



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**14.08.2013 Bulletin 2013/33**

(51) Int Cl.:  
**B65B 69/00** (2006.01) **B65D 75/42** (2006.01)  
**B65D 75/58** (2006.01)

(21) Application number: **12154175.9**

(22) Date of filing: **07.02.2012**

(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**

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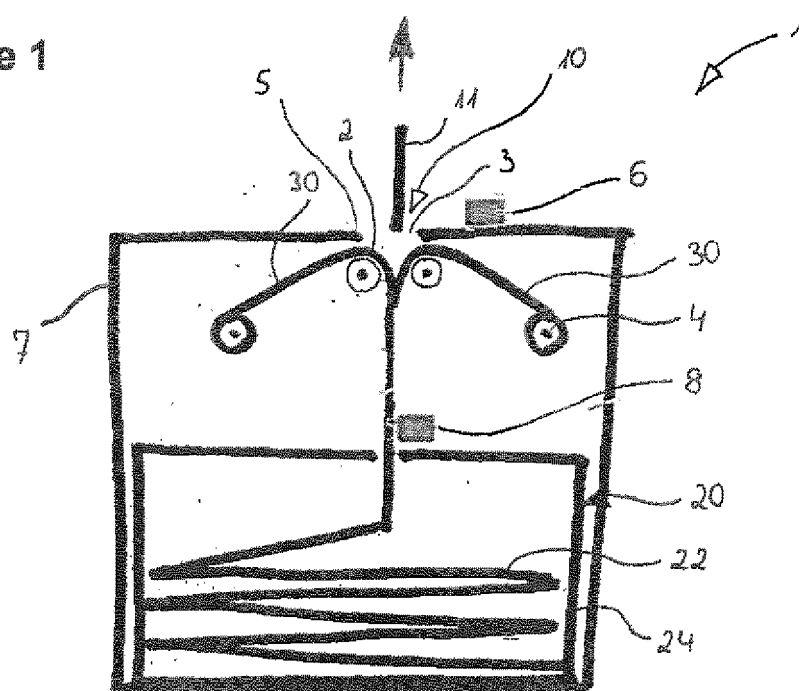
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(54) **Food dispenser**

(57) A food dispensing apparatus suitable for use with a food storage means and for providing a wrapped food product, which is at least partly covered with a wrapper. Further, the food dispensing apparatus has redirecting means for redirecting the wrapper away from the food

product to opposite faces in order to separate the wrapper and to dispense the food product. Feeding means transport the food product for feeding the wrapped food product towards the redirecting means, where the food product is unwrapped and dispensed.

**Figure 1**



## Description

### Technical Field

**[0001]** The present invention relates to a food dispensing apparatus for unwrapping a wrapped food product and dispensing the product, preferably for further processing in the professional food industry wherein the dispensing apparatus is suitable for use with a food storage means.

### Technical Background

**[0002]** Ready-made food products have become increasingly popular in modern society. In particular during breaks or while travelling, there is a continuous high demand for food products mainly intended for immediate consumption. In this respect, many restaurants offer the possibility to order prepared customized food, i.e. the customer orders according to his or her desires and might even be present while the food is prepared. Further, there is a need for ready-made products to stock up vending machines or to offer these products to travellers, for example in airplanes.

**[0003]** It is characteristic for this business sector that its low entry barriers for new participants in this market cause a fierce competition. Thus, in order to survive, businesses generally have to keep an eye on their production costs. However, the potential for cost cutting is limited since the preparation of these food products is traditionally very labour intensive. Nonetheless, there is potential to reduce production costs by, for example, optimizing the supply chain for producing these products. In addition, for protection of the consumers, the food industry is highly regulated, for example in terms of hygiene requirements.

**[0004]** One aspect of optimizing the supply chain is the utilization of automation. For example, machines can be used to supply ingredients of a food product during preparation and to transport the food between subsequent production steps such as for multi-layered foods, i.e. cold and hot sandwiches, pizzas, casseroles or related products.

**[0005]** Restaurants, in particular fast food restaurants, have a high output in prepared food. This can only be achieved if there is a sufficient supply of food products. Currently, sliced products are normally provided in stacks that are in thermoformed trays. To prevent exposure to the environment before being used, the sliced products in these trays, such as cheese or cold cuts, are normally sealed with a layer of plastic foil. For taking out the sliced products, the plastic foil layer is removed. This may cause desiccation of these products, leading to a change in texture and taste. Typically, there are about 50 to 60 slices stacked on top of each other to be subsequently taken out. Coming to the end of slice stack, taking out the slices becomes inconvenient.

**[0006]** For example, US Patent 4,111,332 discloses a

slice dispenser unit with a supply roll that provides sliced cheese, meat or the like. Said roll is a rolled up length of a carrier sheet on which the slice material is placed in a strip or row, whereby in the roll the carrier sheet covers the outside of the slice material on the sheet in the underlying winding of the roll. The dispenser unit comprises means for rotatably supporting the roll and the guiding edge member enabling the sheet to be drawn off the roll with a substantially sharp bent about the guiding edge so as to cause the slice material to be successively released from the sheet by a pull in the free sheet end downstream of said guiding edge. The free sheet end extends from said guiding edge and back to and at least partially about the roll in such a manner that before finally leaving the roll the free sheet end engages and covers the outside of at least a partial length of the slice material constituting the outermost slice material layer of the roll.

**[0007]** However, guiding the sheet as in US Patent 4,111,332 after dispensing the sliced food product again around the roll puts the sheet further into contact with the not yet dispensed food product, especially if sliced material or a fraction of the sliced material fails to be dispensed and is drawn back into the slice dispenser unit. Especially the guiding edge might not be sufficient to release the product from the carrier sheet, in particular if the food product is soft, brittle and/or sticks to the carrier sheet. In addition, guiding the empty carrier sheet again about the roll results on compressive forces exerted on the slice material, which might cause damage to the food product.

**[0008]** Thus, the present invention takes these issues into account and provides a food dispenser apparatus that is fit to provide food products having different sizes and forms.

### Summary of the Invention

**[0009]** In a first embodiment of the present invention, the food dispensing apparatus comprises a food storage means for storing a wrapped food product and which dispenses a wrapped food product. The wrapped food product is at least partly covered with a wrapper. Further, the food dispensing apparatus has redirecting means for redirecting the wrapper away from the food product to opposite faces in order to separate the wrapper and the food product. Feeding means transport the food product for feeding the wrapped food product towards the redirecting means, where the food product is unwrapped.

**[0010]** Redirecting the wrapper away from the food product to opposite faces allows delivering the unwrapped product in the feeding direction and at the same time avoids that the food product gets into direct contact with any other part of the food dispensing apparatus. Further, by providing redirecting means, it is possible to (1) separate the wrapper from the food product and to (2) separate the wrapper into at least two parts that are redirected to opposite faces. In contrast to the food trays of the state of the art described above, the food products

are provided individually without the need for time consuming manual unwrapping of the products. Moreover, the products waiting in line to be unwrapped by the food dispenser keep their texture and taste, i.e. their freshness. Further, keeping each product wrapped until needed for preparation minimizes the time period in which the product can be contaminated. The food storage means further allows providing a high number of food products with each batch of supplied food instead of the limited number of food products that can be provided by trays. Although preferably each food product is wrapped individually, it is also possible to provide individually packed food product units that contain more than one food product or combinations of food products.

**[0011]** The feeding means may be arranged to feed the wrapped food product by directly driving the wrapper. Thus, no additional transporting means such as a belt are needed in order to dispense the food product. The redirection of the wrapper may be performed symmetrical in respect to the feeding direction of the wrapped food product. Further, when the wrapper is redirected to opposite faces, it is preferably separated into at least two parts in order to unwrap the food product wrapped therein.

**[0012]** The food storage means may be configured so that a stored food product may be replaced as a whole. This facilitates the change of the stored food product to either restock or change the food product during production while preventing contact with any part of the food dispensing apparatus, which facilitates the change between different types of food products, such as cheese, meat, vegetables, and/or fruits.

**[0013]** At the beginning of a food product stored in the storage means, the wrapped food product preferably comprises a section with a length of the wrapper but without the food product. After installing the food storage means, this section is separated and guided about the redirecting means. In other words, before starting the dispensing operation, the front section of the wrapper without any food product is taken from the food storage means, is led about the redirecting means, where it is to be separated into two parts towards opposite faces and is engaged with the feeding means, so that the wrapped food product can be fed from the food storage means towards the redirecting means to be unwrapped and being dispensed for further processing.

**[0014]** In another embodiment of the present invention, the food dispensing apparatus comprises an activating and/or deactivating element that is connected to the feeding means and which is configured to activate and or deactivate the feeding means for dispensing a predetermined amount of the food product.

**[0015]** The incorporation of an activating and/or deactivating element within the food dispensing apparatus that starts and/or stops has the advantage to provide an increased efficiency in supplying the product for further processing or consumption.

**[0016]** The activating and/or deactivating element may

comprise electronic and/or mechanical means to activate and/or deactivate the feeding means in order to control the movement of the feeding means. As long as the activating and/or deactivating element causes the feeding means to be activated, the feeding means move the wrapped food product so that the food dispensing apparatus dispenses the unwrapped food product. The food dispensing apparatus may be configured to dispense a predetermined amount of the food product after being activated by an activating and/or deactivating element and/or to provide the food product as long as an activating and/or deactivating element is activated directly or indirectly. It may further be of advantage to be able to set a predetermined amount of the food product to be dispensed before an activation of the feeding means.

**[0017]** Setting the amount of the food product to be dispensed has the advantage to provide an increased efficiency in supplying the product for further processing or consumption since no intervention of an operator is necessary.

**[0018]** In another preferred embodiment, the activating and/or deactivating element is a switch and/or a sensor, preferably a proximity sensor.

**[0019]** Using a switch and/or a proximity sensor as an activating and/or deactivating element has the advantage that an operator may activate the feeding means such as an electric motor and at the same time is in a position to use both hands for taking and processing the dispensed food product.

**[0020]** Moreover, the switch and/or sensor is preferably positioned on the dispensing side of the food dispensing apparatus so that the activation and/or deactivation of the food dispensing apparatus can be caused by an operator, markers, features of the product, and/or features of the wrapper.

**[0021]** For example, a switch may directly be attached to the food dispensing apparatus such as to the housing and/or can be provided as a separate entity such as a foot switch or a switch that is placed at the workplace, preferably nearby the food dispensing apparatus. If a proximity sensor is used, it may be placed at the location where the food is being dispensed, i.e. the food dispensing area so that the feeding means are activated as soon as an operator approaches this area. The skilled person will appreciate that it is possible to activate and/or deactivate the feeding means with the same switch and/or sensor as well as by using separate switches and/or sensors.

**[0022]** In another embodiment of the present invention, the food dispensing apparatus comprises a sensor, preferably a photocell, which is configured to stop the feeding means after a predetermined amount of the food product has been dispensed.

**[0023]** Supplying a predetermined amount of the food product may facilitate the production process since the operator is only required to activate the food dispensing apparatus without having to actively control the amount of the food product to be dispensed. In other words, the

amount of the food product dispensed upon activation can be preset to match the demand for the respective production process. No further interaction of an operator with the apparatus is necessary.

**[0024]** For example, by providing a fixed number of units, preferably slices, pieces and/or chunks, of a food product provides the advantage to facilitate the preparation of layered food such as sandwiches since an operator only has to activate the food dispensing apparatus to be provided with the desired amount of the food product to start, finish or continue preparation.

**[0025]** The sensor used in this embodiment should be able to sense the amount of the food product supplied directly and/or indirectly to be further processed by an operator and/or another apparatus. Directly sensing the amount of food supplied is to be understood that the sensor is able to directly track the amount of food by sensing inherent properties of the food product. However, as an additional measure or as an alternative indirect sensing can be applied in order to register the amount of the food product supplied, i.e. sensing properties of the wrapper such as a marker or characteristics of the wrapped food product resulting from the combination of the wrapper and the food product such as gaps in between subsequent wrapped units of the food product. Preferably, the sensor is a photocell. However, other types of sensors may also be used such as ultrasound, temperature or magnetic sensors.

**[0026]** Sensing indirectly exhibits the advantage that the amount of food supplied by the food dispensing apparatus can simply be controlled by the design of the wrapper and/or the way the food product is wrapped. On the other hand, sensing directly allows for a simpler wrap for the food product.

**[0027]** In another embodiment of the present invention, the redirecting means is a roller and/or an edge, preferably two rollers and/or edges facing each other.

**[0028]** Redirecting the wrapper away from the food product by using two opposing rollers has the advantage that redirecting the wrapper is achieved without causing significant material stresses that may cause rupture of the wrapper material. In addition, the rollers could be implemented to further form at least part of the feeding means by a connection to driving means or even by the integration of driving means into the rollers. On the other hand, using edges that preferably have a chamfer and/or a radius constitutes redirecting means that are available for a low production cost and causing low costs during service life since they are generally maintenance free. Naturally, it is also possible to combine rollers and edges in order to redirect the wrapper away from the food product.

**[0029]** In another embodiment according to the present invention, the feeding means are connected to a reel, which is configured to wind up the wrapper after it has been separated from the food product and, preferably, has been split into at least two parts. Preferably, two reels are situated on opposite faces along the dis-

persing direction of the food product in order to redirect the separated sections of the wrapper.

**[0030]** Winding up the wrapper on a reel has the advantage to collect the used wrapper in a convenient and space-efficient way, even more so if the reels are configured to be easily interchanged, for example, after the food product provided by the food storage means is used up.

**[0031]** The reel may be connected to driving means like a motor such as an electric motor and/or mechanical driving means such as a handle. By connecting the reel to driving means or by integrating driving means into the reel it is possible to use the reel not only for winding up the empty wrapper but also to embody the feeding means for feeding the wrapped food product towards the redirecting means.

**[0032]** In another embodiment the reel also constitutes the redirecting means.

**[0033]** By integrating the functions of redirecting the wrapper during/after unwrapping the food product and winding up the wrapper by using a reel, provides a design of the food dispensing apparatus at an especially low cost. In this embodiment, the reels are connected to driving means to be able to feed the wrapped product towards the reel itself. Like in the previous embodiment, it is further preferred that the reel can be detached from the food dispensing apparatus in order to provide a fast and efficient interchange to the next lot of food to be supplied.

**[0034]** In another preferred embodiment the wrapped food product is a sliced product, preferably cheese, confectionaries, vegetables, fruits and/or cold cuts.

**[0035]** Especially for sliced food products, the food dispensing apparatus provides a cost-efficient way to supply the food product for further processing such as to produce ready-made food. For example, the slices could be used for the production of cold or hot sandwiches, pizzas, cakes, and/or casseroles. However, the slices do not necessarily have to be thin slices but can also be rather thick "slices" as may be found for steaks or any other food product for dispensing. Being able to dispense a large variety of products enables the adaption of the apparatus to a multitude of possible applications within the food industry.

**[0036]** In another preferred embodiment of the present invention, the food dispensing apparatus comprises a cooling section that is configured to cool the food product before being dispensed.

**[0037]** This embodiment has the advantage that the food does not have to be removed from the dispensing apparatus in order to make the food product contained therein to last until fully used up. Further, extra appliances are saved as well as the time and production costs needed to uninstall and install the wrapped food product.

**[0038]** In this embodiment, the cooling section may cool the food product and/or the wrapped food products installed downstream from the food storage means. Alternatively, the cooling section cools the food storage means. In this case, preferably, the wrapped food prod-

ucts that already left the food storage means to be dispensed can be transported back to the food storage means. This may simply be achieved by reversing the feeding means or by an additional manual and/or automatic driving means.

**[0039]** In a preferred embodiment the present invention provides a wrapper for wrapping a plurality of food products that are to be dispensed with the food dispensing apparatus. The wrapper comprises a wrapper front section, a wrapper back section and a food product in between the wrapper front section and the wrapper back section, wherein the wrapper front section and the wrapper back section are at least partly connected to each other.

**[0040]** Having a wrapper front section and a wrapper back section allows the wrapper to be separated to opposite faces later on when installed in the food dispensing apparatus. Further, it is possible to avoid contact of the food product with the environment until being dispensed and thus to preserve the food product, i.e. to make it more lasting and more storable. The wrapper wrapping a plurality of food products further has the advantage that a food storage means using such a wrapper can contain a plurality of food products in one wrapper. Preferably, the wrapper is designed to contain at least 50 pockets or compartments for food products, more preferably at least 200, 500 or 1000. The wrapper may also be used to transport the wrapped food product from the food storage means to the food dispensing area, preferably by pulling the wrapper with the feeding means.

**[0041]** In another embodiment of the present invention, the connection between the wrapper front section and the wrapper back section is at least partly formed by a longitudinal seal area oriented in the dispensing direction and/or a transverse seal area oriented transverse to the dispensing direction.

**[0042]** The seal areas ensure that the food product is sufficiently sealed and therefore has the effect to keep the product from being contaminated. More specifically, the wrapped food product may last longer due to the seal area. The seal areas of the wrapper may be designed to open up if forces in approximately opposite directions directed away from the wrapper are applied in order to separate the wrapper into at least two parts. At least one of the longitudinal seal areas may be a fin seal area.

**[0043]** In another embodiment, the wrapper back section or the wrapper front section is formed by at least two parts located along the longitudinal sides of the wrapper front section or the wrapper back section, respectively.

**[0044]** By separating either the wrapper back section or the wrapper front section into at least two parts enables the packaging of the product by wrapping the wrapper around the edges of the food product that are in general oriented longitudinally, i. e. in the dispensing direction of the food dispensing apparatus. Such a design has the advantage that it only requires one longitudinal seal area along the dispensing direction. Thus, this embodiment provides a simpler and more cost-efficient wrapper de-

sign for the food product to be dispensed.

**[0045]** The wrapper front section and/or the wrapper back section may constitute the front section and/or back section for only one product but may also constitute the front and/or back section for multiple products placed in a row (i. e. transverse to the food dispensing direction) that are dispensed in a parallel manner at the food dispensing area of the food dispensing apparatus.

**[0046]** In another embodiment, the wrapper further comprises at least one laser scored line between the wrapper front section and the wrapper back section.

**[0047]** Providing at least one laser scored line has the advantage to facilitate the separation of the wrapper and at the same time to dispense the food product in a precise and predetermined manner. In other words, the subdivision of the wrapper during separation can be easily controlled by the placement of the laser scored lines.

**[0048]** Preferably, the laser scored lines are provided along the dispensing direction of the wrapper. Further, these weakened sections, i.e. laser scored line sections may be provided at opposite sides in respect to the width of the wrapped food product. Consequently, the wrapper can be separated into at least two, preferably equally sized subsections. After separation, these subsections are then collected, for example by the aforementioned reels or another collecting means such as the transport packaging or an additional container.

**[0049]** In a further embodiment, the wrapper comprises a marker that is located on the wrapper front section and/or wrapper back section, wherein each marker indicates a unit of a food product to be dispensed.

**[0050]** Using markers in order to control the amount of the food product to be supplied has the advantage that the sensing means registering the markers does not have to be adapted to characteristics of the food product and is thus more robust towards external influences that may lead to an incorrect amount of the food product to be dispensed. It is possible to mark each packaged food product. If more than one food product is to be supplied at a time, markers passing by a sensor such as one of the aforementioned sensors can simply be added up until the predetermined number of products has been dispensed. On the other hand, it is also possible to provide multiple products with one marker to form one unit to be dispensed.

**[0051]** Further, providing a marker may also provide additional information about the food product while the food product is being dispensed such as the type of food product or any other information that may be useful for processing the food product or how the food product should be handled by the food dispensing apparatus.

**[0052]** In another embodiment, the wrapper further comprises a tag configured to provide information about the food product, preferably the shelf life.

**[0053]** This has the advantages that the apparatus and/or the user are provided with information that may help to properly dispense the food product (e. g. feeding speed, feeding acceleration) or about the product itself

(e. g. shelf life, type(s) of products contained in the wrapper).

**[0054]** In another embodiment of the present invention, the wrapper is made out of plastic, paper, aluminium or combinations thereof.

**[0055]** Using at least one of these wrapping materials allows adapting the wrapping to the requirements concerning the properties of the wrapper, the interaction between the wrapper and the food product and/or the interaction between the wrapper and the food dispensing apparatus. For example, there may be a difference if the packaging material is only used to seal the food product from the environment or if an additional treatment to the food product before dispensing such as heating, cooling and/or a mechanical treatment is applied.

**[0056]** In another embodiment of the invention, the wrapper is made out of a material, preferably polypropylene, having a primary material orientation that is approximately parallel to the dispensing direction.

**[0057]** The wrapper having primarily a material orientation that is running parallel to the dispensing direction has the advantage that it facilitates the separation of the wrapper into at least two parts. More specifically, such a material orientation may easily tear the wrapper along the feeding direction in an approximately straight line during the separation of the food product from the wrapper.

**[0058]** In another embodiment of the present invention, the wrapper comprises a release agent to facilitate the separation of the food product from the wrapper.

**[0059]** The application of a release agent has the advantage that it allows for a more easy separation of a food product from the wrapper material, especially when a delicate food product that easily rips is separated from the wrapper material. Further, the application of such a release agent makes it possible to redirect the wrapper in the food dispensing area in a steeper angle in respect to the feeding direction while still properly dispensing the food product.

**[0060]** In another preferred embodiment the wrapper is provided as a roll and/or in a stacked lay flat configuration.

**[0061]** This allows a provision of the food product without exposing the food product to the environment before dispensing. By using a roll, it is possible to simply provide the wrapped food product from this roll in order to feed it towards the redirecting means, i. e. the food dispensing area. On the other hand, by using a stacked lay flat configuration, it is possible to provide the wrapped food product without applying additional pressure to the food product. In other words, the food product does not get squeezed by pulling the wrapped food product from the roll, which may be important when dispensing food products that are pressure sensitive such as thin sliced or delicate food products. Like in the embodiments described above, the food storage means can provide single or multiple food products wrapped into one pocket or unit. The food storage means, in particular the food storage means in the form of a roll, further has the advantage

that the food dispenser can be installed either as a countertop appliance or as an overhead appliance. Since countertop space at food production sites such as in fast food restaurants is limited, particular the latter option of an overhead installation offers a significant advantage.

**[0062]** In another embodiment of the present invention, the wrapper is placed in a transportation packaging representing a food storage means for a food dispensing apparatus.

**[0063]** Placing the wrapper containing the food product in a transportation packaging facilitates a fast replacement of an emptied food storage means with a full food storage means. It is also possible to not fully use up one food storage means before replacing it with another one, for example if another type of food product is needed for the production process. The transportation may also facilitate to temporarily remove the food storage means, for example to keep it cool and fresh while not needed for production purposes.

**[0064]** In another embodiment of the present invention, the transportation packaging has an opening that is configured to supply the food product to the food dispensing apparatus.

**[0065]** Although it is possible to fully remove the wrapped food product from the transportation packaging before dispensing it by the use of the food dispensing apparatus, it is advantageous to only open parts of the transportation packaging in order to supply the food product through such an opening and thus avoid time consuming unpacking and mounting of a wrapped food product. The size of the opening may be chosen according to the wrapped food product to be dispensed so that, for example, instead of opening a whole side of the transportation packaging, a small window within the transportation packaging serves as a sufficient opening to let the food product pass from the food storage means towards the redirecting means.

**[0066]** The present invention further provides a combination of a food dispensing apparatus and a wrapper configured for supplying a food product for further processing.

**[0067]** The combination of the food dispensing apparatus and the wrapper of the present invention offers to use both to their full advantage as described in the embodiments above.

**[0068]** The present invention further provides a method for dispensing a food product with a food dispensing apparatus, comprising the steps of activating feeding means of the food dispensing apparatus, automatically unwrapping a wrapped food product by separating a wrapper and the food product, dispensing the food product for further processing, and deactivating the feeding means of the food dispensing apparatus.

**[0069]** This automated method to provide a food product for further processing serves to optimize the supply chain. In order to prevent contamination of food products, food products used during the preparation of for instance ready-made food are preferably wrapped. However,

since the food dispensing apparatus automatically unwraps and dispenses the product for further processing, the time normally needed in handling and unwrapping is saved. Thus, this method is more cost efficient, especially when compared to the standard procedure by providing these products in small batches as described above.

**[0070]** In another embodiment, the activation and/or deactivation of the food dispensing apparatus is triggered by a switch or a sensor, preferably a proximity sensor.

**[0071]** Using a switch or a sensor allows direct control over the point of time when a food product is dispensed. Thus, adaptation to the speed or requirements of the production process is easily achieved. Using a proximity sensor is contactless and thus cannot be affected by the food concerning the activation and/or deactivation of the food dispensing apparatus, which otherwise may lead to malfunctioning. Further, the sensor can be integrated in the work movement of the production process, enhancing its efficiency.

**[0072]** In another preferred embodiment of the present invention the method further comprises a step of charging the dispensing apparatus with a food storage means comprising the wrapped food product, preferably placed in a transportation packaging.

**[0073]** Providing the food product in a food storage means leads to a further improvement in the supply chain. The size of the food storage means holding the wrapped food product can be chosen according to the production cycle in order to optimize the point in time for recharging the food dispensing apparatus. Thus, disturbances in the production process may be reduced. Further, providing the food in a transportation packaging enhances the efficiency in changing or restocking the wrapped food product.

**[0074]** In another embodiment of the present invention, a marker on the wrapper triggers the deactivation of the food dispensing apparatus.

**[0075]** In this embodiment the deactivation by a marker makes user-interaction in stopping the food dispense unnecessary. In other words, it is unlikely that after activation, the food dispensing action continues which may lead to a waste of food products.

**[0076]** In a further embodiment of the present invention, the redirecting means separate the food product and the wrapper by redirecting the wrapper away from the food product.

**[0077]** On top of enhancing the efficiency of the production process by automating the unwrapping of the food product, redirecting the wrapper may also lead to an easy and controlled disposal of the wrapper. In contrast to a manual disposal, this process does not need any intervention. The efficiency of the disposal of the used wrapper may be further enhanced by redirecting the used wrapper back into the transportation packaging, either in the same or a different compartment of the transportation packaging.

**[0078]** Consequently, the food dispensing apparatus as well as the food storage means and the wrapper ac-

cording to the invention provide a fast, efficient and economical way to dispense a food product for further processing.

## 5 Description of the drawings

### **[0079]**

Fig. 1 shows a first embodiment of the food dispensing apparatus according to the present invention.

Fig. 2 shows a second embodiment of the food dispensing apparatus according to the present invention.

Fig. 3 shows a third embodiment of the food dispensing apparatus according to the present invention.

Fig. 4 shows a layout of a wrapper for usage with the food dispensing apparatus of the present invention.

## Detailed description of preferred embodiments

**[0080]** The skilled person will appreciate that in the following identical reference signs refer to identical or corresponding features or features having an identical or corresponding function.

**[0081]** Fig. 1 illustrates a first embodiment of the food dispensing apparatus 1 according to the present invention. The food storage means 20 of the food dispensing apparatus 1 is preferably situated below a food dispensing area 10. As shown in Fig. 1, the food storage means 20 provides the wrapped food product 22 within a transport packaging 24. Naturally, it is also possible to place the wrapped food product 22 without transport packaging 24 within the food dispensing apparatus 1. In Fig. 1, the wrapped food product 22 is provided as a sliced product 11, wrapped in a wrapper 30 (cf. Fig. 4).

**[0082]** Within the transport packaging 24, the wrapped food product 22 is disposed in a stacked lay flat configuration. Alternatively, the wrapped food product 22 may also be provided as a roll, possibly rotatable supported on a roller 23, either in the transport packaging 24 or directly in the food dispensing apparatus 1 (cf. Fig. 2).

**[0083]** Preferably, the wrapped food product 22 is guided to the food dispensing area through a window 25 within the transport packaging 24. However, it is also possible to simply open at least one side of the transport packaging 24 to access the wrapped food product 22 in order to contrive the wrapped food product 22 into the mechanism of the food dispensing apparatus 1.

**[0084]** Outside the transport packaging 24, the wrapped food product 22 is guided towards redirecting means 2. At the redirecting means the wrapper 30 in which the food product 11 is prepacked, is separated to opposite faces from the food product 11. In other words, the food product 11 is in a wrapped state before reaching

the redirecting means 2, preferable in a fully wrapped state to be sealed off the environment and is unwrapped by the separation of the wrapper, preferably at weakened sections. The weakened sections of the wrapper 30 are preferable laser scored lines 35, so that it can be pulled apart towards opposing faces in order to unpack the food product 11. More specifically, at the end of the food product 11 in the dispensing direction, the wrapper 30 is pulled to opposing sides so that the wrapper 30 of the wrapped food product 22 rips open at the laser scored lines 35. By pulling further, the wrapped food product 22 continues to be unpacked along these laser scored lines. After being unwrapped, the food product is dispensed, preferably through an opening in the housing of the food dispensing apparatus and the used wrapper is collected in one of the above mentioned ways. Naturally, other means than laser scored lines could be used to weaken the wrapper at predetermined portions in order to facilitate the unwrapping of the wrapped food product 22 at the height of the food dispensing area 10.

**[0085]** In order to allow for pulling the wrapper 30 to opposite faces, redirecting means 2 are positioned on two opposing sides of the wrapped food product 22, respectively. Rollers and/or edges may be used as redirecting means about which the wrapper 30 is being redirected.

**[0086]** Preferably, the food product 11 is provided through an opening 3 of the food dispensing apparatus 1 such as a slit. In a preferred embodiment, the edges 5 of the opening 3 are used as the redirecting means 2 (Fig. 3). The wrapper 30 may further be redirected while the food product 11 is unwrapped through at least one opening situated on the dispensing side with the dispensing opening 3 and may be guided back into the food dispensing apparatus 1 through another opening (Fig. 3).

**[0087]** After being redirected into the housing 7 of the food dispensing apparatus 1, the wrapper is being collected, preferably by rolling up the wrapper 30 about the feeding means. In Figs. 1 and 2 the feeding means are shown as reels that are situated on two opposing sides in respect to the wrapped food product 22 transported towards the food dispensing area 10.

**[0088]** An alternative solution for collecting the separated wrapper 30 is to transport the wrapper to a collection point to facilitate its disposal. The collecting point may be the transport packaging 24 of the food product 11 itself or a separate container. Such a configuration makes the disposal of the separated used wrapper 30 efficient and easy. However, the same effect is achieved if the separated wrapper 30 is rolled up on reels 4 that can preferably at least partly be detached from the food dispensing apparatus so that the used wrapper 30 can be disposed.

**[0089]** The feeding means could be driven by a motor or alternatively by using a handle, i.e. a manual feed. In case of a motor such as an electric motor, the feeding means could manually be activated by switches (not shown) or may automatically be activated and/or deac-

tivated by using at least one sensor. For example, the feeding means could be activated by a proximity sensor 6 so that the food product is started to be dispensed. As a further feature, it is also within the scope of the invention to use a sensor that registers markers 36 integrated within the wrapper 30. This allows after activation of the feeding means to dispense a predetermined amount of food to deactivate the dispensing apparatus.

**[0090]** The food dispensing apparatus 1 of Fig. 2 uses instead of a food storage means 20 with a transport packaging 24 in which the wrapped food product 22 is stored in a lay flat configuration a food storage means in which the wrapped food product 22 is provided on a roller 23. As can be seen in Fig. 1 and Fig. 2, there are multiple possibilities to slice the wrapped food product 22 in order to dispense a food product 11 at the height of the food dispensing area 10.

**[0091]** Fig. 4 shows an exemplary layout for a wrapper. Such a wrapper can be made out of plastic, paper, aluminium or any other package materials known to the skilled person as well as combinations thereof. The wrapping of the products can be done separately, i. e. each wrapping compartment contains one entity of the product, or together, i. e. multiple food products are contained in one pocket of the wrapper 30.

**[0092]** The wrapper has a length in the dispensing direction along which multiple pockets for a food product 11 are situated. Each of those pockets consists of a wrapper front section 32 and a wrapper back section 34. In the wrapper layout of Fig. 4 the food product is positioned on the wrapper front section 32. Afterwards, the wrapper back section 34 is wrapped around the food product 11. This is achieved by a layout in which the wrapper front section is situated centrally along the length of the wrapper wherein the wrapper back section 34 is separated into two parts that are running along both sides of the wrapper front section 32.

**[0093]** Thus, after folding the wrapper back section 34 over the food product 11, the food product 11 is sealed within a pocket by closing longitudinal seal areas 31 situated at the outer edges along the length of the wrapper 30 and transverse seal areas 33 situated in a transverse direction in respect to the longitudinal direction of the wrapper 30.

**[0094]** In order to facilitate the opening of the wrapper, i. e. the unwrapping of the food product 11 at the food dispensing area 10, the wrapper comprises weakened sections such as laser scored lines 35. These weakened sections 35 are positioned between the central wrapper front section 32 and the adjacent wrapper back sections 34. Thus, the wrapped food product 22 is unwrapped by separating the wrapper at the weakened sections 35.

**[0095]** Such a design has the advantage in comparison to opening the wrapped food product 22 along the longitudinal seal area that the design of the longitudinal seal area does not have to be reopenable. However, if needed, opening the wrapped food product 22 along the longitudinal seal areas can be an alternative or additional



option to the weakened section 35 for unwrapping the food product 11.

**[0096]** Since the transverse seal area 33 is separated at the redirecting means, it is important to choose a design for the seal area that on one hand facilitates the separation of the wrapper front section 32 and the wrapper back section 34 to open up the compartment/pocket in which the food product 11 is placed and on the other hand allows for a secure sealing of the food product 11 within its compartment of the wrapper 30. It is also important to appreciate that the transverse seal area should not cause a weakening of the wrapper to such an extent that there is a risk of the wrapper being separated transverse to its longitudinal, i. e. dispensing direction. However, it can be advantageous to include such a weakened section transverse to the longitudinal direction of the wrapper 30 such as for example at the end of a food stock of the food storage means 20 provided on a roller 23. Naturally, it is within the scope of the invention to pack more than one product in separate compartments in rows and/or columns along the transverse direction of the wrapper. It is also within the scope of the invention to provide more than one type of product in a wrapper 30.

#### Claims

1. A food dispensing apparatus (1) comprising a food storage means (20) for storing a wrapped food product (22) that is at least partly covered with a wrapper (30), redirecting means (2) for redirecting the wrapper (30) away from the food product (11) to opposite faces to separate the wrapper (30) and the food product (11), and feeding means for feeding the wrapped food product (22) towards the redirecting means (2).
2. The food dispensing apparatus (1) according to claim 1, further comprising an activating and/or deactivating element (6, 8) connected to the feeding means, configured to activate and/or deactivate the feeding means for dispensing a predetermined amount of the food product (11).
3. The food dispensing apparatus (1) according to claim 2, wherein the activating and/or deactivating element (6, 8) is a switch and/or a sensor, preferably a proximity sensor.
4. The food dispensing apparatus (1) according to one of the preceding claims, further comprising a sensor (8), configured to stop the feeding means after a predetermined amount of the food product (11) has been dispensed, the sensor preferably being a photocell.
5. The food dispensing apparatus (1) according to one of the preceding claims, wherein the redirecting means (2) is a roller and/or an edge, preferably two

rollers and/or edges facing each other.

6. The food dispensing apparatus (1) according to one of the preceding claims, wherein the feeding means are connected to a reel (4), configured to wind up the wrapper (30) after being separated from the food product, preferably two reels (4) situated on opposite faces along the dispensing direction of the food product (11).
7. The food dispensing apparatus (1) according to claim 6, wherein the reel (4) also constitutes the redirecting means.
8. The food dispensing apparatus (1) according to one of the preceding claims, wherein the wrapped food product is a sliced product, preferably cheese, confectionaries and/or cold cuts.
9. The food dispensing apparatus (1) according to one of the preceding claims, further comprising a cooling section that is configured to cool the food product (11) before being dispensed.
10. A wrapper (30) for a food dispensing apparatus (1) wrapping a plurality of food products (11), the wrapper (30) comprising a wrapper front section (32), a wrapper back section (34) and a food product (22) in between the wrapper front section (32) and the wrapper back section (34), wherein the wrapper front section (32) and the wrapper back section (34) are at least partly connected to each other.
11. The wrapper (30) according to claim 10, wherein the connection between the wrapper front section (32) and the wrapper back section (34) is at least partly formed by a longitudinal seal area (31) oriented in the dispensing direction and/or a transverse seal area (33) oriented transverse to the dispensing direction.
12. The wrapper (30) according to claim 10 or 11, wherein the wrapper back section (34) or the wrapper front section (32) is formed by at least two parts located along the longitudinal sides of the wrapper front section (32) or the wrapper back section (34).
13. The wrapper (30) according to one of the claims 10 to 12, further comprising at least one scored line (35) between the wrapper front section (32) and the wrapper back section (34).
14. The wrapper (30) according to one of the claims 10 to 13, wherein the wrapper (30) comprises a marker (36) located on the wrapper front section and/or wrapper back section, wherein each marker indicates a unit of a food product to be dispensed.

15. The wrapper according to one of the claims 10 to 14, wherein the wrapper further comprises a tag configured to provide information about the food product.
16. The wrapper (30) according to one of the claims 10 to 15, wherein the wrapper (30) is made out of plastic, paper, aluminium or combinations thereof.
17. The wrapper (30) according to one of the claims 10 to 16, wherein the wrapper (30) is made out of a material, preferably polypropylene, having a primary material orientation that is approximately parallel to the dispensing direction.
18. The wrapper (30) according to one of the claims 10 to 17, wherein the wrapper (30) comprises a release agent to facilitate the separation of the food product (11) from the wrapper (30).
19. The wrapper (30) according to one of the claims 10 to 18, being provided as a roll and/or in a stacked lay flat configuration.
20. The wrapper (30) according to one of the claims 10 to 19, wherein the wrapper (30) is placed in a transportation packaging (24) representing a food storage means (20) for a food dispensing apparatus (1).
21. The wrapper (30) according to one of the claims 10 to 20, wherein the transportation packaging (24) has an opening, configured to supply the food product (11) to the food dispensing apparatus (1).
22. A combination of a food dispensing apparatus (1) according to claims 1 to 9 and a wrapper (30) according to claims 10 to 21 configured for supplying a food product for further processing.
23. A method for dispensing a food product with a food dispensing apparatus (1), comprising the steps of:
- activating feeding means of the food dispensing apparatus (1)
  - automatically unwrapping a wrapped food product (22) by separating a wrapper (30) and the food product (11)
  - dispensing the food product (11) for further processing and
  - deactivating the feeding means of the food dispensing apparatus (1).
24. The method according to claim 23, wherein the activation and/or deactivation of the food dispensing apparatus (1) is triggered by a switch or a sensor, preferably a proximity sensor.
25. The method according to claim 23 or 24, wherein the method further comprises a step of charging the dispensing apparatus (1) with a food storage means (20) comprising the wrapped food product (22), preferably placed in a transportation packaging (24).
26. The method according to one of the claims 23 to 25, wherein a marker (36) on the wrapper (30) triggers the deactivation of the food dispensing apparatus (1).
27. The method according to one of the claims 23 to 26, wherein redirecting means (2) separate the food product (11) and the wrapper (30) by redirecting the wrapper (30) away from the food product (11).

Figure 1

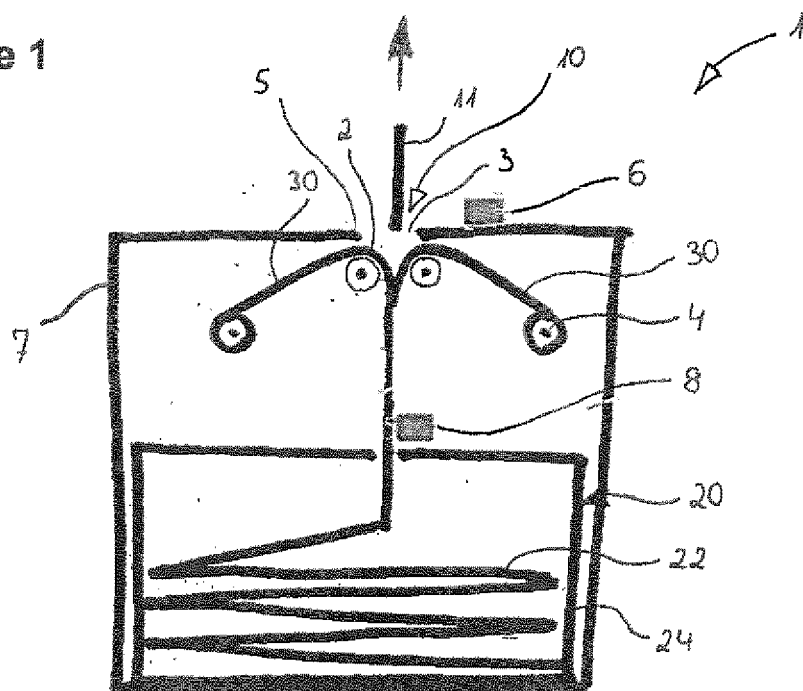


Figure 2

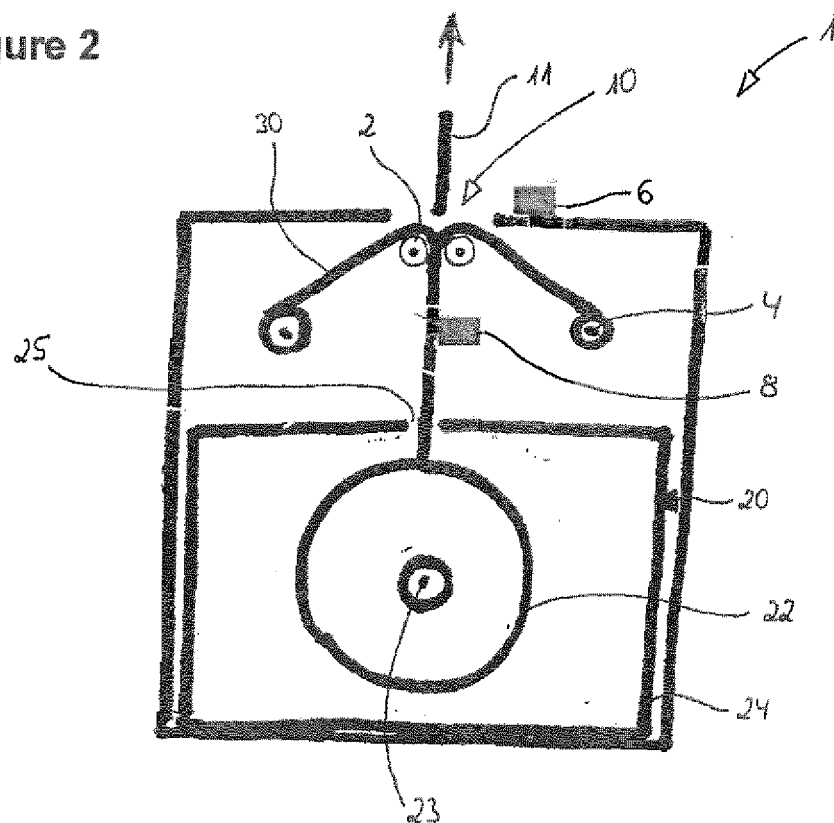


Figure 3

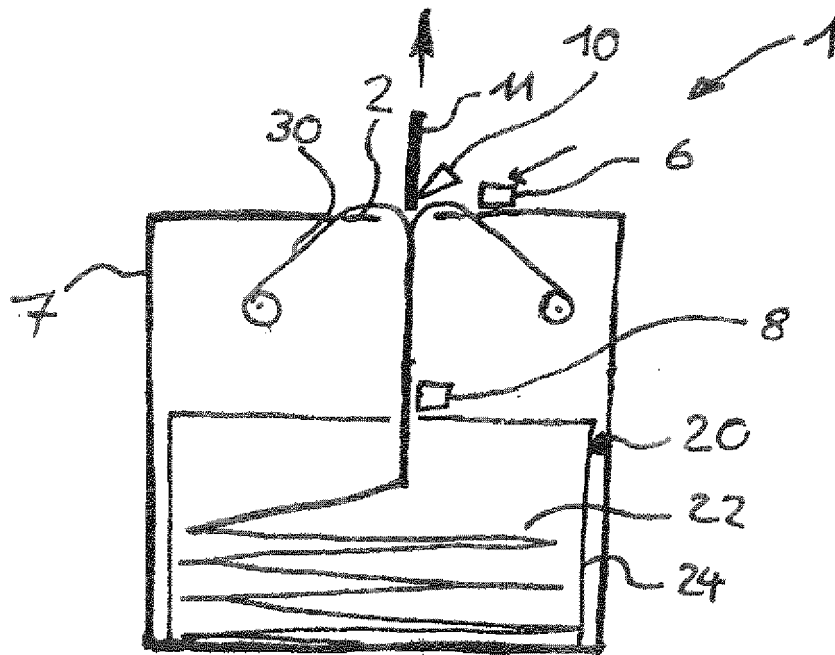
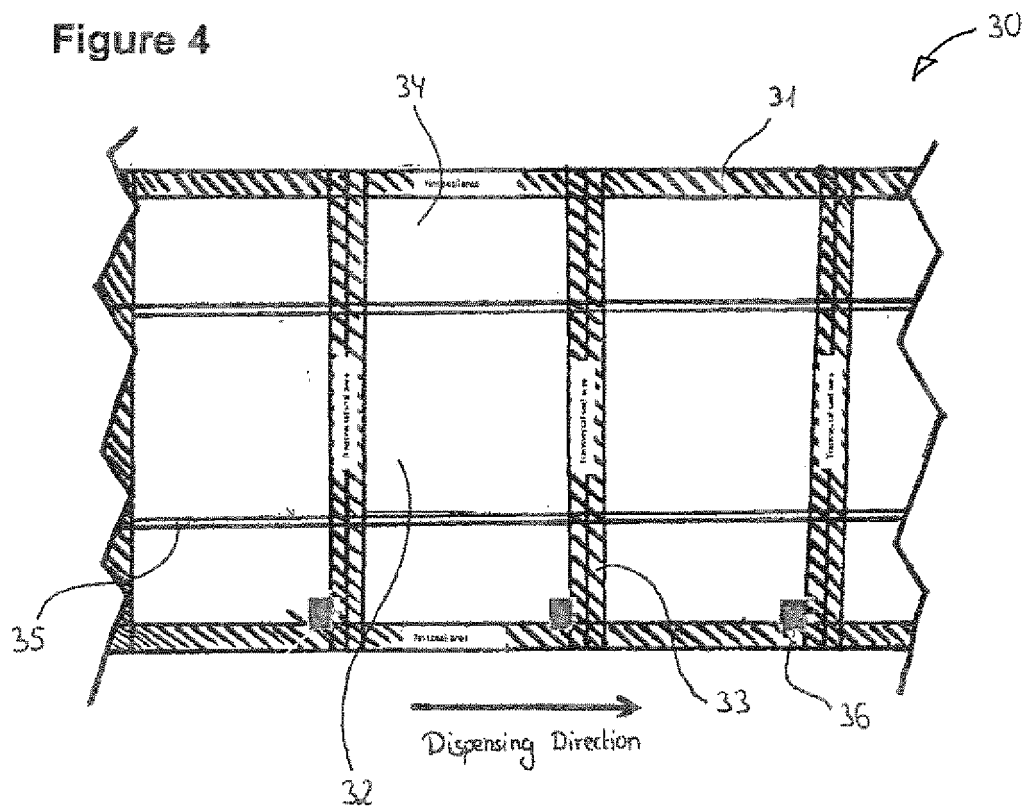


Figure 4





## EUROPEAN SEARCH REPORT

Application Number  
EP 12 15 4175

| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                     |                                                          |                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Citation of document with indication, where appropriate, of relevant passages                                                                       | Relevant to claim                                        | CLASSIFICATION OF THE APPLICATION (IPC)     |
| X<br>A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | WO 2006/125058 A2 (ALMBLAD ROBERT [US])<br>23 November 2006 (2006-11-23)<br>* page 11, line 10 - page 18, line 2;<br>figures 2-6 *                  | 1,5,8,9,<br>22,23,27<br>2-4,7,<br>24-26                  | INV.<br>B65B69/00<br>B65D75/42<br>B65D75/58 |
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| X<br>A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | US 2004/045975 A1 (LEYKIN LEON [US] ET AL)<br>11 March 2004 (2004-03-11)<br>* paragraphs [0088] - [0091], [0124] -<br>[0127]; figures 30-32,66-68 * | 1,5,9,<br>22,23,27<br>2-4,6-8,<br>24-26                  |                                             |
| X<br>A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | US 5 400 699 A (CAILBAULT CHRISTIAN J G<br>[FR]) 28 March 1995 (1995-03-28)<br>* column 2, line 34 - column 3, line 63;<br>figures 1,2 *            | 1,5,6,<br>22,23,27<br>2-4,7-9,<br>24-26                  |                                             |
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| <p>1 <del>The present search report has been drawn up for all claims</del></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                     |                                                          |                                             |
| Place of search<br><b>Munich</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                     | Date of completion of the search<br><b>3 August 2012</b> | Examiner<br><b>Kulhanek, Peter</b>          |
| <p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone<br/>Y : particularly relevant if combined with another document of the same category<br/>A : technological background<br/>O : non-written disclosure<br/>P : intermediate document</p> <p>T : theory or principle underlying the invention<br/>E : earlier patent document, but published on, or after the filing date<br/>D : document cited in the application<br/>L : document cited for other reasons<br/>.....<br/>&amp; : member of the same patent family, corresponding document</p> |                                                                                                                                                     |                                                          |                                             |

EPO FORM 1503 03.82 (P04C01)



Application Number

EP 12 15 4175

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

**LACK OF UNITY OF INVENTION**

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-9, 23-27(completely); 22(partially)

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



**LACK OF UNITY OF INVENTION  
SHEET B**

Application Number  
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-9, 23-27(completely); 22(partially)

An apparatus and a method for dispensing a food product by separating a wrapper from the food product

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2. claims: 10-21(completely); 22(partially)

A wrapper for a food product where the wrapper comprises a wrapper front section and a wrapper back section which are partly connected to each other and having a food product placed in between

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 15 4175

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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03-08-2012

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