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Opposition against European Patent 3 883 277
Application No.: 21 173 368.8
Patentee: Vusion Group

In the name and on behalf of

Hanshow Germany GmbH
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Duesseldorf, Germany

(hereinafter the "Opponent")

O P P O S I T I O N

is filed against the above-mentioned European patent EP 3 883
277 B1 (hereinafter referred to as "Opposed Patent")

Köln

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Application number: 21 173 368.8

Publication of grant: 09 August 2023

Title: METHOD FOR COMMUNICATING SPATIALLY LOCATED
INFORMATION TO A MOBILE TERMINAL

Patent proprietor: Vusion Group (was SES-imagotag before)
55 Place Nelson Mandela
92000 Nanterre, France

(hereinafter referred to as the "Proprietor")

The opposition fee is paid via online fee payment.

I. Request

- (i). It is requested to revoke the European patent EP 3 883 277 B1 in its entirety.
- (ii). As an auxiliary request, oral proceedings according to Art. 116 EPC are requested.

II. Ground and Extent of Opposition

The Opposition is based on the grounds under Art. 100(a) and Art. 100(c) EPC. In particular, the subject-matter of the Opposed Patent (EP 277) extends beyond the content of the application as originally filed (Art. 100(c) EPC). Moreover, the claimed invention does not meet the requirements of novelty and inventive step in view of the prior art, contrary to Art. 52, 54 and 56 EPC.

III. Evidence

The Opposition is based on the following prior art documents:

- D2 : EP 2 402 930 A1
- D3 : US 2005/0253685 A1
- D4 : TW M345297 U
- D5 : TW M353498 U
- D6 : WO 2008/073181 A2
- D7 : CN202068693U
- D8 : US2008/0198098 A1
- D9 : CN201673520U
- D10 : US 8 061 600 B2
- D11 : US 7 973 722 B1

- KSW9: Christian Kern, *Anwendungen von RFID-Systemen*, Springer-Verlag, Berlin, 2. 2007, ISBN-13 978-3-540-44477-0

- KSW10: Klaus Finkenzeller, *RFID-Handbuch – Grundlagen und praktische Anwendungen von Transpondern, kontaktlosen Chipkarten und NFC*, Carl Hanser Verlag München, 5. Aufl., 2008, ISBN 978-3—446-41200-2

- KSW 10a *RFID Handbook – Fundamentals and Applications in Contactless Smart Cards, Radio Frequency Identification and Near-Field Communication*, John Wiley and Sons, Ltd., 3. Edition, 2010, ISBN 978-0-470-69506-7

- KSW 19 application for preliminary injunction filed with the UPC Local Chamber Munich based on the opposed patent

- KSW 27 EP 0 447 278 A2
- KSW 28 WO 01/44919 A1
- KSW 29 WO 2004/064258 A2
- KSW 30 JP2012038270 A

KSW 31 JP2006011617 A
KSW 32 Wikipedia article "Near field communication"
KSW 40 US 7,520,429 B2
KSW 41 US 2011/0289023 A1

IV. Reasons for the Opposition

The decision to grant a European patent was taken on July 13, 2023. It was published in the European Patent Bulletin No. 23/32 on August 09, 2023.

The language of the Opposed Patent (EP '277) is French. The English translation is entitled " METHOD FOR COMMUNICATING SPATIALLY LOCATED INFORMATION TO A MOBILE TERMINAL ".

The Opposed Patent is a divisional application filed on the basis of parent application EP 12 762 019.3. This parent application has the filing date April 11, 2012, and is filed as

Annex KSW 1.

A copy of the publication of the Opposed Patent is submitted as

Annex KSW 2.

The publication of the application EP 3 883 277 A1 in French is filed as

Annex KSW 3.

Furthermore, the application documents originally filed in French are submitted as:

Annex KSW 5.

Subject matter of the Opposed Patent

The patent relates to an electronic label for a sales area. Such electronic labels, in particular electronic price labels, are referred to as "electronic shelf labels", abbreviated as "ESL", and can be attached to the shelves of a supermarket, for example (cf. [0004] of EP'277 patent).

EP '277 describes at the beginning the following problems of previously known ESL as:

[0010] En outre, l'émergence du commerce électronique a fait naître chez le consommateur l'habitude d'une information qui lui est spécifiquement destinée. Or, l'affichage des informations tel qu'il est actuellement pratiqué dans les surfaces de vente n'offre aucune interaction avec le consommateur.

[0011] Il n'existe aujourd'hui aucun moyen de diffuser des informations spécifiquement à l'attention d'un consommateur en relation avec sa position dans le magasin, voire avec un produit spécifique à ce consommateur.

In English translation:

[0010] In addition, the emergence of electronic commerce has created a habit among consumers of information that is specifically intended for them. However, the display of information as it is currently practiced in sales areas does not offer any interaction with the consumer.

[0011] *There is currently no way to disseminate information specifically to a consumer in relation to their position in the store, or even to a product specific to this consumer.*

To eliminate these disadvantages, the Opposed Patent proposes to arrange an antenna (38) on a front side of the ESL separately from a chip (37). This solution is shown in a concrete embodiment example in the Opposed Patent as follows:

[0034] *La puce 37 et l'antenne 38 sont agencées en des endroits différents de l'étiquette électronique 3, des connexions 39 assurant la liaison entre l'antenne 38 et la puce 37.*

[0035] *La puce 37 est connectée au microcontrôleur 34 de l'étiquette électronique 3, et l'antenne 38 est disposée sur ou dans le boîtier 30 à l'intérieur duquel est logé ledit microcontrôleur 34. L'antenne 38 est disposée du côté de la face avant de l'étiquette électronique 3, vers son écran d'affichage 31, tandis que la puce électronique 37 est disposée sur la carte de circuit imprimé 35, du côté de la face arrière de l'étiquette électronique 3.*

[0036] *En effet, l'intégration d'un périphérique radiofréquence 36 rassemblant sur un même support puce et antenne n'est pas souhaitable sur la face avant de l'étiquette électronique 3, car préjudiciable à la maximisation de la surface d'affichage de l'écran d'affichage 31, afin notamment de permettre la densification des étiquettes électroniques 3 sur une gondole de présentation d'articles, spécialement dans le cas de petits articles.*

[0037] *En outre, la connectique entre la puce électronique 37 et le microcontrôleur 34 peut être complexe et délicate à réaliser industriellement à un coût réduit. La puce 37 est alors de préférence implantée sur la carte de*

circuit imprimé, facilitant ainsi la connexion de celle-ci au microcontrôleur 34.

[0038] Cependant, un positionnement de l'antenne sur la face arrière à l'intérieur à côté de la puce 37 réduirait la distance et la fiabilité de lecture puisque celle-ci devrait alors se faire à travers l'écran d'affichage 31 de l'étiquette électronique 3 (typiquement d'une épaisseur de 1cm) et les perturbations électromagnétiques induites par la carte de circuit imprimé.

[0039] Il est donc préférable de séparer l'antenne 38 de la puce 37. La puce 37 est alors implantée sur la carte de circuit imprimé, facilitant ainsi la connexion de celle-ci au microcontrôleur 34.

In English translation:

[0034] The chip 37 and the antenna 38 are arranged in different locations on the electronic label 3, connections 39 ensuring the connection between the antenna 38 and the chip 37.

[0035] The chip 37 is connected to the microcontroller 34 of the electronic label 3, and the antenna 38 is placed on or in the housing 30 inside which said microcontroller 34 is housed. The antenna 38 is arranged on the side of the front side of the electronic label 3, towards its display screen 31, while the electronic chip 37 is arranged on the printed circuit board 35, on the side of the rear side of the electronic label 3.

[0036] Indeed, the integration of a radio frequency device 36 bringing together a chip and antenna on the same support is not desirable on the front of the electronic label 3, because it is detrimental to maximize the display surface of the display screen 31, in particular to allow the densification of

electronic labels 3 on an article presentation gondola, especially in the case of small articles.

[0037] In addition, the connection between the electronic chip 37 and the microcontroller 34 can be complex and delicate to produce industrially at a reduced cost. The chip 37 is then preferably installed on the printed circuit board, thus facilitating its connection to the microcontroller 34.

[0038] However, positioning the antenna on the rear face inside next to the chip 37 would reduce the reading distance and reliability, since it would then have to be done through the display screen 31 of the electronic label 3 (typically 1 cm thick) and the electromagnetic disturbance induced by the printed circuit board.

[0039] It is therefore preferable to separate the antenna 38 from the chip 37. The chip 37 is then installed on the printed circuit board, thus facilitating its connection to the microcontroller 34.

Figures 1 to 3 of opposed patent are shown below to illustrate the operation of the claimed subject matter:

- 9 -

FIG. 1

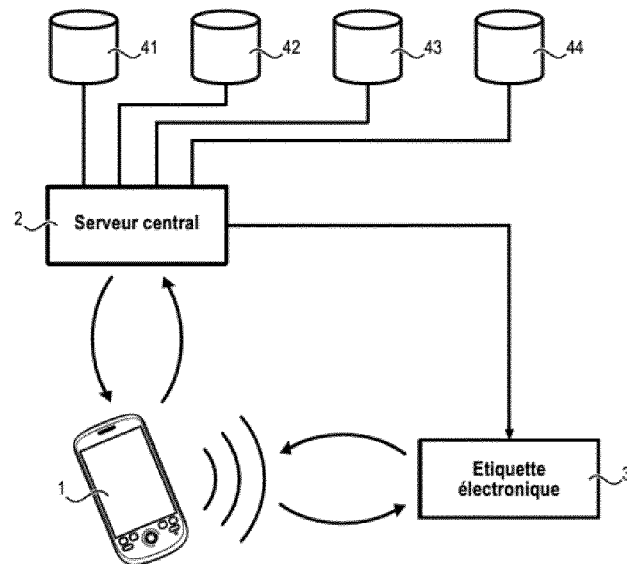


FIG. 2

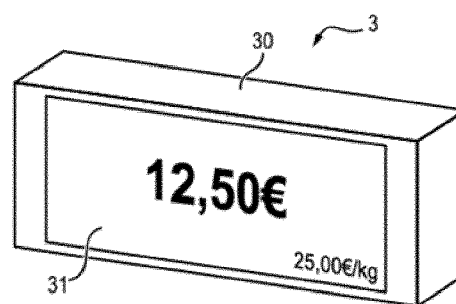


FIG. 3

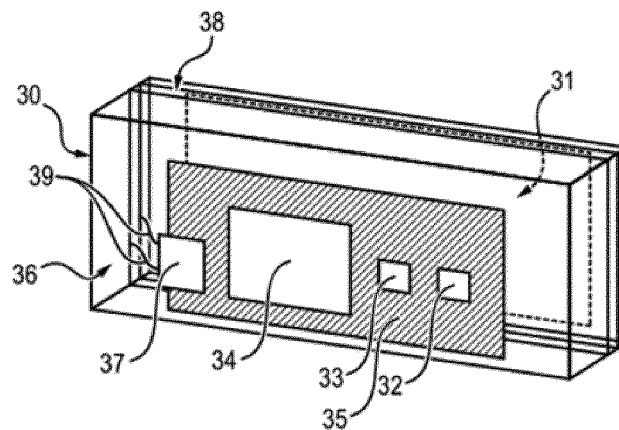


Fig. 3 is a perspective rear view of the ESL.

Skilled person

The skilled person in this case is a graduate engineer for electrical engineering with several years of experience in the development and construction of electronic labels with RFID functionality.

Feature breakdown

To simplify further discussion, the subject matter of claim 1 of the Opposed Patent is broken down to the following features:

Feature	Claim 1
M1	Electronic label (3) for sales area with a series of distributed electronic labels (3),

Feature	Claim 1
M2	each electronic label (3) being identified by a unique label identifier specific to it, comprising:
M3	- a radio frequency communication module (32) configured to receive from a central server (2) data representative of information relating to an article;
M4	- a memory (33) to store said data representative of information relating to an article;
M5	- a display screen (31) configured to display said information relating to an article;
M6	- a microcontroller (34) configured to control the display of said information relating to an article on the display screen (31);
M7	- a case (30);
M8	- a printed circuit board (35),
M8.1	housed in the case (30) on the side of the back of the case and
M8.2	on which are arranged the radio frequency communication module (32), the memory (33) and the microcontroller (34);
M9	- a radio frequency device (36) capable of establishing a communication (S1) by radio frequency with a mobile terminal (1) and communicating to said mobile terminal the identifier of the electronic label,
M10	the radio frequency device (36) comprising an antenna (38) and an electronic chip (37) of NFC or RFID type, the communication (S1) by radio frequency between the radio frequency device (36) and the mobile terminal (1) being established by NFC or RFID communication,
M11	the electronic chip (37) of the radio frequency device being disposed on the printed circuit board (35), and
M12	the antenna (38) of the radio frequency device being disposed on or in the housing on the side of the front of said electronic label.

The list of features is additionally submitted as

Annex KSW 23

Interpretation of the claim features

Features M8, M8.1, and M9, M10 and M12 of claim 1 require some explanation as to their interpretation:

On September 4, 2023, the Proprietor filed an application for preliminary injunction with the UPC Local Chamber Munich claiming an infringement of the Opposed Patent. This application for preliminary injunction is filed as

Annex KSW 19.

Feature Group 8:

Features 8/8.1 require:

a printed circuit board (35),

housed in the case (30) on the side of the back of the case and

In KSW 19, the patent proprietor argues with regard to these features that it is sufficient that the printed circuit board lies in the same plane relative to the NFC antenna, to already lie, according to the wording of the claim, on the side of the rear surface of the housing (see e.g., figure on page 36 of the application for injunction). The application for preliminary injunction does not contain any explanations as to how far from the rear side the printed circuit board must be positioned in the housing of the ESL to comply with feature M8.1. This is not surprising, since the Opposed Patent does not contain any information on this.

In this respect, feature M8.1 is bound to be interpreted in such a way that, relative to the NFC antenna, the printed circuit board is located further back in the housing of the ESL. This is at least true if one follows the argumentation of the patent proprietor in the application for injunction.

Feature M12

In contrast to that, feature 12 states that:

the antenna (38) of the radio frequency device being disposed on or in the housing on the side of the front of said electronic label.

From this it is clear that the antenna is offset forward in the housing relative to the printed circuit board.

Feature M9:

According to feature M9, the electronic label includes

a radio frequency device (36) capable of establishing a communication (S1) by radio frequency with a mobile terminal (1) and communicating to said mobile terminal the identifier of the electronic label.

Feature M9 is a feature specifying the suitability of the radio frequency device for radio frequency communication with a mobile terminal, but does not require actual communication with a mobile terminal, in particular does not require actual communication of an identifier of the electronic label to a mobile terminal.

This is already evident from the fact that claim 1 is directed to an electronic label, i.e., to a apparatus, and does not concern a method. Accordingly, feature M9 can only indicate a suitability of the structure of the radio frequency device (36) in that it must be able to establish radio frequency communication with a mobile terminal and communicate the identifier of the electronic label to it. The actual communication of the identifier is not the subject matter of the claim.

The term "producing" ("établir") cannot mean anything other than the production of a communication which did not previously exist. If this communication had previously existed, it would no longer have to be established. Feature M9 clearly defines the radio frequency peripheral 36 as the entity that establishes and thus initiates the communication.

Feature M10:

According to feature M10, the radio frequency device (see feature M9) includes

an antenna (38) and an electronic chip (37) of NFC or RFID type, the communication (S1) by radio frequency between the radio frequency device (36) and the mobile terminal (1) being established by NFC or RFID communication.

In the context of apparatus claim 1, the method-like formulated feature M10 ("wherein communication by radio frequency [...] being established") is to be interpreted as a structural suitability indication for the radio frequency device to perform *NFC or RFID communication* but does not require actual communication with a mobile terminal.

Again, this is clear from the fact that claim 1 relates to an electronic label, i.e., an apparatus, not a method. We refer here to our comments on feature M9.

Inadmissible extension (Art. 100(c) EPC)

The Opposed Patent (EP'277) is not legally valid due to inadmissible amendments which extend the claimed subject matter beyond the content of the application as originally filed. The subject-matter of the granted claim 1 goes beyond both the original content of the EP'277 application (divisional application) and the original content of the parent application.

Lack of original disclosure of the feature M9

Feature M9 is not originally disclosed.

In granted claim 1 of EP '277, feature M9 is in French:

un périphérique radiofréquence (36) apte à établir une communication (S1) par radiofréquence avec un terminal mobile (1) et à communiquer audit terminal mobile l'identifiant de l'étiquette électronique,

and in English

a radio frequency device (36) capable of establishing a communication (S1) by radio frequency with a mobile terminal (1) and communicating to said mobile terminal the identifier of the electronic label.

This technical teaching, according to which the radio frequency device (36) is capable of establishing radio frequency communication with a mobile terminal (1) - that is, for actively establishing (by itself) a communication link with the mobile

terminal - is not originally disclosed, neither in the original divisional application, nor in the original parent application.

The original claim 1 of EP '277 only discloses a method step in which the mobile terminal (1) establishes radio frequency communication with the radio frequency device (36):

un terminal mobile (1) établit une communication (S1) par radiofréquence avec un périphérique radiofréquence (36) d'une étiquette électronique (3),

in English:

a mobile terminal (1) establishes communication (S1) via radio frequency with a radio frequency device (36) of an electronic label (3),

This is exactly the wording in the original method claim 1 of the parent application.

Dependent claim 3 of the parent application corresponds to the original claim 6 of the divisional application. They support the understanding of the original teaching that the mobile terminal (1) establishes the communication, namely by "activating" the radio frequency device (36) by the energy emitted by the mobile terminal (1) in the first place:

Procédé selon l'une quelconque des revendications 1 à 2 [divisional application: 1 à 5], dans lequel l'établissement de la communication entre le terminal mobile (1) et le périphérique radiofréquence (36) comprend les étapes selon lesquelles :

- *un utilisateur amène le terminal mobile (1) à proximité du périphérique radiofréquence (36) de l'étiquette électronique (3), de sorte que le péri-*

périphérique radiofréquence (36) soit à portée d'ondes électromagnétiques émises par le terminal mobile (1),

- *ledit périphérique radiofréquence (36) est activé par l'énergie des ondes électromagnétiques émises par le terminal mobile (1) afin d'établir la communication par radiofréquence entre le périphérique radiofréquence (36) de l'étiquette électronique (3) et le terminal mobile (1),*

in English:

The method according to any one of claims 1 to 2 [or divisional application: 1 to 5], wherein establishing the communication between the mobile terminal (1) and the radio frequency peripheral (36) comprises the following steps:

- *a user brings the mobile terminal (1) close to the radio frequency peripheral device (36) of the electronic tag (3) so that the radio frequency peripheral device (36) is within range of the electromagnetic waves emitted by the mobile terminal (1),*
- *the radio frequency device (36) is activated by the energy of the electromagnetic waves emitted from the mobile terminal device (1) to establish the radio frequency communication between the radio frequency device (36) of the electronic label (3) and the mobile terminal device (1).*

Nothing else is described in the original description of EP'277 and the description of the parent application (see Annex KSW 3, column 2, lines 50-51 and parent application, page 3, lines 4 and 5). Feature M9 cannot be inferred from the above disclosures.

For while feature M9 specifies

"a radio frequency device (36) capable of establishing a communication (S1) by radio frequency with a mobile terminal (1)"

i.e., ascribing to the radio frequency peripheral the ability to (actively) establish radio frequency communication, the original method claim merely specifies the purpose (i.e., "to ... establish") why **the mobile terminal** activates the radio frequency peripheral by electromagnetic waves, namely

"to establish radio frequency communication between the radio frequency peripheral (36) of the electronic tag (3) and the mobile terminal (1)"

In other words, the original claims 3 (parent application) or 6 (divisional application) do not state that the activated radio frequency peripheral device establishes the radio frequency communication. The formulation of establishing a radio frequency communication is used, but without specifying the radio frequency peripheral device as the initiator of this establishment of a radio frequency communication. The wording in granted claim 1 of the Opposed Patent deviates from this, where the ability to (actively) establish a communication link is attributed to the radio frequency peripheral device.

As a matter of fact, the original claim 3 or 6 expresses that the mobile terminal device (first) activates the radio frequency peripheral device by electromagnetic energy transmission in order to (subsequently) be able to establish the radio frequency communication with the radio frequency peripheral device.

This understanding is consistent with the original method claim 1 of the parent application or divisional application, to which claims 3 or 6 refers back to and which specifies the establishment of communication by the mobile terminal device:

un terminal mobile (1) établit une communication (S1) par radiofréquence avec un périphérique radiofréquence (36) d'une étiquette électronique (3),

In English:

a mobile terminal (1) establishes communication (S1) via radio frequency with a radio frequency peripheral device (36) of an electronic tag (3),

Independent device claim 7 of the parent application and original device claim 10 of the divisional application, directed to a communication system (*Système de communication*) comprising a mobile terminal (1) and a series of electronic labels (3), also teaches that it is the mobile terminal (1) that establishes communication with the electronic label (3), and not the other way around:

[...] caractérisé en ce qu'une étiquette électronique (3) de ladite série d'étiquettes électroniques (3) comporte également un périphérique radiofréquence (36) avec le terminal mobile (1) peut établir une communication pour acquérir l'identifiant d'étiquette de ladite étiquette électronique (3), [...]

in English:

[...] characterized in that an electronic label (3) of the series of electronic labels (3) also comprise a radio frequency device (36) with which the mobile terminal (1) can establish communication to detect the label identifier of the electronic label (3), [...].

The wording in the original description of EP '277 and the description of the parent application is exactly the same (see p. 3, lines 18-20, respectively):

dans lequel une étiquette électronique de ladite série d'étiquettes électroniques comporte également un périphérique radiofréquence avec le terminal mobile peut établir une communication pour acquérir l'identifiant d'étiquette de ladite étiquette, [...].

in English:

wherein an electronic label of the series of electronic labels also comprise a radio frequency device with which the mobile terminal can establish communication to detect the label identifier of the label, [...].

In the detailed description, the establishment of the communication by the mobile terminal and the subsequent communication is explained in more detail, namely by way of clarification with regard to claims 3 and 6 (parent application, p. 10, lines 1-18, also divisional application, p. 9, lines 1-18 and paragraphs [0045] - [0048] of the A1 publication, hereinafter in English translation):

*[0045] First, **the mobile terminal 1 establishes** radio frequency communication with a radio frequency device 36 of an electronic tag 3 (step S1).*

[0046] To do this, a user brings the mobile terminal 1 close to the radio frequency device 36 of the electronic label 3, so that the radio frequency device 36 is within range of electromagnetic waves emitted by the mobile terminal 1.

[0047] The radio frequency device 36 is then activated by the energy of the electromagnetic waves emitted by the mobile terminal 1 in order to establish radio frequency communication with the radio frequency device 36 of the electronic label 3.

[0048] The radio frequency device 36 of said electronic label 3 then communicates to said mobile terminal 1 a label identifier of said electronic label 3 (step S2). This label identifier can be communicated alone, or accompanied by other information, or even by the communication of data, which are at least partially generated from said identifier, and which make it possible to identify the electronic label 3 in the sales area.

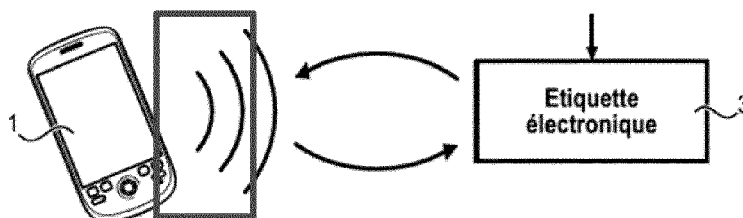
These paragraphs of the original description correspond to the teaching of original claim 3 of the parent application and claim 6 of the divisional application (see above). Noteworthy is the wording of paragraph [0047], reproduced below in the original French language, which makes it unmistakably clear which device establishes the communication link, namely the mobile terminal "with the radio frequency peripheral device 36" ("avec le périphérique radiofréquence 36"):

[0047] Le périphérique radiofréquence 36 est alors activé par l'énergie des ondes électromagnétiques émises par le terminal mobile 1 afin d'établir une communication par radiofréquence avec le périphérique radiofréquence 36 de l'étiquette électronique 3.

In English:

[0047] The radio frequency device 36 is then activated by the energy of the electromagnetic waves emitted by the mobile terminal 1 in order to establish radio frequency communication with the radio frequency device 36 of the electronic label 3.

The schematic representation in Figure 2 of EP '277 also supports this technical understanding (see waves emanating from the mobile terminal (1); highlighted by red frame):



There is no disclosure beyond that which would support the above amendment (M9) in the claim of the Opposed Patent.

A suitability of the radio frequency device (36) for establishing a radio frequency communication with a mobile terminal can thus not be inferred from the original application documents nor from the parent application. On the contrary, it is originally disclosed that only the mobile terminal (1) can establish radio frequency communication with the radio frequency device (36), but not vice versa.

The inadmissibility of this amendment is clearly evident from the fact that, as shown above, embodiments are at least intended to be included in which the radio frequency device (36) is activated by the energy of the electromagnetic waves emitted by the mobile terminal (1).

Before this happens, of course, this radio frequency device (36) itself cannot establish a connection to the mobile terminal.

In other words, a passive radio frequency device was originally disclosed, while the issued claim 1 improperly claims an active radio frequency device capable of independently establishing a communication link to a mobile terminal.

The subject matter of claim 1 of the Opposed Patent is thus based on an inadmissible amendment.

The patent must therefore be revoked if only for this reason.

To facilitate the discussion, professional understanding of the feature M9 is further discussed to prove that the wording of feature M9 regarding the establishment of a communication ("établir une communication") requires "that the radio frequency peripheral device itself initiates the establishment of the connection".

In the field of communication technology, in particular RFID and NFC communication, a person skilled in the art understands the establishment of communication to mean the establishment of a communication connection in the sense of initiating this communication connection.

The understanding of the person skilled in the art on the priority date (11 April 2012) is decisive for the original disclosure. Since not only RFID communication but also NFC communication (cf. feature M10) had long been established on the priority date, the corresponding knowledge of the skilled person's understanding of the term must be taken into account.

The standard work on RFID technology, Klaus Finkenzeller, *RFID Handbook – Fundamentals and Applications in Contactless Smart Cards, Radio Frequency Identification and Near-Field Communication*, John Wiley and Sons, Ltd., 3. Edition, 2010, ISBN 978-0-470-69506-7, which is submitted as

Annex KSW 10a

describes in chapter 3.4 entitled "Near-Field Communication (NFC)" that when two NFC interfaces communicate, there is an NFC initiator (master device) and an NFC target (slave device) and that communication is "always" started by the NFC initiator (KSW 10a, p.57):

"For communication between two NFC interfaces, the individual NFC interface can take on different functions, i.e. that of an NFC initiator (master device) or an NFC target (slave device). Communication is always started by the NFC initiator."

The Wikipedia article "Near field communication", which was made publicly available on March 5, 2011 and can also be found in the Wayback Machine Internet archive under the link

https://web.archive.org/web/20110305020451/http://en.wikipedia.org/wiki/Near_field_communication

and which is filed as:

Annex KSW 32

describes that there is "always" this distribution of roles between the *initiator* and the *target* in NFC communication (underlining added):

Near field communication, or NFC, is a set of short-range wireless technologies, typically requiring a distance of 4cm or less. NFC operates at 13.56 MHz and at rates ranging from 106 kbit/s to 848 kbit/s. NFC communication always involves an initiator and a target: the initiator actively generates an RF field that can power a passive target. This enables NFC targets to take very simple form factors such as tags, stickers, key fobs, or cards that do not require batteries. NFC peer-to-peer communication is also possible, where both devices are powered.

With regard to the communication between the mobile terminal and the radio frequency peripheral device of the electronic tag, the person skilled in the art

understands the establishment of communication according to feature M9 precisely in this sense of initiation, namely as initiation of the communication connection by the mobile terminal.

There are two different modes for data exchange via NFC communication, an active and a passive mode, whereby the NFC initiator that establishes the communication connection is defined in each case. The Wikipedia article (KSW 32) describes these modes as follows:

There are two modes:

Passive Communication Mode: The Initiator device provides a carrier field and the target device answers by modulating the existing field. In this mode, the Target device may draw its operating power from the Initiator-provided electromagnetic field, thus making the Target device a transponder.

Active Communication Mode: Both Initiator and Target device communicate by alternately generating their own fields. A device deactivates its RF field while it is waiting for data. In this mode, both devices typically have power supplies.

The RFID Handbook (KSW 10a) also describes these two modes accordingly as *Active mode* and *Passive mode*.

In passive mode, the NFC initiator not only establishes communication, but also ensures the necessary power supply to the NFC target, which does not have its own power supply.

Based on this technical knowledge on the priority date, the skilled person understands that the original disclosure relates to an electronic tag with a radio frequency

peripheral device which communicates in passive mode and cannot establish communication itself because it has no power supply from the radio frequency peripheral device and is therefore dependent on the mobile terminal device to establish communication and activate it energetically. This is particularly clear from the original claim 3 (parent application) and claim 6 (application in dispute/divisional application):

"the radio frequency device (36) is activated by the energy of the electromagnetic waves emitted from the mobile terminal device (1) to establish the radio frequency communication [...]"

It is noteworthy in this context that neither the application in dispute nor the parent application mentions in any way a power supply for the radio frequency peripheral device or the RFID or NFC type chip.

The ability to establish communication requires certain structural characteristics (e.g. a power supply) and facilities (e.g. the ability to operate according to specified protocols), so that from the technical point of view of a person skilled in the art on the priority date, the explicit disclosure of the establishment of communication by the mobile terminal device cannot be used to infer the same capability in reverse for the radio frequency peripheral device.

Based on this understanding, feature M9 is not originally disclosed from the perspective of a person skilled in the art on the priority date.

Inadmissible amendment by omitting the essential feature (intermediate generalization)

If the original claim 3 (parent application) or 6 (application in suit/divisional application) or the corresponding passages in the description were to be regarded -

incorrectly - as sufficient original disclosure supporting the establishment of communication by the radio frequency peripheral device within the meaning of feature M9, this would nevertheless constitute an inadmissible amendment to claim 1 of the Opposed Patent. This is because omitting the initially mandatory step of activating the radio frequency peripheral device by the energy of the electromagnetic waves emitted by the mobile terminal device according to claim 3 or 6 would go beyond the originally disclosed technical teaching.

The energetic activation of the electronic tag by the mobile terminal device is described in the original application in connection with the disclosure of the subject matter of claim 3 or 6 as absolutely necessary and in close technical interaction with the (subsequent) establishment of communication. The skilled person understands that such a tag activated by electromagnetic induction refers to a passive RFID or NFC tag which does not have its own power supply for the radio frequency peripheral device. Without prior activation by external energy, a passive label cannot communicate.

An electronic label according to claims 3 or 6, which was originally disclosed to the skilled person exclusively as passive, would have been inadmissibly extended to an electronic label which can communicate both actively and passively with the mobile terminal device and thus would have gone beyond the original content of the application if this claim had been used as the basis of disclosure in the granted claim one of the patent in suit. New technical information is introduced and thus violates Art. 76(1) and Art. 123(2) EPC.

Lack of inventive step because the technical effect is not achieved across the entire scope of the claims

The technical effect of placing the antenna in front of the printed circuit board (that is, at a distance from it) is described in paragraph [0038] of the Opposed Patent:

"Cependant, un positionnement de l'antenne sur la face arrière à l'intérieur à côté de la puce 37 réduirait la distance et la fiabilité de lecture puisque celle-ci devrait alors se faire à travers l'écran d'affichage 31 de l'étiquette électronique 3 (typiquement d'une épaisseur de 1cm) et les perturbations électromagnétiques induites par la carte de circuit imprimé."

In English:

" However, positioning the antenna on the rear face inside next to the chip 37 would reduce the reading distance and reliability since this would then have to be done through the display screen 31 of the electronic label 3 (typically 1cm thick) and the electromagnetic disturbances induced by the printed circuit board."

By separating the antenna from the PCB, interference should thus be avoided so that the distance and reliability with which it is possible to read RFID information read can be increased.

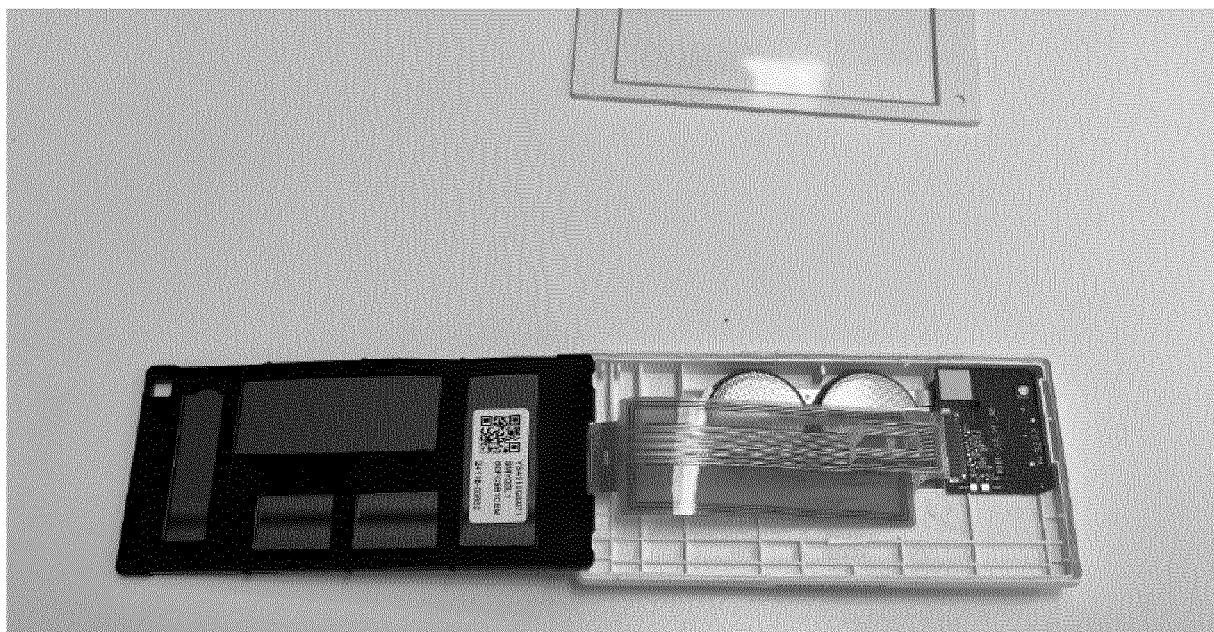
The same technical effect was also named by the patent proprietor in the examination proceedings as the basis for the inventive step. In its submission of March 17, 2022, which is filed as a

Annex KSW 22

the patent proprietor mentions in the penultimate paragraph on page 2 a reduction of electromagnetic interference caused by the printed circuit board.

However, this technical effect cannot be achieved over the entire scope of the patent claim, since the patent claim also includes embodiments in which other metallic

components (for example the batteries of the electronic label) are arranged in the immediate vicinity of the antenna. That such embodiments are intended to fall within the scope of protection of the claim, at least in the opinion of the patent proprietor, is apparent from its application for a preliminary injunction (Annex KSW19). Here, they attack embodiments of electronic labels of the present Opponent in which the batteries are arranged directly behind the antenna:



The above figure is taken directly from the injunction application, p.27 (KSW 19).

The arrangement of two comparatively massive metallic objects in the form of batteries directly behind the antenna will, in addition to the arrangement of the circuit board in the same plane as the antenna, cause further considerable interference. It must be considered here that the circuit board in the attacked embodiment shown is also offset laterally with respect to the antenna, which is also not ruled out according to the claims.

Furthermore, the claim does not define how large a distance (in a front-to-back direction) should be between the printed circuit board and the antenna to achieve the desired technical effect. The patent proprietor's explanations in the application for injunction (Annex KSW 19) make it clear that even a minimal distance should be sufficient to realize feature M12 of the patent claim.

In order to achieve the claimed technical effect across the entire scope of the patent claim, the latter would at least have to define that no other metallic components may be arranged in the immediate vicinity of the antenna in addition to the printed circuit board, since otherwise the readability and reception cannot be improved by a distance to the printed circuit board (which can also be very small in accordance with the claims).

Furthermore, the patent claim would have to define how large such a distance must be at least to achieve the claimed technical effect. It is obvious that a minimum distance where the antenna is placed directly above the printed circuit board is hardly suitable to avoid interferences and to improve readability.

Furthermore, at least according to the Proprietor in the application for injunction (Annex KSW 19), the patent claim also includes embodiments in which the antenna is arranged behind the display. However, the display itself can also cause interference that can prevent interference-free reception by the antenna. This problem is also described in paragraph [0038] of the Opposed Patent:

[0038] Cependant, a positionnement de l'antenne sur la face arrière à l'intérieur à côté de la puce 37 réduirait la distance et la fiabilité de lecture puisque celle-ci devrait alors se faire à travers l'écran d'affichage 31 de l'étiquette électronique 3 (typiquement d'une épaisseur de 1cm) et les perturbations électromagnétiques induites par la carte de circuit imprimé.

However, the claim lacks any definition that the antenna should be placed in front of or outside the display to avoid such interference.

Since all the above features are missing from the claim, it has such a scope that it includes numerous embodiments in which the claimed technical effect of improved readability and reduced interference will not occur. The claimed technical effect is thus not achieved over the entire scope of the patent claims, so that they lack inventive step if only for this reason.

In this context, we refer to the Examination Guidelines of the European Patent Office, Part G, Chapter VII, 5.2. March 2023 Edition.

The penultimate paragraph of the aforementioned section of the Guidelines states:

" A technical problem may be regarded as being solved only if it is credible that substantially all claimed embodiments exhibit the technical effects upon which the invention is based."

Since embodiments exist in the present case which fall within the scope of protection of the claims and which do not exhibit the claimed technical effects, this criterion is not met.

Lack of novelty compared to US 8,061,600 B2 (D10).

A copy of the publication US 8,061,600 B2 (D10) in English is enclosed as

Annex KSW 17.

D10 was published on November 22, 2011, and is thus relevant for assessing the novelty and inventive step of the Opposed Patent (Art. 54(2) EPC).

D10 describes a wireless display tag (WDT) that performs the same function as the electronic label of the Opposed Patent: it is also used to display information about products, for example, in a supermarket (see, for example, Abstract of D10). The features of claim 1 of the patent-in-suit emerge from D10 as follows:

Feature M1:

Electronic label (3) for a sales area with a series of distributed electronic labels (3),

D10 discloses, as shown above, an electronic label for a sales area (see, for example, Abstract and column 1, lines 46-50 of D10).

"Generally, the present invention relates to electronic inventory systems. Further, the present invention relates to electronic shelf labels and electronic inventory tags. More specifically, the present invention relates to electronic shelf labels and tags adapted to communicate wirelessly."

Feature M2:

each electronic label (3) is identified by a unique label identifier specific to it, comprising:

Column 3, lines 56-62 of D10 discloses such a label identifier as follows:

"The WDT may maintain a unique identifier (ID) that is stored in volatile or non-volatile memory. The volatile memory may be continuously supplied with power and refreshed to maintain the integrity of the WDT's ID. An in-store central application server or controller may maintain a database linking the WDT IDs to a retail item's UPC number."

Feature M3:

- a radio frequency communication module (32) configured to receive from a central server (2) data representative of information relating to an article);

The electronic label of the D10 also receives information about a product from a central server, which is shown on the display. This can be seen, for example, in column 2, lines 59-63:

"The invention provides for bidirectional communication between the WDT and a central database using an RF integrated Circuit (RFIC) that combines the backscatter RF communications method, amplified backscatter RF communications method and the active RF communications method."

The same communication channel to a central server or remote host is disclosed in claim 18 of D10 (emphasis added):

18. A processor adapted for use in a wireless display tag comprising:

display processor for driving a programmable dot matrix display to display information about an item intended to be associated with the display tag;

RF circuitry for communicating bidirectionally with a remote host, directly or indirectly, using backscatter RF and at least one communications technology selected from a group comprising passive RF and active RF; and

mesh networking and display tag logic providing at least two functions selected from a group comprising real time location identification, real time path tracking, anti-theft signaling, inventory counting, inventory tracking, environmental sensing, and RFID.

Feature M4:

- a memory (33) to store said data representative of information relating to an article;

D10 discloses in many places that the electronic device has a volatile or non-volatile memory (see, for example, column 3, line 18). Since the D10 electronic label also contains information about a product from a central server (see above for feature M3) for display on the display at a later time, a memory is mandatory.

Such a memory thus follows directly from D10.

Feature M5:

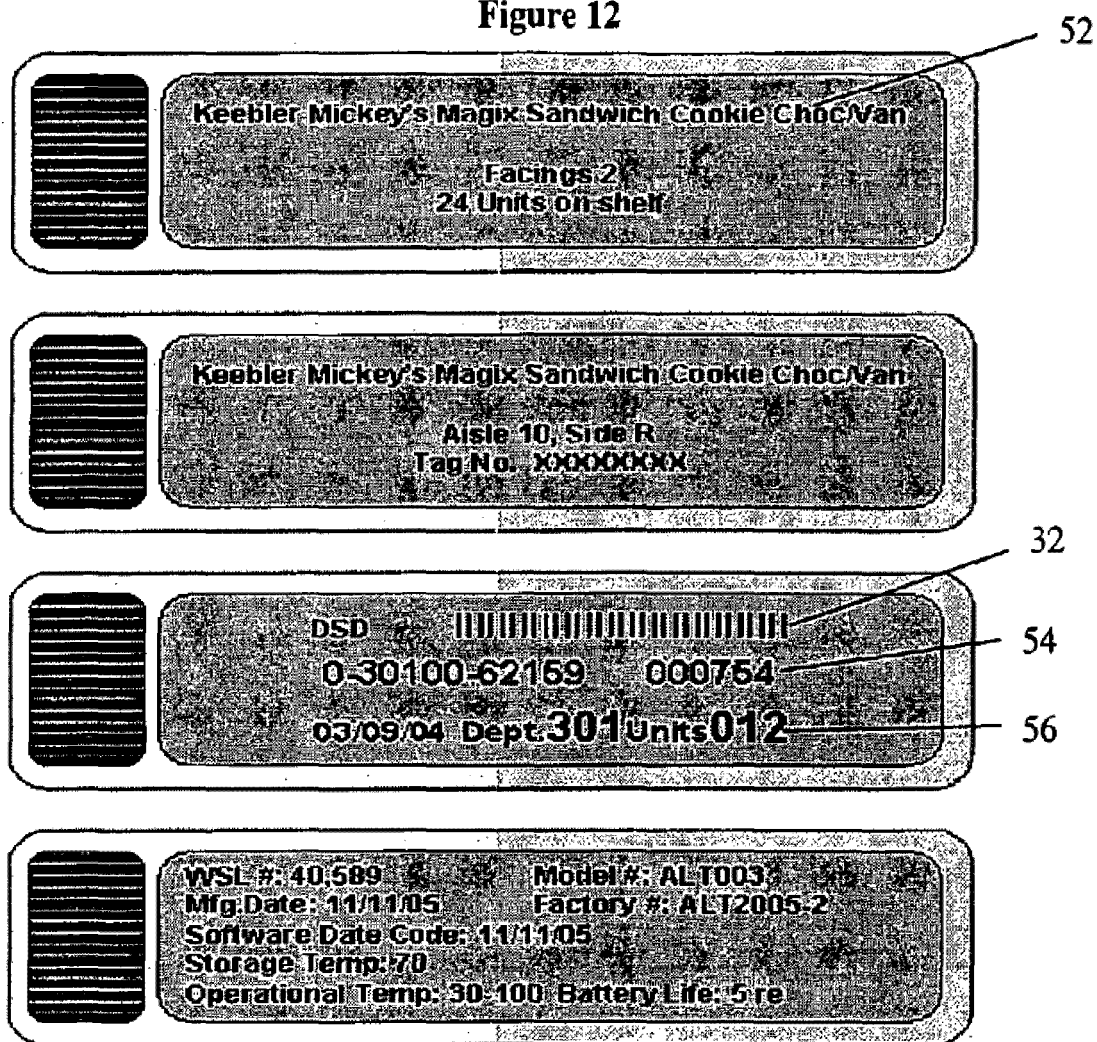
- a display screen (31) configured to display said information relating to an article;

In the case of the D10 electronic label, article-related information is also shown on the display in accordance with column 4, lines 2 to 6:

"First, a variety of store operations information may be maintained by the WDT and displayed upon request by store staff. While the pricing screens are always visible by default, staff may temporarily change the display to store operations information screens using a hand-held terminal."

This is also shown in figure 12 of D10:

Figure 12



Feature M6:

- a microcontroller (34) configured to control the display of said information relating to an article on the display screen (31);

Article-related information is also displayed on the display screen in D10 (see, for example, Fig. 12 and column 4, lines 4-6 of D10). The fact that this is controlled by a microcontroller is necessarily read by a skilled person.

On page 3, lines 17-19 of D10, it is disclosed that the RFIC includes digital logic, a memory, display drivers, and analog RF circuitry:

"... the RFIC includes digital logic, volatile and non-volatile memory, display driver and analog RF circuitry."

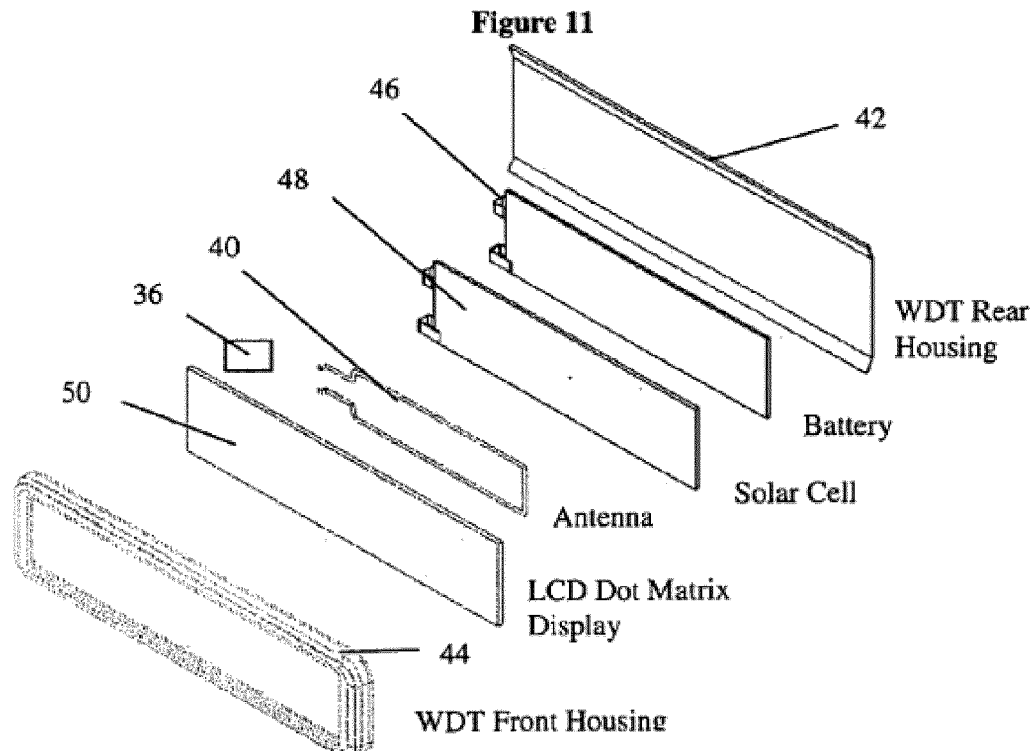
On page 35 of its application for injunction (Annex KSW 19), the patent proprietor argues that the embodiments challenged there include a microcontroller which is absolutely necessary for controlling the display and is present in any case. The same standard must apply to the legal content of the patent, so that at least if one assumes the interpretation of the patent proprietor in the application for injunction, D10 discloses a microcontroller.

Feature M7:

- a case (30);

The electronic label of the D10 also has a case/housing. This is shown, for example, in Fig. 11:

- 37 -



Feature M8:

- a printed circuit board (35),

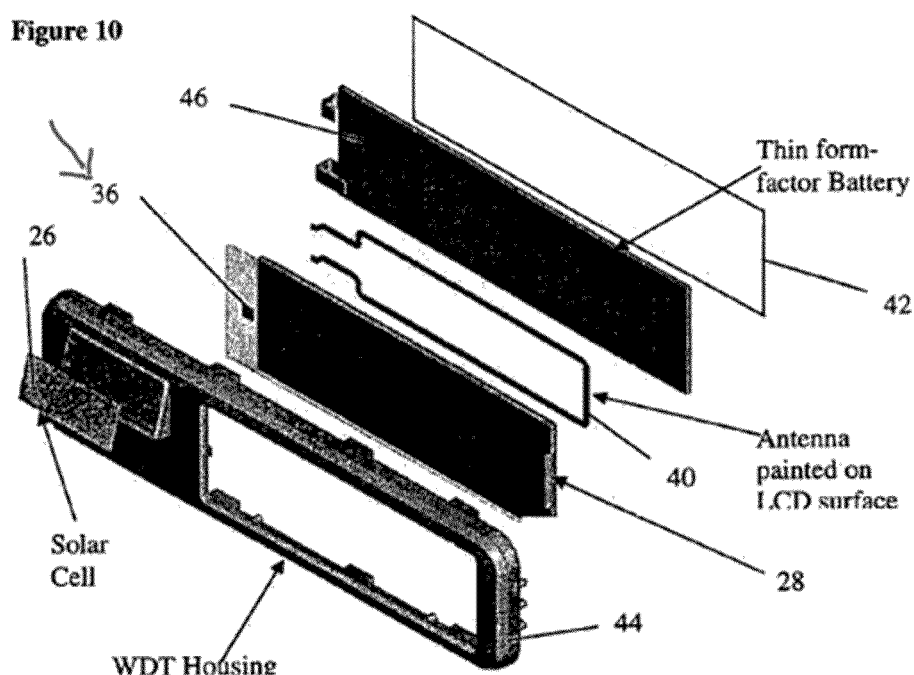
Column 5, lines 35-38 of D10 discloses a "radio frequency integrated circuit (RFIC) 36" used to communicate with a background system:

"With reference to FIG. 9, the WDT 20 may also include a radio frequency (RF) integrated circuit (RFIC) 36 that enables the WDT to communicate wirelessly in a bidirectional manner with an in-store computer system"

This RF circuitry is also disclosed in claim 18.

Such an integrated circuit (integrated circuit) is a chip that must be connected to other components of the electronic label. This can be done either by a fixed or a flexible printed circuit board. Feature M8 includes both possibilities, so it is also at least implicitly disclosed by D10.

In addition, Fig. 10 of D10 shows an embodiment in which the RFIC 36 is mounted on a substrate on which the display 28 is also mounted. This substrate is identified in Fig. 10 reproduced below:



Since this substrate is used for the arrangement of the RFIC 36, it must also have electrical conductor tracks for contacting the contact points of the RFIC 36. It is therefore a printed circuit board within the meaning of the patent.

Feature M8.1:

housed in the case (30) on the side of the back of the case

D10 discloses in column 5, lines 61-63 an antenna located at the front of the housing:

"Alternative embodiments may utilize an RF antenna that is painted or etched onto the face of the front or rear housing 42."

At least, relative to the antenna arranged at the front, the circuit board of the D10 is arranged in a rear part of the housing.

As can be seen from our comments on the interpretation of feature M8.1, this feature is to be interpreted in such a way that the printed circuit board in the housing of the ESL is offset to the rear relative to the RFID antenna. This is also the case in D10.

In KSW 19, the patent proprietor acknowledges that it is sufficient for the feature that the PCB is located on the side of the back surface of the electronic tag to be interpreted as it is located in a rear part of the housing at least relative to the antenna arranged on the front side.

D10 thus discloses feature 8.1, at least if the interpretation of the patent proprietor in the injunction proceedings is taken as a basis.

Feature M8.2:

on which are arranged the radio frequency communication module (32), the memory (33) and the microcontroller (34);

According to column 5, lines 35-38 of D10, a "radio frequency integrated circuit (RFIC) 36" is provided. This corresponds to the radio frequency communication

module 32 according to feature 8.2. A memory must also necessarily be present in D10 to be able to show the information about an article transmitted by the server on the display.

In their application for preliminary injunction, the patent proprietor has also not evidenced the arrangement of the NFC chip, the memory and the microcontroller on the printed circuit board. It merely argues on page 44 of its application, under feature 1.9.3, that these components must necessarily be arranged on the printed circuit board. This is also the case in the cited prior art, and the same standard must be applied here.

Feature M9:

- a radio frequency device (36) capable of establishing a communication (S1) by radio frequency with a mobile terminal (1) and communicating to said mobile terminal the identifier of the electronic label,

Column 6, lines 60-63 of D10 describes the ability of the electronic label to respond to a request from a "near-field RF transmitter/receiver 58".

"Additionally, in some embodiments, the passive backscatter capability of the WDT permits its use as a transponder that responds on demand to a poll by a near-field RF transmitter/receiver 58."

D10 thus discloses a radio frequency device suitable for communicating with a transmitting and receiving device. Since this communication is explicitly a near-field communication using radio waves, it also follows that this radio frequency device is suitable for establishing radio frequency communication with a mobile terminal. In this context, the identifier of the electronic label can also be communicated to the mobile terminal. As stated at the beginning in connection with the

interpretation of feature M9, this feature only requires that the radio frequency device is suitable for establishing such a radio frequency communication with a mobile terminal device and for communicating the identifier of the electronic label to the mobile terminal device. The claim does not require actual transmission of the identifier to the mobile terminal.

Further, D10 discloses that the radio frequency device (RFIC 36) can communicate in backscatter communication:

"the RFIC 36 may combine active transceiver and backscatter communications ..."

This also directly results in the suitability of the radio frequency device to establish radio frequency communication with a mobile terminal.

Furthermore, claim 19 of D10 literally discloses that the RF circuitry includes at least two of the communication technologies recited in claim 18. Claim 18 expressly discloses RFID as a possible communication technology. This can take place in addition to communication with a background system, which can be realized, for example, as "active RF" communication.

It is apparent from claims 18 and 19 that the ESL according to D10 has two communication channels, one of which may be RFID. Here, claim 19 discloses that the "RF circuitry", which is the RFIC 36, includes the two communication technologies. In other words, the RFIC 36 of D10 includes both the communication module and the peripheral device of claim 1.

The use of two communication channels is also clearly evident from D10, column 5, lines 43 - 46:

ence. The RFIC 36 may combine active transceiver and back-scatter communications as disclosed in the concurrently filed U.S. Provisional Patent Application "Wireless Display Tag 45 (WDT) Using Active and Backscatter Transceivers."

Regarding the "mobile terminal" defined in Feature M9, column 4, lines 4 – 6 of D10 disclose the use of a "hand-held terminal" to change the information displayed on the electronic label. This is a mobile terminal according to feature M9.

A skilled person knows that the WDT needs to identify itself if the displayed information shall be changed, in order to make sure that the displayed information on the correct WDT is changed. For that purpose, the WDT will transmit a unique identifier to the hand held terminal.

In addition, the "transmitter-receiver 58" in Figure 13 can also be designed as a mobile terminal device. This is because it can be used both for communication over a greater distance (far-field) and for near-field communication, as can be seen from Figure 13 itself. In the case of near-field communication, a person skilled in the art would assume that the transmitter/receiver 58 must be located in the immediate vicinity of the electronic tag, so that a mobile terminal device can be assumed here.

Regarding the communication of a unique identifier defined in feature M9, Column 6, lines 54 ff. disclosed in connection with Figure 13:

"Referring now to FIG. 13, in various embodiments, WDT's may be used as anti-theft devices because they contain an RFIC that can be readily identified and located in the store."

The electronic label can thus be identified. This is to be done by a near-field RF transmitter/receiver 58. In order for the electronic tag to be identified, it must of course transmit its unique identifier to the "near-field RF transmitter/receiver 58",

which, as shown above, may be a possible terminal device. This feature can be seen even more clearly in column 5, lines 20 - 26:

Transceivers," incorporated herein by reference. The WDT 20 may be initialized using a system and method for matching the ID of the WDT 20 to the proper product located on a specific shelf space using an error-free process as disclosed in the concurrently filed U.S. Provisional Patent Application titled "An Poor Free Method for Wireless Display Tag Initialization."

This also corresponds to the applicant's interpretation in KSW 19, which states on page 31 that it is sufficient for an electronic label to be identified via an ID and assigned to a product.

Feature M10:

the radio frequency device (36) comprises an antenna (38) and an electronic chip (37) of NFC or RFID type, wherein the communication (S1) by radio frequency between the radio frequency device (36) and the mobile terminal (1) being established by NFC or RFID communication,

Said radio frequency device according to feature M9 must necessarily have an antenna and an electronic chip to establish near-field communication with a transmitting and receiving device. These features are thus at least implicitly disclosed in D10.

Since it is RF near-field communication according to column 6, lines 60-63 of D10, it must also be an RFID-type electronic chip through which radio frequency

communication can be established between the electronic label and a mobile terminal via RFID communication.

The suitability of the D10 electronic tag for RFID communication is even more apparent from claim 9, which discloses (emphasis added):

"The wireless display tag of claim 1, wherein the integrated circuit is further adapted to receive information from RFID devices within a local area and to retransmit information from such other RFID devices to the host using RF backscatter."

This claim explicitly discloses that the electronic tag according to D10 communicates with another device via an RFID communication channel. It should be noted here that the mobile terminal is not part of feature M10. This feature, on the contrary, as already shown in the interpretation part, only requires that the radio frequency device 36 is configured in such a way that an RFID communication can be established to such a terminal device. This is also the case according to claim 9 of D10.

That the RFID communication channel according to claim 9 of D10 is a different (i.e., second communication channel) from the RF communication channel to the background system is apparent from claims 18 and 19 of D10. Claim 19 describes that the RF circuitry of the electronic tag comprises at least two of the communication technologies recited in claim 18. Claim 18 recites, among other things, an RF circuitry for communicating bidirectionally with a remote host ("RF circuitry for communicating bidirectionally with a remote host") and further recites RFID.

Claims 18 and 19 of D10 thus explicitly disclose that the electronic tag can communicate via two different communication channels, once with a remote host via an RF communication channel and once via RFID.

Furthermore, the passage of D10 in column 5, lines 43,44 already quoted above discloses that the RFIC 36 enables communication via two different communication paths, namely on the one hand active communication with a background system ("active transceiver") and secondly passive backscatter communication via RFID:

"the RFIC 36 may combine active transceiver and backscatter communications..."

Further, in the context of the same embodiment, D10 column 5, line 49,50 discloses that RFIC 36 transmits and receives electromagnetic signals using RF antenna 40:

"the RFIC 36 may transmit and receive electromagnetic signals using an RF antenna 40"

In addition, M10 does not limit prescribe a specific frequency for RFID communication. Thus, the RFID communication can also take place at a frequency of 2.4 GHz. 13.56 MHz or any suitable frequency. Thus, D10 also discloses a nearfield communication in which a unique identifier of the electronic tag is transmitted and thus an RFID communication. Here too, a person skilled in the art will inevitably assume the use of an RFID chip.

Feature M11:

the electronic chip (37) of the radio frequency device being deposited on the printed circuit board (35), and

D10 does not explicitly disclose that an electronic chip of the radio frequency device is disposed on the printed circuit board. However, as shown above, since the chip must necessarily communicate with the other components of the electronic tag via a flexible or rigid printed circuit board, this feature is implicitly disclosed in D10.

It must be taken into account that a printed circuit board is already required for connection to the battery and the antenna.

Feature M12:

the antenna (38) of the radio frequency device being deposited on or in the housing on the side of the front of the electronic label.

D10, column 5, lines 61-63 discloses the placement of an antenna on the front of the electronic label:

"Alternative embodiments may utilize an RF antenna that is painted or etched onto the face of the front or rear housing 42."

Providing an RF antenna for RFID communication at the front of the electronic label according to D10 has the technical effect of enabling interference-free communication with a terminal device that will approach the electronic label mounted on a shelf, typically from the front, without being disturbed by interference.

D10 thus discloses all the features of claim 1, so that it is not novel over D10.

It should also be noted that the structure of the embodiment according to Fig. 11 of D10 is almost identical to the structure of the attacked embodiments in the application for preliminary injunction. In the following, a perspective view of one of the attacked embodiments (**Nebular 2. 9**) is compared with Fig. 11 of D10:

Exploded view of Nebular 2.9:

Figur

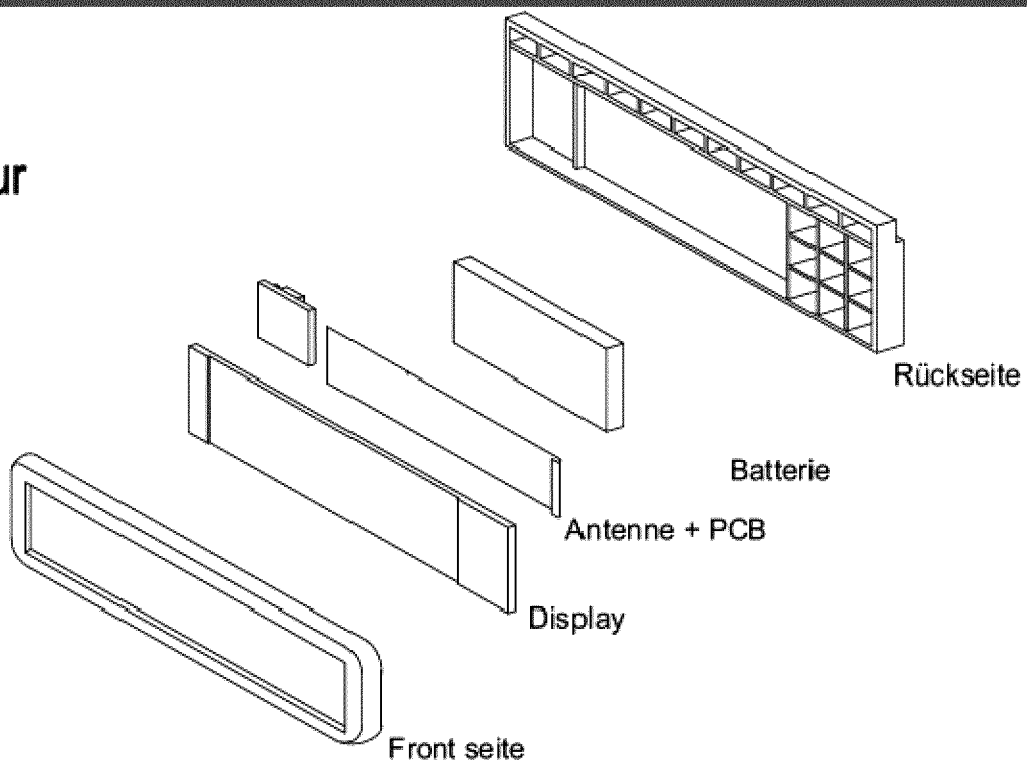
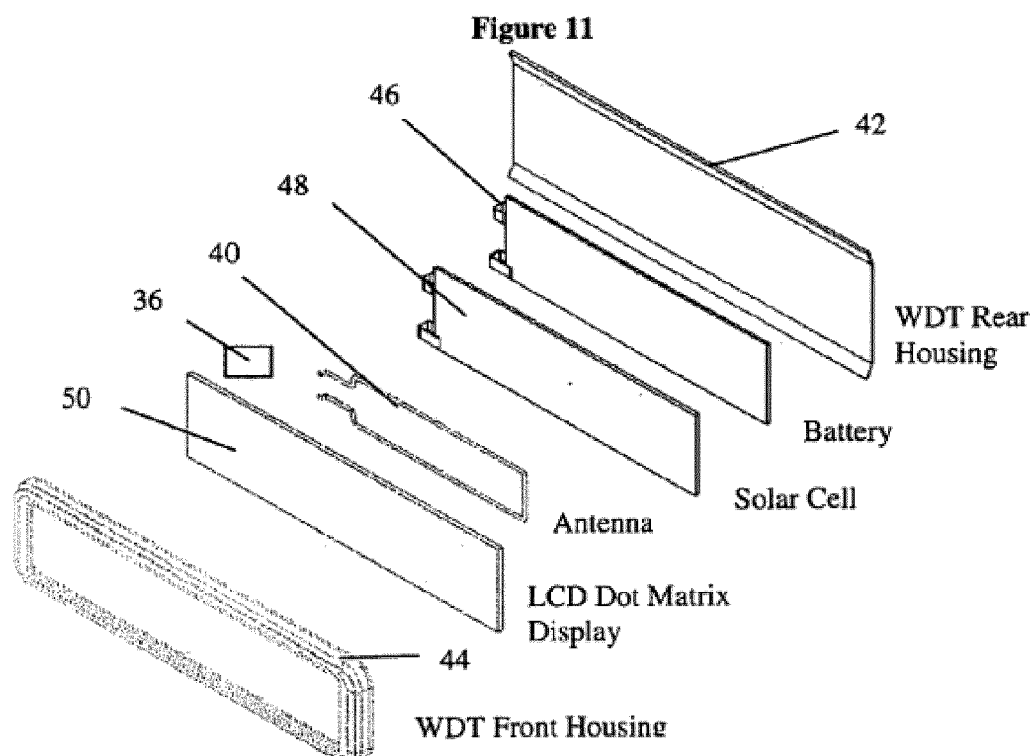


Fig.11 of D10:



As can be seen from these figures, the basic structure is almost identical in both embodiments. In particular, it is clearly recognizable that the antenna and the RFID chip are arranged in the same plane in both embodiments, so that if the attacked embodiment, which according to the patent proprietor's explanations in the application for preliminary injunction (Annex KSW 19) is intended to fall within the scope of protection of the claims, the granted claim 1 of the Opposed Patent cannot be novel compared to Fig. 11 of D10.

Lack of novelty compared to US 2005/0253685 A1 (D3)

Document US 2005/0253685 A1 (D3) originates from Store Electronic Systems, a predecessor of one of the applicants. D3 was published on November 17, 2005. and thus constitutes pre-published prior art relevant to the question of novelty and inventive step (Art. 54(2) EPC).

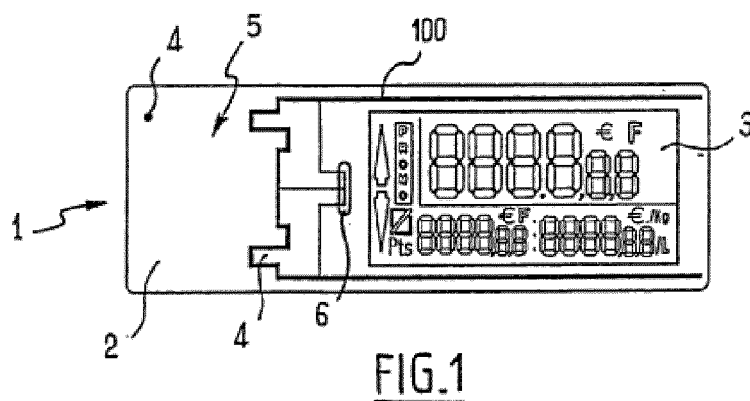
A copy of the publication US 2005/0253685 A1 in English language is attached as

Annex KSW 8.

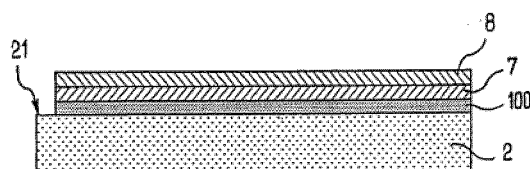
D3 is based on an ESL (*Electronic Shelf Label*) known from EP 0 447 278 A2, which receives information from a central station. It is described as a disadvantage that the central station cannot receive information from an ESL if the ESL does not have a suitable transmitting antenna (see paras. [0002] - [0005]).

Based on this, it is an object of D3 to provide an ESL with a transmitter that is both compact and cost-effective.

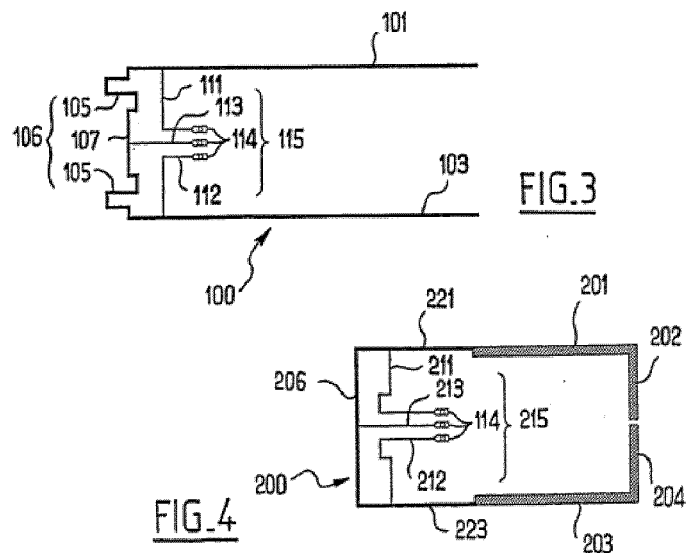
As a solution, it is proposed (see par. [0007]) to provide a transmitter means comprising an antenna 100, 200 on an inner or outer side of a wall 2 of the enclosure 5, in particular a front wall of the enclosure (see [0015]) comprising an LCD display 5 (see [0016], [0031]). The antenna may extend around the display (see [0016], [0052], Fig. 1).



An insulating layer 7 and a decorative layer 8 are arranged over the antenna 100 (see [0034], [0035], Fig. 2). Preferably, the antenna 100, 200 is made of copper (see [0052]) and manufactured by a common method, for example as a flexible printed circuit (see [0052]).



In addition to the antenna 100 shown in Figure 3, a more compact antenna 200 with two antenna heads 201, 203 shown in Figure 4 is also disclosed.



D3 discloses all features **M1 to M12** as follows:

Feature M1:

The feature M1 reads:

Electronic label (3) for a sales area with a series of distributed electronic labels (3),

D3 disclosed in paragraph [0001]:

The invention relates to electronic labels for systems for displaying prices, in particular in stores of the hypermarket type.

Paragraphs [0003] and [0032] also mention the term "supermarket" ("hypermarket or supermarket type").

Feature M1 is disclosed.

Feature M2

Feature M2 reads:

each electronic label (3) is identified by a unique label identifier specific to it,

From the point of view of the skilled person, this method-like feature is necessarily present in the case of several distributed electronic labels (cf. feature M1: "series of distributed electronic labels"), because otherwise several labels could not be distinguished from each other.

Due to the explicit reference in paragraphs [0002] and [0032] of D3 to document EP 0 447 278, the skilled person immediately and unambiguously infers from D3 that each label (corresponds in EP 0 447 278: *module d'affichage 200*) is assigned an "identifier" (see EP 0 447 278, e.g., claim 6: *identificateur*) or an identification code (see EP 0 447 278, column 7, line 22: *un code d'identification du module*).

For the sake of completeness, EP 0 447 278 A2 in French Language is submitted as

Annex KSW 27.

Column 7, line 18 - 22 of this document reveals the following:

Comme on le verra plus loin, les fonctions principales du module électronique sont :

– la réception et la mémorisation, dans une mémoire vive sauvegardée intégrée au microprocesseur, d'un code d'identification du module;

In English:

*As we will see later, the main functions of the electronic module are
-Reception and storage, in a stored RAM memory integrated in the micro-processor, of an identification code of the module;*

A code used to identify the module (i.e. the electronic label) is a unique label identifier according to feature M2.

The identification of the electronic label by means of an identification code is also apparent from paragraph [0032] of the said publication which discloses:

Comme on le verra plus loin, les fonctions principales du module électronique sont :

la réception et la mémorisation, dans une mémoire vive sauvegardée intégrée au microprocesseur, d'un code d'identification du module;

la réception et la reconnaissance de données de prix destinées en particulier à ce module, et

l'affichage desdites données.

in English:

As we will see later, the main functions of the electronic module are

-Receipt and storage of an identification code for the module in a secure RAM integrated in the micro-processor;

-receiving and recognizing price data intended for this module in particular, and

-the display of the specified data.

The document WO 01/44919 A1 referred to in paragraph [0031] which is submitted as:

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also discloses an "address of the label" as a register variable for identifying the label (see p. 6, lines 20-30):

"Architecture générale

Structure d'ensemble

On notera tout d'abord que les étiquettes électroniques du système selon l'invention présente une architecture générale comportant principalement :

-un pilotage par microcontrôleur, en association avec un système d'exploitation contenu dans une mémoire morte et avec des circuits intégrés spécifiques ; appropriés

-un jeu de mémoires ou registres pour des variables (prix, adresse d'étiquette, différents drapeaux, etc.) ;"

in English:

"General architecture

Overall structure

First of all, it should be noted that the electronic labels of the system according to the invention have a general architecture consisting mainly of :

- a microcontroller control, in conjunction with an operating system contained in a read-only memory and with specific integrated circuits; appropriate

-a set of memories or registers for variables (price, label address, various flags, etc.);"

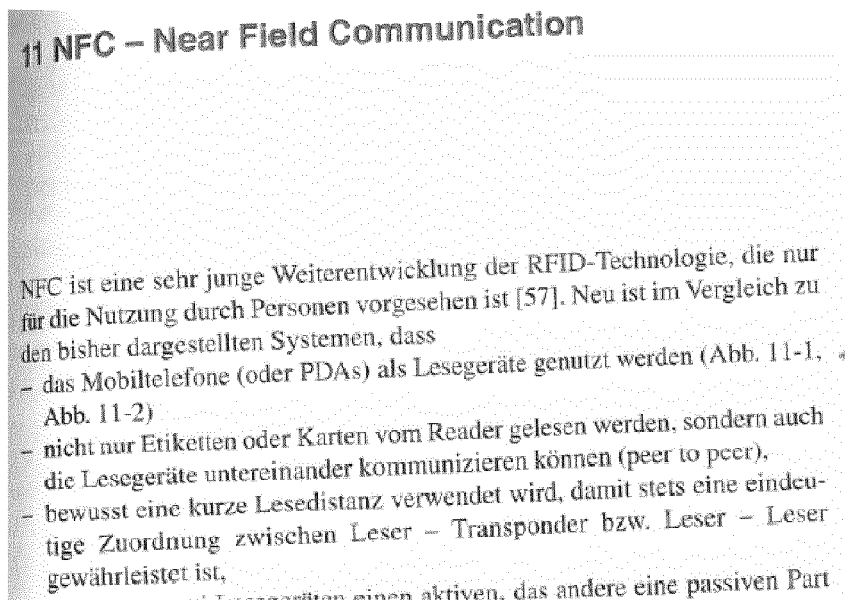
Furthermore, the skilled person is also aware based on his technical knowledge that an electronic label must be identified by a unique identifier, since, otherwise, it cannot be assigned to a specific product whose price it is intended to display. Feature M2 is therefore already apparent to a skilled person based on the knowledge of the art.

Furthermore, on the priority date of EP '277, the communication of identification information from an RFID or NFC tag to a mobile terminal had long been common knowledge.

The reference book on RFID applications: Christian Kern, *Anwendungen von RFID-Systemen*, Springer-Verlag, Berlin, 2nd ed., 2007, ISBN-13 978-3-540-44477-0, which is submitted as

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already stated in chapter 11 *NFC - Near Field Communication* (p. 209) that mobile phones and PDAs are used as readers:



In English:

"NFC is a very recent advancement of RFID technology that is intended for use by people only [57]. What is new compared to the systems presented so far is that

- cell phones (or PDAs) are used as readers (Fig. 11-1, Fig. 11-2)*
- not only labels or cards are read by readers, but the readers can also communicate with each other (peer to peer)*
- a short reading distance is deliberately used so that a clear assignment between reader - transponder or reader - reader is always guaranteed, ..."*

On page 211 it states that devices with NFC technology can communicate with each other by transmitting ID numbers. It confirms at the same time that conventional transponders (i.e. RFID transponders) provide an ID number:

Mit der NFC-Technologie können Geräte sowohl in sehr einfacher (Übertragung einer ID-Nummer) als auch in sehr komplexer Weise (Verschlüsselung, bis hin zum Austausch von Dateien) miteinander kommunizieren. Damit ist auch die Grenze zwischen Lesegerät und dem ursprünglichen Transponder, der nur eine ID-Nummer lieferte und hauptsächlich für die Identifikation des Objektes zuständig war, nicht mehr deutlich erkennbar. Es hat eine Entwick-

In English:

"With NFC technology, devices can communicate with each other in both very simple (transmission of an ID number) and very complex ways (encryption, up to and including the exchange of files). This also means that the boundary between the reader and the original transponder, which only provided an ID number and was mainly responsible for identifying the object, is no longer clearly recognisable."

Also the standard book on RFID technology: Klaus Finkenzeller, *RFID-Handbuch - Grundlagen und praktische Anwendungen von Transpondern, kontaktlosen Chipkarten und NFC*, Carl Hanser Verlag München, 5th ed., 2008, ISBN 978-3-446-41200-2, which is herewith filed as

Annex KSW 10

describes that an RFID transponder transmits its unique serial number as soon as it is in the reception range of a reader (see p. 25):

Auch *Read-only-Transponder*, die bereits mit einem Mikrochip ausgestattet sind, gehören noch zu den Low-end-Systemen. Diese Transponder verfügen über einen fest kodierten Datensatz, der in der Regel nur aus einer eindeutigen, mehrere Bytes langen *Seriennummer* („*unique number*“) besteht. Wird ein Read-only-Transponder in das HF-Feld eines Lesegerätes gebracht, so beginnt er damit, fortlaufend seine ihm eigene Seriennummer auszusenden. Eine Möglichkeit, einen Read-only-Transponder durch das Lesegerät anzu-

In English:

"Read-only transponders, which are already equipped with a microchip, also still belong to the low-end systems. These transponders have a hard-coded data record that usually consists only of a unique serial number several bytes long ("unique number"). When a read-only transponder is brought into the RF field of a reader, it begins to continuously transmit its own serial number. One way in which a read-only transponder can be read by the reader ..."

NFC communication with a mobile phone is also already described in detail in this standard book from 2008 (see e.g. chapter 11.6, p. 398).

The communication of identification information of a label by means of RFID or NFC communication to a mobile terminal was part of the skilled person's knowledge on the priority date of EP '277.

Feature M2 is disclosed in D3 from the point of view of a skilled person.

Feature M3:

According to feature M3, the electronic tag includes

a radio frequency communication module (32) configured to receive from a central server (2) data representative of information relating to an article.

Paragraph [0002] already describes a communication module with an antenna for receiving item data from a central server as common. This is repeated in paragraph [0032] of D3:

"The electronic label 1 forms part of a system for displaying prices in particular in stores of the hypermarket or supermarket type. The display system comprises a central station possessing means for transmitting information to the electronic labels, which, for this purpose, include means for receiving such information, said means being preferably integrated in the electronic circuit. For greater detail, reference can be made to document EP 0 447 278."

Such information transmission by means of antennas physically takes place through electromagnetic waves in the broad frequency range of radio frequencies (between 20 kHz to around 300 GHz) (cf. https://en.wikipedia.org/wiki/Radio_frequency : "20 kHz to around 300 GHz").

This information transfer is explained in general terms in paragraph [0002]:

Electronic labels such as those described in document EP 0 447 278 include means for receiving information coming from a central station. Those receiver means include a receive antenna electromagnetically coupled with a current loop constituting the transmit antenna of the central station.

It is also obvious to a skilled person that information transmitted from the central server in D3 is product information that is to be displayed on the electronic labels attached to the shelves of a store in close proximity to these products. This corresponds to the usual function of electronic labels.

Feature M3 is disclosed.

Feature M4:

According to feature M4, the electronic tag also includes:

a memory (33) to store said data representative of information relating to an article;

Paragraph [0031] in D3 describes such a memory:

The portion of this front wall 2 presents a display 3 of the liquid crystal (LCD) type connected to the electronic circuit in such a manner as to display information contained in a memory (not shown) of said electronic circuit.

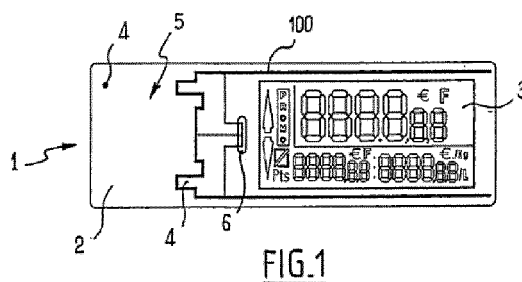
Feature M4 is disclosed.

Feature M5:

According to feature M5, the electronic tag further comprises:

a display screen (31) configured to display said information relating to an article;

The electronic label in D3 includes an LCD screen for displaying prices (see [0016], [0031]: "display 3 of the liquid crystal (LCD) type"; [0032]: "displaying prices";).



Feature M5 is disclosed.

Feature M6:

According to feature M6, the electronic tag also includes

a microcontroller (34) configured to control the display of said information relating to an article on the display screen (31);

A skilled person will anyway read a microcontroller into D3 as a necessary technical means to control the display of the LCD.

However, D3 also contains in paragraph [0031] an explicit reference to document WO 01/44919 A1, which discloses a microcontroller 8 for exactly this purpose.

The portion of this front wall 2 presents a display 3 of the liquid crystal (LCD) type connected to the electronic circuit in such a manner as to display information contained in a memory (not shown) of said electronic circuit. Such electronic labels are described in particular in document WO 01/44919 to which reference can be made for greater detail.

Document WO 01/44919 A1 states on page 8, para. 2:

Le module ou la carte selon l'invention comprend un microcontrôleur (8) pourvu d'une unité de mémoire (9). Il est connecté à la puce lecteur RFID (6) et au transceiver (5). It carries out the transmission, reception and storage of data in the memory unit (9) via the transceiver (5). Par ailleurs, il pilote l'écran d'affichage (2) (fonction " display driver ").

In English:

The module or card according to the invention comprises a microcontroller (8) with a memory unit (9). It is connected to the RFID reader chip (6) and to the transceiver (5). It carries out the transmission, reception and storage of data in the memory unit (9) via the transceiver (5). It also drives the display screen (2) ("display driver" function).

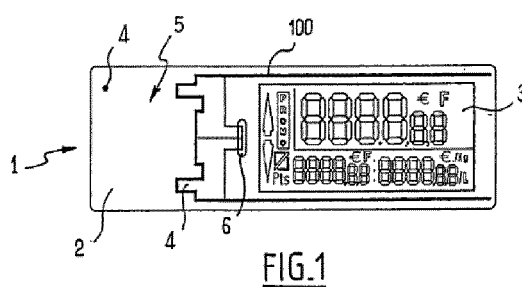
Feature M6 is implicitly disclosed in D3 and explicitly disclosed by reference to WO 01/44919 A1.

Feature M7:

According to feature M7, the electronic tag comprises

a case (30).

D3 discloses a case/housing 5 ("housing", see e.g. [0031]; Fig. 1):



Feature M7 is disclosed.

Feature M8:

According to feature M8, the electronic tag further comprises:

a printed circuit board (35).

D3 mentions an electronic circuit in the housing, but this is not shown (see [0022] and [0031]):

[0022] the label includes an electronic circuit, and the antenna includes a flat cable suitable for electrically connecting the antenna to the electronic circuit;

[0031] With reference to FIG. 1, an electronic label 1 in a preferred embodiment comprises a housing 5 containing an electronic circuit (not shown) forming the core of said electronic label.

The design of an electronic circuit as a printed circuit board is absolutely standard to a skilled person, so that he reads a printed circuit board with respect to the electronic circuit in the housing 5 in D3 (cf. German Wikipedia entry "Leiterplatte", available at <https://de.wikipedia.org/wiki/Leiterplatte> , underlining added):

" Eine Leiterplatte (Leiterkarte, Platine oder gedruckte Schaltung; englisch printed circuit board, PCB) ist ein Träger für elektronische Bauteile. Sie dient der mechanischen Befestigung und elektrischen Verbindung. Nahezu jedes elektronische Gerät enthält eine oder mehrere Leiterplatten.
"

In English:

A printed circuit board (PCB) is a carrier for electronic components. It is used for mechanical fastening and electrical connection. Almost every electronic device contains one or more PCBs.

Paragraph [0033] in D3 explicitly mentions a printed circuit board ("printed circuit", cf. Wikipedia article) in the housing:

By placing the antenna on the outside surface of the front wall of the front face of the housing, the antenna is moved away from metal masses contained within the enclosure of said housing (such as a power supply battery, a printed circuit, [...]) that might interfere with proper operation of the antenna.

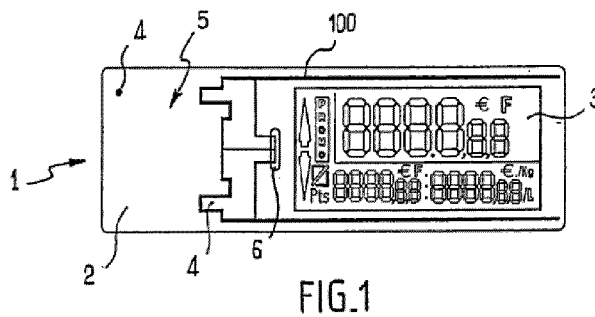
Feature M8 is disclosed.

Feature M8.1:

According to feature M8.1

the printed circuit board (35) housed in the housing (30) on the side of the back of the case;

D3 discloses an antenna 100 arranged at the front of the housing (see feature M12 below). Since the antenna 100 at the front of the enclosure 5 is connected to the electronic circuit on the printed circuit board inside the enclosure 5 via a passage 6 in the enclosure 5, the printed circuit board must be accommodated inside the enclosure - at least relative to the antenna 100 arranged at the front - on one side of the rear of the enclosure 5:



The antenna 100 is electrically connected to the electronic circuit integrated in the housing, and in this case it is connected by means of three electric wire connections passing through a through orifice 6 provided for this purpose in the front wall 2 of the housing 5. By placing the antenna on the outside surface of the front wall of the front face of the housing, the antenna is moved away from metal masses contained within the enclosure of said housing (such as a power supply battery, a printed circuit, and an antenna of the above-mentioned receiver by means of the label, etc.). that might interfere with proper operation of the antenna.

Feature M8.1 is disclosed.

Feature M8.2:

According to characteristic M8.2

the radio frequency communication module (32), the memory (33) and the microcontroller (34) are arranged on the printed circuit board (35).

Paragraph [0032] of D3 discloses that *receiving means* corresponding to the radio frequency communication module (32) are integrated in the electronic circuit arranged on the printed circuit board (see above for feature M8):

The display system comprises a central station possessing means for transmitting information to the electronic labels, which, for this purpose, include means for receiving such information, said means being preferably integrated in the electronic circuit. For greater detail, reference can be made to document EP 0 447 278.

For a skilled person, a memory and a microcontroller are naturally arranged on a printed circuit board as components of an electronic circuit.

Moreover, the memory in D3 (cf. above on feature M4) is explicitly part of the electronic circuit (see para. [0031]: "*information contained in a memory (not shown) of said electronic circuit*").

Similarly, the microcontroller disclosed by reference to WO 01/44919 A1 in US '685 (cf. above to feature M6) is arranged on the printed circuit board, namely together with the memory (see WO 01/44919 A1, page 8, para. 2: "*comprend un microcontrôleur (8) pourvu d'une unité de mémoire (9)* "). In English, "*includes a microcontroller (8) with a memory unit (9)*".

Moreover, paragraph [0033] of D3 also discloses a printed circuit board ("printed circuit"). With regard to the arrangement of the necessary components of the "receiving means" in document D3, which corresponds to the radio frequency communication module 32 of feature M8.2, a skilled person would simply assume that, in D3, the components mentioned are arranged on the same printed circuit board, which would at least implicitly disclose this feature M8.2.

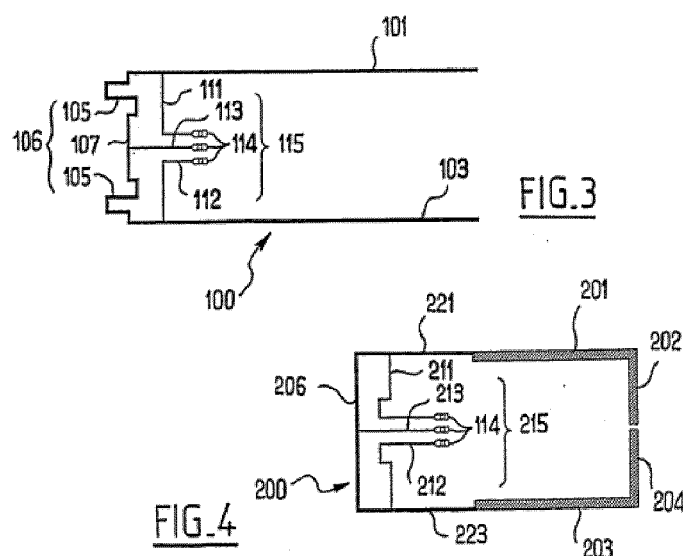
Feature M8.2 is disclosed.

Feature M9:

According to feature M9, the electronic tag includes

a radio frequency device (36) capable of establishing a communication (S1) by radio frequency with a mobile terminal (1) and communicating to said mobile terminal the identifier of the electronic label,

D3 discloses a radio frequency device in the form of antenna 100 in Fig. 3 (or 200 in Fig. 4), which is soldered to an electronic circuit via a *flat* cable 115 (or 215) (see [0042]). Possible radio frequency ranges are described in paragraph [0043].



The skilled person takes from D3 the necessary presence of a variable for the identification of the label in the electronic label, e.g. as a stored register variable (cf. above to feature M2 in WO 01/44919 A1, p. 6, lines 20-30: "address of the label"; "storing or registering for variables (price, address of the label, [...].)"):

According to D3 (see paras [0053] and [0055]), contents of the register are also transmitted away from the label as intended by means of antenna 100 (or 200) described in US'685:

[0053] *The use of such transmit antennas on electronic labels makes it possible, in non-exhaustive manner:*

[...]

[0055] *to send information concerning the state of the electronic label, such as re-reading data that has already been sent or the contents of registers present within the electronic label;*

Since an identification variable or code must technically be present in D3 for unambiguous identification of the label among several labels present in the supermarket (cf. above on feature M2), the label disclosed in D3 is also objectively suitable, according to the teaching of paragraphs [0053] and [0055], for sending a necessarily present variable (stored in the register) for identification of the label by means of antenna 100 (or 200). Feature M9 does not require anything else.

Feature M9 emerges even more clearly from paragraphs [0032]-[0033] of D3:

Paragraph [0033] describes the technical effect of placing the antenna at the front of the enclosure in that the antenna is removed from metallic masses inside the enclosure. These can include a printed circuit board but also another receiving antenna (*underlining added*):

"the antenna is moved away from metal mases contained within the enclosure of said housing (such as a power supply battery, a printed circuit, and an antenna of the above mentioned receiver means of the label, etc...)".

This "receiver means" is a receiving device through which the electronic tag receives information from a background system ("central station") according to paragraph [0032].

D3 thus discloses an electronic tag with two different antennas and thus with two different communication channels. The first communication channel with the first antenna, which is located inside the housing, is used to receive information from a background system, while another antenna, which bears the reference sign 100, is located on the front side of the housing.

This further antenna can be operated with a frequency of 868 MHz according to paragraph [0043]:

[0043] The operation of the antenna 100 is described below for a context in which it is to operate at high frequency, preferably at a frequency of about 433 MHz. It should be observed that other high frequencies could be used: e.g. frequencies of about 868 MHz or about 2.4 gigahertz (GHz).

As can be seen from page 180 of the already introduced standard work on RFID technology (Annex KSW 10), the mentioned frequencies of 868 MHz and 2.4 GHz can be RFID frequencies. The skilled person can thus directly deduce from D3 that the antenna 100 located on the front can be used for RFID communication, while the other antenna located in the housing serves to receive product information from a background system.

It should also be noted that the two communication channels of claim 1 of the patent-in-suit need not be bidirectional communication channels. Feature M3 merely requires that the radio frequency communication module 32 is adapted to receive data from a central server 2, while feature 9 requires that the radio frequency peripheral 36 is capable of communicating the electronic tag identifier to

the mobile terminal. In other words, according to the claim, the radio frequency communication module 32 is only for receiving data, while the radio frequency peripheral 36 is for transmitting data. The claim thus defines only two uni-directional communication channels.

Identical thereto, D3 discloses a transmitter antenna ("transmitter antenna 100") arranged on the front side of the electronic tag according to paragraph [0033] of D3, while the other antenna is part of a receiver means ("receiver means", para. [0033], second half). Since the transmitting antenna 100 is arranged at the front of the housing, the other antenna and the printed circuit board can be arranged away from it only by being located further back in the housing of the electronic tag. As explained in paragraph [0033] of D3, this ensures that the metal masses of the printed circuit board and the other antenna do not act on the antenna arranged at the front.

D3 thus directly teaches a person skilled in the art that the antenna 100 located on the front can be used for RFID communication, while the other antenna located in the housing is used to receive product information from a background system.

As already explained in connection with the interpretation, the claim does not require that communication takes place with a mobile terminal device. It merely requires that the electronic tag is capable of establishing such communication. This is the case in D3, since RFID communication with a mobile terminal device can be established via the antenna 100 suitable for RFID communication.

In this respect, feature M9 is disclosed.

Feature M10:

According to feature M10, the radio frequency device (36) comprises:

an antenna (38) and an electronic chip (37) of NFC or RFID type, the communication (S1) by radio frequency between the radio frequency device (36) and the mobile terminal (1) being established by NFC or RFID communication,

D3 discloses antenna 100 (or 200) as a component of a radio frequency device (cf. above to feature M9).

In the already introduced standard work on RFID technology (Annex KSW 10)

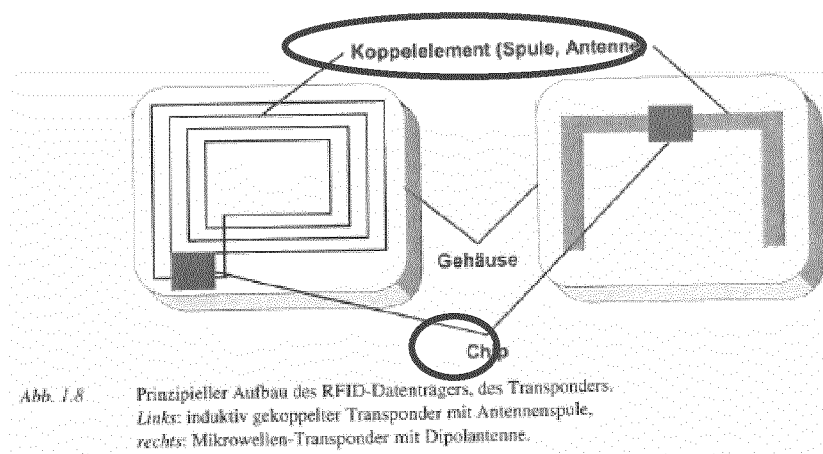
Klaus Finkenzeller, *RFID-Handbuch – Grundlagen und praktische Anwendungen von Transpondern, kontaktlosen Chipkarten und NFC*, Carl Hanser Verlag München, 5th ed., 2008, ISBN 978-3-446-41200-2

the frequencies of 868 MHz and 2.4 GHz mentioned in paragraph [0043] of D3 are described as possible RFID frequencies (see RFID-Handbuch, p. 180).

In addition, other possible frequencies for RFID communication are listed in ISO18000. The use of the frequency of 433 MHz is defined in part 7 of ISO18000, the frequency band around 2.4 GHz in part 4 and frequencies of 865 – 868 MHz in part 6. Paragraph [0043] of D3 explicitly discloses that the antenna 100 can be used at frequencies of 433 MHz, 868 MHz or 2.4 GHz. This corresponds to the above-mentioned RFID frequencies according to ISO18000.

Thus, from the point of view of a skilled person, D3 also discloses an RFID antenna in the sense of feature M10 by means of the antenna 100, 200 operating in the frequency ranges mentioned.

Furthermore, according to the knowledge of a skilled person, each RFID transponder includes an antenna and an electronic circuit in the form of a chip (see RFID manual, p. 9).



The reference book on RFID applications already introduced as Annex KSW 9,

Christian Kern, *Applications of RFID Systems*, Springer-Verlag, Berlin, 2nd ed., 2007, ISBN-13 978-3-540-44477-0,

also illustrates that an RFID system always has a “transponder antenna” and a “transponder chip” (see illustration copied in below on p. 34):

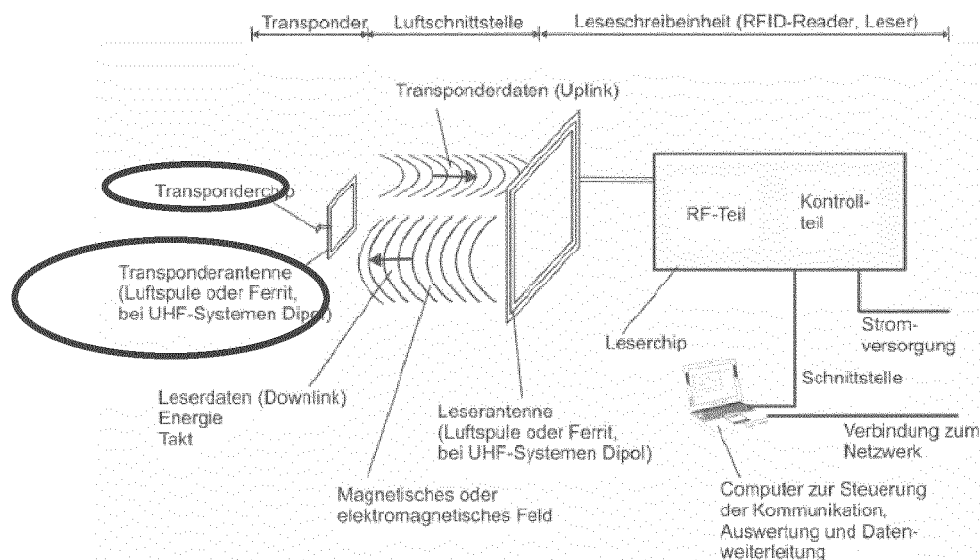


Abb. 3-20. Grundlegender Aufbau und Funktion eines RFID-Systems [36]

A skilled person will therefore easily infer an RFID chip from the disclosure of an RFID antenna.

Such a unit consisting of an RFID antenna and an RFID chip is in principle also suitable for radio frequency communication with a mobile terminal (cf. claim interpretation for feature M10 with its indication of suitability).

Feature M10 is thus disclosed in D3 from the point of view of a skilled person.

Feature M11:

According to feature M11

the electronic chip (37) of the radio frequency device being disposed on the printed circuit board (35),

The arrangement of an electronic chip of the RFID or NFC type (cf. feature M10) on a printed circuit board does not seem to be explicitly described in D3.

However, D3 clearly describes that the antenna 100 is electrically connected to the electronic circuit integrated in the housing (see [0033]: *The antenna 100 is electrically connected to the electronic circuit integrated in the housing*), namely through the *flat* cable 115 with connections 111, 112, 113 (see [0041], [0042]).

This teaches the skilled person that the electronic circuit for controlling the antenna is arranged separately in the housing. Providing an electronic circuit for the antenna 100, e.g., as an RFID chip, on the printed circuit board is therefore already part of the general teaching in D3 from the point of view of a skilled person, which provides for a transmitting antenna and an associated circuit spatially separated from each other.

In contrast to the teaching of D3, a chip arranged in the antenna plane – which is thus not arranged separately on the printed circuit board inside the housing – would mean an undesirable thickening of the layered structure of the antenna 100 on the front housing wall 2 intended in D3 (cf. para. [0008] and Fig. 2).

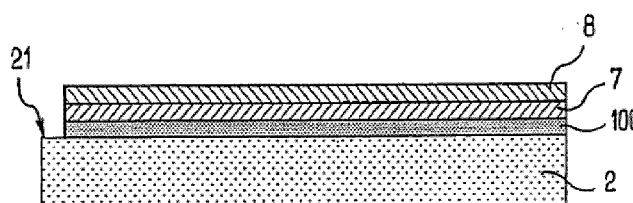


FIG. 2

[0008] *Thus, the antenna merely forms a slight extra thickness on the inside or the outside of the wall of the housing. In both cases, this thickening increases the overall size of the label imperceptibly, and the label remains*

entirely compatible with being used, in particular on the shelves of a store of the hypermarket type.

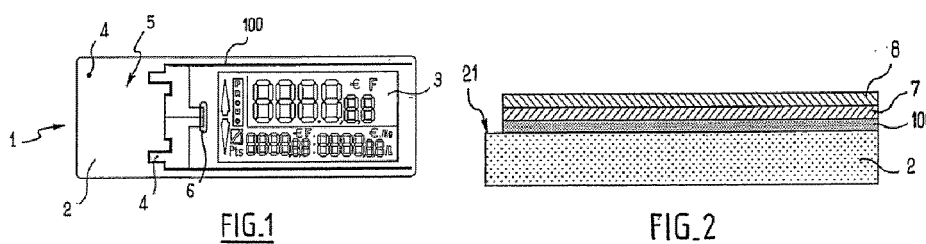
The feature M11 is therefore at least implicit in D3 for a skilled person.

Feature M12:

According to feature M12

the antenna (38) of the radio frequency device being disposed on or in the housing on the side of the front of said electronic label.

In D3, the antenna 100 is preferably arranged on the front wall 2 of the housing 5 (see para [0008]: "*Thus, the antenna merely forms a slight extra thickness on the inside or the outside of the wall of the housing*"; [0015]: "*the wall is a front wall*"; see Figs. 1 and 2).



The advantageous technical effects of placing the antenna 100 on the front of the housing and separate from a circuit are described in D3, namely the avoidance of disturbing interference with metal bodies and an increase in the transmission range of the antenna (see [0033]):

[...] By placing the antenna on the outside surface of the front wall of the front face of the housing, the antenna is moved away from metal masses

contained within the enclosure of said housing (such as a power supply battery, a printed circuit, and an antenna of the above-mentioned receiver means of the label, etc.). ...) that might interfere with proper operation of the antenna. In addition, this disposition makes it possible to make use of all of the energy radiated by the antenna by eliminating an obstacle (the wall of the housing) between said antenna and the receiver means of the central station, thereby increasing the transmit range of said antenna.

Feature M12 is disclosed.

Lack of inventive step compared to US 8,061,600 B2 (D10) and general technical knowledge.

Even if it were assumed that D10 does not explicitly disclose features M8 – M12 of claim 1 of the Opposed Patent, these features are at least based on measures obvious to a skilled person, which cannot establish an inventive step.

In detail:

Feature M8:

As discussed above, Figure 10 of D10 shows an embodiment in which the RFIC 36 is mounted on a substrate with conductive tracks, which also holds the display. This substrate is thus a printed circuit board within the meaning of claim 1.

Even if it were assumed that D10 does not disclose that the RFIC 36 is arranged on a printed circuit board, this is a completely obvious and technically necessary measure for the skilled person, which cannot support an inventive step, since an electronic circuit must necessarily be contacted via a printed circuit board, as already shown.

Feature M9:

D10 discloses in claim 9 that the electronic label communicates with a near"y "RFID-dev"ce""

"The wireless display tag of claim 1, wherein the integrated circuit is further adapted to receive information from RFID devices within a local area and to retransmit information from such other RFID devices to the host using RF backscatt"r."

Even if one were to assume that this RFID device does not represent a mobile terminal within the meaning of feature M9, it would still be obvious to a skilled person to also enable communication with such a mobile terminal.

As already explained, it is inherent to RFID communication to send a unique identifier to identify the RFID tag. Since, according to column 5, lines 43 et seq. of D10, the RFIC 36 can be used both for communication with the background system ("active transceiver") and for RFID communication ("backscatter communication") and would use the RF antenna 40 for this purpose according to column 5, lines 49 and 50, it is obvious that the RFIC and the antenna are also used to send an identifier to a mobile terminal.

Furthermore, column 4, lines 6 - 28 also disclose the transmission of information from the electronic label to a handheld wireless terminal.

Additionally, since the electronic label according to D10 is already suitable for communication with an RFID device (feature M9 does not require more), no technical adaptations of the electronic label would be necessary.

However, even if one were to assume that such technical adaptations would be necessary to be able to communicate with a mobile terminal, this would be within the scope of measures customary in the art and likewise cannot constitute an inventive step.

Based on D10, a skilled person would also have a reason to provide for communication with a mobile terminal, as such a communication is already mentioned on page 4, lines 26 ff. of D1 (command from authorized handheld wireless terminals).

In summary, feature M9 cannot support an inventive step.

Feature M11:

Even if one were to assume that the arrangement of the RFID chip on the printed circuit board is not expressly disclosed in D10, this is also an obvious measure and furthermore a technical necessity, since a chip is regularly arranged on a printed circuit board.

Thus, this feature cannot support an inventive step either.

Feature M12:

As shown above, D10 discloses the arrangement of an RF antenna on the front side of the electronic label. Even if one were to assume that this RF antenna is not expressly intended for RFID communication with a mobile terminal, but only for communication with the background system, it would still be an obvious measure for a skilled person to provide this antenna located on the front also for RFID communication. A skilled person would have reason to do this, based on the consideration that a user will usually approach the electronic label with "n "RFID-dev"ce", which is to communicate with the electronic label, from the front side of the electronic label when the label is located on a shelf. In order to enable the most interference-free inductive coupling possible, on which the principle of RFID communication is based, a skilled person would also want to place the RFID antenna at the front of the electronic label.

In addition, a skilled person knows that the same antenna could be used for communication with the background system and for RFID communication (e.g. at 2,4 GHz, which is also an RFID frequency). In that scenario the antenna which can be arranged at the front of the WDT will also be used for RFID communication.

Thus, based on D10, the provision of the RFID antenna on the front of the ESL cannot support an inventive step either.

Lack of inventive step compared to D10 and US 7,973,722 B1 (D11).

A copy of the publication US 7,973,722 B1 in English is attached as.

Annex KSW 20,

D11 was published on July 05, 2011, and is thus relevant for assessing the novelty and inventive step of the Opposed Patent (Art. 54(2) EPC).

Even if a skilled person would still have doubts about the arrangement of the RFID antenna based on D10 and would thus not directly infer feature M12 from D10, he would refer to the teaching of D11, which discloses in claim 1 that a part of the antenna is arranged on the exterior surface of the display:

"wherein a portion of the planar antenna lies on the exterior surface of the display."

D11 relates to an electronic device with an antenna that supports NFC communication. Column 1, lines 27 - 31 of D11 specifies the electronic device as follows:

In accordance with an embodiment of the present invention, an electronic device is provided that has an antenna. The electronic device may be a computer monitor or other device with a display. The electronic device may include a housing in

D11 can therefore apply to any electronic device with a display. An ESL is also such an electronic device with a display that has RFID/NFC communication capabilities.

D10 and D11 thus relate to the same technical subject matter, so that a person skilled in the art would not be prevented from combining the two teachings.

With respect to the placement of the antenna on the front of the electronic label, the Opposed Patent discloses in paragraph [0038]:

"Cependant, un positionnement de l'antenne sur la face arrière à l'intérieur à côté de la puce 37 réduirait la distance et la fiabilité de lecture puisque celle-ci devrait alors se faire à travers l'écran d'affichage 31 de l'étiquette électronique 3 (typiquement d'une épaisseur de 1cm) et les perturbations électromagnétiques induites par la carte de circuit imprimé."

In English:

" However, positioning the antenna on the rear face inside next to the chip 37 would reduce the reading distance and reliability since this would then have to be done through the display screen 31 of the electronic label 3 (typically 1cm thick) and the electromagnetic disturbances induced by the printed circuit board."

The same technical problem is addressed by D11 in column 4, lines 43-74:

"If, for example, a conventional antenna were to be placed directly behind an LCD display, the conductive nature of the internal components of the LCD display would serve as radio-frequency shielding and would block electromagnetic fields emanating from the antenna."

To avoid such interference from internal components of the display, D11 suggests placing the antenna on the front of the electronic label, that is, outside the display, as already shown.

Since D11 explicitly describes the same technical effect to this feature as the Opposed Patent, a skilled person would have reason to apply this feature of D11 to the teaching of D10 to solve the same technical problem and would thus arrive at the subject matter of granted claim 1 of the Opposed Patent without being inventive.

Lack of inventive step compared to D10 and EP 2 402 930 A1 (D2)

A copy of the publication EP 2 402 930 A1 (D2) in English is enclosed as

Annex KSW 7,

D2 was published on January 04, 2012, and is thus relevant for assessing the novelty and inventive step of the Opposed Patent (Art. 54(2) EPC).

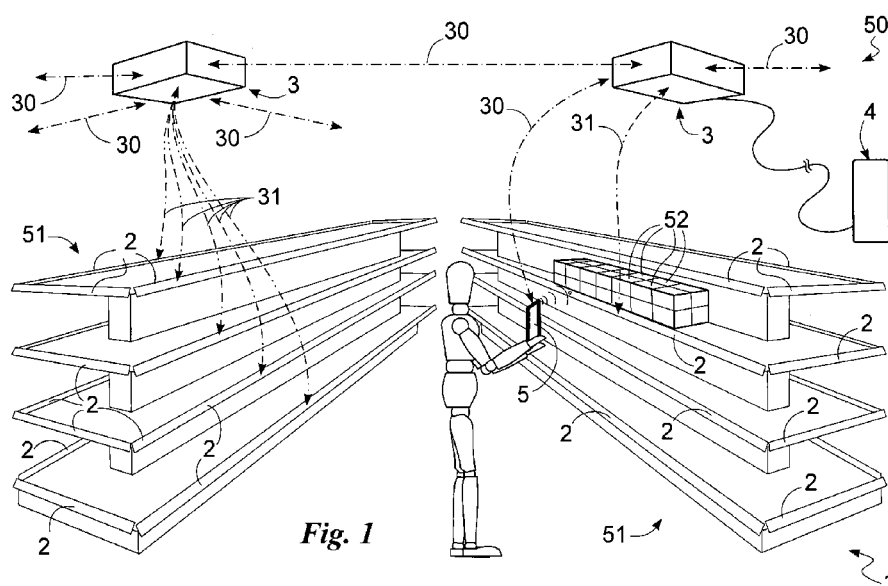
Even if one were to assume that D10 does not disclose features M9 and M10, these features can be derived from D2. According to the abstract, D2 also discloses an electronic label for a sales area provided with a series of distributed electronic labels. Thus, D2 relates to the same technical subject matter as D10, so that a skilled person would have no difficulty in combining the two documents.

Due to the lack of features M9 and M10 starting from D10, a skilled person would look for a way to control the electronic label by an operator located near the electronic label.

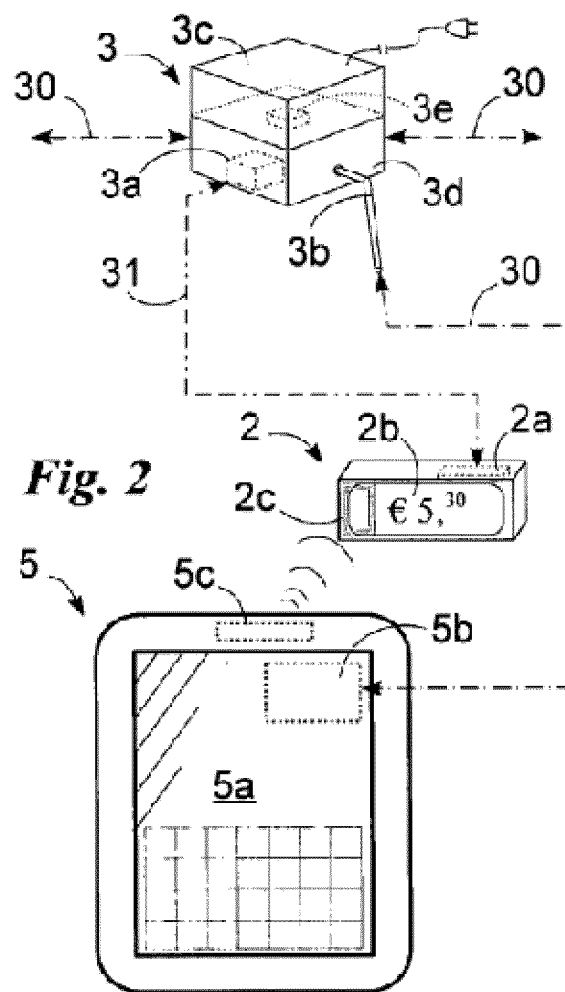
- 83 -

For this, a skilled person would find a solution in the D2.

D2 discloses attaching a plurality of electrical labels to shelves in, for example, a supermarket:



The electronic labels 2 have at least two communication channels. This can be seen from Fig. 2 of D2:



The electronic label 2 has a first connection means for establishing a connection with a background system. This is the "first end connection means 2a", which according to paragraph [0030] comprises an antenna and a transmission circuit for electromagnetic waves with a frequency of 2.4 GHz:

"In greater detail, the end connection means 2a is preferably made up of an antenna and a transceiver circuit for aerial electromagnetic waves, i.e. not through a cable, to a frequency of about 2.4 GHz,..."

Thus, D2 first discloses that the electronic label communicates with a background system via a first communication channel.

As can be seen from Fig. 2, the electronic label communicates directly with a mobile terminal device ("control device 5"). This can be a PDA or a tablet computer, for example:

"The control devices 5 suitably consist of PDA, palm-sized computers, tablet computers or others. They are adapted to be used by the responsible persons or operators inside the store 50 and to supply information about the amount of products 52 in stock or other service information."

This terminal thus provides an easy way for an operator who is in close proximity to the electronic label to control it.

This is done via an RFID connection that is established via the "identifying element 2c". This can be seen from paragraph [0030]:

"It suitably consists of a so-called passive RFID tag, comprising an antenna adapted to also charge a communicating circuit with energy on reception, or

alternatively of a bar code or the like or a mere alphanumeric identification code."

Even if a person skilled in the art were to assume that communication with the mobile terminal device does not take place via RFID in 13.56 MHz , but exclusively via the frequency of 2.4 GHz disclosed in some embodiments of D10 and another type of communication, a person skilled in the art would set himself the task of enabling more energy-efficient communication with a mobile terminal device on the basis of D10.

A skilled person finds a solution to this in D2 as follows, column 4, lines 18 - 22 reveals the following (em-phasis added):

communicating with the protocol IEEE 802.15.4. The identifying element 2c is preferably passive and therefore does
20 not involve any energy waste. It suitably consists of a so-called passive RFID tag, comprising an antenna adapted to also charge a communicating circuit with energy on

D2 therefore expressly states that the use of passive RFID communication results in energy savings, unless this is already known to the person skilled in the art from his specialist knowledge.

A skilled person would thus find in D2 a simple way to control the electronic device by an operator located in its vicinity using a mobile terminal. A skilled person would apply this teaching of D2 to D10 and arrive at the subject matter of the grant claim 1 of the Opposed Patent without any inventive step.

Lack of inventive step compared to D2 and D10

Alternatively, D2 could also be considered the closest prior art.

D2 does not disclose the arrangement of the RFID antenna on the front side of the electronic label according to feature M12 of claim 1. This feature has the technical effect that an antenna arranged on the front side of the electronic label will have a better transmission performance to a mobile terminal which is also located on the front side of the electronic label. Furthermore, electromagnetic interference between the antenna and other metallic components of the electronic label located inside it (for example, printed circuit board, battery, etc.) can be avoided.

To achieve this technical effect, a skilled person finds in D10 the solution of placing the antenna on the front side of the electronic label. This is clear from D10, paragraph [0051], as already shown:

"Alternative embodiments may utilize an RF antenna that is painted or etched onto the face of the front or rear housing 42."

To avoid repetition, please refer to our comments in this regard in the sections above.

It is obvious to a skilled person that the arrangement of the antenna on the front side of the electronic label enables better transmission power to a mobile terminal that is also located on the front side of the electronic label. This corresponds to the normal case, since an operator will always approach the electronic label with the mobile terminal from its front side. Furthermore, it is clear to a skilled person based on his or her professional knowledge that a radio antenna should not be arranged in the vicinity of other metallic components if possible, so that interference can be avoided.

A skilled person would thus apply the teaching of D10 to D2 and arrive at the subject matter of claim 1 of the patent-in-suit without inventive step.

Lack of inventive step based on US 2005/0253685 A1 (D3)

Even if one were to assume that a skilled person would not clearly infer from D3 the provision of two different communication channels, one to the background system and one to a mobile terminal, this is an obvious measure that a skilled person would infer from numerous other publications, e.g., D2, D4, D5 or D6. On this in detail:

Disclosure of document D2

As discussed above, D2 discloses an electronic label that communicates with a background system via a first communication channel and communicates with a mobile terminal via a second RFID communication channel. To avoid repetition, please refer to our discussion above in connection with D2.

Disclosure of document D4

Taiwanese utility model TW M345297 U (D4) was published on November 21, 2008, and is thus relevant to the question of inventive step (Art. 54(2) EPC).

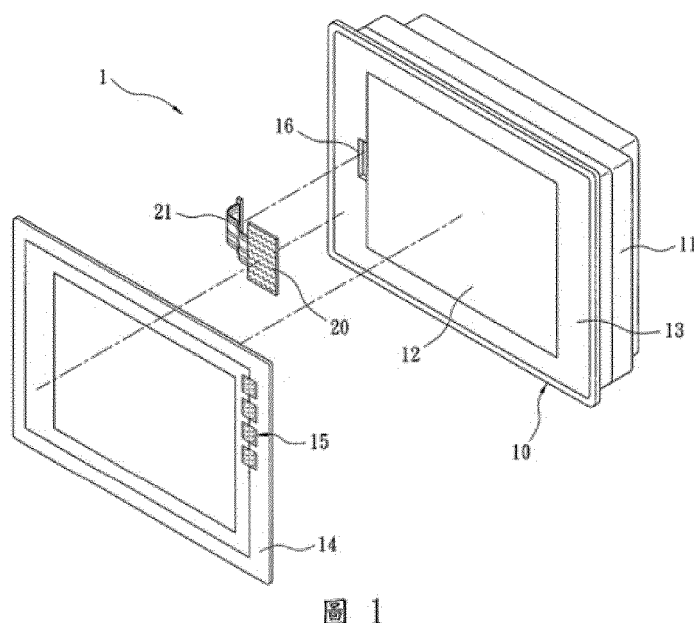
A copy of the publication TW M345297 U is attached as

Annex KSW11 ,

as well as an English machine translation is submitted as

Annex KSW11a.

D4 describes a display device 1, such as a tablet computer (par. [0005]: *tablet computer*) having a display 12, a body 11 (*body*), a front frame 13 (*front frame*), and a membrane 14 (*membrane*) in the form of a waterproof sheet.



The display device 1 has a wireless identification system of the RFID type. The aim of the technical teaching of the D4 is to be able to identify the display device.

D4 describes in general terms the ability, in the sense of feature **M9**, to transmit identification data from the tablet computer via WLAN or Bluetooth to other devices, such as a *host computer* (para. [0004]).

D4 discloses a flat RFID antenna 20 of a wireless identification system, which is implemented as a foil and is connected to the interior of the display device via a connection cable 21 through a slot 16. Thus, D4 discloses a radio frequency device having an RFID antenna according to feature **M10**. An existing system *circuit* (para.

[0009]: *system circuit*) for controlling the RFID antenna is designed as a chip, i.e. as an RFID chip, from the point of view of a skilled person.

The arrangement of an RFID chip on a printed circuit board (feature **M11**) is specified by D4 at least insofar as a system circuit is explicitly provided inside the display device, i.e., spatially separated from the RFID antenna 20 (para. [0009]: "*The interior is provided with the system circuit*").

The RFID film antenna 20 is disposed between the front frame 13 (*front frame*) of the housing and the waterproof film 14, i.e., on the front side of the display device. Feature **M12** is disclosed.

The purpose of arranging the RFID antenna 20 on the front side is to avoid shielding of the antenna by metal (see [0003]: "*electric waves cannot pass through metals*"; [0005]: *avoid shielding effect*). D4 thus discloses the technical effect of arranging the antenna on the front side to avoid shielding, thereby increasing the range of the antenna.

Disclosure of document D5

Taiwanese utility model TW M353498 U (D5) was published on March 21, 2009, and is thus relevant to the question of inventive step (Art. 54(2) EPC).

A copy of the publication TW M353498 U is attached as

Annex KSW12 ,

as well as an English machine translation is submitted as

Annex KSW12a

D5, entitled *Near Field Communication Antenna*, discloses a *near field communication* (NFC) antenna 100 arranged on the front of a *display panel* 200, which may be, for example, part of a cell phone (para. [0021]: *cell phone*).

The NFC antenna 100 is mounted on a flexible substrate 110 having *an* opening H (par. [0026]: *flexible substrate 110 may have an opening H*) and includes electrodes 122 (*electrodes*) and a coil assembly 124 (*coil assembly*) extending around the display area 204 (*display area*) of the display panel 200 (see par. [0029]), which is an LCD display (par. [0017]: "*Liquid Crystal Display panel (LCD panel)*").

The NFC antenna 100 is electrically connected to a circuit board 300 disposed on the back of the display 200. The circuit board 300 may be the motherboard of a hand-held electronic device, such as a cell phone or a *personal digital assistant* (PDA) device:

[0031] It is worth mentioning that, in this embodiment, the NFC antenna 100 can be electrically connected to a circuit board 300. The circuit board 300 can be a main board of a hand-held electronic device such as a mobile phone or a personal digital assistant, and the NFC antenna 100 can be electrically connected to the circuit board 300 through the electrodes 122, wherein the circuit board 300 can be a rigid printed circuit board.

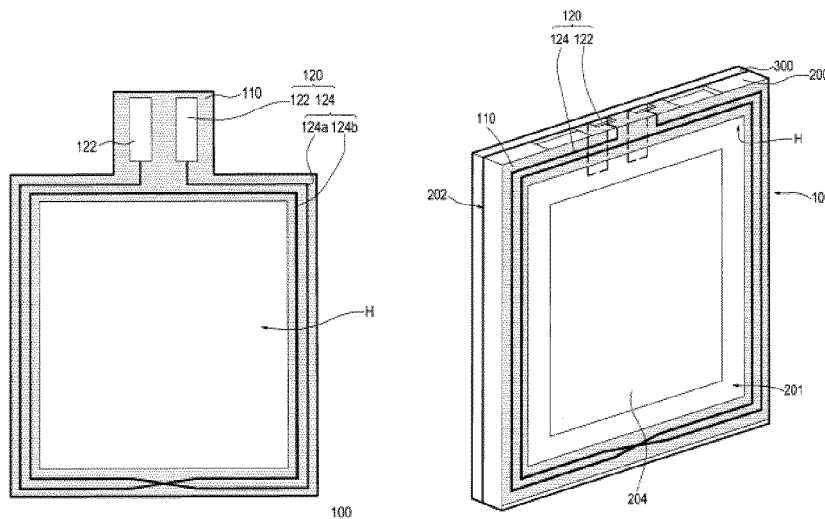


圖 1

圖 2A

D5 discloses in summary at least expressly the features **M5** (display screen 200), **M8** (printed circuit board 300), **M8.1** (printed circuit board 300 on the rear side), **M12** (NFC antenna on the front side) as well as an NFC antenna 100 and technically necessarily an associated NFC chip according to **M10** and for a skilled person also the feature **M11** (chip on the printed circuit board 300).

In paragraph [0004], the problem is described at the beginning that the placement of an NFC antenna directly on the printed circuit board ("mother board") of a cell phone is disadvantageous:

[0004] *The mobile phone with the function of the near field communication technology usually has a near field communication antenna (NFC antenna) installed inside it. It is known that most NFC antennas are directly installed on the mother board of the mobile phone, and occupy a large area on the mother board, so that the NFC antenna will affect the arrangement of multiple electronic components (such as capacitors, inductors, resistors,*

diodes and transistors, etc.) on the mother board. Therefore, this mobile phone will encounter many difficulties in circuit design.

As a solution, D5 describes the arrangement of the NFC antenna 100 on the front side of the screen 200 separately from the printed circuit board 300 arranged on the back side of the screen 200 (see paras [0020], [0021]). The avoidance of electromagnetic interaction between electronic components on the printed circuit board with the antenna is described as a major advantage (see para [0033]):

[0033] It can be seen from this that the display panel 200 is still interposed between the NFC antenna 100 and the circuit board 300. Therefore, when a plurality of electronic components (not shown) on the circuit board 300 are in operation, the Electromagnetic Interference (EMI) generated by these electronic components will not affect the operation of the NFC antenna 100, thereby ensuring the quality of receiving and transmitting electromagnetic wave signals.

This advantage is explained again in paragraphs [0034] and [0036]:

[0034] To sum up, the NFC antenna of the present invention can be fixed on the display panel of the mobile phone, and does not occupy a large area on the circuit board (such as the motherboard of the mobile phone or personal digital assistant). Therefore, the NFC antenna of the present invention will not affect the arrangement of multiple electronic components on the circuit board. In this way, the invention can reduce the difficulties encountered in the circuit design of the mobile phone.

[0036] *Furthermore, the NFC antenna of the present invention does not need to be directly mounted on a circuit board (such as a main board of a mobile phone or a personal digital assistant), and a display panel is also interposed between the NFC antenna and the circuit board. Compared with the conventional technology, the invention can reduce the influence of the electromagnetic interference from the circuit board on the near field communication antenna, so as to maintain the quality of receiving and sending electromagnetic wave signals.*

D5 discloses exactly the technical solution and states the advantages of a separate arrangement of an NFC antenna on the front of a display to avoid electromagnetic interference with components on the printed circuit board, which the Opposed Patent also considers advantageous.

Disclosure of document D6

Document WO 2008/073181 A2 (D6) was published on June 19, 2008, and is thus relevant to the question of inventive step (Art. 54(2) EPC).

A copy of the publication WO 2008/073181 A2 is attached as

Annex KSW13.

According to paragraph [0002], WO'181 deals with the activation and reading of RFID *tags and labels*:

[0002] *An embodiment relates generally to the field of Radio Frequency Identification (RFID). More particularly, an embodiment relates to a method and a system for activating and powering RFID tags and labels.*

The structure of the components of an RFID tag 2 with integrated circuit 6, 543 and antenna 8, 580 on a *circuit board* are described in paragraph [0033] with respect to Fig. 2 and in paragraph [0047] with respect to Fig. 5, whereby an RFID circuitry 560 *and* thus an RFID antenna 580 are disclosed in Fig. 5.

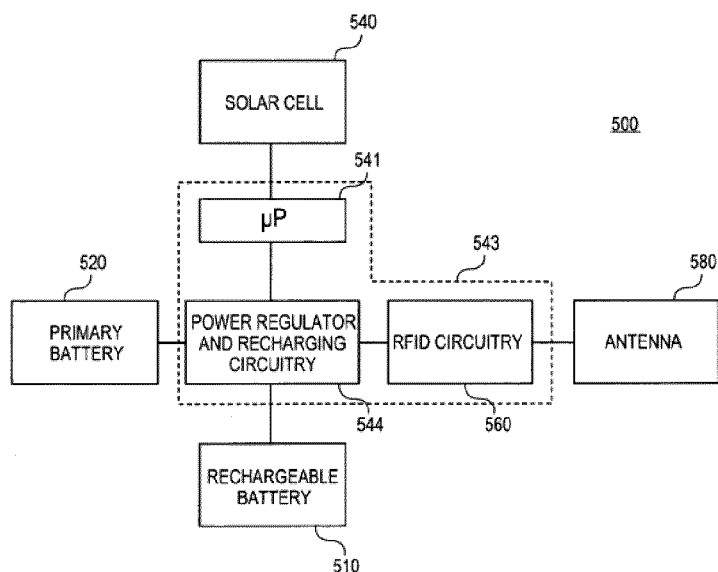


FIG. 5

After activation by a reader, the RFID label sends a unique identification code to a reader, such as a *handheld device*:

[0012] [...] In one embodiment, a user can turn the label "on" by activating the label with the device, for example, a handheld device. In one embodiment, the activation may be accomplished by sending a radio frequency signal to the label. Next, an antenna on the label receives the signal from the device. The received signal provides energy to activate the label. In one embodiment, once activated, the label may perform a registration operation with the device, e.g., the label may exchange its unique code with

the device. This "registration" of the label may provide the device with a unique identifier for the label.

This functionality is also described in paragraphs [0045] through [0048] with reference to RFID antenna 580 in Figure 5:

[0045] [...] The user can turn the label on by activating the label with a device (i.e. a handheld device). The activation is accomplished by sending a radio frequency signal to the label. The antenna on the label will receive the signal from the device. This received signal will provide energy to activate the label.

[0046] Once activated, the label will exchange its unique code with the device. This "registration" of the label provides the device with a unique identifier for the label.

[0047] [...] As shown in Figure 5, label 500 includes an integrated circuit 543 coupled to antenna 580 and powering device 540 (e.g., a solar cell), powering device 520 (e.g., a primary battery), and 510 (e.g., a rechargeable battery). Integrated circuit includes a microprocessor 541 coupled between a solar cell powering device 540 and power regulator and recharging circuitry 544, as shown in Figure 5. Integrated circuit 543 further includes an RFID circuitry 560 that can contain a label identifier information. RFID circuitry 560 is coupled to power regulator and recharging circuitry 544 and to antenna 580, as shown in Figure 5.

[0048] Antenna 580 may be used to receive from and transmit RF signals to another device, e.g., an object locating handheld device.

The RFID circuitry 560 is understood by the skilled person to be part of an RFID chip arranged on a printed circuit board.

In summary, WO'181 at least explicitly discloses features **M2** (label identifier), **M8** (printed circuit board), **M9** (communication of a label identifier to a mobile terminal), **M10** (RFID antenna 580 with RFID chip for RFID communication), in particular the intended functionality for communicating a label identifier to a mobile terminal via RFID communication.

Obviousness of the subject matter of claim 1

Starting from document D3, the subject matter of claim 1 of the Opposed Patent has been obvious to a skilled person in consideration of the disclosure of either one of documents D2, D4, D5 or D6.

Due to the lack of features M9 and M10 starting from D3, a skilled person would look for a way to control the electronic label by an operator located near the electronic label.

To achieve this technical effect, a skilled person would consult D2, which, as already discussed, concerns the same technical object, namely the electronic label. A skilled person would find in D2 a simple way to control the electronic device by an operator located in its vicinity using a mobile terminal via an RFID connection. A skilled person would apply this teaching of D2 to D3 and arrive at the subject matter of claim 1 of the patent-in-suit without inventive step.

Furthermore, similar solutions from TW '297 (D4) for RFID communication and TW '498 (D5) for NFC communication were already known.

RFID communication of a label identifier to a mobile terminal was also explicitly known from D6.

A skilled person would have applied the teaching on RFID and NFC communication from documents D4, D5 or D6 to adapt the ESL from D3 for communication with a mobile terminal. This is because the advantage of providing a front side separately arranged transmitting antenna with the effect mentioned in the Opposed Patent, namely avoiding electromagnetic interference between components on the printed circuit board and the transmitting antenna, are already mentioned in D3 (see para. [0033]) and are also addressed in D4 and especially in D5.

The skilled person, considering his expert knowledge (see above) of the possibilities of the technology of RFID and NFC communication long known at the priority time, had a reason to adapt the ESL from D3 based on D2, D4, D5 or D6 accordingly for suitability for communicating identification information to a mobile terminal by means of RFID or NFC.

In this way, the skilled person would have arrived at the subject-matter of claim 1 of the Opposed Patent without inventive step.

Lack of inventive step based on US 7,520,429 B2 (D12)

A copy of the publication US 7,520,429 B2 (D12) in English is enclosed as

Annex KSW40.

D12 was published on 21 April 2009 and is therefore relevant for assessing novelty and inventive step of the opposed patent.

D12 also discloses an electronic shelf label (named "electronic programmable display tag" in this document). A plurality of these wireless displays will be used to indicate prices of a product in a shop as shown in Fig. 1 of D12.

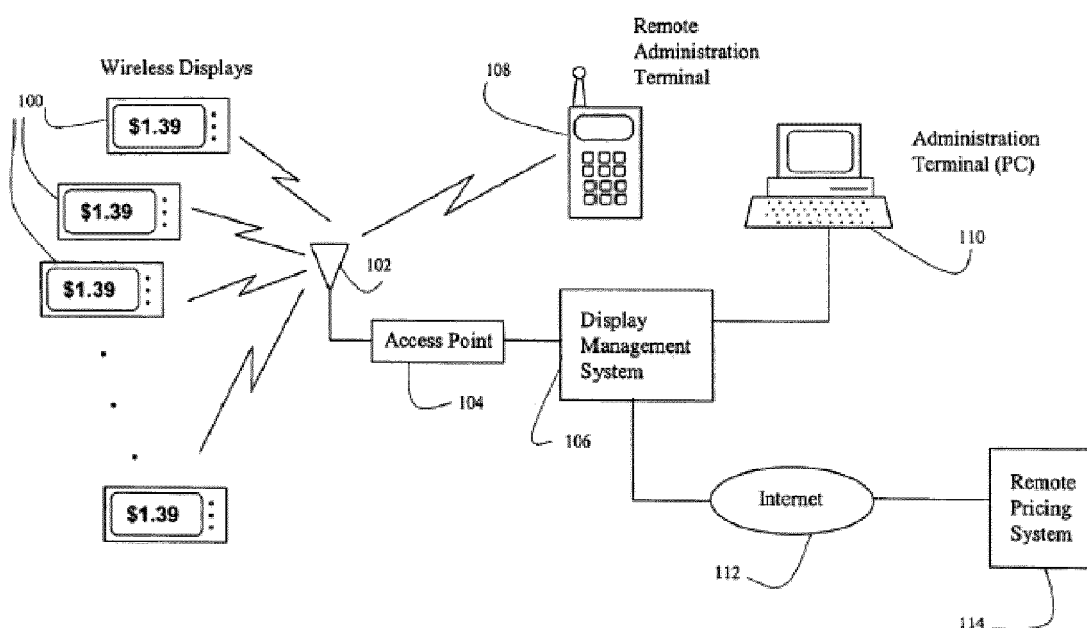


Figure 1

As can be seen in this figure, the wireless displays are connected via an access point 104 and the internet 112 to a remote pricing system 114 which is equivalent to the central server 2 of the opposed patent.

As will be explained in more detail below, the wireless display also comprises an additional RFID antenna for direct communication with a nearby device.

The features of the opposed patent are disclosed in D12 as follows:

Feature M1:

Electronic label (3) for a sales area with a series of distributed electronic labels (3),

D12 discloses in column 1, lines 13 to 15:

"This invention generally relates to electronic programmable display tags that are remotely programmed to indicate prices for merchandise."

Feature M2:

each electronic label (3) is identified by a unique label identifier specific to it, comprising:

D12 discloses in column 8, lines 9 to 15:

"The tag number 300 illustrates a numerical value uniquely associated with the display tag. This value is typically stored in non-volatile memory in the tag, as well as in memory in the DMS, and unique identifies the tag. In order to program display data for display on a given physical tag, as well as identify a tag, each display tag is provided a unique number."

Feature M3:

- a radio frequency communication module (32) configured to receive from a central server (2) data representative of information relating to an article);

D12 discloses in column 2, lines 19 to 26:

"These and other benefits are realized in the present invention that provides a programmable display tag ('tag') that can be remotely programmed using a wireless communications interface, such as by utilizing the IEEE 802.11 or 802.15.4 based series of wireless communication specifications. A small transceiver in the wireless display receives updated information, including regular price, sale price, and other consumer information."

Feature M4:

- a memory (33) to store said data representative of information relating to an article;

A memory 806 is disclosed in Fig. 19 of D12:

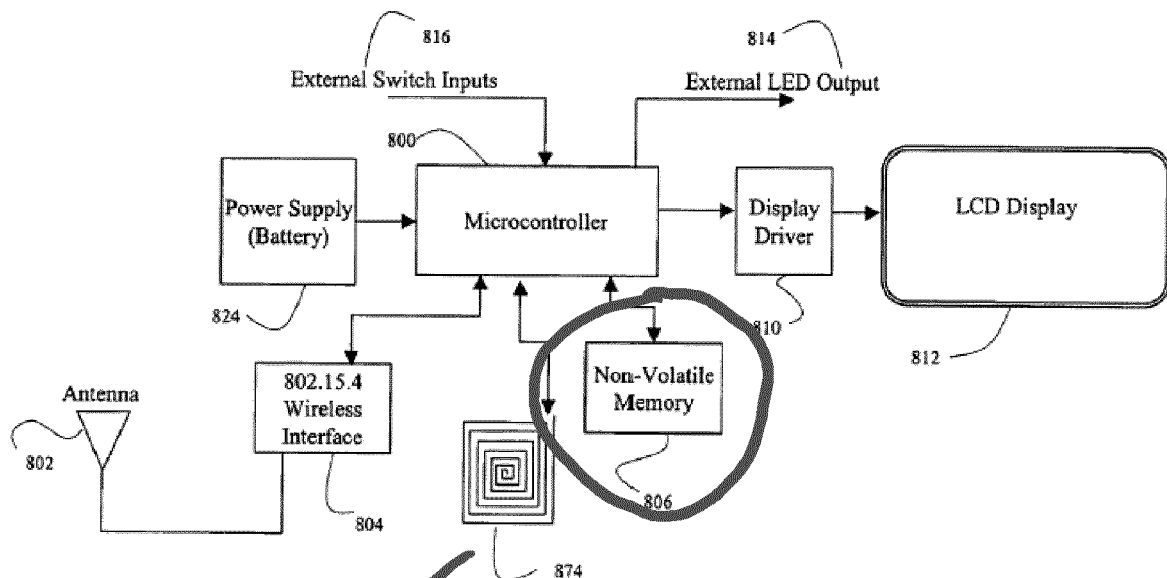


Figure 19

RFID
antenna

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Since the wireless display of D12 is used for indicating prices downloaded from a remote pricing system it is clear that this memory is also used for storing information about an article.

Feature M5:

- a display screen (31) configured to display said information relating to an article;

Fig. 3 of D12 discloses that wireless display comprises a display screen:

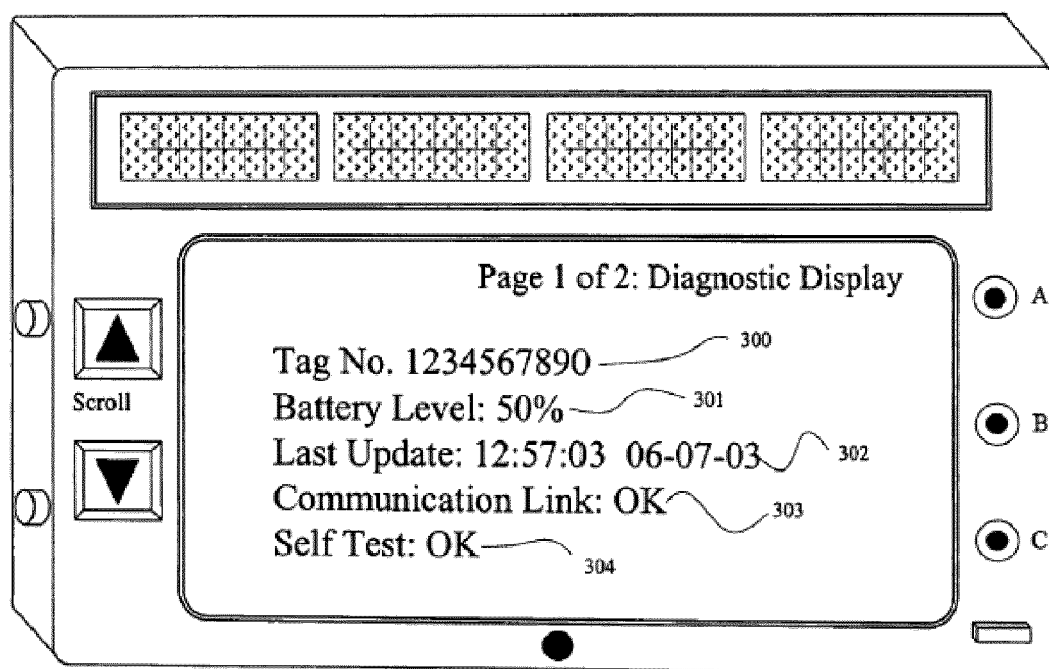


Figure 3

In this context, column 2, lines 56 to 58 disclose:

"FIG. 3 illustrates one embodiment of an administration display screen image according to the principles of the present invention."

Feature M6:

- a microcontroller (34) configured to control the display of said information relating to an article on the display screen (31);

D12 discloses in column 9, lines 48 to 50:

"In FIG. 8, a major component of the system is the micro-controller 800."

Feature M7:

- a case (30);

D12 discloses in column 6, lines 15 and 16:

"The tag is typically housed in a plastic case 200."

Feature M8:

- a printed circuit board (35),

As stated above, Fig. 19 of D12 discloses that the wireless display comprises several electronic components such as a microcontroller, a memory and a wireless interface. Although not explicitly mentioned, the most obvious alternative would be

to arrange these components on a printed circuit board. Therefore, at least use of a printed circuit board in the opposed patent cannot support inventive step.

Feature M8.1:

housed in the case (30) on the side of the back of the case

Of course, a skilled person would arrange such a printed circuit board inside the case or housing.

As already discussed above (see our explanations with regard to feature M8.1 in relation to D10 in page 39), at least when considering the interpretation used by the patent proprietor in KSW 19 it is sufficient if the PCB is located behind the RFID antenna. As will be shown later, a skilled person would be motivated to arrange the RFID antenna of D12 at the front of the housing so that the PCB would be arranged at the back of the housing relative to the position of the antenna.

Feature M8.2:

on which are arranged the radio frequency communication module (32), the memory (33) and the microcontroller (34);

As discussed above, a skilled person would arrange the wireless interface 804, memory 806 and a microcontroller disclosed in Fig. 19 on a PCB. This feature cannot support inventive step.

Feature M9:

- 105 -

- a radio frequency device (36) capable of establishing a communication (S1) by radio frequency with a mobile terminal (1) and communicating to said mobile terminal the identifier of the electronic label,

In relation with Fig. 19, D12 discloses in column 29, lines 6 to 11:

"The micro-controller can transmit and receive data via the 802.15.4 wireless interface 804 using an antenna 802. A second antenna 874 is interfaced with the micro-controller, but in a manner slightly different than the 802.15.4 antenna. The second antenna is of the type used with RFID tags."

D12 also discloses to transmit a unique identifier of the electronic label via RFID. D12 discloses in column 29, lines 12 to 14:

"Recall that passive RFID tags operate by having a resonator antenna functioning with an integrated circuit (IC) wherein the integrated circuit stores the particular number."

A concrete example is illustrated in D12, column 29, lines 33 to 38:

"An example illustrates the principles of this integration. Assume a programmable display tag with the integrated RFID tag is placed on a crate and used to track the crate in a warehouse. The warehouse may have RFID tag reader that reads the display tag and uses that number to identify the particular crate."

As stated above, it should be considered that the mobile terminal is not part of the claimed device since the claim relates only to the electronic label which

according to feature M9 is capable of communicating a unique identifier to a mobile terminal via RFID (which is disclosed in D12).

Feature M10:

the radio frequency device (36) comprises an antenna (38) and an electronic chip (37) of NFC or RFID type, wherein the communication (S1) by radio frequency between the radio frequency device (36) and the mobile terminal (1) being established by NFC or RFID communication,

As stated above, Fig. 19 of D12 discloses that the wireless display comprises an RFID antenna 874.

An RFID chip is disclosed in D12, column 29, lines 24 to 26:

"Thus, a RFID tag with a particular value is integrated with the programmable display tag wherein the programmable display tag also stores the value in the RFID tag."

The RFID tag of D12 corresponds to the RFID chip according to feature M10.

Feature M11:

the electronic chip (37) of the radio frequency device being deposited on the printed circuit board (35), and

It would be the most obvious alternative to arrange this RFID chip (RFID tag) on a printed circuit board inside the housing. This feature at least cannot support inventive step.

Feature M12:

the antenna (38) of the radio frequency device being deposited on or in the housing on the side of the front of the electronic label.

The only feature which is not disclosed or rendered obvious by D12 alone is that the RFID antenna is arranged at the front of the electronic label.

It should be noted that D12 discloses that the wireless display comprises a passive RFID tag (D12, column 29, lines 1 and 2):

"FIG. 19 illustrates one embodiment of integration of a passive RFID data with the programmable display tag."

Column 29, lines 12 to 14 further disclose:

"Recall that passive RFID tags operate by having a resonator antenna functioning with an integrated circuit (IC) wherein the integrated circuit stores the particular number."

Such a resonator antenna will be activated by inductive coupling. A skilled person knows that inductive coupling will be affected by metallic components placed between the receiving antenna (passive RFID antenna 874) and the active RFID antenna of the RFID reader (mobile terminal).

Therefore, even without considering any further prior art documents, a skilled person would be motivated only based on his or her technical understanding to arrange the RFID antenna which is intended to be used for inductive coupling at the front of the housing of the wireless display of D12 since any mobile terminal will approach the wireless display from its front side. Of course a skilled person

would be motivated to arrange the RFID antenna at the closest position possible to the mobile terminal in order to improve inductive coupling.

For this reason alone, feature M12 cannot support inventive step.

However, a skilled person would derive this feature also from a plurality of other documents which will be explained in detail below:

Disclosure of document US 7,973,722 B1 (D11)

As already discussed, D11 relates to an electronic device with an antenna that supports NFC communication. Column 1, lines 27 - 31 of D11 specifies the electronic device as follows:

In accordance with an embodiment of the present invention, an electronic device is provided that has an antenna. The electronic device may be a computer monitor or other device with a display. The electronic device may include a housing in

D11 can therefore apply to any electronic device with a display. An ESL is also such an electronic device with a display that has RFID/NFC communication capabilities.

D12 and D11 thus relate to the same technical subject matter, so that a person skilled in the art would not be prevented from combining the two teachings.

With respect to the placement of the antenna on the front of the electronic label, the Opposed Patent discloses in paragraph [0038]:

"Cependant, un positionnement de l'antenne sur la face arrière à l'intérieur à côté de la puce 37 réduirait la distance et la fiabilité de lecture puisque

celle-ci devrait alors se faire à travers l'écran d'affichage 31 de l'étiquette électronique 3 (typiquement d'une épaisseur de 1cm) et les perturbations électromagnétiques induites par la carte de circuit imprimé."

In English:

"However, positioning the antenna on the rear face inside next to the chip 37 would reduce the reading distance and reliability since this would then have to be done through the display screen 31 of the electronic label 3 (typically 1cm thick) and the electromagnetic disturbances induced by the printed circuit board."

The same technical problem is addressed by D11 in column 4, lines 43-74:

"If, for example, a conventional antenna were to be placed directly behind an LCD display, the conductive nature of the internal components of the LCD display would serve as radio-frequency shielding and would block electromagnetic fields emanating from the antenna."

To avoid such interference from internal components of the display, D11 suggests placing the antenna on the front of the electronic label, that is, outside the display. This is disclosed in claim 1 of D11:

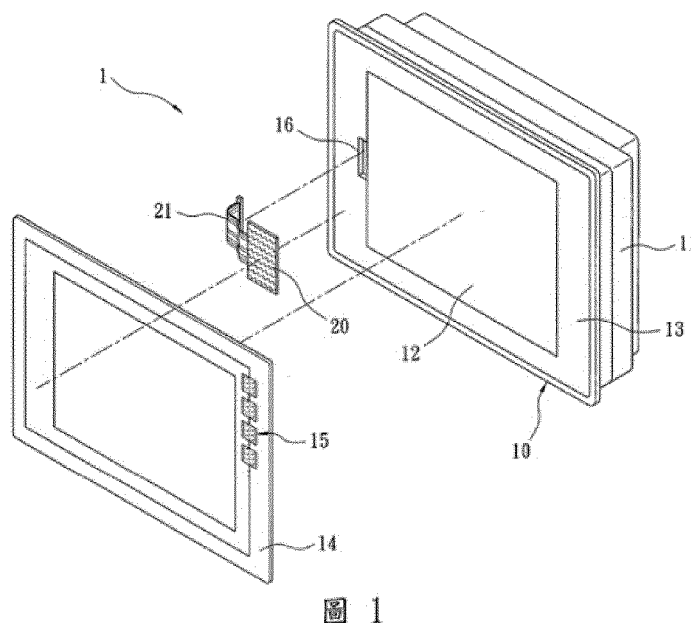
"wherein a portion of the planar antenna lies on the exterior surface of the display."

Since D11 explicitly describes the same technical effect to this feature as the Opposed Patent, a skilled person would have reason to apply this feature of D11 to the teaching of D12 to solve the same technical problem and would thus arrive at

the subject matter of granted claim 1 of the Opposed Patent without being inventive.

Disclosure of document D4

As already discussed, D4 describes a display device 1, such as a tablet computer (par. [0005]: *tablet computer*) having a display 12, a body 11 (*body*), a front frame 13 (*front frame*), and a membrane 14 (*membrane*) in the form of a waterproof sheet.



The display device 1 has a wireless identification system of the RFID type. The aim of the technical teaching of the D4 is to be able to identify the display device.

D4 describes in general terms the ability, in the sense of feature **M9**, to transmit identification data from the tablet computer via WLAN or Bluetooth to other devices, such as a *host computer* (para. [0004]).

D4 discloses a flat RFID antenna 20 of a wireless identification system, which is implemented as a foil and is connected to the interior of the display device via a

connection cable 21 through a slot 16. Thus, D4 discloses a radio frequency device having an RFID antenna according to feature **M10**.

The RFID film antenna 20 is disposed between the front frame 13 (*front frame*) of the housing and the waterproof film 14, i.e., on the front side of the display device. Feature **M12** is disclosed.

The purpose of arranging the RFID antenna 20 on the front side is to avoid shielding of the antenna by metal (see [0003]: "*electric waves cannot pass through metals*"; [0005]: *avoid shielding effect*). D4 thus discloses the technical effect of arranging the antenna on the front side to avoid shielding, thereby increasing the range of the antenna.

Therefore, a skilled person would apply the disclosure of D4 to document D12 in order to improve the inductive coupling and arrive at the subject matter of claim 1 without being inventive.

Disclosure of document D5

As discussed above, D5, entitled *Near Field Communication Antenna*, discloses a *near field communication* (NFC) antenna 100 arranged on the front of a *display panel* 200, which may be, for example, part of a cell phone (para. [0021]: *cell phone*).

The NFC antenna 100 is mounted on a flexible substrate 110 having *an* opening H (par. [0026]: *flexible substrate 110 may have an opening H*) and includes electrodes 122 (*electrodes*) and a coil assembly 124 (*coil assembly*) extending around the display area 204 (*display area*) of the display panel 200 (see par. [0029]), which is an LCD display (par. [0017]: "*Liquid Crystal Display panel (LCD panel)*").

The NFC antenna 100 is electrically connected to a circuit board 300 disposed on the back of the display 200. The circuit board 300 may be the motherboard of a hand-held electronic device, such as a cell phone or a *personal digital assistant* (PDA) device:

[0031] It is worth mentioning that, in this embodiment, the NFC antenna 100 can be electrically connected to a circuit board 300. The circuit board 300 can be a main board of a hand-held electronic device such as a mobile phone or a personal digital assistant, and the NFC antenna 100 can be electrically connected to the circuit board 300 through the electrodes 122, wherein the circuit board 300 can be a rigid printed circuit board.

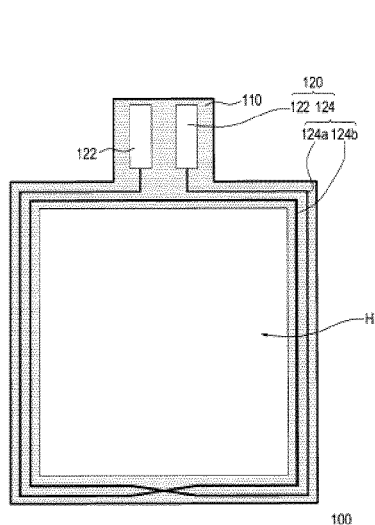


圖 1

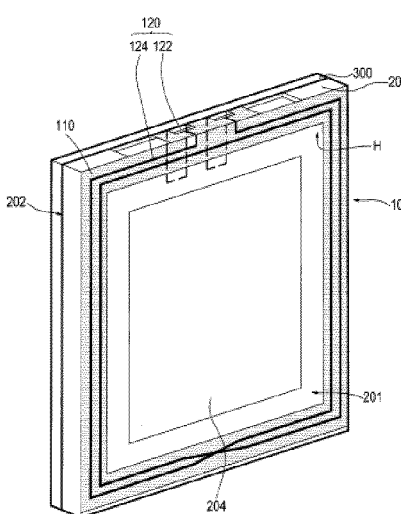


圖 2A

D5 discloses in summary at least expressly the features **M5** (display screen 200), **M8** (printed circuit board 300), **M8.1** (printed circuit board 300 on the rear side), **M12** (NFC antenna on the front side) as well as an NFC antenna 100 and technically

necessarily an associated NFC chip according to **M10** and for a skilled person also the feature **M11** (chip on the printed circuit board 300).

In paragraph [0004], the problem is described at the beginning that the placement of an NFC antenna directly on the printed circuit board ("mother board") of a cell phone is disadvantageous:

[0004] *The mobile phone with the function of the near field communication technology usually has a near field communication antenna (NFC antenna) installed inside it. It is known that most NFC antennas are directly installed on the mother board of the mobile phone, and occupy a large area on the mother board, so that the NFC antenna will affect the arrangement of multiple electronic components (such as capacitors, inductors, resistors, diodes and transistors, etc.) on the mother board. Therefore, this mobile phone will encounter many difficulties in circuit design.*

As a solution, D5 describes the arrangement of the NFC antenna 100 on the front side of the screen 200 separately from the printed circuit board 300 arranged on the back side of the screen 200 (see paras [0020], [0021]). The avoidance of electromagnetic interaction between electronic components on the printed circuit board with the antenna is described as a major advantage (see para [0033]):

[0033] *It can be seen from this that the display panel 200 is still interposed between the NFC antenna 100 and the circuit board 300. Therefore, when a plurality of electronic components (not shown) on the circuit board 300 are in operation, the Electromagnetic Interference (EMI) generated by these electronic components will not affect the operation of the NFC antenna 100, thereby ensuring the quality of receiving and transmitting electromagnetic wave signals.*

This advantage is explained again in paragraphs [0034] and [0036]:

[0034] *To sum up, the NFC antenna of the present invention can be fixed on the display panel of the mobile phone, and does not occupy a large area on the circuit board (such as the motherboard of the mobile phone or personal digital assistant). Therefore, the NFC antenna of the present invention will not affect the arrangement of multiple electronic components on the circuit board. In this way, the invention can reduce the difficulties encountered in the circuit design of the mobile phone.*

[0036] *Furthermore, the NFC antenna of the present invention does not need to be directly mounted on a circuit board (such as a main board of a mobile phone or a personal digital assistant), and a display panel is also interposed between the NFC antenna and the circuit board. Compared with the conventional technology, the invention can reduce the influence of the electromagnetic interference from the circuit board on the near field communication antenna, so as to maintain the quality of receiving and sending electromagnetic wave signals.*

D5 discloses exactly the technical solution and states the advantages of a separate arrangement of an NFC antenna on the front of a display to avoid electromagnetic interference with components on the printed circuit board, which the Opposed Patent also considers advantageous.

A skilled person would therefore apply the disclosure of D5 to document D12 in order to improve inductive coupling of the antenna and arrive at the subject matter of claim 1 without being inventive.

Disclosure of D13 (US 2011/0289023 A1)

Document US 2011/0289023 A1 (D13) was published on 24 November 2011 and is therefore relevant for the question of inventive step.

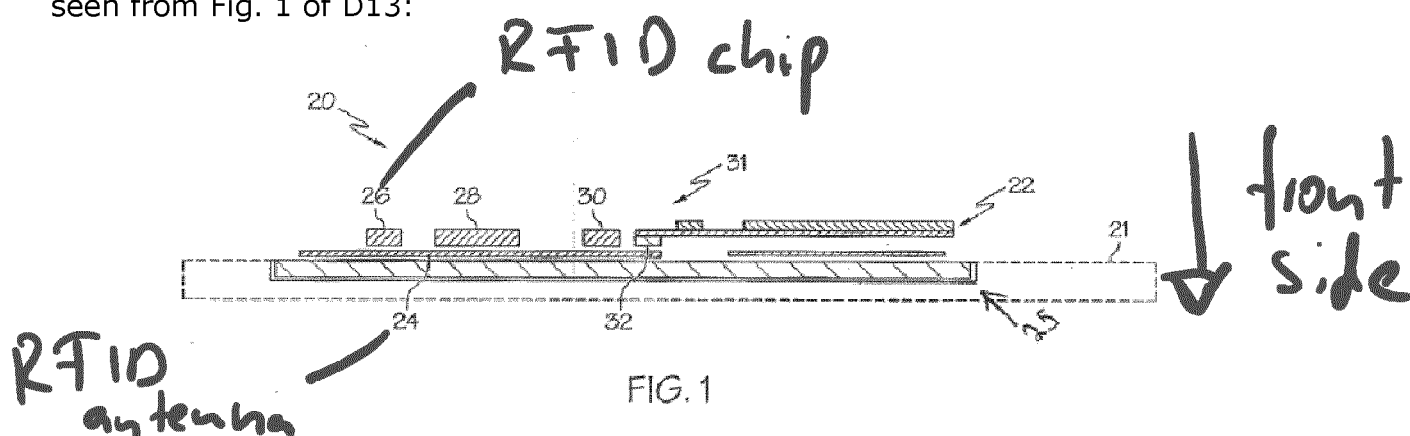
A copy of the publication US 2011/0289023 A1 is herewith filed as

Annex KSW41.

Similar to the opposed patent, D13 discloses a wireless display with an RFID antenna. For example, the abstract of D13 discloses:

"A retail item display includes an RFID processor, a display driving mechanism, at least one power source, and an electronic display. The RFID processor can include an antenna and an RFID processor."

In D13, the RFID antenna 24 is arranged in front of the RFID chip 26. This can be seen from Fig. 1 of D13:



In this figure, the front side of the wireless display is at the lower end of the figure so that RFID antenna 24 is arranged in front of the RFID chip 26.

D13 is from the same technical field as D12. Therefore, a skilled person would apply the disclosure of D13 to arrange the RFID antenna in front of the RFID chip

to the RFID antenna disclosed in D12 and arrive at the subject matter of claim 1 of the opposed patent without being inventive.

Lack of inventive step compared to D10 and CN202068693U (D7) or D3 and D7

D7 was published on 07.12.2011 and is thus relevant for the assessment of the inventive step of the Opposed Patent (Art. 54(2) EPC).

A copy of publication CN202068693U (D7) is attached as:

Annex KSW14 ,

and an English machine translation as

Annex KSW14a.

D7 discloses, according to par. 0002, a terminal for electronic communication that is suitable for NFC communication according to par. 0004.

Para 0008 discloses that the NFC antenna is located on the front of the housing:

In accordance with an aspect of the present invention, a shell of a front shell of a terminal device is provided, wherein an NFC antenna for short-range communication is embedded in a predetermined region of the shell.

Para 0013 discloses that the NFC antenna can be, for example, vapor deposited or applied by an etching process.

In addition, the above-mentioned NFC antenna is embedded in a predetermined area of the housing by one of the following methods: Vapor Deposition, Etching, Spraying, and Bonding.

Paragraph 0016 further discloses, the placement of an NFC chip within the housing connected to a printed circuit board ("motherboard"):

In addition, the feed line of the above-mentioned NFC antenna is connected to the NFC chip inside the terminal via a connector on the main board of the terminal.

Starting from D10 as the closest prior art, a skilled person would consider the teaching of D7 in his effort to improve the transmit power of the antenna. A corresponding motivation for the skilled person results explicitly from paragraph 0048:

Since the NFC antenna is on top, the card can be swiped conveniently, and the LCD display is below the antenna, away from the motherboard and battery, so the performance of the antenna is less affected.

This technical effect is identical to the alleged technical effect of the Opposed Patent claimed by the patent proprietor.

A skilled person would infer from this paragraph that the NFC antenna should be located at a distance from the printed circuit board and the battery in order to avoid influencing the transmission power of the antenna.

A skilled person would thus apply the teaching of D7 to D10 and arrive at the subject matter of claim 1 of the patent-in-suit without inventive step.

The same applies to a combination of document D3 with D7.

Lack of inventive step compared to D10, D3 and US2008/0198098 A1 (D8)

D8 was published on 21 August 2008, and is thus relevant for assessing the inventive step of the Opposed Patent (Art. 54(2) EPC).

A copy of publication US2008/0198098 A1 (D8) is attached as

Annex KSW15 .

D8 also discloses an electronic label for a sales floor (cf. par. 0006):

The present invention provides an electronic sign or sign card that uses a bistable display material that can be activated by electrodes to convey information.

Referring to paragraph 0117 and Figure 6b, the electronic label includes an RFID layer 32 located behind a display layer 30:

According to one embodiment shown in FIG. 6A and FIG.6B, the electronic tag or label 100b may comprise at least three relatively thin, flexible layers stacked to form a relatively thin, flexible tag or label 100b.

Each layer may include multiple sublayers. The uppermost layer forms a display layer 30 for forming and displaying information. According to an illustrative embodiment, the display layer 30 comprises a bistable, non-volatile display medium, such as electronic ink as described above, capable of forming a display 13. The display layer 30 may further comprise a top electrode having a protective layer disposed over the layer of display media. The middle layer 31 comprises an integrated circuit in the form of a flexible backplane

(i.e., a printed circuit board or thin film material or substrate) electrically connected to the display layer 30. The bottom layer 32 includes a radio frequency identification (RFID) layer and display drivers for controlling the information displayed by the display layer. An RFID is a wireless communication device that transmits and receives data via radio. The exemplary RFID layer 32 includes a transceiver and an antenna to facilitate transmission and reception of data associated with the information to be displayed by the display layer 30.

The RFID layer communicates with a remote controller or device such as a personal computer, a PDA, a handheld portable device, a mobile cart or robot-mounted device, an overhead shelf or merchandising device, or a node in a network. The remote control executes an application program that controls and communicates with the RFID equipment and provides instructions regarding the information to be displayed by the display layer 30. The three layers 30, 31, 32 are joined together, as shown in Fig. 6b, to form a thin, flexible shield or label 100b. As shown, one embodiment of the exemplary display layer 30 covers the entire upper portion of the shield or label 100b.

As can be further inferred from this paragraph, the RFID layer can communicate with a handheld mobile device.

As further disclosed in paragraph 0126, the electronic label may communicate with one or more databases 170. To this end, said paragraph discloses a variety of wireless protocols, including RFID, Bluetooth, mesh networking, the Internet, etc.:

In addition, data about an item may be stored in one or more databases 170 associated with the RFID tag.

These databases may reside on the electronic tag or label 1000 or may be connected to the electronic tag or label 1000 via a communication protocol, such as an encrypted wireless connection. The electronic tag 1000 may use communication protocols, message formats, etc., such as radio frequency, radio frequency identification (RFID), RFID/EPC, 802.11, Bluetooth, mesh networking, TCIP, Internet, mesh networking, reflective scattering, backscattering, and other protocols known in the art, among others. For clarity, the database is shown 170 away from the electronic tag or label 1000.

Thus, D8 discloses an electronic label that can communicate with a mobile terminal via an RFID communication channel and communicate with a background system via another communication channel.

The arrangement of the RFID layer on the rear side of the electronic label is also apparent from D8 (see Figure 6b). In said par. 0117, there is further disclosed a transceiver:

The exemplary RFID layer 32 includes a transceiver and antenna to facilitate transmission and reception of data associated with information to be displayed by the display layer 30.

This transceiver corresponds in its functionality to the RFID chip of the Opposed Patent.

D8 thus describes at least the following features of claim 1:

M1 (electronic label for a retail space), M3 (radio frequency communication module), M4 (memory for storing data, at least implicitly disclosed), M5 (display screen), M6 (microcontroller, at least implicitly disclosed), M7 (case), M8.2

(arrangement of the radio frequency communication module on the back of the housing), M9 (radio frequency device for communication with a mobile terminal), M10 (antenna and RFID chip).

Starting from D10 as the closest prior art, a skilled person would, as already shown, look for a way to control the electronic label by an operator located in its vicinity. To this end, D8 discloses as a solution the use of an RFID communication channel through which communication with a mobile terminal is possible.

In other words, D8 demonstrates that a person skilled in the art would also take a second communication channel in the form of an RFID communication channel from this publication. In his endeavour to enable an energy-saving possibility for communication to a mobile terminal (see above arguments on D2), a person skilled in the art would also take into account D8, which discloses the use of an energy-saving RFID communication channel for this purpose.

A skilled person would thus, without any inventive step, apply the teaching of D8 to D10 and arrive at the subject-matter of claim 1 of the Opposed Patent.

The same arguments apply with regard to a combination of D3 with D8.

Lack of inventive step compared to D8 and D10 or D8 and D3

A skilled person could also assume D8 as the closest prior art. D8 does not indicate the arrangement of an antenna on the front side of the electronic label. As already discussed, this results in the technical effect of an improved transmission power of the antenna in the direction of a mobile terminal located on the front side of the electronic label.

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To achieve this technical effect, one skilled in the art, as also discussed above, optionally in D10 or D3, finds the solution of placing the antenna on the front side of the electronic label, so that electromagnetic interference with other components of the electronic label can be avoided at the same time.

A skilled person would have cause to apply the technical teaching of D10 or D3 to D8 to achieve this technical effect and would thus arrive at the subject matter of claim 1 of the Opposed Patent without an inventive step.

Lack of inventive step compared to D2 or D8 each in conjunction with CN201673520U (D9).

D9 was published on December 15, 2010, and is thus relevant for the assessment of inventive step (Art. 54(2) EPC).

A copy of publication CN201673520U (D9) is submitted as:

Annex KSW16 ,

as well as an English machine translation is submitted as

- Annex KSW16a -.

D9 discloses an RFID tag that has a display and is in the form of a bottle cap. This can be seen, for example, in Figure 4 of D9:

- 123 -

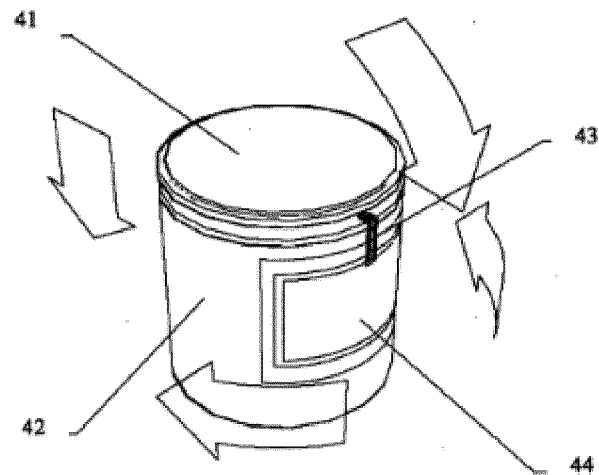
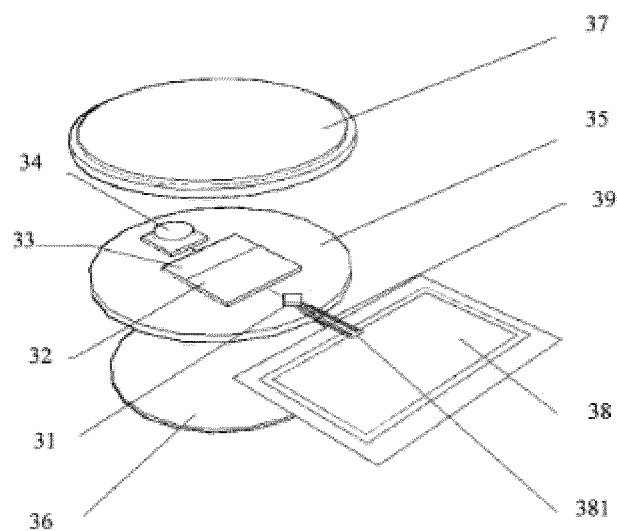


图 4

In connection with Figure 3, par. 0045 discloses an RFID antenna 31 and a display 37:



This embodiment discloses the application example of the RFID electronic tag on the circular bottle cap as shown in Figure 3, the RFID chip 31, the baseband signal processing module 32, the display module 33 and the peripheral button 34 are

placed on the bottle cap together on the circular flexible circuit board 35 of the same diameter, the whole flexible circuit board 35 and the circular thin film battery 36 are overlapped on the back of the circular screen 37 of the same size, and the three are connected by flexible cables or presses.

The RFID antenna 38 has a rectangular shape, and the pin 381 of the antenna is connected to the radio frequency portion 311 of the RFID chip 31 via a flexible connecting wire 39.

The flexible connecting wire 39 can be bent to any angle, which facilitates installation of the RFID antenna 38.

In use, the antenna is folded down onto the front of the bottle cap (see Figure 4) so that it can be screwed onto a bottle. For this purpose, par. [0046] discloses:

Fig. 4 is a specific installation diagram of the above embodiment.

During installation, the stacked circular flexible circuit board, thin film battery, and electronic display component 41 are first connected to the top of the bottle cap 42, and then the flexible connection 43 is bent to attach the RFID antenna 44 to the side wall of the bottle cap, and then the RFID antenna 44 is bent to adhere firmly to the side of the bottle cap.

When the RFID electronic tag communicates with the reader, the reader can communicate with the RFID antenna on the side of the bottle cap; when it is used as a visual reader tag, the user directly presses the screen on the top of the bottle cap and touches the button under the screen to start the local video. Read display.

Figure 3 and paragraph [0045] further show a circular flexible PCB board 35.

D9 thus discloses an electronic label whose RFID antenna is arranged on its front side according to feature M12 of claim 1 of the Opposed Patent.

Further, D9 discloses that the RFID chip 31 is mounted on a printed circuit board 35 on the rear side of the housing (at least in relation to the antenna mounted on the front side) (see features M8, M8.1, M11).

Starting from D2 or D8 as the closest prior art, a skilled person would set the already discussed task of achieving improved transmission performance of the antenna in the direction of a mobile terminal located at the front of the electronic label.

To this end, a skilled person will find in D9 the solution discussed above of arranging the antenna on the front side of the electronic label while at the same time arranging the printed circuit board and the RFID chip in the housing below.

Thus, a skilled person would apply the teaching of D9 to either D2 or D8 and arrive at the subject matter of claim 1 of the Opposed Patent without inventive step.

Lack of inventive step vis-à-vis D2 and D10 or D9

As already shown, D2 expressly discloses an electronic label with two communication channels. Thus, if one were to assume that the electronic label of D10 does not have two communication channels, D2 would be considered the closest prior art.

D2 does not disclose the arrangement of the RFID antenna on the front side of the electronic tag according to feature M12 of claim 1. However, a person skilled in the

art would take this feature from D10 and transfer it to D2 in an effort to enable better transmission performance to a mobile terminal device which is also located on the front side of the electronic tag.

Claim 1 is therefore not inventive over D2 and D10.

The same arguments apply to a combination of D2 with D9, which also shows the arrangement of an RFID antenna on the front.

Lack of inventive step over D9 and D2 or D9 and D8.

A skilled person could also start from D9 as the closest prior art. He would set himself the task of establishing a way for the electronic label to communicate with a background system from which the electronic label can directly obtain information about an article.

For this purpose, a skilled person finds optionally in D2 or D8 the solution to use an additional communication channel to enable communication with a background system.

Thus, a skilled person would apply the teaching of D2 or D8 to D9 and arrive at the subject matter of claim 1 of the Opposed Patent without inventive step.

Lack of inventive step compared to D3 with D2, D4, D5 or D6

D3 discloses very similar features to publication D10 and can therefore be used as an alternative to D10 as the closest prior art.

Similarly to the combination D10 and D2, a person skilled in the art would transfer the second communication channel disclosed in D2 to the teaching of D3 and arrive at the subject-matter of claim 1 without any inventive step. To avoid repetition, we refer to our arguments in connection with D10 plus D2.

The same arguments apply to the combination of D3 with D4: D4 also gives rise to two communication channels, namely WLAN or Bluetooth communication (paragraph [0004]) on the one hand and RFID communication (paragraph [0008]) on the other. Here again, a person skilled in the art would transfer the teachings of D4 to D3 to enable energy-saving communication with a mobile terminal device and, without having to engage in inventive step, arrive at the subject matter of claim 1.

The same also applies to D5 and D6, which also reveal the use of two communication channels.

Also on the basis of the following considerations, a person skilled in the art would arrive at the subject-matter of claim 1 on the basis of citation D3, even assuming that D3 did not disclose some of the claim features as follows:

- Feature M3: Transmission of article information from the central server to the electronic label

Reference is also made to EP 0 447 278 A2 (KSW 27), from which it can be seen, for example from paragraph 1, that price information is transmitted from a central server 100 to display modules 200 (see Fig. 1). Price information is article information within the meaning of feature M3.

- Feature M9: Transmission of an electronic tag identifier by the radio frequency peripheral 36

As already shown, paragraph 0043 of D3 discloses the use of the antenna 100 at various RFID frequencies. The basic task of RFID communication is the transmission of identification information of an RFID tag (see for example the already cited Wikipedia article: https://en.wikipedia.org/wiki/Radio-frequency_identification). The mention of RFID communication in D3 is thus at least one reason for a person skilled in the art to transmit an identifier of the electronic tag within the meaning of feature M9. This feature cannot therefore establish inventive step).

- Features M9 and M10: Communication with a "mobile terminal"

Although the electronic chip 37 in feature M10 is defined as an NFC or RFID chip, this does not limit the claim wording to near-field communication. RFID communication can include distances of 1m - 10m or even 100m. Any device within this distance can therefore be a potential recipient of a data transmission. Again, it is noted that the mobile terminal device is not part of the claim and thus the electronic tag need only have a radio frequency peripheral device capable of establishing RFID communication with such a terminal device.

Communication from electronic labels to portable or mobile end devices is known from various printed documents, for example from D10: "transmitter receiver 58".

Reference is also made to the publication WO 2004/064258 A2 (KSW 29) known from the examination procedure and cited in the Opposed Patent. There, a communication of the electronic label with a "portable unit 110" is disclosed (e.g. first paragraph of the "summary of embodiments of the invention" and Fig. 1).

Reference is also made to document JP2012038270 A (KSW 30), which is also cited in the Opposed Patent. The "Abstract" also refers to communication with a portable terminal ("portable terminal 1, which is carried by a user").

Finally, we refer to document JP2006011617 A (KSW 31) cited in the patent in suit. The "Abstract" of this document also discloses communication with a mobile device ("a cell phone or a PDA portably carried by the shopper").

A person skilled in the art would thus already arrive at the subject-matter of claim 1 of the Opposed Patent on the basis of the above considerations, without having to take inventive step.

Lack of inventive step of the subject matter of claim 2

The additional feature of dependent claim 2 reads in English translation:

wherein the antenna (38) is integrated into the case around a reserve housing the display screen (31).

This feature is at least suggested by D3, since an arrangement of the antenna around the display is already disclosed (see par. [0016]: *the antenna extends on the face of the wall around the display*).

D4 and D5 also show such an arrangement of the antenna around the screen.

The subject-matter of claim 2 also cannot support inventive step.

Lack of inventive step of the subject matter of claim 3

The additional feature of claim 3 reads in English translation:

wherein the radio frequency device (36) has a communication range of less than 20 cm.

For RFID and NFC communication, short ranges of less than 20 cm are common, especially for communication with mobile devices (see e.g. cited reference books according to appendices KSW9 and KSW10).

As already explained, publication D10 expressly discloses the provision of RFID communication, which is regularly used with a range of less than 20 cm due to the inductive coupling used there. The same applies to the numerous other printed publications which also disclose RFID communication.

The subject-matter of claim 3 also cannot support inventive step.

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Patent Attorney

Annexes:

KSW 1	EP 12 762 019. 3 (WO 2013/153290 A1)
KSW 2	EP 3 883 277 B1
KSW 3	EP 3 883 277 A1
KSW 5	Specification of the patent application as originally filed

KSW 7	EP 2 402 930 A1 (D2)
KSW 8	US 2005/0253685 A1 (D3)
KSW 9	Christian Kern, <i>Anwendungen von RFID-Systemen</i> , Springer-Verlag, Berlin, 2. 2007, ISBN-13 978-3-540-44477-0
KSW 10	Klaus Finkenzeller, <i>RFID-Handbuch – Grundlagen und praktische Anwendungen von Transpondern, kontaktlosen Chipkarten und NFC</i> , Carl Hanser Verlag München, 5. Aufl., 2008, ISBN 978-3-446-41200-2
KSW 10a	<i>RFID Handbook – Fundamentals and Applications in Contactless Smart Cards, Radio Frequency Identification and Near-Field Communication</i> , John Wiley and Sons, Ltd., 3. Edition, 2010, ISBN 978-0-470-69506-7
KSW 11	TW M345297 U (D4)
KSW 11a	TW M345297 U (English machine translation)
KSW 12	TW M353498 U (D5)
KSW 12a	TW M353498 U (English machine translation)
KSW 13	WO 2008/073181 A2 (D6)
KSW 14	CN202068693U (D7)
KSW 14a	CN202068693U (English machine translation)
KSW 15	US2008/0198098 A1 (D8)
KSW 16	CN201673520U (D9)
KSW 16a	CN201673520U (English machine translation)
KSW 17	US 8 061 600 B2 (D10)
KSW 19	Application for preliminary injunction filed by SES
KSW 20	US 7 973 722 B1 (D11)

KSW 22	Submission of SES to the EPO dated 17 March 2022
KSW 23	Description of the feature breakdown
KSW 24	Notice from the Examining Division dated 29 June 2021
KSW 25	Minutes from the Examiner dated 26 January 2023
KSW 26	Submission of SES to the EPO dated 7 February
KSW 27	EP 0 447 278 A2
KSW 28	WO 01/44919 A1
KSW 29	WO 2004/064258 A2
KSW 30	JP2012038270 A
KSW 31	JP2006011617 A
KSW 32	Wikipedia article "Near field communication" available on 05 March 2011
KSW 40	US 7,520,429 B2
KSW 41	US 2011/0289023 A1