

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.: IPR2024-00189

Patent No. 10,674,340

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

CONTENTS

I.	MANDATORY NOTICES.....	1
A.	Real Party In Interest.....	1
B.	Related Matters.....	1
C.	Counsel And Service Information.....	2
II.	GROUND FOR STANDING AND IDENTIFICATION OF CHALLENGE	2
A.	Standing.....	2
B.	Statutory Grounds for Each Claim.....	2
C.	Claim Construction.....	3
D.	How The Challenged Claims Are Unpatentable And Evidence Supporting Challenge	4
III.	THE CHALLENGED CLAIMS ARE UNPATENTABLE	4
A.	Background of the Field.....	4
B.	Overview of the Alleged Inventions	5
C.	The Level of Skill in the Art	9
D.	Principles of Law.....	9
E.	Ground 1	11
1.	Fujiwara	11
2.	Claims 1-9 are rendered obvious by Fujiwara.....	16
F.	Ground 2	52
1.	Arntzen	52
2.	Claims 1-9 are rendered obvious by Fujiwara in combination with Arntzen	54
G.	Ground 3	56

1. Bandy.....	56
2. Fowler.....	59
3. Claims 1-5 and 8-9 are rendered obvious by Bandy in combination with Fowler.....	61
H. Ground 4.....	91
1. Claims 1-5, 8-9 are rendered obvious by Bandy in combination with Fowler and Arntzen	92
IV. SECONDARY CONSIDERATIONS	92
V. THE BOARD SHOULD INSTITUTE IPR.....	93
A. No Discretionary Denial Under <i>Fintiv</i>	93
B. No Discretionary Denial Under §325(d).....	94
C. Multiple Petitions	94
VI. CONCLUSION	95

Exhibit List

Exhibit	Description
1001	U.S. Patent No. 10,674,340
1002	Prosecution history of U.S. Patent No. 10,674,340
1003	Certified translation of Japan Patent Application Publication No. 2008-77131A by Fujiwara (“Fujiwara”)
1004	Japan Patent Application Publication No. 2008-77131A by Fujiwara
1005	International Patent Application Publication No. WO 2010/082835A1 by Arntzen (“Arntzen”)
1006	U.S. Patent Application Publication No. 2007/024436A1 by Bandy (“Bandy”)
1007	U.S. Patent Application Publication No. 2008/0231228A1 by Fowler (“Fowler”)
1008	<i>Curriculum Vitae</i> of Dr. Manos M. Tentzeris
1009	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 1-9 are obvious over Fujiwara
2	Claims 1-9 are obvious over Fujiwara and Arntzen
3	Claims 1-5 and 8-9 are obvious over Bandy and Fowler
4	Claims 1-5 and 8-9 are obvious over Bandy, Fowler and Arntzen

The '340 Patent claims priority to an April 11, 2012 filing date. Ex.1001 at (63). As explained in sections **Error! Reference source not found.**—I 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. iii, iv-vii. 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.

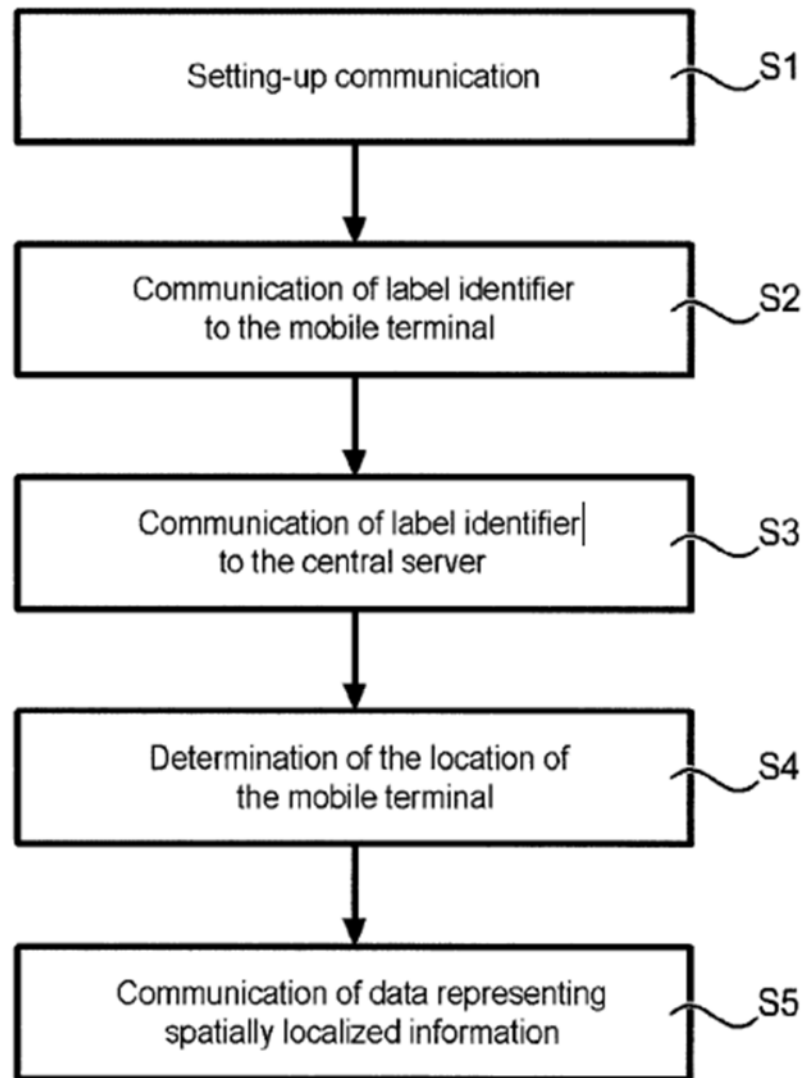
Such methods and systems are well established in the art. For example, Japan Patent Application Publication No. 2008-77131A (“Fujiwara”) discloses “a collaborative system of electronic shelf label and mobile information terminal” wherein the mobile information terminal comprises “information presenting means for displaying information about items associated with the electronic shelf label ID received from the store server.” Ex. 1003, [0015]. In another example, U.S. Patent App. Pub. No. 2008/0231228A1 (“Fowler”) discloses a system of displaying localized advertisements (spatially localized information) on a media enhanced shopping cart (mobile terminal). Ex. 1007, [Abstract].

Furthermore, the claimed use of NFC technology, and in particular the claimed communication range of less than twenty centimeters, are all well established in the art. Ex. 1009, ¶¶46-48. The advantages of NFC technology in electronic shelf are also well known by the claimed date of invention. Ex. 1009, ¶49.

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].

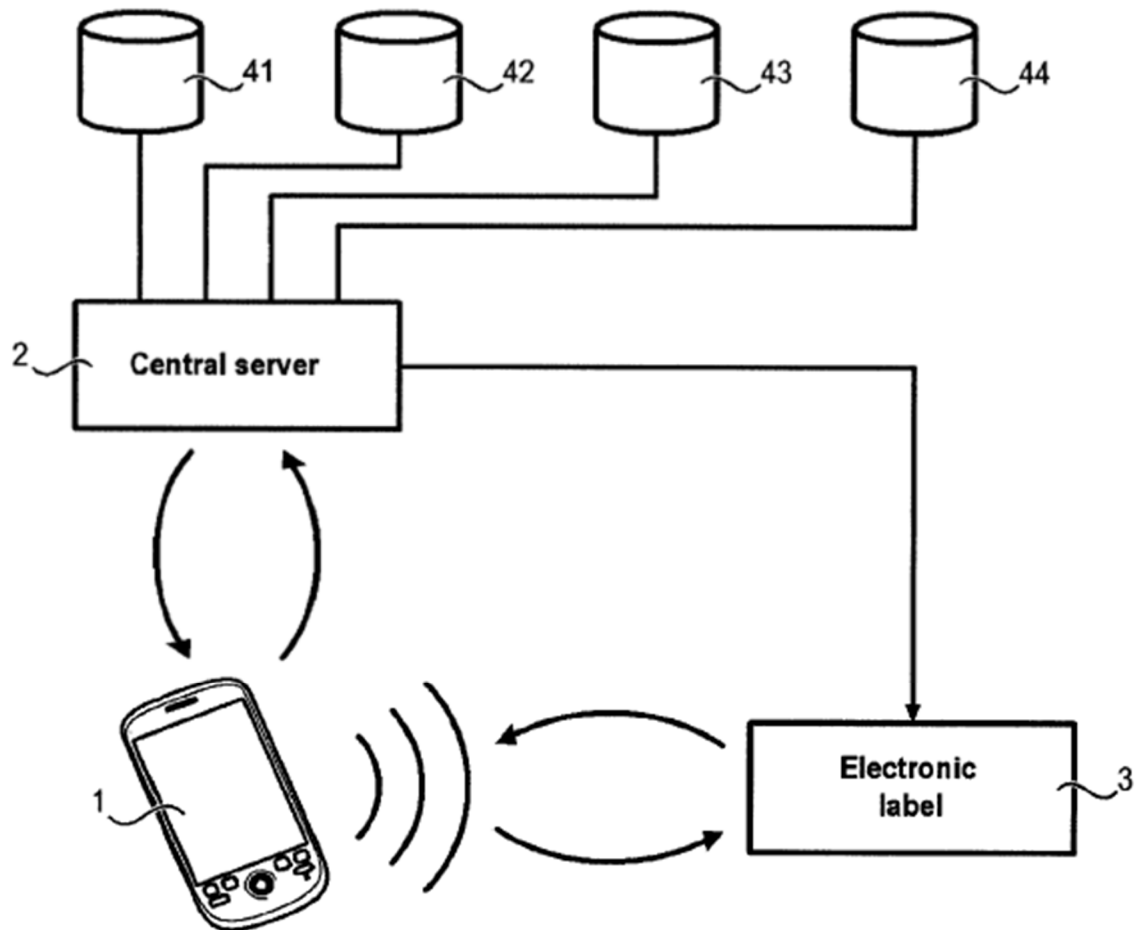
FIG. 4



Ex. 1001, FIG. 4.

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

FIG. 1



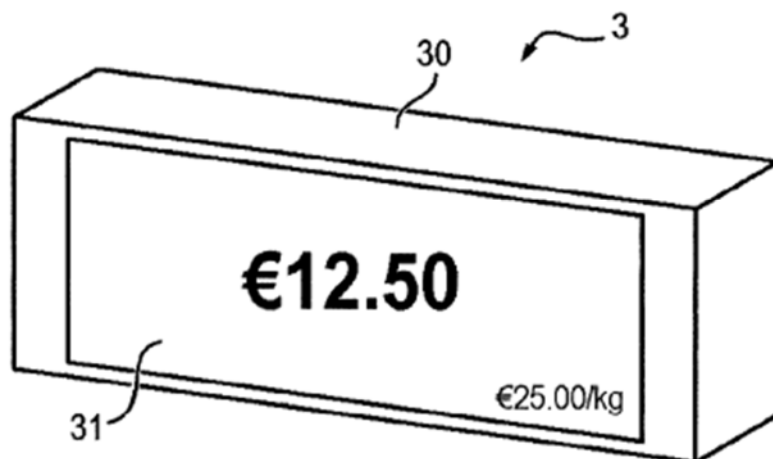
Ex. 1001, FIG. 1.

The '340 Patent claims a method for communicating spatially localized information to such a mobile terminal. Ex. 1001, [Claims 1-5].

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

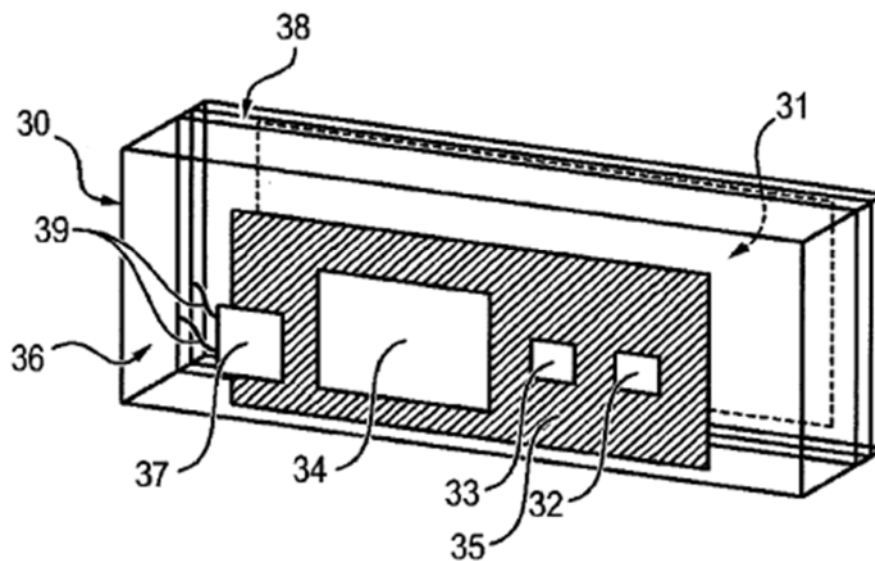
structures of radio-frequency peripherals, as illustrated in FIGs. 2 and 3 reproduced below. Ex. 1001, [Claims 6-9].

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. 1009, ¶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). 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 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.

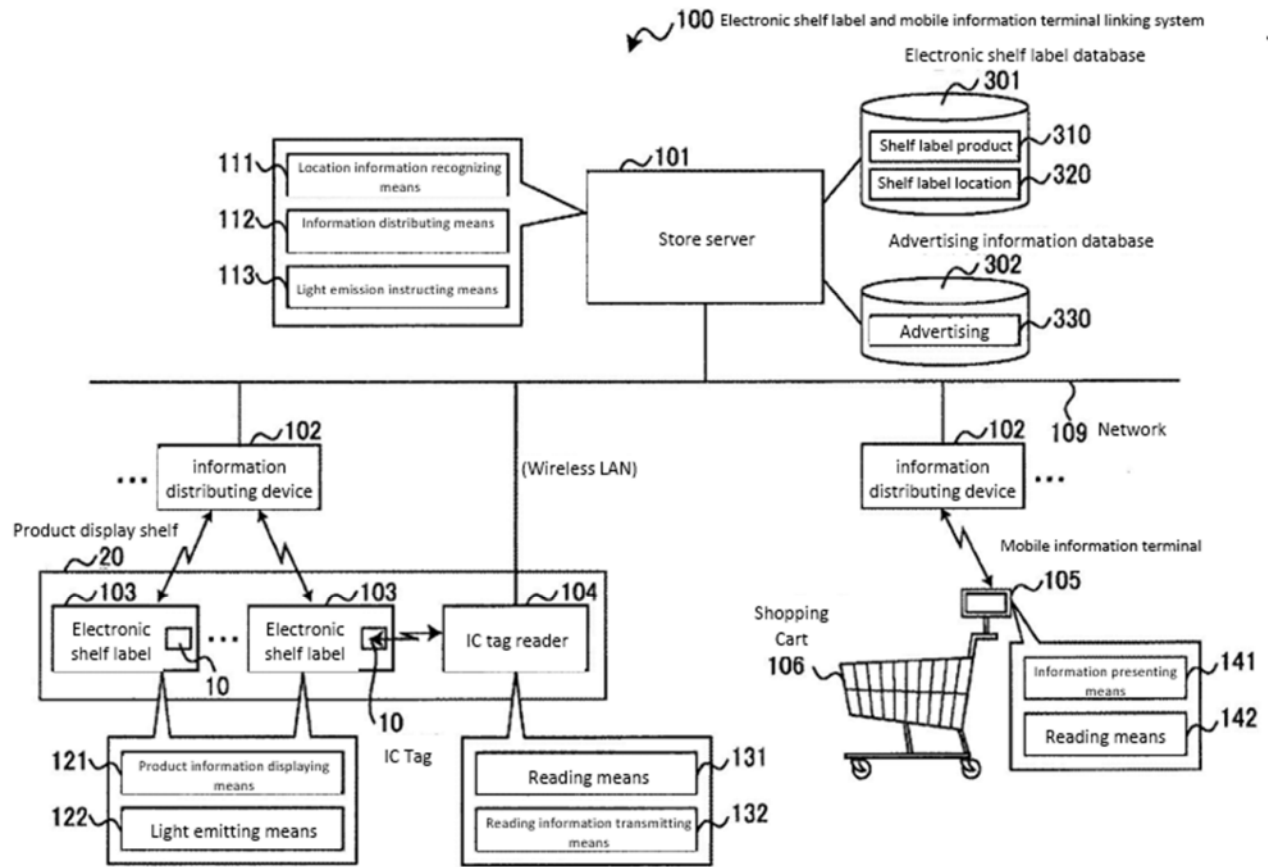
A patent can be obvious in light of a single prior art reference if it would have been obvious to modify that reference to arrive at the patented invention. *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016).

E. Ground 1

Claims 1-9 are rendered obvious by Fujiwara, as disclosed in more detail below.

1. Fujiwara

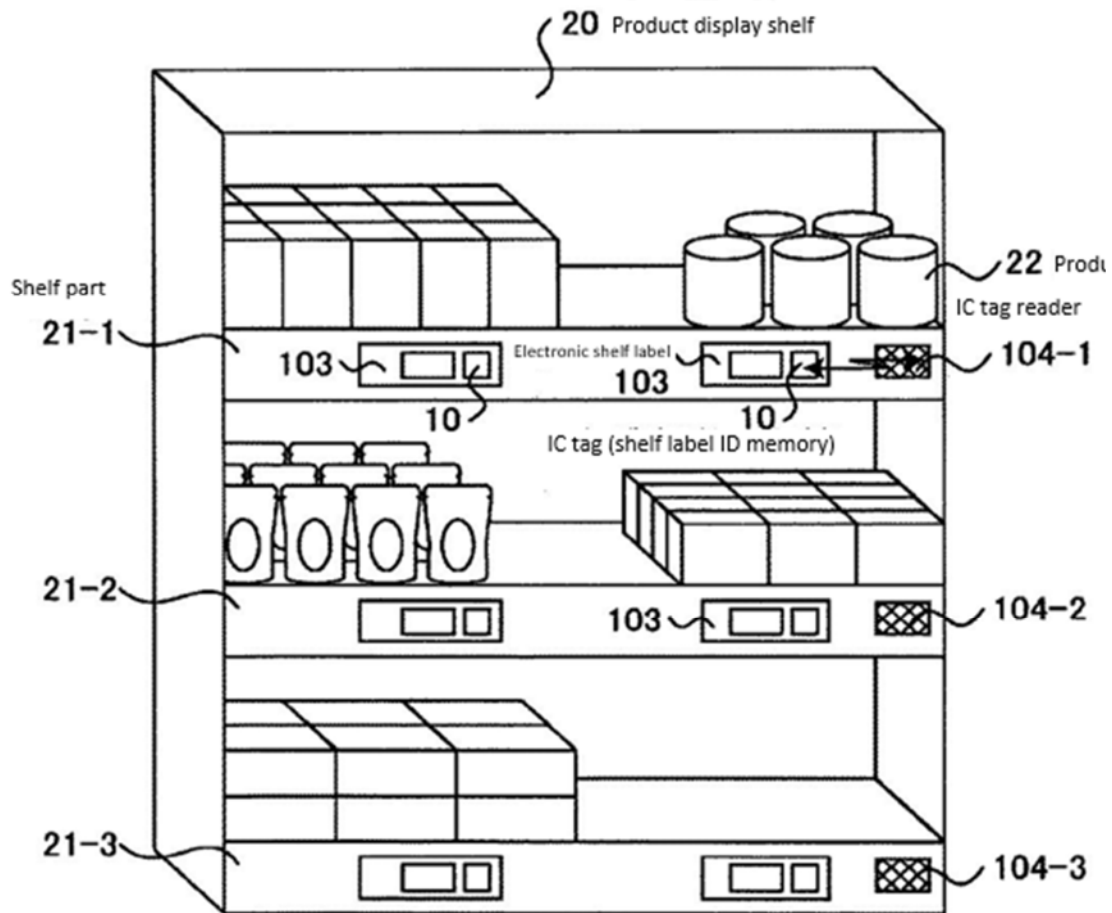
Japan Patent Application Publication No. 2008-77131A by Fujiwara (“Fujiwara”) is directed to providing “a collaborative system of electronic shelf label and mobile information terminal, and the like, that provides a function for locating a product in a store and presenting the location of the product.” Ex. 1003, [0006]. Fujiwara further discloses a “location recognizing system” that identifies the location information of a reading device (Ex. 1003, [0008]) and a store server that “transmits the information related to the product, based on both the shelf label product information and the shelf label location information, to the mobile information terminal” (Ex. 1003, [0016]). FIG. 1 of Fujiwara, reproduced below, is a diagram of the collaborative system 100 of electronic shelf label and mobile information terminal of one embodiment.



Ex. 1003, FIG. 1.

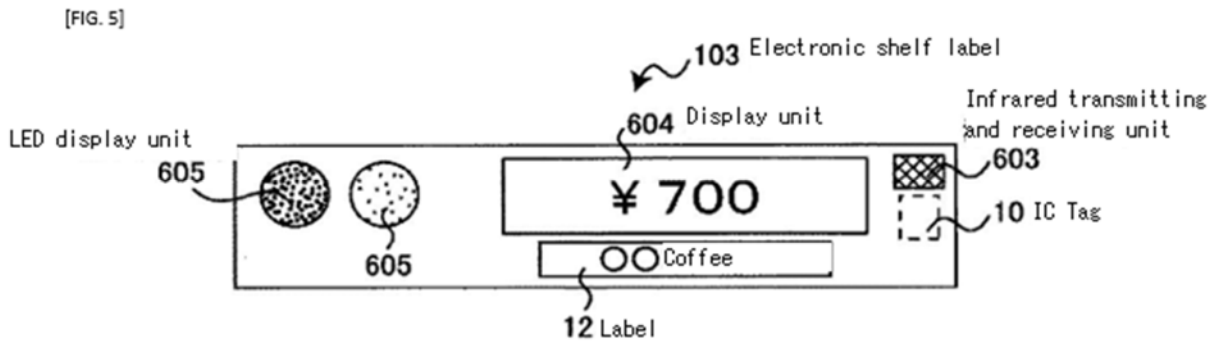
FIG. 4 of Fujiwara, reproduced below, depicts the arrangements of electronic shelf labels 103 on a product display shelf 20 in one embodiment.

[FIG. 4]



Ex. 1003, FIG. 4.

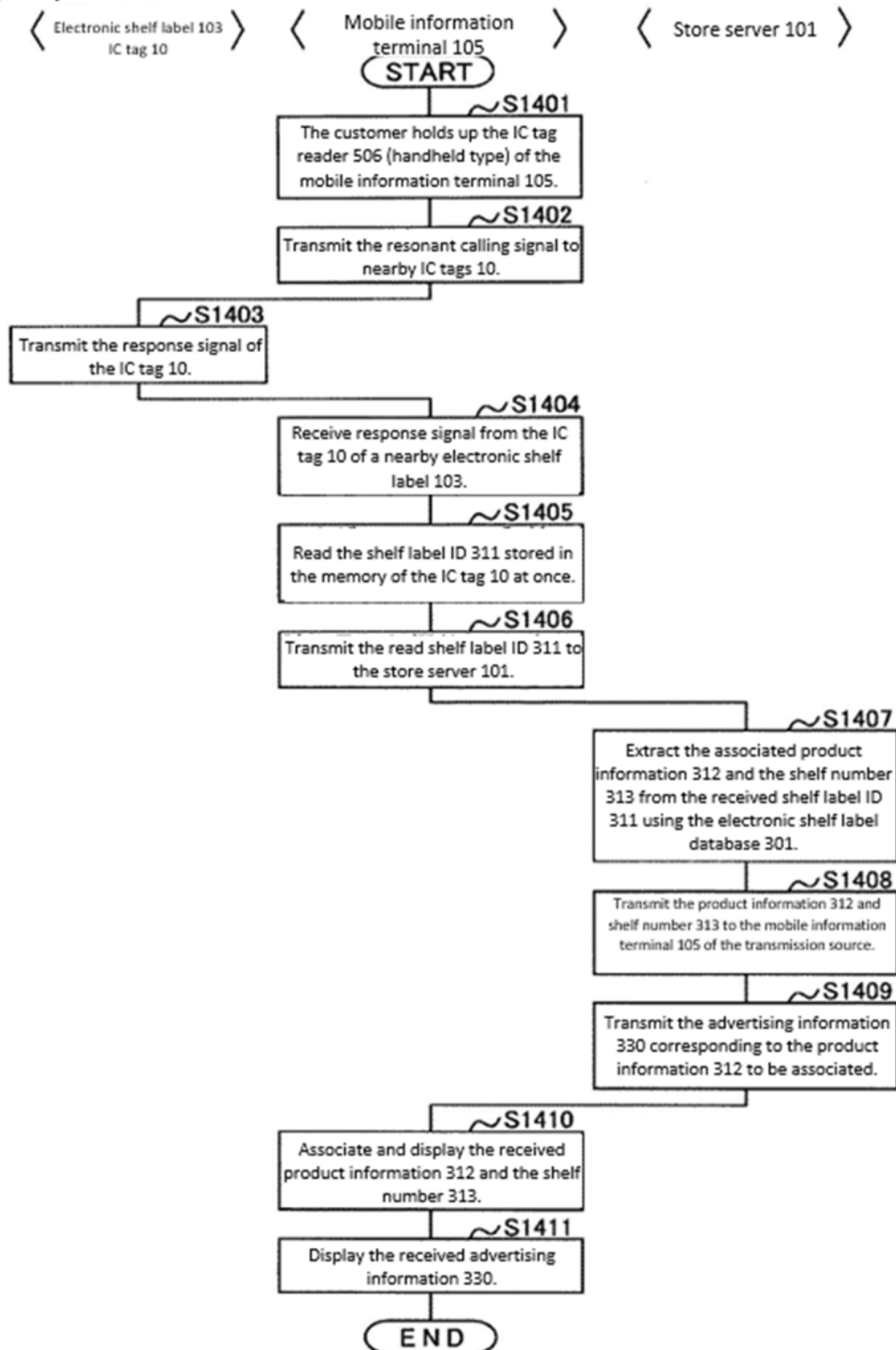
Fujiwara discloses the components wireless transmitting and receiving unit (infrared transmitting and receiving unit) 603, a display unit 604, one or more LED display units 605, a label 11, and the like, of the electronic shelf label 103. Ex. 1003, [0067]. FIG. 5 of Fujiwara, reproduced below, depicts an electronic shelf label 103.



Ex. 1003, FIG. 5.

FIG. 14 of Fujiwara, reproduced below, is a flow chart depicting the procedure for the information acquiring process based on the location information of the product in one embodiment.

[FIG. 14]



Ex. 1003, FIG. 14.

Fujiwara qualifies as prior art under pre-AIA 35 U.S.C. § 102(b) because it was published on April 3, 2008, which is more than one year before the '340 Patent's April 11, 2012 claimed priority date. Ex. 1003, (43).

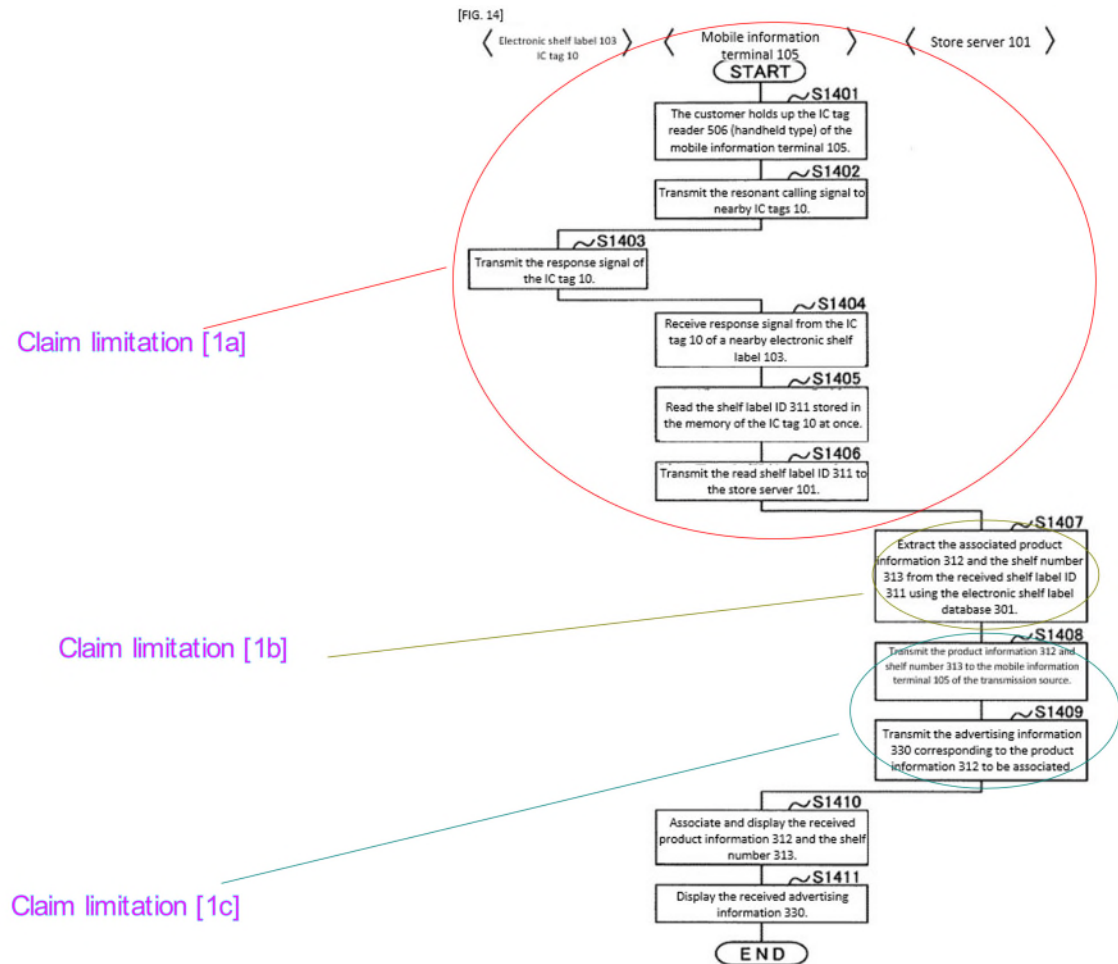
Fujiwara is analogous prior art to the '340 Patent. The '340 Patent is directed to “means for providing consumers with spatially localized information, in relation to the place and context of a consumer, which complements the information already visually available in a sales area” (Ex. 1001, [2:8-12]) while Fujiwara is directed to providing “a collaborative system of electronic shelf label and mobile information terminal, and the like, that provides a function for locating a product in a store and presenting the location of the product” (Ex. 1003, [0006]) and discloses a store server that “transmits the information related to the product, based on both the shelf label product information and the shelf label location information, to the mobile information terminal” (Ex. 1003, [0016]). Thus, both Fujiwara and the '340 Patent are in the same field of endeavor for providing consumers with spatially localized information. Ex. 1009, ¶61.

2. Claims 1-9 are rendered obvious by Fujiwara

As set forth in detail below, a POSITA reading Fujiwara will find each and every limitation recited by Claims 1-9 either expressly disclosed in Fujiwara or obvious over Fujiwara's disclosure. Ex. 1009, ¶62.

a. Claim 1

The annotated figure below is a high-level overview of the correspondence between Fujiwara’s disclosures and the main steps of Claim 1 of the ’340 Patent. More details are set forth below.



Ex. 1003, FIG. 14

(1) [1pre]

The preamble portion “A method for communicating spatially localized information” is not limiting, because it merely states the purpose or intended use of

the alleged invention. 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). Ex. 1009, ¶64. To the extent that this portion is limiting, Fujiwara teaches this portion, please refer to Section III.E.2.a.(4) below.

Fujiwara teaches the claimed **mobile terminal** through its disclosure of “one or more mobile information terminals installed in self-service transporters for storing and transporting products in a store.” Ex. 1003, [0015].

Fujiwara discloses a store server (**central server**). Ex. 1003, [0015]. Fujiwara discloses “one or more electronic shelf labels corresponding to each product on the sales floor and displaying information about the product.” Ex. 1003, [0015]. Fujiwara discloses that an IC tag 10 is provided inside the electronic shelf label 103. Ex. 1003, [0067]. Fujiwara discloses that IC tag 10 is a non-contact IC tag that comprises a coil-shaped antenna and may communicate with IC tag reader 104 at a distance of several to several tens of centimeters. Ex. 1003, [0071], [0072].

While Fujiwara discloses that IC tag reader uses a microwave transmitting and receiving unit to communicate with the IC tag (Ex. 1003, [0076]), a POSITA would understand that this is merely a preferred embodiment of Fujiwara and does not limit the communication protocol between the IC tag reader and the IC tag to that of microwave communication, especially as Fujiwara explicitly negates any example as limiting (Ex. 1003, [0112]). Ex. 1009, ¶68. Thus, a POSITA would find

it obvious to implement Fujiwara's IC tag with the well-known, conventional, and low-cost RFID tag, thus simplifying the design of the electronic shelf label by utilizing mature and conventional components, and saving costs, and further a POSITA would have a reasonable expectation of success in this mere substitution of one element for another known in the field. Ex. 1009, ¶69. Thus, a POSITA would find the claimed “**radio-frequency peripheral**” obvious over Fujiwara's disclosure of electronic shelf label integrating an IC tag (implemented obviously as an RFID tag). *Id.*

Further, a POSITA would also find it obvious to implement Fujiwara's IC tag as not just any RFID tag, but an NFC tag conformant with ISO 14443 that has a communication range of less than twenty centimeters, thus realizing the advantages of increased and standardized communication security and reduced interference, and would have a reasonable expectation of success in this mere substitution of one element for another known in the field. Ex. 1009, ¶70. Thus, a POSITA would additionally find the claimed “**radio-frequency peripheral**” obvious over Fujiwara. *Id.*

Fujiwara discloses that the store server possesses “an electronic shelf label database storing the shelf label product information associating the electronic shelf label information with the product information, and storing the shelf label location information identifying the location of the electronic shelf label.” Ex. 1003, [0015].

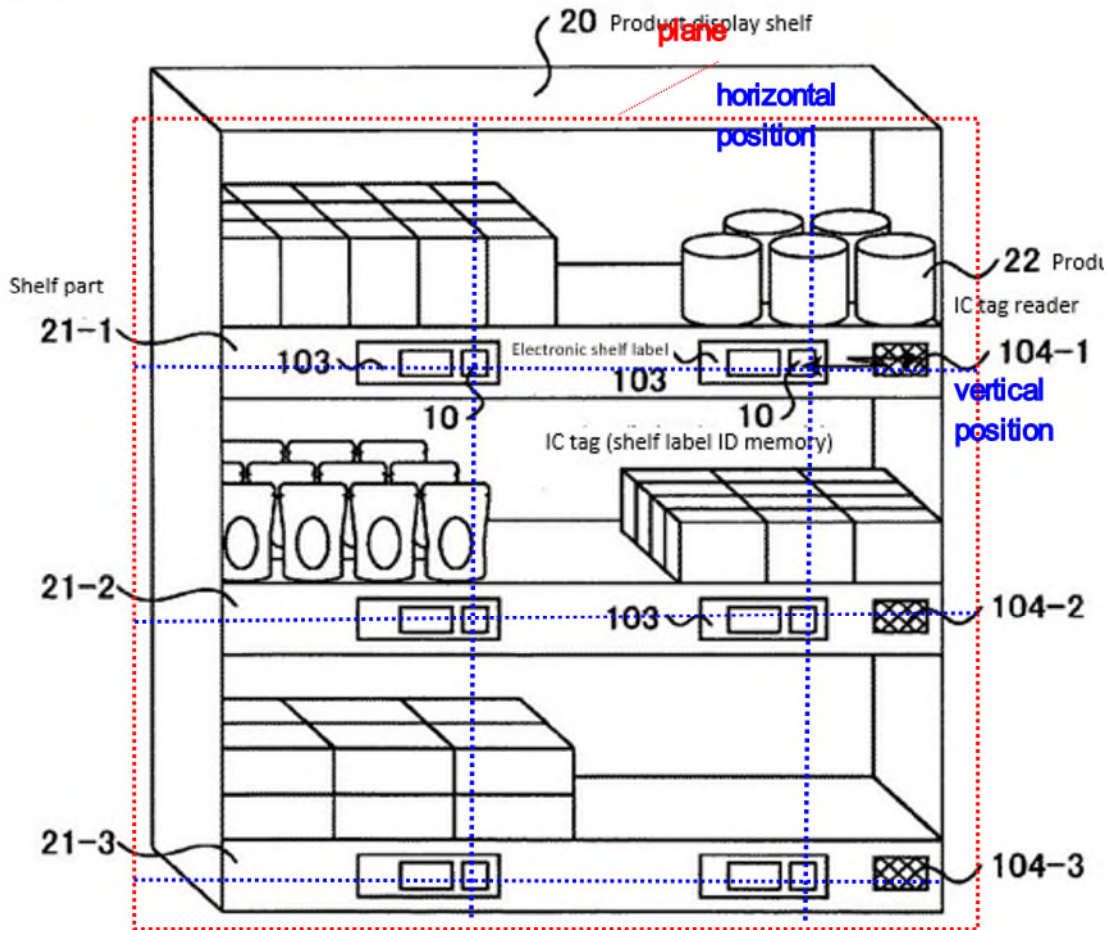
Fujiwara discloses that the electronic shelf label database 301 includes a plurality of shelf label product information 310 and shelf label location information 320. Ex. 1003, [0062]. Fujiwara further discloses that shelf label product information 310 has shelf label ID 311, product information 312, and the like. Ex. 1003, [0062]. Fujiwara discloses that the shelf label location information 320 includes shelf label ID 311, shelf number 313, and the like. Ex. 1003, [0062]. Fujiwara discloses that the store server may acquire the shelf label product information and the shelf label location information associated with the electronic shelf label IDs from the one or more electronic shelf label IDs received from the mobile information terminal using the electronic shelf label database. Ex. 1003, [0015].

Thus, a POSITA would recognize that the electronic shelf label database is a **planogram associating a plurality of unique identifiers** (shelf label ID 311, as Fujiwara explicitly discloses that “[t]he shelf label ID 311 is the identification information of the electronic shelf label 103.” Ex. 1003, [0062]) **of radio-frequency peripherals** (electronic shelf labels) **with a plurality of locations** (shelf label location) **within a predetermined area** (the sales floor). Ex. 1009, ¶¶72-73. And Fujiwara discloses that the store server (**central server**) is configured to access this planogram. Ex. 1003, [0015]-[0016]. Further, as Fujiwara discloses “the shelf label product information and the shelf label location information associated with the electronic shelf label IDs” (Ex. 1003, [0015]), a POSITA would find it obvious that

each of the plurality of shelf label location is **associated one-to-one with** an electronic shelf label ID. Ex. 1009, ¶74.

Fujiwara further discloses that shelf label location information includes shelf label ID 311, shelf number 313, and the like, and that the shelf number 133 is the location information for each shelf part 21 of the product display shelf 20. Ex. 1003, [0062]. This, together with FIG. 4 of Fujiwara, discloses that each of the plurality of locations is defined by a **vertical position** (represented by shelf number 313) and a **horizontal position** (the horizontal position of the electronic shelf label along the horizontal shelf part 21, as shown in FIG. 4) **within a plane** (“the front side of the shelf”, *see* Ex. 1003, [0084]) **perpendicular to a floor of the predetermined area** (the sales floor). Ex. 1009, ¶75.

[FIG. 4]

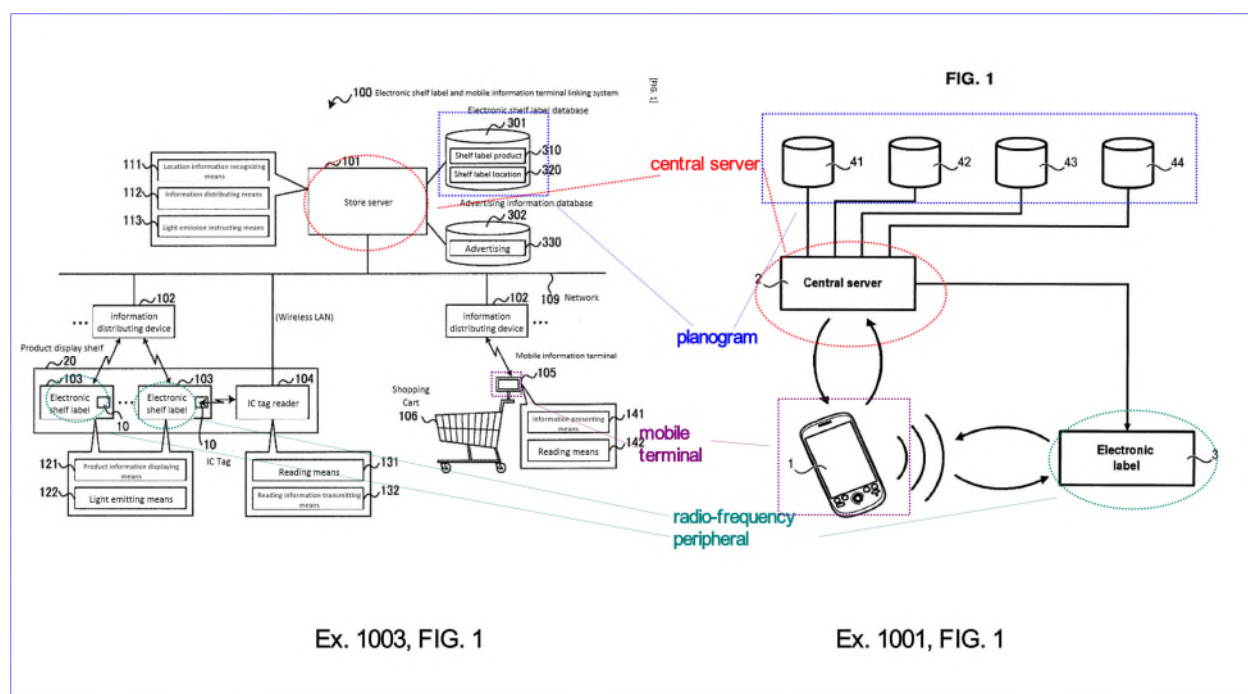


Ex. 1003, FIG. 4 (annotated).

Alternatively, a POSITA, familiar with the typical layout of a retail store, would find it obvious that multiple product display shelves 20 can be placed side by side within an aisle, and thus the horizontal position of a product display shelf 20 within the aisle is the claimed **horizontal position**, while the shelf number 313 has already been disclosed as the **vertical position**, and the **plane** is the front plane of the whole aisle. Ex. 1009, ¶76.

Therefore, a POSITA would find [1pre] obvious over Fujiwara (after the obvious modification of implementing Fujiwara's IC tag 10 with an RFID tag, or more specifically with an NFC tag conformant to NFC standards such as ISO 14443). Ex. 1009, ¶77.

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



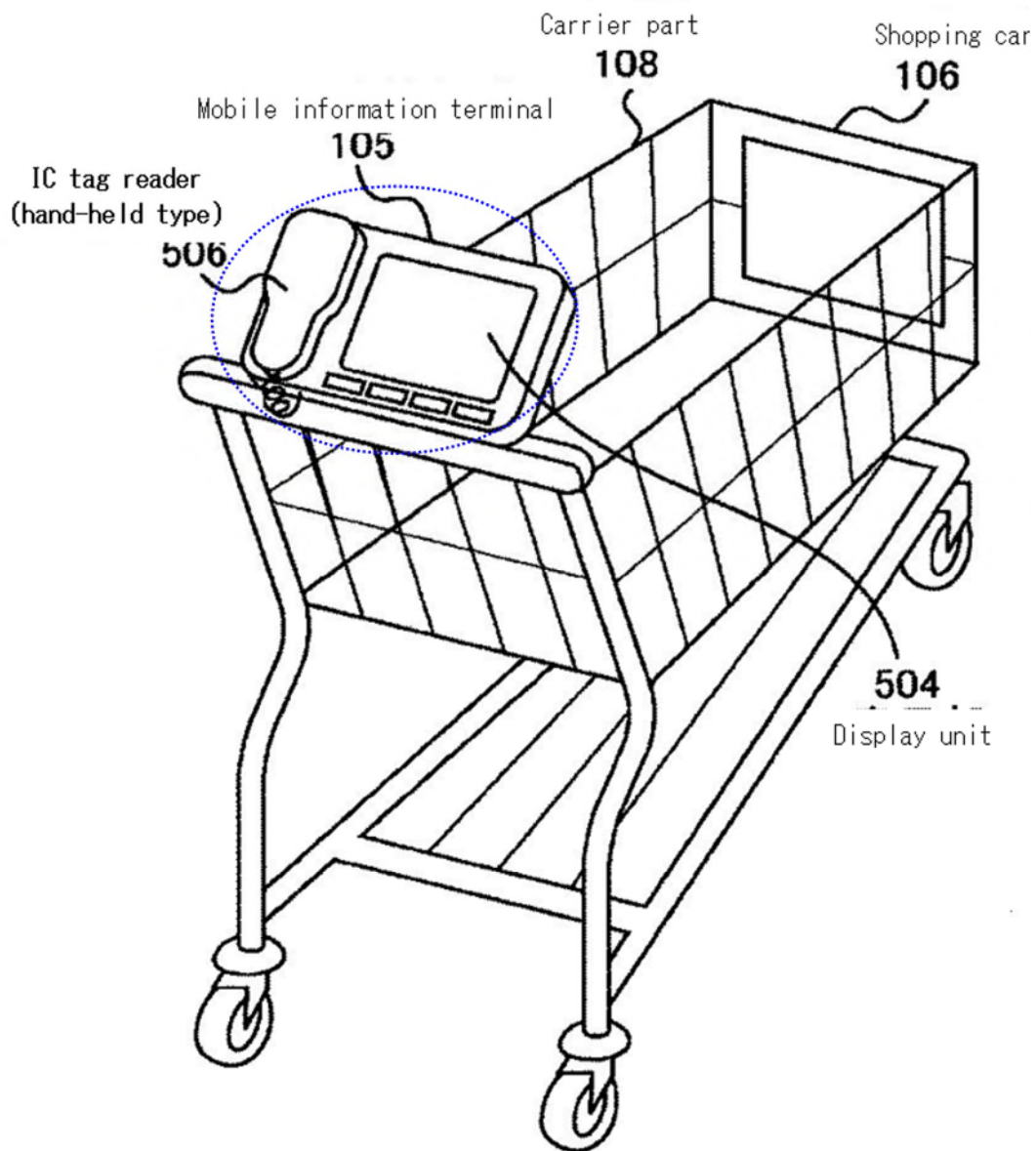
(2) [1a]

Fujiwara discloses “mobile information terminals.” Ex. 1003, [0015]. Fujiwara discloses that the mobile information terminal 105 has a display unit 504 and an IC tag reader 506. Ex. 1003, [0079]. Fujiwara discloses that the IC tag reader 506 is a handheld type IC tag reader and can be held over the product display shelf

20. Ex. 1003, [0103]. The mobile information terminal is the claimed **mobile terminal**. Ex. 1009, ¶79.

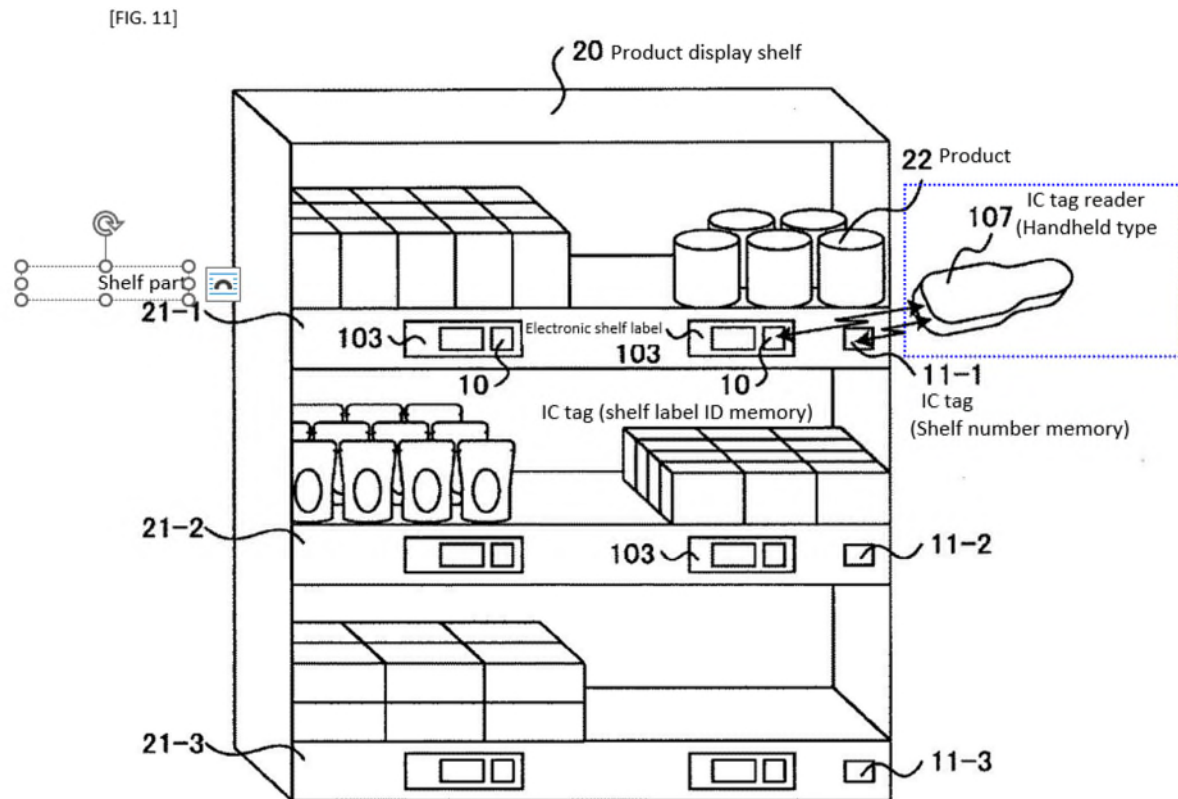
FIG. 8 of Fujiwara shows a mobile information terminal 105 on a shopping cart 106, with a handheld type IC tag reader 506, where it is being held over an IC tag 10 and is in communication with the IC tag 10.

[FIG. 8]



Ex. 1003, FIG. 8 (annotated).

FIG. 11 of Fujiwara shows the operation of a handheld type IC tag reader.



Ex. 1003, FIG. 11 (annotated).

Fujiwara discloses that “[w]hen acquiring the location of a product while moving, the handheld type IC tag reader 506 of the mobile information terminal 105 provided on the shopping cart 106 is held over the product display shelf 20 (step S1401).” Ex. 1003, [0103]. A POSITA would understand that this operation is essentially the same as the one depicted in FIG. 11. Ex. 1009, ¶82.

Fujiwara discloses that the IC tag reader 506 then “transmits a resonant call-up signal to the IC tag 10 (step S1402).” Ex. 1003, [0103]. Fujiwara further discloses

that “[t]he IC tag 10 of the electronic shelf label 103 receives the call-up signal and transmits a response signal (step S1403).” Ex. 1003, [0104]. Fujiwara discloses that, as the next step, “[t]he IC tag reader 506 receives a response signal from the IC tags 10 of the surrounding electronic shelf labels 103 (step S1404), and collectively reads the shelf label IDs 311 stored in the memories of the IC tags 10 (step S1405).” Ex. 1003, [0104]. Thus the mobile information terminal 105, of which the IC tag reader 506 is a part, receives a shelf label ID 311 (**unique identifier**) from at least one electronic shelf label 103 (**radio-frequency peripheral**), and the shelf label ID 311 is **particular to** the associated electronic shelf label 103. Ex. 1009, ¶¶83-84.

A POSITA would recognize that the sequence of the IC tag reader 506 transmitting a resonant call-up signal to the IC tag 10 and then the IC tag 10 receiving the call-up signal and transmitting a response signal is a sequence whereby the **radio-frequency peripheral** is **activated** by the **mobile terminal**. Ex. 1009, ¶85.

Fujiwara discloses that “[t]he IC tag reader 506 transmits a call-up signal resonant with respect to the IC tags 10, 11, reads the response signal from the IC tags 10, 11 at a distance of several to several tens of centimeters, and reads the shelf label IDs, shelf numbers, and the like, which are the information recorded in the IC tags 10, 11.” Ex. 1003, [0082]. This is a disclosure of a **communication range** of “several to several tens of centimeters” (*Id.*), a range that significantly overlaps with the claimed “less than twenty centimeters.”

While the '340 Patent claims that a range of less than twenty centimeters brings certain advantages, *see* Ex. 1001, [6:52-65], the '340 Patent nowhere explains why the arbitrary choice of the cutoff point of twenty centimeters, as opposed to a slightly longer distance, is critical to such benefits. *See also* Ex. 1009, ¶48. Therefore, the disclosure in Fujiwara of the significantly overlapping range is *prima facie* evidence of obviousness for the claimed “less than twenty centimeters.” *See In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003) (“A *prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art.”)

Further, as discussed in Section III.E.2.a.(1), a POSITA would find it obvious to implement Fujiwara’s IC tags with NFC tags conformant to standards such as ISO 14443 that has a communication range of less than twenty centimeters. *See also* Ex. 1009, ¶90. Thus, a POSITA would find the claimed “less than twenty centimeters” obvious over Fujiwara. Ex. 1009, ¶91.

Fujiwara further discloses that an IC tag 10 comprises a coil-shaped **antenna**. Ex. 1003, [0071]. Fujiwara further discloses that an IC tag 10 comprises an IC **chip**. Ex. 1003, [0071]. As Fujiwara discloses a communication range of “several to several tens of centimeters” (Ex. 1003, [0082]), a POSITA would find that the lower end of this range falls within the range of near-field communication, and therefore

the antenna and the chip are **configured for near-field communication**. Ex. 1009, ¶92.

In fact, the NFC standards such as ISO 14443 and their advantages (such as increased security) have been within common knowledge of a POSITA at the time of the claimed invention, and there is a trend towards utilizing NFC standards in the relevant industry. Ex. 1009, ¶¶46-53. As discussed in Section III.E.2.a.(1), a POSITA would find it obvious to implement Fujiwara's IC tags with NFC tags conformant to standards such as ISO 14443, so as to achieve Fujiwara's explicitly disclosed functionality of communication within a range of "several to several tens of centimeters", and thus implement the antenna and the chip as **configured for near-field communication**. *See also* Ex. 1009, ¶93.

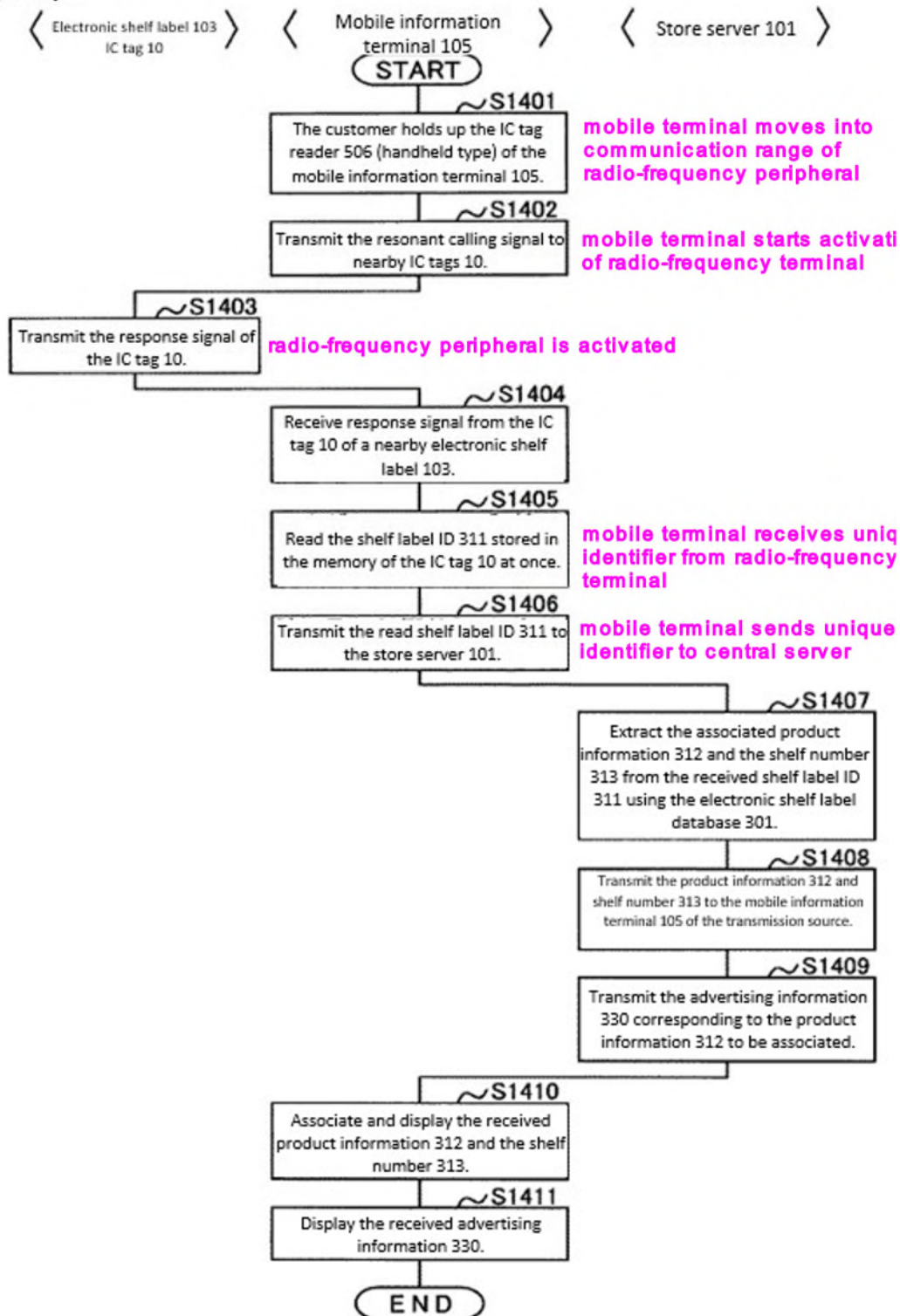
In fact, Fujiwara is explicitly directed to a need in the relevant industry for "means to automatically detect the location of the corresponding product in the store" and "function to inform [the customers] of the location of the relevant product in the store." Ex. 1003, [0005]. While Fujiwara's IC tag reader 506 interacts with a plurality of IC tags within a range of several to several tens of centimeters (Ex. 1003, [0082]), or "the IC tags 10 in the range of a one-third part of the product display shelf 20", and sends the unique identifiers of all these IC tags to the central server (Ex. 1003, [0104]), a POSITA would understand that, by employing the well-known NFC standards such as ISO 14443 and reducing the communication range to less

than twenty centimeters, Fujiwara's system can be improved in the precision of product locating and can provide more targeted "information related to the product[] based on both the shelf label product information and the shelf label location information" (Ex. 1003, [0016]) to the mobile terminal, thus achieving the universal, obvious and expressly disclosed objectives of easy shopping and effective sales promotion effect (Ex. 1003, [0108]). Ex. 1009, ¶94. Such improvement in the precision of product locating will also improve the other embodiments of Fujiwara, such as the planogram maintenance embodiment (Ex. 1003, [0090]-[0095]), thus achieving the universal, obvious, and expressly disclosed objective of reducing the burden on the person in charge of product management (Ex. 1003, [0108]). Ex. 1009, ¶94.

Fujiwara further discloses that "The control unit 501 of the mobile information terminal 105 transmits the 1 or more shelf label IDs 311 that were read to the store server 101 (step S1406)." Ex. 1003, [0104]. This teaches the claimed communication sequence. Ex. 1009, ¶96.

Thus, a POSITA would find each and every limitation of [1a] obvious over Fujiwara after making the obvious modification of implementing Fujiwara's IC tag 10 with an NFC tag conformant to NFC standards such as ISO 14443 with a communication range of less than twenty centimeters. Ex. 1009, ¶¶97-98. The correspondences are shown in the annotations to FIG. 14 of Fujiwara below:

[FIG. 14]



Ex. 1003, FIG. 14.

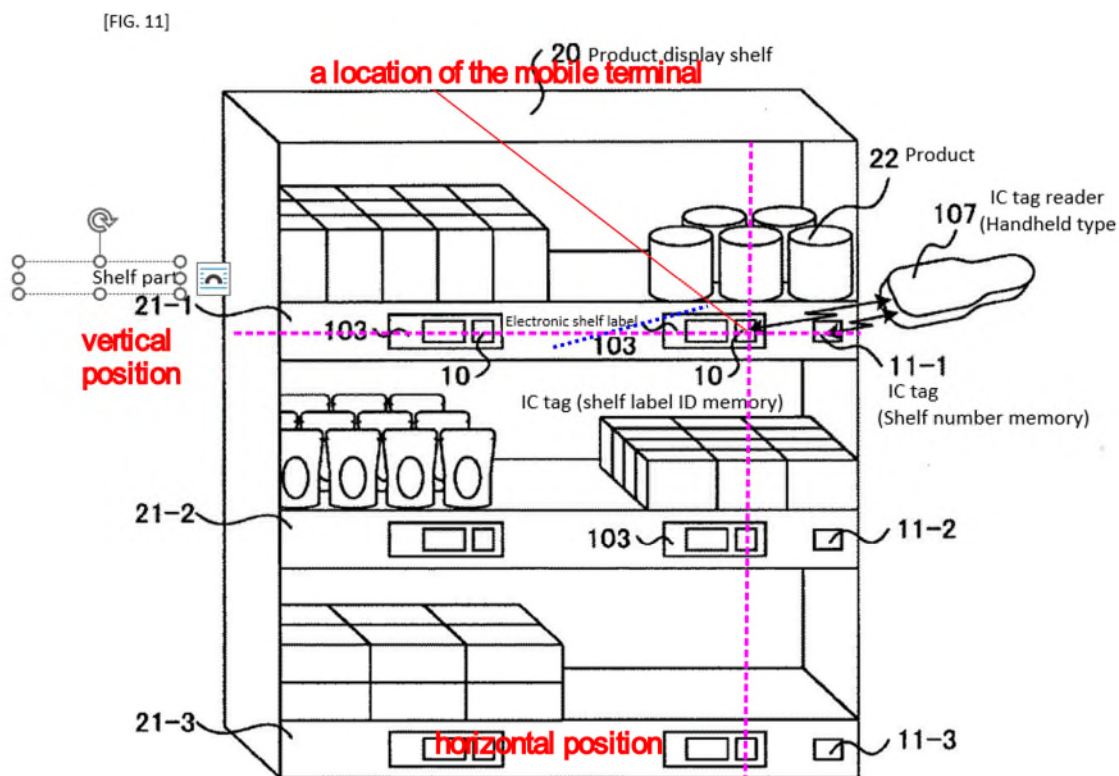
(3) [1b]

Fujiwara discloses that the store server comprises an “acquiring means for acquiring the shelf label product information and the shelf label location information associated with the electronic shelf label IDs from the one or more electronic shelf label IDs received from the mobile information terminal using the electronic shelf label database.” Ex. 1003, [0015]. Thus, the central server is configured to access the **planogram** (electronic shelf label database) to determine a location associated with a **unique identifier** (electronic shelf label ID) of **the received communication**. Ex. 1009, ¶99.

Fujiwara discloses that “[t]he control unit 201 of the store server 101 extracts the associated product information 312 and shelf number 313 from the one or more shelf label IDs 311 that were received using the electronic shelf label database 301 (step S1407).” Ex. 1003, [0105]. Shelf number 313 and shelf label ID 311 form shelf location information 320. Ex. 1003, [0062]. As discussed in Section III.E.2.a.(1), this information is a **location associated with the unique identifier of the received communication in the planogram**.

Fujiwara discloses that the received shelf label ID 311 is from the IC tags 10 of the surrounding electronic shelf labels 103. Ex. 1003, [0104]. Fujiwara discloses that the IC tag reader 506 and electronic shelf label 103 must be within a communication range of several to several tens of centimeters. Ex. 1003, [0082]. A

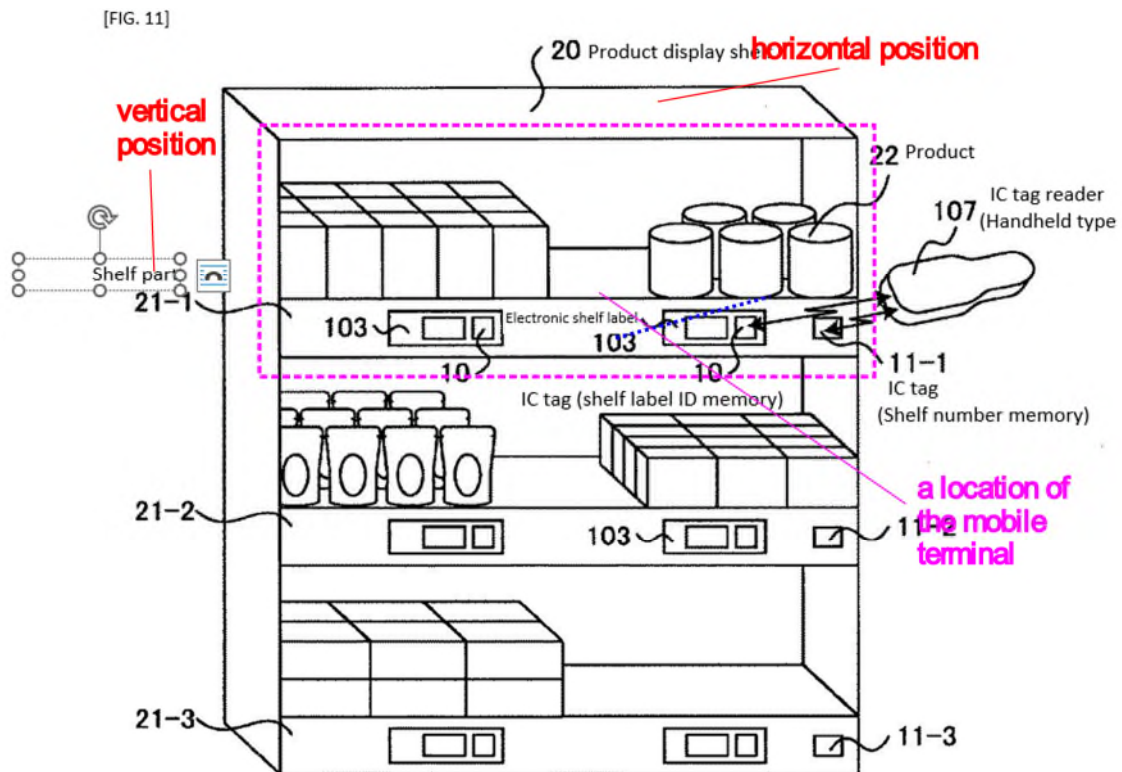
POSITA would understand this to mean that retrieving the location associated with the unique identifier is necessarily **determination of a location of** the mobile information terminal, namely, the location of the IC tag reader 506 of that mobile information terminal 105. Ex. 1009, ¶101. As discussed in Section III.E.2.a.(1), this location comprises **vertical** and **horizontal** positions.



Ex. 1003, FIG. 11 (annotated).

Alternatively, as Fujiwara discloses that an IC tag reader 506 may interact with the IC tags 10 in the range of a one-third part of the product display shelf 20 (Ex. 1003, [0104]), a POSITA looking at this disclosure, in view of the disclosure of interacting with “the IC tag 10 integrated in one or more electronic shelf labels

103 on the same shelf part 21 on the front side of the shelf” in Ex. 1003, [0084], as well as in view of FIG. 11, would find it obvious that this one-third part corresponds with one shelf part in the product display shelf 20 depicted in FIG. 11. Ex. 1009, ¶102. Thus, a POSITA would further understand that this range (one shelf part) is a **location of the mobile terminal**, and comprises a **vertical position**. *Id.* As discussed in Section III.E.2.a.(1), the product display shelf 20 itself is a **horizontal position** within a plane (face of aisle) perpendicular to a floor of the predetermined area. A POSITA would further understand that, by extracting shelf number 313 and shelf tag label 311 (Ex. 1003, [0105]), this range/location (shelf part) is necessarily **determined**. Ex. 1009, ¶102.

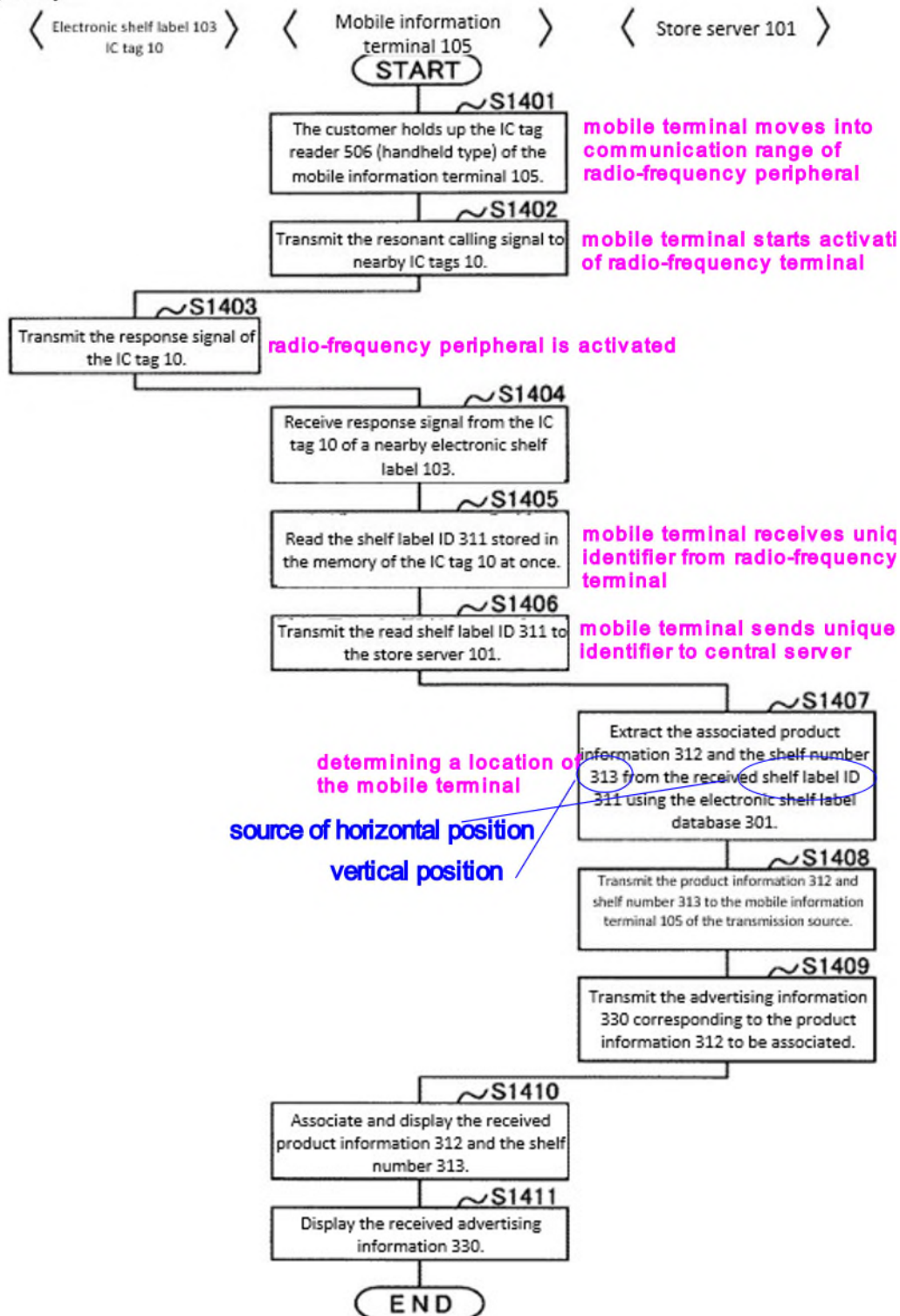


Ex. 1003, FIG. 11 (annotated).

Thus, Fujiwara discloses each and every limitation of [1b]. Ex. 1009, ¶103.

The correspondences are shown in the annotations to FIG. 14 of Fujiwara below:

[FIG. 14]



(4) [1c]

Fujiwara discloses that “[t]he control unit 201 transmits the associated product information 312 and the shelf number 313 to the mobile information terminal 105 of the transmission source (step S1408). Furthermore, the control unit 201 transmits advertising information 330 corresponding to the product information (product ID) to be associated (step S1409).” Ex. 1003, [0105].

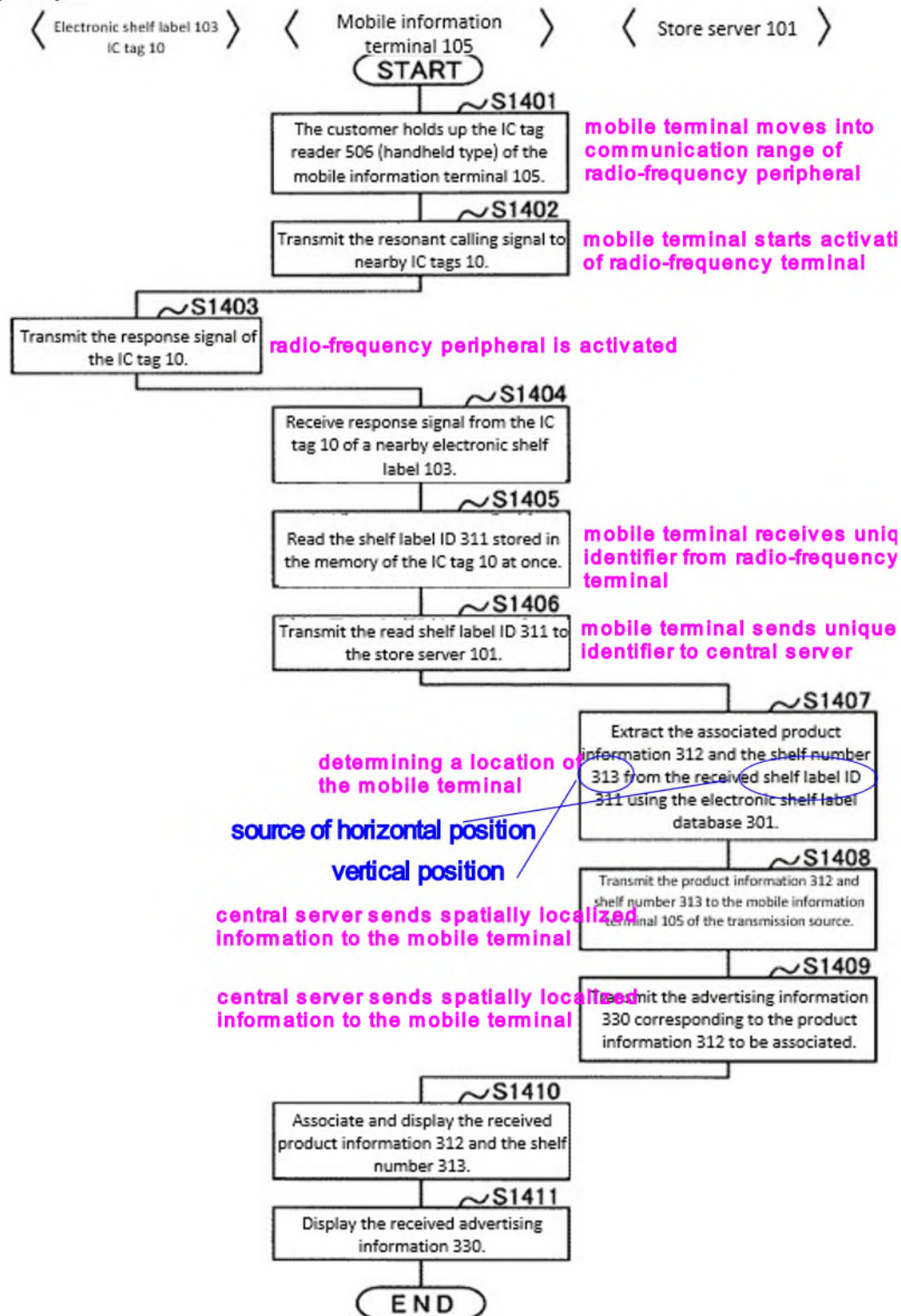
Fujiwara discloses that “product information 313” (from the context, a POSITA would find this to be obviously a typo of “product information 312”) is “information related to the product to be displayed on the electronic shelf label 103 (product ID, product price, and the like).” Ex. 1003, [0062]. Fujiwara further discloses that “[t]he advertising information 330 is information provided from advertisers/store such as advertisements, pop content, in-store information, and contains advertising information ID, advertisement data (video, still image, character data, and the like), and the like.” Ex. 1003, [0063].

From these disclosures, together with the explicit disclosure that the central server “transmits the information related to the product, based on both the shelf label product information and the shelf label location information, to the mobile information terminal” (Ex. 1003, [0016]), a POSITA would recognize that the product information 312 and advertising information 330 are **spatially localized information associated with the location of the mobile terminal**. Ex. 1009, ¶107.

Further, in a separate embodiment also directed to the same universal, conventional and explicitly disclosed objectives of easy shopping and effective sales promotion (Ex. 1003, [0108]), Fujiwara discloses a product location present procedure that presents product location to the customer. Ex. 1003, [0095]. A POSITA, in view of such disclosure, would find it obvious to have the store server also transmit, to the mobile information terminal, the relative positions of the products inside the product display shelf 20 relative to the determined location of the mobile terminal, as well as the relative direction to locate such products. Ex. 1009, ¶108. This involves no more than a small addition to the product information and advertising information already set to be transmitted to the mobile information terminal, and the mobile terminal is well configured to display such information, as it is already configured to display advertising information in the form of “video, still image, character data, and the like” (Ex. 1003, [0063]). Ex. 1009, ¶108. Such a small modification represents nothing more than the combination of known elements to achieve predictable results, and would have been well within the skills of a POSITA. *Id.* Such relative location information is spatially localized information. *Id.*

Therefore, Fujiwara, discloses each and every limitation of [1c]. Ex. 1009, ¶110. The correspondences are shown in the annotations to FIG. 14 of Fujiwara below:

[FIG. 14]



Ex. 1003, FIG. 14 (annotated).

Therefore, Fujiwara renders Claim 1 obvious. Ex. 1009, ¶111.

b. Claim 2

Claim 1 is addressed in Section III.E.2.a.

As discussed in Section III.E.2.a, a POSITA would find it obvious to implement Fujiwara's IC tag 10 with an NFC tag conformant to NFC standards such as ISO 14443. *See also* Ex. 1009, ¶113. A POSITA would further know that ISO 14443-conformant NFC tags are activated passive RFID tags powered and activated by electromagnetic waves received by the tags, in the way claimed by Claim 2. *Id.* Therefore, after this obvious modification, Fujiwara renders obvious Claim 2 obvious. *Id.*

c. Claim 3

Claim 1 is addressed in Section III.E.2.a.

Fujiwara discloses that the collaborative system 100 of electronic shelf label and mobile information terminal includes a network 109. Ex. 1003, [0041], [0042]. Fujiwara further discloses that network 109 is a network such as a local area network (LAN), in-house LAN, or the like, and can be wired or wireless. Ex. 1003, [0042].

A POSITA would also have been motivated and able to modify Fujiwara so as to implement Fujiwara's network 109 with the universal and conventional element of the Internet with a POSITA's background knowledge, and to use the

Internet for the communications between Fujiwara's mobile information terminal and the store server. Ex. 1009, ¶116. Fujiwara discloses that network 109 can be one of a broad range of wired or wireless networks. Ex. 1003, [0042]. Fujiwara further discloses that IC tag readers 104 and the store server may communicate through network 109. Ex. 1003, [0042], [0055]. A POSITA would have known the Internet and its predictable results. Ex. 1009, ¶¶54, 116. Implementing Fujiwara's network 109 via the Internet 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 Fujiwara to effect communications between the mobile terminal and the central server. Ex. 1009, ¶116. Further, using the Internet-implemented network 109 for the communications between IC tag reader 506 of the mobile information terminal 105 and the store server is a mere substitution of one element (IC tag reader 506) for another known in another embodiment (IC tag reader 104) that serves the same objectives of easy shopping and effective sales promotion (Ex. 1003, [0108]). Ex. 1009, ¶116. This modification would have been well within the skill of a POSITA. *Id.*

Thus, Fujiwara, after the obvious modification of implementing Fujiwara's network 109 via the well-known and conventional Internet, renders Claim 3 obvious. Ex. 1009, ¶117.

d. Claim 4

Claim 1 is addressed in Section III.E.2.a.

Fujiwara discloses that the advertising information 330 (**spatially localized information**) is delivered based on the attribute information of the customer such as gender, age, and purchasing point history. Ex. 1003, [0098]. Fujiwara further discloses that the attribute information is customer information that may be acquired from a customer card. Ex. 1003, [0098]. Such attribute information that can be obtained from the customer's card is the claimed "**account data specific to the user of the mobile terminal**" of [4], and the **spatially localized information** is associated with it. Ex. 1009, ¶119.

Fujiwara discloses that "[r]egarding the attribute information of the customer, when a customer enters the store and pushes the shopping cart 106 to make a purchase, for example, the customer information (attribute information) can be acquired by holding a customer card over the IC tag reader 506 of the portable information terminal 105 provided on the shopping cart 106." Ex. 1003, [0098]. Thus the account data was previously stored in a database (inside the portable information terminal 105) that is now accessible to the store server via a communication network (the network over which the mobile information terminal 105 and the store server communicates). Ex. 1009, ¶120.

Therefore, Fujiwara renders Claim 4 obvious. Ex. 1009, ¶121.

e. Claim 5

Claim 5 recites a system analogous to method claim 1, and is rendered obvious by Fujiwara for same reasons set forth for claim 1. Ex. 1009, ¶¶122-130.

(1) [5pre]

The limitations of [5pre] are substantially the same as the corresponding limitations of [1pre]. Ex. 1009, ¶122. *See* Section III.E.2.a.(1).

(2) [5a]

The limitations of [5a] are substantially the same as the corresponding limitations of [1pre]. Ex. 1009, ¶123. *See* Section III.E.2.a.(1).

(3) [5b]

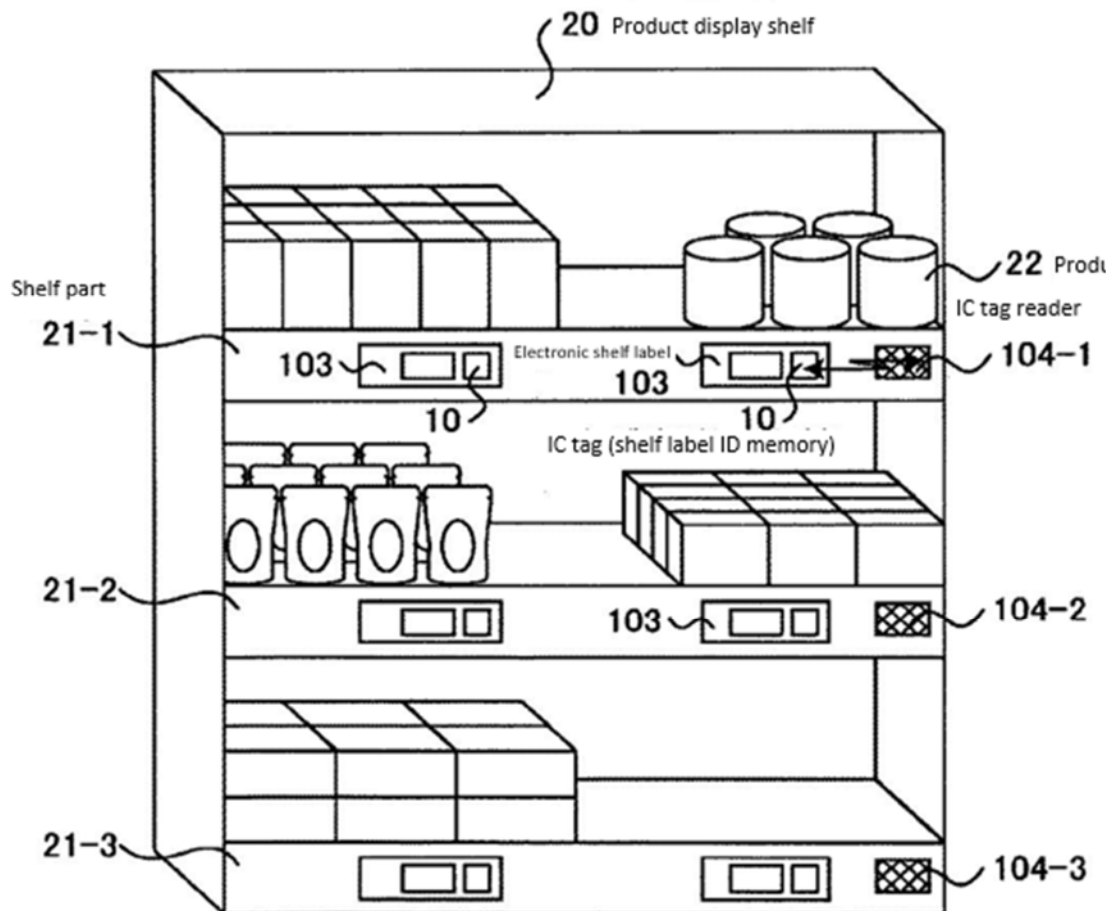
[1pre] and [1a] claim the central server receiving a communication from the mobile terminal, therefore the mobile terminal is configured to communication with the central server. Ex. 1009, ¶124. *See* Sections III.E.2.a.(1) and III.E.2.a.(2).

(4) [5c]

The limitations of [5c] are substantially the same as the corresponding limitations of [1pre] and [1a]. Ex. 1009, ¶125. *See* Sections III.E.2.a.(1) and III.E.2.a.(2). Fujiwara (with the obvious modifications discussed for Claim 1)

discloses that the plurality of IC tags (**radio-frequency peripherals**) are **distributed throughout** the predetermined area through figures such as FIG. 4.

[FIG. 4]



Ex. 1003, FIG. 4.

(5) [5d]

[5d] introduces no new limitation. Ex. 1009, ¶126. *See* Section III.E.2.a.(1).

(6) [5e]

The limitations of [5e] are substantially the same as the corresponding limitations of [1a]. Ex. 1009, ¶127. *See* Section III.E.2.a.(2).

(7) [5f]

The limitations of [5f] are substantially the same as the corresponding limitations of [1b]. Ex. 1009, ¶128. *See* Section III.E.2.a.(3).

(8) [5g]

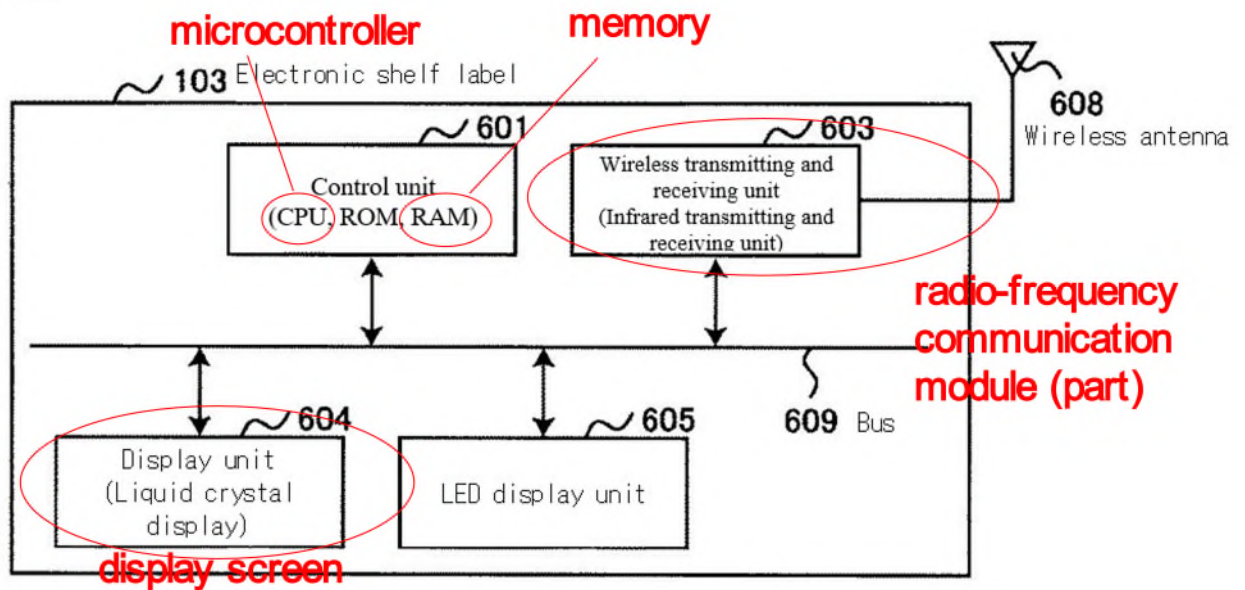
The limitations of [5g] are substantially the same as the corresponding limitations of [1c]. Ex. 1009, ¶129. *See* Section III.E.2.a.(4).

Therefore, Fujiwara renders Claim 5 obvious. Ex. 1009, ¶130.

f. Claim 6

The annotated figure below is a high-level overview of the correspondence between Fujiwara's disclosures and Claim 6. More details are set forth below.

[FIG. 6]



Ex. 1003, FIG. 6 (annotated)

(1) [6pre]

Claim 5 is addressed in Section III.E.2.e.

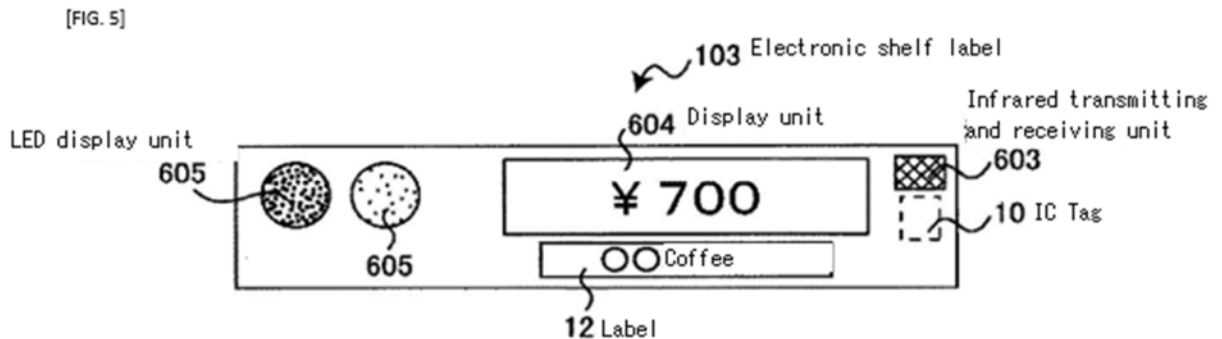
As discussed in Section III.E.2.a, a POSITA would find the claimed radio-frequency peripheral obvious over Fujiwara's disclosure of an **electronic shelf label** integrating an IC tag. Thus Fujiwara renders obvious each and every limitation of [6pre]. Ex. 1009, ¶133.

(2) [6a]

Fujiwara discloses that the electronic shelf label 103 comprises wireless transmitting and receiving unit 603. Ex. 1003, [0067]. While Fujiwara discloses an embodiment of wireless communication as infrared communication, a POSITA would understand that infrared communication is only provided as one possible

example of wireless communication, a point that is made clear by Fujiwara's wording of "for example" (Ex. 1003, [0067]). Ex. 1009, ¶134. Thus, a POSITA, familiar with the well-known and conventional radio frequency communication, and in particular with the widespread use of low-cost RFIDs in electronic shelf labels, would find it obvious to substitute infrared communication with well-known and conventional radio frequency communication, thus simplifying the design of the electronic shelf label by utilizing mature and conventional component, and saving costs. *Id.* This would also harmonize the internal design of two different components (wireless transmitting and receiving unit 603 and IC tag 10) of Fujiwara's electronic shelf label 103 by employing one single communication method for both, instead of two methods, and thus allow a POSITA to reuse hardware and software solutions for both, simplifying the design, reducing the cost, and facilitating maintenance. *Id.* This is no more than a mere substitution of one element (infrared communication) for another known in the field (radio-frequency communication), and a POSITA would have a reasonable expectation of success in doing so. *Id.* Not only would this have been obvious to try, but it would also have yielded no more than predictable results due to the combination of familiar elements in a known way. *Id.* A POSITA would thus find the claimed **radio-frequency communication module** obvious over Fujiwara through the modified wireless transmitting and receiving unit 603. *Id.*

As discussed in Section III.E.2.a.(1), a POSITA would find it obvious to modify Fujiwara by implementing the IC tag integrated inside the electronic shelf label as an NFC tag conformant to NFC standards such as ISO 14443. Ex. 1009, ¶135. A POSITA would know that such NFC tags engage in radio-frequency communication. *Id.* Thus, a POSITA would further find the claimed **radio-frequency communication module** obvious over Fujiwara through the modified IC tag (an integral part of the label). *Id.*



Ex. 1003, FIG. 5.

Fujiwara discloses that the wireless transmitting and receiving unit is configured to communicate with information distributing device 102. Ex. 1003, [0070]. Fujiwara discloses that information distributing device 102 wirelessly transmits information sent from the store server 101 to the electronic shelf labels 103. Ex. 1003, [0045]. Fujiwara further discloses that the electronic shelf label 103 receives product information (product price, and the like) by wireless communication from the store server 101 via the information distributing device 102.

Ex. 1003, [0046]. Thus the wireless transmitting and receiving unit is configured to receive **data representing information relating to an item**. Ex. 1009, ¶137.

Therefore, a POSITA would find each and every limitation of [6a] obvious over Fujiwara. Ex. 1009, ¶138.

(3) [6b]

Fujiwara discloses that the electronic shelf label 103 includes a control unit 601. Ex. 1003, [0068]. Fujiwara discloses that the control unit 601 includes a CPU, ROM, RAM, and the like. Ex. 1003, [0069]. RAM is the claimed **memory**. Fujiwara discloses that “product prices, information for customers, and the like” are **stored** in RAM. *Id.* Therefore, Fujiwara discloses each and every limitation of [6b]. Ex. 1009, ¶139.

(4) [6c]

Fujiwara discloses that the electronic shelf label 103 includes a control unit 601. Ex. 1003, [0068]. Fujiwara discloses that the control unit 601 includes a CPU. Ex. 1003, [0069]. CPU is the claimed **microcontroller**. Ex. 1009, ¶140. Fujiwara discloses that the CPU controls each device connected via the bus 609. Ex. 1003, [0069]. A POSITA would find it obvious that the CPU controls the display unit 604 (disclosed in Ex. 1003, [0067]) which **displays the information relating to an item**

(see Ex. 1003, [0046], [0067]). Ex. 1009, ¶140. Therefore, Fujiwara discloses each and every limitation of [6c]. *Id.*

(5) [6d]

Fujiwara discloses that the electronic shelf label 103 comprises a display unit 604, which is a liquid crystal display or the like, and presents customers with (displays) product price and information for customers. Ex. 1003, [0067]. The display unit 604, being a liquid crystal display, is the claimed **display screen**. Ex. 1009, ¶141. Therefore, Fujiwara discloses each and every limitation of [6d]. Ex. 1009, ¶142.

Therefore, Fujiwara renders Claim 6 obvious. *Id.*

g. Claim 7

Claim 6 is addressed in Section III.E.2.f.

Fujiwara discloses that “[t]he IC tag reader 506 of the mobile information terminal 105 transmits a resonant call-up signal to the IC tag 10 (step S1402).” Ex. 1003, [0103]. As discussed in Section III.E.2.f.(2), a POSITA would find it obvious that the IC tag 10, after the obvious modification of implementing it as an NFC tag, forms a part of the radio-frequency communication module. Ex. 1009, ¶144. Thus a POSITA would understand that the mobile terminal is adapted to transmit data (resonant call-up signal) to the electronic label via the radio-frequency

communication module (taught in part by the modified IC tag 10). *Id.* Therefore, Fujiwara renders Claim 7 obvious. *Id.*

h. Claim 8

Claim 5 is addressed in Section III.E.2.e.

Fujiwara discloses that “[t]he IC chip is connected to both end parts of the antenna.” Ex. 1003, [0071]. Thus the antenna and the chip are inherently arranged at different points of the radio-frequency peripheral, as the chip is connected to the two ends of the antenna, which is not possible when the chip and the antenna are arranged at the same point. Ex. 1009, ¶146. Further, such connection is the claimed **connections configured to ensure a communications link between the antenna and the chip**. *Id.* Therefore, Fujiwara renders Claim 8 obvious. *Id.*

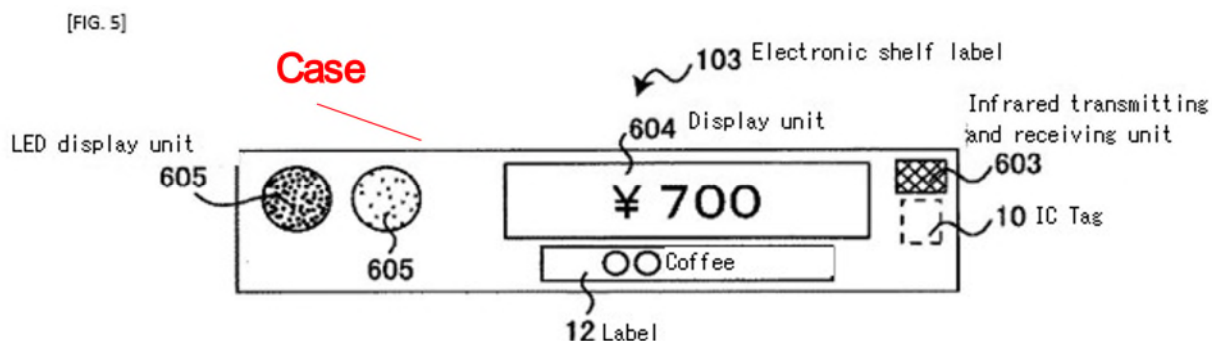
i. Claim 9

Claim 8 is addressed in Section III.E.2.h.

Fujiwara discloses that the CPU “controls each device connected via the bus 609.” Ex. 1003, [0069]. Thus the CPU (**microcontroller**) is connected through bus 609 with parts of the electronic shelf label 103 such as the wireless transmitting and receiving unit 603. Ex. 1009, ¶148. As IC tag 10 is an integrated part of electronic shelf label 103, and forms the radio-frequency communication module together with the wireless transmitting and receiving unit 603 (*see* Section III.E.2.f.(2)), a POSITA would find it obvious that the CPU is also connected through bus 609 with IC tag 10

and its chip. *Id.* Such an arrangement will serve to simplify the design of the electronic shelf label by integrating all needed control functionalities for the IC tag inside the central place of the CPU, and represents no more than arranging old elements with each performing the same function it had been known to perform and yielding no more than one would expect from such an arrangement. *Id.* Such an arrangement would have been well within the skills of a POSITA. *Id.*

FIG. 5 of Fujiwara shows the electronic shelf label to be enclosed inside a **case**.



Ex. 1003, FIG. 5 (annotated).

A POSITA, looking at this figure, would know that the **antenna** (part of IC tag 10) is arranged within this **case** inside which the **microcontroller** is also housed.

Ex. 1009, ¶150.

Therefore, Fujiwara renders Claim 9 obvious. Ex. 1009, ¶152.

F. Ground 2

As discussed in Section III.E, Claims 1-9 are rendered obvious by Fujiwara, after the obvious modifications of (1) implementing IC tag 10 as an NFC tag conformant with NFC standards such as ISO 14443 with a communication range of less than twenty centimeters (*see* Section III.E.2.a.(1)) (the “NFC tag modification”); and (2) implementing the wireless transmitting and receiving unit 603 to use radio-frequency communication method (*see* Section III.E.2.f.(2)) (the “RF modification”). Ex. 1009, ¶153.

As discussed further in detail below, Arntzen explicitly supplies these two modifications and teaches their advantages, and a POSITA would have also been motivated and able to modify Fujiwara by implementing these two modifications from Arntzen in Fujiwara. Therefore, as discussed further below, Claims 1-9 are obvious over Fujiwara in combination with Arntzen.

1. Arntzen

International Patent App. No. WO 2010/082835A1 (“Arntzen”) is directed to a “system and method for displaying and updating price and product related information.” Ex. 1005, [Title]. Arntzen further discloses that the system comprises “a number of price labels in the form of an electronic display, for display of relevant information.” Ex. 1005, [1:4-6]. FIG. 2 of Arntzen, reproduced below, is a schematic diagram of the system.

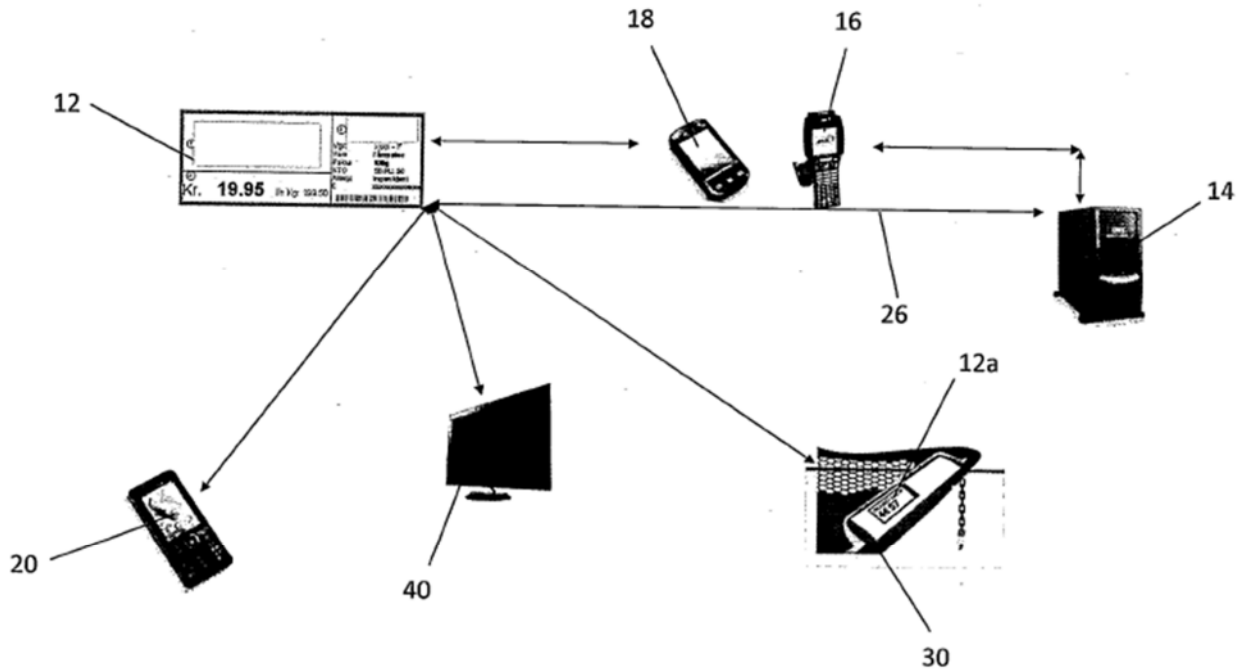


Fig. 2

Ex. 1005, FIG. 2.

Arntzen qualifies as prior art under pre-AIA 35 U.S.C. § 102(b) because it was published on July 22, 2010, which is more than one year before the '340 Patent's April 11, 2012 claimed priority date. Ex. 1005, (43).

Arntzen is analogous prior art to the '340 Patent. The '340 Patent is directed to "the display of information in a sales area" (Ex. 1001, at [1:18-19]) while Arntzen is directed to "system and method for displaying and updating price and product related information." (Ex. 1005, [Title]). Thus, both Arntzen and the '340 Patent are in the same field of endeavors for displaying information in a sales area. Ex. 1009, ¶157.

2. Claims 1-9 are rendered obvious by Fujiwara in combination with Arntzen

a. Arntzen supplies the NFC tag modification.

Arntzen discloses electronic displays 12 adjoining goods on shelves. Ex. 1005, [11:9-12]. Arntzen discloses that these electronic displays 12 can be ESL-displays with an internal memory to be able to store all necessary information about the goods and which are also equipped with wireless communication equipment. Ex. 1005, [11:15-20]. Arntzen discloses that the ESL-displays communicate with a central server. Ex. 1005, [11:22-23]. Arntzen discloses that the electronic displays shall also be able to communicate with handheld units. Ex. 1005, [12:15-17]. Arntzen discloses that such communication is intended to be via NFC on 13.56MHz. Ex. 1005, [5:34-35], [12:15-20]. Arntzen discloses that products with built-in NFC simplify the way units communicate with each other. Ex. 1005, [5:31-32]. Arntzen discloses that the communication range of NFC is within a radius of four centimeters. Ex. 1005, [6:1-3]. Arntzen discloses that the short range of NFC is advantageous because the transactions are inherently secure and because the users have the reassurance of having control. Ex. 1005, [6:8-11]. Arntzen discloses that the NFC communications are established via a simple wave or touch. Ex. 1005, [6:4]. A POSITA would understand that such establishment of NFC communication is covered by well-known and conventional standards such as ISO 14443, which employs the claimed electromagnetic wave activation. Ex. 1009, ¶158.

Thus, Arntzen discloses electronic displays that are functionally and structurally analogous to Fujiwara's IC-tag-embedded electronic shelf labels, and Arntzen's electronic displays are implemented with the claimed NFC technology. Therefore, Arntzen supplies the NFC tag modification. Ex. 1009, ¶159.

b. Arntzen supplies the RF modification.

Arntzen discloses that the wireless communication between the electronic displays and the central server is via ZigBee, which a POSITA would know to employ radio frequency communication. Ex. 1009, ¶160. Arntzen further discloses that price display systems with RF communications present significant advantages such as cost reduction, easy installation, and centralized control over those with infrared communications. Ex. 1005, [4:3-5], [4:30-5:6]. Arntzen further discloses that systems with RF communications are becoming adopted by the industry. Ex. 1005, [4:1-5].

Therefore, Arntzen supplies the RF modification. Ex. 1009, ¶161.

c. A POSITA would have reason to modify Fujiwara with Arntzen

As discussed in Section III.E, a POSITA would have reason to make the NFC tag modification and the RF modification and would have a reasonable likelihood of success in doing so. For the same reasons, and for the additional reason that Arntzen discloses further advantages for NFC technology (Ex. 1005, [5:31-32], [6:8-11]) and RF technology (Ex. 1005, [4:3-5], [4:30-5:6]), a POSITA would have reason to

modify Fujiwara and implement Arntzen's NFC technology for communication with mobile terminal as well as Arntzen's RF technology for communication with central server in Fujiwara's electronic shelf label. Ex. 1009, ¶162. This represents nothing more than the combination of known elements to achieve predictable results, and is well within the skills of a POSITA. *Id.*

G. Ground 3

Claims 1-5 and 8-9 are rendered obvious by Bandy in combination with Fowler (the "Bandy-Fowler" combination), as disclosed in more detail below.

1. Bandy

U.S. Patent Application Publication No. 2007/0024436A1 by Bandy ("Bandy") is directed to "methods, systems, and apparatuses to improve an interface between customers and products in warehouse, shopping, and additional environments, including an improved interface with items associated with RFID tags." Ex. 1006, [0007]. In particular, it discloses a mobile device that is configured to "read a radio frequency identification (RFID) tag associated with an item to determine an identification number corresponding to the RFID tag" and "transmit the identification number of the RFID tag to a computer system of the merchant, and to receive a response from the computer system that includes information regarding the item." Ex. 1006, [0013].

FIG. 9 of Bandy, reproduced below, is a diagram showing an example embodiment.

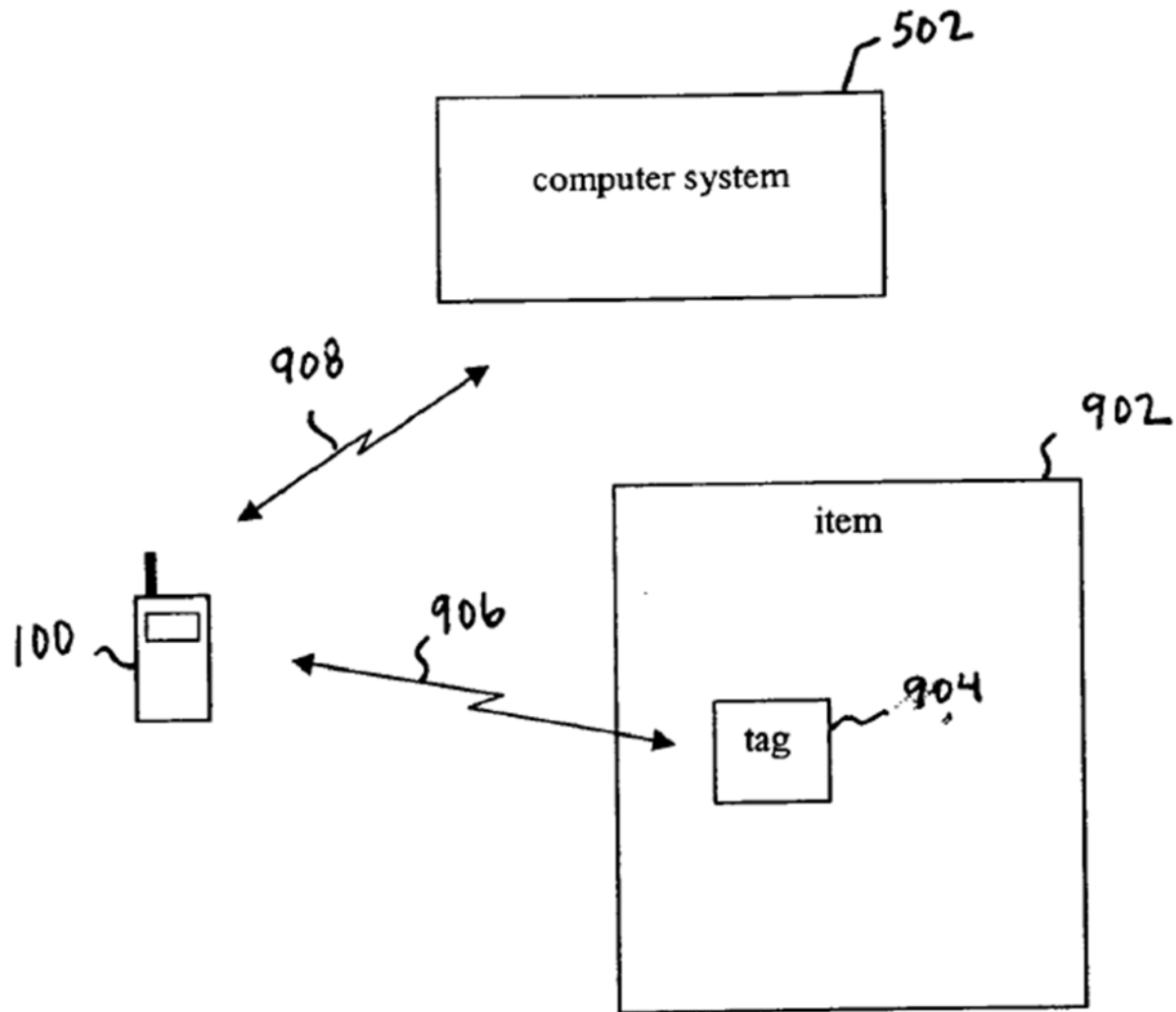


FIG. 9

Ex. 1006, FIG. 9.

FIG. 8 of Bandy, reproduced below, is a flow diagram providing example steps for requesting information for an item associated with an RFID tag.

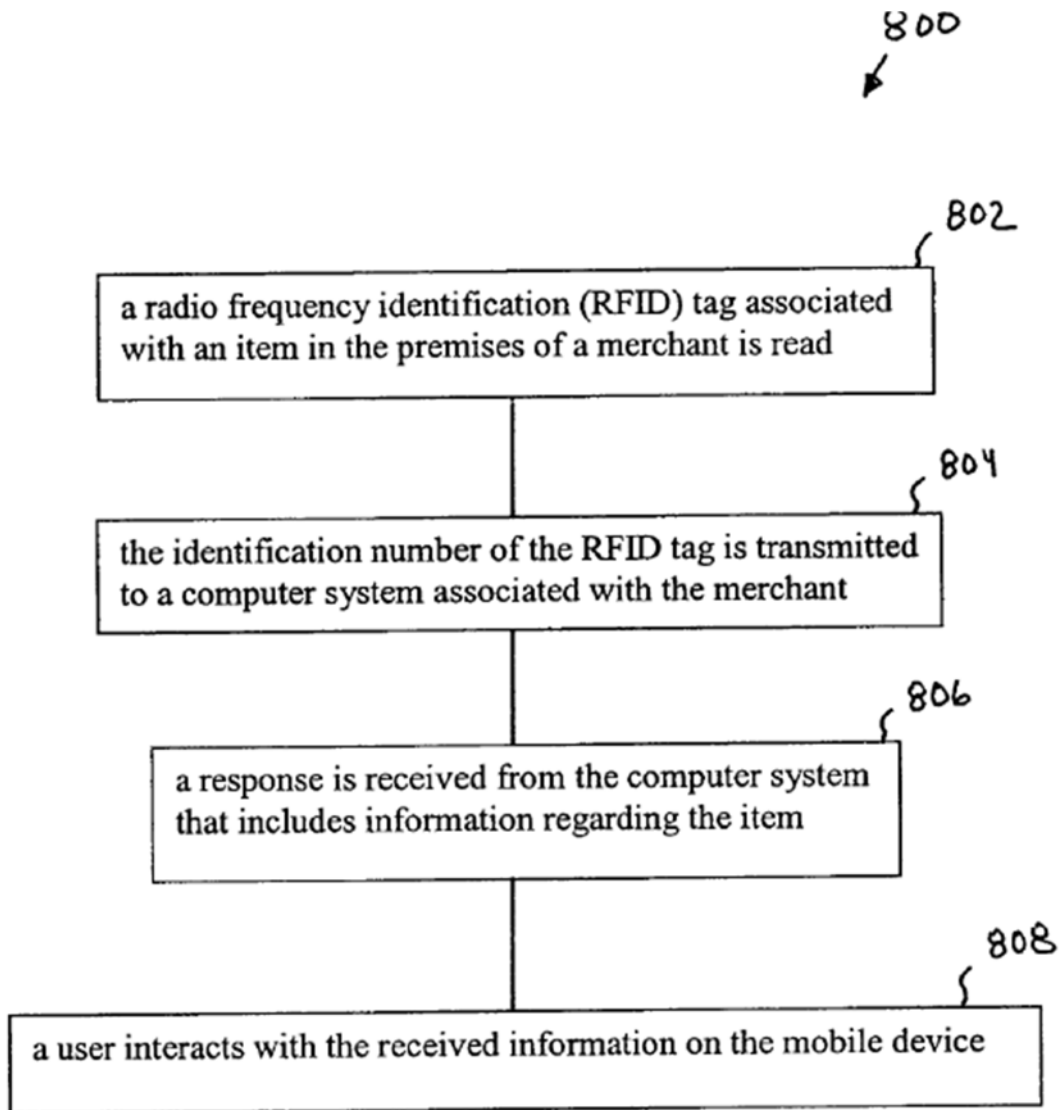


FIG. 8

Ex. 1006, FIG. 8.

Bandy qualifies as prior art under pre-AIA 35 U.S.C. § 102(b) because it was published on February 1, 2007, which is more than one year before the '340 Patent's April 11, 2012 claimed priority date. Ex. 1006, (43).

Bandy 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 Bandy is directed to “improv[ing] an interface between customers and products in warehouse, shopping, and additional environments, including an improved interface with items associated with RFID tags” (Ex. 1006, [0007]). In particular, Bandy discloses methods for a user to “obtain information regarding the item, such as from a computer system” (Ex. 1006, [0010]) and specifically to obtain such information through RFID tag interactions (Ex. 1006, [0013]). Thus, both Bandy and the '340 Patent are in the same field of endeavor for providing consumers with information in shopping environments. Ex. 1009, ¶167.

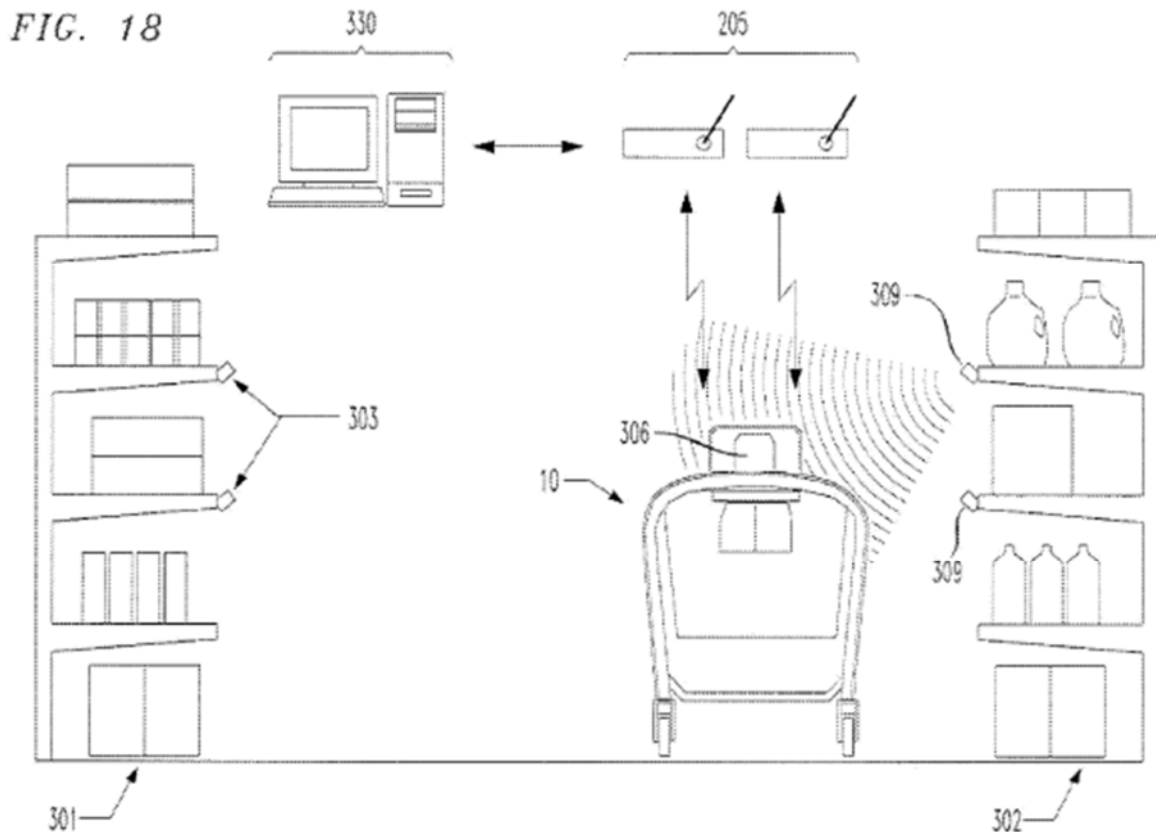
2. Fowler

U.S. Patent Application Publication No. 2008/0231228A1 by Fowler (“Fowler”) is directed to “a media enhanced shopping cart system, and more particularly, but not by way of limitation, to a system and method for providing information such as advertising.” Ex. 1007, [0001]. In particular, Fowler discloses a

method of “performing a proximity scan from a shopping cart, determining a location of the cart within a store based on the scan; displaying at least one product advertisement based on the location of the cart, correlating a location of an advertised product with the location of the cart, and displaying an indication of the location of the advertised product with respect to the location of the shopping cart.”

Ex. 1007, [0005].

FIG. 18 of Fowler, reproduced below, is an illustrative view of the media enabled shopping cart in a store network system.



Ex. 1007, FIG. 18.

Fowler qualifies as prior art under pre-AIA 35 USC § 102(b) because it was published on September 25, 2008, which is more than one year before the '340 Patent's April 11, 2012 claimed priority date. Ex. 1007, at (43).

Fowler 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 Fowler is directed to “a system and method for providing information such as advertising” (Ex. 1007, [0001]). Further, the '340 Patent discloses methods to provide the user of a mobile terminal with spatially localized information such as the path to be followed to reach a specific item (Ex. 1001, [7:41-44]) while Fowler discloses a method to determine the location of the consumer's shopping cart and indicating the location of advertised products with respect to the location of the shopping cart (Ex. 1007, [0005]). Thus, both Fowler and the '340 Patent are in the same field of endeavor for providing customers with information (and in particular with item-finding information) in the shopping area. Ex. 1009, ¶173.

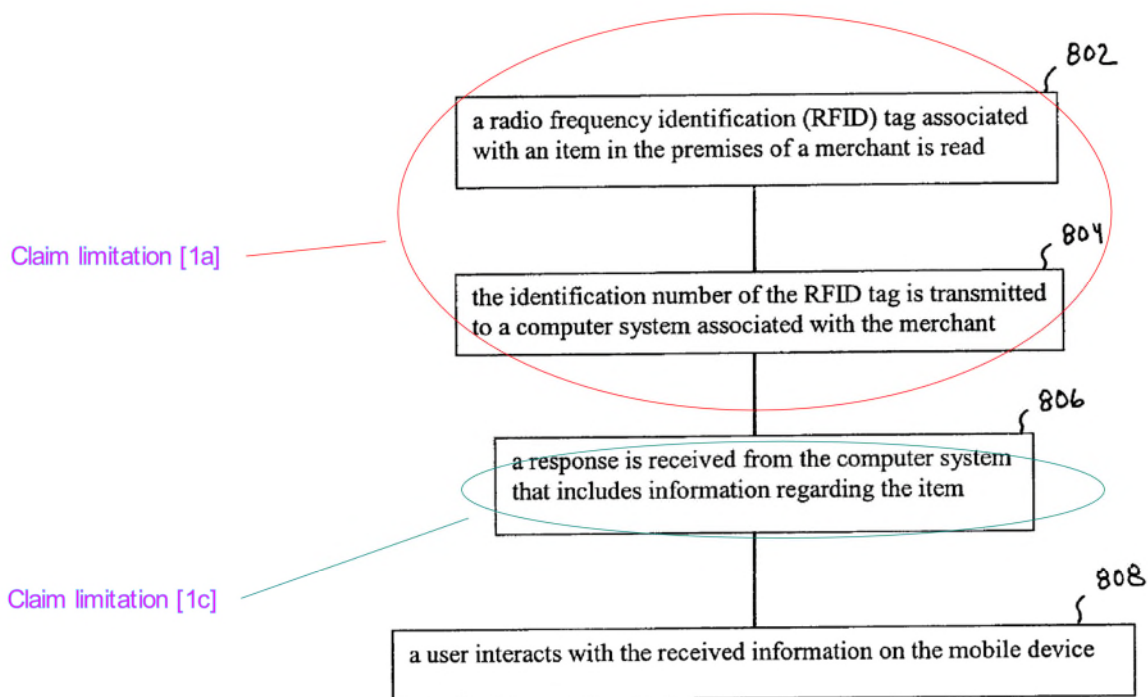
3. Claims 1-5 and 8-9 are rendered obvious by Bandy in combination with Fowler

As set forth in detail below, Bandy-Fowler discloses each and every limitation recited by claims 1-5 and 8-9. Furthermore, A POSITA would have had a reason to

combine Bandy with Fowler and would have had a reasonable expectation of success in doing so.

a. Claim 1

The annotated figure below is a high-level overview of the correspondence between Bandy’s disclosures and the main steps of Claim 1. More details of the correspondence between Bandy-Fowler and Claim 1 are set forth below.



Ex. 1006, FIG. 8

(1) [1pre]

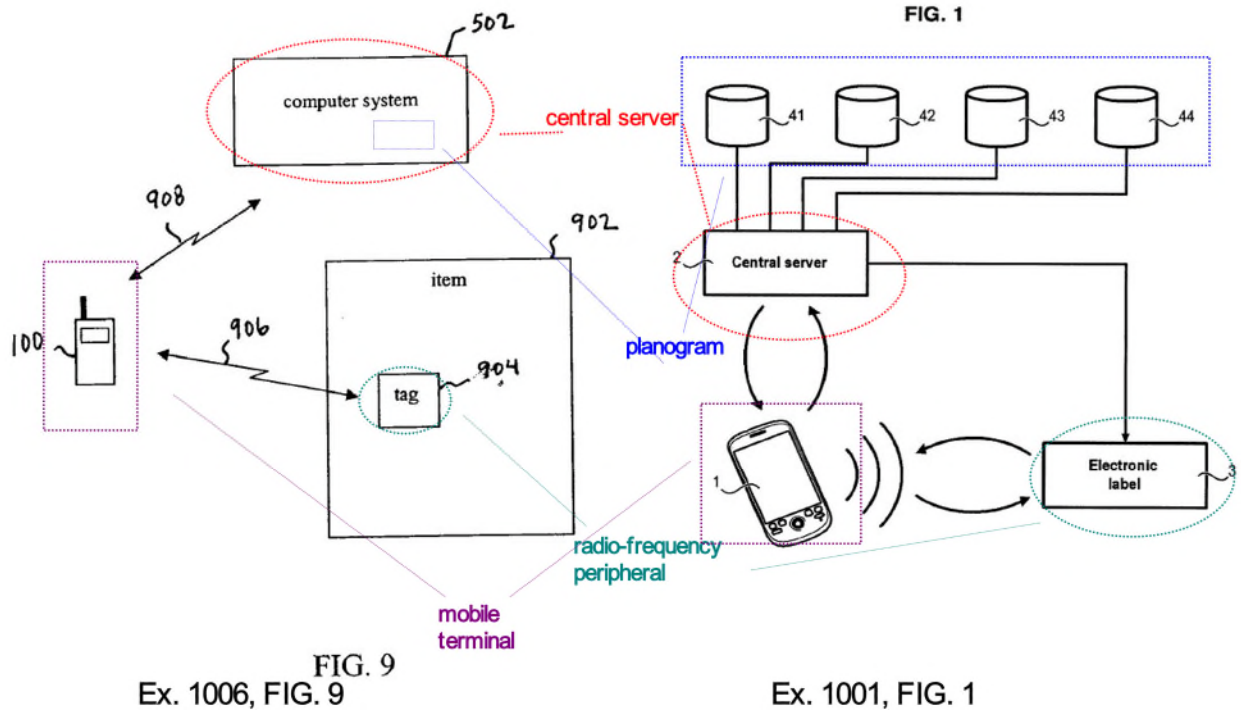
The preamble portion “A method for communicating spatially localized information” is not limiting, because it merely states the purpose or intended use of

the alleged invention. 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). Ex. 1009, ¶176. To the extent that this portion is limiting, Bandy-Fowler teaches this portion, please refer to Section III.G.3.a.(4) below.

Bandy discloses a mobile communications device 100 (**mobile terminal**) that communicates with RFID tags (**radio-frequency peripheral**) and remote computer systems and/or networks. Ex. 1006, [0037]. In particular, Bandy discloses the mobile terminal communicating with a computer system associated with the merchant (**central server**). Ex. 1006, [0056].

Bandy discloses an identification number (**unique identifier**) of the RFID. Ex. 1006, [0054], [0056]. Bandy discloses that computer system 502 associates the identification number with item 904 and is able to obtain further data related to item 904 after having received the identification number, due to this association. Ex. 1006, [0056]. Bandy discloses that the item data may comprise **location** data regarding the item in store 500 (**predetermined area**). Ex. 1006, [0057]. This association is thus the claimed **planogram**. A POSITA would understand that the identification number must be **associated one-to-one with** the location of the items for the system and method of Bandy to work as disclosed. Ex. 1009, ¶178.

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



Fowler discloses an in-store server (“ISS”) 330. Ex. 1007, [0062]. Fowler also discloses a Host Central Server (“HCS”) 340. Ex. 1007, [0259]. These servers comprise the **central server**. Ex. 1009, ¶180.

Fowler discloses a shopping cart 10 (**mobile terminal**). Ex. 1007, *passim*.

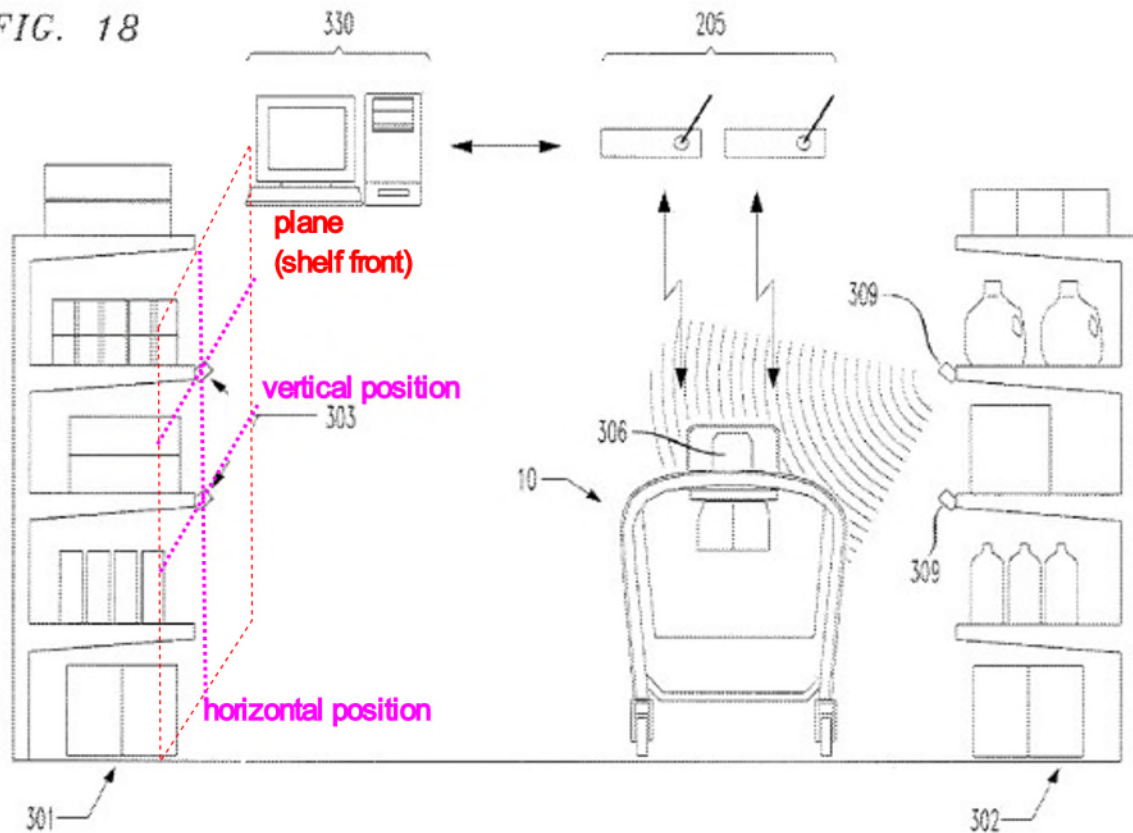
Fowler discloses “a number of reference or anchor RFID tags (e.g., shelf or fixture level tags) placed around the store in known locations.” Ex. 1007, [0144]. The RFID tags are the claimed “**radio-frequency peripheral**” of [1pre]. Ex. 1009, ¶182.

Thus, Fowler also teaches the claimed “**mobile terminal**”, “**central server**” and “**radio-frequency peripheral**” of [1pre], and a POSITA would look at the disclosures of Fowler to supplement their corresponding elements in Bandy, thus reaching the Bandy-Fowler combination, as this involves no more than the combination of familiar elements in a known way. Ex. 1009, ¶183.

Fowler discloses a **planogram** that involves the **location** of products within the store. Ex. 1007, [0221]. Fowler discloses that a planogram is a diagram of fixtures and products that illustrates how and where retail products should be displayed, usually on a store shelf, bin or counter in order to influence consumer selection. Ex. 1007, [0221]. A POSITA would also look at the disclosures of Fowler to supplement the planogram of Bandy, as this involves no more than the combination of familiar elements in a known way. Ex. 1009, ¶184.

A POSITA would understand that a location of a product on a shelf or bin necessarily comprises a **vertical and horizontal position within a plane** (the shelf front plane) **perpendicular to a floor of the predetermined area** of the store. Ex. 1009, ¶185. FIG. 18 of Fowler depicts such vertical and horizontal position.

FIG. 18



Ex. 1007, FIG. 18 (annotated)

In fact, Fowler discloses, as a first step for locating a cart, building an electronic representation of a base map of the store (the planogram) with “a number of reference or anchor RFID tags (e.g., shelf or fixture level tags) placed around the store in known locations.” Ex. 1007, [0144]. Fowler further discloses “RFID tags located at various heights and locations along the shelves.” Ex. 1007, [0137]. Fowler also discloses that RFID tags may be attached at a product level, with a tag on each individual product or package. Ex. 1007, [0141]. A POSITA would understand that the “known locations” of the reference or anchor RFID tags that may be associated

with each individual product and that may be at different heights and locations along the shelves necessarily comprises **vertical and horizontal positions** of the locations. Ex. 1009, ¶186.

Fowler discloses that the RFID tags may be active or passive RFID tags. Ex. 1007, [0139]. Such RFID tags are **radio-frequency peripherals**. A POSITA at the time of the invention would have been familiar with the advantages of passive RFID tags such as saved cost and easier maintenance, and therefore a POSITA reading Bandy in view of Fowler at the time of the invention would be motivated to implement Bandy's RFID tags as Fowler's passive RFID tags, in order to realize such advantages, and would have a reasonable expectation of success in this mere application of a known technique to a piece of prior art ready for the improvement. Ex. 1009, ¶188.

Fowler further discloses that a cart RFID tag is associated with a serial or identification number. Ex. 1007, [0231]. A POSITA would find it obvious that the shelf RFID tags are also associated with such a **unique identifier**. Ex. 1009, ¶189. Fowler further discloses that each product may be located by means of the RFID tag, enabling retailers to locate products throughout the store to manage, update, and design the store planogram. Ex. 1007, [0222]. A POSITA would recognize that this necessarily means that the **planogram** associates the **unique identifiers** of RFID tags (**radio-frequency peripherals**) with **locations** of products within the

predetermined area of the store, and such association is necessarily **one-to-one**.

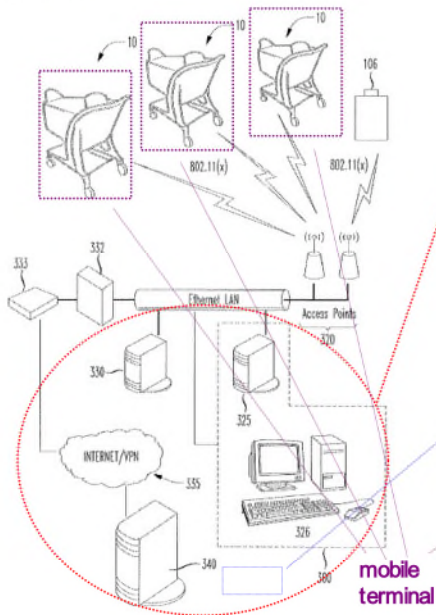
Ex. 1009, ¶189.

In fact, Fowler expressly discloses that a series of virtual **locations** are created and positioned within the defined framework of the store, i.e., the base store map (**planogram**), with each location being “for example a shelf, freezer fixture, aisle, or produce bin” and defined as **associated with** one or more anchor RFID tags. A POSITA would recognize this as a further disclosure of the claimed association in the planogram, as well as a further disclosure of **vertical and horizontal position**.

Ex. 1009, ¶190.

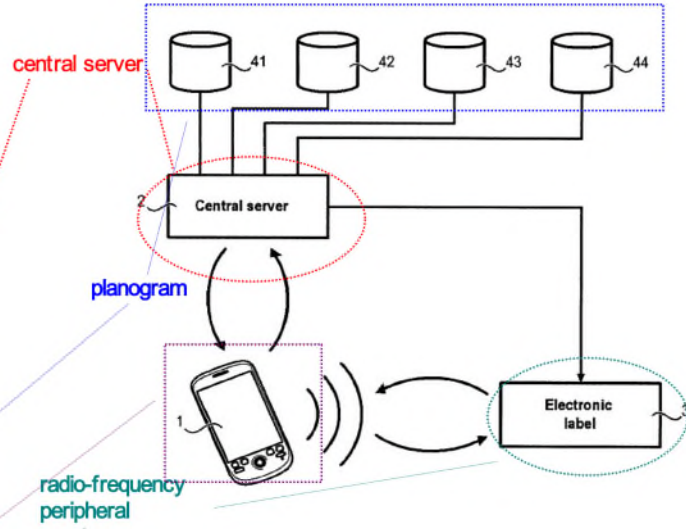
The following annotated figure shows the correspondence between the components of Fowler and the components of the '340 Patent.

FIG. 17



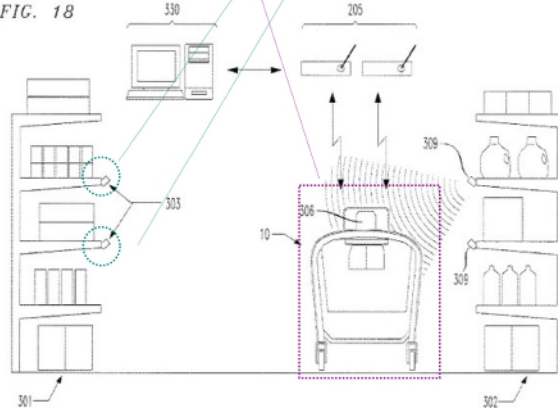
Ex. 1007, FIG. 17

FIG. 1



Ex. 1001, FIG. 1

FIG. 18



Ex. 1007, FIG. 18

Therefore, Bandy-Fowler discloses each and every limitation of [1pre] because Bandy alone discloses all of them except for the “vertical and horizontal position” limitation, while Fowler supplements that limitation. Ex. 1009, ¶192. As discussed in Section III.G.3.h below, a POSITA would have been motivated and able

to modify Bandy by implementing the vertical plane positions of Fowler in Bandy's planogram, and thus meeting the "vertical and horizontal position" limitation.

(2) [1a]

Bandy discloses the mobile communications device 100 (**mobile terminal**) reading a radio frequency identification (RFID) tag (**radio-frequency peripheral**) associated with an item in the store of a merchant. Ex. 1006, [0054]. Bandy discloses that tag 902 provides its identification number (**unique identifier**) (and/or other data) to mobile communications device 100. Ex. 1006, [0054]. A POSITA would understand that such an identification number is necessarily **particular to** such a tag. Ex. 1009, ¶193. Bandy discloses that the identification number of the RFID tag is transmitted to a computer system (**central server**) associated with the merchant. Ex. 1006, [0056].

Bandy discloses that the communication begins with the reader module 304 of the mobile communications device 100 interrogating a tag 902 associated with an item 904 using interrogation signal 906. Ex. 1006, [0054]. A POSITA would understand that such the tag is configured to be **activated** by such interrogation and the tag necessarily has to be within a **communication range** of the mobile communications device for such activation to happen. Ex. 1009, ¶194.

Further, Bandy discloses that reader module 304 performs one or more interrogation/read protocols, as would be known to persons skilled in the relevant art(s), to read tag 902. Ex. 1006, [0055]. A POSITA would have known the NFC protocols and standards, including the ISO 14443 standard that is directed to proximity cards with a communication range of less than twenty centimeters, and would have known the advantages of protocols with such short communication ranges. Ex. 1009, ¶195. Thus, a POSITA would be motivated and able to use the NFC standards, including the claimed **activation** and **communication range less than twenty centimeters**, to implement Bandy's tag and reader module, and would have a reasonable expectation of success in doing so. *Id.*

Bandy discloses that an RFID tag 1600 includes a die 1604 and related electronics 1606 located on a tag substrate 1616. Ex. 1006, [0074]. Bandy discloses that die 1604 is an integrated circuit (**electronic chip**) that performs RFID operations, such as communicating with one or more tag readers (not shown) according to various interrogation protocols. Ex.1013, [0077]. Bandy discloses that related electronics 1606 includes an **antenna** 1614. Ex. 1006, [0074]. A POSITA, with knowledge of NFC protocols and standards, would find it obvious that the antenna and the electronic chip are **configured for near-field communication**. Ex. 1009, ¶196.

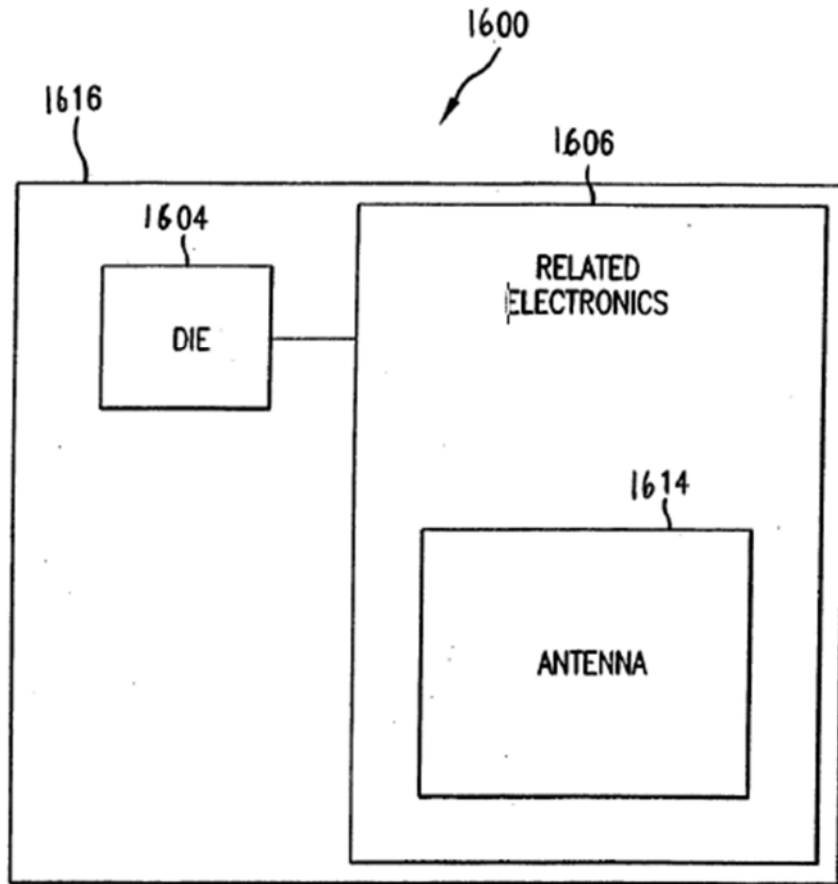


FIG. 16

Ex. 1006, FIG. 16.

Fowler discloses the cart (**mobile terminal**) processing signals from RFID tags 303 and 304 (**radio-frequency peripheral**) that are within range (**communication range**) of the aisle RFID reader 225 of the cart. Ex. 1007, [0143]. Fowler discloses that various RFID data along with other positioning information (for example, motion sensor data) may be gathered and analyzed using software algorithms, for example operating on ECM 200 or a remote location such as a store

server (**central server**) and provided to the cart. Ex. 1007, [0147]. A POSITA would understand that this necessarily means that the cart will obtain the **unique identifiers** of the RFID tags and **communicate** them to the central server for such processing, including the looking up of locations associated to the tags (*see* Ex. 1007, [0145]) in the “electronic representation of the store configuration” (Ex. 1007, [0144]), that is, the **planogram**. Ex. 1009, ¶197.

Fowler further discloses that the RFID tags may be passive RFID tags. Ex. 1007, [0140]. Fowler discloses a range (**communication range**) of the RFID reader. Ex. 1007, [0142]. A POSITA will understand that a passive RFID tag is configured to be **activated** by the cart (through the RFID reader) when the RFID tag is within a **communication range** of the cart. Ex. 1009, ¶198.

Therefore, Bandy-Fowler discloses each and every limitation of [1a] because Bandy alone discloses all of them except for the “less than twenty centimeter” limitation, while, as discussed in Section III.G.3.h below, a POSITA would have been motivated and able to use the well-known and conventional NFC standards to modify Bandy’s RFID tag, thus meeting the “less than twenty centimeter” limitation. Ex. 1009, ¶200.

(3) [1b]

Bandy discloses that computer system 502 (**central server**) associates the identification number (**unique identifier**) stored in tag 902 with item 904 and is able to obtain further data related to item 904 after having received the identification number, due to this association. Ex. 1006, [0056]. Bandy discloses that item data may include **location** data regarding the item in store 500. Ex. 1006, [0057]. A POSITA would find it obvious that the central server necessarily determines a **location of the mobile terminal** in this step through the looking up of the location data of the item in the association/**planogram**. Ex. 1009, ¶201.

Fowler discloses locating the cart in the store through the various RFID data gathered and analyzed in the central server. Ex. 1007, [0147]. A POSITA would understand that such locating of the cart, or more specifically of the aisle RFID reader 225, is necessarily based on the location associated with the unique identifiers in the planogram. Ex. 1009, ¶202. A POSITA will use this teaching of Fowler to supplement Bandy because this involves no more than the combination of familiar elements in a known way. *Id.*

Further, as discussed in Section III.G.3.a.(1), a POSITA would have been motivated and able to implement Fowler's vertical-plane placement of RFID tags and vertical/horizontal position information in Bandy's planogram. As discussed above, a POSITA would find it obvious over Bandy to determine a location of the mobile terminal based on such planogram location data, thus a POSITA would find

it obvious that the determined location of the mobile terminal also includes the claimed vertical and horizontal positions. Ex. 1009, ¶203.

Therefore, Bandy-Fowler discloses each and every limitation of [1b] because Bandy discloses all of them except for the “vertical and horizontal position” limitation, while, as discussed in Section III.G.3.h below, a POSITA would have been motivated and able to modify Bandy by implementing the vertical plane positions of Fowler in Bandy’s planogram, and thus meeting the “vertical and horizontal position” limitation. Ex. 1009, ¶204.

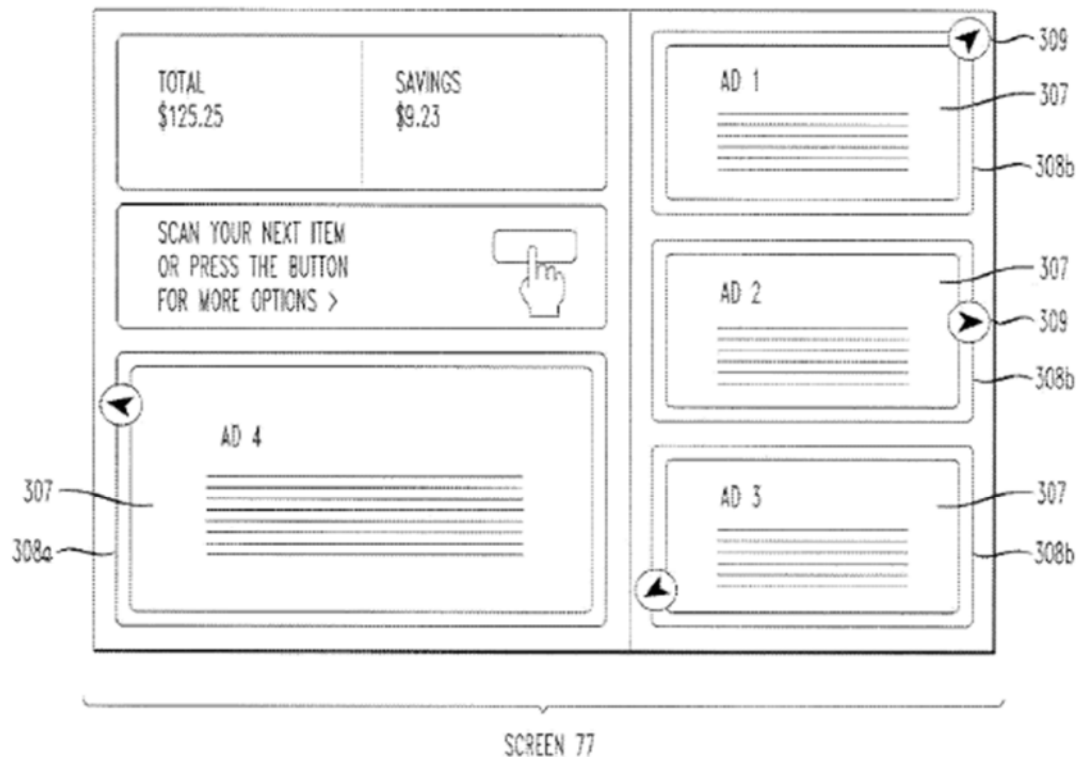
(4) [1c]

Bandy discloses that the further data obtained by computer system 502 is then received from computer system 502 (**central server**) in step 806 by mobile communications device 100 (**mobile terminal**). Ex. 1006, [0056]. Bandy discloses that such data may include various data related to the item such as price, configuration, specification, etc. Ex. 1006, [0057]. Such data are thus **spatially localized information** associated with the item near the mobile terminal and therefore associated with the location of the mobile terminal. Ex. 1009, ¶205.

Fowler discloses that, upon determining the proximity of the cart 10 to any particular tag or tags 303 or 304, the ECM 200 causes at least one advertisement 306 to be displayed to the consumer 85 on the video display 75. Ex. 1007, [0166]. Such

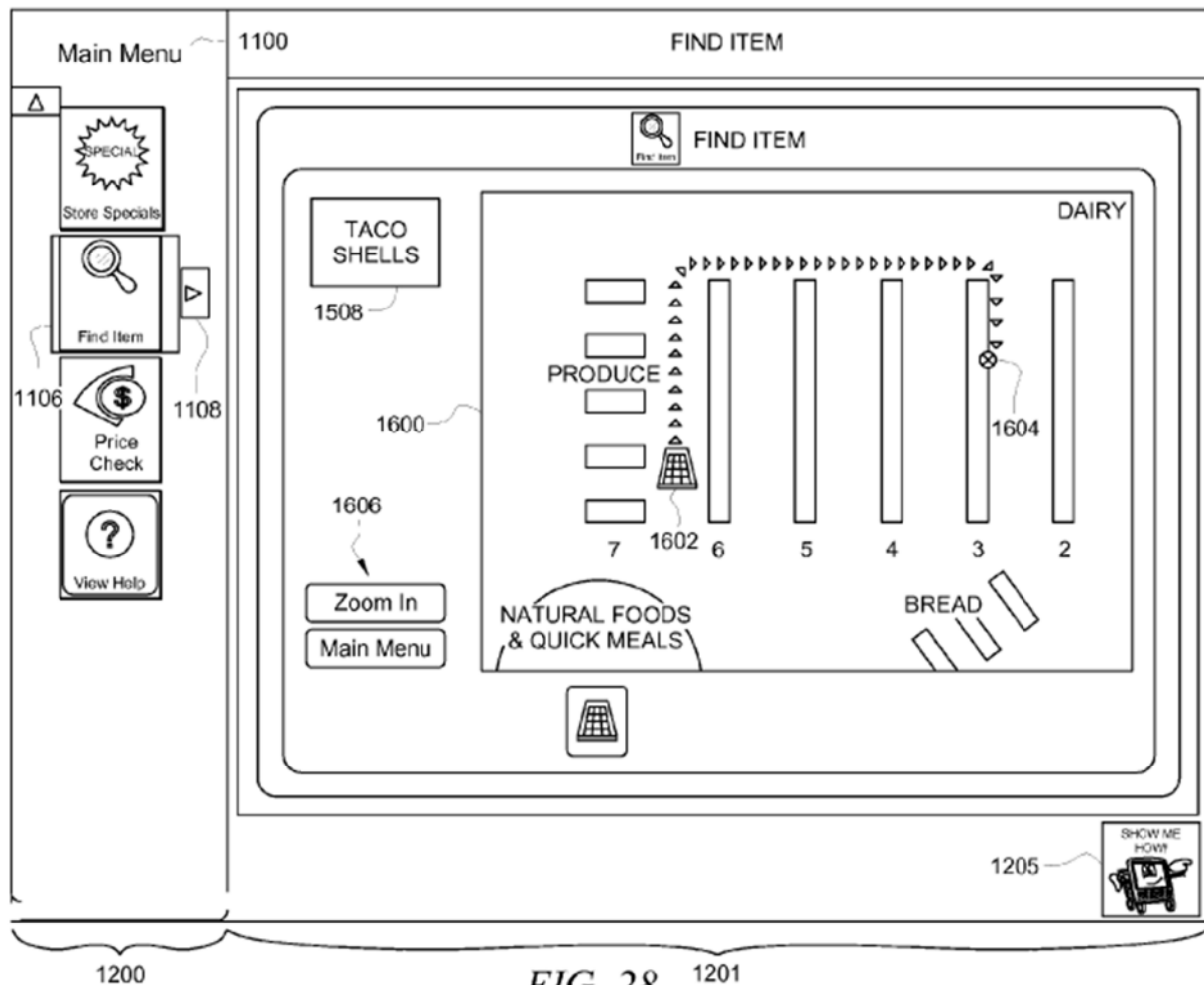
advertisement information is **spatially localized information associated with the location of the mobile terminal**. Ex. 1009, ¶206.

FIG. 16



Ex. 1007, FIG. 16.

Fowler discloses that “the location of specific products can be provided relative to the known location of the cart within the store, and the consumer may be provided directions to such products.” Ex. 1007, [0145]. Fowler further discloses the graphical display of such location and direction information on the display of the cart. Ex. 1007, [0164], FIG. 28. Such direction information is **spatially localized information associated with the location of the mobile terminal**. Ex. 1009, ¶207.



Ex. 1007, FIG. 28.

Therefore, Bandy-Fowler discloses each and every limitation of [1c] because Bandy alone discloses all of them. Further, as discussed in Section III.G.3.h below, a POSITA would have been motivated and able to implement Fowler’s route finding in Bandy’s system, thus enhancing Bandy’s disclosure of the “spatially localized information” limitation of [1c]. Ex. 1009, ¶208.

Therefore, Bandy-Fowler renders Claim 1 obvious. Ex. 1009, ¶209.

b. Claim 2

Claim 1 is addressed in Section III.G.3.a.

A POSITA would find the claimed interaction between the mobile terminal and the radio-frequency communication peripheral to be inherent in the interrogation/read protocols between the modified passive NFC/RFID tag of Bandy-Fowler and the mobile communications device. Ex. 1009, ¶211. A POSITA would also find the claimed interaction to be inherent in the interaction between the aisle RFID reader and Fowler's passive RFID tags. *Id.*

Therefore, Bandy-Fowler discloses each and every limitation of [2] because, as discussed in Section III.G.3.h below, a POSITA would have been motivated and able to use the well-known and conventional NFC standards and Fowler's passive RFID tags to modify Bandy's RFID tag, thus meeting all of the limitations of [2]. Ex. 1009, ¶212. Thus Bandy-Fowler renders Claim 2 obvious. *Id.*

c. Claim 3

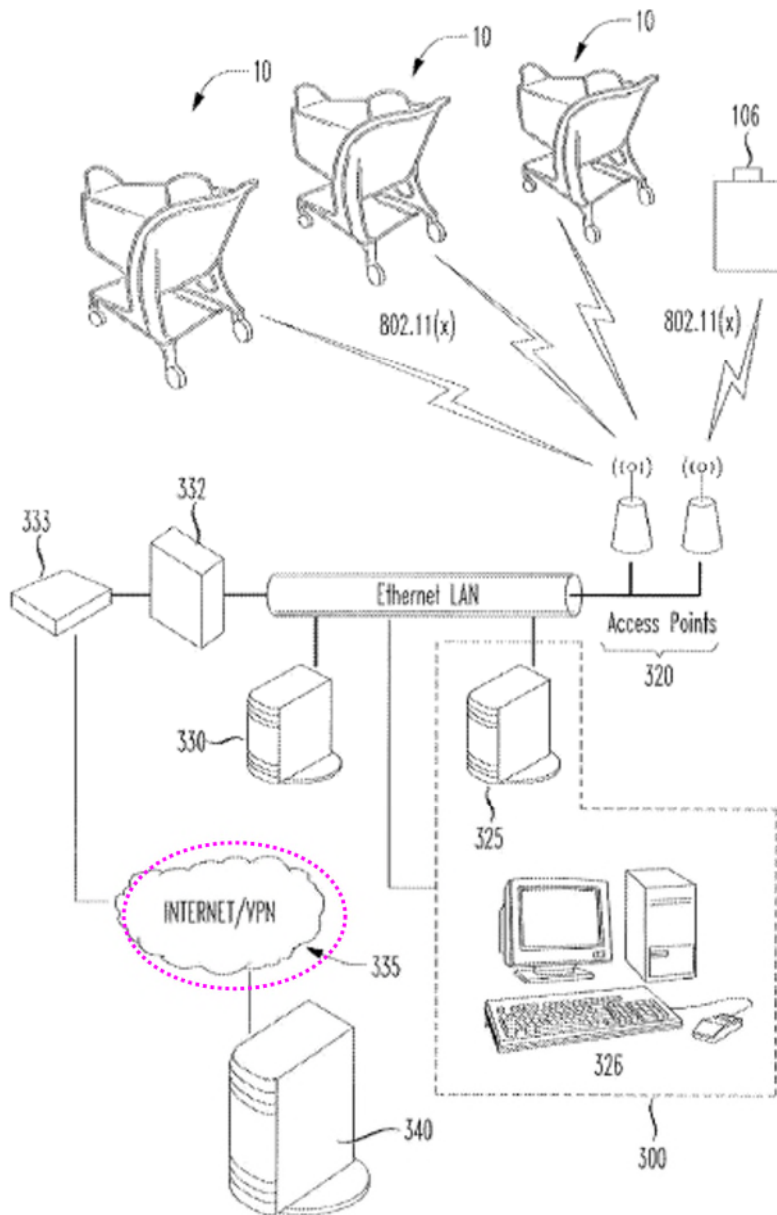
Claim 1 is addressed in Section III.G.3.a.

Bandy discloses the use of the Internet by the mobile communications device. Ex. 1006, [0035], [0059]. Thus a POSITA would find it obvious to have the mobile communications device communicate with the central server via the Internet. Ex. 1009, ¶214.

Fowler discloses that the cart connects to the store system via ISS, which in turn may connect to the HCS over the Internet. Ex. 1007, [0259]. Thus, HCS, part

of the **central server**, receives the communication via the Internet. Further, Fowler discloses that ECM 200 has the ability to connect to the Internet. Ex. 1007, [0237]. Fowler also discloses that the cart connects to the store server wirelessly and has a connection to the Internet. Ex. 1007, [0240]. A POSITA would thus find it obvious to have the cart communicate with the store server via the Internet. Ex. 1009, ¶215.

FIG. 17



Ex. 1007, FIG. 17 (annotated).

Therefore, Bandy-Fowler renders Claim 3 obvious because Bandy and Fowler each alone discloses all the additional limitations of [3] over Independent Claim 1.

Ex. 1009, ¶216.

d. Claim 4

Claim 1 is addressed in Section III.G.3.a.

Fowler discloses correlating information to a specific consumer, for example via a loyalty card program. Ex. 1007, [0251]. Fowler discloses that advertising data may be correlated or integrated with sales data to determine the effectiveness of the ad on an identifiable consumer via further correlation of data provided via a loyalty program, and purchasing data may be tracked over time to determine the effectiveness of advertising and to determine whether additional and/or modified advertising is desired. Ex. 1007, [0256]. A POSITA would understand that such sales data and purchasing data are **account data** that must necessarily be **stored in a database accessible to the central server via a communication network**. Ex. 1009, ¶218. A POSITA would further understand that the correlation or integration disclosed by Fowler is an **association** between the **spatially localized data** (advertising data) with such **account data**. *Id.*

Bandy discloses that the user may search for a particular item by inputting or selecting the item in a network accessible database and/or website of merchant 1106. Ex. 1006, [0059], [0060]. Such input, representing an electronic shopping list of the particular user, is the claimed “**account data specific to the user of the mobile terminal**” of [4]. Ex. 1009, ¶220. Bandy further discloses that merchant 1106 determines one or more stores related to merchant 1106 that have the item in stock, and provides a list of the one or more stores to the user on mobile communications

device 100. Ex. 1006, [0060]. Such information is “**spatially localized information associated with account data.**” Ex. 1009, ¶220.

Therefore, Bandy-Fowler renders Claim 4 obvious because all the additional limitations of [4] over Independent Claim 1 are either obvious over Fowler, or taught by Bandy. Ex. 1009, ¶222.

e. Claim 5

Claim 5 recites a system analogous to method claim 1, and is rendered obvious by Bandy-Fowler for same reasons set forth for claim 1. Ex. 1009, ¶¶223-231.

(1) [5pre]

The limitations of [5pre] are substantially the same as the corresponding limitations of [1pre]. Ex. 1009, ¶223. *See* Section III.G.3.a.(1).

(2) [5a]

The limitations of [5a] are substantially the same as the corresponding limitations of [1pre]. Ex. 1009, ¶224. *See* Section III.G.3.a.(1).

(3) [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. 1009, ¶225. *See* Sections III.G.3.a.(1) and III.G.3.a.(2).

(4) [5c]

The limitations of [5c] are substantially the same as the corresponding limitations of [1pre] and [1a]. Ex. 1009, ¶226. *See* Sections III.G.3.a.(1) and III.G.3.a.(2). Further, Fowler discloses that that the plurality of RFIDs (**radio-frequency peripherals**) are **distributed throughout** the predetermined area as they are “placed around the store in known locations.” (Ex. 1007, [0144]). Ex. 1009, ¶226.

(5) [5d]

[5d] introduces no new limitation. Ex. 1009, ¶227. *See* Section III.G.3.a.(1).

(6) [5e]

The limitations of [5e] are substantially the same as the corresponding limitations of [1a]. Ex. 1009, ¶228. *See* Section III.G.3.a.(2).

(7) [5f]

The limitations of [5f] are substantially the same as the corresponding limitations of [1b]. Ex. 1009, ¶229. *See* Section III.G.3.a.(3).

(8) [5g]

The limitations of [5g] are substantially the same as the corresponding limitations of [1c]. Ex. 1009, ¶230. *See* Section III.G.3.a.(4).

Therefore, Bandy-Fowler renders Claim 5 obvious. Ex. 1009, ¶231.

f. Claim 8

Claim 5 is addressed in Section III.G.3.e.

FIG. 16 of Bandy shows the claimed arrangement of chip and antenna by disclosing a die 1604 and an antenna 1614 at different points of the RFID tag 1600. Bandy further teaches that the RFID tag 1600 includes “**connections configured to ensure a communications link between the antenna and the chip**” by disclosing that related electronics 1606 are connected to die 1604 through a plurality of contact pads of IC die 1604. Ex. 1006, [0078] and FIG. 16.

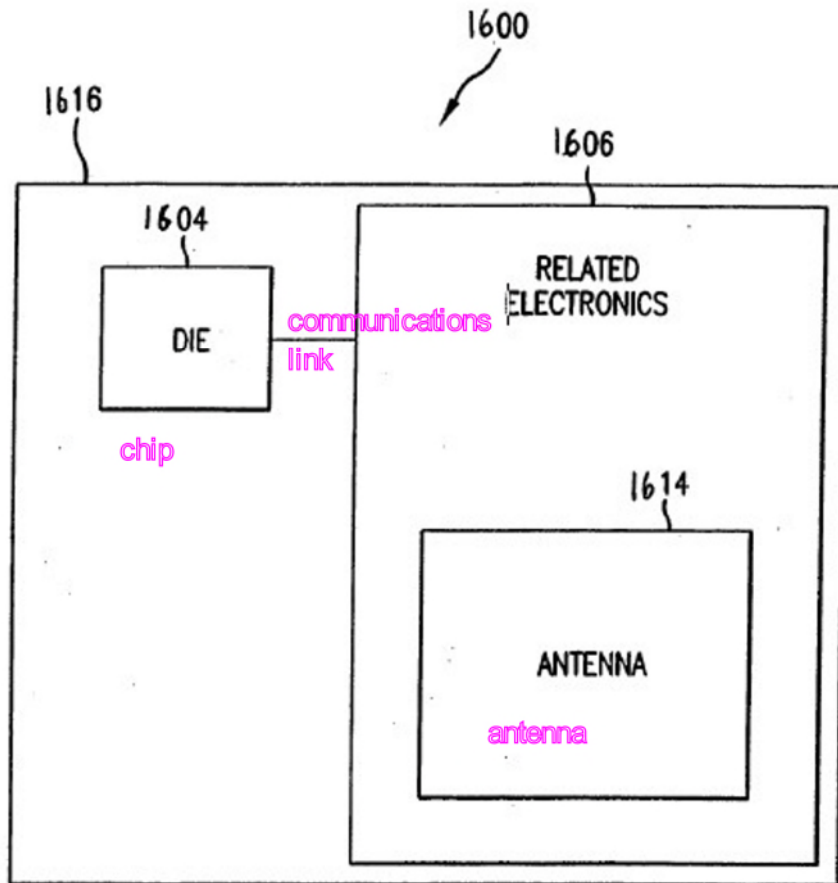


FIG. 16

Ex. 1006, FIG. 16 (annotated)

Therefore, Bandy-Fowler renders Claim 8 obvious. Ex. 1009, ¶234.

g. Claim 9

Claim 8 is addressed in Section III.G.3.f.

Bandy discloses that the “related electronic 1606 provides one or more capabilities, including RF reception and transmission capabilities, impedance matching, sensor functionality, power reception and storage functionality, as well as additional capabilities.” Ex. 1006, [0078]. A POSITA would understand that some part of the related electronic 1606 is the claimed **microcontroller**. Ex. 1009, ¶236. Further, Bandy discloses that related electronics 1606 are connected to die 1604 through a plurality of contact pads of IC die 1604. Ex. 1006, [0078] and FIG. 16.

Further, two alternative identifications of the claimed “**case**” of [9] are marked in annotated FIG. 16 below. In each alternative case, the antenna is arranged within the identified case and the microcontroller is also housed inside the case.

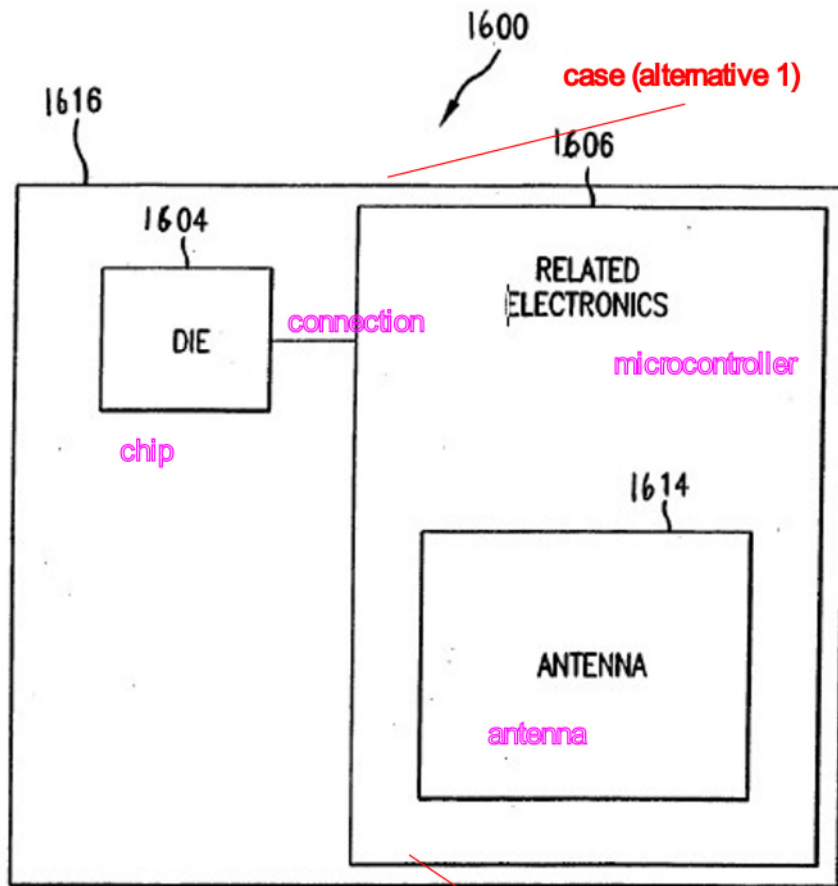


FIG. 16 case (alternative 2)

Ex. 1006, FIG. 16 (annotated).

Therefore, Bandy-Fowler renders Claim 9 obvious. Ex. 1009, ¶238.

h. A POSITA would have reason to combine Bandy with Fowler

A POSITA would have had a reason to combine Bandy with Fowler, and would have had a reasonable expectation of success in doing so.

As discussed in Section III.G.3.a.(1), each of Bandy and Fowler discloses a mobile device-central server-radio frequency peripheral system, and a POSITA

would find it obvious to use Fowler's teachings of a particular component of that system in place of Bandy's corresponding component, or to use Fowler's teachings to enhance Bandy's corresponding component. Ex. 1009, ¶240.

Further, a POSITA would have been motivated to combine Fowler's disclosures of route finding and vertical positioning with Bandy, the primary reference, to implement Bandy's expressly taught objectives of "improv[ing] an interface between customers and products in warehouse, shopping, and additional environments, including an improved interface with items associated with RFID tags" (Ex. 1006, [0007]). Ex. 1009, ¶241. Specifically, Bandy teaches a mobile communications device interrogating an RFID tag associated with an item to obtain the identification number of the tag, sending the identification number to a computer system, and obtaining item data associated with such item including location data from the computer system. Ex. 1006, [0053]-[0057]. Bandy further teaches obtaining location information for particular items. Ex. 1006, [0059]-[0060]. Bandy further teaches displaying item location data on the user interface of the mobile device. Ex. 1006, FIG. 6.

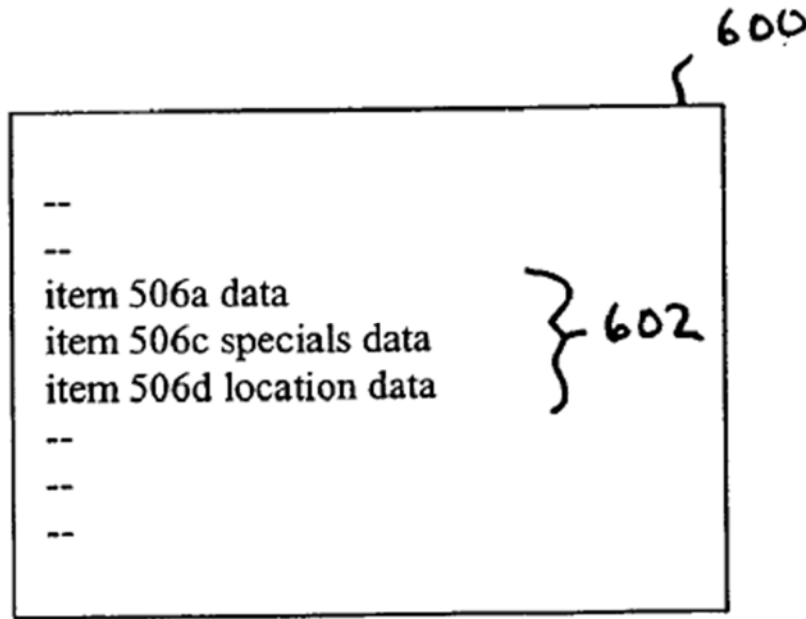


FIG. 6

Ex. 1006, FIG. 6.

A POSITA reading Bandy in view of Fowler would thus have been motivated and able to use the teachings of Fowler to modify Bandy such that the location data of the item that is transmitted to and displayed on the mobile device further includes vertical and horizontal position of the item, and such that routing information based on the present location of the mobile device be provided to and displayed by the mobile communications device to make it easier for the customer to find products. Ex. 1009, ¶242. Provision of such information falls within the range of the universal,

obvious and expressly disclosed objective of Bandy for an improved interface with items associated with RFID tags, and will aid Bandy's explicitly disclosed objective of improving an interface between customers and products in warehouse, shopping, and additional environments. *Id.*

The combination of the Bandy with Fowler represents nothing more than the combination of known elements to achieve predictable results. Ex. 1009, ¶243. Both Bandy and Fowler disclose central servers, mobile terminals, radio-frequency peripherals capable of interacting with mobile terminals, and planograms associating unique identifiers of such radio-frequency peripherals with locations. *Id.* A POSITA would have known the universal, conventional and obvious element of vertical positioning of product (there are only so many ways to describe where a product is on a shelf in a store) and routing information from a given location. *Id.* Applying such universal, conventional and obvious element present in Fowler to the elements in Bandy that are fully analogous to their counterparts in Fowler represents, at most, an obvious extension of the functionality expressly disclosed in Bandy to address the universal, obvious, and expressly taught objective of improving the interface between customers and products. *Id.* Such an extension would have been well within the skill of a POSITA. *Id.* Further, Bandy already teaches the display of location data on the mobile device, and it is well within the skills of a POSITA to display the additional data (vertical and horizontal position of the location data, routing

information) on the mobile device by making routine and simple changes. *Id.* 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 doing so. *Id.*

Furthermore, a POSITA would have been motivated and able to use the command and background knowledge of NFC standards such as ISO 14443, as well as Fowler's passive RFID tags, to implement Bandy's RFID tags. Ex. 1009, ¶244. Bandy discloses RFID tags that communicate with nearby mobile communications devices. Ex. 1006, [0054]. Bandy further teaches that the interrogation/read protocols between the mobile device and the RFID tag would be known to persons skilled in the relevant art(s), to read tag 902. Ex. 1006, [0055]. A POSITA would have been familiar with the NFC protocols and standards, and would further have been familiar with the industry trend to implement RFID tags with NFC protocols and standards such as ISO 14443. Ex. 1009, ¶244. A POSITA would also have been familiar with Fowler's passive RFID tags (Ex. 1007, [0139]) and familiar with the advantages of passive RFID tags over active RFID tags such as saved cost and easier maintenance. Ex. 1009, ¶244. Thus, a POSITA would be motivated and able to use the ISO 14443 protocol and standard as well as Fowler's passive RFID tags, which includes the claimed **activation and communication range less than twenty centimeters** of [1a], as well as the claimed activating by **energy of electromagnetic**

waves of [2], to implement Bandy's tag and reader module, and would have a reasonable expectation of success in this mere application of a known technique to a piece of prior art ready for the improvement. *Id.*

Therefore, a POSITA would have been motivated and able to implement the ISO 14443 protocol and standard, a common and background knowledge of a POSITA, as well as Fowler's passive RFID tags, for Bandy's RFID tags, and meet the missing limitations of [1a] and [2]. Ex. 1009, ¶245. Further, a POSITA would have been motivated and able to implement the vertical placement and route finding of Fowler in Bandy's system, and meet the missing limitations of [1pre] and [1b] as well as supplement Bandy's disclosures of [1c]. *Id.* Thus, a POSITA would find it obvious to reach the Bandy-Fowler combination that discloses each and every limitation of Claims 1-5 and 8-9. *Id.*

H. Ground 4

As discussed in Section III.G, Claims 1-5 and 8-9 are rendered obvious by Bandy in combination with Fowler, where a POSITA would also use NFC technology that has a communication range of less than twenty centimeters and supports activation by electromagnetic wave to modify Bandy's passive RFID tags (the "NFC tag modification").

As discussed further in detail below, Arntzen also supplies this modification, and a POSITA would additionally have been motivated to combine Bandy-Fowler with Arntzen and implement this modification from Arntzen in Bandy-Fowler, and

would have a reasonable expectation of success in doing so. Ex. 1009, ¶247. Therefore, Claims 1-5, 8-9 are additionally obvious over Bandy in combination with Fowler and Arntzen. *Id.*

- 1. Claims 1-5, 8-9 are rendered obvious by Bandy in combination with Fowler and Arntzen**
 - a. Arntzen supplies the NFC tag modification.**

As discussed in Section III.F.2.a, Arntzen teaches ESL displays (price labels) that are functionally and structurally analogous to Bandy's RFID tags, and Arntzen's price labels are implemented with the claimed NFC technology. Ex. 1009, ¶248. Therefore, Arntzen supplies the NFC tag modification. *Id.*

- b. A POSITA would have reason to modify Bandy-Fowler with Arntzen**

For the same reasons as discussed in Sections III.F (for Arntzen) and III.G (for NFC tag modification), a POSITA would have reason to modify Bandy-Fowler and implement Arntzen's NFC technology for communication with mobile terminal in Bandy-Fowler's RFID tag. Ex. 1009, ¶249. This represents nothing more than the combination of known elements to achieve predictable results, and is well within the skills of a POSITA. *Id.*

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). In particular, when the Examiner, apart from initialing the asserted art in an IDS, did not indicate a substantive evaluation of the asserted art, such asserted art does not weigh in favor of exercising discretion under §325(d). *Scientific Design Company, Inc. v. Shell Oil Company*, IPR2021-01537, Paper 7 at 25 (PTAB Mar. 18, 2022). Here, only one reference used in the Grounds (Fujiwara) was cited during prosecution, along with 18 other references. For this reference (Fujiwara), the Examiner only provided a brief “ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH” initialing, and did not otherwise apply it against the claims, discuss it, or indicate a substantive evaluation of it. 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 13,963 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 and supporting materials have been served via e-mail and courier service to the Patent Owner by serving the correspondence address of record for the '340 Patent:

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and via electronic mail to the attorneys of record for Plaintiff in the concurrent litigation matter:

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