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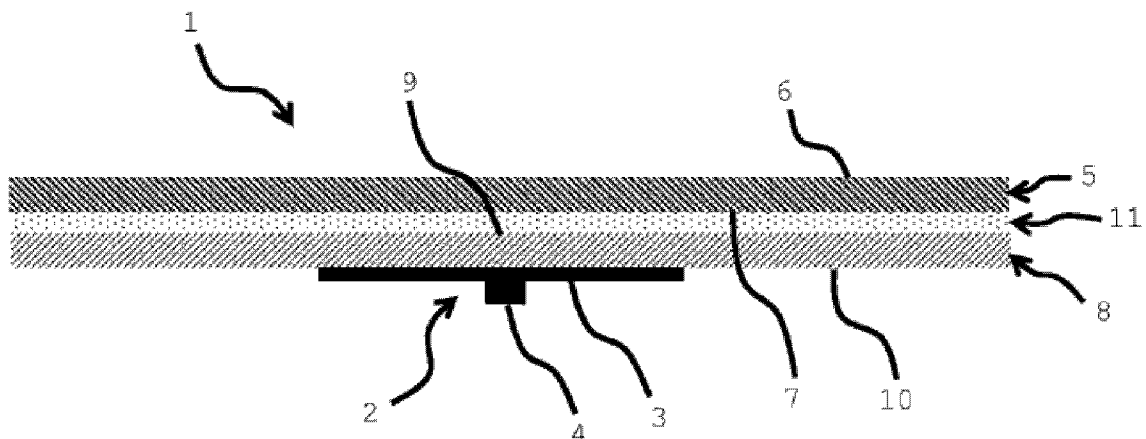
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(54) Title: BAGGAGE TAG
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(57) Abstract:

The present invention relates to a baggage tag (1) to be fastened to a luggage, such that the luggage can be tracked and traced via the baggage tag. The baggage tag comprising a face material (5) with a first side (6) and a second side (7). A liner (8) with a first side (9) and a second side (10), wherein the first side is siliconized and facing against the second side (7) of the face material (5); and a pressure sensitive adhesive layer (11), which is arranged between the second side of the face material and the first side of the liner. The baggage tag further comprising an RFID tag which tag comprises an RFID antenna (3) and an IC (4) attached onto the antenna such that the antenna and the IC form the RFID tag and wherein the RFID antenna is formed directly onto the second side of the liner.



A B S T R A C T

The present invention relates to a baggage tag (1) to be fastened to a luggage, such that the luggage can be tracked and traced via the baggage tag. The baggage tag comprising a face material (5) with a first side (6) and a second side (7). A liner (8) with a first side (9) and a second side (10), wherein the first side is siliconized and facing against the second side (7) of the face material (5); and a pressure sensitive adhesive layer (11), which is arranged between the second side of the face material and the first side of the liner. The baggage tag further comprising an RFID tag which tag comprises an RFID antenna (3) and an IC (4) attached onto the antenna such that the antenna and the IC form the RFID tag and wherein the RFID antenna is formed directly onto the second side of the liner.

Baggage tagTechnical field

The present invention relates to a baggage tag to be
5 wrapped around and fastened to a luggage, such that the
luggage can be tracked and traced via the baggage tag,
the baggage tag comprising:

- a face material made of paper with a first side and a
second side;
- 10 - a liner with a first side and a second side, wherein
the first side is siliconized and facing against the
second side of the face material; and
- a pressure sensitive adhesive layer, which is arranged
between the second side of the face material and the
15 siliconized first side of the liner.

In the following the expression "RFID" (Radio Frequency
Identification) tag will be frequently used. An RFID tag
is a tag that is intended to be attached onto objects to
20 be identified in a radio-frequency identification system.

An RFID tag comprising an RFID antenna and an IC
(integrated circuit or microchip), which IC is
electrically connected onto the antenna.

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Moreover, the expression "luggage" will be frequently
used. In this context the expression covers all types of
luggage that a passenger at an airport may check-in
before he enters an aircraft. Examples of such luggage
30 may be any of the following objects: bag, suitcase,
backpack, box, bike, stroller, skis or similar.

Prior art - Problem

Generally, when a passenger checks-in her or his luggage with an airline, a baggage tag is generated and attached to the luggage. The baggage tag includes an original
5 luggage number along with customer information and routing information relating to an itinerary of the passenger. The baggage tag is used by a baggage sortation system. Generally, the baggage sortation system aids in loading the luggage onto the same aircraft as the
10 passenger, and thus the luggage arrives with the passenger at the destination of the passenger.

A conventional baggage tag with an RFID tag comprising a face material made of paper which has a laminated plastic
15 layer to bring tear resistance to the baggage tag. This prevents the tag to be torn and falling off the baggage during handling. The face material has a direct thermal printable coating on the face side of the paper. This is direct thermal printed with heat at airport baggage tag
20 printing stations. The baggage tag further comprising a pressure sensitive adhesive (PSA) layer. This layer is used to affix the baggage tag into a loop form after it has been wrapped around the handle of the luggage.

25 Moreover, the tag comprising a siliconized liner, which covers the PSA layer. The liner is partially peeled off when the baggage tag is wrapped around a luggage handle, exposed PSA will attach to the back side of the liner. Before the liner is laminated with the face material, a
30 converting company inserts an RFID wet inlay on top of the backing liner and then laminates the face material on top. Hence, the RFID wet inlay gets encapsulated in the middle of the baggage tag.

RFID wet inlays have an adhesive backing making them easy to stick on to surfaces. An RFID wet inlay comprises an integrated chip (IC) with an RFID antenna. RFID Wet
5 Inlays are like RFID stickers and are ideal for applications which require a "peel and stick" type of tag.

10 However, these conventional baggage tags with RFID wet inlays have some drawbacks:

- RFID wet inlay is made of fossil materials (PET substrate, PU adhesive and PET face material).
- RFID wet inlays have a siliconized liner paper just for handling purposes which liner will be thrown
15 away (wasted) during converting.
- The RFID wet inlay comprises an extra PSA layer which is only needed for fasten the RFID inlay to the baggage tag.
- Aluminum etching process uses lot of water,
20 electricity, harmful chemicals and causes chemical etching waste.
- In baggage tag converting process, extra process steps and equipment are needed to insert RFID wet inlays into the material stack.

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Object of invention

An object with the invention is to provide a more environmentally friendly RFID baggage tag which is more cost efficient in comparison to prior art, requires fewer
30 converting steps and in turn solves the above-mentioned problems.

Summary of the invention

In accordance with the invention, the baggage tag is characterized in that the baggage tag further comprising an RFID tag which tag comprises an RFID antenna and an IC, which IC is attached onto the antenna such that the antenna and the IC form the RFID tag and wherein the RFID antenna is formed directly onto the non-siliconized second side of the liner.

Figures and detailed description of the invention

10 Figure 1 discloses a schematic view of a baggage tag in accordance with the invention.

Figure 2 discloses how the inventive baggage tag is wrapped around and attached to a luggage.

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In the following, the invention will be described more in detail with reference to Figure 1 and 2. The invention discloses an elongated baggage tag 1 to be wrapped around and fastened to a luggage 12, such that the luggage 12 can be tracked and traced via the baggage tag 1. The elongated baggage tag is typically about 500 mm long and about 54 mm wide. However, the skilled person realizes that the inventive baggage tag 1 is not limited to these specific sizes.

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The baggage tag 1 comprising an elongated face material 5 made of paper with a first side 6 and a second side 7, which second side 7 faces away from the first side 6.

30 In a preferred embodiment, the first side 6 is coated with a direct thermal printable coating. This is direct thermal printed with heat at the airport baggage tag printing stations.

In a yet more preferred embodiment, the second side 7 is laminated with a polypropylene (PP) film or a polyethylene terephthalate (PET) film to bring tear
5 resistance to the baggage tag 1.

However, the skilled person realizes that is not essential for the invention to laminate the second side 7. It is obvious that there are other possible solutions
10 to bring tear resistance to the tag, e.g. lamination of the first side 6 or by using a more tear resistant paper with no additional lamination at all.

The baggage tag 1 further comprising a liner 8 with a
15 first side 9 and an opposite second side 10 which faces away from the first side 9. The liner 8 is preferably made of a non-plastic material, preferably paper.

The first side 9 is siliconized, i.e. the side has been
20 coated or treated with silicon, such that the side has non-sticky properties. The second side 10 is untreated or non-siliconized, i.e. it has not been siliconized.

The siliconized first side 9 of the liner 8 is facing
25 against the second side 7 of the face material 5.

Further, the baggage tag 1 comprising a pressure sensitive adhesive layer 11 which is arranged between the second side 7 of the face material 5 and the siliconized
30 first side 9 of the liner 8.

The baggage tag 1 further comprising an RFID tag 2 which tag comprises an RFID antenna 3 and an integrated chip

(IC) 4. The IC is electrically connected to the antenna such that the antenna and the IC forms the RFID tag. The RFID antenna 3 is formed directly onto the non-siliconized second side 10 of the liner 8.

5

The skilled person realizes that many ways are possible to form the RFID tag directly onto the second side 10 of the liner 8. In a preferred first embodiment, of forming the antenna, electrically conductive solid particles are formed, in a predefined pattern, onto the second side 10 of the liner 8.

The conductive material is then cured to form a solidified, more compact antenna pattern. This can e.g. be made by application of heat with a suitable heater. Hereby, the conductive material is preferably heated to a temperature exceeding a characteristic melting temperature of the conductive material.

The transfer of the conductive particles and the curing and solidification may be made in the way disclosed in one or several of the WO2013/113995, WO2009/135985 WO2008/006941 and WO2016/189446. All said documents hereby being incorporated in their entirety by reference.

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Further, other ways of forming the conductive material in a pattern can also be used. In a second embodiment the forming of the RFID antenna can be made by additive printing with a conductive ink. A conductive ink is an ink comprising conductive particles. The conductive ink can for example be silver ink, copper ink or graphene ink. The conductive inks inks are then made conductive by drying them or treating them with hot-air, radiation (UV,

30

EB), photonic curing, laser or some other treatment method.

In a third embodiment the forming of the RFID antenna is
5 made by first providing the second side with a conductive
layer, preferably an aluminum foil. Parts of the
conductive layer is then subtracted, such that the
remaining conductive layer, on the liner, forms the RFID
antenna. The subtraction of the conductive layer into the
10 desired conductive pattern could for example be through
cutting, grinding, brushing, etching or the like.

Thereafter, the method comprising the step of attaching
the RFID IC onto the antenna 3, such that, an electrical
15 connection between the IC 4 and the antenna is
established, wherein the RFID tag 2 is formed.

In use, when the baggage tag 1 is wrapped around and
fastened to a luggage 12, a portion of the siliconized
20 liner 8 is peeled off from the adhesive layer 11, such
that a portion of the adhesive layer 11 is exposed. The
portion of the exposed adhesive layer 11 is then fastened
against a portion of the non-siliconized second side 10
of the liner 8. Figure 2 discloses an embodiment where
25 the luggage 12 is a bag 12 and wherein the baggage tag 1
is wrapped around and fastened to a handle 13 of the bag
12. A part of the baggage tag forms a loop wherein the
handle 13 of the luggage 12 is located within the loop.

30 There are several benefits with the present invention in
comparison to a conventional baggage tags with RFID tag.
Since, the RFID antenna 3 in accordance with the
invention is printed directly onto the second side 10 of

the liner 8, there is no need for an RFID wet inlay. This results in the following benefits:

- 5 - Less process steps and equipment are needed to insert RFID tag into the material stack.
- Less fossil materials are used, since RFID wet inlays comprising PET substrate, PU adhesive and PET face material.
- 10 - No extra siliconized layer for handling purposes and will be thrown away (wasted) during converting.
- No extra PSA layer is needed for fasten the RFID inlay to the baggage tag.
- In baggage tag converting process, extra process steps and equipment are needed to insert RFID wet
15 inlays into the material stack. In the proposed method these process steps and equipment are not needed.

20 In the foregoing, the invention has been described based on some specific embodiments. However, a person skilled in the art realises that other embodiments and variants are possible within the scope of the following claims.

CLAIMS

1. A baggage tag (1) to be wrapped around and fastened to a luggage (12), such that the luggage can be tracked and traced via the baggage tag, the baggage tag comprising:
- 5 - a face material (5) made of paper with a first side (6) and a second side (7);
- a liner (8) with a first side (9) and a second side (10), wherein the first side is siliconized such that a said first side has non-sticky properties and wherein the first side is facing against the second side (7) of the face material (5); and
- a pressure sensitive adhesive layer (11), which is arranged between the second
- 10 side of the face material and the siliconized first side of the liner;
- characterized in that the baggage tag further comprising an RFID tag which tag comprises an RFID antenna (3) and an IC (4), which IC is attached onto the antenna such that the antenna and the IC form the RFID tag and wherein the RFID antenna is formed directly onto the non-siliconized second side of the liner.
- 15
2. Baggage tag according to claim 1, characterized in that the first side (6) has a direct thermal printable coating.
3. Baggage tag according to claim 1 or 2, characterized in that the second side (7)
- 20 of the face material (5) is laminated to bring tear resistance to the baggage tag.
4. Baggage tag according to any of claims 1-3, characterized in that the liner is made of paper.
- 25
5. Baggage tag according to any of claims 1-4, characterized in that the RFID antenna is formed by an antenna pattern of electrically conductive solid particles and that the conductive material has been heated to a temperature exceeding a characteristic melting point of the material, such that the RFID antenna is formed.
- 30
6. Baggage tag according to any of claims 1-4, characterized in that the RFID antenna has been produced by additive printing, wherein the antenna has been printed with a

conductive ink.

7. Baggage tag according to any of claims 1-4, characterized in that the liner is laminated with a conductive layer and wherein the RFID is formed by using subtractive manufacturing, wherein parts of the conductive layer is subtracted, such that the remaining conductive layer on the substrate web forms the RFID antenna.

I följande bilaga finns en översättning av patentkraven till svenska. Observera att det är patentkravens lydelse på engelska som gäller.

A Swedish translation of the patent claims is enclosed. Please note that only the English claims have legal effect.

1. Bagageetikett (1) anpassad att vikas runt och fästas mot ett bagage (12), så att bagaget kan spåras och följas med hjälp av bagageetiketten, bagageetiketten innefattar:

5 - ett framsidesmaterial (5) gjort av papper med en första sida (6) och en andra sida (7);

- en stoppning (8) med en första sida (9) och en andra sida (10), varvid den första sidan är silikonbelagd så att nämnda första sida har icke klistrande egenskaper och varvid den första sidan är vänd mot den andra sidan (7) av framsidesmaterialet (5); och

10 - ett tryckkänsligt vidhäftande lager (11), som är anordnat mellan den andra sidan av framsidesmaterialet och den silikonbelagda första sidan av stoppningen;

kännetecknad av att bagageetiketten vidare innefattar en RFID-tag som innefattar en RFID-antenn (3) och en integrerad krets (4), IC, varvid den integrerade kretsen är fastsatt mot antennen så att antennen och den integrerade kretsen formar RFID-taggen och
15 varvid RFID-antennen formas direkt mot den icke silikonbelagda andra sidan av stoppningen.

2. Bagageetikett enligt patentkrav 1, kännetecknad av att nämnda första sida (6) har en beläggning för direkt termisk märkning.

20 3. Bagageetikett enligt patentkrav 1 eller 2, kännetecknad av att den andra sidan (7) av framsidesmaterialet (5) är laminerad för att göra bagageetiketten rivningssäker.

4. Bagageetikett enligt något av patentkrav 1-3, kännetecknad av att stoppningen är gjord av papper.

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5. Bagageetikett enligt något av patentkrav 1-4, kännetecknad av att RFID-antennen formas av ett antennmönster av elektriskt ledande solida partiklar och att det ledande materialet har värmts till en temperatur som överskrider en karaktäristisk smältpunkt hos materialet, så att RFID-antennen formas.

30

6. Bagageetikett enligt något av patentkrav 1-4, kännetecknad av att RFID-antennen har tillverkats med additiv tryckning, varvid antennen har tryckts med ett elektriskt ledande bläck.

5 7. Bagageetikett enligt något av patentkrav 1-4, kännetecknad av att stoppningen är laminerad med ett ledande material och varvid nämnda RFID formas genom subtraktionstillverkning, varvid delar av det ledande materialet subtraheras, så att det resterande elektriskt ledande lagret på substratnätet formar RFID-antennen.

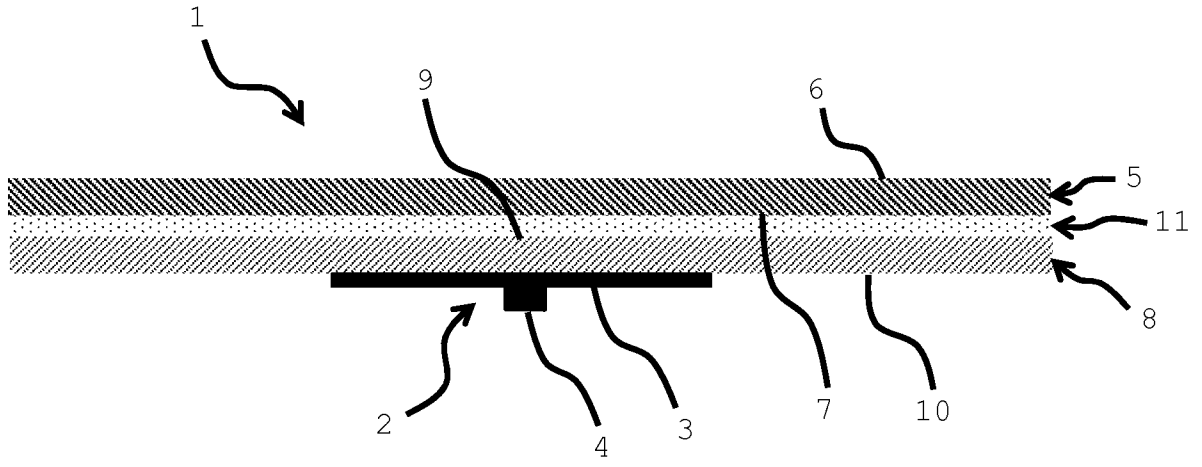


Fig. 1

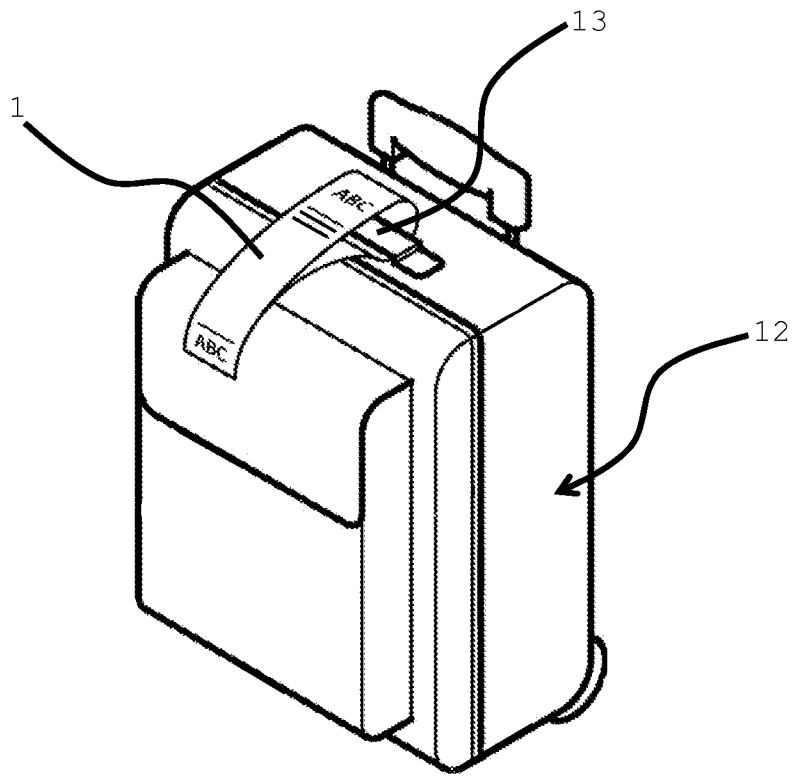


Fig. 2