

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

HANSHOW AMERICA INC.,
HANSHOW TECHNOLOGY CO., LTD.,

Petitioners

v.

SES-IMAGOTAG INC.

Patent Owner

Case No.: IPR2024-00190

Patent No. 10,674,340

PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 10,674,340

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Exhibit List

Exhibit	Description
1001	U.S. Patent No. 10,674,340
1002	Prosecution history of U.S. Patent No. 10,674,340
1003	U.S. Patent Application Publication No. 2010/0070365A1 by Siotia (“Siotia”)
1004	Certified translation of Japan Patent Application Publication No. 2009-064316A by Akao (“Akao”)
1005	Japan Patent Application Publication No. 2009-064316A by Akao
1006	U.S. Patent No. 7,283,036B2 by Chen (“Chen”)
1007	U.S. Patent Application Publication No. 2012/0095805A1 by Ghosh (“Ghosh”)
1008	Certified translation of Japan Patent Application Publication No. 2007-155383A by Sakata (“Sakata”)
1009	Japan Patent Application Publication No. 2007-155383A by Sakata
1010	<i>Curriculum Vitae</i> of Dr. Manos M. Tentzeris
1011	Declaration of Dr. Manos M. Tentzeris

Claim List

Claim	Text
[1pre]	A method for communicating spatially localized information to a mobile terminal, the method being performed by a central server configured to access a planogram associating a plurality of unique identifiers of radio-frequency peripherals with a plurality of locations within a predetermined area, each of the plurality of locations being defined by a vertical and horizontal position within a plane perpendicular to a floor of the predetermined area, and each of the plurality of locations being associated one-to-one with a corresponding unique identifier, the method comprising:
[1a]	receiving a communication from a mobile terminal, the communication comprising a unique identifier received by the mobile terminal from a radio-frequency peripheral located in the predetermined area, the unique identifier being particular to the radio-frequency peripheral, wherein the radio-frequency peripheral includes an antenna and an electronic chip configured for near-field communication, and is configured to be activated by the mobile terminal when the radio-frequency communication peripheral is within a communication range of the mobile terminal, wherein the communication range is less than twenty centimeters;
[1b]	determining a location of the mobile terminal within the predetermined area based on the location associated with the unique identifier of the received communication in the planogram, the location of the mobile terminal comprising the vertical and horizontal position of said location; and
[1c]	transmitting to the mobile terminal spatially localized information associated with the location of the mobile terminal.
[2]	The method according to claim 1, further comprising: when the mobile terminal is positioned relative to the radio-frequency communication peripheral within the communication range, energy

	of electromagnetic waves emitted by the mobile terminal activating the radio-frequency communication peripheral, thereby setting-up a radio-frequency communication between the mobile terminal and the radio-frequency peripheral, wherein the communication range is a range of the electromagnetic waves emitted by the mobile terminal.
[3]	The method according to claim 1, wherein the central server receiving the communication from the mobile terminal is via the Internet.
[4]	The method according to claim 1, wherein the spatially localized information is further associated with account data specific to the user of the mobile terminal previously stored in a database accessible to the central server via a communication network.
[5pre]	A system for communicating spatially localized information to a mobile terminal, the system comprising:
[5a]	a central server configured to access a planogram associating a plurality of unique identifiers of radio-frequency peripherals with a plurality of locations within a predetermined area, each of the plurality of locations being defined by a vertical and horizontal position within a vertical plane of the predetermined area, and each of the plurality of locations being associated one-to-one with a corresponding unique identifier;
[5b]	a mobile terminal configured to communicate with the central server; and;
[5c]	a plurality of radio-frequency peripherals distributed throughout the predetermined area, wherein each radio-frequency peripheral includes an antenna and an electronic chip configured for near-field communication, and is configured to be activated by the mobile terminal when the radio-frequency communication peripheral is within a communication range of the mobile terminal, wherein the communication range is less than twenty centimeters,

[5d]	wherein the central server is configured to:
[5e]	receive a communication from a mobile terminal, the communication comprising a unique identifier received by the mobile terminal from a radio-frequency peripheral located in the predetermined area, the unique identifier being particular to the radio-frequency peripheral;
[5f]	determine a location of the mobile terminal within the predetermined area based on the location associated with the unique identifier of the received communication in the planogram, the location of the mobile terminal comprising the vertical and horizontal position of said location; and;
[5g]	transmit to the mobile terminal spatially localized information associated with the location of the mobile terminal.
[6pre]	The system according to claim 5, wherein at least one radio-frequency peripheral is an electronic label which comprises:
[6a]	a radio-frequency communication module configured to receive data representing information relating to an item from a central server;
[6b]	a memory to store said data;
[6c]	a microcontroller to control the display of information relating to an item;
[6d]	a display screen to display said item-related information.
[7]	The system according to claim 6, wherein the mobile terminal is adapted to transmit data to the electronic label via the radio-frequency communication module of said electronic label.
[8]	The system according to claim 5, wherein the chip and the antenna are arranged at different points of the radio-frequency peripheral, and wherein the radio-frequency peripheral comprises connections configured to ensure a communications link between the antenna and the chip.

[9]	The system according to claim 8, wherein the chip is connected to a microcontroller of the radio-frequency peripheral, and wherein the antenna is arranged on or within a case inside which the microcontroller is housed.
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In accordance with 35 U.S.C. § 311, Petitioners Hanshow America Inc. and Hanshow Technology Co., Ltd. respectfully request *inter partes* review (“IPR”) of Claims 1–9 (the “Challenged Claims”) of U.S. Patent No. 10,674,340 (“the ’340 Patent”), attached hereto as Exhibit 1001.

I. MANDATORY NOTICES

A. Real Party In Interest

The real parties-in-interest, pursuant to 37 C.F.R. § 42.101(b)(1), are Hanshow America Inc. (“Hanshow America”), having a place of business at 219 36th Street, Box #25, Brooklyn, New York 11232, United States, and Hanshow Technology Co., Ltd. (“Hanshow Technology”), having a place of business at Floor 4, Building 1 and Floor 7, Building 5, Jiaxing Guangfu Innovation Park, No. 1288 Kanghe Road, Xiuzhou District, Jiaxing, Zhejiang Province, China (collectively, “Petitioners” or “Hanshow”).

B. Related Matters

The following litigation involves allegations of non-infringement or invalidity of the ’340 Patent, and may be affected by a decision in this proceeding:

- *SES-imagotag SA, SES-imagotag Gmbh and SES-imagotag Inc. v. Hanshow America Inc. and Hanshow Technology Co. Ltd.*, Case No. 1:23-cv-1667 (E.D.N.Y.).

Petitioners are unaware of any applications that claim the benefit of the ’340 Patent and may be affected by a decision in this proceeding.

C. Counsel And Service Information

Petitioners provide the following designation of counsel, to which all correspondence should be addressed.

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II. GROUNDS FOR STANDING AND IDENTIFICATION OF CHALLENGE

A. Standing

Petitioners certify, pursuant to Rule 42.104(a), that the '340 Patent is available for IPR and that Petitioners are not barred or estopped from requesting an IPR of the Challenged Claims on the grounds identified in this Petition, in particular, Petitioners certify that Petitioners are not barred from requesting the current IPR by 35 USC 315(b) because the current Petition is filed within 1 year after Petitioners were served with a complaint alleging infringement of the '340 Patent. Petitioners further certify that fees due for this Petition under Rule 42.15 have been tendered together with this Petition, pursuant to Rule 42.103.

B. Statutory Grounds for Each Claim

Petitioners request IPR of Claims 1–9 in view of the following:

Ground	Proposed Statutory Rejections for the '340 Patent
1	Claims 1-5, 8 are obvious over Siotia and Sakata
2	Claims 6-7, 9 are obvious over Siotia, Sakata, and Akao
3	Claims 8-9 are obvious over Siotia, Sakata, Akao, and Chen
4	Claims 1-3, 5, 8 are obvious over Ghosh and Sakata
5	Claims 6-7, 9 are obvious over Ghosh, Sakata, and Akao
6	Claims 8-9 are obvious over Ghosh, Sakata, Akao, and Chen

The '340 Patent claims priority to an April 11, 2012 filing date. Ex.1001, (63). As explained in sections III.E–J below, each reference listed in the preceding table qualifies as prior art under 35 U.S.C. § 102.

C. Claim Construction

Claims only need to be construed to the extent necessary to resolve a controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017). For the purposes of this IPR, Petitioners, at the time of this Petition, believe that no claim construction is necessary to resolve the controversy involved in this IPR, and the terms of the '340 Patent should be given their ordinary and customary meaning as understood by a person of ordinary skill in the art at the time of the claimed invention. Petitioners reserve all rights to propose or supplement claim constructions at a later stage of this IPR and/or in other proceedings, including but not limited to the litigation pending before the Eastern District of New York.

D. How The Challenged Claims Are Unpatentable And Evidence Supporting Challenge

A detailed explanation of how the Challenged Claims are unpatentable is provided in the following sections. An Exhibit List and a Claim List are attached. *See pp. v, vi-ix.* Relevance of the evidence, including identifying the specific portions of the evidence that support the challenge, may be found in the following sections.

III. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Background of the Field

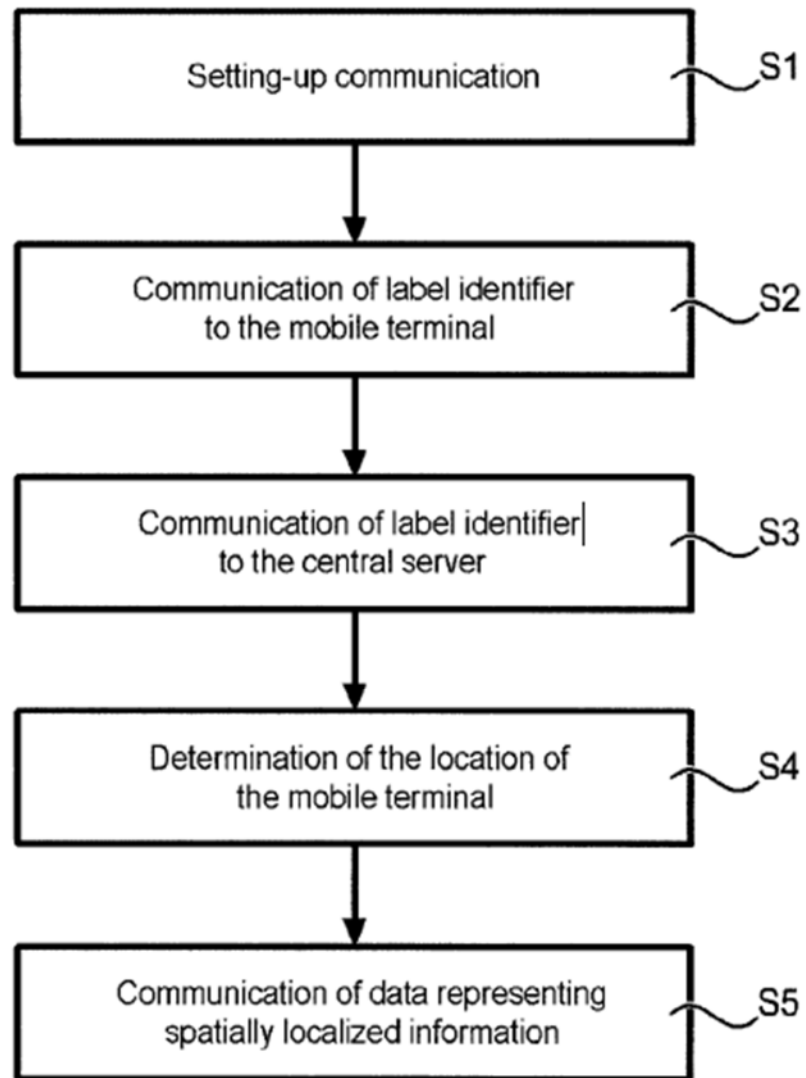
As explained in more detail below, the '340 Patent is directed to the display of information in a sales area and communicating spatially localized information to a mobile terminal. *See* Section III.B.

Such methods and systems are well established in the art. For example, U.S. Patent App. Pub. No. 2010/0070365A1 (“Siotia”) discloses a method and system of facilitating shopping within a store that provides guided shopping information (spatially localized information) to a wireless device (mobile terminal). Ex. 1003, [Abstract]. In another example, Japan Patent Application Publication No. 2009-064316A (“Akao”) discloses an electronic shelf label system that “can provide the product information required by customers from electronic shelf label to the customer’s mobile device, increase the convenience of the customer, and promote the purchase of products.” Ex. 1004, [0011].

B. Overview of the Alleged Inventions

The '340 Patent is directed to “the display of information in the sales area.” Ex. 1001, [1:18-19]. As illustrated in FIG. 4 reproduced below, the '340 Patent alleges the invention of a “means for providing consumers with spatially localized information, in relation to the place and context of a consumer, which complements the information already visually available in a sales area.” Ex. 1001, [2:8-12].

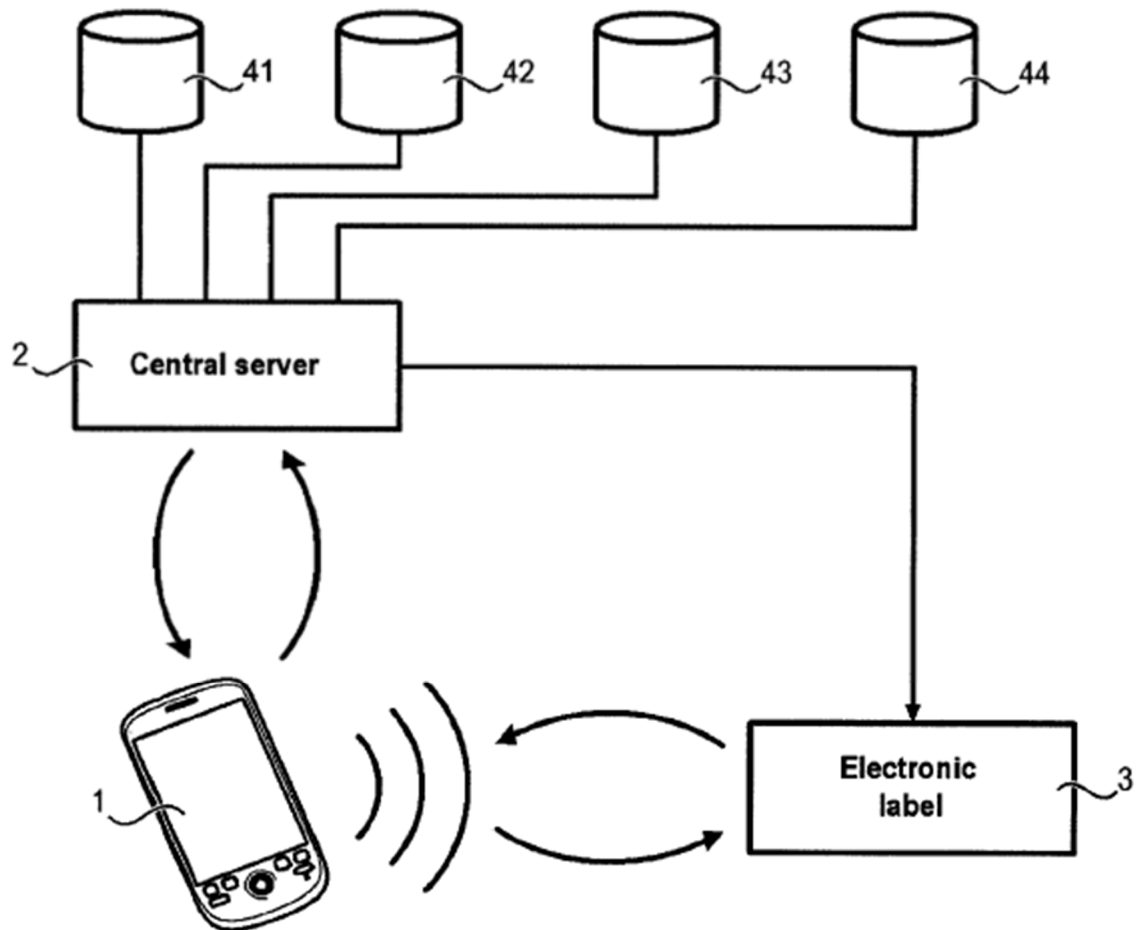
FIG. 4



Ex. 1001, FIG. 4.

The '340 Patent claims to have invented a system to carry out such method, as shown in FIG. 1, reproduced below.

FIG. 1



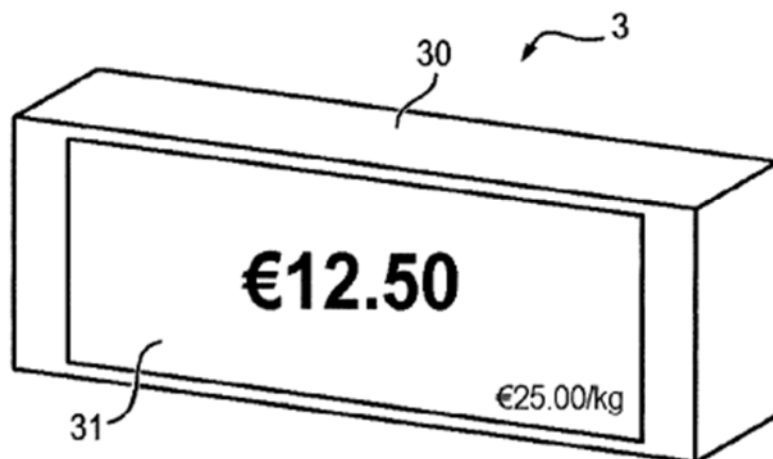
Ex. 1001, FIG. 1.

The '340 Patent claims a method for communicating spatially localized information to such a mobile terminal. Ex. 1001, [Claims 1-4].

The '340 Patent further claims radio-frequency peripherals that are electronic labels capable of displaying information relating to an item, as well as certain

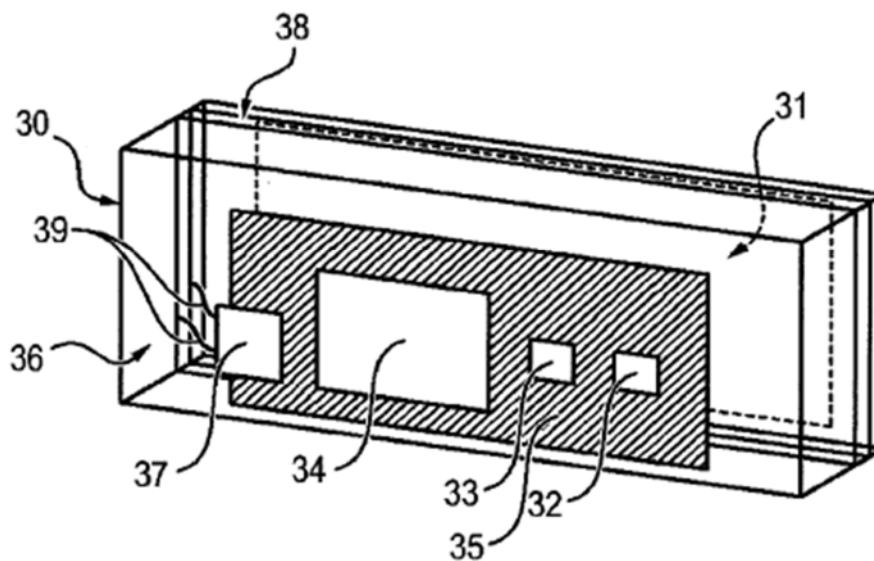
structures of radio-frequency peripherals, as illustrated in FIGs. 2 and 3 reproduced below. Ex. 1001, [Claims 5-9].

FIG. 2



Ex. 1001, FIG. 2.

FIG. 3



Ex. 1001, FIG. 3.

This Petition demonstrates that the alleged inventions were well known before the claimed priority date of the '340 Patent, rendering Claims 1-9 unpatentable.

C. The Level of Skill in the Art

A person of ordinary skill in the art relating to the subject matter of the '340 Patent as of the Critical Date ("POSITA") would have had at least a Master of Science Degree in an academic area emphasizing electrical engineering, computer engineering, wireless telecommunication systems, or an equivalent field (or a similar technical Master's Degree, or higher degree). Ex. 1011, ¶34. Alternatively, a POSITA would have had a Bachelor's Degree (or higher degree) in an academic area emphasizing electrical engineering, computer engineering, wireless telecommunication systems, or an equivalent field with two or more years of work experience in electrical engineering, wireless telecommunication systems, computer engineering, or an equivalent field. *Id.* Additional education in a relevant field or relevant industry experience may compensate for a deficit in one of the other aspects of the requirements stated above. *Id.*

D. Principles of Law

A claim is unpatentable under § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*,

550 U.S. 398, 406 (2007). “If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. . . . [I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *Id.* at 417. In evaluating obviousness, “[t]he question is not whether the combination was obvious to the patentee but whether the combination was obvious to a person with ordinary skill in the art.” *Id.* at 420.

The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. *Id.* at 416. Such an obvious combination occurs when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, when a patent claims a device combining pre-existing elements that each did no more than they would in separate, sequential operation, and when a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement. *Id.* at 416-7.

Prior art can be used to show the obviousness of a patent if the reference is “analogous art” to the patent. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). A reference is analogous art if the reference is from the same field of endeavor as the

patent, regardless of the problem addressed. *Id.* The field of endeavor is determined by reference to explanations of the alleged invention’s subject matter in the patent application, including the embodiments, function, and structure of the claimed invention. *Id.* at 13256–26.

E. Ground 1: Claims 1-5 and 8 are rendered obvious by Siotia in combination with Sakata

As set forth in detail below, Siotia in combination with Sakata (“Siotia-Sakata”), discloses each and every limitation recited by claims 1-5 and 8. Ex. 1011, ¶64. Furthermore, a POSITA would have had a reason to combine Siotia with Sakata and would have had a reasonable expectation of success in doing so. *Id.*

1. Siotia

U.S. Patent App. Pub. 2010/0070365A1 (“Siotia”) discloses a “method and system of facilitating shopping within a store.” Ex. 1003, [Abstract]. In particular, it discloses detection of a wireless device and provision of guided shopping information to the wireless device by accessing item location data. Ex. 1003, [Abstract]. FIG. 6 of Siotia, reproduced below, depicts an embodiment of the system.

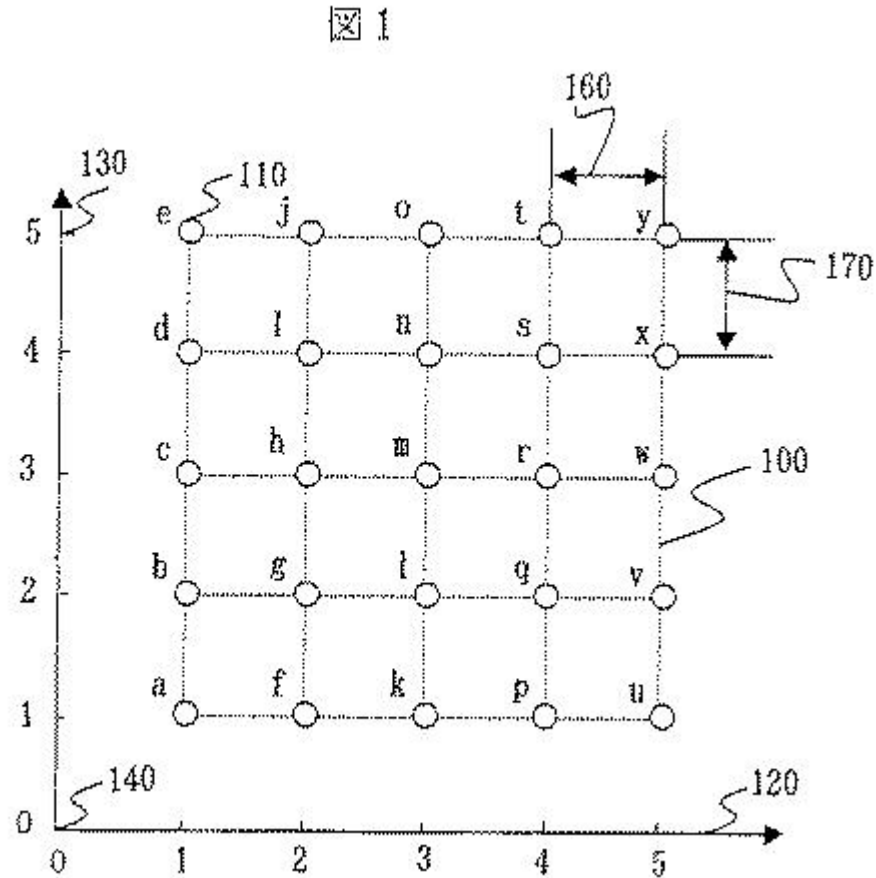
Siotia qualifies as prior art under pre-AIA 35 U.S.C. § 102(b) because it was published on March 18, 2010, which is more than one year before the '340 Patent's April 11, 2012 claimed priority date. Ex. 1003, (43).

Siotia is analogous prior art to the '340 Patent. The '340 Patent alleges an invention of a “means for providing consumers with spatially localized information, in relation to the place and context of a consumer, which complements the information already visually available in a sales area” (Ex. 1001, [2:8-12]) while Siotia is directed to “the provision of guided shopping information to [the consumer's] wireless device by accessing item location” (Ex. 1003, [Abstract]). Thus, both Siotia and the '340 Patent are in the same field of endeavor of providing customers with spatially localized information. Ex. 1011, ¶59.

2. Sakata

Japan Patent Application Publication No. 2007-155383A by Sakata (“Sakata”) discloses “a position information identifying member that can be easily installed at an arbitrary location or position, and can accurately identify position information both outdoors and indoors without radio wave interference.” Ex. 1008, [0007]. Sakata discloses that the invention “is based on the idea that by arranging IC tags (RFID: Radio Frequency Identification), each of which has a unique ID, in a matrix pattern based on a two-dimensional coordinate system, and by mapping the unique ID of an IC tag to an address (x, y) in the coordinate system.” Ex. 1008,

[0012]. Sakata discloses that such two-dimensionally arranged IC tags can be spread on a wall of a building. Ex. 1008, [0011], [0019]. FIG. 1 of Sakata shows a diagram of such two-dimensional arrangement.



Ex. 1008, FIG. 1.

Sakata further discloses that the readable distance of the IC tags must be kept sufficiently smaller than the coordinate point interval, and the latter can be as low as 1cm. Ex. 1008, [0015], [0022]. Sakata discloses that the IC tags are read non-contact, using the radio waves received as operating power. Ex. 1008, [0022].

Sakata qualifies as prior art under pre-AIA 35 USC § 102(b) because it was published on June 21, 2007, which is more than one year before the '340 Patent's April 11, 2012 claimed priority date. Ex. 1008, (43).

Sakata is analogous prior art to the '340 Patent. The '340 Patent discloses methods and systems involving short-range communication via radio-frequency between a mobile terminal and a radio-frequency peripheral for the purposes of location identification (Ex. 1001, [5:45-48], [5:65-67], [6:48-51]) while Sakata is directed to a position information identifying member that utilizes RFIDs with short communication ranges that may communicate with reader devices for the purposes of location identification (Ex. 1008, [0007], [0012], [0022]). Thus, both Sakata and the '340 Patent are in the same field of endeavor for short-range radio-frequency communications between reading devices and tags for the purposes of location identification. Ex. 1011, ¶63.

3. Claim 1

a. [1Pre]

The portion “A method for communicating spatially localized information” of [1pre] is not limiting, because it merely states the purpose or intended use of the alleged invention. Ex. 1011, ¶65. It does not define any of the claim limitations, which are set forth fully in the body of the claim (i.e., a communicating method of

spatially localized information). *Id.* But even if it were limiting, the prior art discloses this portion, as discussed in Section III.E.3.d below.

Siotia discloses a store **planogram** containing data that indicates the **location** of store items. Ex. 1003, [0023]. Siotia discloses a store server 104 (**central server**) that may be configured to access the planogram. Ex. 1003, [0039]. Siotia discloses that the store items may have radio frequency identifications (RFIDs), and thus teaches the claimed **radio-frequency peripherals**. Ex. 1003, [0041].

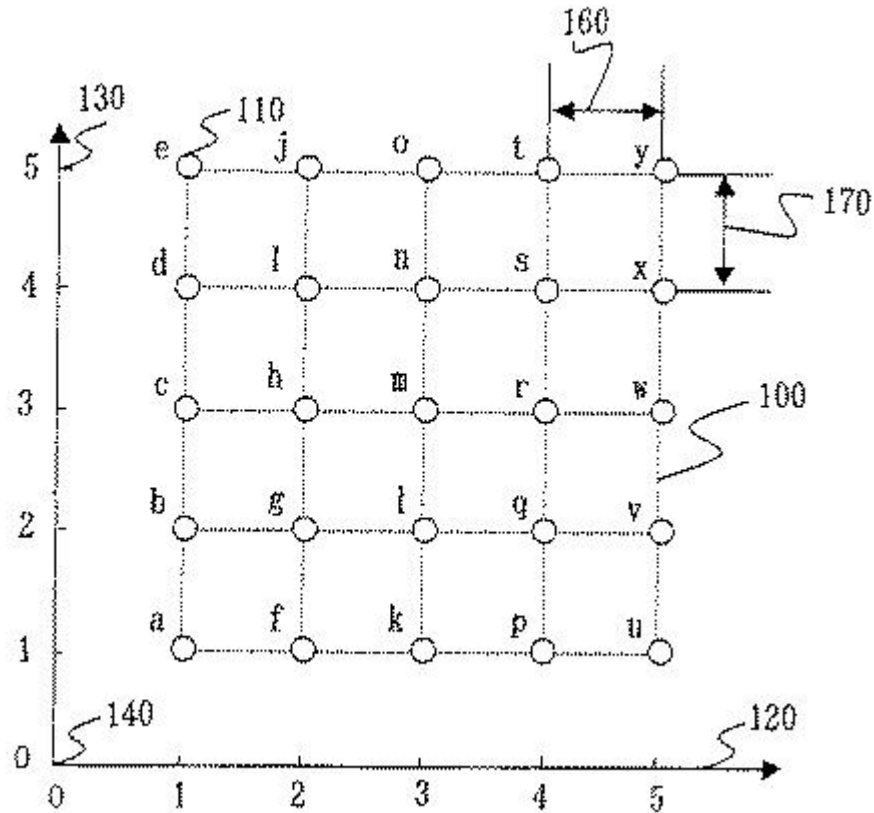
Sakata discloses “IC tags (RFID: Radio Frequency Identification), each of which has a unique ID.” Ex. 1008, [0012]. A POSITA would recognize that Sakata’s IC tag (RFID) is functionally and structurally equivalent to Siotia’s RFID tag. Ex. 1011, ¶67. Thus, a POSITA would find it obvious to implement Sakata’s disclosures of RFIDs in Siotia’s RFID. *Id.* Further, Sakata discloses “a coordinate point-to-IC tag ID correspondence table 200 and a coordinate basic information management table 300.” Ex. 1008, [0016]. A POSITA would recognize that these tables are functionally and structurally analogous to Siotia’s planogram. Ex. 1011, ¶67. Thus, a POSITA would find it obvious to implement Sakata’s disclosures of location-ID correspondence in Siotia’s planogram. *Id.*

By thus implementing Sakata’s IC tags in Siotia’s RFID and Sakata’s location-ID correspondence in Siotia’s planogram, a POSITA would find that the

Siotia-Sakata combination teaches the claimed **radio-frequency peripherals** (RFIDs) with **unique identifiers** (the unique IDs of Sakata) that are **associated one-to-one** with the item locations and **particular to** the RFID (as disclosed by Sakata's location-ID correspondence). Ex. 1011, ¶68. The Siotia-Sakata combination also teaches that the planogram associates the unique identifiers with the **locations** of the item within the **predetermined area** of the store, and that such association is **one-to-one**, as such association is inherent in Sakata's location-ID correspondence. *Id.*

Sakata discloses that the IC tags are placed in a matrix pattern based on a two-dimensional coordinate system, with each tag placed on a coordinate point. Ex. 1008, [0012], [0015]. Sakata further discloses that “[t]he IC tag coordinate system... is constituted by a one-to-one correspondence between the unique ID held by each IC tag 110 located at each coordinate point of the two-dimensional coordinate IC tag location information holding means 100 and the address on the coordinate system (X coordinate system and Y coordinate system).” Ex. 1008, [0016]. FIG. 1 of Sakata shows the placement of IC tags on the coordinate system.

FIG. 1

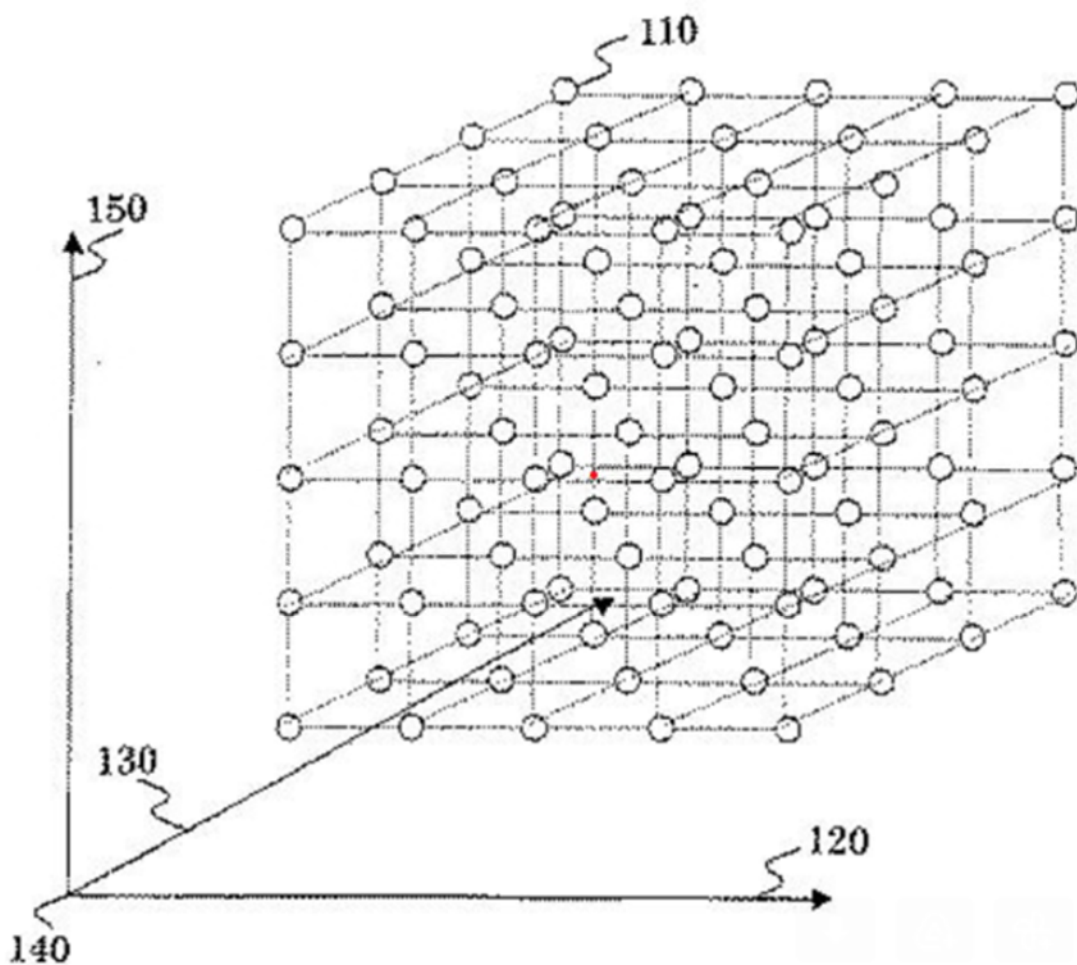


Ex. 1008, FIG. 1.

Sakata further discloses that the two-dimensional IC tag arrangement can be on a wall of a building. Ex. 1008, [0011], [0013], [0019]. Thus Sakata discloses the claimed “each of the plurality of locations (*IC tag position*) being defined by a vertical (*y coordinate*) and horizontal (*x coordinate*) position within a plane (*the wall*) perpendicular to a floor of the predetermined area (*the building*)” of [1pre]. Ex. 1011, ¶70. Sakata, through its disclosure that the IC tags can be arranged in a three-dimensional coordinate system (Ex. 1008, [0021], FIG. 6), further teaches this

limitation, because a three-dimensional coordinate system inherently includes at least one claimed two-dimensional vertical-plane coordinate system. Ex. 1011, ¶70.

FIG. 6



Ex. 1008, FIG. 6.

Further, as discussed in Section III.E.9 below, a POSITA reading Siotia in view of Sakata would recognize that it is obvious to implement Sakata's 2-dimensional vertical arrangement of tags in Siotia's planogram, especially because Siotia already shows, through figures in the specification (such as Figure 6 attached

and annotated below), that the tags are placed at locations **defined by a vertical and horizontal position within a plane** (the display plane of the smart poster) **perpendicular to a floor of the predetermined area** of the store. Ex. 1011, ¶71.

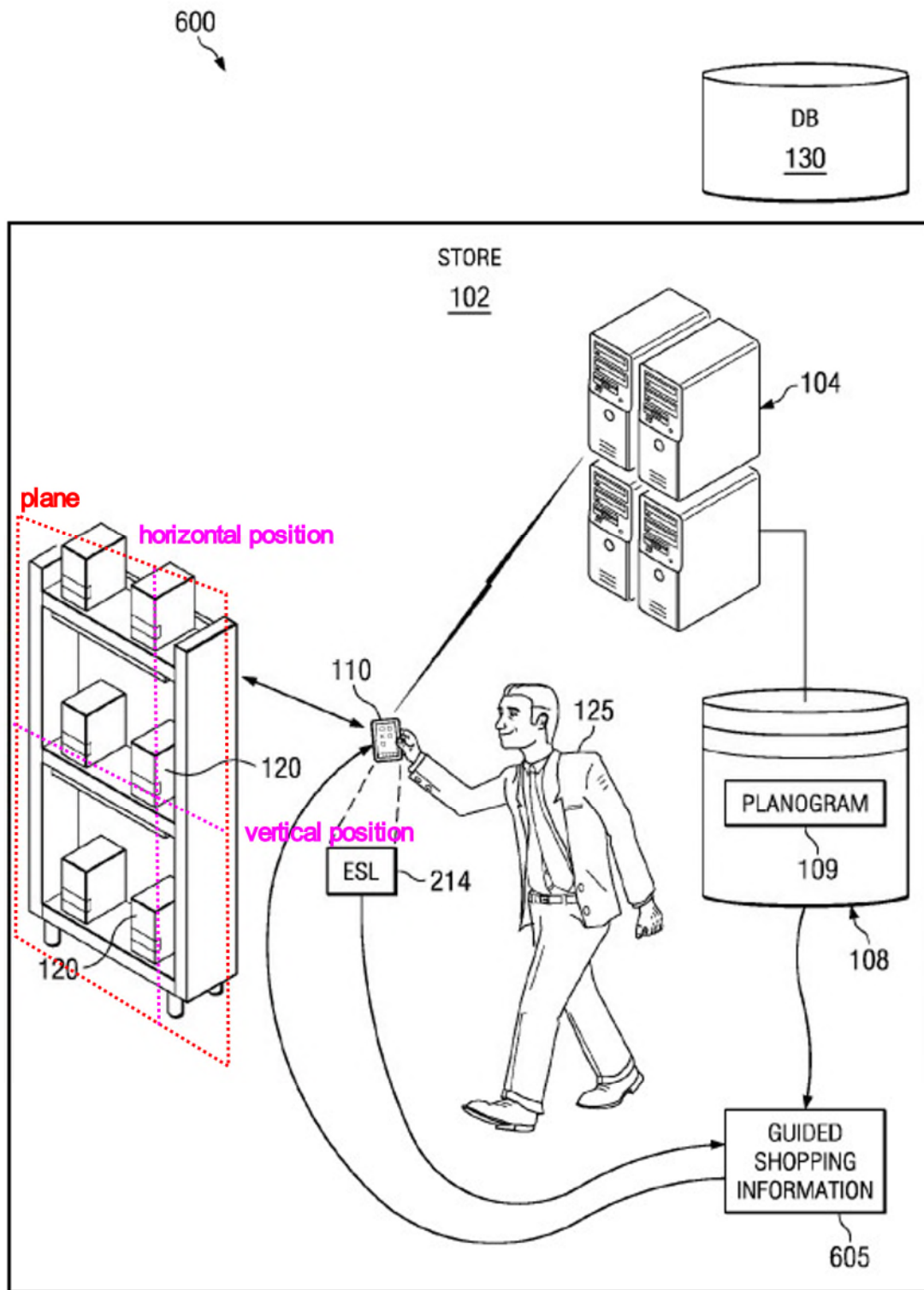
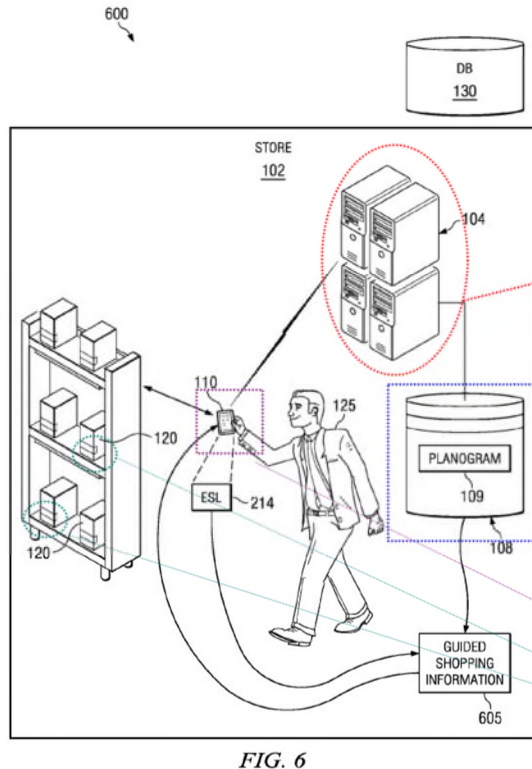


FIG. 6

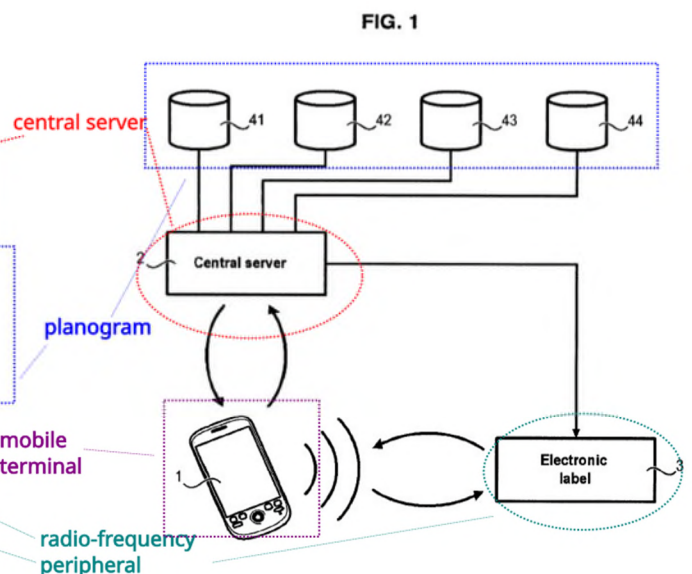
Ex. 1003, FIG. 6 (annotated)

Siotia further discloses a mobile device 110 (**mobile terminal**). Ex. 1003, [0041]. Sakata discloses a reading device that can read the unique IDs of the IC tags. Ex. 1008, [0008], [0012]. Sakata discloses that the reading device can be “installed on a cane, footwear, cart, or self-propelled robot” and is therefore mobile. Ex. 1008, [0011]. Thus, a POSITA would recognize that Sakata’s reading device is functionally and structurally analogous to Siotia’s mobile device 110, and would find it obvious to implement the reading device-IC tag interaction of Sakata in Siotia’s mobile device 110 and RFID device. Ex. 1011, ¶72.

The following annotated figure shows the correspondence between the components of Siotia and the components of the ’340 Patent.



Ex. 1003, FIG. 6



Ex. 1001, FIG. 1

Thus, Siotia-Sakata discloses each and every limitation of [1pre]. Ex. 1011, ¶75. In particular, Siotia discloses the central server, the planogram, the radio-frequency peripherals, and the mobile terminal, Sakata then supplements Siotia by explicitly disclosing the vertical-plane placement of radio-frequency peripherals and the location-unique ID association. Ex. 1011, ¶74.

b. [1a]

Siotia discloses that a mobile device 110 (**mobile terminal**) may be utilized to detect a radio frequency identification (RFID) of a store item using RF module 230, and then transmit an event (the claimed **communication**) using wireless adapter 220 to store server 104 (**central server**). (Ex. 1003, [0041]). A POSITA would find it obvious that the communication comprises a **unique identifier** received by the mobile terminal from the radio-frequency peripheral and that the unique identifier is **particular to** the peripheral. Ex. 1011, ¶76. A POSITA would further understand that RFID technology includes NFC technology as a subspecies, and that radio-frequency peripherals employing NFC technology will be implemented as claimed in [1a]. Ex. 1011, ¶77.

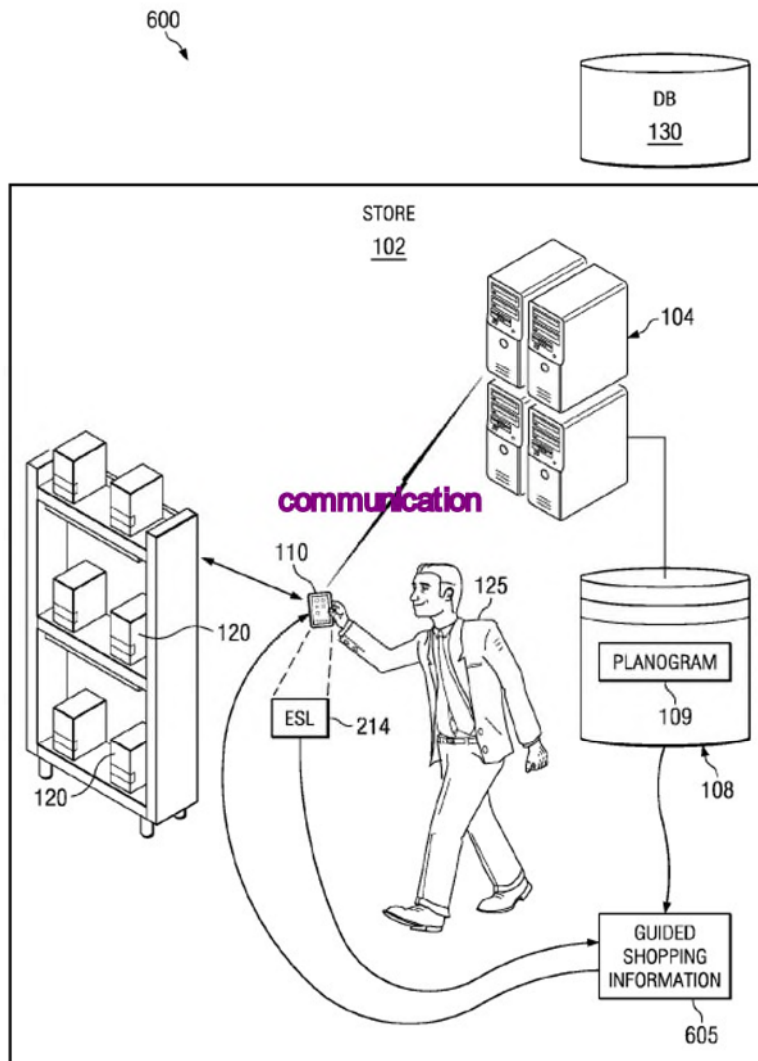


FIG. 6

Ex. 1003, FIG. 6 (annotated).

As discussed earlier in Section III.E.3.a, a POSITA would find it obvious to implement Sakata's IC tags in Siotia's RFIDs. Sakata discloses that each IC tag comprises an **antenna** and an IC **chip**. Ex. 1008, [0022]. Sakata discloses that "the reading range is restricted to the immediate vicinity of the IC tag" (*Id.*), thus the antenna and the chip are **configured for near-field communication**. Ex. 1011, ¶78.

Sakata further discloses that the reading range must be kept sufficiently smaller than the corresponding coordinate point interval to avoid incorrect reading of IC tags at adjacent coordinate points, and the latter interval can be as small as 1cm. Ex. 1008, [0015]. Thus, Sakata teaches a **communication range** that is **less than twenty centimeters**. Ex. 1011, ¶78.

Sakata discloses that the IC tags can transmit its unique ID “by non-contact, using the radio waves received by the antenna as operating power.” Ex. 1008, [0022]. A POSITA, familiar with the activation sequence of passive RFID devices through received electromagnetic wave, would recognize in this disclosure this well-known and standardized activation sequence, and thus understand that this inherently means the tag **is configured to be activated** by a reader when it is within its communication range with the reader, through this well-known and standardized activation sequence. Ex. 1011, ¶79. Further, a POSITA, familiar with the working mechanism of the ubiquitous, well-known and conventional RFID tags and their common working mechanism of transmitting unique IDs to readers for identifying themselves, would recognize this mechanism in the disclosures of Sakata as well as in Siotia’s disclosure of the detection of the RFID in Siotia by the mobile device, thus a POSITA would find it obvious that the detection of Siotia would involve the same transmission of the unique ID by the RFID to the mobile device, and that the transmitted event of Siotia would include the unique ID, as the detection event of

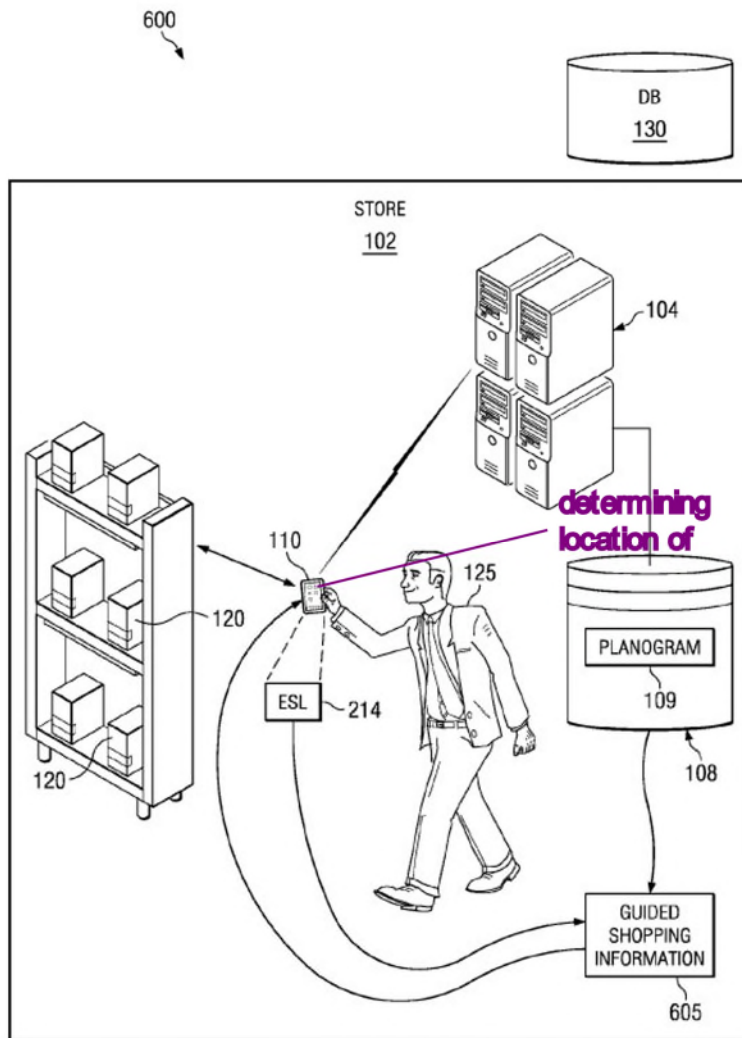
Siotia inherently includes the unique ID for identifying the detected RFID, and as this is the only possible way to match the detection event against the location-ID correspondence information in Siotia-Sakata's planogram. *Id.*

Thus, Siotia-Sakata discloses each and every limitation of [1a]. Ex. 1011, ¶81. In particular, Siotia discloses the claimed communication sequence between the radio-frequency peripheral, the mobile device, and the central server, and Sakata discloses the transmission of unique ID, the activation, the communication range, and the antenna/chip. Ex. 1011, ¶80. As discussed in Section III.E.9 below, a POSITA would have been motivated and able to modify Siotia by using Sakata's IC tags for Siotia's RFID device, and thus reach the Siotia-Sakata combination that discloses all of the limitations of [1a]. *Id.*

c. [1b]

Siotia discloses "resolv[ing] user location within a store by making the store's planogram or schematic accessible to the user's mobile or wireless device." Ex. 1003, [0024]. Siotia discloses that "[w]hen a shopping event, such as the mobile device interacting with a store item using the phone or the user moving an item from the ESL to a shopping cart, the shopping assistant may identify the location of the user from the store item involved in the shopping event." *Id.* A POSITA would understand that this resolving of user location within a store is **determining a location of the mobile terminal within the predetermined area**, and it is

necessarily based on the location associated with the unique identifier of the received communication in the planogram. Ex. 1011, ¶82.



Siotia-Sakata discloses **the vertical and horizontal position**, *see* Section III.E.3.a. Ex. 1011, ¶83.

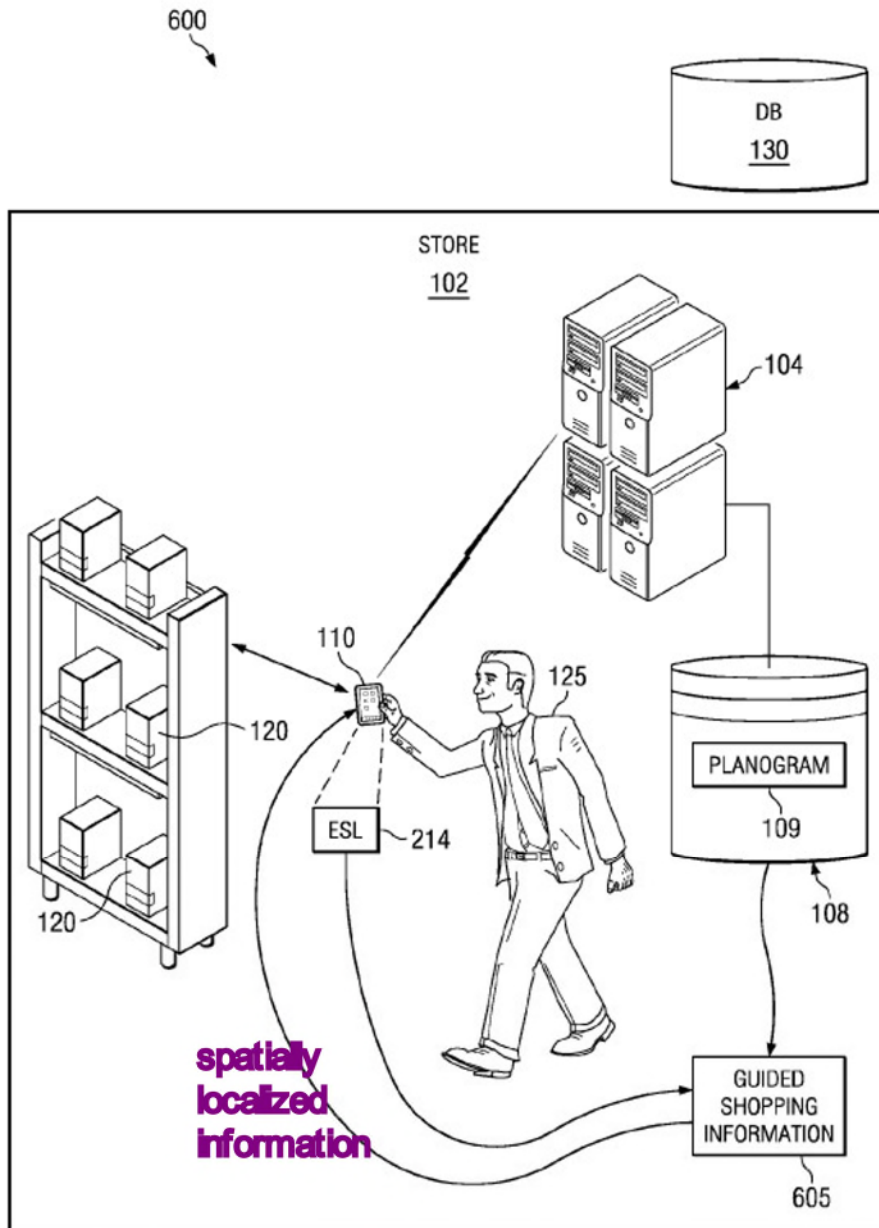
Further, Sakata is directed to location determination (Ex. 1008, [0008]) and teaches two-dimensional location determination in a vertical plane (Ex. 1008,

[0011], [0012], [0013], [0019]), and as discussed in Section III.E.9 below, a POSITA would have been motivated and able to use Sakata's two-dimensional location determination to supplement Siotia's teachings, thus further strengthening Siotia-Sakata's disclosure of the "vertical and horizontal position" limitation. Ex. 1011, ¶84.

Thus, Siotia-Sakata teaches each and every limitation of [1b]. Ex. 1011, ¶¶85-86.

d. [1c]

Siotia discloses that server 104 may expose database 108, "which may include planogram 109, directly to shopping assistant 212 resident on mobile device 110 to provide guided shopping information 605." Ex. 1003, [0047]. Siotia discloses that "[g]uided shopping information 605 may include an image of a layout of store 102, the location of the mobile device in store 102, text based directions for navigating store 102 to locate the items, and/or the ESL (electronic shopping list) sorted based on the location of the items in store 102." Ex. 1003, [0048]. Such directions for navigating the store to locate the items is **spatially localized information associated with the location of the mobile terminal**. Ex. 1011, ¶87.



Ex. 1003, FIG. 6 (annotated).

Thus, Siotia-Sakata discloses each and every limitation of [1c] as Siotia alone discloses all of them. Ex. 1011, ¶¶88-89.

Therefore, Siotia-Sakata renders Claim 1 obvious. Ex. 1011, ¶90.

4. Claim 2

Sakata teaches the claimed powering by electromagnetic wave through its disclosure of “using the radio waves received by the antenna as operating power.” Ex. 1008, [0022]. As discussed in Section III.E.3.b, Sakata discloses the claimed radio-frequency communication and the communication range. Ex. 1011, ¶92. As Sakata discloses the use of the radio waves as operating power, a POSITA would find it obvious that the communication range is a range of the radio waves (electromagnetic waves) emitted by the source of the radio waves such as the reading device of Sakata (the mobile device of Siotia-Sakata). *Id.*

Therefore, Siotia-Sakata renders claim 2 obvious. Ex. 1011, ¶¶93-94.

5. Claim 3

Siotia discloses that, after the detection of a radio frequency identification (RFID) of a store item using RF module 230, this event may be “transmitted by mobile device 110 using wireless adapter 220 to server 104.” Ex. 1003, [0041]. Siotia discloses that “wireless data communication includes Web communication, email communication, instant messaging communication, and the like.” Ex. 1003, [0040]. A POSITA would recognize that Web communication, email communication, and instant messaging communication are **via the Internet**. Ex. 1011, ¶96.

Therefore, Siotia-Sakata renders claim 3 obvious. Ex. 1011, ¶97.

6. Claim 4

Siotia discloses server 104 detecting the presence of electronic shopping guide 214 in mobile device 110. Ex. 1003, [0047]. The electronic shopping guide 214 is **account data specific to the user of the mobile terminal** and it is **previously stored in a database** (inside the mobile device) (*See e.g.*, Ex. 1003, [0024]). Ex. 1011, ¶99. When the server 104 detects the electronic shopping guide, this database is now **accessible to the central server via a communication network**. *Id.* Siotia discloses that guided shopping information sent to the mobile device (the **spatially localized information**) may include text based directions for navigating store 102 to locate the items, and/or the ESL sorted based on the location of the items in store 102. Ex. 1003, [0048]. Thus it is **associated with** the account data. Ex. 1011, ¶99.

Therefore, Siotia-Sakata renders claim 4 obvious. Ex. 1011, ¶100.

7. Claim 5

Claim 5 recites a system analogous to method claim 1, and is rendered obvious by Siotia-Sakata for same reasons set forth for claim 1. Ex. 1011, ¶¶101-109.

a. [5pre]

The limitations of [5pre] are substantially the same as the corresponding limitations of [1pre]. Ex. 1011, ¶101. *See* Section III.E.3.a.

b. [5a]

The limitations of [5a] are substantially the same as the corresponding limitations of [1pre]. Ex. 1011, ¶102. *See* Section III.E.3.a.

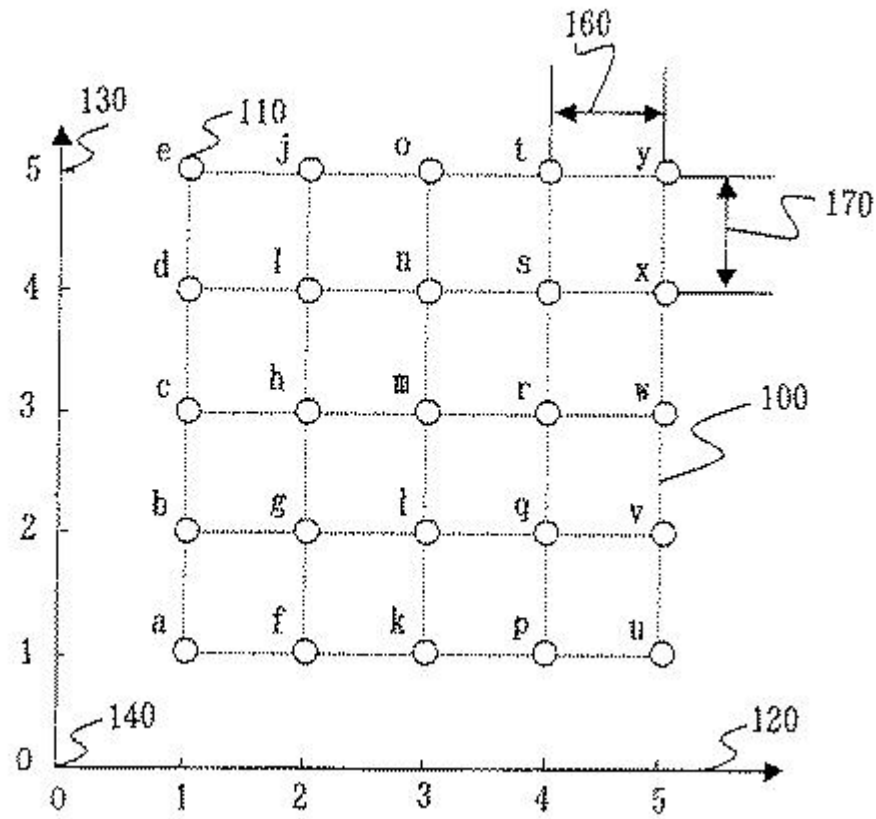
c. [5b]

[1pre] and [1a] claim the central server receiving a communication from the mobile terminal, therefore the mobile terminal is configured to communication with the central server. Ex. 1011, ¶103. *See* Sections III.E.3.a and III.E.3.b.

d. [5c]

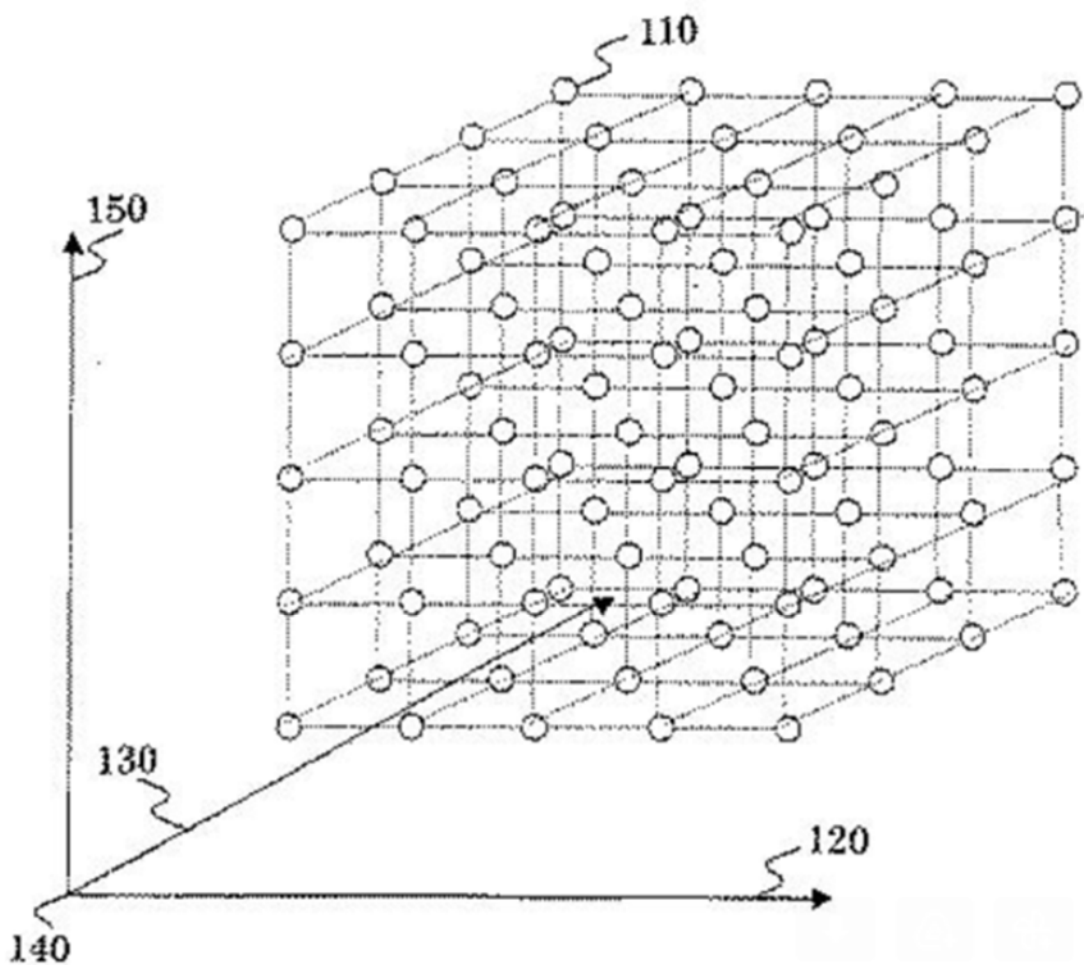
The limitations of [5c] are substantially the same as the corresponding limitations of [1pre] and [1a]. Ex. 1011, ¶104. *See* Sections III.E.3.a and III.E.3.b. Further, Sakata discloses that the plurality of RFIDs (**radio-frequency peripherals**) are **distributed throughout** the predetermined area through FIGS. 1 and 6.

FIG. 1



Ex. 1008, FIG. 1.

FIG. 6



Ex. 1008, FIG. 6.

e. [5d]

[5d] introduces no new limitation. Ex. 1011, ¶105. See Section III.E.3.a.

f. [5e]

The limitations of [5e] are substantially the same as the corresponding limitations of [1a]. Ex. 1011, ¶106. *See* Section III.E.3.b.

g. [5f]

The limitations of [5f] are substantially the same as the corresponding limitations of [1b]. Ex. 1011, ¶107. *See* Section III.E.3.c.

h. [5g]

The limitations of [5g] are substantially the same as the corresponding limitations of [1c]. Ex. 1011, ¶108. *See* Section III.E.3.d.

Therefore, Siotia-Sakata renders Claim 5 obvious. Ex. 1011, ¶109.

8. Claim 8

As discussed in Section III.E.3.b, Sakata discloses the claimed **chip** and **antenna**. Ex. 1011, ¶111. Sakata further discloses that the antenna is contained in a 0.4 mm square chip of its own. Ex. 1008, [0022]. As Sakata discloses the antenna chip and the IC chip separately (Ex. 1008, [0022]), a POSITA would find it obvious that these two chips are distinct and necessarily **arranged at different points of the radio-frequency peripheral**, as the two components necessarily need to occupy different physical locations inside the radio-frequency peripheral. Ex. 1011, ¶111. A POSITA would also find that the disclosure of Sakata inherently teaches the claimed

“ensure a communications link between the antenna and the chip”, through the disclosure that the tag transmits the unique ID held within the IC chip through the antenna (Ex. 1008, [0022]). Ex. 1011, ¶111.

Therefore, Siotia-Sakata renders claim 8 obvious. Ex. 1011, ¶112.

9. A POSITA would have reason to combine Siotia with Sakata

A POSITA would have had a reason to combine Siotia, the primary reference, with Sakata and would have had a reasonable expectation of success in doing so. Ex. 1011, ¶113.

As discussed in Section III.E.3.a, each of Siotia and Sakata discloses RFIDs and mobile reading devices interacting with the RFIDs, and a POSITA would find it obvious to implement Sakata’s teachings of the structural elements (antenna and chip) of the RFIDs and of the communication details between reading device and RFID in Siotia’s RFID and mobile device, which is the mere substitution of one element for another known in the field or the mere application of a known technique to a piece of prior art ready for the improvement. Ex. 1011, ¶114. Further, a POSITA would have been motivated to combine Siotia with Sakata to implement Siotia’s expressly taught functionality of “providing shopping assistance to locate items within a retail shopping environment” (Ex. 1003, [0003]). Ex. 1011, ¶114.

Specifically, a POSITA would have been motivated to modify Siotia by using Sakata's RFID IC tag (Ex. 1008, [0012]) for Siotia's RFID device (Ex. 1003, [0041]), thereby creating the Siotia-Sakata combination that discloses the NFC-related limitations (antenna, chip, communication range, and activation through electromagnetic wave) of [1a] and [2]. Ex. 1011, ¶115. Siotia teaches detecting a radio frequency identification (RFID) of a store item using RF module 230 of the mobile device 110. Ex. 1003, [0041]. A POSITA at the time of the claimed invention would be knowledgeable about NFC technology, which is a subspecies of the RFID technology. Ex. 1011, ¶115. A POSITA would also be knowledgeable about NFC standards such as ISO 14443 and ISO 18092. *Id.* Thus, a POSITA would have been motivated and able to use the teachings of Sakata to modify Siotia such that the RFID of Siotia is implemented as a RFID IC tag of Sakata (*see* Ex. 1008, [0012], [0015], [0022]). Ex. 1011, ¶115. Sakata has disclosed the advantages of such tags with short communication ranges for avoiding communication interference and more precise location finding (Ex. 1008, [0007], [0015], [0022]), a POSITA would thus have been motivated and able to follow such trend and implement the RFID of Siotia as the RFIC IC tag of Sakata to realize such advantages. Ex. 1011, ¶115. This would also address the expressly taught objective of Siotia of "determination of the user's location within the store and facilitate[ing] opportunities for providing targeted promotion and services to the user based on the user's location" (Ex. 1003, [0023])

because it would allow a more precise determination of the user's location. Ex. 1011, ¶115.

A POSITA reading Siotia in view of Sakata would understand that such a modification involves no more than adopting Sakata's expressly disclosed RFID IC tags for Siotia's RFID device. Ex. 1011, ¶116. At most, this is altering the structure of the mobile device-radio frequency peripheral system disclosed in Siotia by mere substitution of one element (the RFID tag) for another known in the field (the RFID IC tag of Sakata), and further, the RFID IC tag itself comes from another mobile device-radio frequency peripheral system disclosed in Sakata (Ex. 1008, [0011], [0012], [0022]), and performs the same function in Sakata's system as the RFID tag performs in Siotia's system. Ex. 1011, ¶116. Not only would this have been obvious to try, it would also have yielded no more than predictable results due to the combination of familiar elements in a known way. *Id.* Thus, a POSITA would have a reasonable expectation of success in making this modification. *Id.*

Furthermore, a POSITA would also have been motivated to modify Siotia by combining Sakata's vertical arrangement of IC tags with Siotia's RFID devices, and thus supply this limitation and meet all of the limitations of [1pre] and [1b]. Ex. 1011, ¶117. Siotia already discloses RFID devices associated with merchandise items (*see* Ex. 1003, [0041]) further already shows, through figures in the

specification, the arrangement of merchandise items on shelves, which represent planes perpendicular to the floor (see Ex. 1003, FIG. 1). Ex. 1011, ¶117.

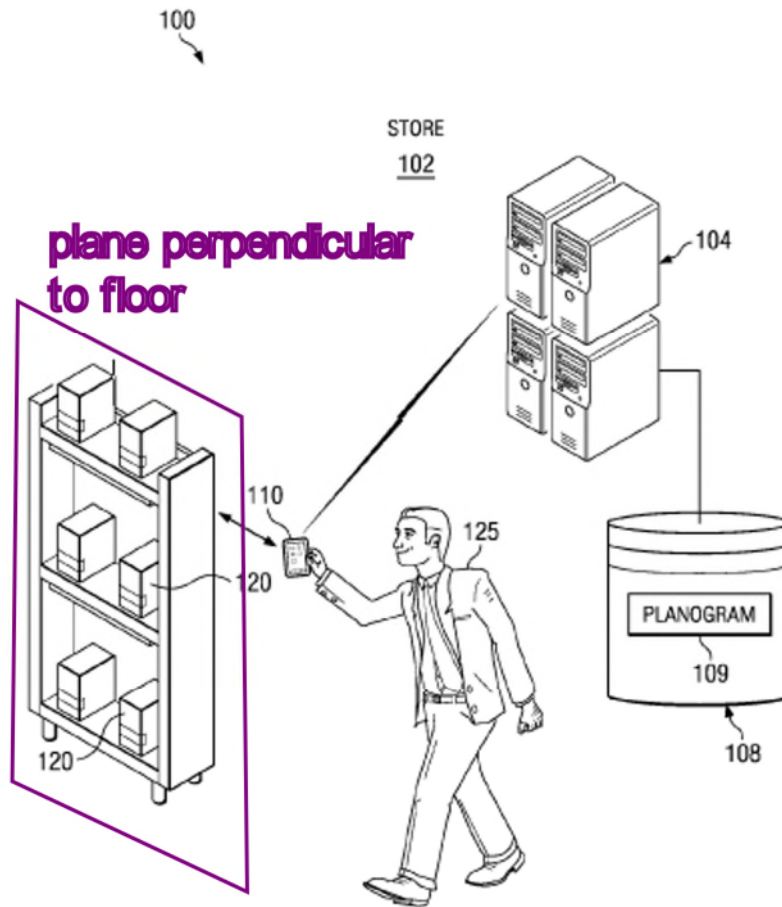


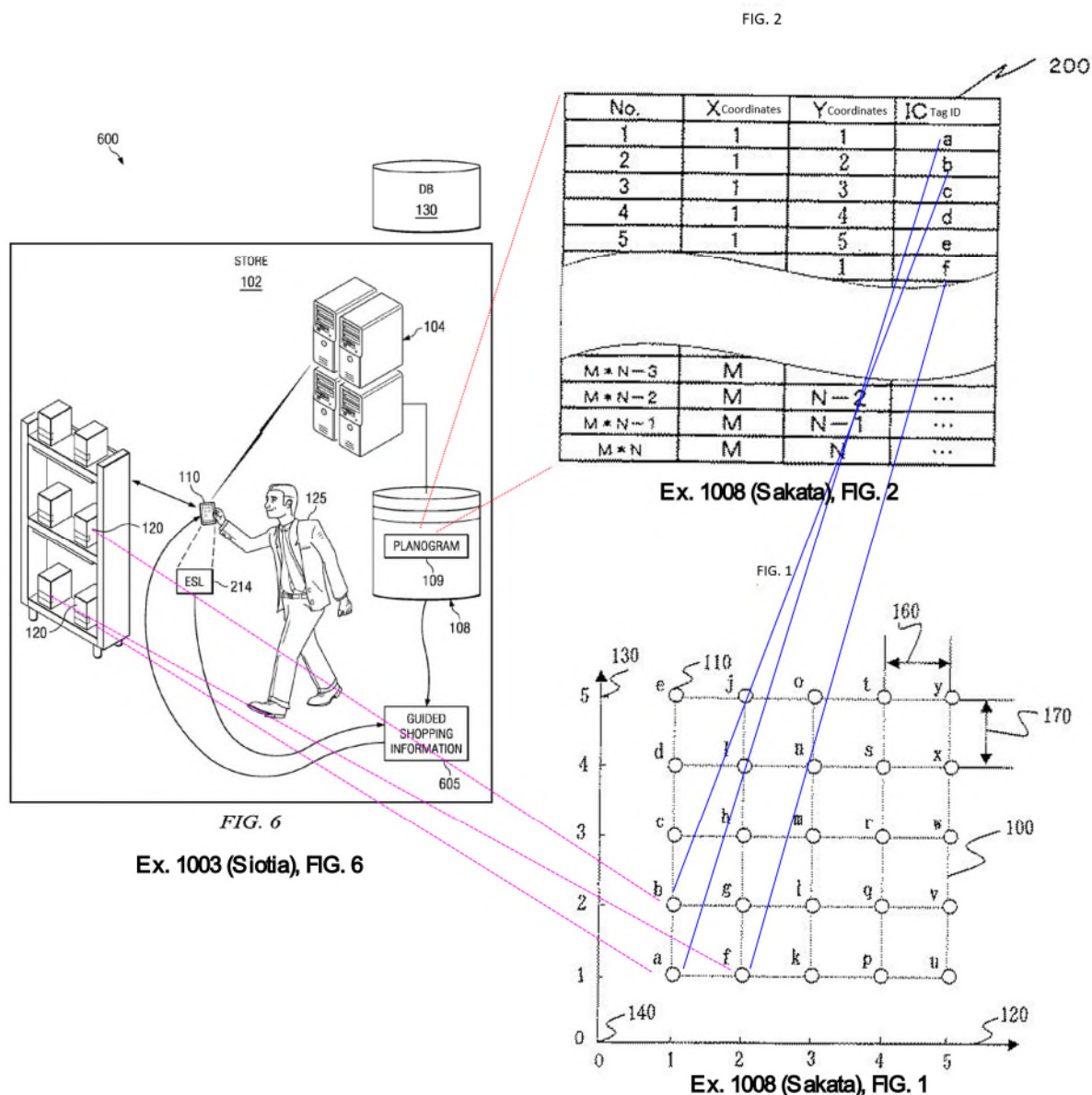
FIG. 1

Ex. 1003, FIG. 1 (annotated).

A POSITA reading Siotia in view of Sakata will realize that an association of each RFID device with a particular location defined with a vertical and horizontal position in this plane, just like the association of Sakata's IC tags with the vertical and horizontal coordinate points on a wall of a building, is a conventional and

obvious way of arranging such devices, and this will address the universal and conventional goal, expressly taught in Siotia, to determine the user's location in the store and provide providing targeted promotion and services to the user based on the user's location, since the introduction of an additional dimension (the vertical dimension) into the user's location would allow more precise determination of the location and more targeted promotion and services (*See* Ex. 1003, [0023]). Ex. 1011, ¶118. Combining Sakata's vertical arrangement of smart tags with Siotia represents nothing more than a combination of known elements to achieve predictable results, and a POSITA would have a reasonable expectation of success in doing so, and thus meeting the "vertical and horizontal position" limitation of [1pre] and [1b]. *Id.*

A diagram showing the implementation of Sakata's vertical arrangement in Siotia is shown below:



F. Ground 2: Claims 6-7 and 9 are rendered obvious by Siotia in combination with Sakata and Akao

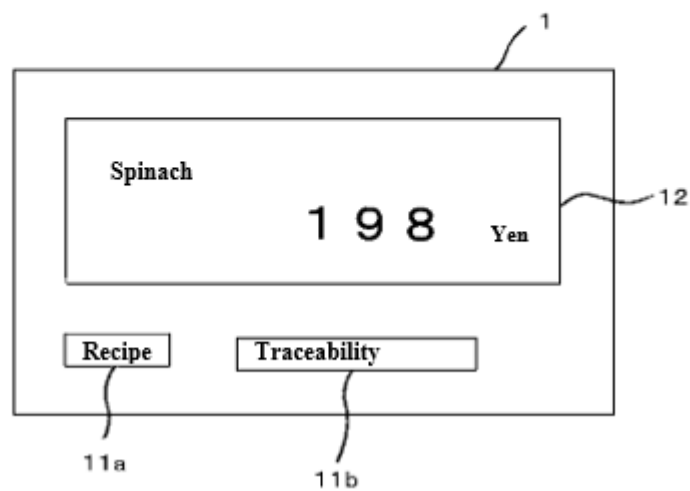
As set forth in detail below, the combination of Siotia, Sakata and Akao (“Siotia-Sakata-Akao”) discloses each and every limitation recited by claims 6-7 and 9. Ex. 1011, ¶126. Furthermore, a POSITA would have had a reason to further

modify Siotia-Sakata of Ground 1 with the teachings of Akao and would have had a reasonable expectation of success in doing so. *Id.*

1. Akao

Japan Patent Pub. 2009-64316A (“Akao”) discloses “an electronic shelf label and an electronic shelf label system.” Ex. 1004, [0001]. In particular, it is directed to “provid[ing] the product information required by customers from electronic shelf label to the customer’s mobile device, increas[ing] the convenience of the customer, and promot[ing] the purchase of products.” Ex. 1004, [0004]. It claims, among others, “an electronic shelf label for displaying product price that is equipped with a memory means for storing product information; a short-range communication means for communicating with a customer’s mobile device; and a control means for transmitting the product information stored in the memory means to a customer’s mobile device by the short-range communication means.” Ex. 1004, [Claim 1], [0005]. FIG. 3 of Akao, reproduced below, is an external view showing the external appearance configuration of the claimed electronic shelf label in Akao.

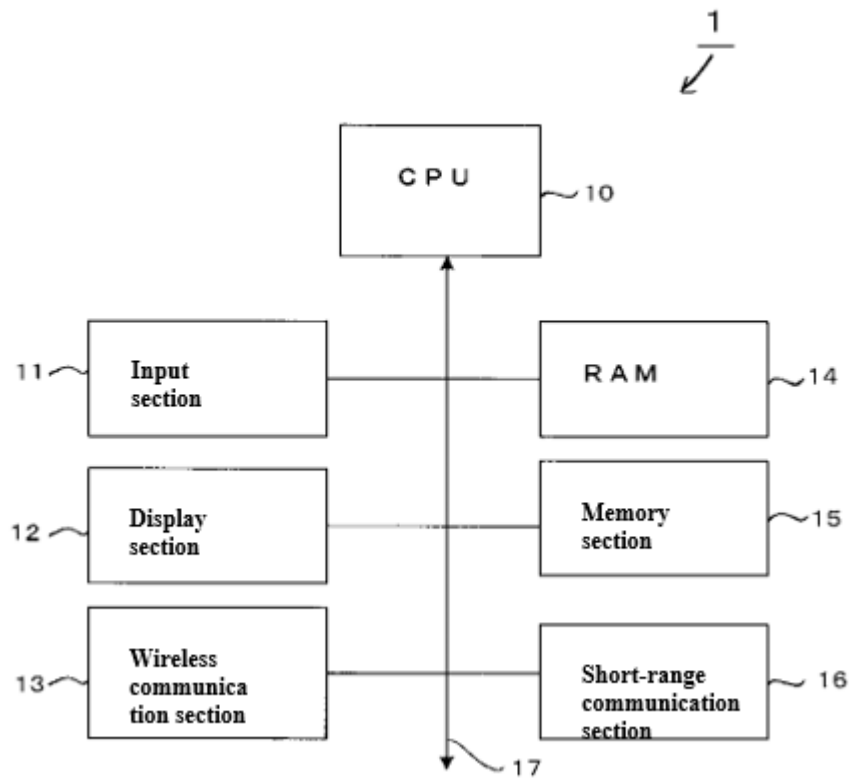
[FIG. 3]



Ex. 1004, FIG. 3.

FIG. 2 of Akao, reproduced below, is a block diagram showing the main configuration of the electronic shelf label.

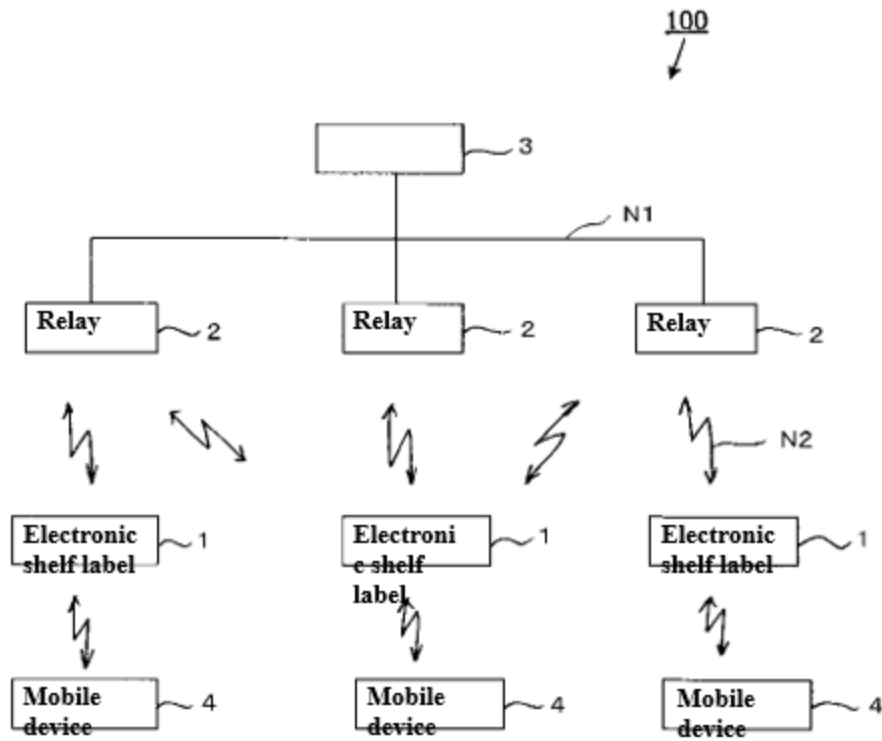
[FIG. 2]



Ex. 1004, FIG. 2.

The electronic shelf labels of Akao are intended to be used in a shopping setting where they communicate with a store server and with mobile devices, as illustrated in FIG. 1 of Akao, reproduced below.

[FIG. 1]



Ex. 1004, FIG. 1.

Akao qualifies as prior art under pre-AIA 35 U.S.C. § 102(b) because it was published on March 26, 2009, which is more than one year before the '340 Patent's April 11, 2012 claimed priority date. Ex. 1004, (43).

Akao is analogous prior art to the '340 Patent. The '340 Patent is directed to “the display of information in a sales area” (Ex. 1001, [1:18-19]) while Akao is directed to electronic shelf label and electronic shelf label system (Ex. 1004, [Title]) which display information in a sales area. Ex. 1011, ¶125. Thus, both Akao and the

'340 Patent are in the same field of endeavor for displaying information in a sales area. *Id.*

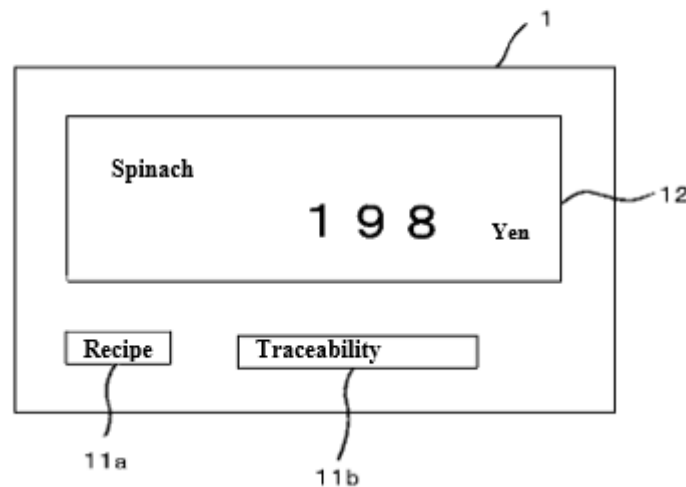
2. Claim 6

a. [6pre]

Claim 5 is addressed in Section III.E.7.

Akao discloses an **electronic shelf label** configured to display a product name and a price. Ex. 1004, [0023].

[FIG. 3]

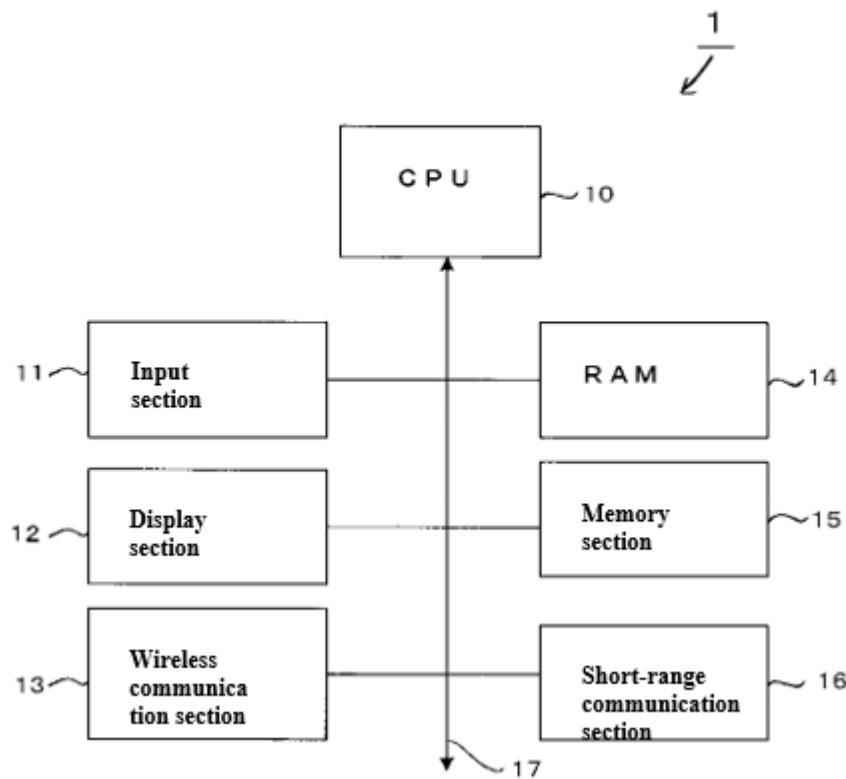


Ex. 1004, FIG. 3.

Akao discloses that the electronic shelf label 1 is configured with a short-range communication section 16. Ex. 1004, [0015]. Akao discloses that the short-range communication section 16 comprises a short-range communication device that

assumes communication at a short distance of 1m or less (which completely encompasses the claimed “less than twenty centimeters” of the ’340 Patent), such as Radio Frequency Identification (RFID). Ex. 1004, [0022]. Thus the electronic shelf label of Akao is a **radio-frequency peripheral**. Ex. 1011, ¶129.

[FIG. 2]



Ex. 1004, FIG. 2.

Therefore, Siotia-Sakata-Akao discloses each and every limitation of [6pre] because Siotia-Sakata discloses “the system according to claim 5” and Akao discloses all the rest of the limitations of [6pre]. Ex. 1011, ¶130. As discussed in Section III.F.5 below, a POSITA would have been motivated and able to modify

Siotia-Sakata by integrating Akao's electronic shelf label into Siotia-Sakata's RFID tags, thus meeting all the limitations of [6pre]. *Id.*

b. [6a]

Akao discloses a store server 3 (**central server**). Ex. 1004, [0012]. Akao discloses that store server 3 can send **data representing information relating to an item**, such as recipe information and traceability information, to a specified electronic shelf label 1. Ex. 1004, [0080]; *see* Ex. 1011, ¶131.

Akao further discloses that an electronic shelf label 1 includes a wireless communication section 13 and a short-range communication section 16. Ex. 1004, [0015]. Akao discloses that the wireless communication section communicates through wireless communication network N2 with store server 3 based on an IP address. Ex. 1004, [0019]. A POSITA would find it obvious that such wireless communication based on IP address (and therefore IP protocol) is carried out via the Wi-Fi standard, which employs radio-frequency communications. Ex. 1011, ¶132. Therefore a POSITA would find it obvious that wireless communication section 13 engages in radio-frequency communications. *Id.* Akao discloses that short-range communication section 16 comprises “a communication device that assumes communication at a short distance of 1 m or less, such as Radio Frequency Identification (RFID).” Ex. 1004, [0022]. Therefore Akao teaches that the short-range communication section 16 engages in radio-frequency communication. Ex.

1011, ¶132. A POSITA would thus find it obvious that the wireless communication section 13 and the short-range communication section 16 together form **a radio-frequency communication module configured to receive data representing an item**. *Id.*

Therefore, Siotia-Sakata-Akao discloses each and every limitation of [6a] because Akao discloses all of them. Ex. 1011, ¶133. As discussed in III.F.5 below, a POSITA would have been motivated and able to modify Siotia-Sakata by integrating Akao's electronic shelf label into Siotia-Sakata's RFID tags, and thus reaching the integrated tag-label of Siotia-Sakata-Akao that discloses all the limitations of [6a]. *Id.*

c. [6b]

Akao discloses that an electronic shelf label 1 includes a memory section 15 (**memory**). Ex. 1004, [0015]. Akao discloses that “[i]n the electronic shelf label 1, the recipe information and traceability information sent from the store server 3 are **stored** in the recipe information file 15c and traceability information file 15b of the memory section 15.” Ex. 1004, [0080].

Therefore, Siotia-Sakata-Akao discloses each and every limitation of [6b] because Akao discloses all of them. Ex. 1011, ¶135. As discussed in III.F.5 below, a POSITA would have been motivated and able to modify Siotia-Sakata by integrating Akao's electronic shelf label into Siotia-Sakata's RFID tags, and thus

reaching the integrated tag-label of Siotia-Sakata-Akao that discloses all the limitations of [6b]. *Id.*

d. [6c]

Akao discloses that an electronic shelf label 1 includes a CPU (Central Processing section) 10 (**microcontroller**). Ex. 1004, [0015]. Akao discloses that the CPU 10 **controls the display of** the shelf label **information** (product name, price) stored in the memory section 15 on the display section 12. Ex. 1004, [0018].

Therefore, Siotia-Sakata-Akao discloses each and every limitation of [6c] because Akao discloses all of them. Ex. 1011, ¶137. As discussed in III.F.5 below, a POSITA would have been motivated and able to modify Siotia-Sakata by integrating Akao's electronic shelf label into Siotia-Sakata's RFID tags, and thus reaching the integrated tag-label of Siotia-Sakata-Akao that discloses all the limitations of [6c]. *Id.*

e. [6d]

Akao discloses that an electronic shelf label 1 includes a display unit 12 (**display screen**). Ex. 1004, [0015]. Akao discloses that the display unit 12 **displays** the shelf label **information** (product name, price) stored in the memory section 15. Ex. 1004, [0018].

Therefore, Siotia-Sakata-Akao discloses each and every limitation of [6d] because Akao discloses all of them. Ex. 1011, ¶139. As discussed in III.F.5 below,

a POSITA would have been motivated and able to modify Siotia-Sakata by integrating Akao's electronic shelf label into Siotia-Sakata's RFID tags, and thus reaching the integrated tag-label of Siotia-Sakata-Akao that discloses all the limitations of [6d]. *Id.*

Therefore, Siotia-Sakata-Akao renders Claim 6 obvious. Ex. 1011, ¶140.

3. Claim 7

Claim 6 is addressed in Section III.F.2.

Akao discloses that the electronic shelf label 1 can engage in mutual communication with the customer's mobile device 4 (**mobile terminal**) through short-range communication section 16. Ex. 1004, [0040], [0047], [0057], [0068]. Akao discloses various data such as customer attribute data that the customer's mobile terminal 4 will **transmit to the electronic shelf label** 1. Ex. 1004, [0041]. Such data is transmitted via the short-range communication section, which, as discussed in Section III.F.2.b, is part of the **radio-frequency communication module**. Ex. 1011, ¶142.

Therefore, Siotia-Sakata-Akao discloses each and every limitation of [7] because Akao discloses all of them. Ex. 1011, ¶¶143-144. As discussed in III.F.5 below, a POSITA would have been motivated and able to modify Siotia-Sakata by integrating Akao's electronic shelf label into Siotia-Sakata's tags, and thus reaching

the integrated tag-label of Siotia-Sakata-Akao that discloses all the limitations of [7].
Ex. 1011, ¶144.

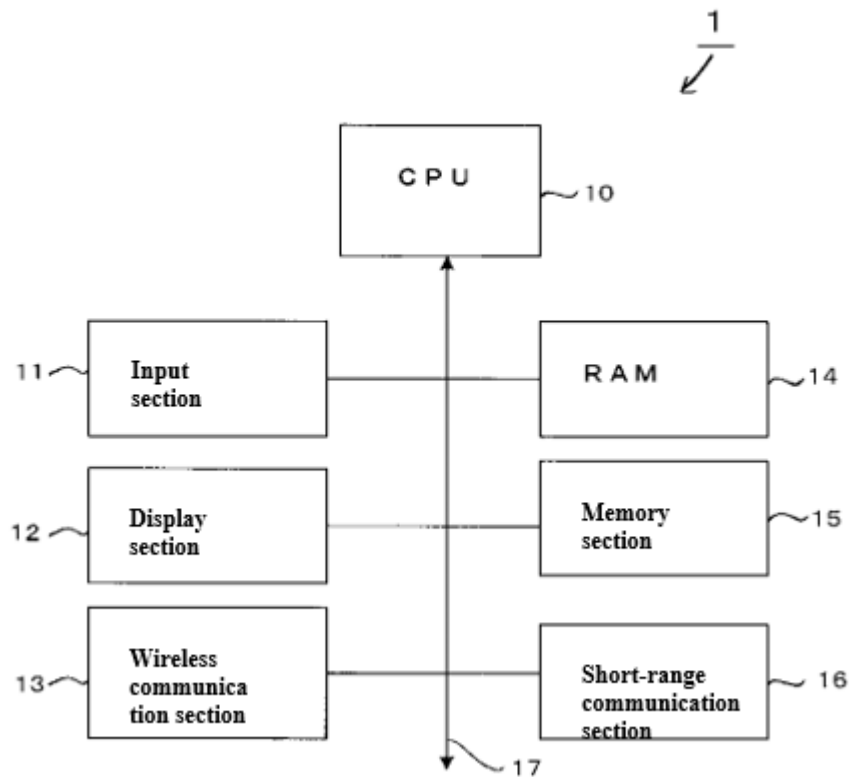
Therefore, Siotia-Sakata-Akao renders Claim 7 obvious. Ex. 1011, ¶144.

4. Claim 9

Claim 8 is addressed in Section III.E.8.

FIG. 2 of Akao depicts the near-range communication section 16. A POSITA would find it obvious that this near-range communication section 16, which comprises a short-distance communication device such as RFID (*see* Ex. 1004, [0022]), would have the **antenna** and **chip** of Siotia-Sakata's tag. Ex. 1011, ¶146. FIG. 2 of Akao shows the near-range communication section 16 as connected to CPU 10 (the **microcontroller**). A POSITA would find it obvious that the chip inside the near-range communication section 16 is connected to CPU 10. Ex. 1011, ¶147.

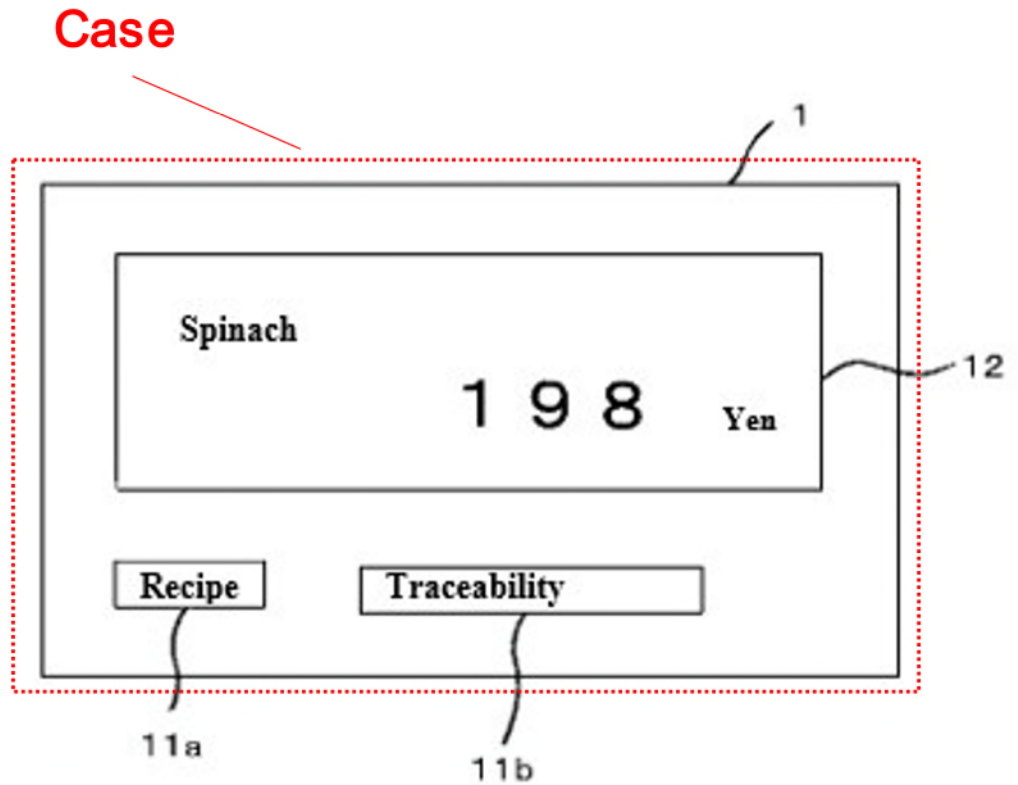
[FIG. 2]



Ex. 1004, FIG. 2.

FIG. 3 of Akao, an external view of an electronic shelf label (the claimed **radio-frequency peripheral**), clearly shows that the label is enclosed inside a **case**. A POSITA would find it obvious that the **antenna** inside the near range communication range 16 of the label is arranged within this case and the **microcontroller** is also housed inside this case. Ex. 1011, ¶148.

[FIG. 3]



Ex. 1004, FIG. 3 (annotated).

Therefore, Siotia-Sakata-Akao discloses each and every limitation of [9] because Akao discloses all of them. Ex. 1011, ¶149. As discussed in III.F.5 below, a POSITA would have been motivated and able to modify Siotia-Sakata by integrating Akao's electronic shelf label into Siotia-Sakata's RFID tags, and thus reaching the integrated tag-label of Siotia-Sakata-Akao that discloses all the limitations of [9]. *Id.* Therefore, Siotia-Sakata-Akao renders Claim 9 obvious. *Id.*

5. A POSITA would have reason to combine Siotia-Sakata with Akao

A POSITA would have had a reason to further combine Siotia-Sakata with Akao and would have had a reasonable expectation of success in doing so. Ex. 1011, ¶150.

Specifically, a POSITA would have been motivated and able to modify Siotia-Sakata by integrating Akao's electronic shelf label into Siotia-Sakata's RFID tag, thus creating an electronic shelf label-tag that discloses all the limitations of [6] through [9]. Ex. 1011, ¶151. A POSITA reading Siotia and Sakata in view of Akao would understand that an electronic label with radio-frequency communication module, memory, microcontroller, and display screen, is an obvious way to enhance the interactions between such electronic label and a mobile device as already disclosed by Siotia and Sakata. *Id.* Further, a POSITA reading Siotia and Sakata in view of Akao would understand that this involves no more than integrating information storage and display abilities into Siotia-Sakata's RFID tags (which already has information storage capacity because it stores the unique ID, *see* Ex. 1008, [0022]). Ex. 1011, ¶151. Not only would this have been obvious to try, it also would have yielded no more than predictable results due to the combination of familiar elements in a known way. *Id.* Further, like Siotia-Sakata's RFID tags, Akao's display-capable electronic shelf labels are also configured for short-range communications that has a range of 1 meter or less (*see* Ex. 1004, [0022]), and this

range encompasses completely the claimed “less than twenty centimeters”. Ex. 1011, ¶151. A POSITA would thus find it obvious to integrate Siotia-Sakata’s RFID tags with Akao’s short-range-communication-capable electronic shelf labels at the time of the alleged invention. *Id.*

A POSITA would have been motivated to combine the Siotia-Sakata with Akao in this way to implement Siotia’s expressly taught functionality of providing information such as promotional materials to the user (Ex. 1003, [0041]). Ex. 1011, ¶152.

Specifically, Akao teaches radio-frequency electronic devices that possess capability to receive, store and display information relating to an item in a store. (Ex. 1004, [0012]-[0023], [0080]). Ex. 1011, ¶153. Akao teaches a configuration of such radio-frequency electronic devices that involves radio-frequency communication module, memory, microcontroller, and display screen. (Ex. 1004, [0012]-[0023]). Ex. 1011, ¶153. As such, a POSITA would have been motivated and able to use the teaching of Akao to modify Siotia-Sakata for purposes of displaying promotional materials and fulfilling Siotia’s expressly taught functionality of providing information such as promotional materials to the user (Ex. 1003, [0041]). Ex. 1011, ¶153.

The combination of the Siotia-Sakata with Akao represents nothing more than the combination of known elements to achieve predictable results. Ex. 1011, ¶154.

Siotia, Sakata and Akao all teach the communications between radio-frequency peripheral and mobile device. Ex. 1003, [0041]; Ex. 1008, [0022]; Ex. 1004, [0040-0047], [0054]-[0057], [0066]-[0068]. Akao then teaches a configuration involving the memory and the display in the smart tag. Ex. 1004, [0012], [0015], [0018]. A POSITA would have known this configuration as well as its predictable results. Ex. 1011, ¶154. Using the configuration in Akao serves to address the universal and obvious goal to allow display or advertisement of product-related information. *Id.* As such, combining the Siotia-Sakata combination with Akao by integrating Akao's electronic shelf label into Siotia-Sakata's RFID tag represents, at most, an obvious extension of the functionality expressly disclosed in Siotia-Sakata combination to address this universal and obvious objective. *Id.* Further, Akao's electronic shelf label is a radio-frequency peripheral (like the RFID tag of Siotia-Sakata). Ex. 1004, [0015], [0022]. Akao also discloses a store server and a mobile device. Ex. 1004, [0004], [0012]. Thus Akao also discloses mobile device-central server-radio frequency peripheral system, structurally similar to the system in Siotia-Sakata. Ex. 1011, ¶154. Integrating Akao's electronic shelf label into Siotia-Sakata's RFID tag is thus, at most, combining two pre-existing elements occupying similar positions in two similar structures, with each doing no more than they would in separate operation. *Id.* This modification would have been well within the skill of a POSITA. *Id.*

A diagram showing the implementation of Akao's electronic shelf labels in Siotia-Sakata is shown below:

[FIG. 3]

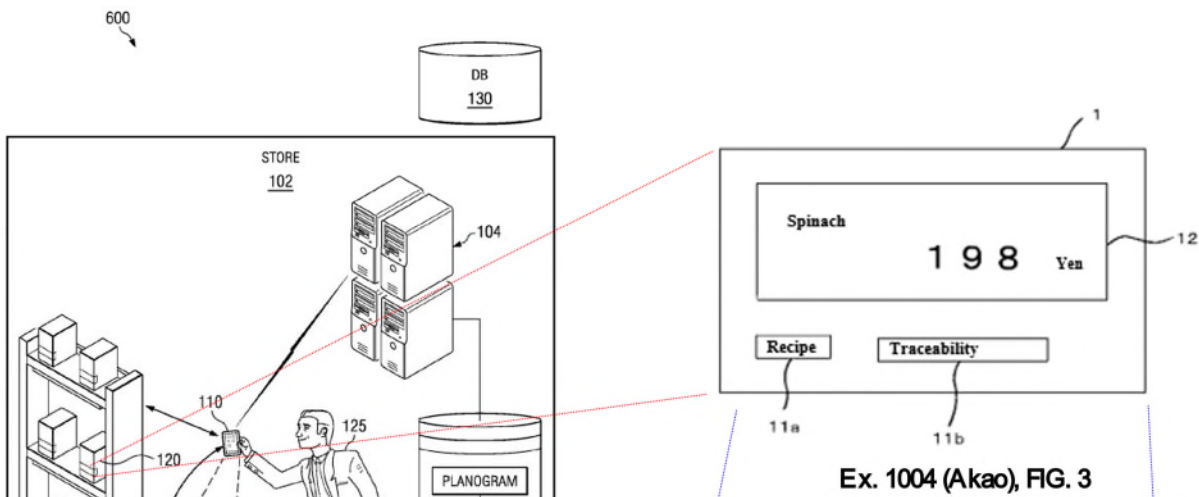
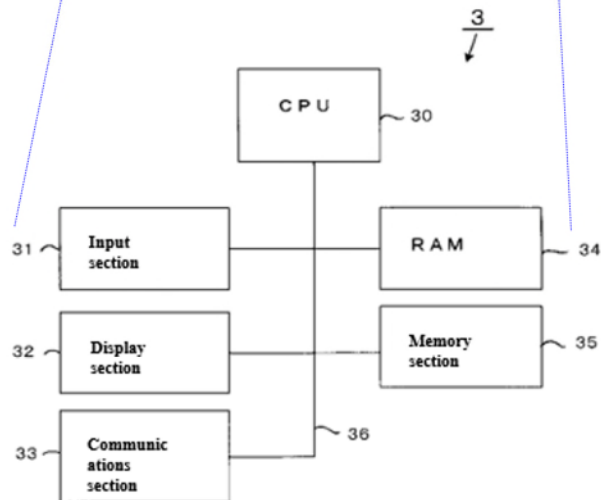


FIG. 6
Ex. 1003 (Siotia), FIG. 6

[FIG. 4]



Ex. 1004 (Akao), FIG. 4

Therefore, a POSITA would have been motivated and able to integrate Akao's electronic shelf label into Siotia-Sakata's RFID tag, thus creating an electronic shelf label-tag that discloses all the limitations of [6], [7] and [9]. Ex. 1011, ¶156.

G. Ground 3: Claims 8-9 are rendered obvious by Siotia in combinaton with Sakata, Akao, and Chen

As discussed in Sections III.E.8 and III.F.4, the Siotia-Sakata-Akao combination already discloses each and every element of Claims 8-9. Claims 8-9 are additionally unpatentable because they are obvious in view of the combination of Siotia-Sakata-Akao and Chen ("Siotia-Sakata-Akao-Chen"). Ex. 1011, ¶162. As set forth in detail below, Siotia-Sakata-Akao-Chen discloses each and every limitation recited by Claims 8-9. *Id.* Furthermore, a POSITA would have had a reason to further modify Siotia-Sakata-Akao with teachings of Chen and would have had a reasonable expectation of success in doing so. *Id.*

1. Chen

U.S. Patent No. 7,283,036B2 ("Chen") is directed to "a display device" and in particular to "a wireless display device, which displays an image without the need for battery power or external power." Ex. 1006, [1:7-10]. Chen discloses that the wireless display device "mainly includes an antenna unit, a processing unit, a display unit, and a power supply unit." Ex. 1006, [1:50-52]. FIG. 2 of Chen shows such a wirelss display device.

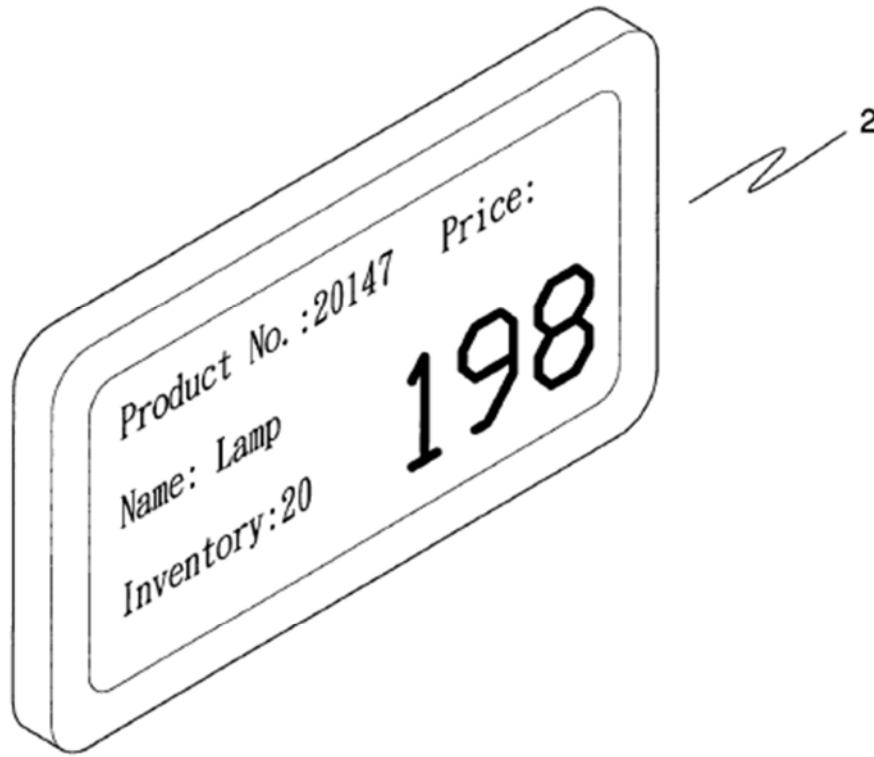


FIG. 2

Ex. 1006, FIG. 2.

Chen discloses that the invention can be “applied to an electronic shelf label (ESL) system and each of the wireless display devices 2 could be fixed on shelves respectively, so as to indicate information about merchandise placed on the shelves, and the information could include product numbers, names and prices etc.” Ex. 1006, [2:55-60].

FIG. 3 of Chen shows the internal structure of the wireless display device.

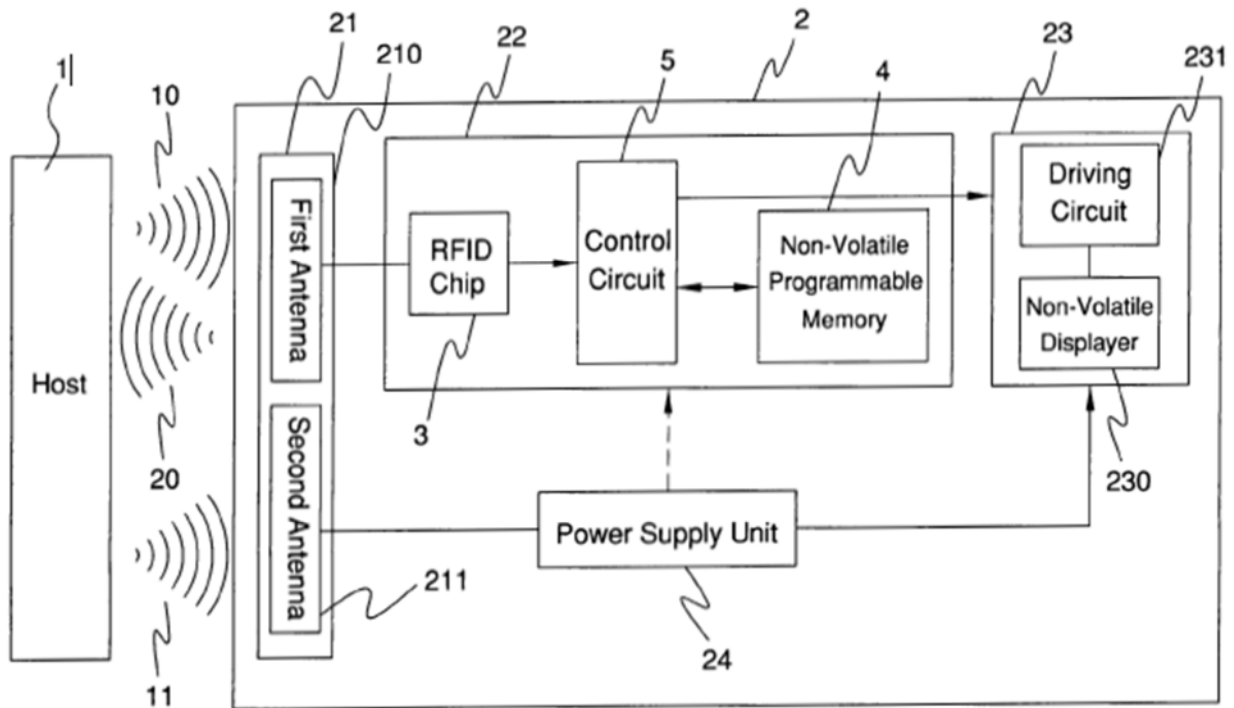


FIG. 3

Ex. 1006, FIG. 3.

Chen qualifies as prior art under pre-AIA 35 U.S.C. § 102(b), because it was published on April 13, 2006 and granted on October 16, 2007, and both dates are more than one year before the '340 Patent's April 11, 2012 claimed priority date. Ex. 1006, (45), (65).

Chen is analogous prior art to the '340 Patent. The '340 Patent is directed to "the display of information in a sales area." Ex. 1001, [1:18-19]. Chen is directed to wireless display devices, and in particular wireless display devices 2 that could be fixed on shelves as part of an electronic shelf label system. Ex. 1006, [1:7-10], [2:55-60]. *See* Ex. 1011, ¶161. Thus, both Chen and the '340 Patent are in the same field of endeavor for displaying information in a sales area. *Id.*

2. Claim 8

Claim 5 is addressed in Section III.E.7.

Chen's wireless display device is a radio-frequency peripheral because it contains a radio-frequency identification chip 3. Ex. 1006, [4:25-27]. Chen discloses the claimed **chip** and **antenna** through its RFID chip 3 and first antenna 210. As depicted in FIG. 3 of Chen, the RFID chip 3 and the first antenna 210 are **arranged at different points** of the radio-frequency peripheral (that is, the wireless display device), and the radio-frequency peripheral comprises **connections configured to ensure a communications link** between the antenna and the chip. Ex. 1011, ¶164.

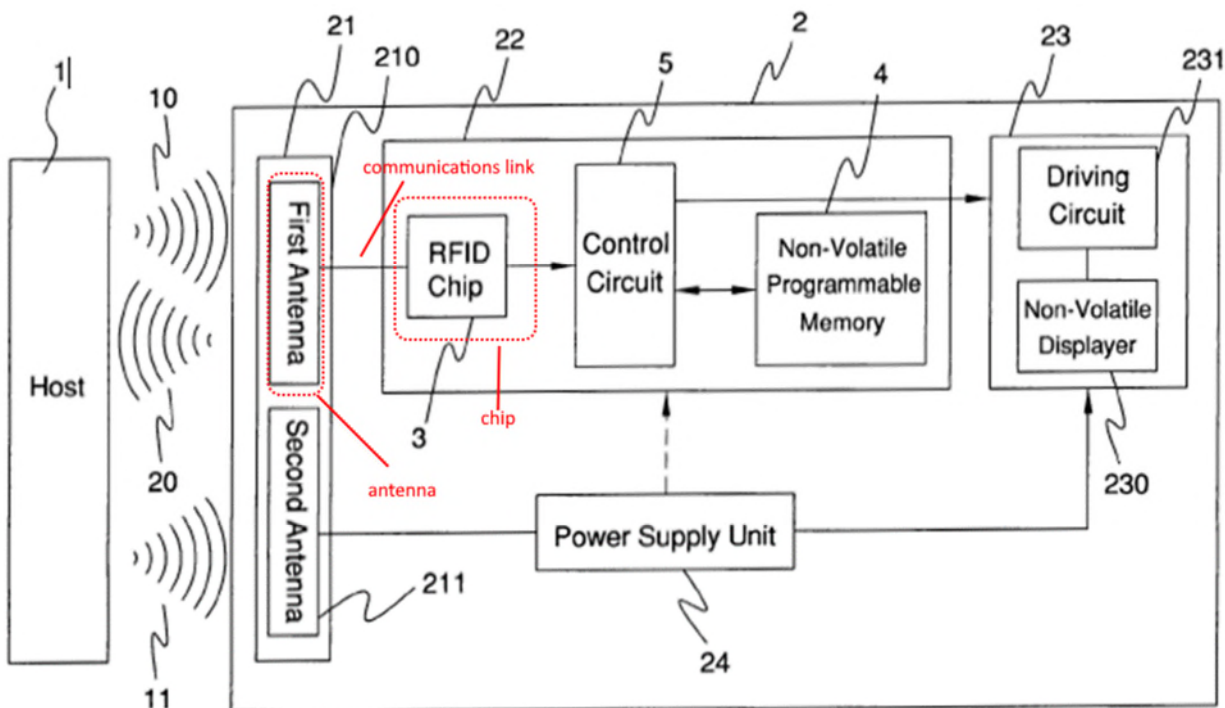


FIG. 3

Ex. 1006, FIG. 3 (annotated).

Thus, Siotia-Sakata-Akao-Chen discloses each and every limitation of [8] because Siotia-Sakata-Akao discloses every limitation in independent Claim 5 and Chen discloses all of the new limitations in [8]. Ex. 1011, ¶165. As discussed in III.G.4 below, a POSITA would have been motivated and able to implement Siotia-Sakata-Akao's electronic shelf label-tag in accordance with Chen's teachings, and thus meeting all the limitations of [8]. *Id.* Therefore, Siotia-Sakata-Akao-Chen renders Claim 8 obvious. *Id.*

3. Claim 9

Claim 8 is addressed in Section III.G.2.

As depicted in FIG. 3 of Chen, the RFID **chip** 3 is **connected to** control circuit 5 (a **microcontroller**) of the radio-frequency peripheral (that is, the wireless display device), and the first antenna 210 is **arranged on a case** inside which the microcontroller is housed. Ex. 1011, ¶167.

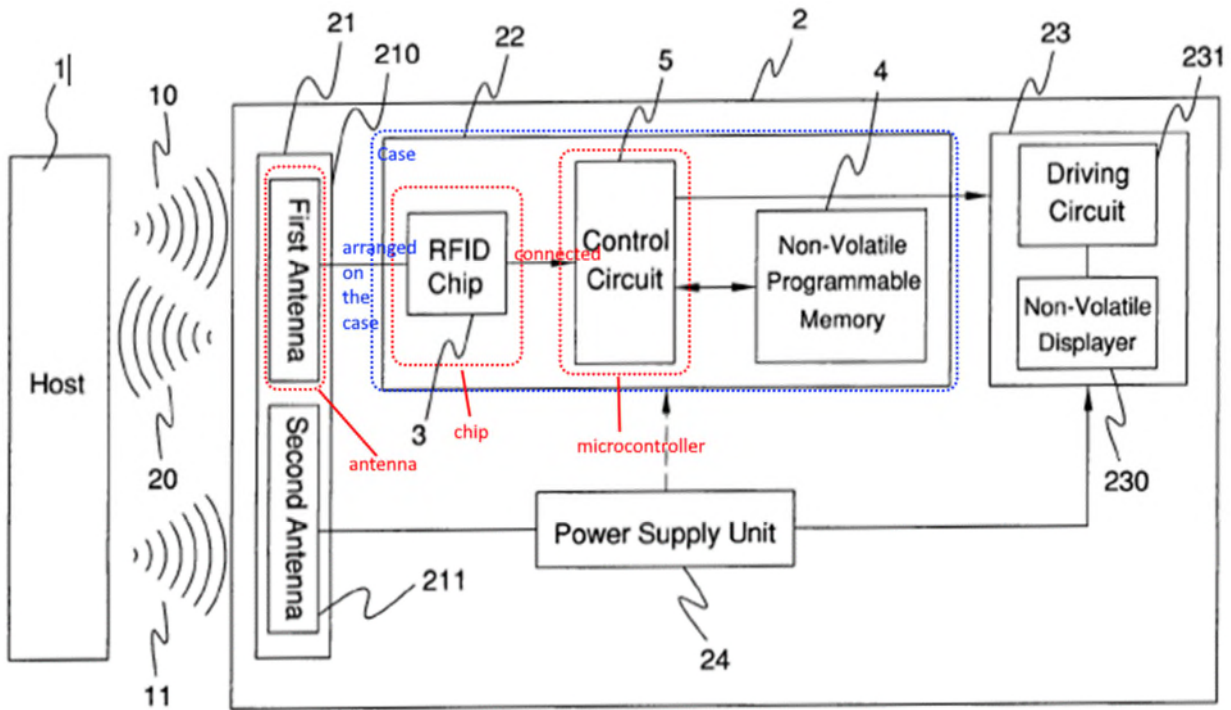


FIG. 3

Ex. 1006, FIG. 3 (annotated).

Alternatively, the first antenna 210 of Chen is **arranged within the case** of the whole wireless display device, inside which the microcontroller is also housed, *see* Ex. 1011, ¶168, as shown in FIG. 2 and FIG. 3 below:

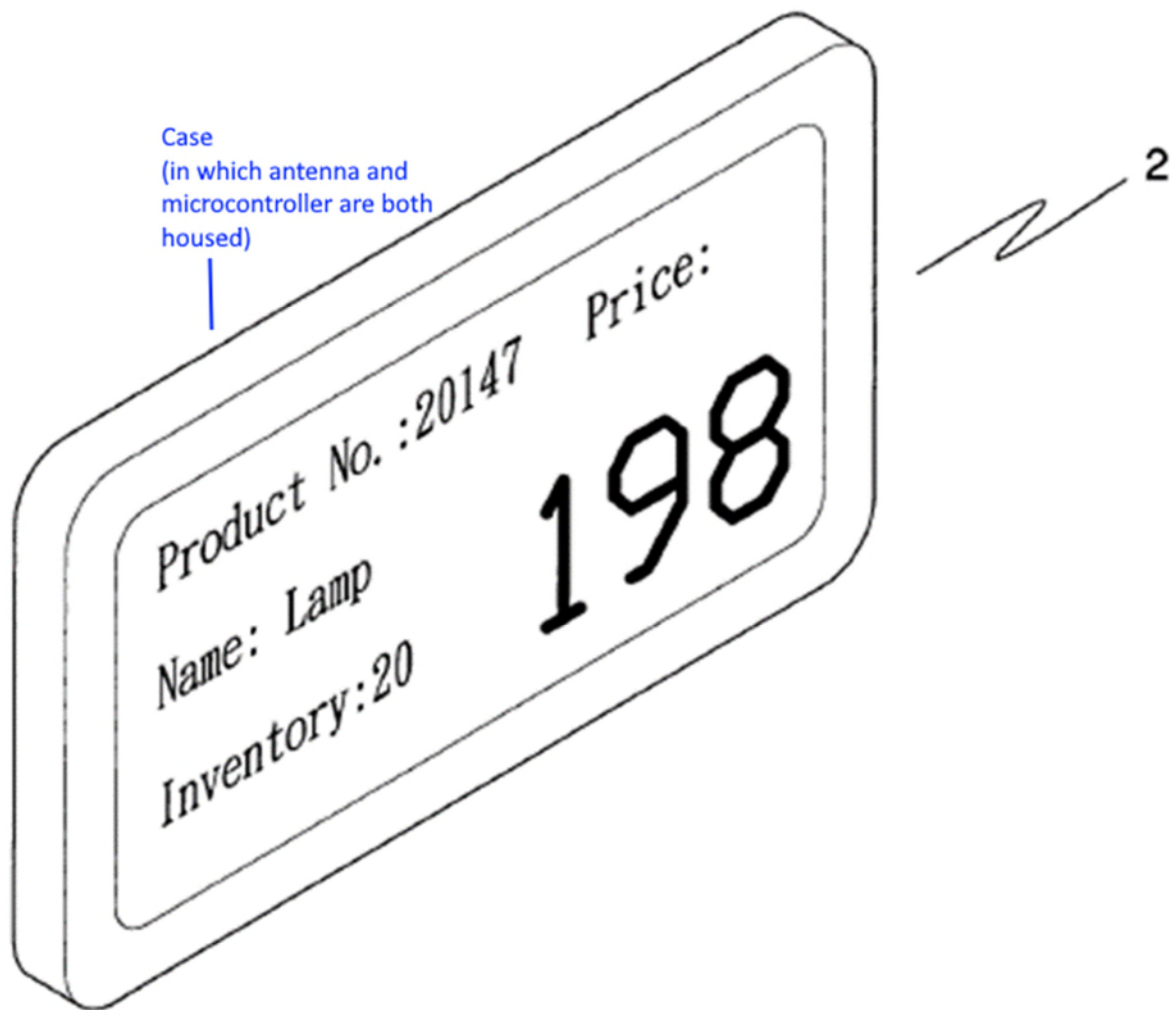


FIG. 2

Ex. 1006, FIG. 2 (annotated)

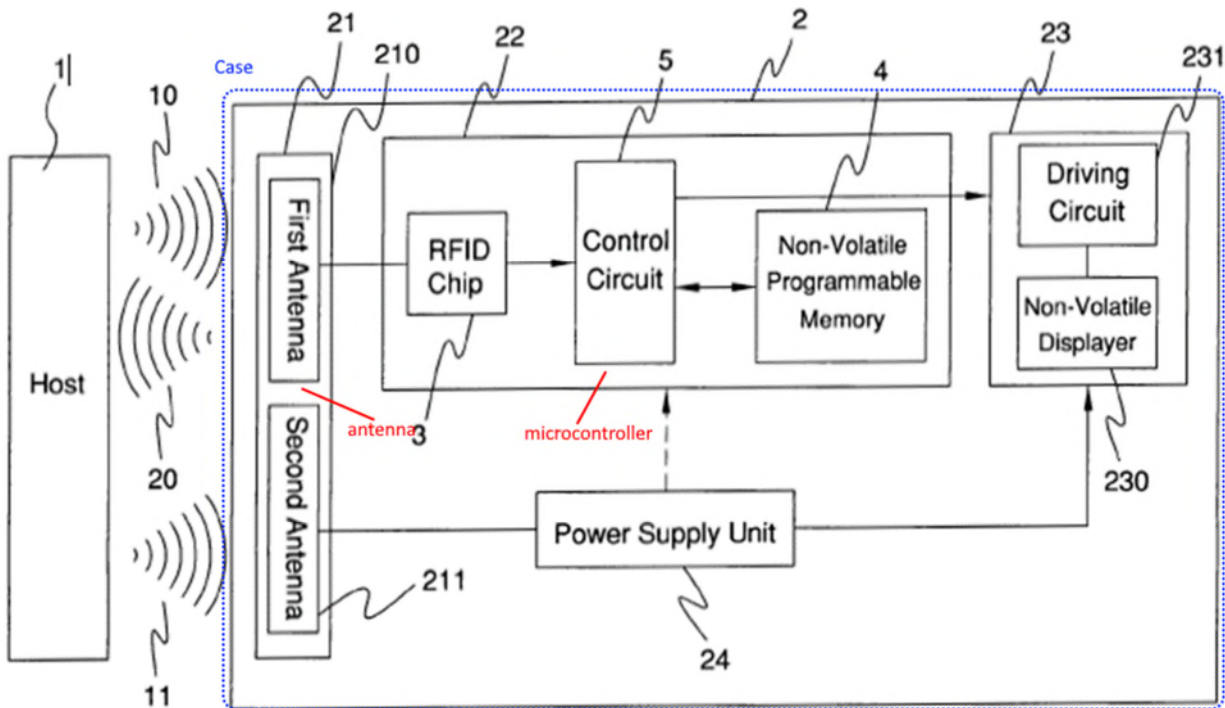


FIG. 3

Ex. 1006, FIG. 3 (annotated).

Thus, Siotia-Sakata-Akao-Chen discloses each and every limitation of [9] because Siotia-Sakata-Akao discloses every limitation in independent Claim 5 and Chen discloses all of the new limitations in [8] and [9]. Ex. 1011, ¶169. As discussed in III.G.4 below, a POSITA would have been motivated and able to implement Siotia-Sakata-Akao's electronic shelf label-tag in accordance with Chen's teachings, and thus meeting all the limitations of [9]. *Id.* Therefore, Siotia-Sakata-Akao-Chen renders Claim 9 obvious. *Id.*

4. A POSITA would have reason to combine Siotia-Sakata-Akao with Chen

A POSITA would have had a reason to combine Siotia-Sakata-Akao with Chen by implementing Siotia-Sakata-Akao's electronic shelf label-tag in accordance with Chen's teachings, and would have had a reasonable expectation of success in doing so. Ex. 1011, ¶170.

A POSITA would have had reason to implement the structure of Chen's wireless display devices to implement the electronic shelf label-tag of Siotia-Sakata-Akao. Ex. 1011, ¶171. Siotia-Sakata-Akao already discloses an electronic shelf label-tag system, in which the electronic shelf labels-tags receive information from a central server and display such information. *Id.* A POSITA would recognize certain obvious structural principles for the electronic shelf label-tag of Siotia-Sakata-Akao. *Id.* A POSITA reading Siotia, Sakata and Akao in view of Chen would further find it obvious to use the detailed structure disclosed in Chen to implement the electronic shelf label-tag of Siotia-Sakata-Akao in actual realization of the system of Siotia-Sakata-Akao. *Id.* Further, using Chen's wireless display device, with its avoidance of battery power (and thus smaller size of the label), would address Akao's express concern over "a large device configuration of the electronic shelf label and high cost" in the prior art electronic shelf systems (Ex. 1004, [0003]), as well as follow Sakata's express disclosure of using received radio waves to power the communication (Ex.

1008, [0022]). *Id.* Thus, a POSITA would have been motivated to use Chen's teachings to implement the electronic shelf label-tag of Siotia-Sakata-Akao in furtherance of these express disclosures of Sakata and Akao. Ex. 1011, ¶171.

Further, the change would be obvious to try because Chen expressly teaches that the wireless display devices can be applied to an electronic shelf label system, *see* Ex. 1006, [2:55-60], and Siotia-Sakata-Akao discloses an electronic shelf label-tag system. Ex. 1011, ¶172. This would be obvious to try for another reason, as several of the components disclosed in Chen (processing unit 22 including RFID chip 3/non-volatile programmable memory 4, display unit 23) all have their functionally corresponding components expressly disclosed in Siotia-Sakata-Akao, namely, the CPU 10, near-range communication section 16, memory section 15, display section 12 of Akao (*see* Ex. 1004, [0015]). Ex. 1011, ¶172. As such, combining Chen's wireless display device structure with the Siotia-Sakata-Akao's electronic shelf label-tag represents nothing more than the mere application of a known technique to a piece of prior art ready for the improvement, and a POSITA would have a reasonable expectation of success in doing so, and thus creating the Siotia-Sakata-Akao-Chen combination that explicitly discloses all the limitations of Claims 8-9. *Id.*

A POSITA familiar with the RFID/NFC technology and standards, including the powering and activation mechanisms for both active and passive RFID/NFC

tags, would recognize that the electronic shelf label/tag of Siotia-Sakata-Akao only requires a single antenna which facilitates both the communication with readers and the supply of power (and thus activation) through received electromagnetic waves, and would recognize that while Chen discloses two antennas, it is not necessary to implement Chen's second antenna (which provides an alternative powering mechanism) in Siotia-Sakata-Akao's electronic shelf label/tag. Ex. 1011, ¶173. As discussed above, a POSITA only needs Chen's teachings of structural elements for reaching a concrete implementation of Siotia-Sakata-Akao's electronic shelf label/tag, and for this a POSITA would know that Chen's first antenna is analogous in its function of near range communication to Siotia-Sakata-Akao's antenna, and Chen's RFID chip, control unit and memory are analogous in their functions to their corresponding components of Siotia-Sakata-Akao's electronic shelf label/tag, while Siotia-Sakata-Akao's antenna already possesses power supply mechanisms (from Sakata's teaching) and therefore Chen's second antenna is not necessary for a concrete implementation of Siotia-Sakata-Akao's electronic shelf label/tag. *Id.* Omitting Chen's second antenna in the concrete implementation would keep the existing integration in Siotia-Sakata-Akao's antenna of both functionalities, as well as reducing the overall components and complexity of the electronic shelf label/tag, thus reducing the scope of modification, simplifying the overall design, saving cost, and facilitating production and maintenance. *Id.*

A diagram showing the implementation of Chen's structural elements in Siotia-Sakata-Akao is shown below:

[FIG. 3]

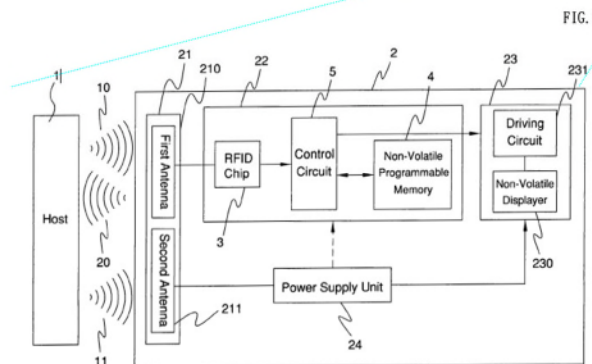
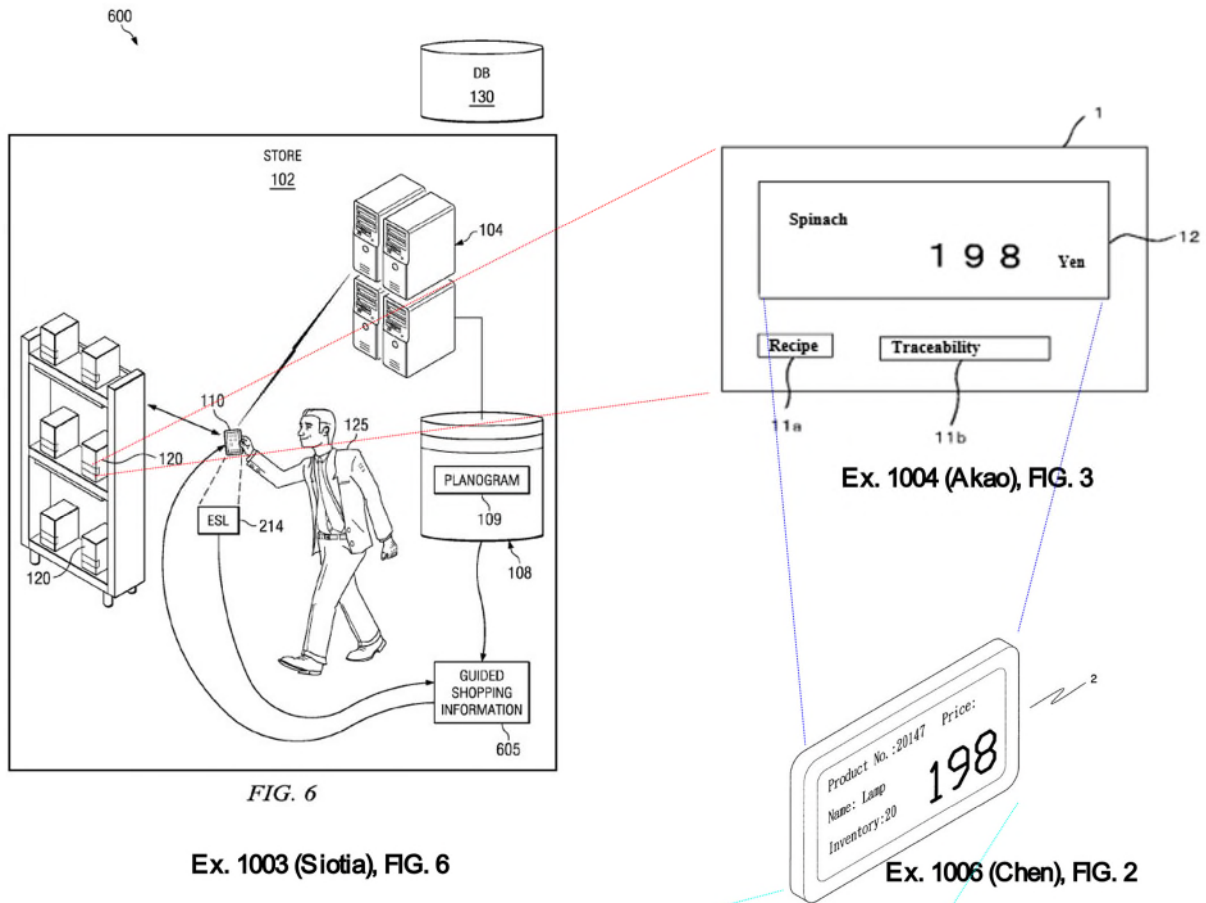


FIG. 3

Ex. 1006 (Chen), FIG. 3

H. Ground 4: Claims 1-3, 5 and 8 are rendered obvious by Ghosh in combination with Sakata

As set forth in detail below, Ghosh in combination with Sakata (“Ghosh-Sakata”), discloses each and every limitation recited by claims 1-3, 5 and 8. Ex. 1011, ¶180. Furthermore, A POSITA would have had a reason to combine Ghosh with Sakata and would have had a reasonable expectation of success in doing so. *Id.*

1. Ghosh

U.S. Patent Application Publication No. 2012/0095805A1 by Ghosh (“Ghosh”) discloses “a computer-implemented method of acquiring customer insight information in a retail environment.” Ex. 1007, [Abstract]. In particular, it discloses that the customer insight system can be used to track customer location and foot traffic within the retail environment, or to initiate personalized customer interactions such as targeted advertising and product offers, product information, customer assistance, and the like. Ex. 1007, [0008].

FIG. 1 of Ghosh is a prospective view of a retail environment that includes a customer insight system in accordance with the embodiments.

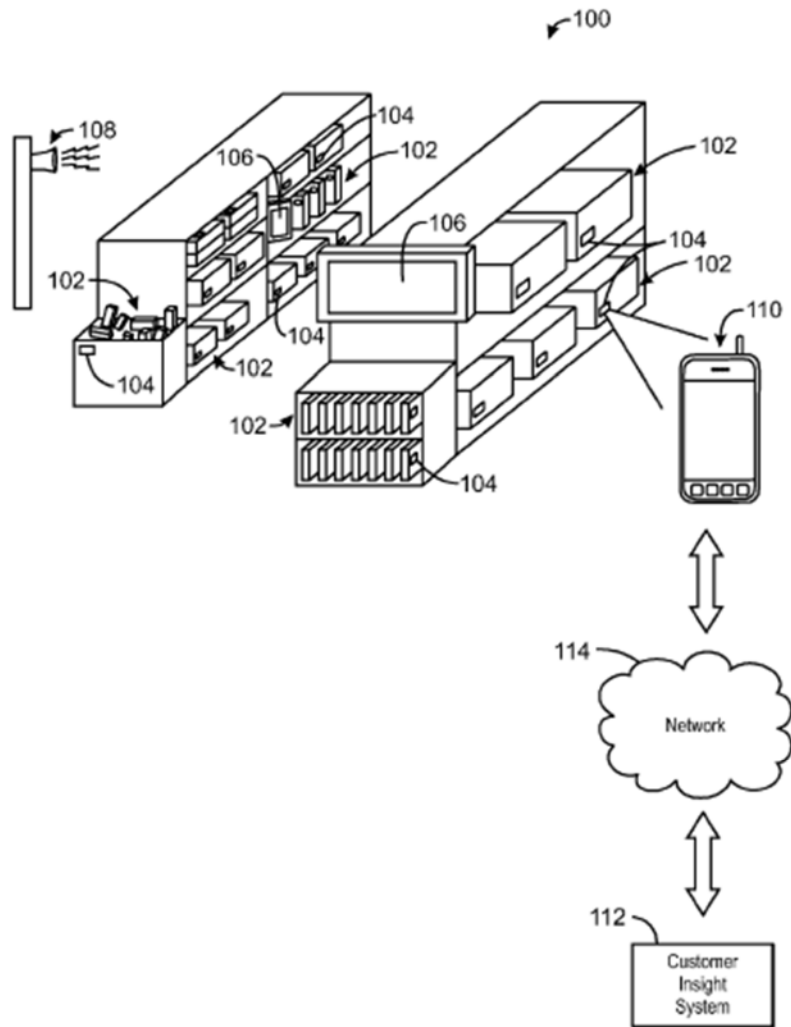
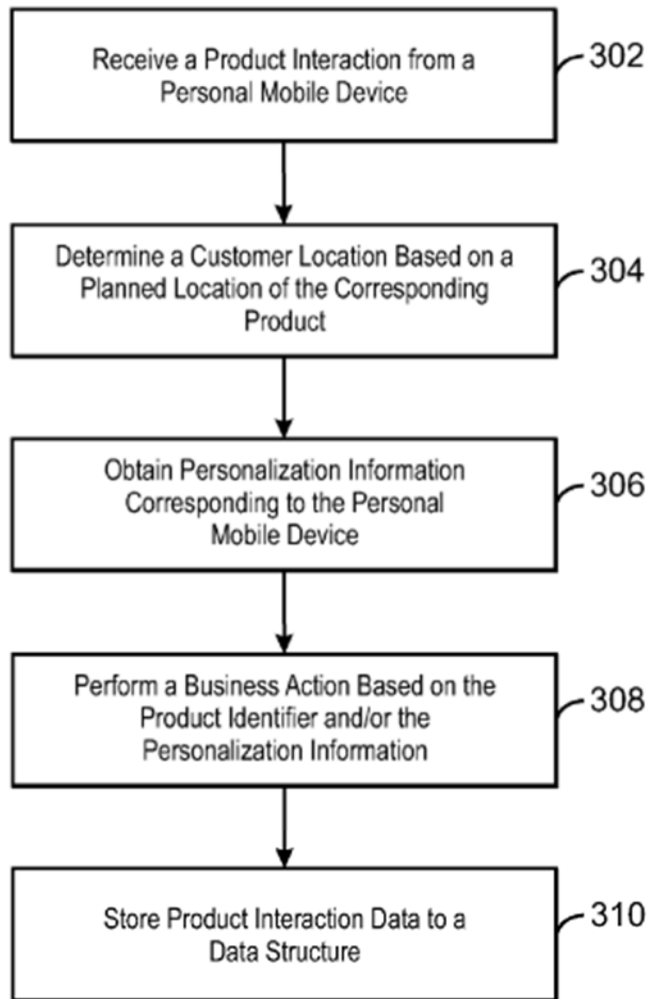


FIG. 1

Ex. 1007, FIG. 1.

FIG. 3 of Ghosh is a flow diagram showing one method in accordance with the embodiments.



300
FIG. 3

Ex. 1007, FIG. 3.

Ghosh qualifies as prior art under pre-AIA 35 U.S.C. § 102(e) because it was filed on October 18, 2010, before the '340 Patent's April 11, 2012 claimed priority date. Ex. 1007, (22).

Ghosh is analogous prior art to the '340 Patent. The '340 Patent alleges an invention of “means for providing consumers with spatially localized information, in relation to the place and context of a consumer, which complements the information already visually available in a sales area” (Ex. 1001, [2:8-12]) while Ghosh discloses methods to “track customer location and foot traffic within the retail environment” as well as “initiate personalized customer interactions such as targeted advertising and product offers, product information, customer assistance, and the like” (Ex. 1007, [0008]). Ex. 1011, ¶179. Thus, both Ghosh and the '340 Patent are in the same field of endeavor for determining customer location within the sales area and providing targeted information to customer. *Id.*

2. Claim 1

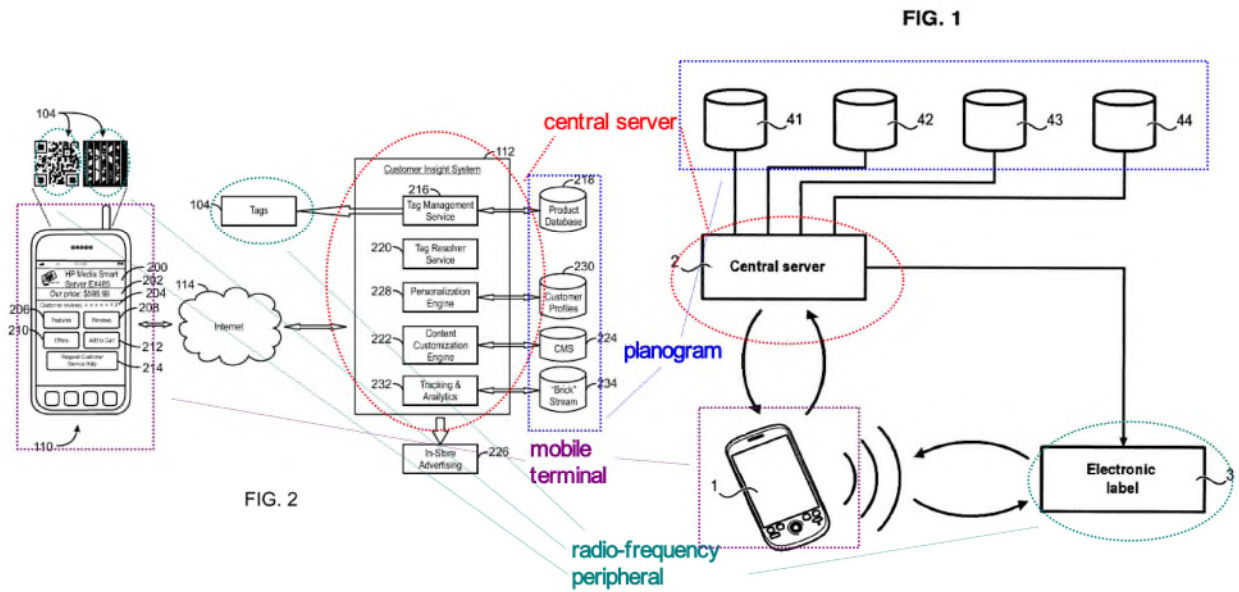
a. [1Pre]

The portion “A method for communicating spatially localized information” is not limiting, because it merely states the purpose or intended use of the alleged invention. Ex. 1011, ¶181. It does not define any of the claim limitations, which are set forth fully in the body of the claim (i.e. a communicating method of spatially localized information). *Id.* But even if it were limiting, the prior art discloses this portion, as discussed in Section III.H.2.d below.

Ghosh discloses a customer insight system 112 (**central server**) accessible through network 114 from mobile device 110 (**mobile terminal**). Ex. 1007, [0012].

Ghosh discloses a store **planogram** that is accessible by the customer insight system 112. Ex. 1007, [0009], [0013]. Ghosh discloses a product identification tag 104 that can be an RFID or NFC tag, that is, a **radio-frequency peripheral**. Ex. 1007, [0009], [0011], [0017]. Ghosh discloses a plurality of products 102 in the retail environment 100, “associated with product identification tags 104 that can be used to electronically identify the corresponding product 102.” Ex. 1007, [0009]. Ghosh discloses that “the location of products within the retail environment can be determined according to a store planogram that indicates how and where the retail products are to be displayed.” Ex. 1007, [0009]. Ghosh discloses that the product identification tags 104 may include a **unique product identifier**. Ex. 1007, [0009]. Ghosh discloses that the product identification obtained from product identification tag 104 can be compared by the customer insight system 112 against the store planogram to accurately identify user location within the retail environment 100. Ex. 1007, [0013]. Thus, the **unique product identifier** of Ghosh is necessarily **associated one-to-one** in the **planogram** with the product **locations** within the **predetermined area** of the retail environment. Ex. 1011, ¶182.

The following annotated figure shows the correspondence between the components of Ghosh and the components of the '340 Patent.



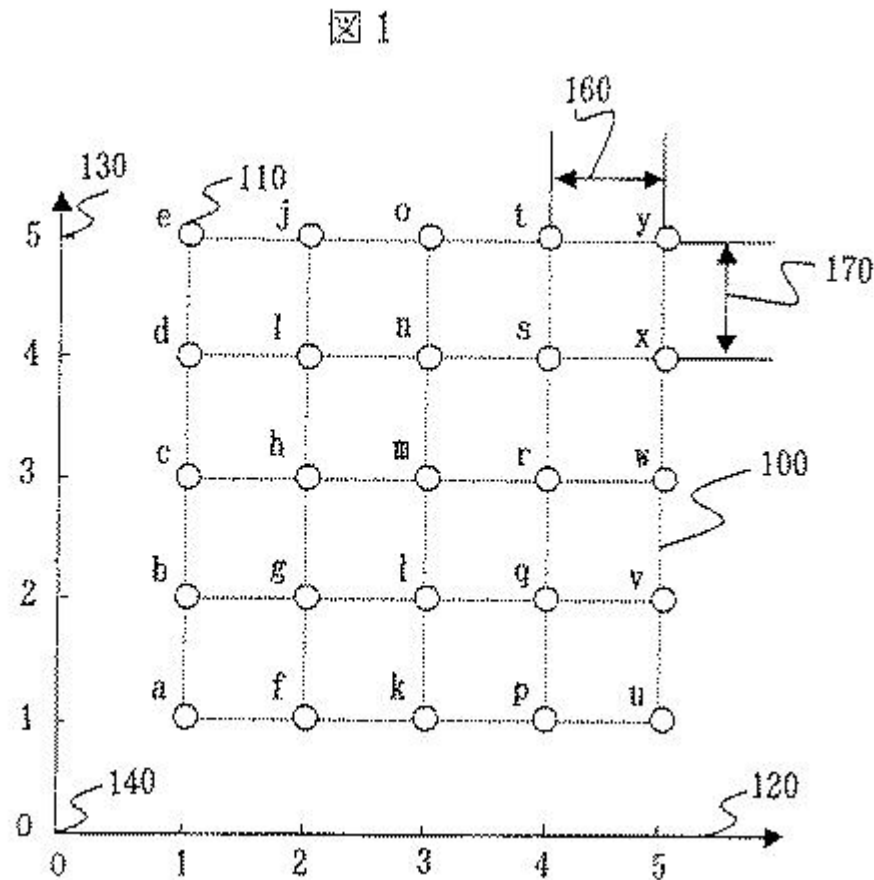
Ex. 1007, FIG. 2

Ex. 1001, FIG. 1

Further, Sakata discloses “IC tags (RFID: Radio Frequency Identification), each of which has a unique ID.” Ex. 1008, [0012]. A POSITA would recognize that Sakata’s RFID tag and its unique ID are functionally and structurally analogous to Ghosh’s product identification tag 104 and unique product identifier. Ex. 1011, ¶184. Sakata further discloses “a coordinate point-to-IC tag ID correspondence table 200 and a coordinate basic information management table 300.” Ex. 1008, [0016]. A POSITA would recognize that these tables are functionally and structurally analogous to Ghosh’s store planogram. Ex. 1011, ¶184.

Sakata then discloses that the IC tags are placed in a matrix pattern based on a two-dimensional coordinate system, with each tag placed on a coordinate point. Ex. 1008, [0012], [0015]. Sakata further discloses that “[t]he IC tag coordinate

system... is constituted by a one-to-one correspondence between the unique ID held by each IC tag 110 located at each coordinate point of the two-dimensional coordinate IC tag location information holding means 100 and the address on the coordinate system (X coordinate system and Y coordinate system).” Ex. 1008, [0016]. FIG. 1 of Sakata shows the placement of IC tags on the coordinate system.

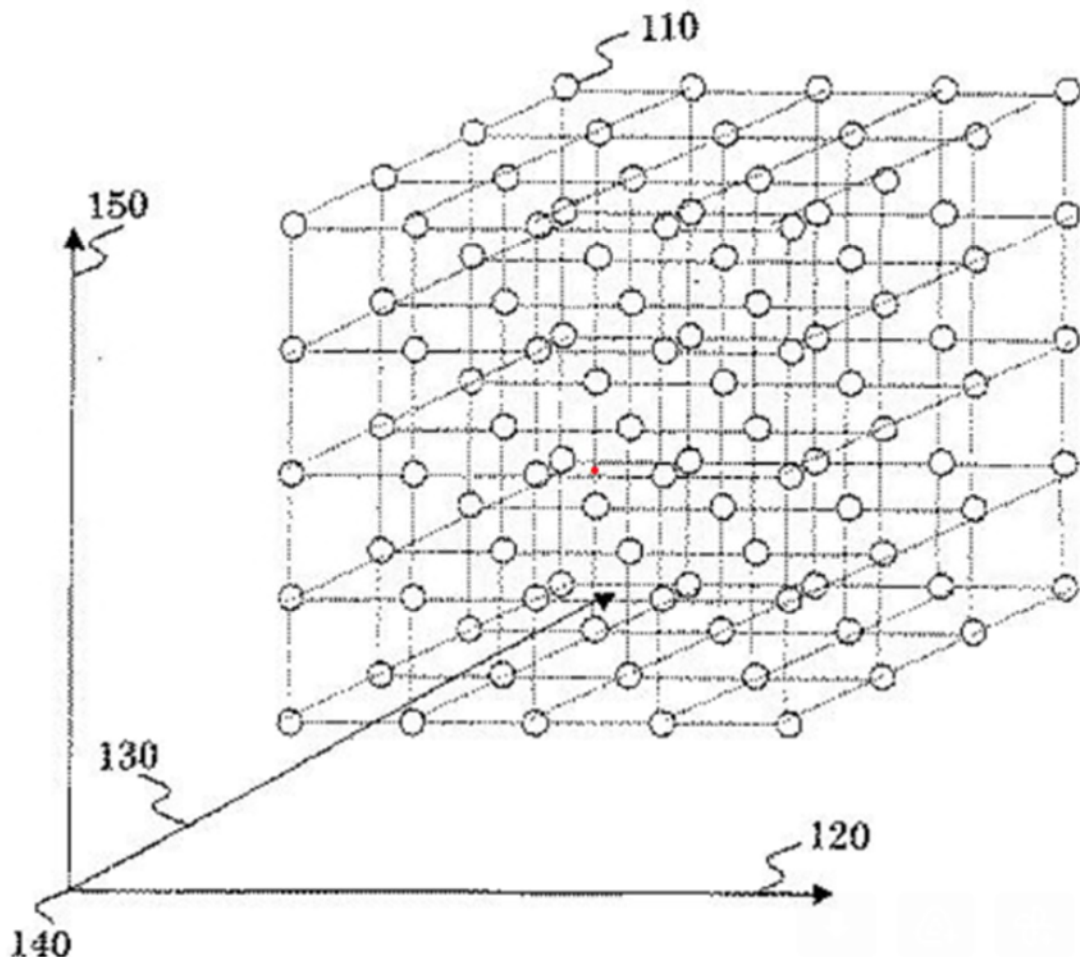


Ex. 1008, FIG. 1.

Sakata further discloses that the two-dimensional IC tag arrangement can be on a wall of a building. Ex. 1008, [0011], [0013], [0019]. Thus Sakata discloses the

claimed “each of the plurality of locations (*IC tag position*) being defined by a vertical (*y coordinate*) and horizontal (*x coordinate*) position within a plane (*the wall*) perpendicular to a floor of the predetermined area (*the building*)” of [1pre]. Ex. 1011, ¶186. Sakata, through its disclosure that the IC tags can be arranged in a three-dimensional coordinate system (Ex. 1008, [0021], FIG. 6), further teaches this limitation, because a three-dimensional coordinate system inherently includes at least one claimed two-dimensional vertical-plane coordinate system. *Id.*

FIG. 6



Ex. 1008, FIG. 6

Further, Ghosh discloses that the product identification tags can be located on a display case or product shelving. Ex. 1007, [0009]. FIG. 1 of Ghosh (attached and annotated below) shows a plurality of product identification tags on several product shelves. As discussed in Section III.H.7 below, a POSITA reading Ghosh in view of Sakata would recognize that it is obvious to implement Sakata's 2-dimensional vertical arrangement of tags in Ghosh's planogram, such that the location of products associated with the unique identifiers would be **defined by a vertical and horizontal position within a plane perpendicular to a floor of the predetermined area** of retail environment 100. Ex. 1011, ¶187.

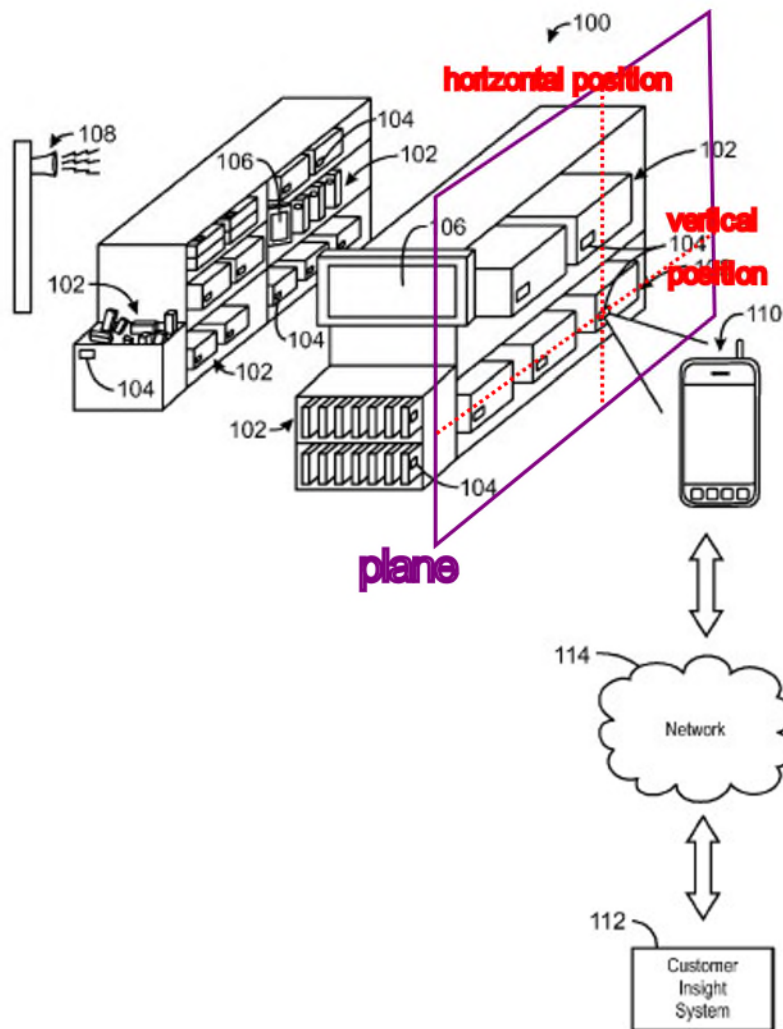


FIG. 1

Ex. 1007, FIG. 1 (annotated).

Therefore, Ghosh-Sakata discloses each and every limitation of [1pre] because Ghosh alone teaches all of these limitations except that Ghosh only implicitly depicts the claimed “vertical and horizontal position” through FIG. 1, and Sakata supplements Ghosh and explicitly teaches this limitation. Ex. 1011, ¶¶188-189. As discussed in Section III.H.7 below, a POSITA would have been motivated

and able to combine Ghosh’s disclosure of tag placement with Sakata’s disclosure of positioning in a vertical plane, and thus further strengthen Ghosh-Sakata’s disclosure of the “vertical and horizontal position” limitation. Ex. 1011, ¶189.

b. [1a]

Ghosh discloses that the mobile device 110 can use RFID tag reader or NFC device to electronically communicate with product tags 104. Ex. 1007, [0011]. Ghosh discloses that the mobile device 110 (**mobile terminal**) then **communicates** the contents of the product identification tag 104 to customer insight system 112 (**central server**) through a network 114. Ex. 1007, [0012]. Ghosh discloses that such content may include the **unique** product **identifier**. Ex. 1007, [0009].

A POSITA, with background knowledge of NFC technology and standards such as ISO 14443, would understand that a product tag 104 that communicates with mobile device 110 through NFC necessarily includes **an antenna and an electronic chip configured for near-field communication**, and is configured to be **activated by the mobile terminal** when the radio-frequency communication peripheral is within a **communication range** of the mobile terminal. Ex. 1011, ¶191. A POSITA would further understand that NFC standards such as ISO 14443 typically operate within a distance of less than twenty centimeters, therefore a POSITA would find

that Ghosh’s disclosure of NFC tags necessarily and inherently teaches the claimed communication range of **less than twenty centimeters**. *Id.*

Sakata discloses that each IC tag comprises an **antenna** and an IC **chip**. Ex. 1008, [0022]. Sakata discloses that the reading range is restricted to the immediate vicinity of the IC tag, thus the antenna and the chip are **configured for near-field communication**. Ex. 1011, ¶192. Sakata further discloses that the reading range must be kept sufficiently smaller than the corresponding coordinate point interval to avoid incorrect reading of IC tags at adjacent coordinate points, and the latter interval can be as small as 1cm. Ex. 1008, [0015]. Thus, Sakata teaches a **communication range** that is **less than twenty centimeters**. Ex. 1011, ¶192.

Sakata discloses that the IC tags can transmit its unique ID, “by non-contact, using the radio waves received by the antenna as operating power.” Ex. 1008, [0022]. A POSITA would understand that this inherently means the tag **is configured to be activated** by a reader when it is within its communication range with the reader. Ex. 1011, ¶193.

Therefore, Ghosh-Sakata discloses each and every limitation of [1a]. Ex. 1011, ¶¶194-195. In particular, Sakata supplements Ghosh through its explicit disclosures of NFC structural elements and communication capacities, which Ghosh implicitly discloses through its disclosure of NFC device, and Ghosh explicitly

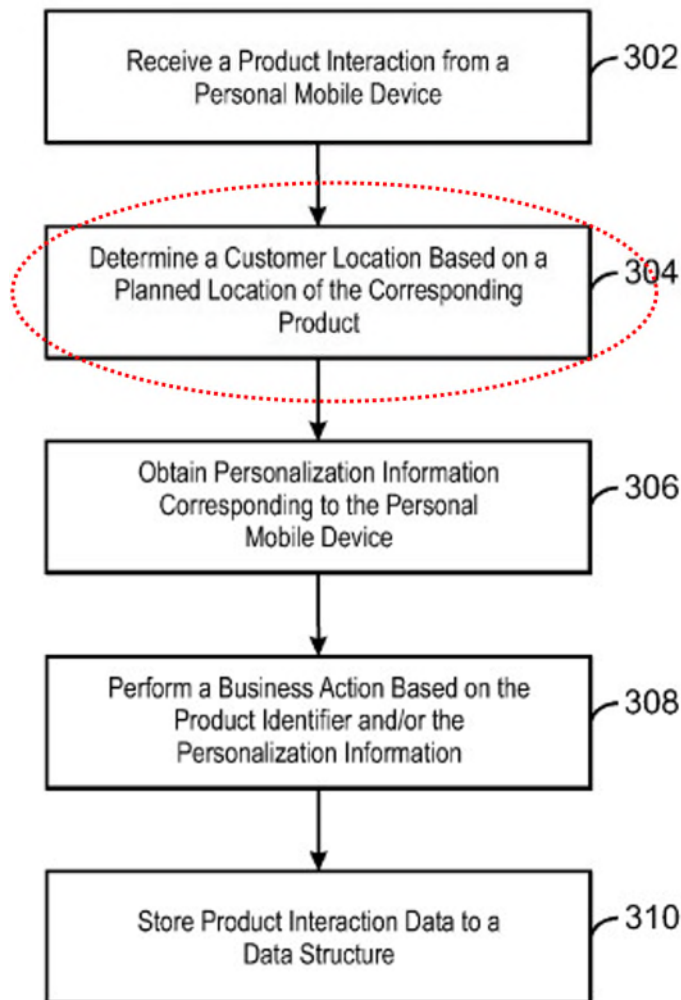
discloses all other limitations of [1a]. Ex. 1011, ¶195. As discussed in Section III.H.7 below, a POSITA would have been motivated and able to modify Ghosh by implementing Ghosh's NFC device with Sakata's NFC structural elements and communication capacities, and thus reach the Ghosh-Sakata combination that discloses all of the limitations of [1a]. *Id.*

c. [1b]

Ghosh discloses **determining** the customer's **location** within the retail environment 100. Ex. 1007, [0013]. Ghosh further discloses comparing the product identification (the **unique identifier**) obtained from the product identification tag 104 against the store **planogram** (product map) to accurately identify user location within the retail environment 100. Ex. 1007, [0013]. A POSITA would understand that this necessarily means determining the location of the mobile device 110 of the customer based on the location associated with the unique identifier in the planogram. Ex. 1011, ¶196.

Because the location associated with the unique identifier comprises **the vertical and horizontal position of said location**, *see* Section III.H.2.a, and because the mobile device is necessarily within a short range less than twenty centimeters of that location, *see* Section III.H.2.b, a POSITA would find it obvious that the determined location of the mobile device necessarily comprises **the vertical and horizontal position of said location**. Ex. 1011, ¶197.

FIG. 3 of Ghosh summarizes such determining of the location.



300
FIG. 3

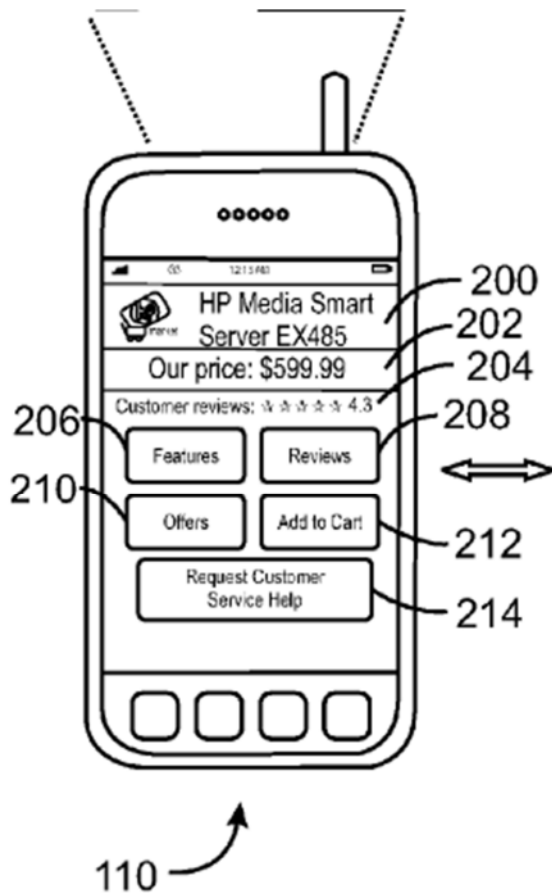
Ex. 1007, FIG. 3 (annotated).

Therefore, Ghosh-Sakata discloses each and every limitation of [1b] because Ghosh alone discloses all of them. Ex. 1011, ¶¶199-200. Moreover, Sakata is

directed to location determination (Ex. 1008, [0008]) and teaches two-dimensional location determination in a vertical plane (Ex. 1008, [0011], [0012], [0013], [0019]), and as discussed in Section III.H.7 below, a POSITA would have been motivated and able to use Sakata's two-dimensional location determination to supplement Ghosh's teachings, thus further strengthening Ghosh-Sakata's disclosure of the "vertical and horizontal position" limitation. Ex. 1011, ¶200.

d. [1c]

Ghosh discloses that, after the customer insight system 112 compares the product identification obtained from the product identification tag 104 against the store planogram (product map) to accurately identify user location within the retail environment 100, the location of the customer can be used to provide targeted, in-store advertising and customer assistance. Ex. 1007, [0013]. Ghosh discloses sending product-related content to the customer's mobile device 110 and initiating in-store advertising. Ex. 1007, [0012]. Ghosh discloses that such content may include "name of the product 200, product pricing 202, overall customer review rating 204, and the like." Ex. 1007, [0016]. Such product-related content, associated with the location of product corresponding to the obtained product identification, and sent after determination of the user location, is **spatially localized information**. Ex. 1011, ¶201.



Ex. 1007, FIG. 2 (portion).

Sakata discloses indicating object locations to the user through LED lamps to make it easier for the user to identify objects. Ex. 1008, [0025]-[0026]. Such indication of locations of objects to be found provides **spatially localized information associated with the location of the mobile terminal**. Ex. 1011, ¶202.

Therefore, Ghosh-Sakata discloses each and every limitation of [1c] because Ghosh alone discloses all of them. Ex. 1011, ¶¶203-204. As discussed in Section III.H.7 below, a POSITA would have been motivated and able to combine Ghosh's

disclosure of targeted information with Sakata’s disclosures of location indication, and thus further strengthen Ghosh-Sakata’s disclosure of the “spatially localized information” limitation. Ex. 1011, ¶204.

Therefore, Ghosh-Sakata renders Claim 1 obvious. Ex. 1011, ¶205.

3. Claim 2

A POSITA would find the claimed interaction between the mobile terminal and the radio-frequency communication peripheral to be inherent in the NFC functionality (Ex. 1007, [0011]) disclosed by Ghosh. Ex. 1011, ¶207.

Sakata teaches the claimed powering by electromagnetic wave through its disclosure of “using the radio waves received by the antenna as operating power.” Ex. 1008, [0022]. As discussed in Section III.H.2.b, Sakata discloses the claimed radio-frequency communication and the communication range. Ex. 1011, ¶208. As Sakata discloses the use of the radio waves as operating power, a POSITA would find it obvious that the communication range is a range of the radio waves (electromagnetic waves) emitted by the source of the radio waves such as the reading device of Sakata (the mobile device of Ghosh-Sakata). *Id.*

Therefore, Ghosh-Sakata discloses each and every limitation of [2]. Ex. 1011, ¶209. In particular, Sakata supplements Ghosh through its explicit disclosures of the claimed activation by electromagnetic wave of [2]. *Id.* As discussed in Section

III.H.7 below, a POSITA would have been motivated and able to modify Ghosh by using Sakata's IC tags for Ghosh's NFC device, and thus reach the Ghosh-Sakata combination that discloses all of the limitations of [2]. *Id.* Therefore, Ghosh-Sakata renders Claim 2 obvious. *Id.*

4. Claim 3

Ghosh discloses that the mobile device 110 may communicate with the customer insight system 112 through a network 114. Ex. 1007, [0012]. Ghosh discloses that "[t]he network 114 can be any suitable type of wireless communication network, including a WiFi network." Ex. 1007, [0012]. A POSITA, familiar with Wi-Fi technology and standards, and with the interchangeability of the terms Wi-Fi and Internet, find it obvious to use a WiFi network on **the Internet** to carry out such communication. Ex. 1011, ¶211.

Sakata discloses using the Internet to provide the IC tag coordinate system. Ex. 1008, [0017].

Therefore, Ghosh-Sakata discloses each and every limitation of [3]. Ex. 1011, ¶213. In particular, Sakata supplements Ghosh through its explicit disclosure of the use of the Internet. *Id.* As discussed in Section III.H.7 below, a POSITA would have been motivated and able to modify Ghosh by implementing Ghosh's WiFi network

on Sakata's Internet, and thus reach the Ghosh-Sakata combination that discloses all of the limitations of [3]. *Id.* Therefore, Ghosh-Sakata renders Claim 3 obvious. *Id.*

5. Claim 5

Claim 5 recites a system analogous to method claim 1, and is rendered obvious by Ghosh-Sakata for same reasons set forth for claim 1. Ex. 1011, ¶¶214-222.

a. [5pre]

The limitations of [5pre] are substantially the same as the corresponding limitations of [1pre]. Ex. 1011, ¶214. *See* Section III.H.2.a.

b. [5a]

The limitations of [5a] are substantially the same as the corresponding limitations of [1pre]. Ex. 1011, ¶215. *See* Section III.H.2.a.

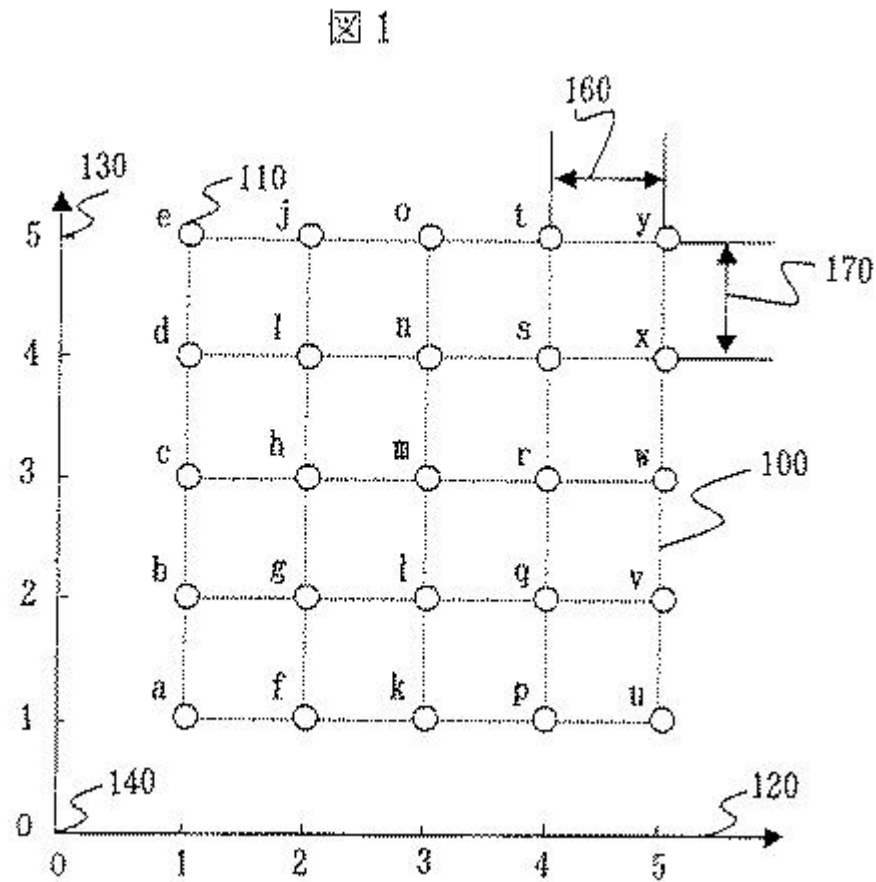
c. [5b]

[1pre] and [1a] claim the central server receiving a communication from the mobile terminal, therefore the mobile terminal is configured to communication with the central server. Ex. 1011, ¶216. *See* Sections III.H.2.a and III.H.2.b.

d. [5c]

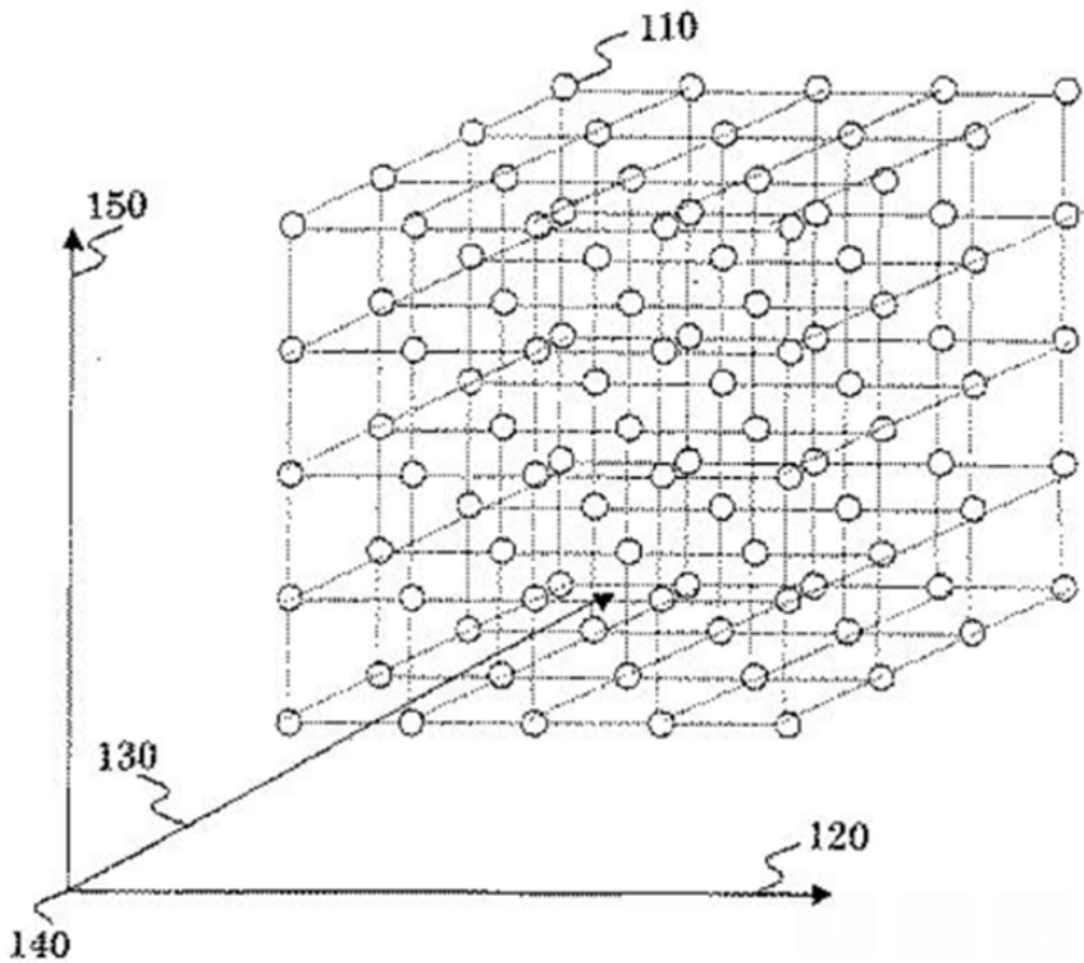
The limitations of [5c] are substantially the same as the corresponding limitations of [1pre] and [1a]. Ex. 1011, ¶217. *See* Sections III.H.2.a and III.H.2.b. Further, Sakata discloses that the plurality of RFIDs (**radio-frequency peripherals**)

are **distributed throughout** the predetermined area through FIGS. 1 and 6. Ex. 1011, ¶217.



Ex. 1008, FIG. 1.

FIG. 6



Ex. 1008, FIG. 6.

e. [5d]

[5d] introduces no new limitation. Ex. 1011, ¶218. *See* Section III.H.2.a.

f. [5e]

The limitations of [5e] are substantially the same as the corresponding limitations of [1a]. Ex. 1011, ¶219. *See* Section III.H.2.b.

g. [5f]

The limitations of [5f] are substantially the same as the corresponding limitations of [1b]. Ex. 1011, ¶220. *See* Section III.H.2.c.

h. [5g]

The limitations of [5g] are substantially the same as the corresponding limitations of [1c]. Ex. 1011, ¶221. *See* Section III.H.2.d.

Therefore, Ghosh-Sakata renders Claim 5 obvious. Ex. 1011, ¶222.

6. Claim 8

As discussed in Section III.H.2.b, Sakata discloses the claimed **chip** and **antenna**. Ex. 1011, ¶224. Sakata further discloses that the antenna is contained in a 0.4 square mm chip of its own. Ex. 1008, [0022]. As Sakata discloses the antenna chip and the IC chip separately (Ex. 1008, [0022]), a POSITA would find it obvious to that these two chips are distinct and necessarily **arranged at different points of the radio-frequency peripheral**, as the two components necessarily need to occupy different physical locations inside the radio-frequency peripheral. Ex. 1011, ¶224. A POSITA would also find that the disclosure of Sakata inherently teaches the claimed “**ensure a communications link between the antenna and the chip**” through the disclosure that the tag transmits the unique ID held within the IC chip through the antenna (Ex. 1008, [0022]). Ex. 1011, ¶224.

Therefore, Ghosh-Sakata renders claim 8 obvious. Ex. 1011, ¶225.

7. A POSITA would have reason to combine Ghosh with Sakata

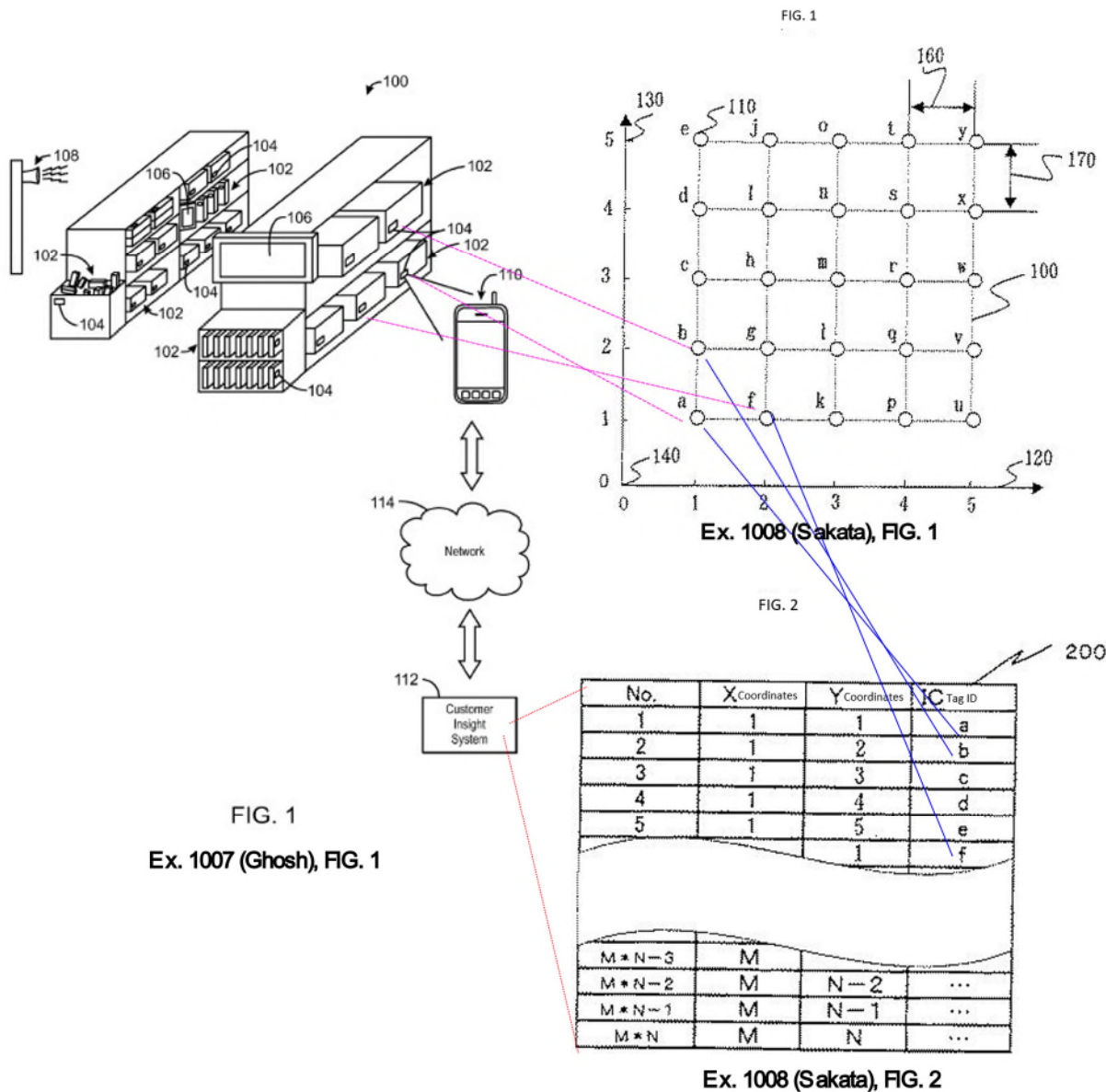
A POSITA would have had a reason to combine Ghosh with Sakata, and would have had a reasonable expectation of success in doing so. Ex. 1011, ¶226.

In particular, a POSITA would have been motivated to combine Sakata's disclosure of vertical positioning with Ghosh to implement Ghosh's expressly taught objectives of tracking customer location and foot traffic within the retail environment, initiating personalized customer interactions such as targeted advertising and product offers, as well as providing customer assistance (Ex. 1007, [0008]). Ex. 1011, ¶227. Specifically, Ghosh teaches determining the precise location of the customer within the store through NFC interactions. Ex. 1007, [0020]. Ghosh further discloses providing targeted customer assistance. Ex. 1007, [0013].

Sakata discloses using 2-dimensionally arranged RFID tags that have a very short communication range (that is, NFC tags) to achieve precise location identification for an indoor environment. Ex. 1008, [0001], [0012], [0015], [0022]. A POSITA would thus have been motivated and able to use the teachings of Sakata to modify Ghosh such that the customer insight system of Ghosh (and the planogram of Ghosh that the customer insight system accesses) will implement the vertical positioning of Sakata to more precisely determine the location of the user (that would include the precise item location in the vertical plane, as depicted by Ghosh through

FIG. 1, *see* Section III.H.2.a) and thus provide more targeted advertising, product offers and user assistance. Ex. 1011, ¶228. This aids Ghosh's explicitly disclosed objective of tracking customer location and foot traffic within the retail environment and of providing targeted customer assistance. *Id.*

A diagram showing the usage of Sakata's vertical arrangement to supplement Ghosh is shown below:



Further, a POSITA would also have been motivated and able to modify Ghosh so as to implement Ghosh's network 114 (Ex. 1007, [0012]) with Sakata's Internet (Ex. 1008, [0017]). Ex. 1011, ¶230. Ghosh already discloses communications between the mobile terminal and the central server through network 114, which can be any suitable type of wireless communication network, including a WiFi network.

Ex. 1007, [0012]. Sakata then teaches explicitly communications through the Internet. Ex. 1008, [0017]. The Internet is a well-known and conventional element to a POSITA at the time of the claimed invention. Ex. 1011, ¶230. Thus, a POSITA would have known the Internet and its predictable results. Implementing Ghosh's network 114, which can be a WiFi network, via the Internet that is not only disclosed explicitly by Sakata but also a well-known and conventional element, represents no more than a mere application of a known technique to a piece of prior art ready for the improvement, and will serve the universal, conventional and expressly disclosed objective of Ghosh to effect communications between the mobile terminal and the central server. *Id.* Implementing Ghosh's network 114 with the Internet would have been well within the skill of a POSITA. *Id.*

A POSITA would also have been motivated and able to modify Ghosh so as to implement Sakata's location indication (Ex. 1008, [0025]-[0026]) in Ghosh. Ex. 1011, ¶231. Ghosh discloses adding products to virtual shopping carts. Ex. 1007, [0016]. Ghosh further discloses that the virtual shopping carts can be used to identify the products that the customer intends to purchase. Ex. 1007, [0016]. Ghosh also discloses providing personalized content to the customer based on the known interests and purchasing habits of the customer. Ex. 1007, [0014]. Sakata then discloses indicating the location of objects to make it easier to locate the objects from the location of the user. Ex. 1008, [0026]. A POSITA reading Ghosh in view

of Sakata would thus find it obvious to have Ghosh's customer insight system sending location information (including routing information from the user's location) for products in Ghosh's virtual shopping cart. Ex. 1011, ¶231. Provision of such information falls within the range of Ghosh's explicitly disclosed objective of providing personalized content to the customer based on the known interests and purchasing habits of the customer (as reflected from the customer's virtual shopping cart), and will aid Ghosh's explicitly disclosed objective of tracking customer location and foot traffic within the retail environment and of providing targeted customer assistance. A POSITA would further be motivated and able to use the teachings of Sakata to such routing information that takes the 3D location of the items into account, so as to provide more detailed and personalized routing information. *Id.* A POSITA would have known this method and apparatus as well as its predictable results. *Id.* This modification using Sakata's teachings of location indication serves to address the universal, obvious and expressly taught goals of customer assistance and customer tracking. *Id.* As such, combining Ghosh with Sakata represents, at most, an obvious extension of the functionality expressly disclosed in Ghosh to address this universal and obvious objective. *Id.* Application of the known teachings by Sakata to Ghosh's method and system would have been well within the skill of a POSITA. *Id.*

A POSITA would further have been motivated to implement Ghosh's expressly taught functionality of determining the precise location of the customer within the store through NFC interactions (Ex. 1007, [0020]) by utilizing Sakata's teachings of the structural details and communication capabilities of IC tags. Ex. 1011, ¶232.

Specifically, Ghosh teaches NFC interactions between product identification tags and mobile devices. Ex. 1007, [0011]. A POSITA at the time of the claimed invention would be knowledgeable about NFC technology. Ex. 1011, ¶233. A POSITA would also be knowledgeable of the short range (less than twenty centimeters) and radio the frequency (13.56MHz) of NFC standards such as ISO 14443, as well as the induction step of NFC communication. *Id.* Sakata then explicitly discloses the short communication range of IC tags as well as the activation of IC tags by power from received electromagnetic waves. Ex. 1008, [0015], [0022]. Sakata further explicitly discloses the antenna and the chip for implementing the range and the activation. Ex. 1008, [0022]. Thus, a POSITA would have been motivated and able to use the teachings of Sakata to modify Ghosh such that the product identification tag of Ghosh is implemented as a short-range RFID tag (that is, an NFC tag) of Sakata, so as to realize the advantages of less communication interference and more precise location finding that are explicitly taught by Sakata (Ex. 1008, [0007], [0015], [0022]). Ex. 1011, ¶233. This would

also address the expressly taught objective of Ghosh of determining the precise location of the customer within the store through NFC interactions. *Id.*

A POSITA reading Ghosh in view of Sakata would understand that such a modification involves no more than adopting a specific configuration of the expressly disclosed NFC tag in Ghosh. Ex. 1011, ¶234. Not only would this have been obvious to try, it would also have yielded no more than predictable results due to the combination of familiar elements in a known way. *Id.* Thus, a POSITA would have a reasonable expectation of success in such a modification. *Id.*

In all, by implementing the vertical positioning of Sakata in Ghosh’s system (which supplements Ghosh’s disclosures of “vertical and horizontal position” limitation in [1pre] and [1b]), and by implementing the NFC structural details and communication capacities of Sakata in Ghosh’s NFC tags (which supplements various limitations in [1a] and [2]), a POSITA would reach the Ghosh-Sakata combination that discloses all of the limitations of Claims 1-2 and 4-5. Ex. 1011, ¶235. Then, by implementing the location indication of Sakata in Ghosh’s system, a POSITA would cause the combination to have a stronger disclosure of the “spatially localized information” limitation of [1c]). *Id.* Further, by implementing Ghosh’s network 114 with Sakata’s Internet (which supplements the “Internet” limitation of Claim 3), a POSITA would cause the combination to disclose all of the limitations of Claim 3. *Id.*

I. Ground 5: Claims 6-7 and 9 are rendered obvious by Ghosh in combination with Sakata and Akao

As discussed in Section III.F, when the Siotia-Sakata combination is further combined with Akao, the resulting Siotia-Sakata-Akao combination discloses each and every limitation of claims 6-7 and 9. As all the discussions regarding the limitations and the motivations to combine there can be directly applied to combining the Ghosh-Sakata combination with Akao (with necessary and immediately obvious modifications), a Ghosh-Sakata-Akao combination thus reached would render Claims 6-7 and 9 obvious. Ex. 1011, ¶236.

J. Ground 6: Claims 8-9 are rendered obvious by Ghosh in combination with Sakata, Akao, and Chen

As discussed in Section III.G, when the Siotia-Sakata-Akao combination is further combined with Chen, the resulting Siotia-Sakata-Akao-Chen combination discloses each and every limitation of claims 8-9. As all the discussions regarding the limitations and the motivations to combine there can be directly applied to combining the Ghosh-Sakata-Akao combination with Chen (with necessary and immediately obvious modifications), a Ghosh-Sakata-Akao-Chen combination thus reached would render Claims 8-9 obvious. Ex. 1011, ¶237.

IV. SECONDARY CONSIDERATIONS

Petitioners are unaware of any evidence regarding secondary considerations of non-obviousness and reserve future rights to address the issue.

V. THE BOARD SHOULD INSTITUTE IPR

The Board should decline to exercise its discretion to deny institution.

A. No Discretionary Denial Under *Fintiv*

Among the six *Fintiv* factors, factor 1 is not in favor of exercising discretion because the Eastern District of New York has a record of granting stays pending the resolution of the IPR. Factors 2 and 3 are also not in favor because the District Court case is still in its early stage, with discovery just beginning and *Markman* Hearing proposed in August – September 2024, and the parties have not invested much in the Litigation. Factor 6 is neutral because Petitioners are unaware of any other circumstances that might impact the Board’s exercise of discretion.

Petitioners stipulate that, should the Board institute this Petition, Petitioners will not pursue in the District Court the specific grounds asserted herein or any other ground that was raised or could have been reasonably raised in an IPR. In view of this stipulation, the Board should decline to exercise its discretion to deny institution under *Fintiv*. Interim Procedure for Discretionary Denials (PTAB Jun. 21, 2022), at 7-8.

Finally, the strong merits presented herein also weigh in favor of not exercising discretionary denial. Overall, the factors weigh in favor of the Board declining to exercise its discretion to deny the petition.

B. No Discretionary Denial Under §325(d)

The Board has consistently “held that a reference that ‘was neither applied against the claims nor discussed by the Examiner’ does not weigh in favor of exercising [] discretion under §325(d).” *Fasteners for Retail, Inc. v. RTC Indus., Inc.*, IPR2019-00994, Paper 9 at 7-11 (PTAB Nov. 5, 2019). Here, none of the references used in the Grounds was cited during prosecution. Thus, there is nothing in favor of exercising discretion under §325(d).

C. Multiple Petitions

Petitioners respectfully file a separate paper that addresses why the Board should exercise its discretion to institute more than one petition.

VI. CONCLUSION

Petitioners respectfully request that the Board institute an IPR for Claims 1–9 of the ’340 Patent and find the claims unpatentable.

Date: November 14, 2023

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

I hereby certify that the foregoing Petition for *Inter Partes* Review of U.S. Patent No. 10,674,340 includes 13,777 words (as calculated by Microsoft Word), excluding those in the table of contents, table of authorities, list of exhibits, list of claims, mandatory notices, signatures, certificate of word count, and certificate of service. Accordingly, this Petition is under the word count limit of 14,000 words.

Date: November 14, 2023

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CERTIFICATE OF SERVICE

I hereby certify on November 14, 2023, that a true and correct copy of the Petition for *Inter Partes* Review of U.S. Patent No. 10,674,340 was served in its entirety via e-mail and UPS to the Patent Owner by serving the correspondence address of record for the '340 Patent:

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