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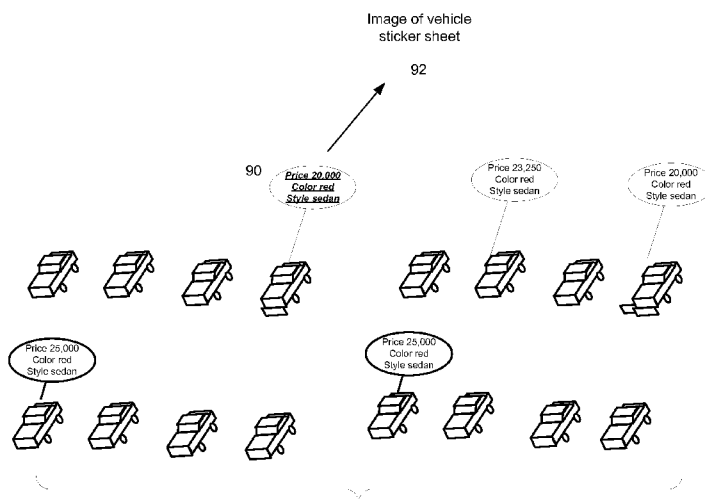


FIG. 8

(57) Abstract: Techniques for searching for products in an inventory of product are disclosed. The techniques receive data that specifies attributes of a product, search inventory of products to determine potential matches or closely related matches to at least some of the attributes of the products, generate messages based on the search of inventory to determine the potential matches, generate positional information associated with the messages and generate a set of informational depictions of the generated messages, with the informational depictions of the messages when rendered on a display device are rendered in juxtaposition with representations of the products according to the generated positional information.

This application claims priority under 35 U.S.C. §119 to U.S. Provisional Patent Application Serial No. 61/466,098, filed March 22, 2011, and entitled “Augmented Reality System for Group Supervision”, and U.S. Patent Application Serial No. 13/325,335, filed December 14, 2011, and entitled “Augmented Reality
5 System for Product Selection”, the entire contents of both are hereby incorporated by reference.

Augmented Reality System for Product Selection

BACKGROUND

This invention relates to tools that assist in product purchasing.

10 Customers can become bewildered with the numerous choices that are available when purchasing goods. Sometimes merely finding a location where such goods are being displayed can be frustrating, especially in large stores or selling areas. In particular, goods such as automobiles and vehicles that are on a dealer’s lot can be an especially frustrating/confusing experience for some customers. For example, auto
15 dealer lots routinely are stocked with a large selection of vehicles, many of which may satisfy needs of customers or potential customers. Typically, a customer or potential customer visits a dealer’s lot and may be greeted by a sales representative. The customer may desire to initially peruse over the available inventory, but that can be a frustrating experience especially when the lot is a large lot, stocked with many vehicles
20 of many makes/models, while the customer has some special features in mind, but does not at that initial stage desire to engage with the sales representative.

Generally, a customer could reluctantly ask for assistance from a sales representative. In a dealer’s showroom the sales representative can conduct a computer search of inventory, and possibly find vehicles that satisfy some of the criteria of the
25 customer. The customer and sales representative together walk around the lot trying to find the vehicles in the lot that met the criteria.

SUMMARY

According to an aspect, a system includes one or more computer systems configured to receive data that specifies attributes of a product, search inventory of

products to determine potential matches or closely related matches to at least some of the attributes of the products, generate messages based on the search of inventory to determine the potential matches, and generate a set of informational depictions of the generated messages, with the informational depictions of the messages when rendered
5 on a display device are rendered in juxtaposition with representations of the products according to generated positional information.

According to an additional aspect, a computer program product tangibly stored on a computer readable storage device includes instructions to cause a processor to receive data that specifies attributes of a product, search inventory of products to
10 determine potential matches or closely related matches to at least some of the attributes of the products, generate messages based on the search of inventory to determine the potential matches, generate positional information associated with the messages, and generate a set of informational depictions of the generated messages, with the informational depictions of the messages when rendered on a display device are
15 rendered in juxtaposition with representations of the products according to the generated positional information.

According to an additional aspect, a method includes receiving by one or more computer systems data that specifies attributes of a product, searching by the one or more computer systems inventory of products to determine potential matches or closely
20 related matches to at least some of the attributes of the products, generating by the one or more computer systems messages based on the search of inventory to determine the potential matches, generating by the one or more computer systems positional information associated with the messages, and generating by the one or more computer systems a set of informational depictions of the generated messages, with the
25 informational depictions of the messages when rendered on a display device are rendered in juxtaposition with representations of the products according to the generated positional information.

One or more embodiments may include one or more of the following features. For the system, the system is further configured to receive information specifying
30 physical locations of the products and generate positional information to associate the messages with the locations of the products. The system is further configured to generate an image depicting a representation of the products residing in a physical

location, the image augmented with the set of informational depictions of the generated messages in juxtaposition with the representations of the products in the image. The system is further configured to cause the informational depictions to be projected onto a display device. The system is further configured to cause the informational depictions
5 to be projected onto a set of eyeglasses comprising a display device configured to receive the informational depictions. The system is further configured to generate a representation of the products and cause the informational depictions to be projected onto a set of eyeglasses comprising a display device configured to receive the informational depictions and the generated representation of the products. The system
10 further includes a portable computing system configured to receive the generated set of informational depictions and a set of eyeglasses comprising a display device, the display device configured to receive the generated set of informational depictions. The products are automobiles/vehicles and the one or more computer systems are further configured to generate the image and an environment containing the
15 automobiles/vehicles and generate the informational depictions as pictorial representations that depicted over the corresponding automobiles/vehicles.

Other features are within the scope of these embodiments. Moreover, analogous features may be included in the method and computer program product embodiments with or without other features.

20 DESCRIPTION OF DRAWINGS

The accompanied figures are to be used in conjunction with the description below.

FIG. 1 is a block diagram

FIGS. 2 and 3 are flow chart diagrams.

25 FIG. 4 is a block diagram.

FIG. 5 is a pictorial depiction of a dealer lot containing a group of vehicles and beacons.

FIG. 6 is block diagram of a representation of information used in the system of FIG. 1.

30 FIG. 7 is a pictorial depiction of a user viewing various vehicles on a dealer lot having informational depictions.

FIG. 8 is pictorial depiction of an exemplary rendition of informational depictions render on a real-world view of a dealer lot.

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

DETAILED DESCRIPTION

Referring now to FIG. 1, a system 10 includes a server type of system 12 comprised of one or more computer systems 12a-12i, each computer system 12a-12i
10 including processor, memory and computer storage that stores a computer program product to augment an image with informational depictions. When executed, the computer program product configures the server 12 to receive input from a client system, generally 14. The input (generally 15) is received over a network 17, which can be a wired or wireless. The computer program product executing on the server 12
15 receives rules from a local or remote database 16 (or has rules embedded in the computer program product). The computer program product also has access to inventory information and location information, e.g., from the database 16. The inventory information includes details on the characteristics of the currently stocked inventory. Inventory can be of any type of items. One type of item is an automobile,
20 truck, motorcycle, etc., referred to herein as “automobiles/vehicles.” In some embodiments of the system 10 the client system 14 and the server system 12 can be one system. Moreover, in other embodiments there need be only one client system 14.

For items such as automobiles/vehicles, details on the characteristics can include for example, model, year, make, engine/transmission details, body type, color,
25 manufacture suggested retail price (MSRP), dealer costs, and options, lease terms, and other information that is commonly used by customers when selecting an automobile/vehicle to purchase as well as other information not necessary used by customers when selecting an automobile/vehicle for purchase such as VIN number, location of the vehicle in the lot and so forth. The positional information that can be
30 stored with or separately from the inventory information identifies, e.g., by VIN, a location within a physical space, such as on an automobile/vehicle dealer’s lot.

Using a client-server model, a client system 14 provides information regarding what features/attributes a customer desires for a car purchase to the server 12. Typically, customers will visit a dealer and rather than talk immediately with a representative that is associated with the dealership, will be asked to input the desired characteristics at the client system 14 through a user interface, and will be issued a portable client device 19 used to display informational depictions of generated messages associated with the inventory, as discussed below. The device 19 can be any type of device capable of displaying information. Device 19 can be a display associated with a portable computer system, such as a tablet computer or a personal digital assistant or a set of virtual reality eyeglasses (or another type of augmenting media device). In some implementations of the system 10, the client system 14a is one of a plurality of portable client systems, generally 14, with each client system 14 associated with the particular device 19 (only one shown in FIG. 1). A customer can carry around one of the client systems 14 modifying user inputs as the customer tours the lot.

Referring to FIG. 2, the system 10 receives 42 various inputs (generally 15 in FIG. 1), either directly from the client systems 14 or by other techniques and analyzes 44 those inputs and conducts a search of product inventory to determine 46 available inventory of products that either match or closely match attributes of such products as desired by the user. In a particular example where automobiles/vehicles are the type of products searched for based on attributes desired by a user, the system 10 processes, e.g., an input 15a from, e.g., a client system 14a. The system 10 analyzes the input 15a associated with the client system 14 by processing the input 15a through the set of search rules executed by a search engine to find matches of automobiles/vehicles for the customer.

The input 15a from the client system 14 can be stored 48 for later marketing purposes, such as data mining in a file or other storage structure in the database 16 or in the one or more computer systems 12a-12i. User data, such as name, address, etc. can also be collected and stored. The system 10 uses the input to match 52 the inputs to available inventory of, e.g., automobiles/vehicles. The system 10 generates 54 an output message or a file or other structure for each (or all) automobile/vehicle that is found to match the attributes specified by the user.

The matching process 40 generates 56 messages regarding the products from the dealer's inventory that match the attributes desired by the customer. The messages are integrated 58 into video/graphic feeds or the like as informational depictions for rendering on a display, as discussed below. The system causes the informational
5 depictions to be rendered 60.

Various levels of sophistication in analysis can be applied by the rules. Relatively, simple rules, such as looking for simple matches can be implemented. Other more complex strategies can be employed, especially where no precise matches are found. Various techniques can be used to generate the messages. For example, a
10 series of messages of increasing granularity can be generated for each matched automobile/vehicle.

Based on user-selectable/determinable combinations of priorities to different attributes different types of messages are generated. For example, at an initial search all vehicles of a certain price range are identified and messages including the prices of
15 each of those automobiles/vehicles are generated. In addition, message of increasing granularity are also generated for each of the identified vehicles.

Typically messages are generated periodically, upon completion of the input of information at the client system 14 or when analysis detects a change in input made by the client system 14. Messages can be generated and displayed for all of the
20 automobiles/vehicles that satisfy the criteria or only for those automobiles/vehicles currently within a field of view of device 19.

The generated messages can be relatively simple as indicated above such as data that when processed for display provides a simple visual indication that a match exists. Such simple messages can be generated by the rules engine to produce data that when
25 rendered, as discussed below provides informational depictions in different colors, e.g., red, yellow or green, which would correspond to different levels of match.

Alternatively, complex messages can be generated. Such complex messages can include textual content that conveys information regarding attributes of the automobiles/vehicles that were found to match the customer's criteria. Typically, such
30 messages with textual content will include results of the search criteria used to find matches. With complex messages, the informational depictions can include part of the

textual content, e.g., the criteria that matched or can include statements generated by the rules engine that summarizes the criteria.

Referring to FIG. 3, the server 12 receives 70 the generated messages from the output of the rules engine and in some embodiments receives 72 data corresponding to a view of the environment, e.g., the dealer's lot containing the automobiles/vehicles, as viewed by the customer. The server 12 also receives 74 information that specifies the physical location of each of the automobiles/vehicles associated with the generated messages. The server generates 76 informational depictions based on the received messages and associates 78 the generated informational depictions with corresponding automobiles/vehicles in the dealer's lot.

In one embodiment, the server 12 generates an image of representations of the automobiles/vehicles. The generated image is a real-world image depicting the automobiles/vehicles or it can be a morphed or virtual depiction (which may be less desired if the user is looking at that morphed or virtual image through eyeglasses). The generated image is augmented with a set of informational depictions of the generated messages. The informational depictions of the generated messages are positioned in the generated image in juxtaposition, e.g., over the representations of automobiles/vehicles in the image, for example, as illustrated in FIG. 8.

In another embodiment, the server 12, rather than generating an image of representations of automobiles/vehicles, the server 12 generates the informational depictions for the generated messages with positional information that when sent and rendered on a display device will depict the informational depictions projected onto a real-world view of the lot containing the automobiles/vehicles. That is, in these embodiments the real world view is provided from looking through a set of eyeglasses

Exemplary eyeglasses are Wrap 920 VR Bundle from Vuzix Corporation 75 Town Centre Drive Rochester, NY 14623. Such eyeglasses often referred to as video eyewear connects media players or video-out capable mobile phones or a laptop, netbook or desktop PC. Such eyewear typically includes a video eyewear a video e.g., VGA Adapter and tracker. Other examples from Vuzix include The Wrap™ 920AR augmented reality eyewear. Other examples include Z800 Pro AR head mounted display (single or dual VGA input version.) standard or ruggedized distributed by CyberWorld, Inc. 60 De Bresoles Unit 202 Montreal, QC, Canada. In general such

eyewear is a wearable display that presents a virtual large screen, stereo video capture, 6-degrees of freedom and head tracking. This view is augmented with the set of informational depictions of the generated messages that are projected on screens of the glasses. The informational depictions of the generated messages are position in the
5 generated image in juxtaposition, e.g., over the representations of the client systems in the image.

Referring now to FIG. 4, a user, is outfitted with the device 19 (FIG. 1, either eyeglasses or tablet computer or other display type of device) that is configured to receive the generated augmentation and/or the generated, augmented image of the lot.
10 In one embodiment, the eyeglasses mentioned above are used as the device 19. The eyeglasses allow the user to see through the glasses and observe the real world as a normal set of glasses. The eyeglasses are configured to receive the generated augmentation of the informational depictions and project the generated augmentation of the informational depictions onto the glasses such that the informational depictions are
15 rendered in juxtaposition with corresponding ones of the client systems 14.

In another embodiment, a user is outfitted with a portable computer system 80. The device 19 is the display portion of the portable computer system 80 that is carried by the user. Examples include a tablet computer or a personal digital assistant. The system 80 includes a local computer 82 that processes an image of the scene received
20 from, e.g., a camera 82 and applies the received augmentation to the generated image for rendering on display 84. Alternatively, the local computer 82 can receive the generated augmentation and the generated image from the server 12.

With the set of eyeglasses used as the display, the eyeglasses are configured to receive the generated image over a wireless or wired connection from either the local
25 computer 82 or directly (not shown) if wireless from the server 12. The portable computing system 82 such as a personal digital assistant or a tablet computing device is typically configured to receive the generated augmented image over a wireless connection.

The server 12 is further configured to generate the informational depictions of the generated messages as pictorial representations that have text corresponding to the
30 message contained in the pictorial representations. Examples include balloon

depictions, callouts, cartoons, simple text boxes, etc. These generated messages are sent in a data stream 86 from the server 12 to the local device 82.

The server 12 is further configured to cause the informational depictions to be rendered by the display as positioned, e.g., over the automobiles/vehicles depicted in the image or the real-world actual view. In other embodiments, the system 10 has an image capture device 84 disposed to view the dealer's lot, either in a fixed position or attached to e.g., the computer 82 or otherwise stand-alone. From the image capture device 84 the computer 84 or sever 12 receives real-world, real time images the client systems 14. Alternatively, the image capture device 84 is mounted in or on the eyeglasses.

Referring now to FIG. 5, positional information regarding each of the automobiles/vehicles is provided to the server 12 (FIG. 1), as discussed below. Generally, the locations of the automobiles/vehicles are fixed. In one embodiment, the automobiles/vehicles contained in the image presented to the user will constantly change depending on the location and orientation of the user with respect to the automobiles/vehicles. For example, as the user walks through the lot different automobiles/vehicles will come into and go out of the field of view in the image. It would be desirable therefore for the server 12 (FIG. 1) to also have information regarding which systems are currently in the field of view of the display carried by the user, e.g., the eyeglasses. This can be accomplished by various techniques, discussed below.

Individual automobiles/vehicles are assigned X and Y coordinate positions so as to map the automobiles/vehicles to a plan of the dealer's lot. The lot can be outfitted with beacons, e.g., beacons A-D. These beacons operate using optical or radio frequency or acoustic signals. The client systems 14 (FIG. 1) are assigned X and Y coordinate positions through a triangulation process. The positions for each vehicle/automobile are stored in the one or more computers of the system 10 (FIG. 1). Other approaches can be used. For example, each vehicle/automobile can be provided with an individual beacon that transmits a signal identifying the automobile/vehicle, (e.g., by VIN or stock no. or the like) to which it is attached. In addition, the beacon on the individual automobile/vehicle can be programmed with the assigned position (space) of the automobile/vehicle in the lot.

The beacons A-D are configured to transmit signals and using conventional triangulation techniques through a receiver on the representative or prospective customer, determine the positional information. The server 12 receive this positional information from the computer system and analyze the received positional information from the computer system to determine the relative position of the display with respect to the group of client systems located in the environment to position the informational depictions from over the depicted representations of those client systems in the group of client systems in the image.

In another embodiment, the system 10 has the one or more computer systems 12a-12i further configured to receive a map of the lot depicting where the client systems are located and receive a current image from the camera mounted on, e.g., the eyeglasses. The one or more computer systems 12a-12i, analyze the received image to produce positional information regarding the automobiles/vehicles in the image with respect to the received map and the current position and orientation of the representative or prospective customer. While eyeglasses or a display device can be used other types of augmenting media devices can be configured to receive the generated image.

Referring now to FIG. 6, a depiction of the types of data/information stored in the database 16 is shown. These data include the X and Y coordinates for each automobiles/vehicles, a lot plan, user attributes/user particulars, and information pertaining to each automobile/vehicle as discussed above. This database can be a local database associated with the dealer or can be a remote database associated with a manufacturer or a group of affiliated dealerships.

Referring to FIG. 7, a representative or prospective customer is outfitted with one of the portable stations mentioned above, e.g., the eyeglasses with a local computer, tablet computer, etc. The portable station using signals from the beacons A-D (FIG. 6) determine through triangulation the position of the representative or prospective customer using active or passive techniques. The position is mapped into the map of the dealer's lot. The representative or prospective customer position and orientation are determined relative to the X and Y coordinates of the locations of the client systems. This is accomplished by the server 12 (FIG. 1) comparing the user's current position in the X and Y coordinates to the assigned/mapped X and Y

coordinates of automobiles/vehicles. Alternatively, the user's location can be determined based on the portable device having a beacon that is detected through triangulation. Other techniques such as Global Positioning Systems can be used to determine position.

5 The server 12 uses the representative or prospective customer position (that can change as the representative or prospective customer moves through the lot) and the X and Y coordinates automobiles/vehicles to generate the particular informational depictions, which the server 12 deems to be in the current field of view of the representative or prospective customer. The server 12 determines which information
10 depictions to generate based on the positional information for the representative or prospective customer, as discussed above, and the positional information regarding the automobiles/vehicles.

 The server 12 is configured to use the map of the dealer's lot and the analysis of the received image to produce positional information regarding the
15 automobiles/vehicles in the image and hence in a current view of the representative or prospective customer. That information is used to decide which informational depictions are used to augment the image and where in the image the informational depictions should be rendered with respect to the automobiles/vehicles when the augmentation is displayed on the display device. The system 10 (FIG. 1) will cause the
20 server 12 to position in the image, the informational depictions over the representations of those automobiles/vehicles that are contained in the image at the time of generation of the image.

 Generally, the server 12 will generate the messages and likewise the informational depictions as the positions substantially change. The particular
25 informational depictions that would be sent to the representative or prospective customer portable station would be those corresponding to the determined current view of the representative or prospective customer. In some implementations, where the lot is not very large all of the generated informational depictions can be sent to the representative or prospective customer portable station.

30 To determine orientation, a representative or prospective customer can signal the server 12 of the representative or prospective customer current orientation either manually or automatically, e.g., by wearing an electronic compass that can send a

signal back to the server 12 giving the user's current orientation. In other simpler implementations, the server 12 can assume that the user is always facing in a particular direction. Other arrangements are possible.

Referring now to FIG. 8, the X and Y coordinate data of the client systems and
5 generated informational depictions are processed to produce a feed that when rendered on e.g., virtual reality glasses (or a portable tablet computing device) renders the generated informational depictions in juxtaposition to (either the actual view of or an image of) those automobiles/vehicles that are determined by the one or more computers to be in a current view, as shown for a simple search for sedans that are red with a price
10 in a range of \$20,000 to \$25,000. Any set of attributes can be searched and displayed. The generated informational depictions are overlaid through an augmented image of the real lot, and the produced feed is projected onto virtual reality glasses or rendered by a display portion of the portable tablet computing device, and so forth.

In one embodiment, the user can select one of the informational depictions (e.g.,
15 depiction 90) either by a signal when wearing the eyeglasses or via touching a display (tablet) or other user device or other techniques. Selection of one or more of the informational depictions, e.g., 90 can cause the system 10 to generate another display 92 that displays more details, such as an image of the vehicle's "sticker sheet" that is conventionally found on vehicles. This other display can be displayed over the display
20 of FIG. 80, as shown or overlaid the display of FIG. 8 or displayed as a separate image.

A block diagram of components of the system 10 is also shown. User devices can be any sort of computing device capable of taking input from a user and communicating over a network (not shown) with server and/or with other client devices. For example, user device can be a mobile device, a desktop computer, a
25 laptop, a cell phone, a personal digital assistant ("PDA"), a server, an embedded computing system, a mobile device, as well as the eyeglasses, and so forth. User devices include monitor which render visual representations.

Server can be any of a variety of computing devices capable of receiving information, such as a server, a distributed computing system, a desktop computer, a
30 laptop, a cell phone, a rack-mounted server, and so forth. Server may be a single server or a group of servers that are at a same location or at different locations.

Server can receive information from user devices via a communication interface. Interfaces can be any type of interface capable of receiving information over a network, such as an Ethernet interface, a wireless networking interface, a fiber-optic networking interface, a modem, and so forth. Server also includes a processor and
5 memory. A bus system (not shown), including, for example, a data bus and a motherboard, can be used to establish and to control data communication between the components of server.

Processor may include one or more microprocessors. Generally, processor may include any appropriate processor and/or logic that is capable of receiving and storing
10 data, and of communicating over a network (not shown). Memory can include a hard drive and a random access memory storage device, such as a dynamic random access memory, machine-readable media, or other types of non-transitory machine-readable storage devices.

Components also include storage device, which is configured to store
15 information, map, map templates, rules data for the rules, software for the rules engine, etc.

Embodiments can be implemented in digital electronic circuitry, or in computer hardware, firmware, software, or in combinations thereof. Apparatus of the invention can be implemented in a computer program product tangibly embodied or stored in a
20 machine-readable storage device and/or machine readable media for execution by a programmable processor; and method actions can be performed by a programmable processor executing a program of instructions to perform functions and operations of the invention by operating on input data and generating output. The invention can be implemented advantageously in one or more computer programs that are executable on
25 a programmable system including at least one programmable processor coupled to receive data and instructions from, and to transmit data and instructions to, a data storage system, at least one input device, and at least one output device. Each computer program can be implemented in a high-level procedural or object oriented programming language, or in assembly or machine language if desired; and in any case,
30 the language can be a compiled or interpreted language.

Suitable processors include, by way of example, both general and special purpose microprocessors. Generally, a processor will receive instructions and data

from a read-only memory and/or a random access memory. Generally, a computer will include one or more mass storage devices for storing data files; such devices include magnetic disks, such as internal hard disks and removable disks; magneto-optical disks; and optical disks. Storage devices suitable for tangibly embodying computer program
5 instructions and data include all forms of non-volatile memory, including by way of example semiconductor memory devices, such as EPROM, EEPROM, and flash memory devices; magnetic disks such as internal hard disks and removable disks; magneto-optical disks; and CD-ROM disks. Any of the foregoing can be supplemented by, or incorporated in, ASICs (application-specific integrated circuits).

10 Other embodiments are within the scope and spirit of the description claims. For example, due to the nature of software, functions described above can be implemented using software, hardware, firmware, hardwiring, or combinations of any of these. Features implementing functions may also be physically located at various positions, including being distributed such that portions of functions are implemented at
15 different physical locations.

What is claimed is:

1. A system comprising:
one or more computer systems configured to:
receive data that specifies attributes of a product;
5 search inventory of products to determine potential matches or closely related matches to at least some of the attributes of the products;
generate messages based on the search of inventory to determine the potential matches; and
generate a set of informational depictions of the generated messages, with the
10 informational depictions of the messages when rendered on a display device are rendered in juxtaposition with representations of the products according to the generated positional information.
2. The system of claim 1 further configured to:
15 receive information specifying physical locations of the products; and
generate positional information to associate the messages with the locations of the products in relation to the user location and orientation with respect to the products such that as the user moves through space different products come into and go out of the field of view in the image rendered on the display device; by:
20 retrieving assigned positional information of products;
determine positional information of the user; and
analyze the relative position of the display device and the assigned positional information of products to position the informational depictions according to products in a current view of the image in the display device.
25
3. The system of claim 1 wherein the system is further configured to:
generate an image depicting a representation of the products residing in a physical location, the image augmented with the set of informational depictions of the generated messages in juxtaposition with the representations of the products in the
30 image.
4. The system of claim 1 wherein the system is further configured to:

cause the informational depictions to be projected onto a display device.

5 5. The system of claim 1 wherein the system is further configured to:
 cause the informational depictions to be projected onto a set of eyeglasses
 comprising a display device configured to receive the informational depictions.

 6. The system of claim 1, wherein the system is further configured to:
 generate a representation of the products; and
10 cause the informational depictions to be projected onto a set of eyeglasses
 comprising a display device configured to receive the informational depictions and the
 generated representation of the products.

 7. The system of claim 1, further comprising:
15 a portable computing system configured to:
 receive the generated set of informational depictions; and
 a set of eyeglasses comprising a display device, the display device configured to
 receive the generated set of informational depictions.

20 8. The system of claim 3 wherein the products are automobiles/vehicles
 and the one or more computer systems are further configured to:
 generate the image and an environment containing the automobiles/vehicles;
 and
 generate the informational depictions as pictorial representations that depicted
25 over the corresponding automobiles/vehicles.

 9. A computer program product tangible stored on a computer readable
 storage device, the computer program product for searching product inventory of
 products, the computer program comprising instructions to cause a processor to:
30 receive data that specifies attributes of a product;
 search inventory of products to determine potential matches or closely related
 matches to at least some of the attributes of the products;

generate messages based on the search of inventory to determine the potential matches;

generate positional information associated with the messages; and

generate a set of informational depictions of the generated messages, with the
5 informational depictions of the messages when rendered on a display device are
rendered in juxtaposition with representations of the products according to the
generated positional information.

10 10. The computer program product of claim 9 further comprising
instructions to:

receive information specifying a physical location of the products.

11. The computer program product of claim 9 further comprising
instructions to:

15 generate an image depicting a representation of the products residing in a
physical location, the image augmented with the set of informational depictions of the
generated messages in juxtaposition with the representations of the products in the
image.

20 12. The computer program product of claim 9 further comprising
instructions to:

cause the informational depictions to be projected onto a display device.

25 13. The computer program product of claim 9 further comprising
instructions to:

cause the informational depictions to be projected onto a set of eyeglasses
comprising a display device configured to receive the informational depictions.

30 14. The computer program product of claim 9 further comprising
instructions to:

generate a representation of the products; and

cause the informational depictions to be projected onto a set of eyeglasses comprising a display device configured to receive the informational depictions and the generated representation of the products.

5 15. The computer program product of claim 9 further comprising instructions to:

 send the generated set of informational depictions to a portable computing system; and

 cause a set of eyeglasses comprising a display device to receive the generated
10 set of informational depictions.

 16. The computer program product of claim 9 wherein the products are automobiles/vehicles and the computer program product further comprises instructions to:

15 generate the image and an environment containing the automobiles/vehicles;
 and

 generate the informational depictions as pictorial representations that depicted over the corresponding automobiles/vehicles.

20 17. A method comprising:

 receiving by one or more computer systems data that specifies attributes of a product;

 searching by the one or more computer systems inventory of products to determine potential matches or closely related matches to at least some of the attributes
25 of the products;

 generating by the one or more computer systems messages based on the search of inventory to determine the potential matches;

 generating by the one or more computer systems positional information associated with the messages; and

30 generating by the one or more computer systems a set of informational depictions of the generated messages, with the informational depictions of the messages

when rendered on a display device are rendered in juxtaposition with representations of the products according to the generated positional information.

18. The method of claim 17 further comprising:
5 receiving information specifying a physical location of the products.

10 19. The method of claim 17 further comprising:
generating an image depicting a representation of the products residing in a physical location, the image augmented with the set of informational depictions of the generated messages in juxtaposition with the representations of the products in the image.

15 20. The method of claim 17 further comprising:
causing the informational depictions to be projected onto a display device.

21. The method of claim 17 further comprising:
20 causing the informational depictions to be projected onto a set of eyeglasses comprising a display device configured to receive the informational depictions.

22. The method of claim 17 further comprising:
generating a representation of the products; and
25 causing the informational depictions to be projected onto a set of eyeglasses comprising a display device configured to receive the informational depictions and the generated representation of the products.

23. The method of claim 17 further comprising:
30 sending the generated set of informational depictions to a portable computing system; and

causing a set of eyeglasses comprising a display device to receive the generated set of informational depictions.

24. The method of claim 17 wherein the products are automobiles/vehicles
5 and the method further comprises:

generating the image and an environment containing the automobiles/vehicles;
and

generating the informational depictions as pictorial representations that depicted over the corresponding automobiles/vehicles.

10

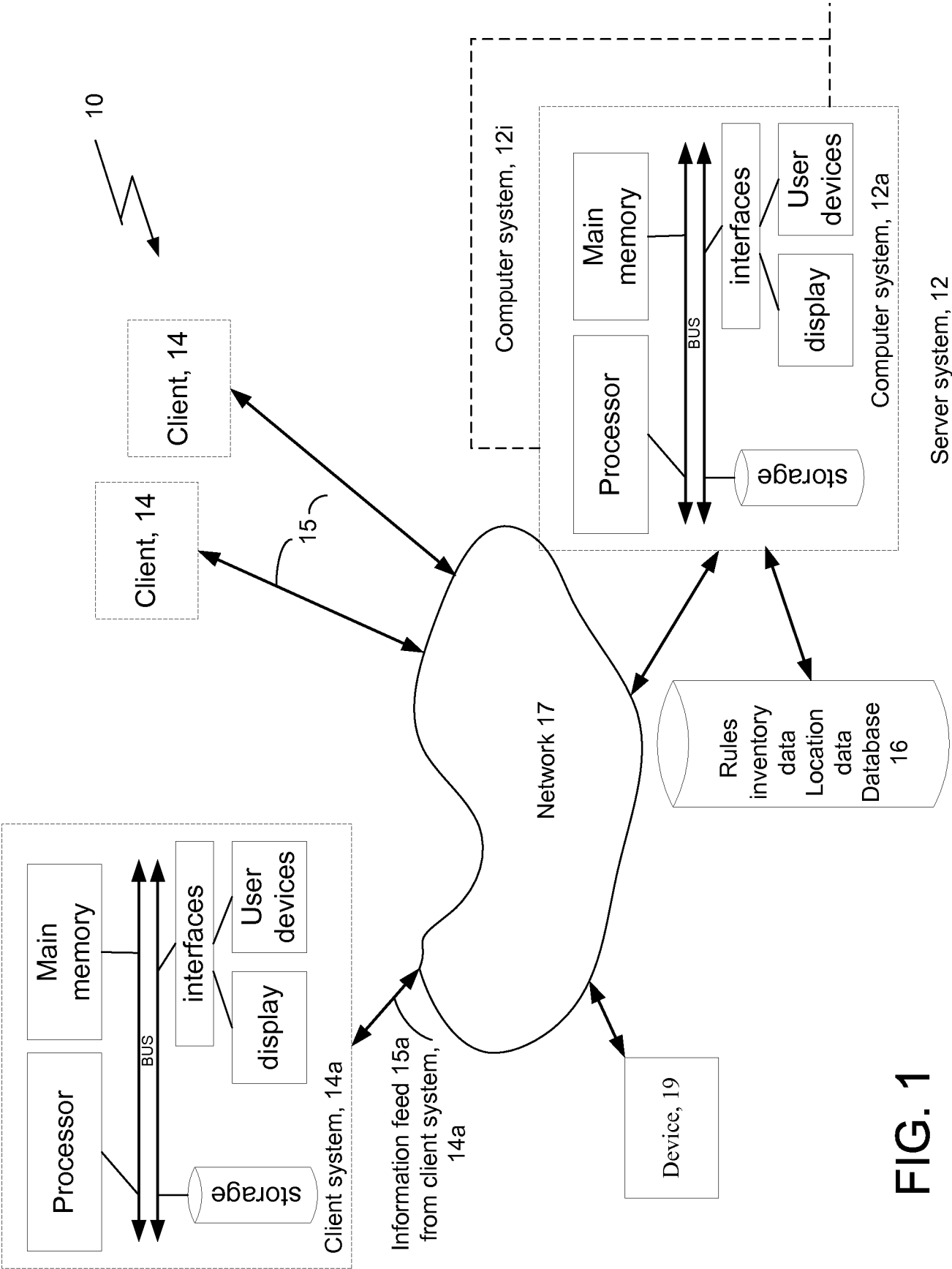


FIG. 1

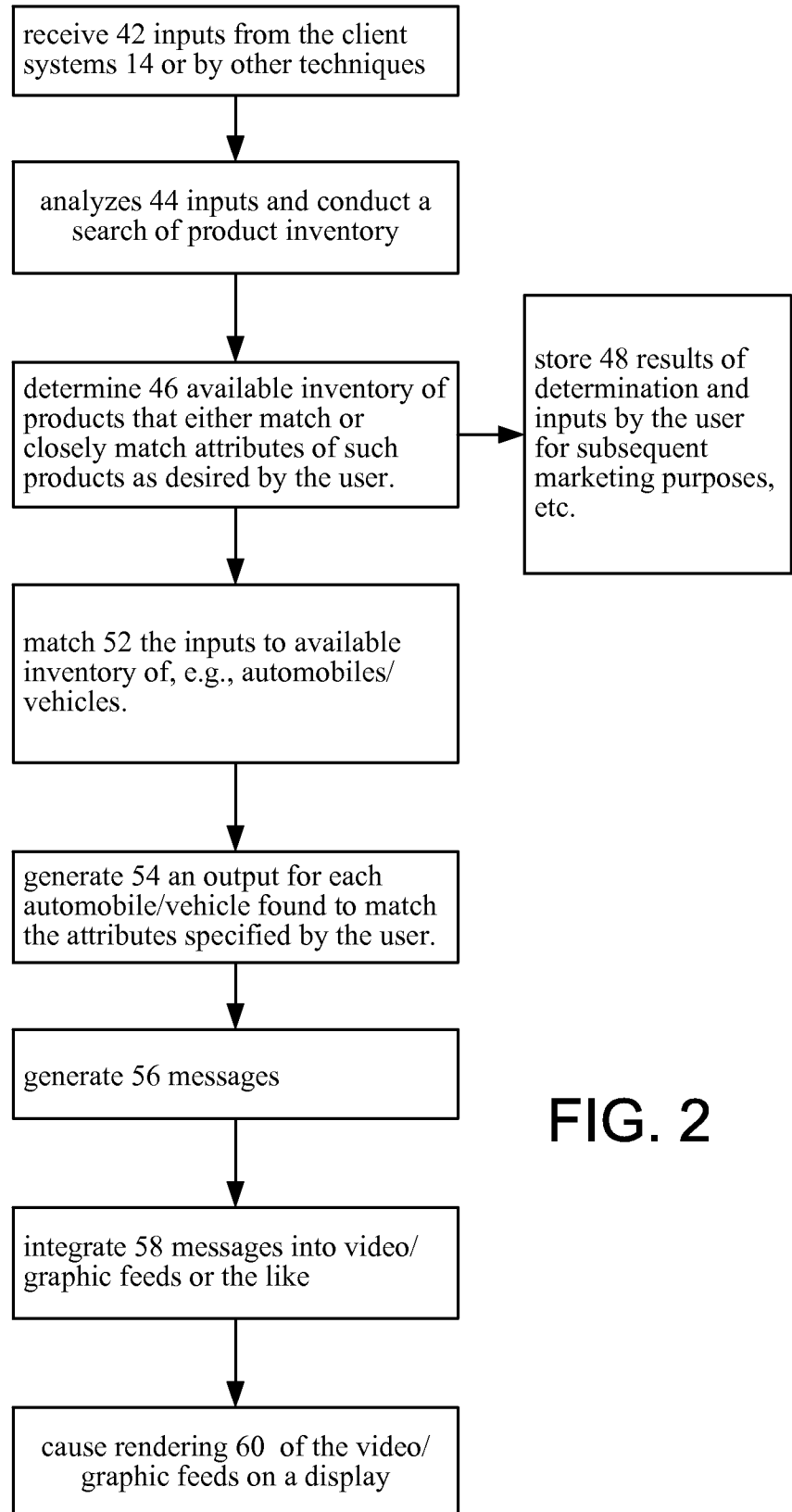


FIG. 2

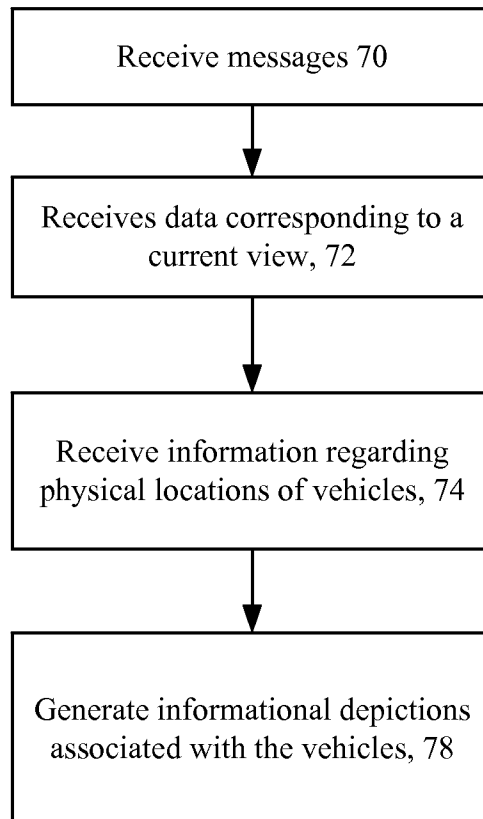


FIG. 3

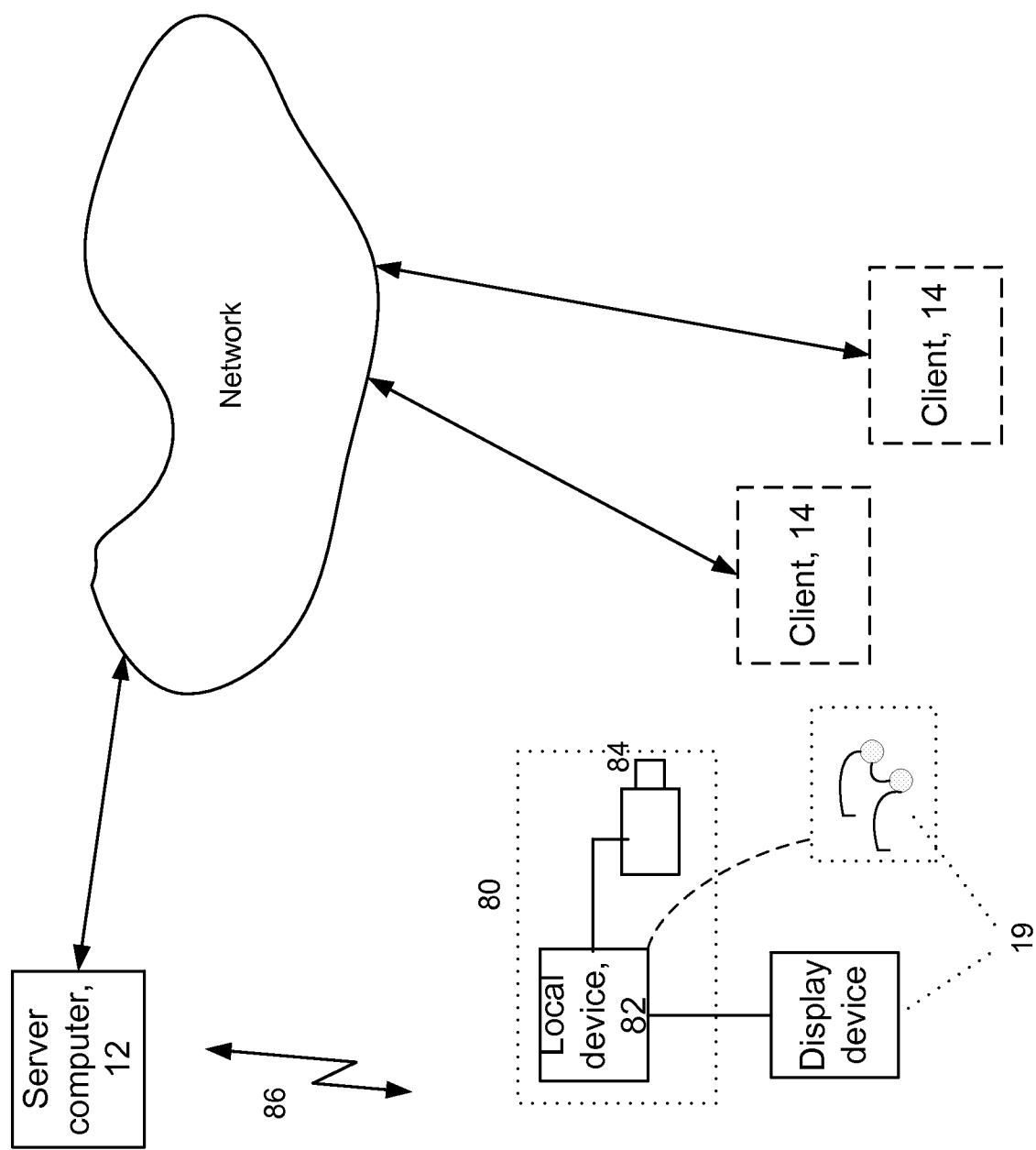


FIG. 4

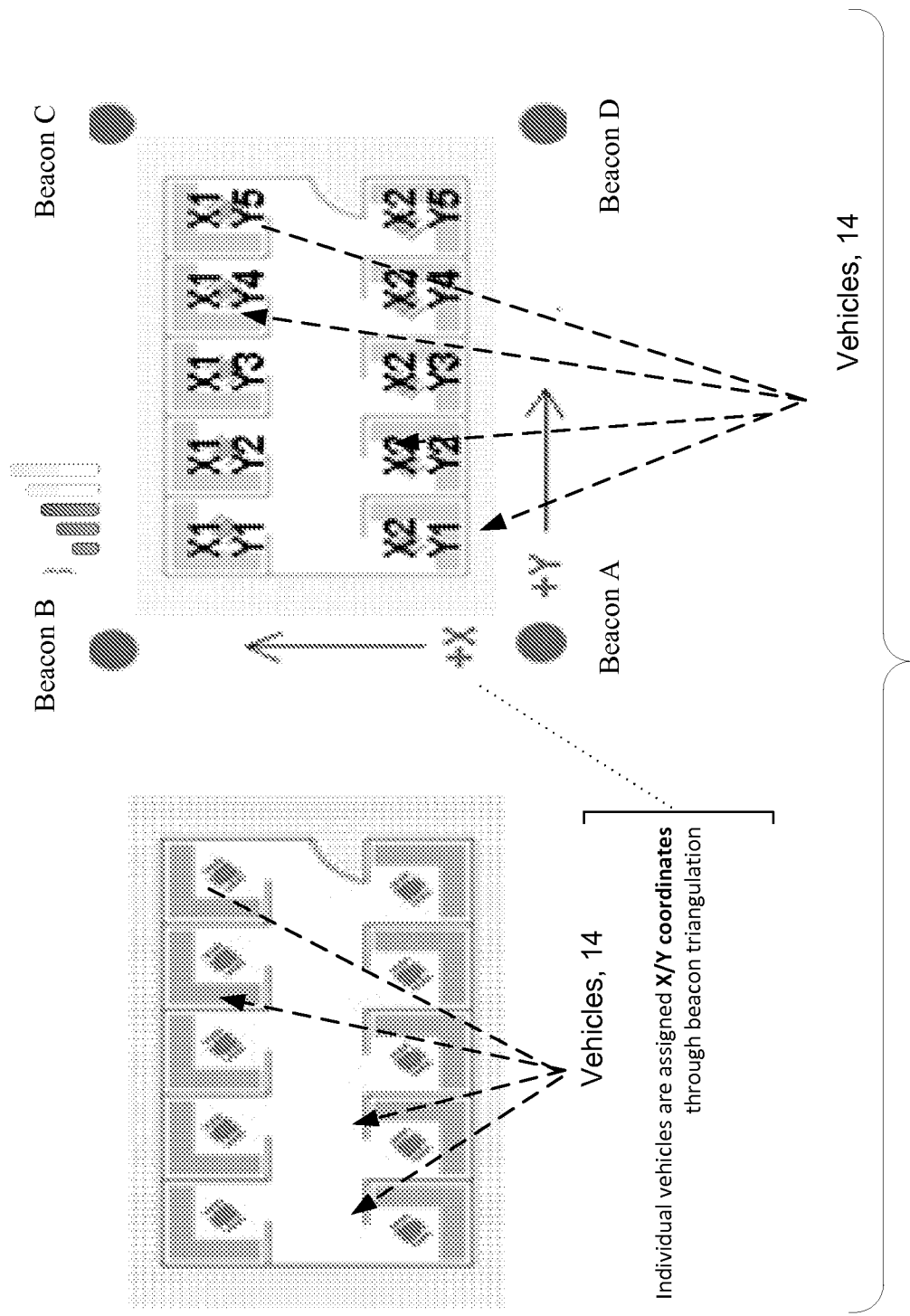


FIG. 5

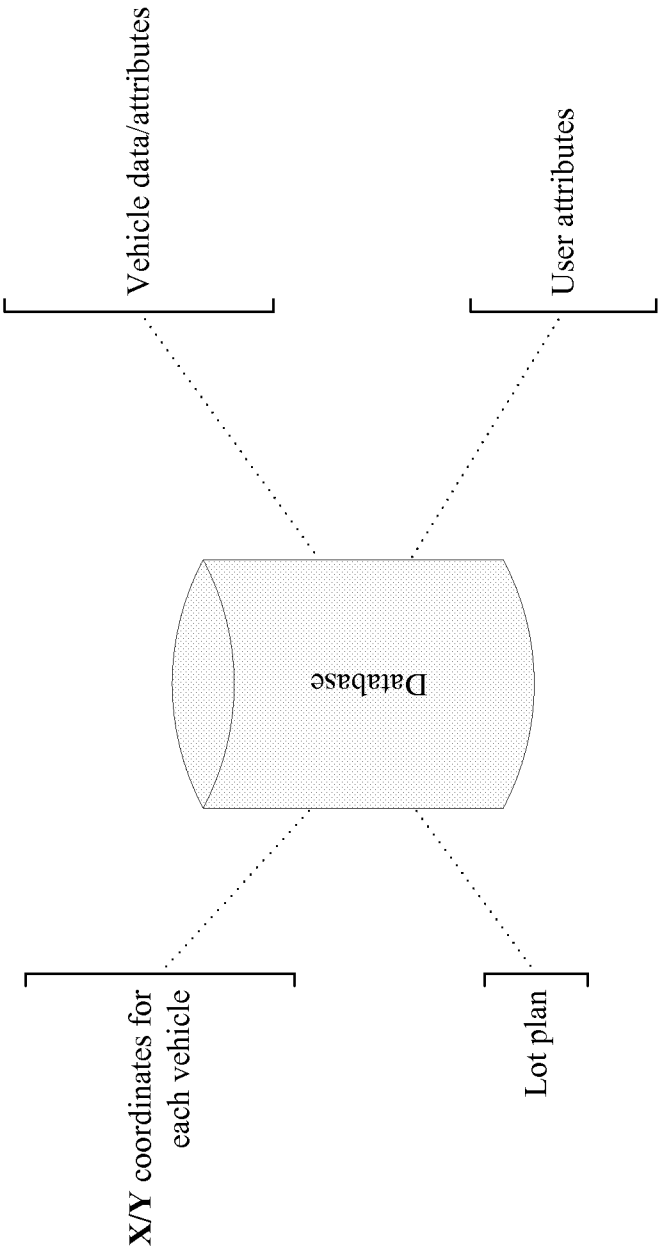


FIG. 6

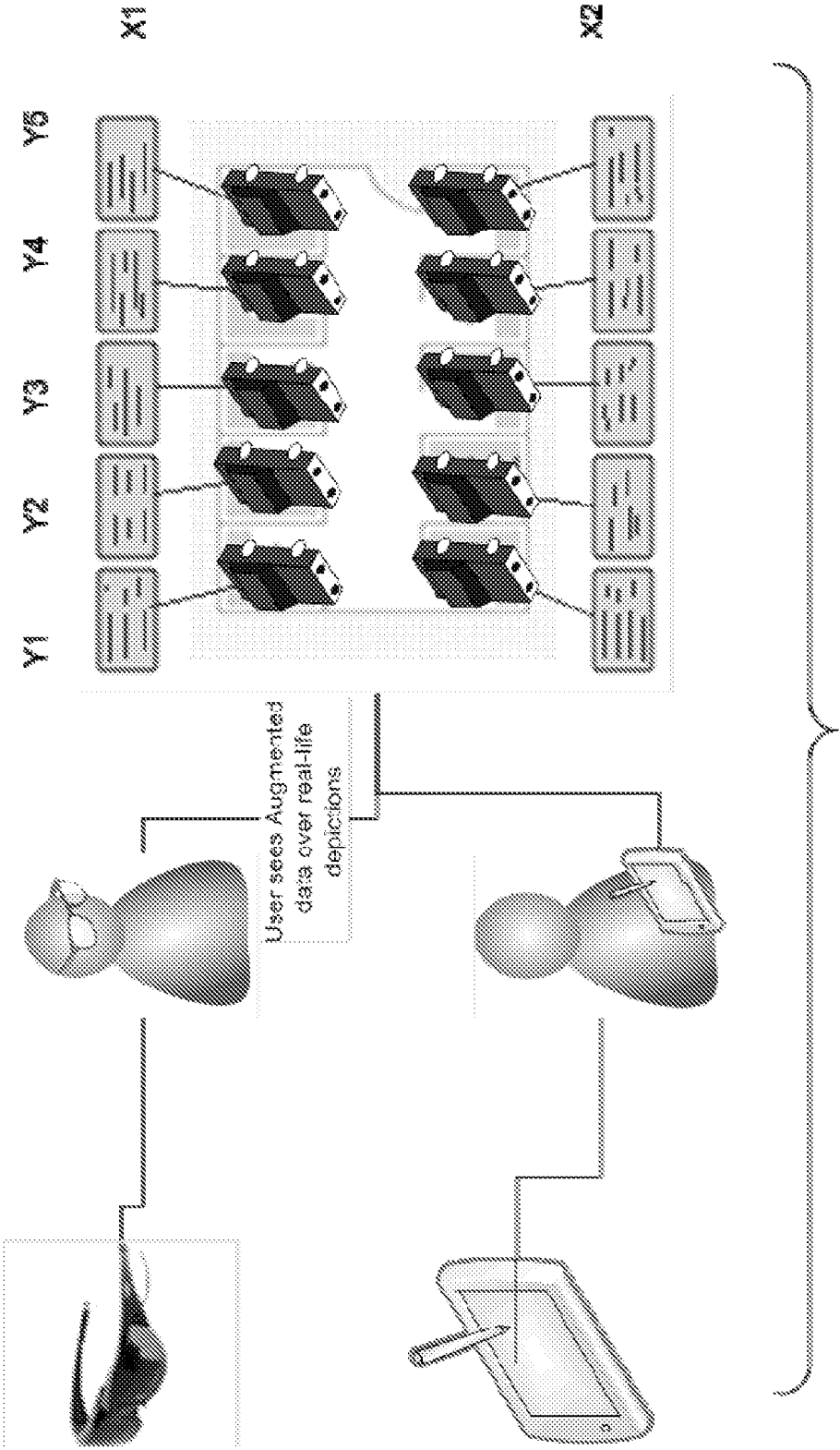


FIG. 7

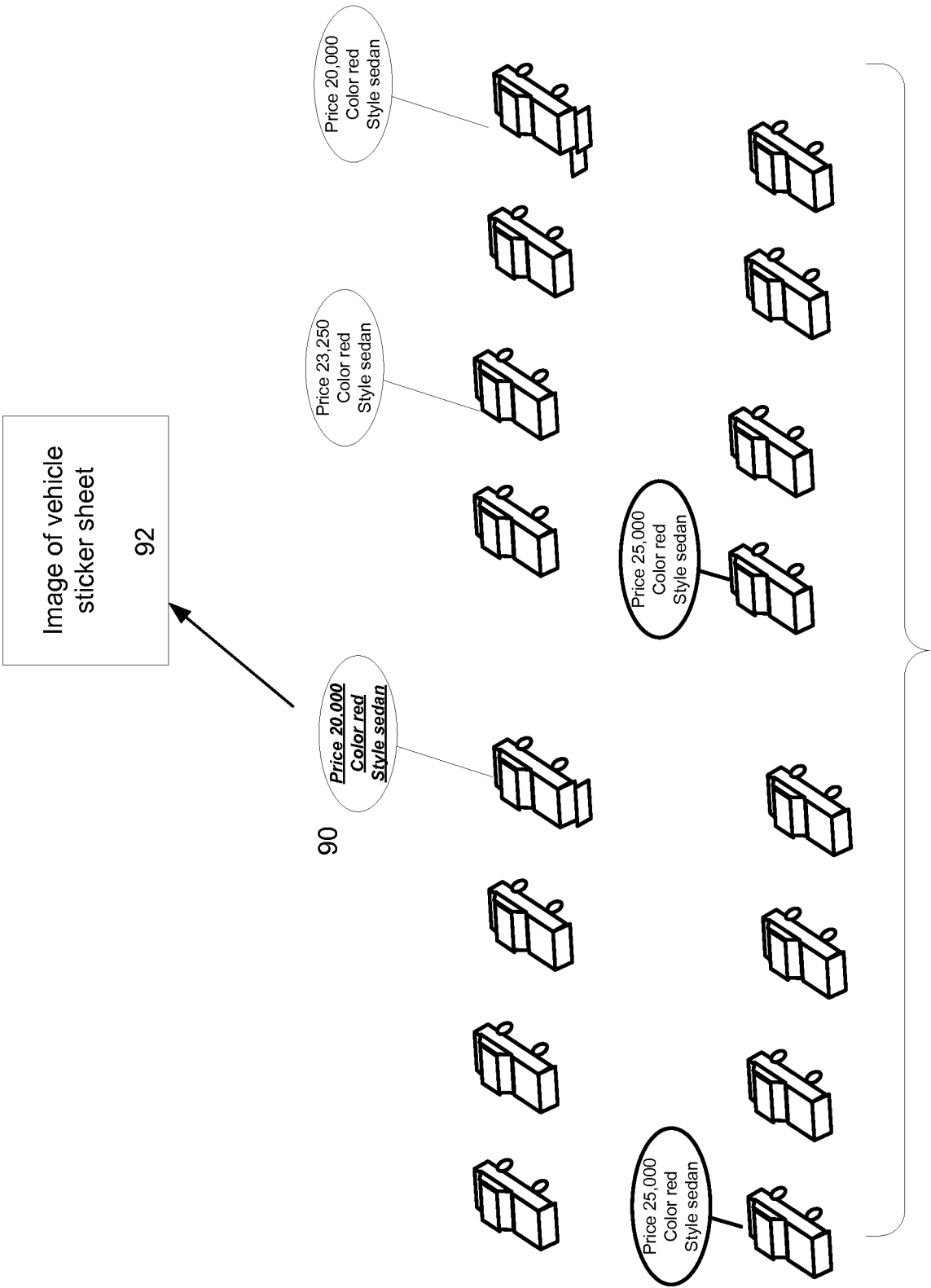


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/029922

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - G06F7/00 (2012.01)

USPC - 707/E17.005

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8) - (2012.01) See Extra Sheet

USPC - See Extra Sheet

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

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

PatBase, Google Patents, Total Patent, Engineering Village

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US20090182499 A1 (BRAVO) 16 July 2009 (16.07.2009) entire document	1-24
A	US6744436 B1 (CHIRIELEISON et al) 01 June 2004 (01.06.2004) entire document	1-24
A	US6289380 B1 (BATTAT et al.) 11 September 2001 (11.09.2011) entire document	1-24
A	US20050261980 A1 (HADI) 24 November 2005 (24.11.2005) entire document	1-24

☐ Further documents are listed in the continuation of Box C.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search

31 May 2012

Date of mailing of the international search report

14 JUN 2012

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/US2012/029922

Continuation of Box B

USPC: 705/26, 27, 27.2; 345/419, 707/E17.005, E17.032

IPC (8): G06F 3/00, 3/048, 7/00, 9/44, 15/16, 17/00, 17/30; G06Q 20/00, 30/00, 50/00; G06T 15/00 (2012.01)