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EUROPEAN PATENT APPLICATION

- (43) Date of publication:
22.10.2014 Bulletin 2014/43

(51) Int Cl.:
 B31D 1/02 (2006.01)
 B65D 33/00 (2006.01)
 B65D 75/00 (2006.01)
- (21) Application number: 14164947.5
- (22) Date of filing: 16.04.2014

(84) Designated Contracting States: AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR Designated Extension States: BA ME (30) Priority: 17.04.2013 IT MI20130624	(71) Applicant: Masterpack S.p.A. 20144 Milano (MI) (IT) (72) Inventor: Binda, Claudio 21020 Monvalle VA (IT) (74) Representative: Pellegrini, Alberto et al Società Italiana Brevetti S.p.A. Via Carducci, 8 IT-20123 Milano (IT)
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Continuous ribbon of a laminated multi-layer film for packaging of product in sacs or packages incorporating an RFID device

(57) The position at which an RFID device is deployed in a sac or package including an outer flexible heat sealed multilayered packaging film is made hardly recognizable, the device made not accessible, not removable and not disabled, while saving on related costs and work time requirements, by automatically adhering a self-adhesive label embedding or carrying an RFID device onto the coupling surface of one of the films of said multilayered packaging film before being laminated with

the other or others films.
 The RFID device carrying label is precisely applied at a point in an area of the coupling surface of a layer film that coincides with a portion opacized by graphic features printed on the same or on a different film of the multilayer laminate that is thence obtained by lamination of the films together and that, typically, is the film constituting the outer surface of the sacs or package wraps.

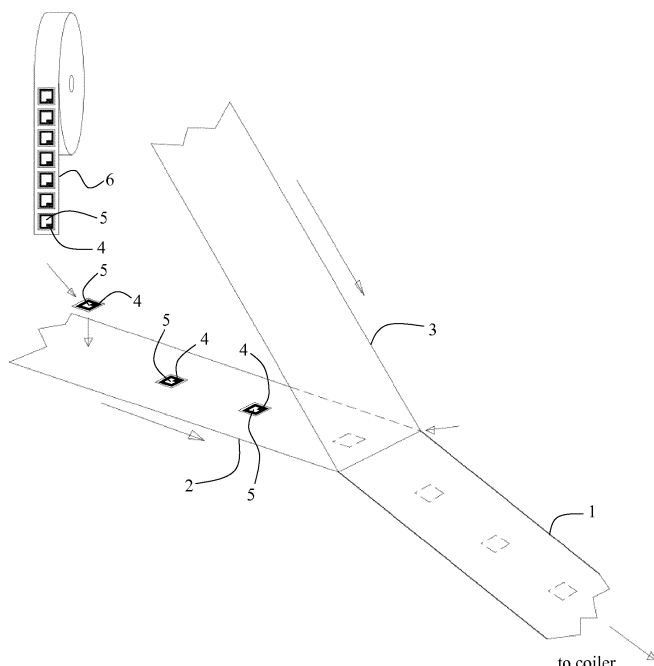


FIG. 1

Description

[0001] The present disclosure relates in general to the packaging of products in flexible heat sealed sacs or packages incorporating a labeling device for contactless RF reading (RFID).

[0002] The commercial practice of packaging consumer goods in heat-sealed sacs or packages of a transparent plastic film in order to prevent mishandling of the goods and ensure hygienic conditions and often a prolonged freshness of the goods distributed through self-service shops, has become widespread.

[0003] Often the packaging film is a flexible laminate composed of two or more films of different material or of the same material typically for sandwiching therebetween a layer of a barrier material adapt to block diffusion-migration of oxygen through the inner film of a plastic material suited to remain in contact with the goods, typically for preserving edible goods that are subject to oxidative alteration in presence of oxygen and/or for preserving a modified atmosphere of packaging the goods inside the heat sealed sac or package.

[0004] Commonly aesthetic reasons, graphic printability of names, logos, commercial trademarks and/or description and relevant dietary data of the packaged goods, visibility of the content etc., may require the use of multilayer films made by laminating two or more films together to form a continuous ribbon on which the different elements contemplated for the particular geometry and dimensions of the packaging sac or other heat sealable container, such as graphical features and descriptions are modularly repeated over the outer film of the continuous multilayer laminated ribbon, destined to be fed to an automatic packaging machine.

[0005] It is rapidly becoming of economic importance implementation of an electronic surveillance systems (EAS) of packaged goods during their transfer, in particular from the moment they enter a shop or distribution chain, to the time they leave it, having been bought by a customer.

[0006] The presence of RFID (RF-EAS) labels readable by specialized apparatuses generally defined as "RF interrogators", strategically deployed on display shelves and eventually even in dressing cabinets in case of wearing uprounds, and, of course, at the exit of cashier counters areas, allows for example even a real-time alertment of the occurrence of a particularly strong interest for certain articles and is in general useful for preventing sold-out situations of specific products being sold and thus significantly reducing inventories. Deployment of RF interrogators at the exit of cashier counters may control shoplifting and in any case represent a decisive deterrent.

[0007] The shoplifting problem is rapidly extending also to relatively low priced goods of such as most edible products, whether fresh vegetables, pre-cooked, refrigerated, frozen goods or alike goods, most of which are packaged in flexible heat sealed sacs.

[0008] In general, differently from durable goods such as wear apparels, relatively heavy high-tech apparatuses, and alike cumbersome goods, in case of goods, the packaging of which includes an outer heat welded sac or wrap, application of an RF identification device, whether of passive type or of active type powerable in a contactless mode by near field electromagnetic coupling or by far field RF source, in this description generally preferred to by the acronym "RFID", poses specific problems and is generally implemented by applying onto the packaging multilayer film a self-adhesive label carrying the RFID device.

[0009] For many edible goods that are packaged at the shop premises, application of an RFID device to the single package is often manually done using special hand held labeling machines commonly loaded with feed rolls of self-adhesive RFID carrying labels, that are dispensed by separating them from a carrier tape the surface of which has been treated to make it anti-adherent.

[0010] Besides the burden of engaging operators for applying the RFID devices, their application onto the surface of the package, though visually discrete and even difficult to spot it for inexpert persons, remains recognizable and easy to disable by ill-intentioned persons.

[0011] To the vulnerability of RFIDs, inconveniences of application, onto a completed package and the relative ease with which the presence and position of deployment of an RFID may be visually found in a heat sealed sac or package wrap of flexible plastic film, has been found an effective solution that on one side allows to hide and make hardly recognizable the position at which the RFID device is deployed on a heat sealed sac or package wrap of generally flexible plastic film and to achieve a substantial impossibility to access it, remove it or disable it and, on the other side, to achieve significant savings of related costs and worktime requirements.

[0012] According to a first embodiment, a continuous ribbon of a laminated multi-layer packaging film suitable to be wound in rolls to be eventually fed to an automated packaging machine of products in heat sealed sacs or package wraps, witnessing un-tampering with the content and/or protecting the packaged product from external agents, comprises at least a first and a second film, at least one of which is of a heat-weldable plastic material, coupled together by lamination to form the continuous ribbon of multi-layer packaging film.

[0013] One of the layer of the laminated packaging film, typically the outermost layer, is a film of printable material, on which graphic features like aesthetic figures, logos, commercial trademarks and/or a description of the packaged product, relevant dietary data etc. have been pre-printed, creating one or several areas that are rendered opaque by printed matter.

[0014] At least a self-adhesive label embedding or carrying, adhered to it, an RFID device, is precisely applied onto the coupling surface of the printed outermost layer film or on the coupling surface of any of the other films before being laminated together to form the multilayer

packaging film.

[0015] In any case, the RFID carrying label is positioned in an area of the coupling surface of the film that, upon lamination coincides with a portion opacized by the printing performed on the same or on a different film of the multilayer laminate that is thence obtained by laminating the films together.

[0016] The RFID device may be any commercial or known otherwise device of identification, of passive type, of semiactive type or of active type, readable by near field electromagnetic coupling and/or by far field activation by an RF source or equivalent device. Preferably, the RFID devices is a passive identification device activated by a remote RF source-interrogator apparatus.

[0017] It has been verified that minuteness and thickness of these commercial devices make them compatible with the process of lamination of multilayer flexible films in calenders commonly used for such operation.

[0018] The invention is defined in the annexed claims, the content of which is intended constituting part of the present description.

[0019] Figure 1 depicts a basic scheme of how the continuous ribbon of laminated multi-layer film may be fabricated.

[0020] The drawing does not show the laminating rolls of a calender used for forming the continuous ribbon of multi-layer film suitable to be stocked in form of feed rolls for an automated packaging machine, coupling a first film 2 over which are applied at precisely defined positions self-adhesive labels 3 each incorporating an RFID device 4, commonly lifted singularly from a carrier tape 6 with surface treated in a way to confer it appropriate peelability characteristics of the self-adhesive labels, by common automated pick-up arms of application of adhesive labels (not shown in the drawing).

[0021] The dimensions of the RFID device 4, of active type or activable in a contact-less mode, may be extremely small, generally less than 3-4 millimeters and of thickness lower than 500 μm , while in case of a passive device activable by a remote RF interrogator apparatus, the device may have dimensions comprised between 1 and 3 cm or even larger, but extremely thin, for example of thickness lower than 100 μm , and thence well tolerating the bending imposed when winding the laminated multi-layer packaging film in rolls.

[0022] The multilayer packaging film may for example be a multilayer laminate of polypropylene/polyamide, polypropylene/polyester, polyethylene-Evoh-polyethylene, polyethylene/paper, Mater-bi/paper.

[0023] Preferably, at least a film of the multi-layer laminated packaging film is of a plastic material belonging to the group composed of polypropylene, polyethylene, Mater-bi-polyamide.

Claims

1. A continuous ribbon of a laminated multi-layer film

(1) suitable to be wound in feed rolls for a packaging machine of a product in heat sealed sacs or wrapped packages made with the multi-layer film, witnessing un-tampering with and/or protecting the product from external agents, comprising:

- a) at least an outermost layer film (2) pre-printed with graphic features that render opaque one or more areas of the film and at least a innermost layer film (3), of which at least the innermost film (3) is of a weldable plastic material, coupled together by lamination to form said multi-layer packaging film (1);
- b) at least a self-adhesive label (4) embedding or carrying an RFID device (5) precisely applied on the coupling surface of one of said films (2, 3) in an area coincident with one of said opaque areas.

2. The ribbon according to claim 1, wherein said RFID device (5) is an identification device of the product packaged in the heat sealed sac or package wrap, of passive type, readable in a far-field mode by an interrogating apparatus source of an RF electromagnetic field.
3. The ribbon according to claim 1, wherein said RFID device (5) is a readable and erasable identification device of the product packaged in the heat sealed sac or package wrap of active type energized by near-field mode electromagnetic coupling.
4. The ribbon according to claim 1, wherein said RFID device (5) is an identification device of active type of the product packaged in the heat sealed sac or package wrap, broadcasting a code when energized by RF electromagnetic waves emitted from a far-field mode reader apparatus.
5. The ribbon according to claim 1, wherein said multi-layer film (1) is a laminated article belonging to the group composed of polypropylene/polyamide, polypropylene/polyester, polyethylene-Evoh-polyethylene, polyethylene/paper, Mater-bi/paper.
6. The ribbon according to claim 1, wherein said weldable plastic material belongs to the group composed of polypropylene, polyethylene, Mater-bi, polyamide.
7. A heat welded sac or package wrap, witnessing un-tampering with and/or protecting from external agents a packaged product, made from a continuous ribbon of a multi-layer film (1), comprising a RFID device (5) between two coupled layers (2, 3) of said multi-layer film (1).
8. The sac or package wrap of claim 7, wherein said

RFID device (5) is readable and erasable once energized by electromagnetic near-field coupling or it broadcasts a code when energized by RF waves from a remote source of a far-field reader.

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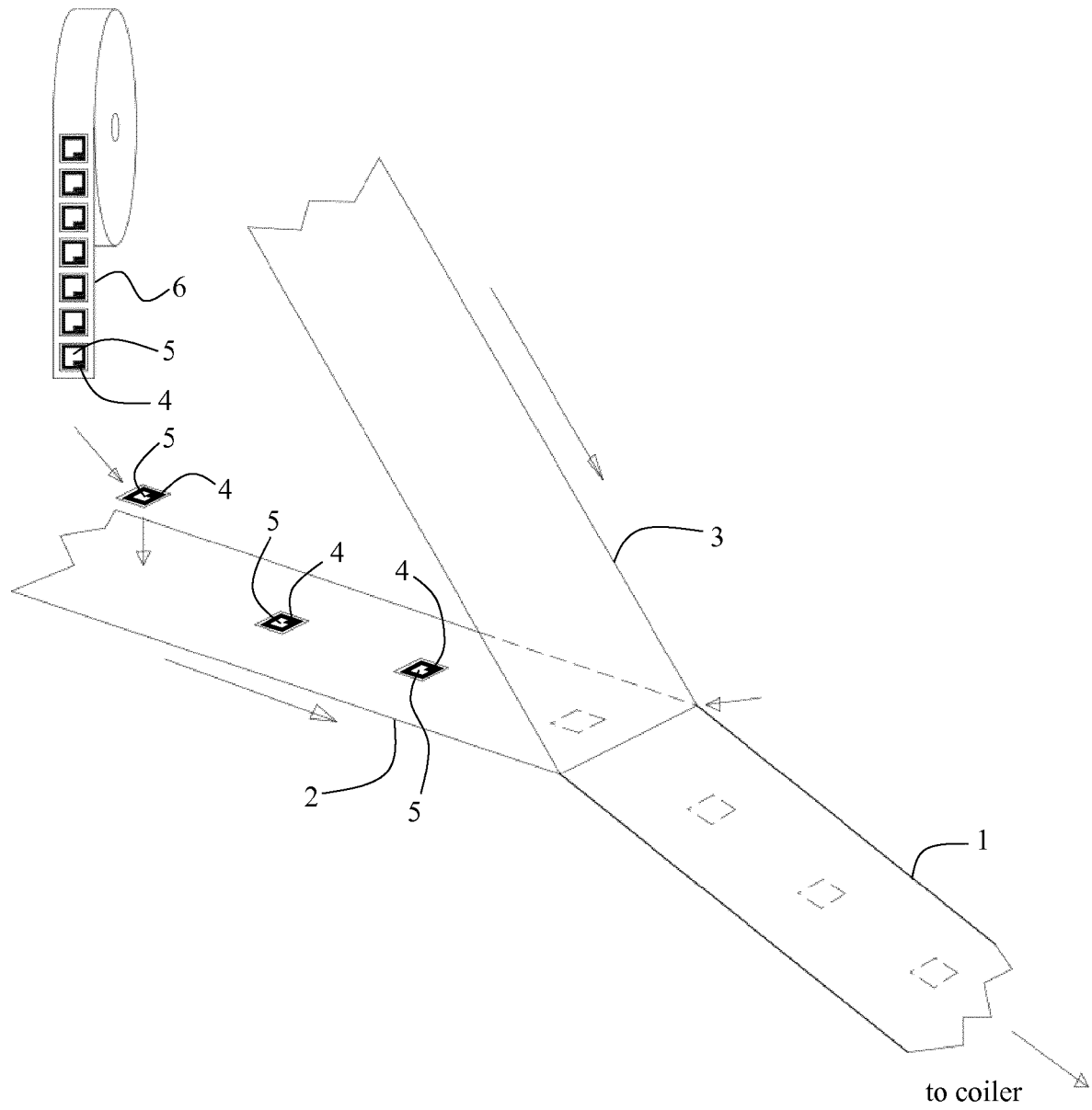


FIG. 1



EUROPEAN SEARCH REPORT

 Application Number
EP 14 16 4947

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 26 August 2014	Examiner Farizon, Pascal
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 14 16 4947

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