computer processor is configured to compute the winning odds for the one of the plurality of time segments based on pari-mutuel principle. Implementations of the system may include one or more of the following. The location sensor and the transmitter can be provided in a unitary portable device. The first wireless signal can include an electromagnetic signal or an optical signal. The first wireless signal can be based on WiMax, WiFi, or a cellular communication standard. The location sensor can receive a second wireless signal from a geo position system (GPS) and to determine the location of the racing animal in response to the second wireless signal. The computer system can send a second wireless signal comprising the position of the racing animal in the race track to a remote computer device. The computer system can receive a wager on the racing animal in the race track from the remote computer device.

[0012] Implementation of the system may include one or more of the following. The transmitter comprises one or more of a laser, a radio-frequency transmitter, or a radio frequency identification (RFID) device and the plurality of sensors can include a radio frequency receiver or an optical sensor. The first wireless signal can include a radio-frequency electromagnetic signal or a laser signal. The portable device can further include a geo position system (GPS) sensor configured to determine a location of the racing animal and the first wireless signal comprises the location of the racing animal. The computer system can determine the position of the racing animal in the race track in response to the location of the racing animal. The computer system can receive from the remote computer device a wager on the racing animal in the race track.

[0013] Implementations of the system may include one or more of the following. The representation of the race track can include a map, an image or graphics of the race track. The symbol representing the racing animal can include one or more of an image resembling the racing animal, an avatar, an icon, a dot, a circle, a rectangle, a polygon, a star, a "+" symbol, or a "x" symbol. The computer device can further include a computer processor configured to compute a position of the racing animal relative to the representation of the race track in response to the location of the racing animal in the race track. The computer processor can produce a first image including the symbol in the representation of the race track in accordance with the location of the racing animal. The computer processor can produce a plurality of second images each including the symbol in the representation of the race track to simulate the movement of the racing animal in the race track. The computer memory can compute the position of the racing animal relative to the representation of the race track in response to the location of the racing animal. The communication device can receive wireless signals comprising the location of the racing animal in a race track from the remote computer system. The computer device can further include an input device that can receive a wager on the racing animal from a user, wherein the communication device is configured to send the wager to the remote computer system. The input device can receive a wager during a race. The display device can display relative positions of a plurality of racing animals in the representation of the race track in accordance with the locations of the racing animals running in a race in the race track.

[0014] The disclosed system and methods include the following advantages. The disclosed system allows users to make bet during an animal race such as a horse race or a dog race (i.e. in running). The users can make bets in accordance with the relative positions of the racing animals and dynamic winning odds during the race. The users can make bets before and during the animal race. Each player can make bets at times more suitable for him. The players can have the option to bet during a race when he has information and possibly better judgment about an ongoing race. A player may also have a chance to correct a seemingly mistaken bet previously made. More types of betting methods can also be created as result. The in-running betting can make the wagering more dynamic and exciting for the players. The in-running betting may attract more players to participate wagering.

[0015] The disclosed system and methods also disclose an efficient wireless system to allow users to enter wagers for an animal race using a portable device without being limited by the communication bandwidth of the wireless systems. The disclosed system can provide positions of the racing animals during a race to the portable devices without using large amount of data such as the video images of racing animals. The users of the portable devices can make bets in accordance with the positions of the racing animals displayed on the portable device.

[0016] The disclosed system and methods also disclose a measurement system for measuring positions of racing animals during a race in a race track. The positions of the racing animals can be determined in real time at high accuracy. The position data can be shared in real time with computer devices through wired or wireless networks. The position data allow users to track the status of the racing animals during a race. The position data also allow users to make bets during a race in accordance with the relative positions of the racing animals during the race.

[0017] The details of one or more embodiments are set forth in the accompanying drawing and in the description below. Other features, objects, and advantages of the invention will become apparent from the description and drawings, and from the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] FIG. **1** is a diagram for an off-track wagering system that can provide position information during a race and facilitate in-running wagering.

[0019] FIG. **2** illustrates a position-measurement system (PMS) in association with a race track.

[0020] FIG. **3** is a block diagram of an exemplified portable device that can be used in the PMS.

[0021] FIG. **4** is a flow diagram for the operations of the system in FIG. **1**.

[0022] FIG. **5** illustrates a functional diagram of a wagering computer system (WCS) compatible with the off-track wagering system of FIG. **1**.

[0023] FIG. **6** is a block diagram of an exemplified computer device compatible with the off-track wagering system of FIG. **1**.

[0024] FIG. **7**A illustrates a portion of a user interface compatible with the computer device of FIG. **6**.

[0025] FIG. **7**B illustrates another portion of a user interface compatible with the computer device of FIG. **6**.

DETAILED DESCRIPTION

[0026] Referring to FIGS. **1-2**, an off-track wager system **100** includes a plurality of position measurement systems (PMS) **110**, **130** each associated with a race track. The PMS **110** can include a computer system **111**, a plurality of portable devices **112**, **113**, and one or more wireless receivers **114-119** that can facilitate communications between the computer system **111** and the portable devices **112**, **113**. Similarly, the PMS **130** can include a computer system **131**, a plurality of portable devices **132**, **133**, and one or more wireless receivers **134-139** that can facilitate communications between the computer system **131** and the portable devices **132**, **133**. The PMS **110**, **130** can be in communication with a wager computer system (WCS) **150** through a computer network **105**.

[0027] The computer network **105** can include various wired, wireless, and satellite communication arrangements including but not limited to a wide area network such as the Internet, a local area network, a cellular phone network under various communication protocols such as 2 G, 2.5 G and 3 G, Global System for Mobile Communications (GSM), General Packet Radio Service (GPRS), EDGE, Code Division Multiple Access (CDMA), Wideband CDMA, TD-SCDMA, Universal Mobile Telecommunications System (UMTS), etc., and wireless communication standards such as IEEE 802.11, Wi-Fi, Wi-MAX, and IEEE 806.16, and others.

[0028] The PMS **110**, **130** and the WCS **150** can be set up by an off-track wager service provider. In some embodiments, the computer system **111** and **131** can communicate with the WCS **150** through an intranet managed by the off-track wager service provider.

[0029] A plurality of computer devices **160**, **170** can be connected to the computer network **105** and communicate with PMS **110**, **130** and the WCS **150**. The computer devices **160** and **170** can include personal computers, portable digital assistance (PDA) devices such as Palm™ and Blackberry™, cellular phones, digital image capture devices equipped with communication devices, portable music players such as IPOD™ and Zune™, and game devices such as Microsoft XBOX, SONY PlayStation OR PS2, and/or Nintendo 64, GameCube, or GameBoy.

[0030] The PMS **110** and **130** can each be installed at or near a race track. For example, various components of PMS **110** can be installed at or near a race track **200**. A plurality of animals **212**, **213** such as horses and greyhounds can participate in a race on a race track **200**. Each racing animal **212**, **213** can carry the portable device **112** or **113**. A coordinate system including an origin, an x-axis, and a y-axis can be defined in the race track **200** for easily describing relative locations of the racing animals **212**, **213** in the race track **200** and the relative positions between the racing animals **212**, **213**. The relative positions of the racing animals can also be based on distances along the race track **200**. For example, distance from the start position "T_0" can be measured along the race track to indicate the distance a racing animal has run.

[0031] The racing animals' (or vehicles') positions can be measured by different arrangements. In some embodiments, referring to FIG. **3**, the portable device **112** can include a GPS communication device that can receive electronic signals from a plurality of satellites **231-233** (for example, the location of a racing animal may be accurately determined by signals from four or more satellite or by signals transmitted to four or more satellite). The electronic signals received form the different satellites **231-233** can be used to calculate the absolute locations (e.g. in longitudes and latitudes) of the racing animal **212** by a computer processor **320**. The computer processor **320** can optionally calculate the relative location of the racing animal **212** in the race track **200**. A wireless transmitter **330** can send the absolute location and/or the relative location of the racing animal **212** to one or more of the wireless receivers **114-119**. The positions for the racing animals **212**, **213** can be measured at pre-defined time intervals. The computer system **111** can receive the position (and optionally time associated with the position measurement) from the wireless receivers **114-119**. The computer system **111** can calculate the relative locations of the racing animals **212**, **213** in the race track **200** using the absolute locations of the racing animals **212**, **213**.

[0032] In some embodiments, the GPS communication device **310** can transmit electronic signals to one or more satellites **231-233**. The electronic signals can carry position information about the racing animal **212**. The one or more satellites **231-233** can send the positions of the racing animals to the computer system **111** or the WCS **150**. The wireless transmitter **330** and the wireless receivers **114-119** may not be required in this arrangement.

[0033] In some embodiments, the racing animals' locations can be measured without a GPS system (including the satellites **231-233** and the GPS communication device **310**). The wireless signals transmitted by the portable devices **112**, **113** can be measured by the wireless receivers **114-119** for determining the positions of the racing animals **212**, **213**. In some embodiments, the relative intensities of the wireless signals transmitted by a portable device **112** can be used to calculate the location of the racing animal **212** at the time of transmission. In one arrangement, the relationship between the different race-track locations of the portable device **112** and the relative intensities received by the different wireless receivers **114-119** can be calibrated prior to a real race. The ratios of the intensities can be used to uniquely determine the location of the portable device **112** (and thus the racing animal **212**) on the race track **200**.

[0034] In some embodiments, the racing animals' locations can be measured by short-range position measure devices such as RFID readers or optical interception devices. The portable device carried by a racing animal can include a RFID sensor having a unique identification. A plurality of RFID readers can be positioned along the race track to detect the specific radio frequency (RF) signals emitted by the RFID sensor. The RFID sensor can include a power supply or being powered by inductive RF signals from the RFID readers. An example of an optical interception device can include a laser beam and a photo sensor installed by the race track. The laser beam is set up to illuminate across the track into the photo sensor. An interruption in the laser signal by a racing animal can be used to determine the location of the racing animal.

[0035] The off-track wager system **100** can provide wagering services to many players. The players can register and open accounts at the off-track wager system **100** through the computer network **105**. A player can access their accounts using a user name and a password. The players can also have store money in his account for automatic withdrawal of wager fees. The user account information and the wager information can be stored in the WCS **150**.

[0036] Referring to FIG. **1-4**, the operations of the off-track wager system **100** can include following steps. A race can be hosted at a race track **200**. The racing animals **212**, **213** positions can be measured by position measurement system (PMS) **110** (step **410**). The racing animals' relative locations in the race track **200** can be calculated using their measured absolute locations by the computer system **111** or the computer processor **320** (step **420**).

[0037] The (relative) locations of the racing animals **212**, **213** running in the race are sent to a remote computer device **160** (step **430**) and received by the communication module **610** (FIG. **6**). The relative positions of the racing animals during the race are instantaneously displayed on the display **640** of the remote computer device **160** (step **440**). The racing animals' relative locations can also be sent to and stored at the WCS **150**. In some embodiments, the racing animals' relative locations in the race track **200** can also be calculated in WCS **150** or by the computer processor **620** in the remote computer device **160**.

[0038] A player can log-in to the off-track wager system **100** using the input device **630** on the remote computer device **160**. The player can enter a wager prior to a race using the remote computer device **160** (step **450**). The player can monitor the performance of the racing animals **212**, **213** during a race. The player can enter a wager during the race using an input device **630** in accordance with the performance of the racing animals **212**, **213** during the race. Information about the wager can be transmitted to the WCS **150** (step **460**) and stored in association with the player's account. The winning odds for the pari-mutuel betting can be continuously computed by the WCS **150** (step **470**). The updated winning odds and other race related information can be received by the computer devices **160**, **170**. After the race results are known after the race, if the player wins, the winning amount is computed by the WCS and stored in the player's account at the off-track wager system **100**.

[0039] A WCS **150**, referring to FIG. **5**, can include an account management subsystem **510**, a pre-race status subsystem **520**, an in-running status subsystem **530**, an odds computation system **540**, a betting subsystem **550**, and a post-race subsystem **560**. The account management subsystem **510** can store information about users of the off-track wager system **100**. The user information can include user identification, password, name and address, account balance, current active bets, betting history, performance analysis, money transfer information (e.g. credit card, bank account information, and other electronic payment method such as Paypal), bonus point management, and payout calculation. The user account can be registered by users using the computer devices **160**, **170** through the computer network **105**. The user information can also be entered and managed by the users and updated by the account management subsystem **510**.

[0040] Before each race at a race track **200**, a user can receive pre-race information about the race from the pre-race status subsystem **520**. The pre-race information can include race schedules, participating animals in the race, pre-game odds, the sizes of each betting pools, race status, track status, track assignment, profiles of the racing animals, jockey profile including historic performance, expert's picks, weather information at the race track, and scratch update. The pre-race information can be pre-stored in the WCS **150** (e.g. historic data), or received from the race track **200** (weather, scratch, and track information) or other race information agencies. The pre-race information can be sent to the pre-race status subsystem **520** through the computer network **105** or through other communication methods. The pre-race status information can also include updated odds for each type of bet for a given race. The odds information can be received from external sources or from the odds computation system **540**.

[0041] The players can receive pre-race information using the computer devices **160**, **170** and enter bets on the racing animals. The bets are received by the betting subsystem **550** from the computer device **160**, **170**. The betting subsystem **550** can verify the validity of the bets, and decides to accept or reject the bets. The balance in the user's account may be checked to ensure sufficient fund is available for the bets. Fees for the bets can be withdrawn. A confirmation message may be sent from the WCS **150** to the computer devices **160** or **170** to inform the players about the successful entries or rejections of the bets.

[0042] The official results after each race can be received by a post-race subsystem **560** from the race tracks **200** or other agencies. The outcome for each bet is determined. The winning amount is calculated for the winning bets. The appropriate fund is transferred into the user accounts associated with the winning bets.

[0043] The players can also receive in-running information from the in-running status subsystem **530** during a race. The in-running status can include the positions and relative order of the racing animals **212**, **213** and real time video or audio information from the race track **200**. As discussed below, the in-running information can be displayed on the computer devices **160** or **170** in image, text, or multi-media presentations/animations. The in-running status can be received from the race track **200**, the PMS **110** and **130** associated with the race tracks, and other systems that may capture live race information. For example, the in-running information can include video signals captured by an electronic Video or still-image camera. The in-running status subsystem **530** can also receive the positional information of the racing animals from the satellites **231-233** if that may determine the locations of the racing animals **212-213** using the signals transmitted from the GPS communication device **310**. The in-running status subsystem **530** can also calculate the relative positions of orders of the racing animals **212**, **213** in the race track **200** using the location information measured by the PMS **110** and **130**, or received from the satellites **231-233**.

[0044] In some embodiments, the off-track wager system **100** can facilitate players to make bets during a race (i.e. in running). The players can send bets during a race to the betting subsystem **550** using the computer devices **160** or **170**. The betting subsystem **550** can verify the validity of the bets, and decides to accept or reject the bets similar to the bets entered before the race. Due to the shorter time available, the betting subsystem **550** may pre-quality certain players that can make bets during a race. For example, the betting subsystem **550** may only allow players having good betting and credit records to make bets during a race. The betting subsystem **550** can also require a minimum fund to be available in the player's user account and specific in-running conditions to be agreed upon.

[0045] The in-running betting information can also include the winning odds and the pool sizes for the pari-mutuel bets. During the race, the odd computation subsystem **540** can continually calculate the winning odds from different bets using information received from the track **200**, PMS **110-130**, and other sources. The players can receive the winning odds

and the pool sizes during the race using the computer devices **160** or **170**, which can help the players make bets during the race.

[0046] In some embodiments, the in-running bets can be arranged in different time segments during a race. For example, referring to FIG. **2**, a race may start at position "T_0" and finish at position "T_4". The race can be divided into four segments "T_0 to T_1", "T_1 to T_2", "T_2 to T_3", and "T_3 to T_4". The in-running bets may be accepted during some or all the four segments. For example, the in-running bets may be entered during the "T_1 to T_2" and "T_2 to T_3" segments, that is, after the racing animals have demonstrated their performances but before they are too close to the finish line. The bets can be entered separately for the "T_1 to T_2" and "T_2 to T_3" segments. The odds computation system **540** can calculate the winning odds for each segment in accordance with the number of bets for each racing animal during that segment. The odds in a segment can be calculated using pari-mutuel principle based on the money betted in this segment only. The odds of different segments can be calculated independently from each other. The odds of different segments can also be calculated based on the bets in several segments.

[0047] Furthermore, the odds in a segment can be calculated before the segment is closed. Alternatively, the odds for a segment can be calculated dynamically as the bets and the money are received and updated as the race progresses during the segment. The winning odds, the total size of the bets for each segment can be sent to the computer devices **160** or **170**. The winning odds before a race and the winning odds for one or more segments during a race can be displayed on the computer devices **160** or **170**. Moreover, the winning odds for the current in-running segment during a race can be displayed on the computer devices **160** or **170** (shown in FIGS. **7**A and **7**B below).

[0048] In some embodiments, the segmentations can also be based on the time. For example, the average run time for a race can be divided into five segments wherein in running bets can be entered in the second, the third and the fourth segments. Other embodiments can include all or any subsets of the segments "T_0 to T_1", "T_1 to T_2", "T_2 to T_3", and "T_3 to T_4". A race may include a portion, one or more rounds around a race track. More or fewer segments can be defined for a race.

[0049] In some embodiments, the off-track wager system **100** can facilitate a social network among the players. For example, the players can post messages on a bulletin board and chat in chat rooms to exchange information and opinions about racing animals, jockeys, and so on. The WCS **150** can allow a group of players to create an account to make bets on racing animals before or during races.

[0050] Referring to FIG. **6**, the computer device **160** can include a communication module **610**, a computer processor **620**, an input device **630**, a display device **640**, and a memory module **650**. The input device **630** can include a mouse, keyboard, touch-sensitive device, a voice recognition system, and so on. The communication module **610** is connected with the computer network **105** and can communicate with the WCS **150**, and optionally PMS **110**, **130**. The communication module **610** can receive pre-race, in-running, and post-race information respectively from the pre-race status subsystem **520**, the in-running status subsystem **530**, and the post-race subsystem **560** in the WCS **150**. The computer processor **620** can process the received information to allow the pre-race and in-running status information to be displayed on the display device **640**. The computer processor **620** can optionally calculate the positions of the racing animals **212**, **213** in the race track **200** using their absolute locations measured by PMS **110** and **130** or satellites **231**-**233**. A player can also enter a bet using the input device **630** prior to or during a race, which can be subsequently transmitted to the WCS **150** by the communication module **610**. The communication module **610** can receive confirmation from the betting system **550** about the successful entry of (or rejection to) a bet. The confirmation can be displayed on the display device **640**.

[0051] In some embodiments, referring to FIG. **7**A, a user interface **700** on the display device **640** can display static information, which can be pre-stored in the memory module **650** before a race, and dynamic information that can be updated in real-time. For example, the static information may include a representation **710** of the race track **200**. The representation **710** can be a layout or an image of the race track **200**. An image of the race track **200** can be obtained from a satellite image or a mag that are available from Internet services such as Yahoo! and Google. The image of the race track **200** can also include computer graphics and drawings. The static information may also include marks at positions "P_0", "P_1", "P_2", "P_3", and "P_4" along the representation **710** of the race track **200**. The positions "P_0", "P_1", "P_2", "P_3", and "P_4" may correspond to the starting and ending points of the segmentations "T_0", "T_1","T_2", and "T_4 " during the race for grouping the in-running bets and calculating the winning odds. A coordinate system can also be defined as part of the static information to allow relative positions of the racing animals to be displayed. The dynamic information can include pre-race, in-running, and post-race information provided in real-time by the WCS **150** and other sources. The dynamic information can include text, image, animation or video information. The dynamic information can include positions of the racing animals during a race. The computer processor **620** can prepare image data and enable the display device **640** to display symbols **712**, **713** representing the racing animals **212**, **213** in the presentation **710** in accordance with the position information. (For clarity, only two symbols **712** and **713** are shown in the race track in the representation **710**. It is understood that other numbers of symbols may be displayed depending on the number racing animals participate in the race. For example, eight racing horses can be displayed in the representation **710**.) The symbol **712**, **713** can also include an image or animation resembling the racing animal (e.g. a horse or a greyhound), an avatar, an icon, a dot, a circle, a rectangle, a polygon, a star, a symbol such as "+" or "x".

[0052] The computer processor **620** can produce a digital image including the symbol representing the racing animal in the representation of the race track. The position of the symbol in the representation is determined by the positions of the racing animal. The digital image can be displayed on the display device **640**. A series of such images can be produced by the computer processor **620** which can simulate the movement of the racing animal in the race track during a race. The player of the computer device **160** can easily determine the relative positions and speeds of the racing animals as the race progresses and can make in-running bets accordingly using the input device **630**.

[0053] A larger view **720** of the relative positions of the racing animals can also be displayed to more clearly show the relative positions of the racing animals. For example, in a race participated by eight horses, the positions of the eight horses in running can be represented by arrow signs labeled by the

horses' numbers in the larger view **720**. For example, the eight horses are sequenced in the order of 6, 4, 2, 1, 5, 8, 3, and 7 at the moment of the race shown in FIG. **7**A. Horse number **6** is leading the group at this particular moment. The relative positions and timing of the horses can be displayed in a table **730**. The row "P" lists the updated sequence of the horses in running. The row "H" indicates the horses at each position. The row "T" can display the times for the horses to catch up with the leading horse (horse number **6** at the moment). The updated winning odds for the horses can be displayed in table **740**. The winning odds for horses **1-8** can be categorized for win, place and show. The winning odds can be calculated from one or more previous segments or dynamically calculated using the bets placed in the current segment. Moreover, the information listed in tables **730** and **740** can include updated in-running information and post race information including the official results.

[0054] The display device **640** can also display the relative positions or the ranking order of the racing animals during a race in accordance with the location in the racing animal in the race track. For example, a horse race, a table in the user interface **700** may include rows of information each for a racing horse. Different columns can include the names of the horse and the jockeys, the track numbers for the horses, the current running sequence for the racing horses, as well as the current number of bets and winning odds for each bet on the horses. The user interface **700** can also include features for accepting bets for different horses and different wagering configurations. Referring to FIG. **7**B, tables **751** and **753** can include a plurality of cells for win, place and show for each of the racing horses (numbers **1** through **8**). Different betting amount can be listed in the same table or different tables **751** and **753**. A user can select betting configurations such as win for horse number **4** and place for horse number **6** at $2 betting value by clicking the corresponding cells in table **751**. Similarly, the user can also select betting configurations such as place for horse number **2** and win for horse number **7** at $6 betting value by clicking the corresponding cells in table **751**. Other betting amounts can also be included in the user interface **700**. The user can click a button **760** to verify the betting (s) he or she placed. The user can click a button **770** to submit the bets. A plurality of bets can therefore submitted by clicking a button.

[0055] It is understood that user interface for the computer device **160** or **170** can take different forms. For example, the betting on a horse can begin by a user using a mouse to click on the arrow sign labeled by the corresponding horse in the larger view **720**. A pull-down menu can occur next to the horse to allow the user to choose a betting method such as "win", "place" or show". After the user clicks on one of these betting methods, a pull-down menu can give the user selections on the betting amount such as $2, $4, $6 . . . , and so on.

[0056] Embodiments of the systems and methods disclosed herein include one or more of a number of advantages. One advantage of the in-running betting is that the winning odds may fluctuate as a function of the performance of the racing animals during the race. The dynamics and added uncertainty can make the in-running betting more exciting than pre-race betting. Another advantage of the in-running betting is that a player can make bets using a combination of pre-race betting and in-running betting. The in-running betting can thus make wagering more entertaining and may attract more players to participate in off-track wagering. The disclosed system and methods also provide effective segmentation methods for racking in-running bets and computing the odds for in-running bets. For example, the beginning and the ending periods may be excluded from the acceptance of the in-running bets.

[0057] It is understood that the disclosed systems and methods are compatible with different techniques and materials in addition to the ones described above. For example, the races can include racing vehicles as well as animals. The off-track wagering system is compatible with different configurations of the position measurement systems and different in-running betting segmentations. The disclosed method and system are also not limited to off-track betting. A player can use a computer device such as a cellular phone or a portable computer to enter bets while watching a race in a race track. The positions of the racing animals can be measured by different techniques other than the ones disclosed above. The disclosed system and methods are compatible with different devices that can communicate with the wager computing and management system. The configuration of the devices and the user interfaces on the devices can also take different forms. The in-running wagering can be implemented in different ways without deviating from the spirit of the disclosure.

[0058] Although specific embodiments of the present invention have been illustrated in the accompanying drawings and described in the foregoing detailed description, it will be understood that the invention is not limited to the particular embodiments described herein, but is capable of numerous rearrangements, modifications, and substitutions without departing from the scope of the invention. The following claims are intended to encompass all such modifications.

What is claimed is:

1. A system for providing in-running wagering, comprising:

a communication system configured to receive a plurality of wagers placed on racing animals competing in a race, wherein the plurality of wagers are placed during the race; and

a computer system in communication with the communication system, wherein the computer processor is configured to compute winning odds for the plurality of wagers in accordance with the plurality of wagers received by the communication system.

2. The system of claim **1**, wherein the communication system is configured to receive the plurality of wagers in wireless signals from a plurality of computer devices.

3. The system of claim **1**, wherein the communication system is configured to send the winning odds to a plurality of computer devices.

4. The system of claim **3**, wherein the winning odds are sent to a plurality of computer devices by the communication system in wireless signals.

5. The system of claim **1**, wherein the computer system is configured to store the plurality of wagers in user accounts associated with a plurality of players that placed the wagers.

6. The system of claim **1**, further comprising a measurement system configured to measure positions of the racing animals during the race and to communicate the positions of the racing animals to a remote computer device or the communication system.

7. The system of claim **6**, wherein the measurement system comprises:

a location sensor to be carried by a racing animal in a race track, wherein the location sensor is configured to determine a location of the racing animal.

8. The system of claim **7**, wherein the measurement system further comprises a transmitter coupled to the location sensor, wherein the transmitter is configured to transmit a first wireless signal comprising the location of the racing animal to the remote computer device or the communication system.

9. The system of claim **7**, wherein the measurement system or the computer system is configured to compute a position of the racing animal in the race track in response to the location of the racing animal.

10. The system of claim **7**, wherein the location sensor is configured to receive one or more second wireless signals from a geo position system (GPS) and to determine the location of the racing animal in response to the one or more second wireless signals.

11. The system of claim **1**, wherein the computer processor is configured to separate the race into a plurality of time segments and the communication system is configured to receive the plurality of wagers in the plurality of time segments during a race, and wherein the computer processor is configured to compute the winning odds for the one of the plurality of time segments using wagers placed in the one of the plurality of time segments.

12. The system of claim **11**, wherein the computer processor is configured to compute the winning odds for the one of the plurality of time segments based on pari-mutuel principle.

13. A method for enabling in-running wagering, comprising:

receiving a plurality of wagers placed on racing animals competing in a race, wherein the plurality of wagers are placed during the race; and

computing winning odds for the plurality of wagers in accordance with the plurality of wagers.

14. The method of claim **13**, further comprising receiving the plurality of wagers in wireless signals from a plurality of computer devices.

15. The method of claim **13**, further comprising sending the winning odds to a plurality of computer devices.

16. The method of claim **15**, further comprising sending the winning odds to the plurality of computer devices in wireless signals.

17. The method of claim **13**, further comprising storing the plurality of wagers in user accounts associated with a plurality of players that placed the wagers.

18. The method of claim **13**, further comprising:

measuring positions of the racing animals during the race, and

communicating the positions of the racing animals to the communication system or a remote computer device.

19. The method of claim **18**, further comprising entering a wager by a player in accordance with the positions of the racing animals during the race.

20. The method of claim **18**, further comprising sending the location or the position of the racing animal to the remote computer device or the communication system.

21. The method of claim **18**, further comprising:

carrying a location sensor by one of the racing animals in a race track;

determining a location of the one of the racing animals using the location sensor; and

computing a position of the one of the racing animals in the race track.

22. The method of claim **21**, further comprising:

receiving one or more second wireless signals from a geo position system (GPS) by the location sensor; and

determining the location of the racing animal in response to the one or more second wireless signals.

23. The method of claim **13**, further comprising:

separating a race into a plurality of time segments;

receiving the plurality of wagers in the plurality of time segments; and

computing the winning odds for the one of the plurality of time segments using wagers placed in the one of the plurality of time segments.

24. The method of claim **23**, wherein the winning odds for the one of the plurality of time segments is computed based on pari-mutuel principle.

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