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(54) **GEOFENCED EVENT-BASED FAN NETWORKING: METHODS**

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Publication Classification

(51) **Int. Cl.**

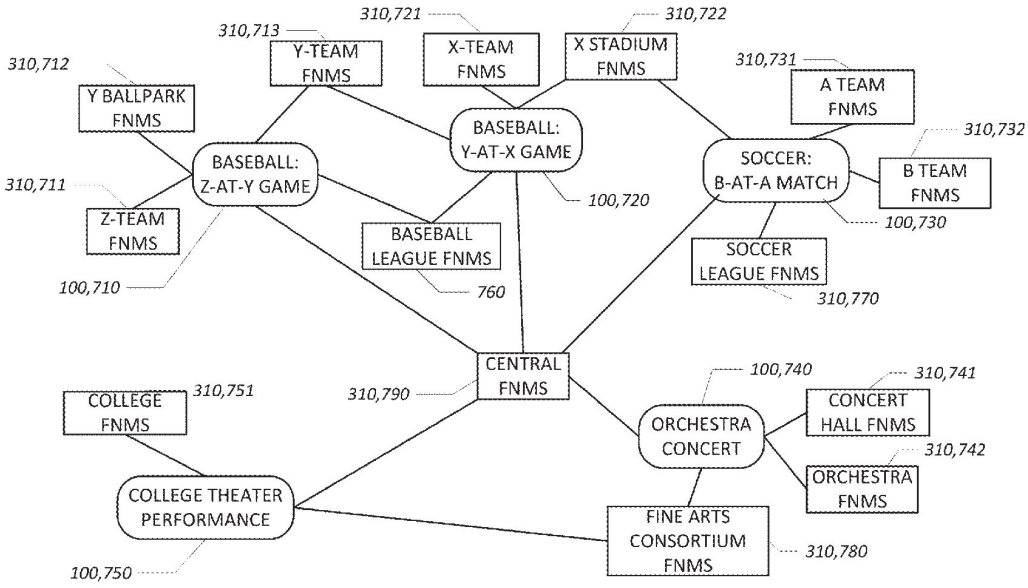
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H04W 4/04	(2006.01)
H04L 29/08	(2006.01)

(52) **U.S. Cl.**

CPC ***G06Q 30/0226*** (2013.01); ***G06Q 30/0258*** (2013.01); ***G06Q 30/0212*** (2013.01); ***H04L 67/10*** (2013.01); ***H04W 4/04*** (2013.01)

(57) **ABSTRACT**

The present invention is a fan networking system (FNS), available through a software application, executing on fans' portable smart devices for an event to be held in a venue. A FNS may offer event-customized services to fans, such as messaging, fan groups, mementos, coupons, "friends", and contests. The level of services might depend on whether a fan is attending; timing (pre-, during, post-performance); for a competitive event, whether the fan affiliates with the home or away team; and the category of fan (e.g., audience, management, performer). Determination of whether a fan is attending may be done with geolocation services, e.g., through GPS. A fan might need to remain within the venue for some period of time to qualify as attending. Services to attending fans may extend for a period beyond the event itself.



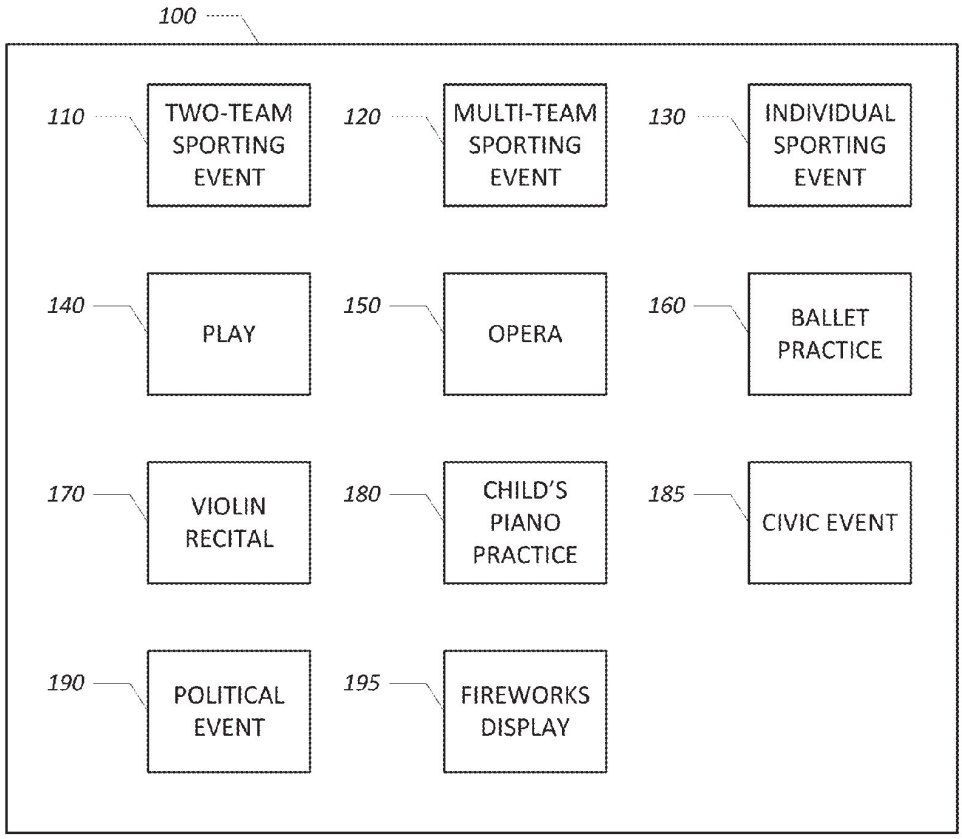

100
110
TWO-TEAM SPORTING EVENT
120
MULTI-TEAM SPORTING EVENT
130
INDIVIDUAL SPORTING EVENT
140
PLAY
150
OPERA
160
BALLET PRACTICE
170
VIOLIN RECITAL
180
CHILD'S PIANO PRACTICE
185
CIVIC EVENT
190
POLITICAL EVENT
195
FIREWORKS DISPLAY

FIG. 1

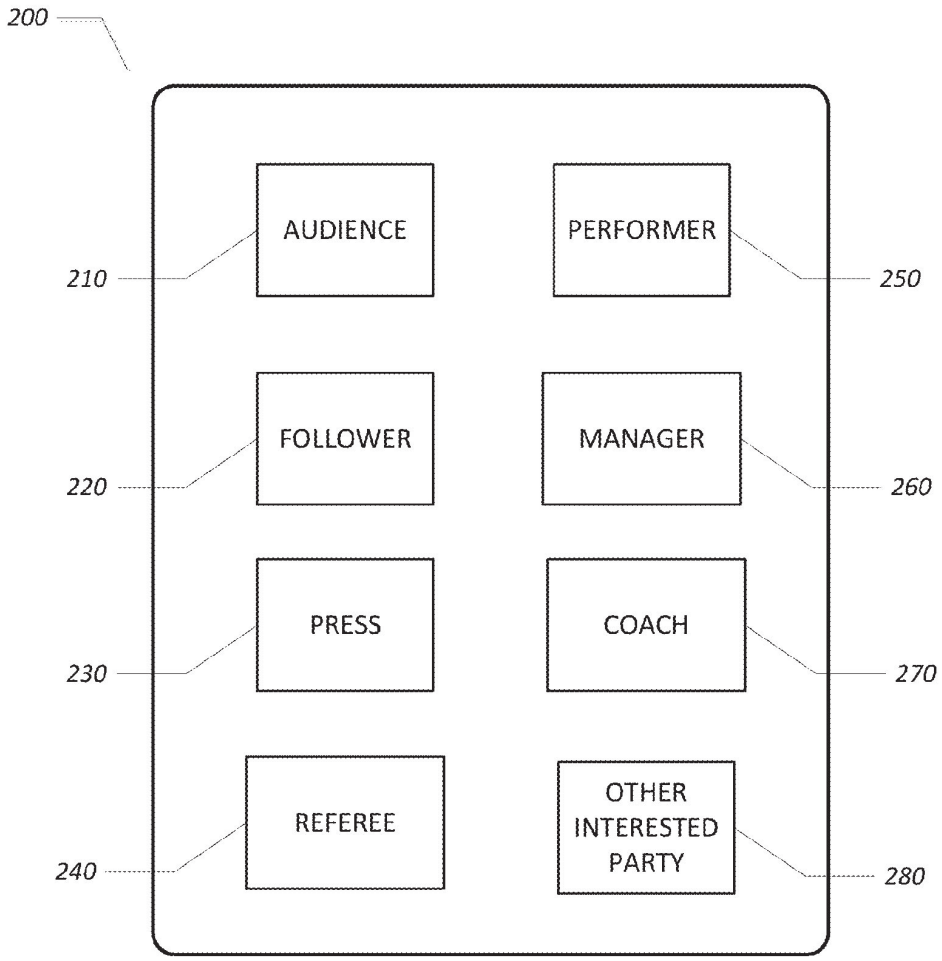

200
AUDIENCE
210
PERFORMER
250
FOLLOWER
220
MANAGER
260
PRESS
230
COACH
270
REFEREE
240
OTHER INTERESTED PARTY
280

FIG. 2

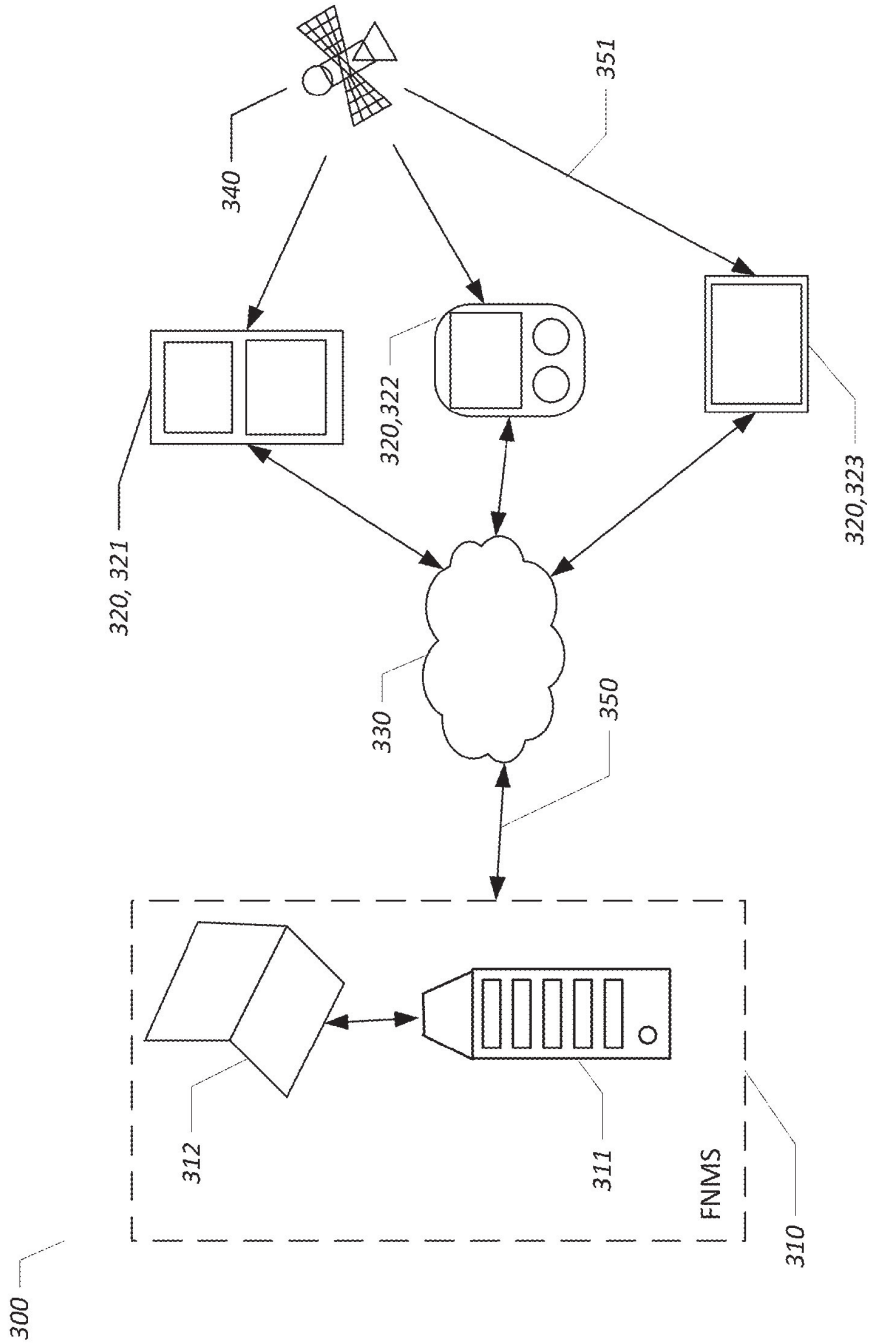


FIG. 3

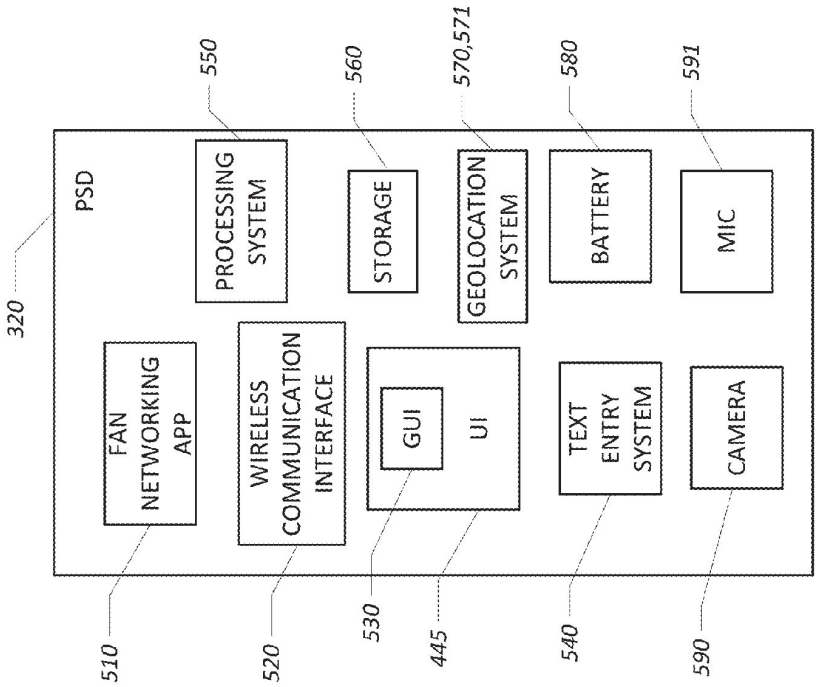

320
PSD
550
PROCESSING SYSTEM
560
STORAGE
570,571
GEOLOCATION SYSTEM
580
BATTERY
591
MIC
FAN NETWORKING APP
WIRELESS COMMUNICATION INTERFACE
GUI
UI
TEXT ENTRY SYSTEM
CAMERA
510
520
530
445
540
590

FIG. 5

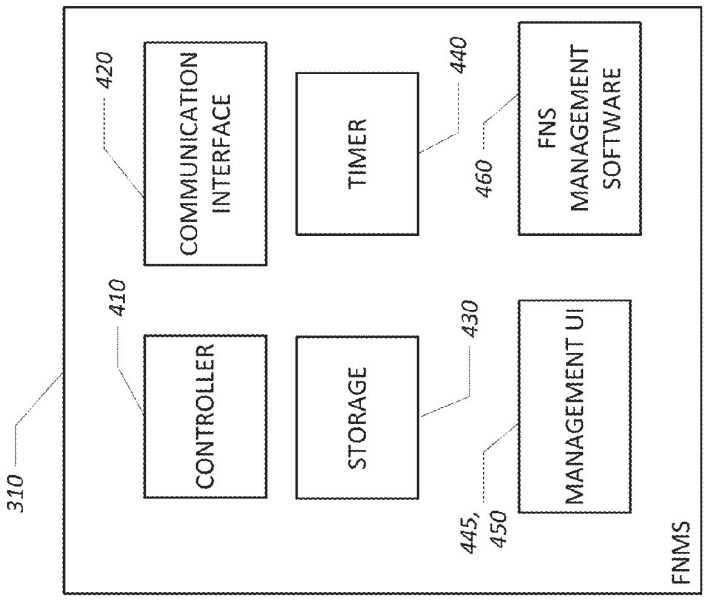

310
FNMS
410
CONTROLLER
420
COMMUNICATION INTERFACE
430
STORAGE
440
TIMER
445, 450
MANAGEMENT UI
460
FNS MANAGEMENT SOFTWARE

FIG. 4

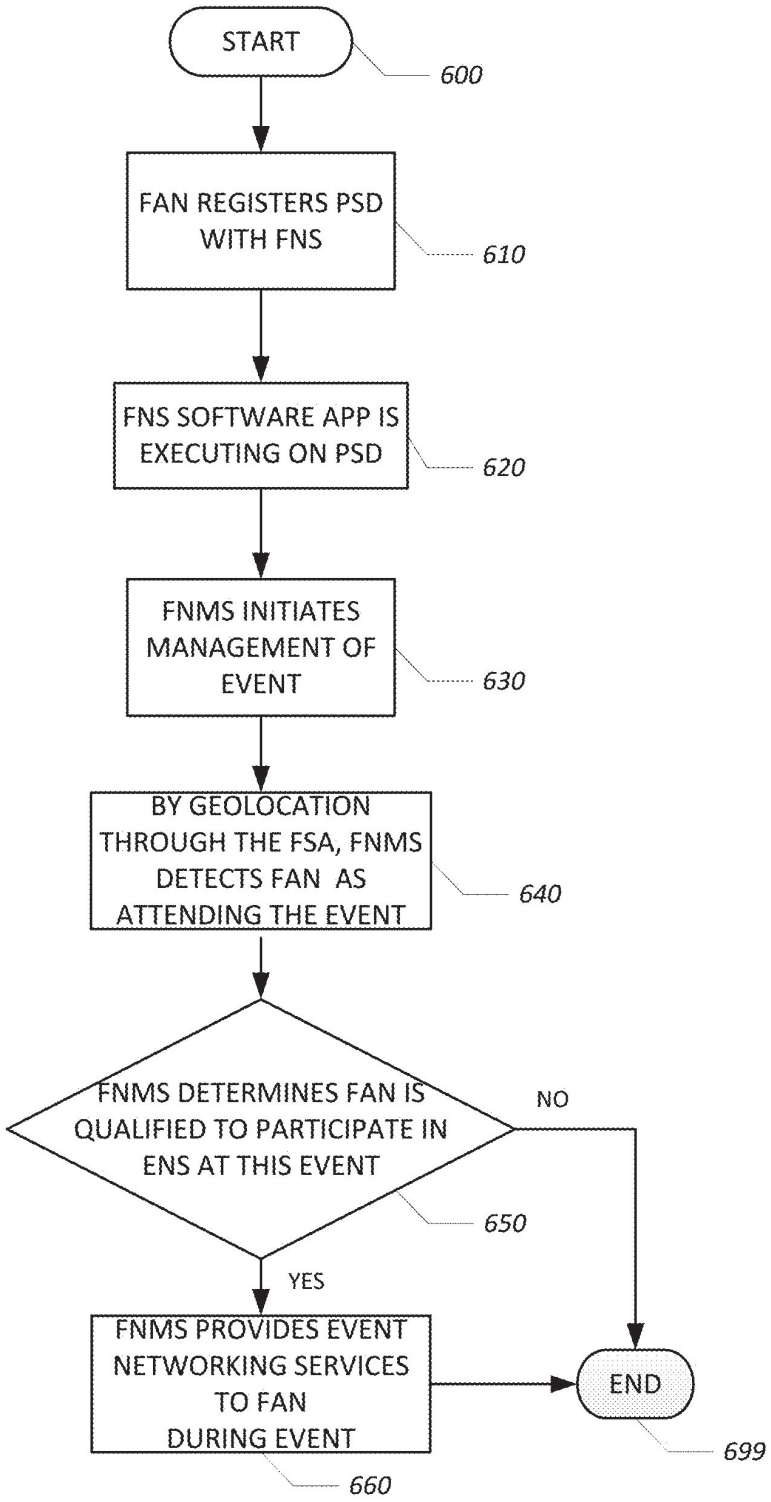

START
600
FAN REGISTERS PSD WITH FNS
610
FNS SOFTWARE APP IS EXECUTING ON PSD
620
FNMS INITIATES MANAGEMENT OF EVENT
630
BY GEOLOCATION THROUGH THE FSA, FNMS DETECTS FAN AS ATTENDING THE EVENT
640
FNMS DETERMINES FAN IS QUALIFIED TO PARTICIPATE IN ENS AT THIS EVENT
650
NO
YES
FNMS PROVIDES EVENT NETWORKING SERVICES TO FAN DURING EVENT
660
END
699

FIG. 6

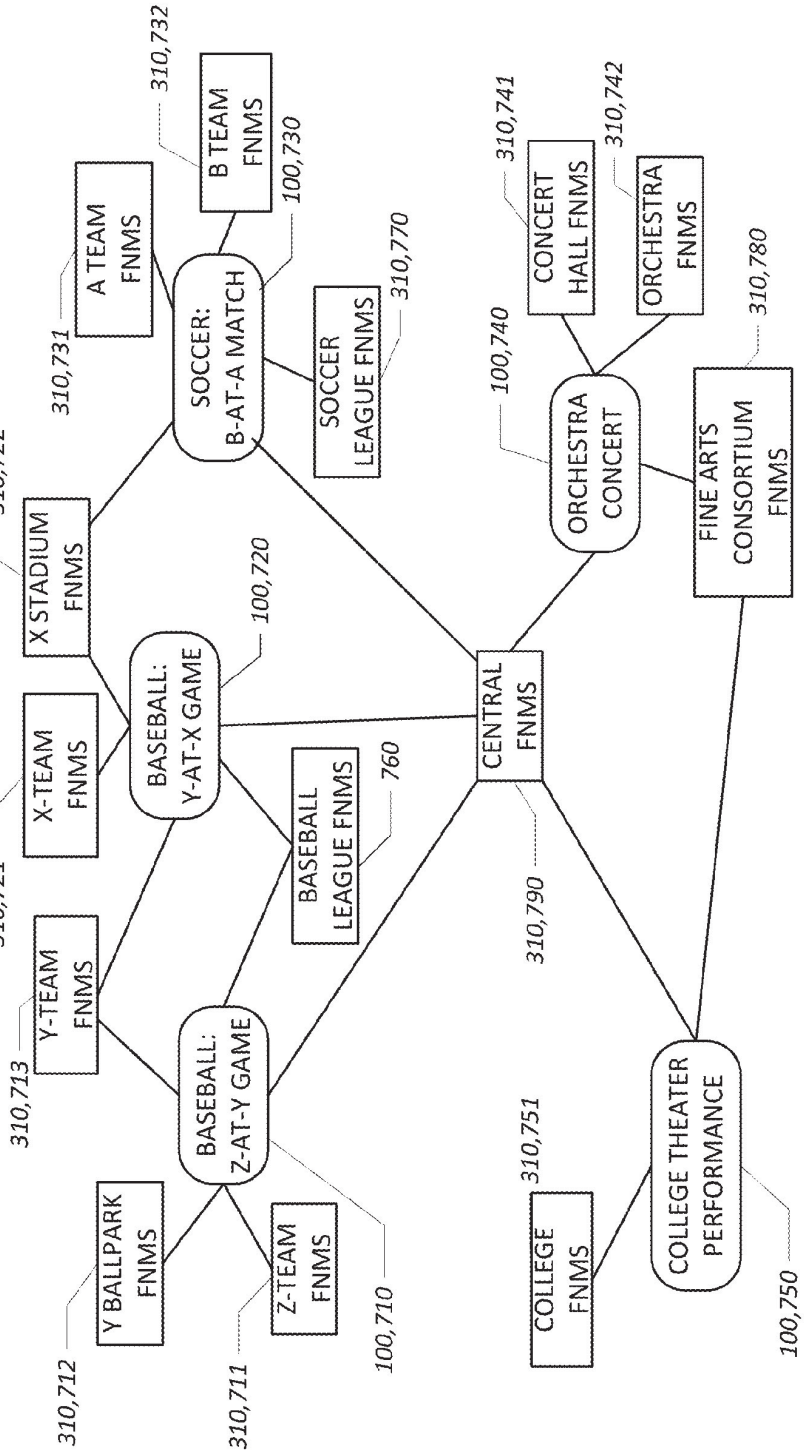

CENTRAL FNMS
100,710
BASEBALL: Z-AT-Y GAME
BASEBALL: Y-AT-X GAME
100,720
SOCCER: B-AT-A MATCH
100,730
ORCHESTRA CONCERT
100,740
COLLEGE THEATER PERFORMANCE
100,750
BASEBALL LEAGUE FNMS
760
Y-TEAM FNMS
310,713
Y BALLPARK FNMS
310,712
Z-TEAM FNMS
310,711
X-TEAM FNMS
310,721
X STADIUM FNMS
310,722
A TEAM FNMS
310,731
B TEAM FNMS
310,732
SOCCER LEAGUE FNMS
310,770
CONCERT HALL FNMS
310,741
ORCHESTRA FNMS
310,742
FINE ARTS CONSORTIUM FNMS
310,780
COLLEGE FNMS
310,751

FIG. 7

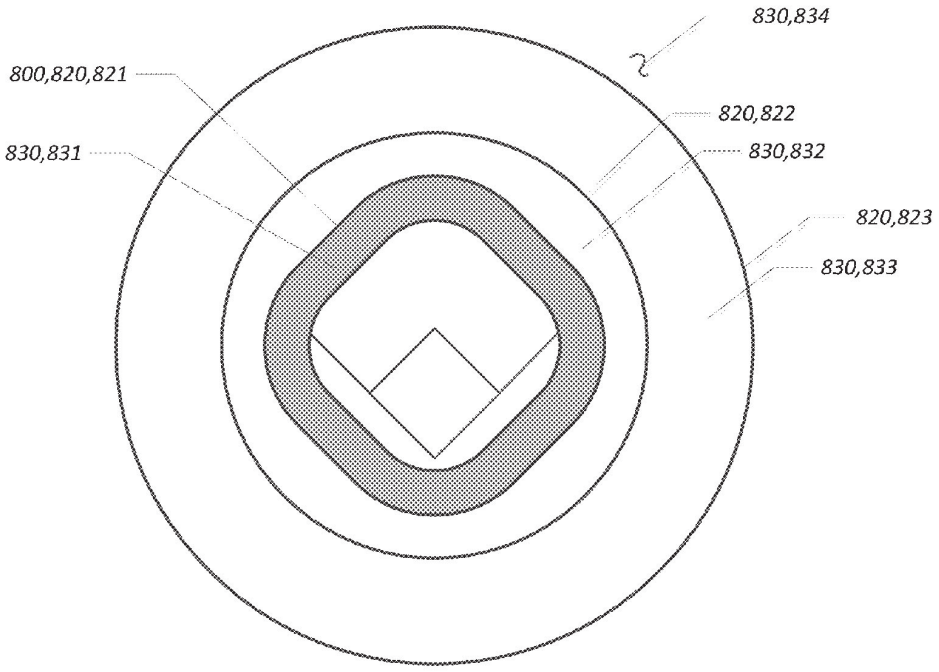


FIG. 8

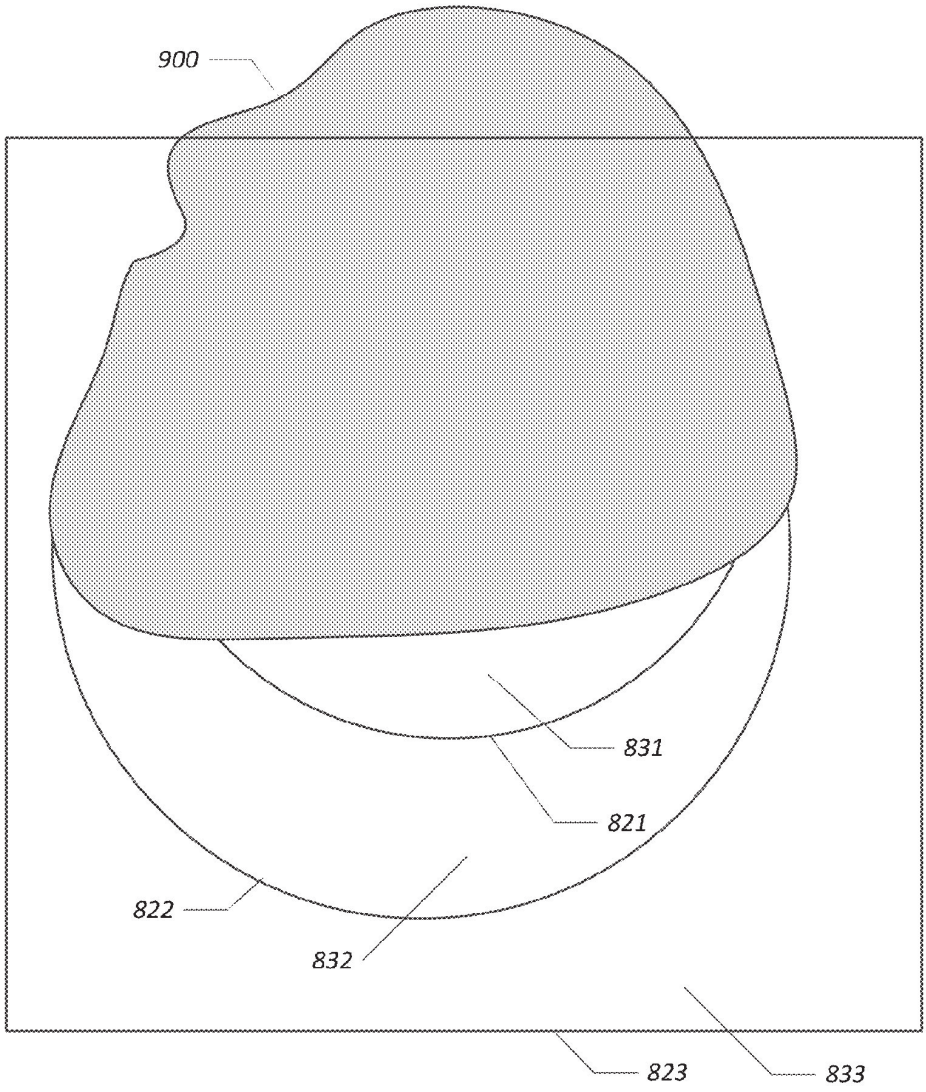


FIG. 9

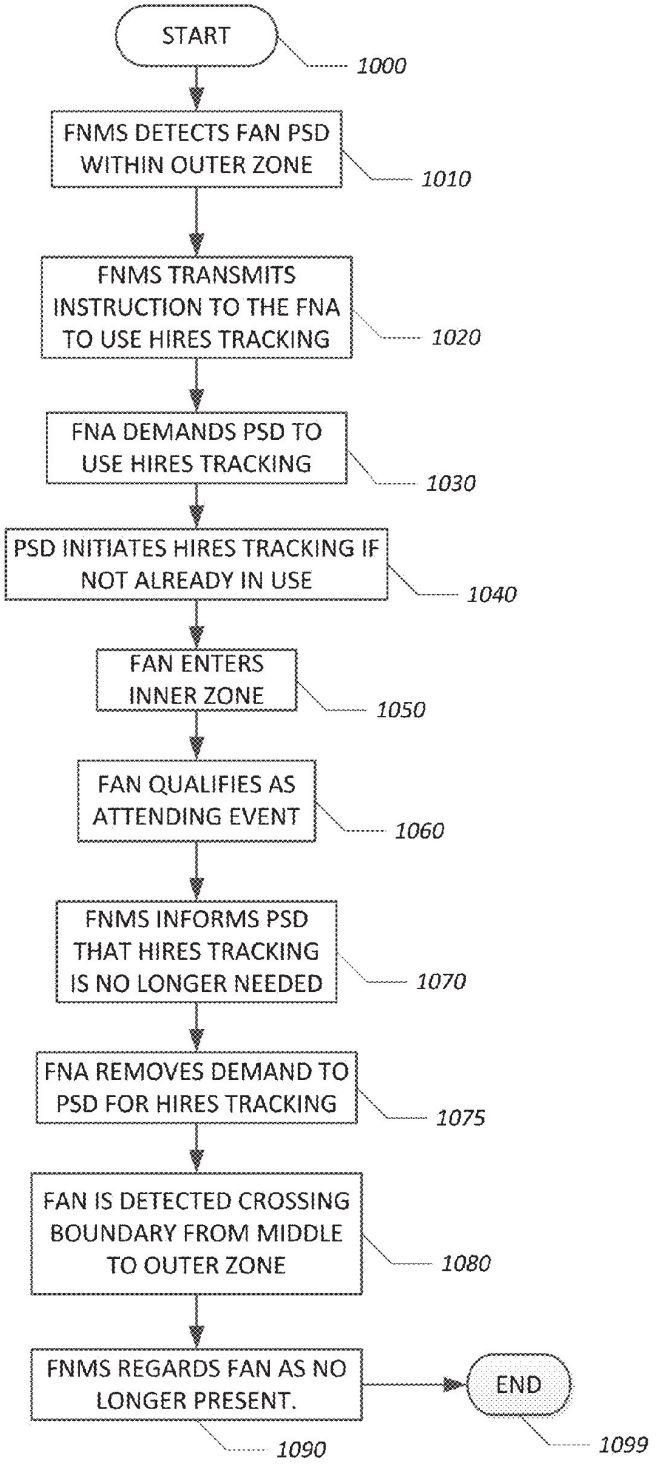

START
1000
FNMS DETECTS FAN PSD WITHIN OUTER ZONE
1010
FNMS TRANSMITS INSTRUCTION TO THE FNA TO USE HIRES TRACKING
1020
FNA DEMANDS PSD TO USE HIRES TRACKING
1030
PSD INITIATES HIRES TRACKING IF NOT ALREADY IN USE
1040
FAN ENTERS INNER ZONE
1050
FAN QUALIFIES AS ATTENDING EVENT
1060
FNMS INFORMS PSD THAT HIRES TRACKING IS NO LONGER NEEDED
1070
FNA REMOVES DEMAND TO PSD FOR HIRES TRACKING
1075
FAN IS DETECTED CROSSING BOUNDARY FROM MIDDLE TO OUTER ZONE
1080
FNMS REGARDS FAN AS NO LONGER PRESENT.
1090
END
1099

FIG. 10

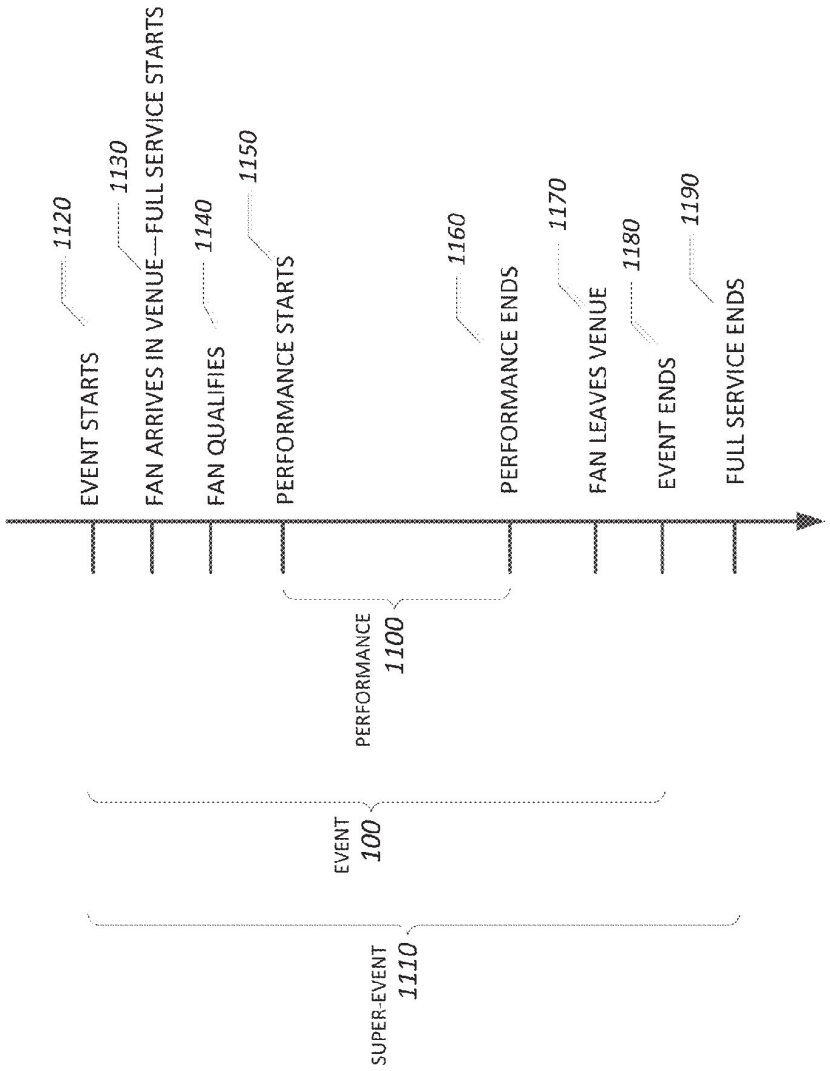

1120
EVENT STARTS
1130
FAN ARRIVES IN VENUE—FULL SERVICE STARTS
1140
FAN QUALIFIES
1150
PERFORMANCE STARTS
1160
PERFORMANCE ENDS
1170
FAN LEAVES VENUE
1180
EVENT ENDS
1190
FULL SERVICE ENDS
PERFORMANCE 1100
EVENT 100
SUPER-EVENT 1110

FIG. 11

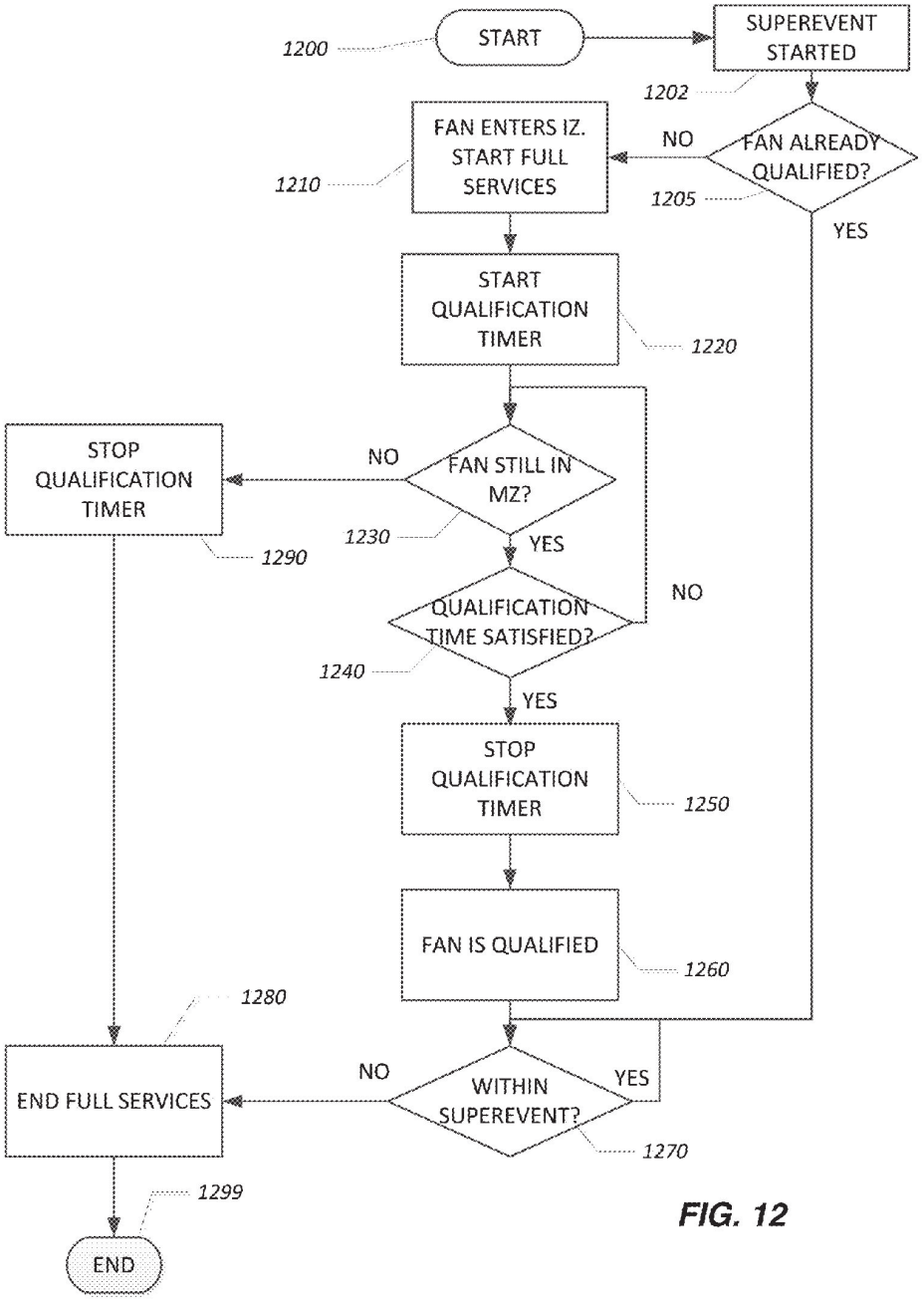

1200
START
SUPEREVENT STARTED
1202
FAN ALREADY QUALIFIED?
1205
NO
YES
FAN ENTERS IZ. START FULL SERVICES
1210
START QUALIFICATION TIMER
1220
FAN STILL IN MZ?
1230
NO
YES
STOP QUALIFICATION TIMER
1290
QUALIFICATION TIME SATISFIED?
1240
NO
YES
STOP QUALIFICATION TIMER
1250
FAN IS QUALIFIED
1260
1280
END FULL SERVICES
WITHIN SUPEREVENT?
1270
NO
YES
1299
END

FIG. 12

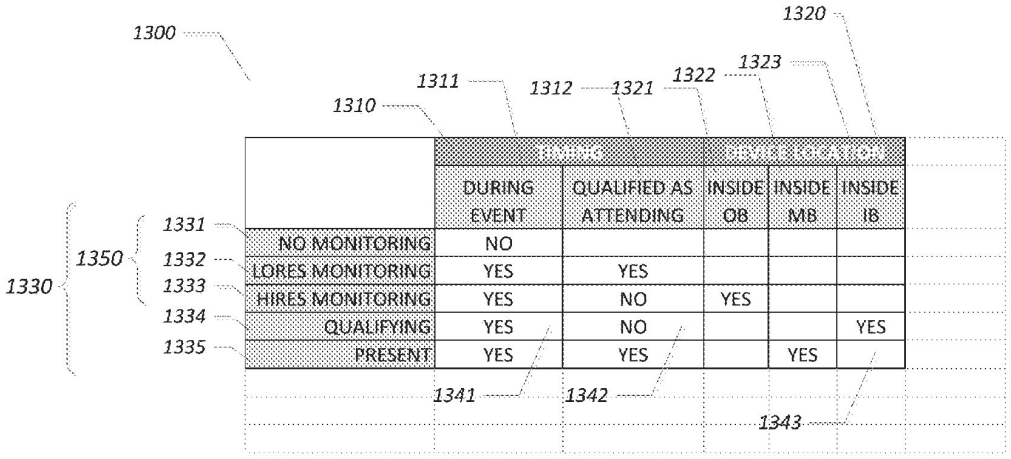

1300
1320
1323
1322
1311
1312
1321
1310
1331
1332
1333
1334
1335
1350
1330
1341
1342
1343
DURING EVENT
QUALIFIED AS ATTENDING
INSIDE OB
INSIDE MB
INSIDE IB
NO MONITORING
LORES MONITORING
HIRES MONITORING
QUALIFYING
PRESENT
NO
YES
YES
YES
YES
NO
NO
YES
YES
YES
YES

FIG. 13

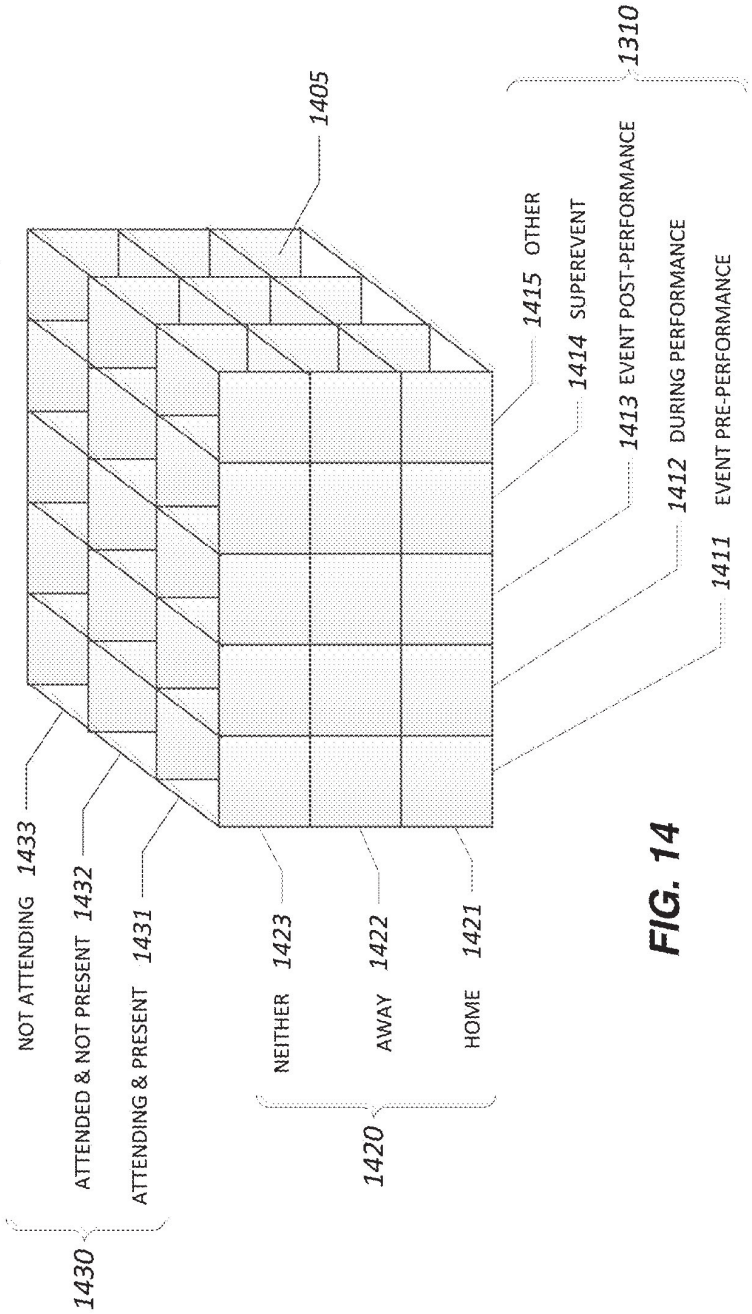

1400
1405
1310
1415 OTHER
1414 SUPEREVENT
1413 EVENT POST-PERFORMANCE
1412 DURING PERFORMANCE
1411 EVENT PRE-PERFORMANCE
NOT ATTENDING 1433
ATTENDED & NOT PRESENT 1432
ATTENDING & PRESENT 1431
1430
NEITHER 1423
AWAY 1422
HOME 1421
1420

FIG. 14

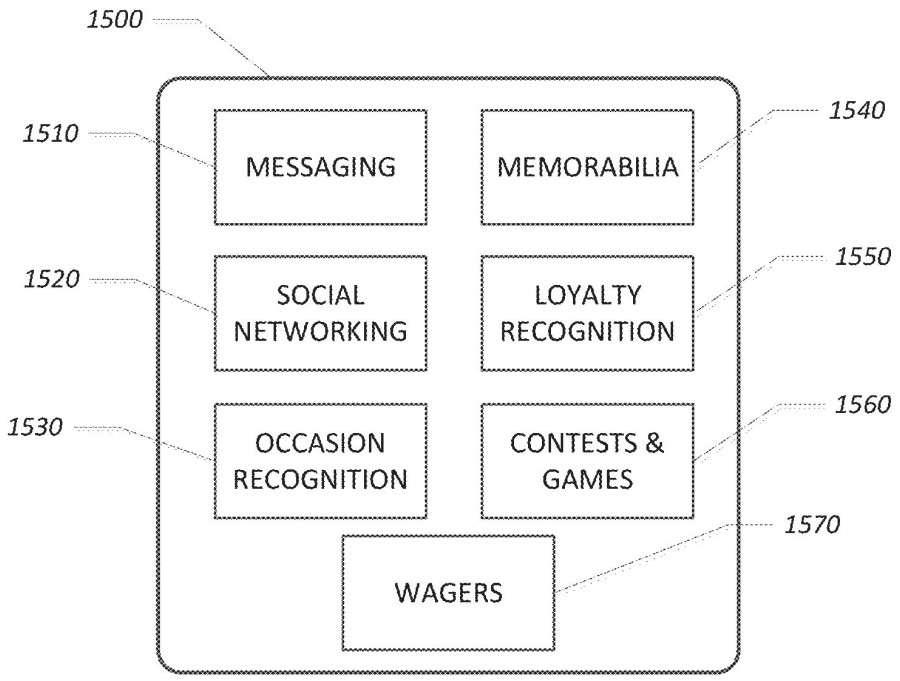

1500
1510
MESSAGING
1540
MEMORABILIA
1520
SOCIAL NETWORKING
1550
LOYALTY RECOGNITION
1530
OCCASION RECOGNITION
1560
CONTESTS & GAMES
1570
WAGERS

FIG. 15

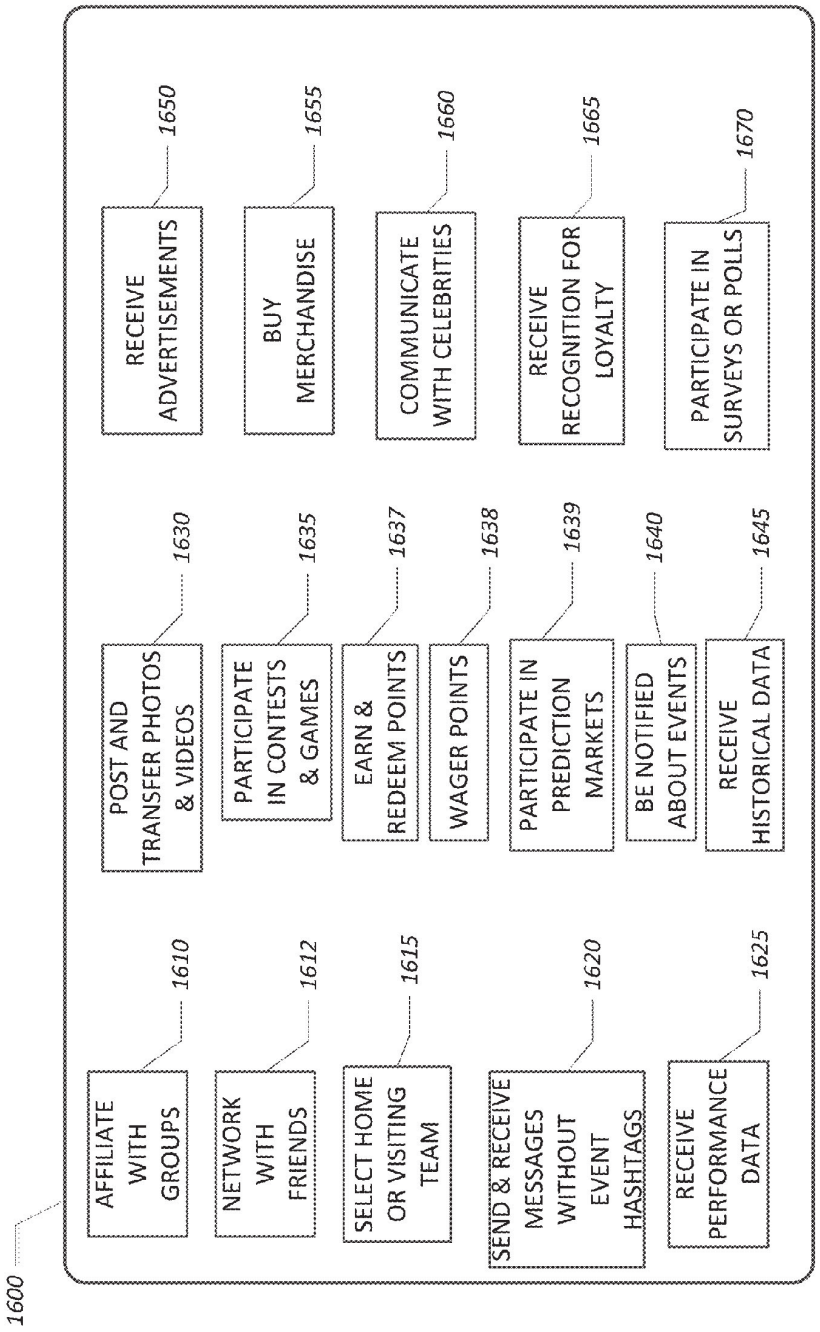

1600
AFFILIATE WITH GROUPS
1610
NETWORK WITH FRIENDS
1612
SELECT HOME OR VISITING TEAM
1615
SEND & RECEIVE MESSAGES WITHOUT EVENT HASHTAGS
1620
RECEIVE PERFORMANCE DATA
1625
POST AND TRANSFER PHOTOS & VIDEOS
1630
PARTICIPATE IN CONTESTS & GAMES
1635
EARN & REDEEM POINTS
1637
WAGER POINTS
1638
PARTICIPATE IN PREDICTION MARKETS
1639
BE NOTIFIED ABOUT EVENTS
1640
RECEIVE HISTORICAL DATA
1645
RECEIVE ADVERTISEMENTS
1650
BUY MERCHANDISE
1655
COMMUNICATE WITH CELEBRITIES
1660
RECEIVE RECOGNITION FOR LOYALTY
1665
PARTICIPATE IN SURVEYS OR POLLS
1670

FIG. 16

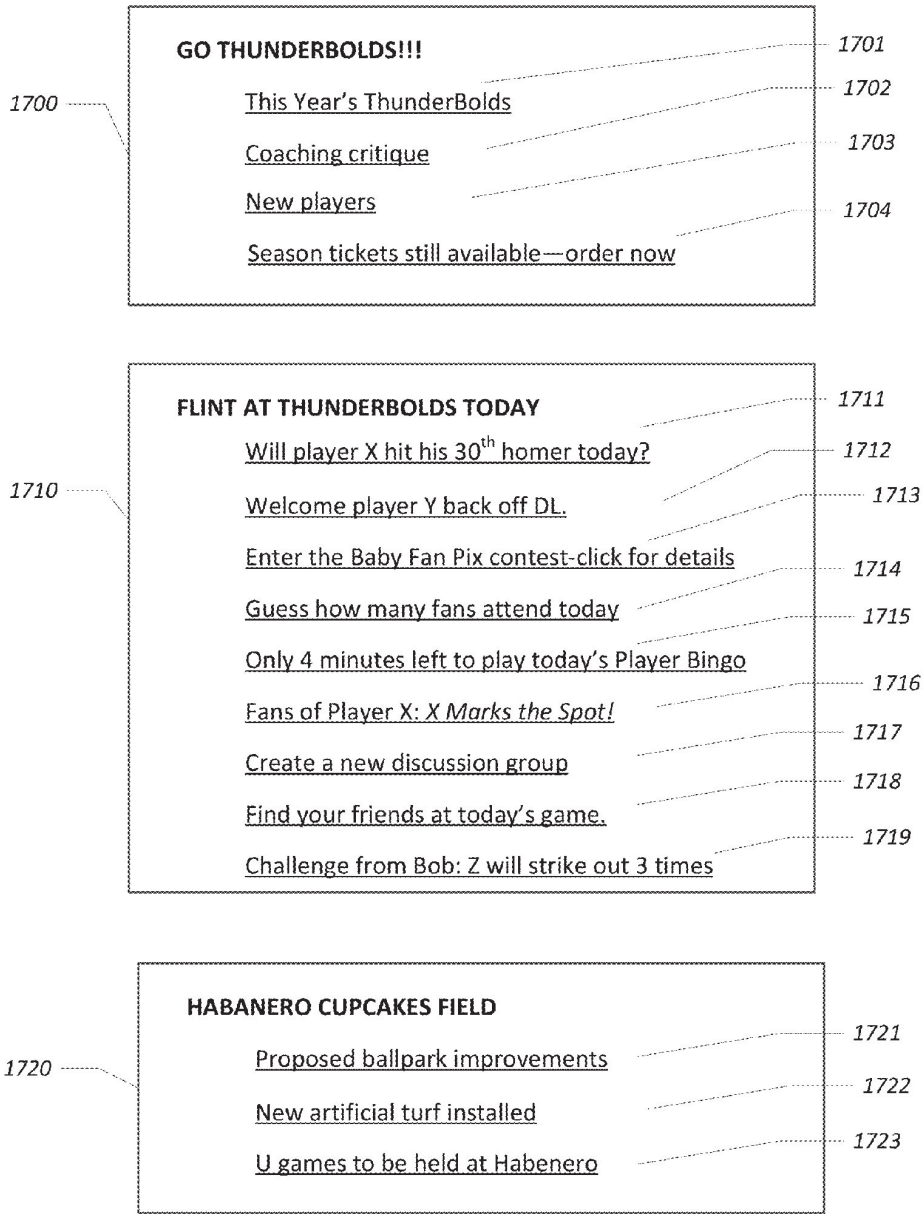

1700
GO THUNDERBOLDS!!!
This Year's ThunderBolds
Coaching critique
New players
Season tickets still available—order now
1701
1702
1703
1704
1710
FLINT AT THUNDERBOLDS TODAY
Will player X hit his 30th homer today?
Welcome player Y back off DL.
Enter the Baby Fan Pix contest-click for details
Guess how many fans attend today
Only 4 minutes left to play today's Player Bingo
Fans of Player X: X Marks the Spot!
Create a new discussion group
Find your friends at today's game.
Challenge from Bob: Z will strike out 3 times
1711
1712
1713
1714
1715
1716
1717
1718
1719
1720
HABANERO CUPCAKES FIELD
Proposed ballpark improvements
New artificial turf installed
U games to be held at Habenero
1721
1722
1723

FIG. 17

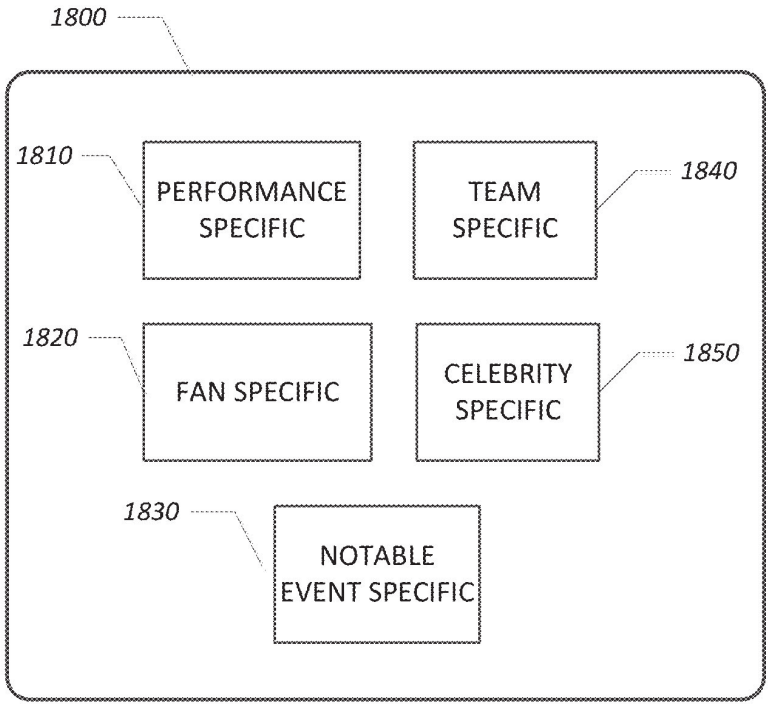

1800
1810
PERFORMANCE SPECIFIC
TEAM SPECIFIC
1840
1820
FAN SPECIFIC
CELEBRITY SPECIFIC
1850
1830
NOTABLE EVENT SPECIFIC

FIG. 18

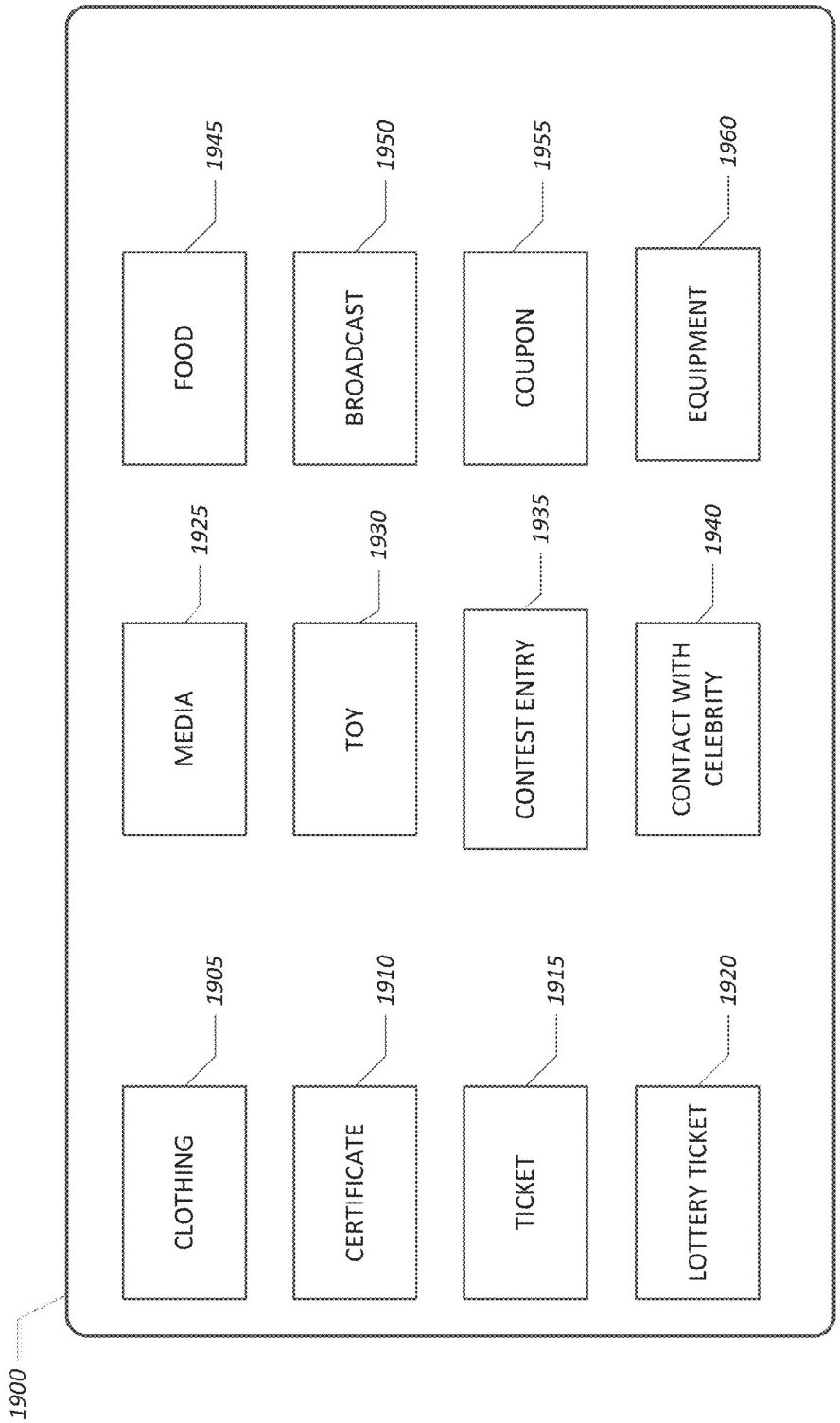

1900
CLOTHING
1905
CERTIFICATE
1910
TICKET
1915
LOTTERY TICKET
1920
MEDIA
1925
TOY
1930
CONTEST ENTRY
1935
CONTACT WITH CELEBRITY
1940
FOOD
1945
BROADCAST
1950
COUPON
1955
EQUIPMENT
1960

FIG. 19

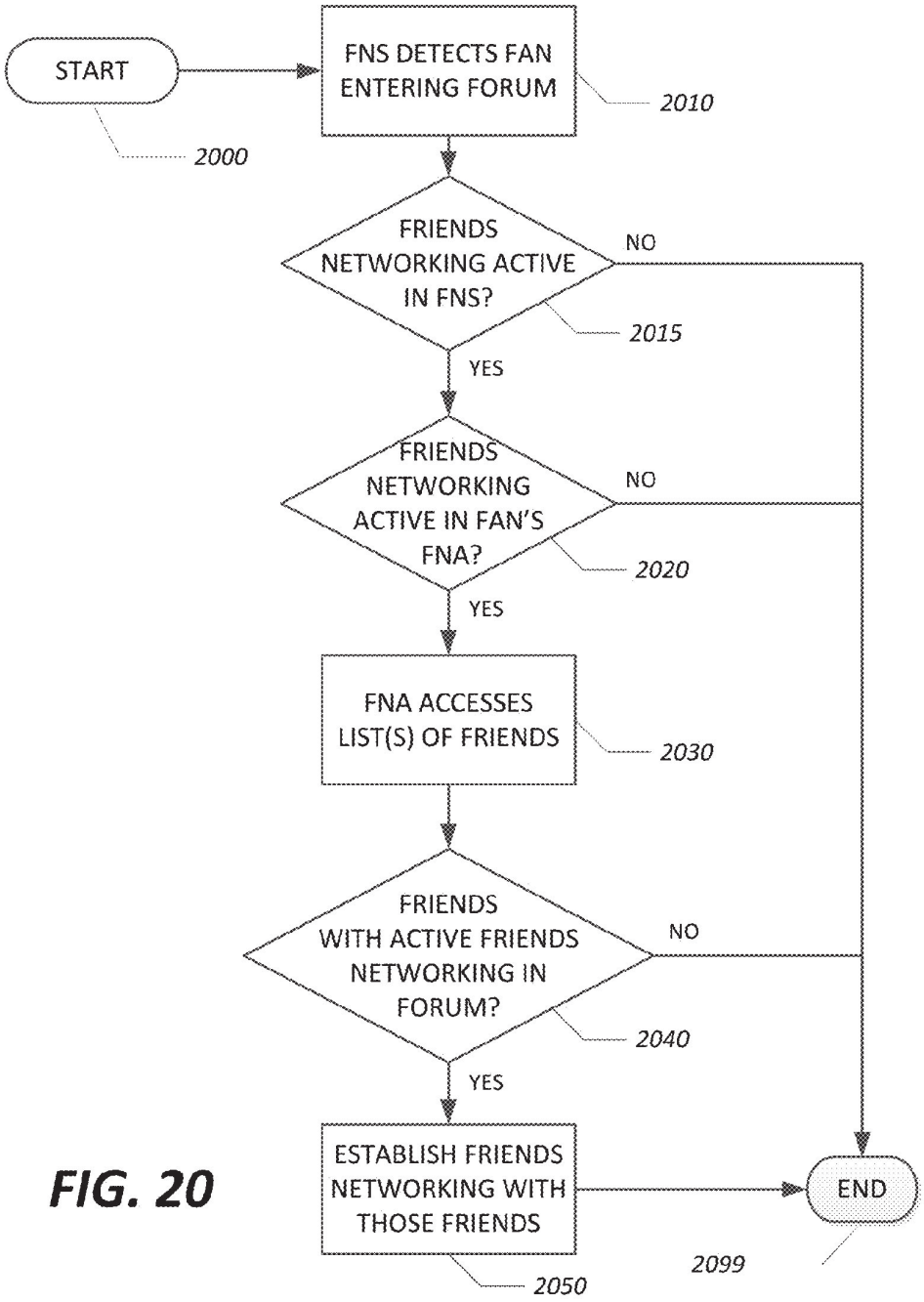

START
2000
FNS DETECTS FAN ENTERING FORUM
2010
FRIENDS NETWORKING ACTIVE IN FNS?
2015
NO
YES
FRIENDS NETWORKING ACTIVE IN FAN'S FNA?
2020
NO
YES
FNA ACCESSES LIST(S) OF FRIENDS
2030
FRIENDS WITH ACTIVE FRIENDS NETWORKING IN FORUM?
2040
NO
YES
ESTABLISH FRIENDS NETWORKING WITH THOSE FRIENDS
2050
END
2099

FIG. 20

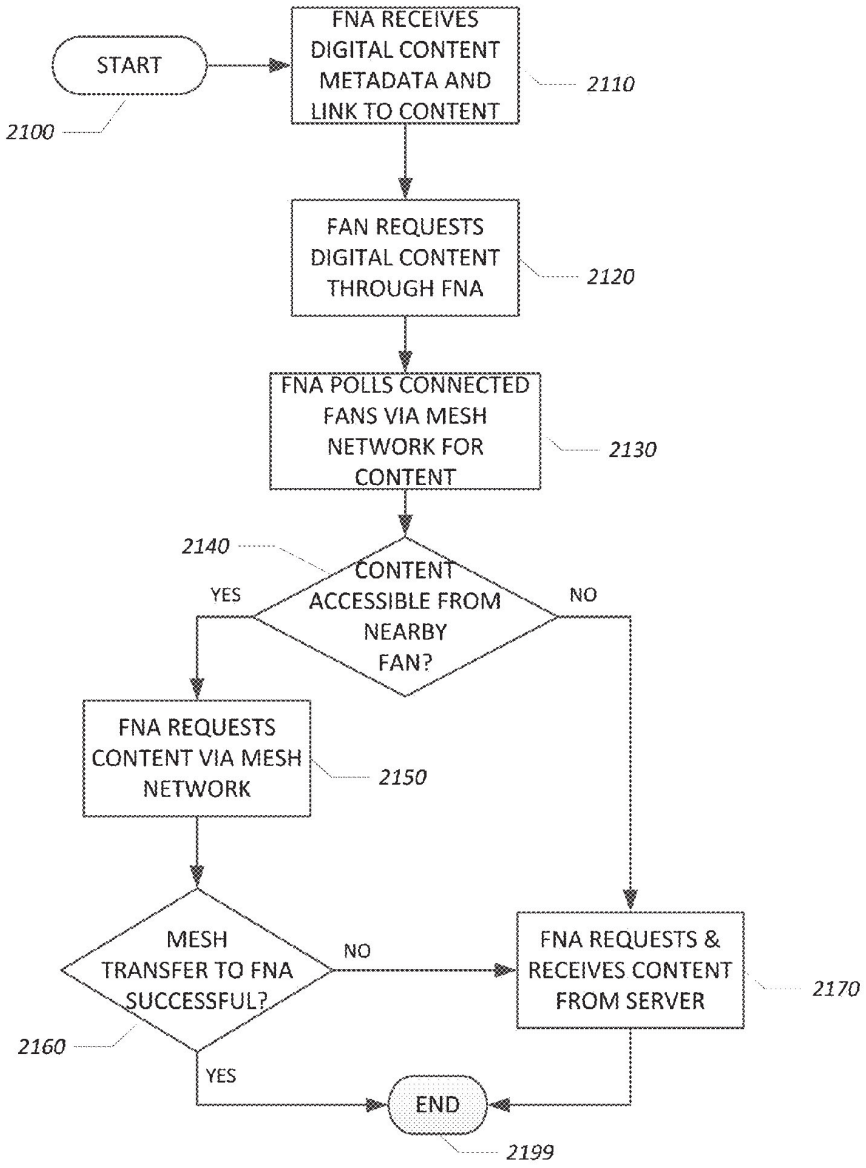

START
2100
FNA RECEIVES DIGITAL CONTENT METADATA AND LINK TO CONTENT
2110
FAN REQUESTS DIGITAL CONTENT THROUGH FNA
2120
FNA POLLS CONNECTED FANS VIA MESH NETWORK FOR CONTENT
2130
2140
CONTENT ACCESSIBLE FROM NEARBY FAN?
YES
NO
FNA REQUESTS CONTENT VIA MESH NETWORK
2150
MESH TRANSFER TO FNA SUCCESSFUL?
2160
NO
YES
FNA REQUESTS & RECEIVES CONTENT FROM SERVER
2170
END
2199

FIG. 21

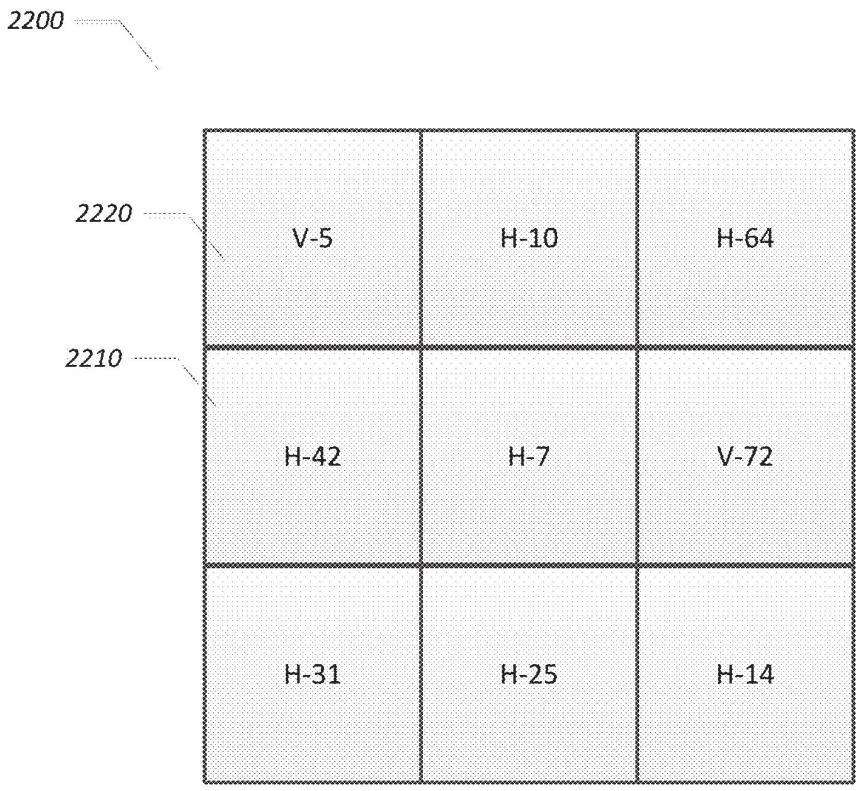


FIG. 22

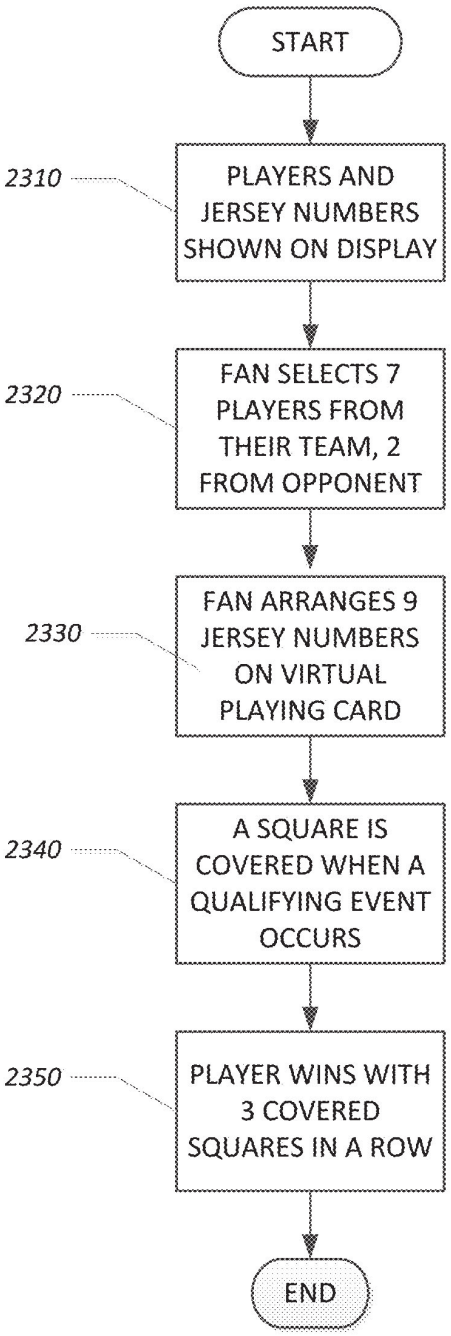

START
2310
PLAYERS AND JERSEY NUMBERS SHOWN ON DISPLAY
2320
FAN SELECTS 7 PLAYERS FROM THEIR TEAM, 2 FROM OPPONENT
2330
FAN ARRANGES 9 JERSEY NUMBERS ON VIRTUAL PLAYING CARD
2340
A SQUARE IS COVERED WHEN A QUALIFYING EVENT OCCURS
2350
PLAYER WINS WITH 3 COVERED SQUARES IN A ROW
END

FIG. 23

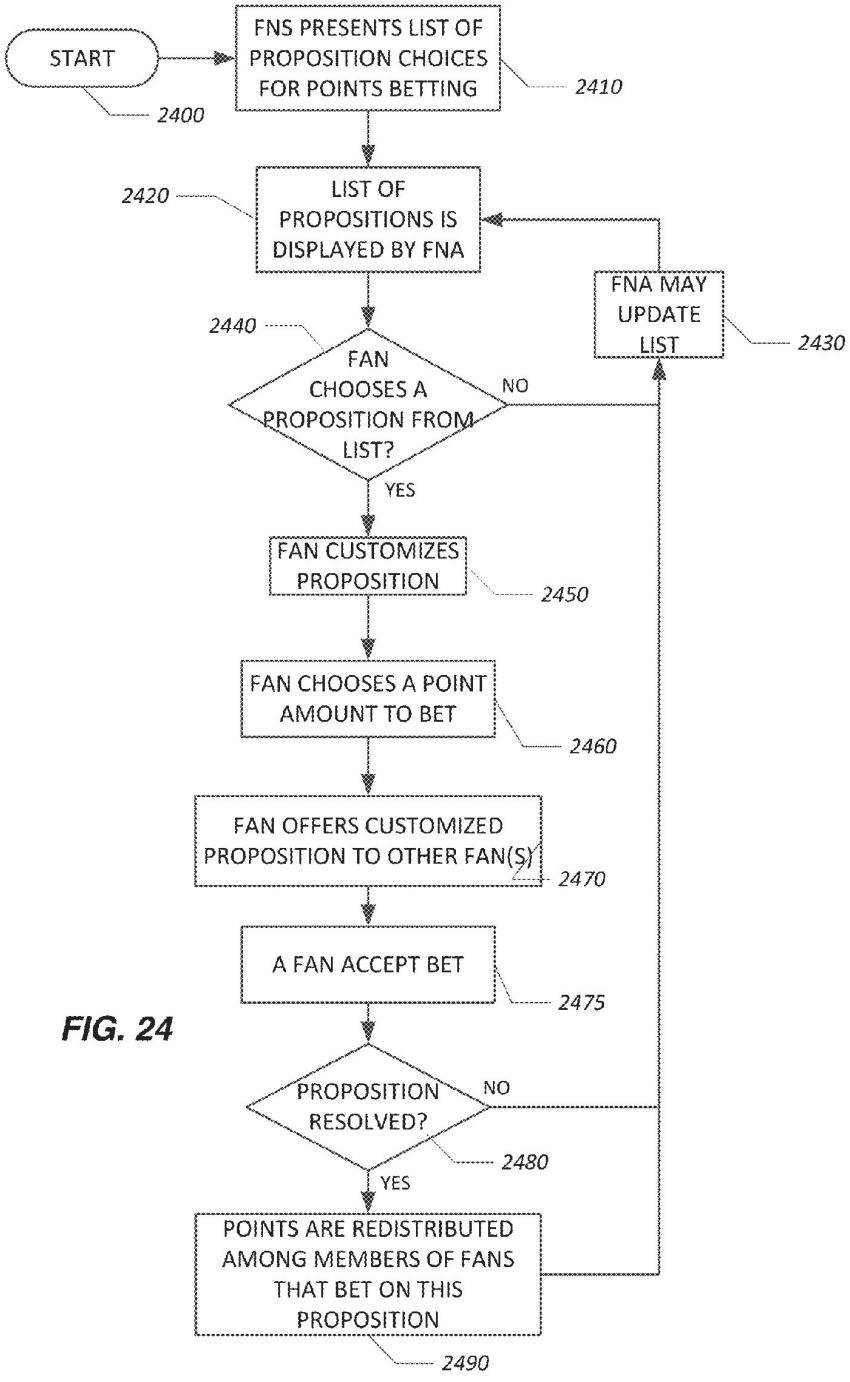

START
2400
FNS PRESENTS LIST OF PROPOSITION CHOICES FOR POINTS BETTING
2410
2420
LIST OF PROPOSITIONS IS DISPLAYED BY FNA
FNA MAY UPDATE LIST
2430
2440
FAN CHOOSES A PROPOSITION FROM LIST?
NO
YES
FAN CUSTOMIZES PROPOSITION
2450
FAN CHOOSES A POINT AMOUNT TO BET
2460
FAN OFFERS CUSTOMIZED PROPOSITION TO OTHER FAN(S)
2470
A FAN ACCEPT BET
2475
PROPOSITION RESOLVED?
NO
2480
YES
POINTS ARE REDISTRIBUTED AMONG MEMBERS OF FANS THAT BET ON THIS PROPOSITION
2490

FIG. 24

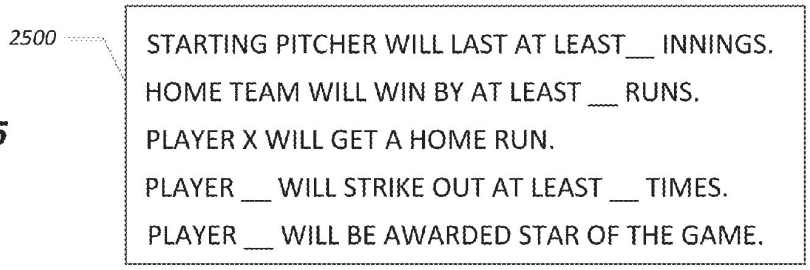

2500
STARTING PITCHER WILL LAST AT LEAST__ INNINGS.
HOME TEAM WILL WIN BY AT LEAST ___ RUNS.
PLAYER X WILL GET A HOME RUN.
PLAYER ___ WILL STRIKE OUT AT LEAST __ TIMES.
PLAYER ___ WILL BE AWARDED STAR OF THE GAME.

FIG. 25

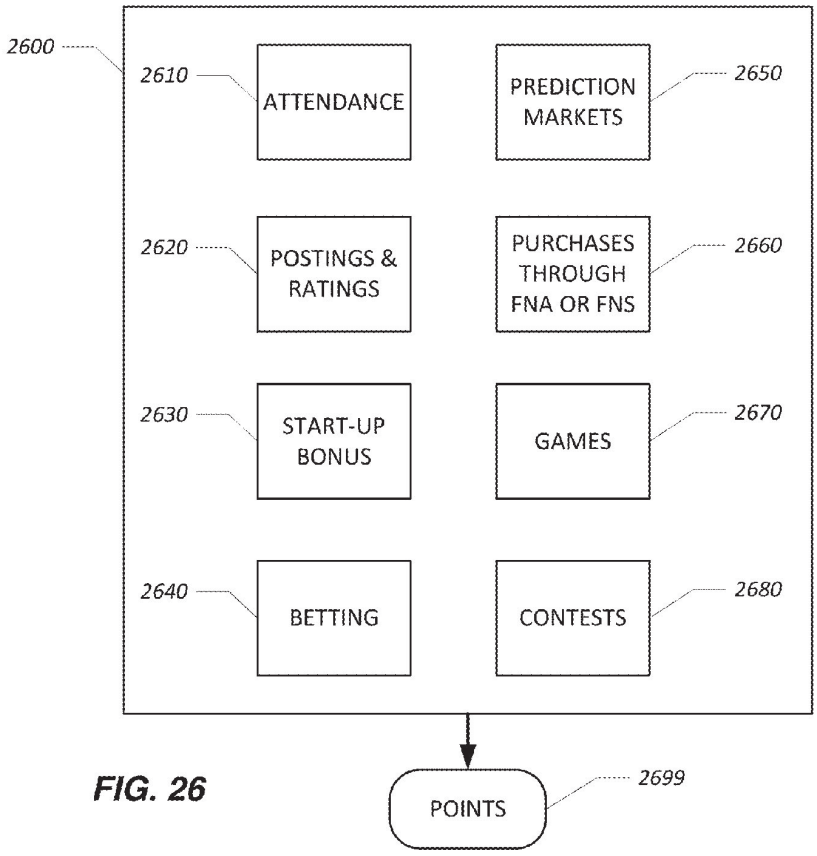

2600
2610
ATTENDANCE
2650
PREDICTION MARKETS
2620
POSTINGS & RATINGS
2660
PURCHASES THROUGH FNA OR FNS
2630
START-UP BONUS
2670
GAMES
2640
BETTING
2680
CONTESTS
2699
POINTS

FIG. 26

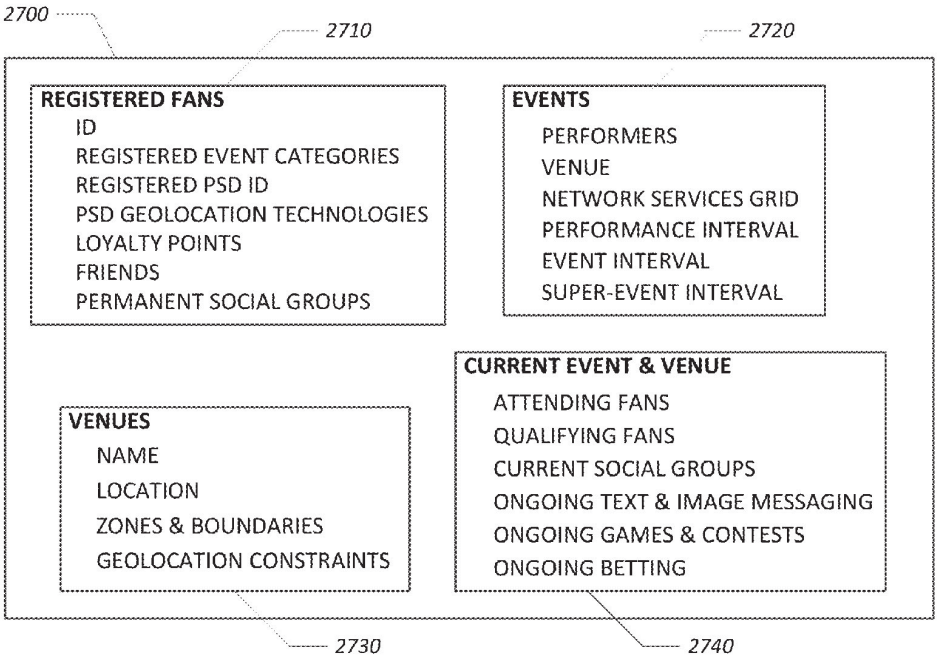

2700
2710
2720
REGISTERED FANS
ID
REGISTERED EVENT CATEGORIES
REGISTERED PSD ID
PSD GEOLOCATION TECHNOLOGIES
LOYALTY POINTS
FRIENDS
PERMANENT SOCIAL GROUPS
EVENTS
PERFORMERS
VENUE
NETWORK SERVICES GRID
PERFORMANCE INTERVAL
EVENT INTERVAL
SUPER-EVENT INTERVAL
CURRENT EVENT & VENUE
ATTENDING FANS
QUALIFYING FANS
CURRENT SOCIAL GROUPS
ONGOING TEXT & IMAGE MESSAGING
ONGOING GAMES & CONTESTS
ONGOING BETTING
VENUES
NAME
LOCATION
ZONES & BOUNDARIES
GEOLOCATION CONSTRAINTS
2730
2740

FIG. 27

GEOFENCED EVENT-BASED FAN NETWORKING: METHODS

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 61/954,093 filed Mar. 17, 2014, and entitled "Fan Networking Using Geofencing: System and Method"; and the benefit of U.S. Provisional Application No. 61/954,655 filed Mar. 18, 2014, and entitled "Fan Networking Using Geofencing: System and Method". This application is related to U.S. Application No. _____, filed Feb. 10, 2015, and entitled "Geofenced Event-Based Fan Networking: Systems." This application is related to U.S. Application No. _____, filed Feb. 10, 2015, and entitled "Geofenced Event-Based Fan Networking: Space-Time Dependence". This application is related to International Application No. PCT/US _____, filed Feb. 10, 2015, and entitled "Geofenced Event-Based Fan Networking". All five of these applications are hereby incorporated in their entirety by this reference.

FIELD OF THE INVENTION

[0002] The present invention relates to social networking at an event in a venue. More specifically, it relates to providing such functionality through geolocated portable smart devices that depends upon fan and event state.

BACKGROUND OF THE INVENTION

[0003] A portable smart device (PSD) is a portable electronic device having a processing system and a housing, which is conveniently carried by a human being on their person. Examples include a cellular phone, a portable music player, a tablet computer, an e-reader, a portable computer, a smart watch, smart glasses, or other wearable smart device. Typically, a PSD will have means for information entry—a user interface (UI), which might include a display, e.g., a touch screen; a keyboard; tactile controls; a camera; a microphone; a sound system; or tactile output, such as vibration. A PSD may have access to a network (e.g., a local, wide area, and/or personal network) through one or more wireless interfaces, such as WiFi, cellular network, or BLUETOOTH®. The processing system may include a processor, and various forms of tangible nontransitory computer-accessible storage. The PSD may facilitate geolocation of the device by one or more technologies, such as GPS, beacons, or cell phone towers, alone or in combination. Such a PSD can be tracked geographically, with varying accuracy depending upon the location technology(ies) used.

[0004] Logic on a PSD with GPS can determine its location and how its location changes over time. An application running on the PSD can transmit its location to a remote system. Thus, so long as GPS is enabled, such a device can be tracked, often with 10 m horizontal resolution or better. GPS location is available in many places outdoors, but might not be available inside some buildings. Within a building, beacons or other technologies may be viable for tracking a PSD.

[0005] Some PSDs have multiple modes of location services, a high resolution (HIRES) mode and at least one low resolution (LORES) mode. A LORES mode provides less location accuracy than HIRES mode, but uses fewer or different resources of the PSD, and so consumes less electricity. Typically, electricity is provided to a PSD by a battery that must be recharged periodically. Useful battery life between charging events can be short. A software application running on the PSD can specify to the operating system when it requires HIRES mode and when LORES mode is adequate. When a LORES mode is adequate for one application, another application might still require the operating system to keep the PSD in HIRES mode. Thus, while HIRES tracking can be demanded by a PSD, transition from HIRES to LORES mode can merely be suggested. Access to these location tracking levels and functions may be provided to software executing on the PSD as services by its operating system.

SUMMARY OF THE INVENTION

[0006] The present invention is a fan networking system (FNS), available through a social networking application (SNA) dedicated to fans of some event or collection of events, and implemented by a software application on their PSDs—i.e., a fan networking app (FNA). The FNA, interacting with a fan through the UI of the PSD, is a proxy for the fan. Exemplary events include a sports competition, an orchestra concert, a state fair, or a day at an amusement park. A FNS offers customized services to fans, such as messaging, fan groups, friends networking, mementos, coupons, and contests. Such services might be customized, based, for example, upon event(s), venue(s), or team(s). The level of event networking services (ENSs) offered by a fan network management system (FNMS), a facility central to the FNS, might depend on the type of event; whether a fan is attending; fan geographic location relative to a venue; timing (pre-, during, post-performance); for a competitive event, whether the fan affiliates with the home or away team; and the category of fan (e.g., audience, management, performer). A fan might need to register with the FNMS to access ENSs. Determination of whether a fan qualifies as attending an event, and the fan's position in or near venue, may be done with geolocation of their PSD, e.g., through GPS. A fan might be required by the FNMS to remain within the venue for some period of time to qualify as attending. Services to attending fans may extend for a period beyond the event itself; some services might be extended to fans who are not in attendance.

[0007] In some embodiments, the FNA may determine whether social networking "friends" of an individual are present at the performance or event. Declaring another person to be a "friend" (or some similar term, such as "follower" or "contact") might be done through another social networking application (SNA), such as FACEBOOK® or LINKEDIN®. The FNS may have access to, and take advantage of, lists of friends from other SNAs. The FNMS might then facilitate communications directly among the friends, as well as communication with attendees at large. Special services or benefits might be offered to groups of friends.

[0008] A FNMS might manage, in any combination, ENSs for a single event; a group of events; or for a set of groups of events. For example, the FNMS might manage all events of a particular team; or a particular league; or a particular venue; or a particular set of forums; or any combination of teams, leagues, venues, forums, performers, or groups of performers. The FNS, through the FNA, might give the user access to any subset of events that it manages. There may or may not be charges for registration with the FNMS, or charges for FNS participation at some or all events or collections of events. These charges might be collected by the FNMS through the FNA. The fan, through the UI of the FNA on their PSD, might be able to configure which events or groups of events for

which they choose to access fan networking from access provided by the FNA. The FNMS might provide ENSs for some subset of those events to which they provide access to the fan. For example, a fan of a baseball team might have fan networking at all games of the league that includes the team. The FNMS might conceivably provide fan networking access for a given user to all events for which the FNS is implemented, simply detecting through their FNA the presence of fans at such events. Thus, a single FNA might automatically provide ENSs to a given fan at a wrestling match and at a ballet by detecting their attendance through one or more FNMSs.

[0009] The FNS might confer "points" on fans for various reasons. For example, a fan might accrue points for attending events. A fan might get bonus points for some achievements, such as attending enough games within a season to be considered a "super-fan". The points might be awarded for events of the same type (e.g., all games of a given baseball team); or for events of multiples types (e.g., all events managed by a FNMS). A fan might accrue points for making certain purchases; for initially joining the FNS; or for participating in certain contests, games, or competitions. Points might be redeemable for goods, services, or cash. A fan may be able to wager points against other fans or groups of fans on, for example, certain outcomes in a game;

[0010] or participate in a prediction market relating to the event. What is permissible with regard to points may vary among legal jurisdictions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. **1** shows exemplary types of events for which a FNS might be provided.

[0012] FIG. **2** is a conceptual diagram that illustrates exemplary types of fans (interested parties).

[0013] FIG. **3** is a conceptual diagram illustrating communication among components of an FNS, including a PSD, which executes a FNA, and a FNMS.

[0014] FIG. **4** is a block diagram illustrating a FNMS.

[0015] FIG. **5** is a block diagram that illustrates exemplary components of a PSD that might be used to provide event networking services to a fan.

[0016] FIG. **6** illustrates an embodiment of a process whereby a FNMS provides, and a fan receives, ENSs.

[0017] FIG. **7** illustrates various possible levels of FNMSs that might provide fan networking services to a variety of exemplary events or performances.

[0018] FIG. **8** illustrates an exemplary event venue, geofenced boundaries, and geofenced regions.

[0019] FIG. **9** illustrates another exemplary event venue, geofenced boundaries, and geofenced regions.

[0020] FIG. **10** is a flowchart that illustrates how zones might be used to reduce battery usage for geolocation, while avoiding providing networking services to people who have not qualified to receive them.

[0021] FIG. **11** is a timeline depicting exemplary occurrences that delineate a performance, an event, and a super-event; i.e., a duration of ENSs targeted to fans who are attending, or who attended the event.

[0022] FIG. **12** is a flowchart that illustrates an exemplary process, which might be required by a FNMS, whereby a fan can qualify as attending an event.

[0023] FIG. **13** is a table that illustrates possible effects of timing and location of the PSD of a fan upon monitoring level, and upon state of the fan as present, or as qualifying to be present, for an event.

[0024] FIG. **14** is a conceptual diagram that illustrates exemplary factors which might be used to determine the "state" of a fan relative to an event, for selecting types and levels of functionality offered to them.

[0025] FIG. **15** is a conceptual diagram that illustrates exemplary categories of event networking services that might be provided by a FNS to fans, with the types of functionality available to a fan depending upon their current state relative to an event.

[0026] FIG. **16** is a conceptual diagram that illustrates exemplary services that might be provided by a FNS within the social networking category.

[0027] FIG. **17** shows examples of opportunities, provided by a FNS to fans attending an event, for team-based messaging, event-based messaging, venue-based messaging, games, contests, wagering, and "friends" networking.

[0028] FIG. **18** is a conceptual diagram that illustrates ways that memorabilia offered to fans might be customized through a FNS.

[0029] FIG. **19** is a conceptual diagram that illustrates types of memento products that might be offered to, and in some cases customized by, fans through a FNS.

[0030] FIG. **20** is a flowchart that shows how social networking "friends" might be identified by, and interact through, a FNS.

[0031] FIG. **21** is a flowchart illustrating sharing of digital content among fans using mesh networking.

[0032] FIG. **22** is an exemplary game board that might be used in a game managed by a FNS.

[0033] FIG. **23** is an exemplary set of rules that might be used by a FNS in conjunction with the game board of the previous figure.

[0034] FIG. **24** is a flowchart illustrating a process for wagering points among fans of a FNS.

[0035] FIG. **25** illustrates a list of propositions relating to a baseball game, some customizable, from which a fan might select as the basis for a wager.

[0036] FIG. **26** illustrates possible elements of a loyalty program, whereby a fan might earn points to be redeemed for goods, services, cash, or recognition.

[0037] FIG. **27** illustrates exemplary kinds of data that might be maintained by a FNMS.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0038] This description provides embodiments intended as exemplary applications of the inventive concept. The reader of ordinary skill in the art will realize that the invention has broader scope than the particular examples described here.

[0039] In this description and claims, the word "store" means store in tangible nontransitory computer-readable storage. By "storage" we mean tangible nontransitory computer-readable storage. By "download", we mean download from a remote system using a wireless communication system; the communication system might be the Internet or some other system or combination of systems. By "data", we mean information stored in, or accessed from, storage. By "database", we mean a collection of data that are somehow inter-

related. By the word "or" we mean "inclusive or", unless it is clear from the context that "exclusive or" is intended; so "A or B" means A, B, or A and B.

[0040] Some of the drawings are flowcharts. The flowcharts are merely illustrative of processes. Within the scope of the invention, the order of steps in a flowchart may be changed; steps may be omitted; different but similar or equivalent steps or groups of steps may be performed; or other steps may be added.

[0041] Reference numerals are keyed to the figure of first appearance of the item to which they refer. So, for example, item **1200** appears in FIG. **12**, and item **800** appears in FIG. **8**.

[0042] FIG. **1** shows exemplary types of events **100** for which a FNS **300** might be implemented. These include a two-team sporting event **110**, a multi-team sporting event **120**, an individual sporting event **130**, a play **140**, an opera **150**, a ballet practice **160**, a violin recital **170**, a child's piano practice **180**, a civic event **185**, a political event **190**, and a fireworks display **195**. At a baseball event, the baseball game itself can be regarded as a performance **1100**; a pre-game show might optionally be regarded as part of the same performance **1100**, or as a separate performance **1100**. Often a single performance **1100** is the focus of an event **100**—what the fans came to observe or experience. But an event **100** may include one or more performances **1100**; events **100** themselves may be hierarchical, with an event **100** including other events **100**.

[0043] A fan **200** is an individual or organization that is interested in an event **100** or in a performer or artist, such as a band or a team. We will refer to any such interested party as a fan **200**, even in contexts, such as those shown in FIG. **1** other than sporting events **100**. FIG. **2** shows various types of fans **200**, including: the audience **210**; a follower **220**; the press **230**; a referee **240**, such as a baseball umpire; a performer **250**; a coach **270**; a manager **260**; or other interested party **280**.

[0044] An event networking service (ENS) **1500** is a service, such as the exemplary ones shown in FIG. **15**, provided by a FNS **300** to registered fans **200** at one or more events **100**. The FNS **300** is implemented collaboratively between a fan networking management system (FNMS) **310** and the PSDs **320** of fans **200**. FIG. **3** is a conceptual diagram illustrating communication among components of an FNS **300**. The FNMS **310** might include any kind of hardware and software appropriate for carrying out its functionality. For example, the FNMS **310** might include a server **311** and a computer **312** providing a user interface (UI) **445** for management of the FNS **300**; i.e., a management UI **450**. Examples of types of PSD **320** include a cellular phone **321**, a portable media player **322**, and a tablet computer **323** or e-reader. FNMS **310** configuration is discussed in more detail in FIG. **3**; PSD **320** configuration, in FIG. **5**.

[0045] Communication occurs over a communication system **330**. The communication system **330** might include a wide-area network such as the Internet, a local network, or a personal network. The communication system **330** may include any kind(s) of hardware of software, and may use any forms of communication protocol(s). A combination of communication systems **330** is itself a communication system **330**. Double-headed arrows, as typified by arrow **350**, indicate the possibility of two-way communication. Single-headed arrows, typified by arrow **351** indicate one-way communication. In particular, GPS satellites **340** transmit microwave signals that the PSD **320** receives and uses to determine its own location. Other geolocation technology might be used alternatively or in addition, such as beacons and cell phone towers. The communication system **330** connects an instance of a FNA **510** running on participating PSDs **320** with the FNMS **310**. The FNA **510** might also facilitate direct communications between PSDs **320** of fans **200**, taking advantage of, for example, BLUETOOTH® or WiFi that might be available in a PSD **320**. See, e.g., FIG. **21** and associated text.

[0046] FIG. **4** is a block diagram illustrating a FNMS **310**. Except for the FNMS software **460**, all components in the figure may include hardware. FNMS **310** provides ENSs **1500** to fans **200** through their PSDs **320**. A FNMS **310** may be remote from most or all of the PSDs **320**. FNMS **310** execute logic, including FNMS software **460**, possibly on one or more servers **311**. FNMS **310** may include a controller **410**, which includes a processor, that runs the automated portions of FNMS **310**, and interacts with staff managing FNMS **310** through a management UI **450**.

[0047] Logic of FNMS **310** facilitates or provides interaction among PSDs **320**, as well as other networking services **1600** described herein. FNMS **310** may register fans **200**; schedule events **100**; organize games and contests; advertise; sell goods and services; provide propositions of outcomes for betting; or manage a prediction market. Ongoing human management, interacting with controller **410**, may be required as types and details of ENSs **1500** may need to respond to evolution of an event **100**. The management UI **450** allows the event **100** management to do whatever is necessary to run a FNS **300**. The FNMS **310** includes storage **430**, which may include FNMS software **460** and data accessed by the controller **410** in executing software instructions. The storage **430** might also include data received from, or to be sent to, any of the types of fans **200** shown in FIG. **2**. The storage **430** might include any databases regarding any of the information described in relation to FIG. **8**-**23**. FIG. **27** illustrates kinds of information that might be included in storage **430**. Alternatively, some or all of this data, especially data pertaining to an individual fan **200**, might reside on their PSD **320**. Information sharing among FNAs **510** of attending fans **200** will be facilitated by the FNMS **310**. FNMS **310** may include a timer **440**. A number of timing tasks and timing needs are described in connection with FIG. **11**-**14**, some or all of which might utilize the timer **440**. FNMS **310** has a communication interface **420** to interact with the PSDs **320** of fans **200**.

[0048] Note that logic of a FNS **300**, in the form of hardware, or software instructions executing on hardware, may be divided in various ways between PSDs **320** of fans **200** and FNMS **310**. For example, some or all of the timing tasks might be carried out on the PSDs **320** rather than by timer **440** and controller **410**. Any workable division of FNS **300** logic is within the inventive scope.

[0049] FIG. **5** is a block diagram that illustrates exemplary components of a PSD **320** that might facilitate fan **200** interaction with ENSs **1500** provided by the FNS **300**. PSD **320** includes a processing system **550**, which includes a processor that executes software FNA **510**. FNA **510** might be installed on the PSD **320**, e.g., by the manufacturer or vendor of the PSD **320** or by a cellular service provider. FNA **510** might be available for download to the PSD **320** from a website such as, for example, the APP STORE®, GOOGLE PLAY®, or from a site provided by FNMS **310**. PSD **320** may include storage, which may contain software instructions of the FNA **510**, and data. The data might, for example, be data required or used by

FNA **510**; or by a FNMS **310**, or it might be images, video. or other computer-readable content that fan **200** might at some point choose to upload to, or has downloaded from, FNS **300**. FNS **300** may allow fans **200** to share such content with other fans **200**. A photo might be used to customize a product, as described in reference to FIG. **18**. PSD **320** has a UI **445**, which may include a graphical user interface (GUI) **530**. UI **445** allows fan **200** to take advantage of FNS **300** services and social interactions, such as those described in relation to FIG. **15-23**. Text entry might be done through a touch screen or some other form of text entry system **540**, such as a keyboard; there may be other tactile controls as well included in the UI **445**. PSD **320** may have a camera **590** for taking still photographs and videos. It may have a microphone (mic) **591**, for making audio recordings. PSD **320** may have other sensors (not shown), such as a thermometer, that might provide sharable data. PSD **320** may include a geolocation system **570** (e.g., a GPS **571** receiver), allowing PSD **320** to determine its location from satellite transmissions, or other hardware or software to facilitate geolocation of PSD **320**. Interaction with FNS **300**, including interaction with FNMS **310** (e.g., transmission of the location of PSD **320**; registration of PSD **320** with one or more FNSs **300**; and qualifying as attending event **100**); and with other fans **200**, may be accomplished through one or more wireless communication interfaces **520**, such as cellular, BLUETOOTH®, or WiFi.

[0050] FIG. **6** illustrates an embodiment of a process whereby a FNMS **310** provides, and a fan **200** receives, ENSs **1500** during an event **100**. After the start **600**, fan **200** registers **620** their PSD **320** with FNMS **310** to participate in the FNS **300** at the event **100**. FNA **510** is executing **630** on a powered-on PSD **320**. For example, the FNA **510** might be configured to execute whenever the PSD **320** boots up, or the user might initiate execution of the FNA **510**. The FNMS **310** initiates management **640** of event **100** and initiates ENS **1500**. Using geolocation, FNA **510** tracks PSD; the tracking data is transmitted by PSD **320**, and received by FNMS **310**. Using the tracking data, FNMS **310** detects **640** that the fan **200** is attending the event **100**. If **650** the FNMS **310** determines that fan **200** is qualified to participate in ENS **1500** at this event **100**, then FNMS **310** provides **660** ongoing ENSs **1500** through PSD **320** of fan **200** during event **100**. The process ends **699**.

[0051] FIG. **7** illustrates that a FNMS **310** might be organized at any of a variety of levels. Some exemplary events **100** are shown in rounded rectangles. The events **100** include two baseball games, team Z playing at Y's ballpark **710** ("Z-at-Y game") and team Y at X's stadium **720** ("Y-at-X game"); a soccer match, team B at A **730** ("B-at-A match"), played at X's stadium; a concert **740** of orchestra M ("concert"); and college theater performance **750** ("play").

[0052] In FIG. **7**, exemplary FNMSs **310** are shown in rectangles. A FNMS **310** might provide a FNS **300** at the level of an institution, team, or performer; for example, college FNMS **751**; orchestra FNMS **742**; Z-team FNMS **711**; X-team FNMS **721**; Y-team FNMS **713**; A-team FNMS **731**, and B-team FNMS **732**. A FNMS **310** might provide FNS **300** at the level of a venue **800** where events **100** are held; for example, Y ballpark FNMS **712**; X stadium FNMS **722**; and concert hall FNMS **741**. A FNMS **310** might provide a FNS **300** at the level of a league, consortium, or other group; for example, baseball league FNMS **760**; soccer league FNMS **770**; and fine arts consortium FNMS **780**.

[0053] A line in FIG. **3**, connecting an event **100** to a FNMS **310** indicates that FNMS **310** might provide ENSs **1500** at the event **100**. There are several things to note. A given FNMS **310** might serve multiple individual events **100** or multiple types of events **100** (e.g., theater and soccer). A given event **100** might be served by a single FNMS **310**, from any level, or by two or more FNMSs **310**. These FNMSs **310** might offer ENSs **1500** to fans **200** through a common FNA **510**, or independently through respective FNAs **510**. A central FNMS **790** might serve multiple types of events **100**, leagues, venues **800**, and so forth. When multiple FNSs **300** serve a given event **100**, each of them may provide different services and rewards to fans **200**. For example, a central FNMS **790** might provide redeemable points for attending a variety of event **100** types, while a venue- or team-level FNMS **310** might offer services and incentives to encourage attendance at its own events **100**.

[0054] A single FNA **510** executing on a user's portable electronic PSD **320** might connect with one or more FNMSs **310** for a single event **100**. The FNA **510** maintains in storage **560** on the PSD **320** a list of the FNMSs **310** it is registered to access. Some of these FNMSs **310** may require a fee or fees for registration, and/or for access to ENS **1500** at particular events **100**. The list of FNMSs **310** might evolve either automatically—e.g., an FNMS **310** might update the list of FNSs **300**; or by user choice by, for example, by accessing a website, or through the UI of the FNA **510** itself. For any event **100** for which the PSD **320** is registered with a relevant FNMS **310**, then the geolocation functionality will cause the FNA **510** to be placed into wireless communication with that FNS **300**; or multiple FNSs **300**. Two FNMSs **310** serving a single event **100** may offer ENSs **1500** through a single FNA **510**, or independently through separate FNAs **510**. In other words, FNMS **310** X may require FNA **510** A, while FNMS **310** Y requires B; or both X and Y may require A.

[0055] FIG. **8** shows venue **800** where a performance **1100** is held before an audience **210**. The venue **800** of FIG. **8** is a ballpark, and the event **100** is a baseball game. A venue **800** might be, for example, a theater, a convention center, a classroom, an auditorium, a park, or any type of sports venue **800**. A venue **800** may or may not include a building, such as a ballpark or concert hall. The venue **800** might be indoor, outdoor, or some combination thereof. The event **100** might be competitive, such as a football game, a debate, or a math competition; or noncompetitive, such as an orchestra concert or a musical.

[0056] As will be described in relation to FIGS. **11** and **13**, the FNA **510** may use the geolocation functionality of a PSD **320** to determine a current state **1400**, relative to the event **100**, of a fan **200**. The selection of ENSs **1500** provided to fans **200** in general, or to a particular fan **200**, may depend upon such event/fan state **1400**.

[0057] Taking full advantage of an FNS **300** might require extended use by the fan **200** of a FNA **510** throughout an event **100**, and possibly even for some time afterward. Some steps can be taken to conserve battery **580** life in those PSDs **320** that offer both a HIRES and a LORES mode of geolocation service by reducing the level of geolocation resolution when feasible, consistent with the state **1400** of the fan **200** relative to the event **100**.

[0058] FIG. **8** depicts an inner boundary (IB) **821**, a middle boundary (MB) **822**, and an outer boundary (OB) **823**. These three boundaries **820** divide the horizontal space in the vicinity of the venue **800**, a ballpark, into four layered zones **830**:

an inner zone (IZ) **831** or interior **831**, a middle zone (MZ) **832**, an outer zone **833**, and an external zone **834** or exterior **834**. Such zones **830** may be used in determining state **1400** of a fan **200**, relative to the performance **1100**, as that state **1400** evolves. The zones **830** might also be used to choose between LORES and HIRES geolocation technology, so as to extend battery **580** life.

[0059] In FIG. **8**, the IB **821** is the boundary of the venue **800** itself (or something closely approximating that boundary), and the MB **822** and OB **823** are both circles. An IB **821** might, in some circumstances, be a closed figure that is entirely or partially inside the venue **800** boundary.

[0060] Admission to an event **100** often requires a fee, and even at free events **100**, attendance in person is often encouraged by management. Because an FNS **300** provides valuable ENSs **1500** to attendees, IB **821** will preferably be chosen so that such services are not extended to people who are not entitled to receive them. Thus, if the venue **800** is a building, an IB **821** that closely tracks the boundary of the building may be preferable.

[0061] For some venues **800** and geolocation technologies, however, locating an IB **821** interior to a wall of a venue **800** might make detection of when a fan **200** has crossed into the IZ **831** impossible. For example, GPS tracking is unavailable in some buildings. Preferably, therefore, IB **821** will be at or beyond the boundary of the venue **800** itself, although in some embodiments, IB **821** might be a simpler shape (e.g., a circle or rectangle) than the exact boundary of a building, or MB **822** or OB **823** might have a less regular shape. However, for any given venue **800**, a simple shape may be easier to implement, and yet be entirely adequate. Other forms of geolocation can be used instead of, or complementary to, GPS, when appropriate.

[0062] FIG. **9** shows a different venue **800** layout to illustrate generality of the zones **830** concept. The venue **800** in this example is a lake **900** over which a fireworks display will be held. The audience will observe from the IZ **831**. Both IZ **831** and MZ **832** are bounded in part by the shore of lake **900**. IZ **831** and MZ **832** are layered, but MZ **832** does not entirely surround IZ **831**. The OB **823** is a square.

[0063] Layered zones **830** can be exploited to reduce the usage of the battery **580** of the PSD **320** required for geolocation, while providing HIRES tracking when needed to facilitate an IB **821** that is coincides with or closely approximates the boundary of the venue **800**. PSD **320** is a proxy for the fan **200** who has registered the PSD **320** with a FNMS **310**. Thus, if we say that a fan **200** is in some specified zone **830**, strictly speaking we mean that the FNMS **310** has detected that the PSD **320**, which is registered to the fan **200**, is within that zone **830**.

[0064] FIG. **10** is a flowchart that illustrates how zones **830** might be used to reduce battery **580** usage when GPS **571** is used for geolocation, while geographically limiting ENSs **1500** to only fans **200** who have qualified to receive them. After the start **1000**, FNMS **310** detects **1010** that fan **200** is within OZ **833**. Such detection will require that PSD **320** is powered on, and that FNA **510** is executing on PSD **320**. FNMS **310** transmits **1020** an instruction to FNA **510** to use HIRES tracking. FNA **510** demands **1030** the geolocation system **570** of PSD **320** to use HIRES tracking. The geolocation system **570** initiates **1040** HIRES tracking if it is not in that mode already. Detection that fan **200** has crossed **1050** into IZ **831**, and that fan **200** is remaining for a qualifying interval within IZ **831**, is thus done with HIRES tracking, which can be quite precise. Once fan **200** qualifies **1060** as attending event **100** (which might require a fee to the FNMS **310**, which the FNMS **310** might automatically charge against an account of the fan **200**), FNMS **310** might choose to be more tolerant of imprecision in geolocation of that fan **200**. FNMS **310** transmits **1070** an indication to PSD **320** that HIRES tracking is no longer needed. FNA **510**, in turn, indicates **1075** to FNA **510** that it no longer needs HIRES tracking. If geolocation system **570** is not using HIRES tracking for some other PSD **320** purpose, it would ordinarily turn off HIRES tracking, conserving battery **580** life. At some later time, fan **200** is detected **1080** as crossing MB **822** into OZ **833** (or alternately, OZ **833** into EZ **834**). At this point, FNMS **310** may regard **1090** the fan **200** as not present at event **100**, and consequently may modify or reduce ENSs **1500** being offered to fan **200**. The process ends **1099**.

[0065] Of course, a FNMS **310** might want to vary ENSs **1500** at detailed locations within venue **800** itself—for example, in a ballpark, FNMS **310** might offer coupons **1955** to only restaurants nearby the fan's seat—then HIRES geolocation, and hence more detailed geolocation might be required throughout event **100** within the interior of the venue **800**. Other aspects of the invention apply, regardless of whether layered zones **830** and/or switching between HIRES and LORES tracking are utilized at a given event **100** or by a given FNMS **310**.

[0066] Commonly, a performance **1100** is embedded in an event **100**. Of course, FNMS **310** has discretion in what it treats as a performance **1100**, and what it treats as an event **100** for purposes of selecting ENSs **1500**. FIG. **11** is a timeline depicting occurrences delineating a performance **1100**, an event **100**, and the duration of a super-event **1110**, during which ENSs **1500** are provided for fans who qualified "attending". The performance **1100** is embedded within the larger event **100**. The event **100** starts **1120** before the start **1150** of the performance **1100**. From the viewpoint of FNMS **310**, and usually the expectations of the audience **210** as well, event **100** might be considered to begin when doors of the venue **800** open, and end when the doors close. For example, at a ballgame, the event **100** might include some pre-game or post-game activities. The performance **1100** might be regarded as lasting from the first pitch to the final out. At an opera event **100**, coffee and cookies might be sold in the lobby before or after the performance **1100**. At a concert, recordings of the performing artists might be sold to attendees after the end **1160** of the performance **1100**, but before the end **1180** if the event **100**. In any case, it takes time for an audience **210** to leave the venue **800**.

[0067] Note that a timeline for an event **100** might be more complex than the exemplary one shown in FIG. **11**. A state fair, for example, might run for several days. The state fair overall might be regarded as an event **100**; each day might be regarded as a separate event; and each performance, display, amusement ride, or game within the fair on a given day might be regarded as a separate event **100**. Similarly, a college football game might be preceded by a tailgating event surrounding the stadium, or at an adjacent location. The super-event **1110** might be regarded by the FNMS **310** as the combination of the tailgating and the game, each of which is treated as a separate event **100**. Alternatively, the FNMS **310** might choose to regard the game as the only event **100**, but change the boundaries **820** of zones **830** during the super-event **1110**. The principles and methods of the invention extend to such situations, perhaps with a central FNMS **310**

(e.g., the manager of the whole state fair) and other FNMSs **310** at the various subsidiary levels each determining whether to take advantage of a FNS **300** for their level of event **100**. The Olympic Games are another example of a complex, hierarchical event. See FIG. **7**. Preferably, in such situations all applicable ENSs **1500** will be offered to fans **200** through a single FNA **510**. The selection of ENSs **1500** provided by the FNMS **310** may vary with factors including timing and location of performances, facilities such as stores and restaurants, and with the state **1400** of fans **200** relative to those factors.

[0068] As will be described in relation to FIGS. **14** and **15** the FNMS **310** may provide more or better ENSs **1500** to fans **200** who are detected to be actually attending the event **100**. However, a FNS **300** might offer a limited selection of ENSs **1500** to some fans **200** who are not in attendance; e.g., fans **200** of a baseball team watching a game on television. We will refer to the level and variety of ENSs **1500** available to fans **200** during the event **100** itself as "full service". Note that "full service" does not imply that such fans **200** will receive an identical or a complete set of ENSs **1500**. Based on location of the PSD **320**, a process of qualifying, described in relation to FIG. **12**, can be applied to make this determination of attendance. An effect of qualification for an exemplary scenario of possible state **1400** relative to an event **100**, which includes a performance **1100**, is shown in FIG. **11**. Immediately upon arrival of the fan **200** inside the venue **800** after the start of the event **100**, full service through the FNA **510** to the fan **200** begins. We will refer to the time interval when full service is available to fans **200** who qualified as attending as the super-event **1110**. Assuming that the fan **200** does qualify **1140**, full service may continue until, depending upon embodiment, either the performance **1100** ends **1160**, the fan **200** leaves **1170** the venue **800**, or the event **100** ends **1180**. The preferred approach, however, is shown in the figure—FNMS **310** will provide full service for a super-event **1110** which extends for some interval after the event **100** ends **1180**. For example, full service for an afternoon baseball game might continue to be provided to fan **200** after the ballpark has closed for the day to the public, and after fan **200** has gone home. The length of the post-performance extension may depend upon the type of performance. An extension having any duration of 30 minutes to 6 hours might be appropriate for a baseball game.

[0069] In order to conserve battery **580** life, preferably, HIRES tracking will not be required until an inbound fan **200** crosses the OB **823** into the OZ **833**. When the fan **200** crosses the OB **823** (or in some embodiments, the MB **822**) in the other direction, then the HIRES requirement can be turned off. This might happen, for example, if a fan **200** enters the OZ **833**, and then exits into the EZ **834** without entering the IZ **831**.

[0070] A relatively large number of people who are registered as fans **200** with the FNMS **310** may enter the IZ **831** after the start **1120** of the event **100**, but not remain for the performance **1100**. Such a fan **200** might, for example, stop to buy a ticket for an upcoming event **100**, or to drop off their child, or to make a delivery. To distinguish an attendee from a fan **200** who is, as it were, "just visiting", we want to know when someone leaves the venue **800** once the FNMS **310** demand for HIRES tracking has been removed. This can be done more or less satisfactorily by using LORES tracking to determine that the fan **200** has exited the MZ **832** into the OZ **833** by crossing the MB **822** (or, in some embodiments, OZ **833** into EZ **834** by crossing the OB **823**).

[0071] As already mentioned, not everyone who is near, or temporarily inside, the venue **800** is necessarily attending the performance **1100**. FIG. **12** is a flowchart that illustrates an exemplary process of qualifying a fan **200** to be considered as "attending" a performance **1100**. The approach of FIG. **12** is to regard a fan **200** as attending if they enter the venue **800**, and remain inside for some qualification time interval DT, for example, **10** min. At the start **1200** of the process, it is assumed that super-event **1110** has already begun **1202**. If **1205** the fan **200** has already qualified, then the qualification steps can be skipped. Once the fan **200** enters **1210** the IZ **831**, the FNMS **310** causes **1220** a timer **440** to be started; the timer **440** might be within the PSD **320**, or within the FNMS **310**. If **1230** the fan **200** leaves the MZ **832**, as detected by step **1240**, before interval DT has expired, then the timer **440** is stopped **1290**, and full service ends **1280**. The fan **200** has failed to qualify. Otherwise, if **1240** the fan **200** remains through interval DT, then the timer **440** is stopped **1250**, and the fan **200** qualifies **1260** as attending the performance **1100**. So long as super-event **1414** has not ended (see the loop at step **1270**), the fan **200** continues to attend. Once the super-event **1414** period ends, full services end **1280**. The process ends **1299**. In some embodiment, additional steps might be required for qualification, such as paying a fee to the FNMS **310** through the FNA **510**.

[0072] Note that some ENSs **1500** might be available to a registered fan **200** prior to qualification. For example, a fan **200** entering the vicinity of a ballpark might receive a banner photo and legend, e.g., "Welcome to Thunderbold Field", through their PSD **320**.

[0073] FIG. **13** is a table **1300** that illustrates possible effects of timing and location of the PSD **320** upon monitoring level **1350** and state **1400** of the fan **200**. Columns in the table **1300** fall into two categories, timing **1310** and device location **1320**. The timing **1310** category includes columns that specify whether it is during the event **1311** and whether the fan **200** is qualified **1312** as attending. The device location **1320** category includes columns that specify whether the fan **200** is inside the OB **1321**, inside the MB **1322**, or inside the IS **1323**. Rows in the table specify monitoring level **1350** (either no monitoring **1331**, LORES monitoring **1332**, or HIRES monitoring **1333**), and whether the fan **200** is in the process of qualifying **1334**, and whether they are regarded as actually present **1335**. The state **1400** of being present **1335** might affect the types and level of services offered to them by the FNMS **310**. Each cell in the table contains either the word "YES", as typified by the cell labeled **1341**; "NO", as typified by the cell labeled **1342**; or is empty, as typified by the cell labeled **1343**. The header for a row represents an exemplary consequence of the Boolean statement formed by the column headers in combination with the contents of cells in that row. Empty cells are irrelevant. The resulting Boolean statements imply the following. When not during an event **100**, no monitoring of fan **200** location is occurring. Otherwise, during an event **100**, once a fan **200** has qualified as attending, LORES monitoring of the location of that fan **200** is done. When a fan **200** is inside the OB **823** and has not qualified as attending, then HIRES tracking of the fan **200** is done. This reduced monitoring level **1350** is particular implementation of a battery **580**—conserving strategy. Once a fan is inside the IB **821**, but has not qualified as attending, then the fan is in the process of qualifying. Once a fan **200** is qualified, and is within the IB **821**, then the fan **200** is regarded as present **1335**.

[0074] FIG. **14** is a conceptual diagram that illustrates exemplary factors which might be used in some embodiments to determine a current state **1400** of a fan **200**, in order to select types and levels of functionality offered to a fan **200** by the FNMS **310** through the FNA **510** on their PSD **320**. In the baseball scenario, a coupon **1955** for a restaurant in the ballpark is appropriate during the performance **1412** for a fan **200** who is attending and present **1431**. However, it would be inappropriate to offer that same fan **200** a free pom-pom in the home team's colors if the fan **200** chooses to affiliate with the away **1422** team. FIG. **14** uses three factors to determine state: timing **1310**, attendance **1430**, and team affiliation **1420**. Depending upon embodiment, not all of these factors might be used in determining state **1400**. For example, team affiliation is irrelevant for an orchestra concert. Other factors might be used in addition to those shown. For example, state **1400**, which may be used to determine levels (e.g., value of a coupon **1955**; probability of receiving a free gift) and types of services (see FIG. **15**), might also be based upon fan **200** type, as illustrated by FIG. **2**; or by "friends" relationships, as illustrated by FIG. **20**.

[0075] The cells **1405** in FIG. **14**, which correspond to states **1400** of fans **200** relative to an event **100**, are shown empty for graphical convenience. However, for respective embodiments, each cell **1405** may correspond to a set of choices, made by FNMS **310**, from among the kinds of exemplary ENSs **1500** shown in FIG. **15** and FIG. **16**. For example, full service to a member of the audience **210** at a performance **1100** might include messaging **1510** among fans **200** and/or among "friends"; the ability to interact with, and possibly create, social groups of other fans **200** interested in the performance **1100**; loyalty recognition **1550** for a fan **200** who may regularly attend performances **1100** of a certain type (e.g., games of a baseball team); and the opportunity to participate in contests. A given cell might correspond to any combination of services, from none at all, to full service (i.e., an enhanced set of services available to a fan **200** during the event **100** or thereafter). (Note that even at "full service", some variations in services offered to fans **200** may vary depending upon their spatial positions within the venue **800**, or upon other factors.)

[0076] The state **1400** of a fan **200** relative to an event **100** can evolve over time. The timing **1310** factor of FIG. **14** is determined by how FNMS **310** chooses to run the event **100** including, for example, when they open and close doors of a venue **800** where the performance **1100** is held. The FNS **300** must know time points relevant to its operation. A time point might be manually entered to FNMS **310** through management UI **450** (e.g., we have just opened the doors); might be available to the FNMS **310** from a database in storage **430**, possibly in a schedule or agenda previously entered through the management UI **450** (e.g., the performance **1100** will begin at 8 PM tomorrow); or obtained from one or more sensors (e.g., a sensor that detects that all the seats in an auditorium are now filled). In embodiments represented by FIG. **14**, the timing **1310** factor can take on values of: within the event **100** but pre-performance **1411**; during the performance **1412**; within the event **100** but post-performance **1413**; in the super-event **1414** (but outside the event **100**), and other time **1415**.

[0077] The attendance **1430** factor in FIG. **14** may be determined by logic and geographical tracking as described, for example, in relation to FIGS. **8**, **12**, and **13**. In embodiments represented by FIG. **14**, the attendance **1430** factor can take on values of attending and present **1431**, attended and not present **1432**, and not attending **1433**. Note that one might have been attending and present **1431**, even though the current time is, for example, post-performance **1413**.

[0078] The affiliation **1420** factor in FIG. **14** might be entered by the fan **200** through the FNA **510**. The affiliation **1420** might be set to a default value during registration of the fan **200** with the FNMS **310**, or upon acquiring the FNA **510**. The fan **200**, again through the FNA **510**, may be able to update the default, or override it temporarily for a particular performance **1100**. In embodiments represented by FIG. **14**, the affiliation **1420** factor can take on values of home **1421**, away **1422**, and neither **1423**.

[0079] Note too that other factors not shown in FIG. **14** may also contribute to determining state of an event **100** and a fan **200**, and hence the types and levels of functionality offered to fans **200** by the FNS **300** through the FNA **510**. For example, a given Olympic Games includes many events **100**, venues **800**, organizations, and levels of management; and might well have many FNMSs **310**. FIG. **11-14** are illustrative of fan state for more commonplace embodiments of the invention. The technologies discussed herein—e.g., FNA **510** on PSD **320**; geolocation; battery optimization; rules defining event **100** state and fan **200** state relative to an event **100**; fan **200** choice of interests or affiliation; and ENSs **1500** that depend upon event **100** state, fan **200** state, and fan **200** choices—can be applied in more complex situations.

[0080] FIG. **15** describes categories of ENSs **1500** that might be provided to fans **200** by a FNS **300**, mostly through their PSD **320**. The categories include messaging **1510**, social networking **1520**, occasion recognition **1530**, memorabilia **1540**, loyalty recognition **1550**, contests and games **1560**, and wagers **1570**. For example, the FNS **300** might recognize a fan **200** for regular attendance at events **100** as an instance of loyalty recognition **1550**. Through the FNS **300**, a ballpark might post a birthday announcement on the scoreboard, possibly for a fee, as part of occasion recognition **1530**. Any given service in any given category might be limited to fans **200** falling within a specific set of states **1400** from among all available states **1400**, such as those depicted in FIG. **14**.

[0081] FIG. **16** is a conceptual diagram that illustrates exemplary services that might be provided by a FNS **300** relating to social networking **1520**. (Some of these services also fit other categories shown in FIG. **15**. Social networking **1520** is provided to the fan **200** through their PSD **320**. Exemplary services might allow a fan **200**: (1) To join **1610** with a group of other fans **200**, or create a new group. (2) To network **1612** with "friends" who are also attending an event; (3) To choose **1615** whether they want to affiliate with the home or the away team, in the context of a two-team sporting event. (4) To send and receive **1620** text or other messages. Such messages might be exchanged with other group members, or with any of the types of fans **200** shown in FIG. **2**. Preferably, to participate, a fan **200** will not have to identify the particular venue **800** or the event **100** they are attending with a hashtag. (5) To receive **1625** data (e.g., game statistics) about the performance **1100** or related performances **1100**. (6) To post **1630** photos, videos, and other digital content to groups and another fans **200**. (7) To participate **1635** in contests and games **1560**, such as that described in relation to FIGS. **22** and **23**. Such contests and games **1560** may be provided by the FNMS **310** through the FNA **510** to fans **200**. (8) To earn and redeem **1637** valuable points **2699**. (9) To wager **1638** such points **2699** among friends, social groups, or the fans **200** of

the event **100** generally. (10) To participate **1639** in prediction markets, preferably using points **2699**. (11) To be notified **1640** about upcoming and related events. (12) To receive **1645** historical information (e.g., season statistics) related to the performance **1100**. (13) To receive **1650** advertising. (14) To buy **1655** merchandise. (15) To communicate **1660** with celebrities (e.g., performers). (16) to receive **1665** recognition for loyalty (e.g., receive a memento for attending a specified number of home games during a season). (17) to participate, using their PSD **320**, in surveys or polls, conducted by event **100** management through the FNMS **310**.

[0082] A posting might be directed by the FNMS **310** to a scoreboard or other similar display, possibly upon request of a fan **200**. The FNMS **310** might also transmit to a fan **200**, and the fan **200** might receive video or A/V relating to the event **100** or venue **800**, such as instant replay video.

[0083] Conventional messaging systems require a sender to specify one or more addresses to which a message is to be sent, such as an e-mail address or text number (each considered a separate "Address"). For some social networks, one or more recipients ("followers") can pre-select a particular sender's Address and receive all messages from such sender. The sender would also identify the message through the use of a keyword(s) by using a hashtag (#) (an "Identifying Subject") and all senders' messages with the same Identifying Subject would be posted together in a message stream. Identifying Subjects are specific to a hashtag. For example, recipients viewing a message stream entitled #Yankeesbaseball will see different posts than #NYYankeesbaseball or #Yanksbaseball, and the viewers of these three message streams will not be "connected together"—even if are all attending the same Yankees baseball game. In conventional messaging, the Address or Identifying Subject is the link between a sender(s) message and recipient(s) who receive or view a message(s).

[0084] Because a FNS **300** is aware of the respective and evolving states **1400** of fans **200** relative to an event **100**, messaging and other forms of sharing through the FNA **510** can eliminate such address multiplicity through event-based messaging. For example, all groups associated with a ballgame and available to fans **200** who are actually present might be displayed in a menu through the FNA **510**. Because this list of groups can contain groups exclusively associated with this event **100**, it would be far easier to navigate, and to find relevant information in, than more conventional SNAs external to the event **100** or the super-event **1110**. The list of groups available to fans **200** who are not present might be different from those who are attending.

[0085] Event-based messaging (EBM) does not require an Address or Identifying Subject. Rather with EBM, messages posted by any fan **200** can be streamed to all other qualified fans **200** at the same event **100**, and only to such qualified fans **200**. The venue **800** and the event **100** becomes the link between the sender and receiver of a message rather than an Address or Identifying Subject and all qualified fans can be connected together in the same message stream without having to know the Address of other fans at the event, or be subject to the vagaries of slight differences in the Identifying Subject (such as those for the Yankees above) that prevent such connection. Team-based and venue-based messaging offer advantages similar to EBM.

[0086] FIG. **17** shows examples of opportunities, provided by a FNS **300** to fans attending an event, for EBM, team-based messaging, and venue-based messaging, games, contests, and wagering. Three windows, which might be displayed to a fan **200** at a baseball game through the GUI **530** on their PSD **320**. The windows might be displayed simultaneously on the GUI **530**, or separately. Entries are underlined to suggest that they are links. If the user selects a link, more information about that entry might pop up on the GUI **530**. The organization of entries in these windows is not particularly realistic, but hopefully they will make more concrete some of the concepts presented so far. The top window **1700** is dedicated to entries relating to a particular team, which might correspond to the FNMS **310** of this FNS **300**; the middle window **1710**, to the event **100**, today's game; the lower window **1720**, to the venue **800**. No hashtag or other identifier is required to participate in messaging **1510** and other ENSs **1500** for the team, the game, or the ballpark; such identification is inherent in attendance by a registered and qualified fan **200** at this event.

[0087] Several of the links shown in FIG. **17** give the fan **200** the opportunity to participate in a discussion group, possibly in response to a news item; these include: Link **1701**; Link **1702**; Link **1703**; Link **1712**; Link **1716**; Link **1721**; Link **1722**; and Link **1723**. Link **1717** is a link to another window, allowing the fan **200** to initiate their own discussion group. Link **1704** is link to a sales offer, which might offer the user points **2699**. Link **1711** and Link **1713** are contests **2680**, which might also offer points **2699** to the winner(s). Link **1718** is a link to a list of the "friends" of this fan **200** currently attending (or alternatively, somehow participation, possibly from home) the game. Link **1719** is an offer for a wager from friend Bob (see, e.g., FIG. **24**). Link **1715** is a link to an opportunity to play a contest, such as that described in FIG. **22**. Note that the content and arrangement of the GUI **530** may, and probably will, change during the course of a super-event **1110**, event **100**, or performance **1100**.

[0088] Through the FNA **510**, the FNMS **310** may offer custom products **1800**, customized in various ways, such as those shown in FIG. **18**. A custom product **1800** might depict or represent something specific **1810** to the performance **1100**, such as a logo or other representation of the two competing teams in a ballgame, and a date. A custom product **1800** might depict or represent something specific **1840** to a team (e.g., home or away), that the fan **200** has chosen to affiliate with. A product might depict or represent something specific **1850**. A product might depict or represent something specific **1830** to some occurrence during the performance **1100**, like the winning team, or a record that was set during the performance **1100**, or a photo of a soloist. Possibly the most interesting kind of customization would be fan-specific **1820**. For example, a fan **200** might upload a picture of a family member or a "selfie" (self-photograph), taken at the performance **1100**. The picture might be combined with one of the other kinds of customization, and included, for example, in a framed photo, on a t-shirt, or on a coffee mug. Depending on its type, a custom product **1800** might be delivered by shipping; picked up at a store in the venue **800**; or if digital, downloaded through the FNA **510**.

[0089] FIG. **19** is a conceptual diagram that illustrates types of memento **1900** products that might be offered to, and in some cases customized by, fans **200** through a FNS **300**. Such mementos **1900** may include clothing **1905**; a certificate **1910**, such as proof of attendance; a ticket **1915** to another performance **1100**; a lottery ticket **1920**; media **1925**, such as a recording or video; a toy **1930**, such as a bobble-head doll; an entry **1935** for a contest conducted by the FNS **300** and run through the FNA **510** during the event **100**; some kind of

contact with a celeb **1940**, perhaps a signature or a face-to-face meeting; food; a broadcast **1950** opportunity, such as the right to post a child's birthday on a display in the venue **800**; a coupon **1955**, which might be redeemed at a store in the venue **800**; or an item of equipment **1960** from the performance **1100**, such as a game ball or an actor's ruby slippers. Any such memento **1900** might be awarded to a winner of a contest.

[0090] FIG. **20** is a flowchart that illustrates how social networking "friends" might be identified by, and interact through, a FNS **300**. Various SNSs allow people to designate other people as "friends" (e.g., FACEBOOK®); "followers" (e.g., TWITTER®); "contacts" (e.g., LINKEDIN®); "circles"; "groups"; or other terms indicating a voluntary social, professional, or business relationship between or among individuals. We will use the term "Friend", with an upper case 'F', generically for such relationships. Note that an FNS **300**, at any level (see FIG. **3**) may maintain its own list(s) of Friends, possibly allowing people to establish such relationships through their FNA **510**.

[0091] As defined in Wikipedia, "Friending is the act of adding someone to a list of Friends on a social networking service." If Friending occurs through the FNA **510** and the SNS is the FNS **300** itself, then the FNS **300** will know if two Friends are present at an event **100** and, depending on the granularity of the geolocation approach(es) being used, may even know where they are sitting. The FNMS **310**, maintains its own list of identifiers (IDs) of fans **200** in storage **430**.

[0092] However, if Friending occurred through an external SNS such as FACEBOOK®, then FNS **300** might be able to access the Friends list of the fan **200** on that other SNS. This may require that the fan **200** give permission for such access; that the permission be communicated to the other SNS; and that somehow the FNS **300** must be able to match the ID of the fan **200** in the FNS **300** with their ID in the SNS. Presumably, their ID in the SNS can be provided to the FNS **300** through the UI of the FNA **510** when the fan **200** gives the FNS **300** permission to access the SNS. Access by the FNS **300** to the Friends list of the other SNS will ordinarily be done through a contractual relationship between the FNMS **310** and management of the SNS. In some embodiments, a fan **200** may be able to log into the SNS using their PSD **320**, and then through the SNS itself log into the FNS **300**. When this approach is implemented, permission, communication of permission, and ID matching might all be able to be accomplished with a single click.

[0093] At a single event **100**, a fan may have multiple relevant lists of Friends contacts. If FNS **300** has access to a list of someone's Friends, then the geolocation services, in conjunction with the FNS **300** and the FNAs **510** of the Friends, can detect pairs of Friends who are attending the event **100**. Social networking Friendship is quasi-contractual, and hence although a Friendship relationship is usually reflexive (if A is a Friend of B, then B is a Friend of A), Friends do not necessarily form groups. For example, A may have Friends B and C, while B has Friends A and D.

[0094] At the **2000** of FIG. **20**, a fan **200** is detected **2010** by the FNMS **310**, in collaboration with the FNA **510** and the geolocation system **570** of their PSD **320**, as entering the venue **800**—. See FIG. **6-14** for exemplary details. If **2015** Friends networking is not active and enabled by the FNS **300**, then the process ends **2099**. If Friends networking is active and enabled by the FNS **300**, then a check may be made whether Friends networking is active through the FNA **510** on the fan's PSD **320**; the FNS **300** might (or might not) give the fan control over whether the Friends networking feature is enabled. If **2020** Friends networking is not active on the PSD **320**, the process ends. Otherwise, the FNS **300** (or the FNA **510**, depending on access means), accesses **2030** the list(s) of Friends. Note that there may be more than one list of Friends if the fan **200** participates in more than one networking group that is enabled by both the FNS **300** and the FNA **510**. If **2040** Friends on such Friends lists are present in the venue **800**, then Friends networking of the fan with those Friends will be established **2050**. Friends networking might include notification to both Friends in a pair of the presence of the other; the ability of mutual Friends to form a group, or to together or individually engage in any of the activities described in FIG. **16**. Rewards might be awarded to groups, such as points **2699**, or credit toward superfan recognition.

[0095] FIG. **21** is a flowchart illustrating sharing of digital content among fans using mesh networking. Such digital content might include, for example, digital images, AN tracks, and documents. A fan **200** might want to request to download such digital content through the UI **445** of the FNA **510** on their PSD **320**. Ordinarily, the request for the digital content would be transmitted by the FNA **510** to a server of the FNS **300**, and the server would, if possible, either download the content from its own storage, or first upload the content from the PSD **320** of another fan **200**. Mesh networking uses, when feasible, direct fan-to-fan communication, and may be able to eliminate the server from uploading and downloading the content, thereby reducing load upon the server and the FNMS **310**, and possibly reducing transfer times. After the start **2100** in FIG. **21**, the fan **200** becomes aware that certain digital content exists through the FNA **510**. This will involve the FNA **510** receiving **2110** metadata about the digital content and a link identifying the content. This information may have been received from the FNMS **310** or from another fan **200**. The fan **200** then requests **2120** the digital content through the FNA **510**. The FNA **510** polls **2130** the fans **200** participating in the FNS **300** via the mesh network; mesh network access might be, for example, by BLUETOOTH® or by WiFi. If **2140** the content is available from a nearby fan **200** through the mesh network, the FNA **510** requests **2150** the content. and if **2160** the transfer to the PSD **320** of the fan is successful, the process ends **2199**. Otherwise, the FNA **510** requests and receives **2170** the content from the server.

[0096] FIG. **22** is an exemplary contest that might be run through a FNS **300**. Preferably, all actions required by the fan **200** to participate in the contest will be available through a UI **445** of the PSD **320**. In our example, the performance **1100** is a sporting event, but the concept might be used in any context in which unrehearsed or random happenings happen during the performance **1100**. The contest is played on a game board **2200** similar to Bingo, and has similar rules regarding winning. In this contest, however, the fan **200** may have some control over game board **2200** contents and arrangement. FIG. **23** is a flowchart illustrating an exemplary embodiment of contest rules. The fan **200** receives **2310** a list of players and their jersey numbers, displayed on their PSD **320**. The fan selects **2320** from the jersey numbers. In some embodiments, the FNS **300** fully randomizes the choices of players. The fan **200** may be required to select a certain number of players from each team; for example, 7 home team players and 2 away team players. Once they pick their players, in some embodiments the fan **200** gets to arrange **2330** them on the

board; in others, the arrangement may be randomized. The game board **2200** of FIG. **22** shows such an arrangement of home team and visiting team jersey numbers. For example, square **2210** contains home player number **42**, and square **2220** contains visiting player number **5**. The player is allowed to cover **2340** a square upon a specific type of happening during the contest; for example, a home team player gets a hit; the home team pitcher strikes out an opposing batter; or a visiting team player is struck out. The fan **200** wins **2350** if they fill N squares adjacent in a row, column, or diagonal of the grid, where N is the grid dimension. The particular board shown is a 3×3 grid. Bingo is traditionally played on a 5×5 grid. The actual dimension of the square grid may be chosen by the managers of the event **100**, depending upon the number of fans **200**, the values of the prizes, and the target number of winners.

[0097] It should be noted that contests and games are slightly different. Fans compete with each other in a game but not in a contest. FIGS. **22** and **23** describe a bingo-like contest. As an example of a game, fans **200** who are present at an event **100** might be requested to submit a photo, taken at the event **100**, by a certain time. Through the FNA **510**, all or some subset of fans **200** might be asked to pick a favorite from among the submitted photos. The remaining set of candidate photos could be narrowed iteratively by additional fan polls through the FNA **510**, until a "fan photo of the event" emerges. The winner might receive a memento, reward, prize, points **2699**, or other recognition.

[0098] FIG. **24** is a flowchart illustrating a process for betting between fans participating in a FNS **300** during an event **100**. Betting might be facilitated by a FNS **300**, in cooperation with the FNAs **510** and PSDs **320** of fans **200**, during the performance **1100**, the event **100**, the super-event **1110**, or some other interval. A wager may be based on a proposed future outcome, a "bet proposition" (e.g., a particular player getting at least one hit) either occurring or not. A given bet proposition might be made available by the FNMS **310** for a wager that might be offered by a fan **200** to a Friend or set of Friends; with another fan **200**; with a social group within the FNS **300**; or with any other subset of FNS **300** members, such as fans **200** attending the event **100**. Note, as discussed in connection with FIG. **3**, that more than one FNS **300** might be available to a given fan **200** for betting during an event **100**. After the **2400** start of FIG. **24**, the FNS **300** presents **2410** a list that includes bet propositions **2500** choices to some subset of the set of fans **200**. A given bet proposition **2500** might be customizable, or not. FIG. **25** illustrates a list of customizable bet propositions **2500** for a baseball game, from which a fan might choose as the basis for a bet. Entries in the list might be chosen by management of the FNS **300**, and might evolve during the event **100**. An entry might be entered into the FNS **300** through a management UI **450** to a central FNMS **310**, such as that illustrated by FIG. **7**. Customization opportunities, timing for appearance, and the fan base who will receive the bet propositions **2500** may all be chosen by FNS **300** management. FIG. **25** shows five bet propositions **2500**, of which one is not customizable; one has two blanks for customization; and the remainder have one blank. If **2440** the fan **200** chooses a bet proposition **2500** from the list available through the GUI **530** of the FNA **510** then the fan **200** may, if appropriate to the given bet proposition **2500**, customize **2450** the bet proposition **2500**. Through the GUI **530**, the fan **200** may choose **2460** a number of points **2699** (see FIG. **26**) to bet; the FNA **510** might also allow (not shown) the fan **200** to set odds. The fan **200** offers **2470** the bet to other fans **200**. One or more other fans **200** accept **2475** the bet. At some point, the bet proposition **2500** is proved **2480** to be either true or false, and points **2699** are redistributed **2490** among the betting fans **200** accordingly by the FNMS **310**. The FNMS **310** through the FNS **300** may update **2430** the list during the interval of betting. The process may continue until that interval ends.

[0099] The FNS **300** might implement other forms of betting or trading among sets of fans **200** detected by geolocation in connection with an event **100**, such as described in connection with FIG. **8-15**. For example, fans **200** might be able, through the FNA **510** on their PSD **320**, to trade, through one or more prediction markets, in futures of outcomes, as selected by the FNS **300** management.

[0100] FIG. **26** illustrates possible elements of a loyalty program **2600**, whereby a fan might earn points **2699** to be redeemed for, e.g., goods, services, cash, or recognition. A fan **200** might earn points **2699** for attendance **1430** at events. For example, a bonus might be awarded to a fan **200** that attends a certain number of games in a season. A fan **200** might earn points **2699** for postings **2620** to social networks implemented by the FNS **300**. Other fans **200** might be given the opportunity to react to a posting **2620** by indicating a ranking, or a LIKE/DISLIKE indication. For example, the FNS **300** might invite fans **200** to post their best "baby fan" video. The fan **200** who posted the video that received the highest rating from other fans might receive a certain number of points **2699**. As another example, a fan **200** might accumulate points **2699** from ratings of their posts **2620** throughout a season. At a point near the end of the season, the fan **200** with the most points **2699** from ratings might receive a bonus of points **2699** from the FNMS **310**. A fan **200** might be given a start-up bonus **2630** for joining the FNS **300**. A fan **200** might gain or lose points **2699** by betting, as illustrated by FIG. **24** and FIG. **25**; or by participating in some form of points **2699** trading in outcome futures, such as prediction markets **2650**. A fan **200** might acquire points **2699** by purchases **2660** of goods or services made through the FNS **300** or through the FNA **510**; or through participation in games **2670** or contests **2680**.

[0101] FIG. **27** illustrates kinds of FNMS data **2700** that might be included by a FNMS in storage **430**. Databases might include registered fans data **2710**; venues data **2720**; events data **2730**; and current event/venue data **2740**. The organization shown here is merely exemplary.

[0102] Note that the concepts of the invention extend to embodiments in which there is an event **100**, but no performance **1100** as such. For example, a day at an amusement park might be treated as an event **100**. Also, some points may use a different system of boundaries or layers, or different tracking method. In such embodiments, some details of the timeline and possible states **1400** will differ from FIGS. **11** and **14**, respectively, but the inventive concepts of fan geolocation and fan/event states still apply.

[0103] Of course, many variations of the above method are possible within the scope of the invention. The present invention is, therefore, not limited to all the above details, as modifications and variations may be made without departing from the intent or scope of the invention. Consequently, the invention should be limited only by the following claims and equivalent constructions.

1. A process, comprising:

a) registering, by a fan network management system (FNMS) through a communication network, a plurality of fans, through their respective portable smart devices (PSDs), to participate in event networking services (ENSs) provided by the FNMS;

b) maintaining by the FNMS in computer-accessible tangible storage remote from the registered PSDs

(i) a list of events at which the FNMS will provide ENSs to qualified fans,

(ii) a list of venues at which at least one event in the list of events will be held, and

(iii) for an event in the list of events, time and geolocation constraints for qualifying as a fan device at the event;

c) during a time interval established by the FNMS and associated with a first event in the list of events, the first event being held at a corresponding first venue in the list of venues, receiving, by the FNMS through a wireless communication interface, from each of a plurality of the PSDs of the registered users, geolocation data that tracks geolocations of the respective PSD;

d) determining by a computer-based processing system of the FNMS which of the PSDs from which the FNMS receives geolocation data satisfy the time and geolocation constraints associated with the event, and thereby qualify as fan devices at the first event;

e) communicating by the processing system through the wireless communication interface with the fan devices and thereby providing the fan devices with ENSs during the first event;

f) for the first event, identifying, and storing in the storage, an inner boundary and an outer boundary, wherein

(i) the inner boundary separates an inner zone, proximate to or including a venue, from a intermediate zone, and

(ii) the outer boundary separates the intermediate zone from exterior locations; and

g) for the first event, for each given PSD in a nonempty subset of the registered PSDs,

(i) upon detecting using the geolocation data that the PSD has crossed the outer boundary into the intermediate zone transmitting by the FNMS a request or demand to a fan networking application (FNA) executing on the PSD to use a geolocation method of a first resolution to track location,

(ii) upon detecting by the FNMS using the geolocation data that the PSD has crossed the inner boundary into the inner zone starting a timer

(iii) upon detecting by the FNMS using the timer and the geolocation data that the PSD has remained within the inner zone for a qualifying constraint time length set by the FNMS, determining that the PSD has qualified as attending, and transmitting a request to the FNA to use a tracking method of a second resolution, coarser than the first resolution, to track location of the qualified PSD.

2. The process of claim **1**, wherein the first event is a sporting event, a cultural event, an arts event, a musical event, a civic event, a political event, a conference, a convention, a class, a seminar, or a display.

3. The process of claim **1**, wherein the processing system includes a server that is remote from the PSDs of the fan devices.

4. The process of claim **1**, further comprising:

h) providing by the FNMS to qualifying PSDs at an event, through the wireless communication interface, a messaging capability whereby the qualifying PSDs can share digital content.

5. The process of claim **1**, further comprising:

h) providing by the FNMS to qualifying PSDs at an event, through the wireless communication interface, a game or a contest.

6. The process of claim **1**, further comprising:

h) implementing a points system, whereby a fan, through a registered PSD, can earn points by at least one of the following actions:

(i) attendance at an event at which the FNMS provides ENSs,

(ii) winning a contest or a game managed by the FNMS, and

(iii) through the FNMS, posting messages or images, and receiving favorable ratings from other fans in response to the posting; and

i) maintaining in storage a record of a respective total number of points earned by each of a plurality of fans.

7. The process of claim **6**, wherein qualified users at an event managed by the FNMS can also earn points by

(iv) winning a wager regarding a proposition whose wording is provided at least in part by the FNMS through the wireless communication interface.

8. The process of claim **7**, wherein the wording of the proposition is customizable by a fan through their PSD.

9. The process of claim **1**, wherein the FNMS transmits to a PSD a request or demand to change the method the PSD is using for tracking geolocation.

10. The process of claim **9**, wherein the request or demand asks the PSD to change resolution of geolocation tracking.

11. The process of claim **1**, wherein the FNMS requires registered PSDs to use GPS for geolocation tracking.

12. The process of claim **1**, further comprising:

h) for a PSD qualified as attending the event, determining that the PSD is no longer attending upon detecting by the FNMS using the tracking data that the PSD has crossed the inner boundary from the inner zone into the intermediate zone.

13. The process of claim **12**, wherein the intermediate zone is divided into a middle zone and an outer zone by a middle boundary, further comprising:

h) for a PSD qualified as attending the event, determining that the PSD is no longer attending upon detecting by the FNMS using the tracking data that the PSD has crossed the middle boundary from the middle zone into the outer zone.

14. (canceled)

15. A process, comprising:

a) using a GPS receiver in a portable smart device (PSD) having a processor, determining that the PSD has been inside a venue for a specified period of time, whereby the PSD is regarded as qualified as attending an event;

b) transmitting to a fan networking management system (FNMS), through a wireless communication interface that includes hardware, by the PSD, a digital photograph; and

c) receiving from the FNMS a memento, in electronic form or tangible physical form, that displays at least a portion of the digital photograph along with graphical or textual information that is unique to the event.

16. A process, comprising:

a) receiving, through a wireless communication interface by a computer-implemented fan networking management system (FNMS) from a portable smart device (PSD) having a processor, geolocation data that tracks the PSD;

b) determining by the FNMS using the geolocation data that the PSD is attending an event;

b) receiving, from the PSD through the wireless communication interface, a digital photograph; and

c) sending by the FNMS a memento, in electronic form or tangible physical form, that displays at least a portion of the digital photograph along with graphical or textual information that is unique to the event.

17. The process of claim **1**, wherein the list of venues contains a plurality of venues and wherein the list of events contains an event corresponding to each venue in the list and a plurality of events corresponding to a venue in the list.

18. The process of claim **1**, further comprising:

h) for the first event, maintaining by the FNMS in computer-accessible tangible storage a table of services that

(i) includes a plurality of PSD states and a plurality of event states, wherein the state of a respective registered PSD depends upon whether the PSD is inside the outer boundary and upon whether the PSD has qualified as attending the first event, and

(ii) for each combination of a PSD state in the plurality of PSD states and an event in the plurality of event states, specifying a set of fan services corresponding to that combination.

19. The process of claim **18**, wherein for a first event state, which is during the event, in the plurality of event states, the services delivered to registered PSDs that are inside the outer boundary are the same as those delivered to PSDs that have qualified as attending the event.

20. The process of claim **1**, further comprising for the first event:

h) receiving through a respective user interface of each of a plurality of PSDs a respective team affiliation,

i) maintaining by the FNMS in computer-accessible tangible storage a table of services that

(i) includes a plurality of PSD states, a plurality of event states, and a plurality of team affiliations, wherein the state of a respective registered PSD depends upon whether the PSD is inside the outer boundary and upon whether the PSD has qualified as attending the first event, and

(ii) for each combination of a PSD state in the plurality of PSD states, an event in the plurality of event states, and a team affiliation in the plurality of team affiliations, specifying a set of fan services corresponding to that combination.

21. The process of claim **1**, wherein for the first event, services associated with the first event are provided to each given PSD in the nonempty subset of the registered PSDs that are detected to be inside the outer boundary.

22. The process of claim **1** wherein the outer boundary is a circle, a square, or a rectangle.

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