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(57) **Abrégé/Abstract:**

Method for packaging products being prone to decay, such as food products, more particularly vegetables and/or fruit in a synthetic foil, wherein the synthetic foil is perforated in an operation step, converted into a package and filled. The foil is thereby conveyed through a punching device, whereby perforations are punched in the synthetic foil, the perforated synthetic foil is formed as packages having the desired dimensions and these packages are filled with the products and closed.



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(54) Title: METHOD FOR PACKAGING PRODUCTS PRONE TO DECAY

(57) Abstract: Method for packaging products being prone to decay, such as food products, more particularly vegetables and/or fruit in a synthetic foil, wherein the synthetic foil is perforated in an operation step, converted into a package and filled. The foil is thereby conveyed through a punching device, whereby perforations are punched in the synthetic foil, the perforated synthetic foil is formed as packages having the desired dimensions and these packages are filled with the products and closed.



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Method for packaging products prone to decay

The invention relates to a process for packaging products being prone to decay, such as food
5 products, more particularly vegetables and/or fruit.

Packaging vegetables and/or fruit in packages, more particularly bags made of synthetic foil, whereby the synthetic foil is provided with perforations, is known from WO-A-93.22207.

10 This way, it is aimed at allowing the package to "breathe", improving thereby shelf life for the product. This patent application describes more in detail that the perforation size, i.e. the size of each perforation combined with the perforation number should
15 be determined depending upon the nature of the product to be packaged.

Consequently, this leads to the problem that another type of package should be used for each type of product, which involves in practice that a large number
20 of different types of packages such as bags should be available in stock. On the other hand, as the package is

made in situ from perforated foil, a large number of different foils should be available in stock, each time for the pertaining products.

The invention aims at offering a method for
5 packaging food products being prone to decay so as to alleviate this problem.

The aim is reached according to the invention by means of a method for packaging products being prone to decay, such as food products, more particularly
10 vegetables and/or fruit in a synthetic foil, wherein the synthetic foil is perforated in an operation step, converted into a packaging and filled, characterized in that the foil is conveyed through a perforation device, whereby perforations are punched in the synthetic foil,
15 the perforated synthetic foil is converted into packages having the appropriate dimensions and these packages are filled with the products and are sealed.

With this method, it can be achieved that only a limited number of synthetic foils should be available
20 in stock, since the perforations are only punched at the start of the packaging process. The synthetic foil types that should be available in stock are thereby reduced to the types of various thickness, colour and/or other quality requirements, but depend upon the desired
25 perforation, that can again be punched each time.

The invention also relates to a device for applying the above-mentioned method, said device being characterized by a combination of a feeding device for feeding a synthetic foil, a device for perforating the
30 synthetic foil, a device for forming a package from the perforated synthetic foil, a device for filling the

formed package with products, and a device for sealing the filled package, said device being characterized in that the various devices are combined into an integrated device.

5 Preferably, the device is provided with regulation elements by means of which the perforation surface per surface unit is controlled.

Other features and advantages of the invention will become evident from the following description
10 referring to the accompanying drawings, wherein the various method steps are illustrated.

In the figure, the annotation 1 schematically illustrates a synthetic foil from stock. This stock may consist in a synthetic foil roll which is unrolled and is
15 conveyed as a continuous strip towards a perforation device 2. It is also possible to start from a stock 1 consisting in separate sheets of synthetic foil, which are conveyed one by one towards the perforation device 2.

In the perforation device 2, the continuous
20 synthetic foil strips or separate sheets of synthetic foil are supplied with perforations. Punching can be done different ways, for example, with fines needles and similar means, but preferably use is made of laser beam perforations. In that aspect, a row of high energy
25 emitters such as laser beam generators can be mounted in device 2, which can extend over the whole width of the supplied synthetic strip or synthetic sheet or over a part of the width. Preferably, the row of laser beam generators extends over a small section, seen in the
30 width, since it is in general sufficient when only part of the package is perforated. Thereby, the numbers of

laser beam generators can be kept limited. Perforations can be punched in the synthetic foils through an intermittent activation of the laser beam generators and the appropriate control of the laser beam intensity.

5 Thereby, it is possible to control the perforation number per surface unit, either by activating or not all the laser beam generators, or by setting the frequency at which the laser beam generators are activated or both. Moreover, the size of each individual
10 perforation can be controlled by controlling the intensity for the laser beam generators. This way, the perforation surface (that is the total surface of the perforations) can be set by surface unit.

 As disclosed in WO-A-9322207, it is important
15 to set the perforation surface for each product type, in order to reach an optimum effect. By means of the punching device 2, the total perforation surface per surface unit can easily be set, via an electronic way, and that according to the product that is to be packaged,
20 in order to obtain an optimum shelf life of the product to be packaged.

 Determining the perforation surface can be done based on calculations, but this is preferably determined based on experimental results.

25 After the synthetic foil is thus provided with perforations, it is further conveyed in an operation step towards a device 4 for forming bags. In the case of a continuous strip, the synthetic foil first passes through a device 3 in which the strip is cut into separate sheets
30 with the desired sizes. In the case of sheets, this device 3 can be omitted.

After these bags have been formed, they are conveyed further towards a filling machine 5, where the shaped bags are filled with a measured quantity of food products, which are also supplied to the filling machine 5. 5.

Further, these filled bags 5 are finally conveyed towards a closing machine 6, where the bags are closed in an appropriate way, for example, by means of a heat sealing equipment.

10 In another embodiment of the invention, the packages are formed by double folding part of the synthetic foil, viewed in the moving direction, and by closing the thus formed edge for example through an heat sealing process. Consecutively or approximately 15 simultaneously with the longitudinal edge being formed, a transversal edge is formed, which is designed as the packaging bottom. Under this form, the thus formed bag is filled with products. Subsequently, a new transversal edge follows, by which the formed and filled package is 20 closed and isolated from the synthetic foil. Preferably in the course of the packaging closure, the bottom edge of the following package is simultaneously formed.

It is obvious that the invention is not limited to the described and illustrated embodiment, but 25 numerous modifications can be made within the scope of the claims. For example, it is more particularly possible to first form the packing after the food products have been placed on a synthetic foil sheet, which actually implies an inversion of steps 4 and 5.

CLAIMS

1. Method for packaging products prone to decay, such as food products, more particularly
5 vegetables and/or fruit in a synthetic foil, wherein the synthetic foil is perforated in an operation step, converted into a package and filled, characterized in that the foil is conveyed through a punching device, whereby perforations are punched in the synthetic foil,
10 the perforated synthetic foil is formed into packages having the desired dimensions, and these packages are filled with the products and closed.

2. Method according to claim 1, characterized in that the number and the size of the perforations are
15 determined depending on the product to be packaged.

3. Method according to any one of claims 1 or 2, characterized in that the packages are formed before being filled with the food products.

4. Method according to any one claims 1 to 3,
20 characterized in that the perforations are punched by means of high energy beams, such as laser beams.

5. Method according to claim 4, characterized in that the high energy beam intensity is set as a function of the desired size of the perforation.

25 6. Method according to claim 4, characterized in that the perforation surface per surface unit is set by controlling the number of energized high energy emitters and/or the beam intensity.

7. Device for applying the method according to
30 one of the preceding claims, characterized in that the device is made of a combination of a feeding device for

feeding a synthetic foil, a device for punching the
synthetic foil, a device for forming a package from the
perforated synthetic foil, a device for filling the
formed package with products, and a device for closing
5 the filled package, and in that the various devices are
combined as an integrated assembly.

8. Device according to claim 7, characterized
in that control elements are present by means of which
the perforation surface per surface unit can be
10 controlled.