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(54) Title: A METHOD AND DEVICE FOR FEEDING MOIST PLANT FIBER CONTAINING PRODUCTS DIVIDED INTO PORTIONS

(57) Abstract: A method for feeding a moist plant fiber containing product divided into portions, said method comprising feeding a predetermined amount of the plant fiber containing product from a volume-defining unit to a portion pack by means of a pressurized gas, a lubricant being added to the pressurized gas.

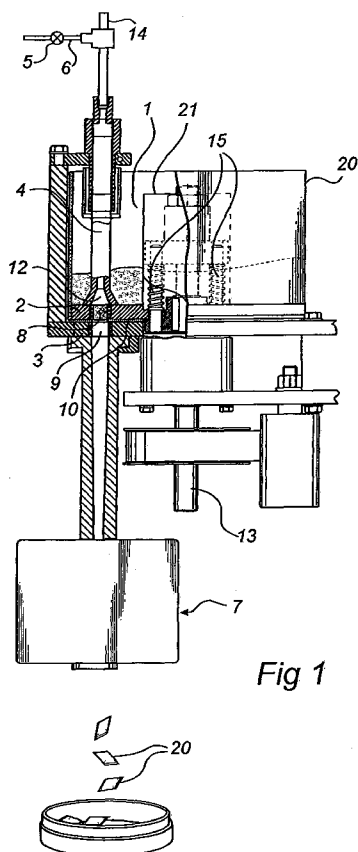


Fig 1

WO 2009/025604 A1

A METHOD AND DEVICE FOR FEEDING MOIST PLANT FIBER  
CONTAINING PRODUCTS DIVIDED INTO PORTIONS

Field of the Invention

The present invention relates to a method for feeding a plant fiber containing product divided into portions by means of a pressurized gas. The invention further relates to a device for producing a predetermined portion-

5   packed amount of a wet or moist plant fiber containing product according to the invention.

Background Art

There are currently a number of different plant fiber containing products on the market, which contain for example tobacco: cigarettes, cigars and

10   snus, in the form of loose snus and pinches of snus packed in portions. In view of today's strict legal requirements regarding non-smoking public environments, many people who smoke opt instead for other tobacco products, such as snus, which do not smell bad or cause discomfort to other people.

15   Many of those who turn to snus want to have a fresh product, for example snus packed in portions of different sizes and flavours. A common complaint, however, is that the packaging material surrounding the snus often has a brown colouring, which is not being perceived as particularly appealing. The brown colouring of the package is the result of the plant fiber containing product depositing, when moist, some discolouring plant extracts. It is desirable to

20   moisten the plant fiber containing product, for example a portion-packed pinch of snus, to a moisture content of 40-50 %, since a drier product will cause the user's mucous membranes to dry up, which gives gum problems, and since a dry product hampers the absorption of nicotine.

25   The prior-art production of portion-packed tobacco products, such as snus and also other plant fiber containing products, includes a number of currently used manufacturing methods and devices for manufacturing the portion packs. In some processes, the plant fiber containing product is, for technical reasons, first treated at a moisture content of about 20-30 %, packaged in

30   portion packs and then sprayed with water to obtain the desired moisture con-

tent. The undesired discolouring of the packaging material occurs during this moistening treatment.

The reason why it is not possible to run the process at a higher moisture content is that a more moist material will often cause clogging of the machine that divides the plant fiber containing product into individual portions  
5 and thus cause production stoppages, which result in lower production capacity. At a moisture content exceeding about 30 % in particular, the risk of a conventional packaging device being clogged is considerable.

EP 0 138 649 B1 discloses a device for forming individual packets or  
10 pouches of snus. The snus contained in a feed hopper is fed through a rotating feed wheel having a plurality of through holes to a fill tube and then to a device for filling the snus into a packaging material. When the feed wheel and the fill tube are aligned, a feed nozzle pneumatically ejects the snus from the feed wheel. Moistening of the snus is carried out after packaging.

15 EP 0 149 985 B1 discloses a method for producing and packaging given portions of snus and an apparatus for carrying out the method. Snus with a moisture content of 50-55 % is fed into pockets in a conveyor belt in which it is compressed and then subsequently blown out by means of pressurized air into a package. The document further discloses a method for  
20 packaging the snus divided into portions.

The methods disclosed in EP 138 649 B1 and EP 0 149 985 B1 for packaging snus can be applied when packaging the plant fiber containing product according to the present document.

SE 506 146 discloses a method for packaging a fine particulate, moistened tobacco material with a moisture content of about 50 %. The tobacco  
25 material is fed to a rotating positioning wheel provided with pockets for positioning the material. The wheel is suspended in a vertical direction and, in its uppermost position, the material is supplied and compressed and, in its lowermost position, a piston pushes the compressed material out onto a conveyor on which the packaging material is located.  
30

Thus, there is a need for a method and a device for feeding a moist plant fiber containing material to be packaged, which result in a fresh portion-packed product that is whiter than a portion-packed product moistened at a

later stage, which contains, for example, snus, with a moisture content of about 40-55 %, said method and device resulting in higher production capacity and a reduced risk of production stoppage.

## 5 Summary of the Invention

An object of the present invention is to provide an alternative method and device, which wholly or in part eliminate the drawbacks of prior art described above.

10 The object is achieved wholly or in part by a method and a device according to the appended independent claims. Embodiments will appear from the appended dependent claims and from the description and the associated drawings.

According to a first aspect, a method for feeding a moist plant fiber containing product divided into portions is provided, said method comprising  
15 feeding a predetermined amount of the plant fiber containing product from a volume-defining unit to a portion pack by means of a pressurized gas. A lubricant is added to the pressurized gas.

As referred to herein, the lubricant may be either liquid or solid and may have such properties that make it suitable for food production and/or as  
20 a food additive.

Non-limiting examples of a liquid lubricant are water, glycerine, propylene glycol and polyethylene glycol.

Non-limiting examples of solid lubricants are powdered or particulate silicon-based lubricants, such as sand.

25 By adding a lubricant, which may be a liquid, when feeding the plant fiber containing product, a lubricating effect is obtained which facilitates the transport of the plant fiber containing product divided into portions from the volume-defining unit to the filling device. The risk of the device according to the invention being clogged due to the formation of lumps in the product may  
30 thereby be reduced. This ability to feed moistened plant fiber containing material through the device for manufacturing products divided into portions in a safe manner enables the provision of a portion-packed plant fiber containing product packed in fresh pouches that are whiter than a pouch moistened at a

later stage, since no subsequent moistening of the material in the pouches is required. By feeding the product using a pressurized gas, a safe and efficient way of transporting the predetermined amount is provided.

5 The lubricant may be added in pulses. By adding the liquid in pulses, an even more controlled way of adding liquid as a lubricant to the process according to the invention is obtained.

The pressurized gas may be air. This offers an inexpensive and simple system for feeding the predetermined amount of the plant fiber containing product through the device.

10 The pressurized gas may be an inert gas. According to one embodiment, said inert gas is nitrogen. By using an inert gas, or more specifically nitrogen, a hygienic agent adapted for feeding of the predetermined amount of the plant fiber containing product is obtained.

The lubricant may comprise water. By using a water-based additive or only water, a safe lubricant is obtained which is easy to use and handle.

The lubricant may be added when the portion amount is discharged from said volume-defining unit.

The plant fiber product comprises at least one of tobacco, beet fiber and cellulose.

20 According to a second aspect, a device for manufacturing a predetermined portion-packed amount of a moist plant fiber containing product is provided, comprising a volume-defining unit, from which a portion amount of the plant fiber containing product defined thereby is discharged by means of a pressurized gas. The device comprises means for adding a lubricant to the  
25 pressurized gas.

The device may further comprise a duct for feeding the defined portion amount to a packaging unit, which is adapted to enclose the defined portion amount in a portion pouch made of a material permeable to liquid.

### 30 Brief Description of the Drawings

The invention will now be described in more detail with reference to the accompanying drawings.

Fig. 1 is a schematic side view of a device for manufacturing a predetermined portion-packed amount of a moist plant fiber containing product according to one embodiment.

Fig. 2 shows a volume-defining unit according to one embodiment.

5

#### Description of Embodiments

The invention will be described below with reference to a tobacco product, for example ordinary snus, but is not limited in any way to tobacco products only. The invention is also applicable to various plant fiber containing products, such as ground coffee and tea, or other products. Non-limiting  
10 examples of plant fiber containing products are tobacco, cellulose and beet fiber, and the plant fiber containing product may or may not contain nicotine and/or even an addition of nicotine.

The invention is thus applicable to snus, which usually contains ground  
15 tobacco, water, humectants, flavour enhancers, acidity regulators and aromas. The material is usually produced in a process comprising pasteurization and holding. This process is well known to the person skilled in the art.

Referring now to Fig. 1, a device for forming individual portions of a moist plant fiber containing product divided into portions is shown. The device  
20 may be used for only one portion-forming step, but may also be used for one or more additional steps in the processing of the product.

The portion-forming device comprises a container 1 for receiving the product to be divided into portions, either by batch filling, or through continuous feeding, for example via some kind of conveyor.

25 The container 1 may comprise a volume-defining unit 2, which according to the embodiment shown may be arranged in the bottom of the container 1. The volume-defining unit may comprise a rotatable plate 2 having one or more volume-defining recesses 8.

The volume-defining unit 2 may be a substantially circular plate, as  
30 shown in Fig. 2, which may have at least one recess 8 extending therethrough and having the form of one or more channels or cups in the plate 2.

According to one alternative, the recesses 8 are arranged along the circumference of the volume-defining unit 2, possibly at a distance from an edge thereof. The recesses 8 may be adapted in shape and size to hold a predetermined amount of the product. For example, the volume-defining unit  
5 2 may be exchangeable, with different thicknesses, and/or different cross-sectional areas adapted for different quantities. In another variant, the recess 8 may have a telescopic design, which allows adjusting of the amount.

The volume-defining unit 2 may be rotatably carried, in which case the rotation is provided by a drive shaft 13 connected to a driving source, such as  
10 a motor.

According to one alternative (not shown), the volume-defining unit 2 may be provided with baffles and/or guide scrapers to obtain homogeneous filling and, possibly, compressing of the product in the recess 8, and, possibly, to stir the product in the container 1.

15 The guide scrapers may be adjustable like ploughs/scrapers for distributing and/or guiding the product to the right filling position in the volume-defining unit. According to one embodiment, the guide scrapers are arranged to slide on top of the volume-defining unit 2 by means of adjustable arms, which may be fixedly mounted. According to another embodiment, the  
20 guide scrapers may be arranged on or slidably against the housing 20 and/or the housing 21.

A discharge unit 3 may be arranged below the volume-defining unit 2, and may be in the form of a substantially circular plate, which may be fixedly mounted relative to the volume-defining unit 2. The discharge unit may, for  
25 example, be provided with a trough hole 9, which may be moved into alignment with a recess 8 of the volume-defining unit located in a predetermined position and with the pressurized gas nozzle 12, so that the discharge unit serves as a valve seat. The volume-defining unit 2 and the discharge unit 3 may be prestressed against each other, for example by  
30 means of a resilient device 15.

A sliding layer 10 may be provided between the volume-defining unit 2 and the discharge unit 3. According to one variant, the sliding layer 10 is

formed of a fluoroplastic. The sliding layer may facilitate a relative movement between the volume-defining unit 2 and the discharge unit 3.

A packaging device 7 known per se in the art for encasing a predetermined amount of a moist plant fiber containing product may be arranged adjacent the discharge unit 3 and perpendicular thereto. The packaging device 7 may be any device suitable for packaging in portions of a predetermined amount of a plant fiber containing product, for example a device such as the one disclosed in EP 0 138 649 B1 or EP 0 149 985 B1. According to one embodiment, a conical tube is connected to the discharge plate 3 adjacent the hole 9, said tube forming a passage to the packaging device 7.

The addition of a pressurized gas may be achieved by connecting the recess to a source of pressurized gas (not shown).

A tube 14 connected to the source of pressurized gas may be coupled to a pressurized gas connection 4.

In one embodiment, a connection 6 for supplying liquid is coupled to the tube 14. The connection 6 may be provided with a valve 5. The valve 5 may be an adjustable, optionally controllable, valve. One alternative may be to provide a pulsed addition of liquid when the recess 8 in the volume-defining unit is aligned with the discharge unit 3 and the connection 4 for pressurized gas, so that the addition of liquid matches the cycle of the device.

The pressurized gas connection 4 may be arranged perpendicularly to the volume-defining unit 2, for example on the upper side of the volume-defining unit 2.

According to one embodiment, the connection 4 may be provided with a nozzle 12, which may be configured as a resilient funnel which is prestressed against the volume-defining unit 2 and arranged to slide against the upper side of the volume-defining unit 2. The nozzle may be arranged to fit tight against the upper side of the volume-defining unit 2.

In the device, the volume-defining unit 2 forms the bottom of the container 1, whereby the product rests on the volume-defining unit. In the case where the bottom of the recesses 8 is made up of the side of the discharge unit facing the volume-defining unit, the recesses 8 exposed to the

product are filled with said product by means of gravity and/or possibly scrapers.

At a predetermined position of rotation, one or more recesses will be aligned, or approximatively aligned, with a recess or a through hole 9 in the discharge unit 3, and aligned, or approximatively aligned, with the pressurized gas nozzle 12. By adding a pressurized gas, the portion amount of the product lodged in the recess 8 is forced out of the recess 8, via the hole 9, and into a transport duct to be transported to a schematically illustrated packaging unit 7 for packaging the plant fiber containing product divided into portions in a suitable package 20.

The product lodged in the container 1 may have a moisture content of about 44 %. It is obvious to the person skilled in the art, however, that a plant containing material with a moisture content of about 40-55 % may be used.

According to one embodiment (not shown), the outer housing 20 and the inner protective housing 21 may be caused to rotate relative to the volume-defining unit 2. According to one embodiment, the housings 20 and 21 may be caused to rotate at different speeds, for example with the housing 21 rotating at lower speed than the housing 20. The housings 20 and 21 may, according to one alternative, be caused to rotate in opposite directions. According to one embodiment, the housing 20 may be fixed and the housing 21 may be rotatable. By causing the housings 20 and 21 to rotate, a more homogeneous filling of the recess 8 is obtained.

According to one embodiment, the addition of pressurized gas is pulsed at a pace that matches the cycle speed of the machine.

A tube 14 is connected to the pressurized gas connection 4, a connection 6 for supplying liquid being arranged on said tube 14. According to one embodiment, the connection 6 is provided with an adjustable valve 5. The amount of liquid added to the pressurized gas is controlled by means of this valve 5. According to one embodiment, the pressurized gas is air, which has been treated in a refrigerant type drier to a dew point of 3 °C, which treatment is in itself known to the skilled person. According to one embodiment, an amount of 0.042 ml of liquid is added per 0.85 g (weight including the packaging material) of portion pack. The weight per portion pack may be

varied between 0.1 and 1.5 g and, according to one embodiment, the amount of lubricant added is varied proportionally to the weight. It is obvious to the skilled person which factors affect this ratio and that the amount of lubricant added is determined by the plant fiber containing material and its properties, as well as how the process and the equipment are designed, and may be varied within a suitable range for obtaining a satisfactory lubricating effect. According to one variant, the period during which liquid is added is also controlled. According to one embodiment, the machine has a cycle speed of 267 portion packs per minute, which means that the liquid addition is pulsed at 267 additions of liquid to 267 recesses 8 filled to volume per minute. According to one embodiment, the addition of liquid and gas are simultaneously pulsed at a pace that matches the cycle speed of the machine.

When the recess 8 is moved in alignment with the hole 9 and the nozzle 12, the adjustable valve 5 is controlled to add liquid to the pressurized gas through the connection 4. By adjusting the liquid supply in this manner a pulsed addition of liquid is obtained. Thus, a lubricating effect is obtained at the same time as the plant fiber containing product is fed from the recess 8 to the hole 9 in the discharge unit 3.

According to one embodiment, the portion-packed plant fiber containing product has a moisture content of about 40-55 %, according to one variant about 44 %.

According to one embodiment (not shown), the supply of gas and liquid is controlled mechanically, for example by means of mechanical locks, which open and close mechanical valves.

According to another embodiment (not shown), the supply of gas and liquid is controlled electrically, for example by means of electric valves.

Also the pressurized gas may be supplied in a pulsed manner, so that pressurized gas is supplied only when a sufficient alignment between the recess 8, the hole 9 and the nozzle 12 has been achieved.

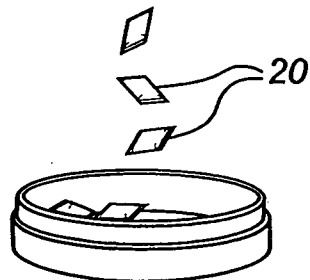
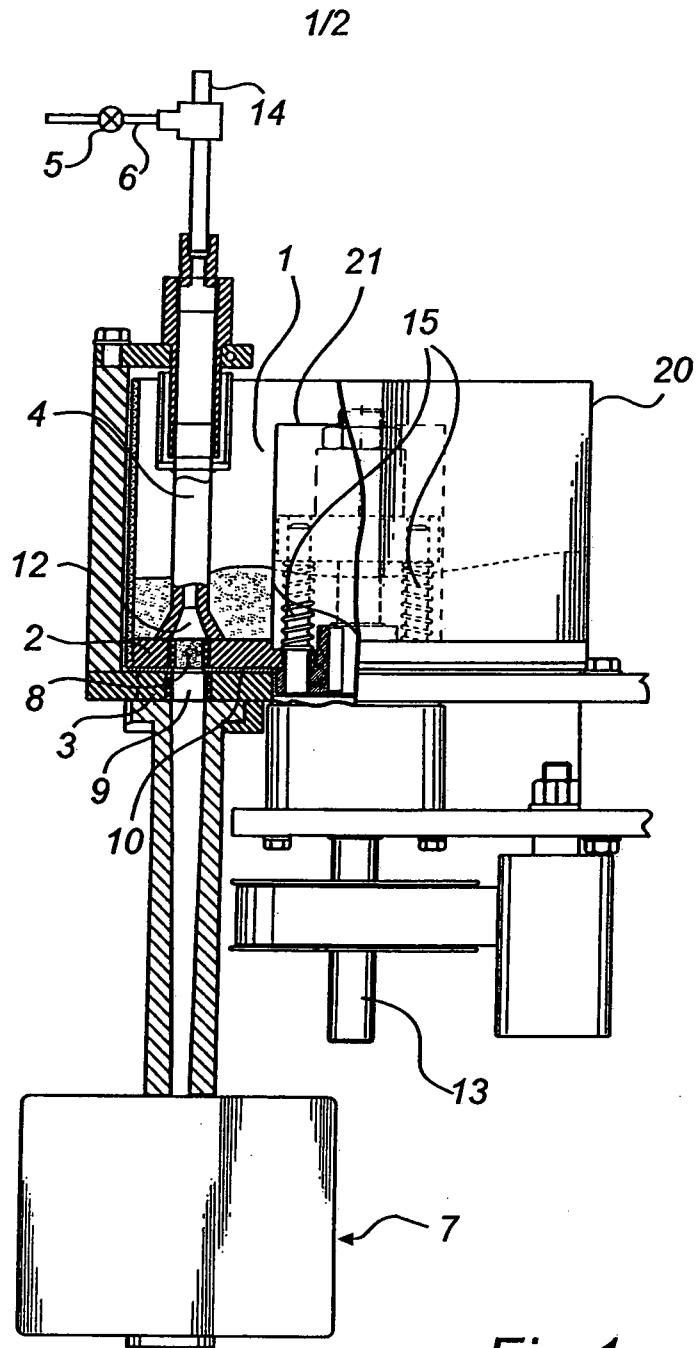
According to one embodiment, the plant fiber containing material consists of plant fiber only.

## CLAIMS

1. A method for feeding a moist plant fiber containing product divided into portions, said method comprising feeding a predetermined amount of the  
5 plant fiber containing product from a volume-defining unit (2) to a portion pack (20) by means of a pressurized gas, c h a r a c t e r i z e d in that a lubricant is added to the pressurized gas.
2. The method according to claim 1, wherein said lubricant is added in  
10 pulses.
3. The method according to claim 1 or 2, wherein the pressurized gas is air.
- 15 4. The method according to claim 1 or 2, wherein the pressurized gas is an inert gas.
5. The method according to claim 4, wherein the inert gas is nitrogen.
- 20 6. The method according to claim 1, wherein said lubricant contains water.
7. The method according to claim 6, wherein said lubricant is water.
- 25 8. The method according to any one of the preceding claims, wherein the addition of lubricant occurs when the portion amount is discharged from said volume-defining unit.
- 30 9. The method according to any one of the preceding claims, wherein said plant fiber containing product comprises at least one of tobacco, beet fiber and cellulose.

10. A device for manufacturing a predetermined portion-packed amount of a moist plant fiber containing product, comprising a volume-defining unit (2) from which a portion amount of the plant fiber product defined thereby is dischargeable by means of a pressurized gas, c h a r a c -  
5 t e r i z e d by  
means (6) for adding a lubricant to the pressurized gas.

11. The device according to claim 10, further comprising a duct for feeding the defined portion amount to a packaging unit (7), which is adapted  
10 to enclose the defined portion amount in a portion pouch (20) made of a material permeable to liquid.



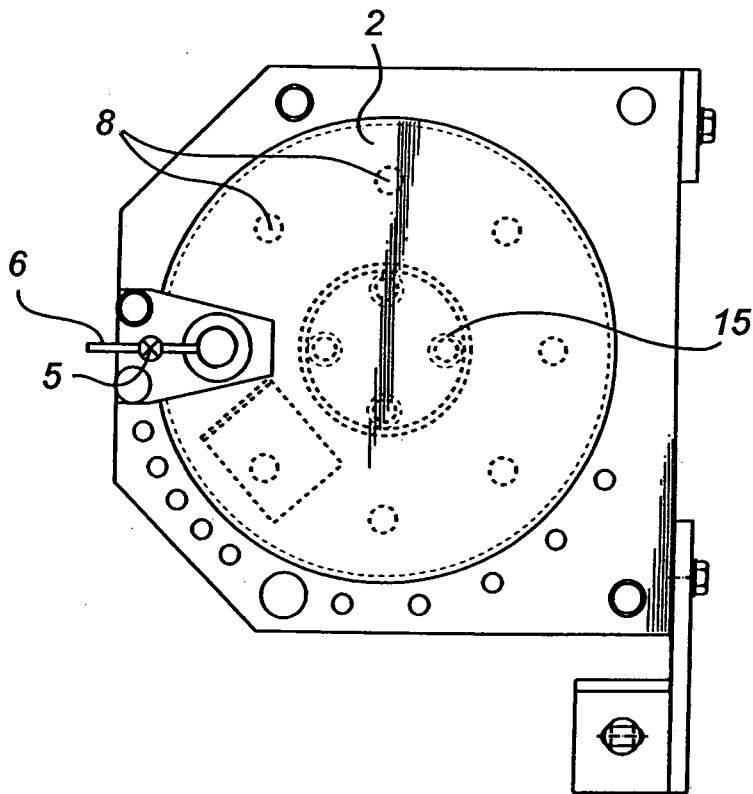


Fig 2

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE2008/000470

## A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: B65B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                   | Relevant to claim No. |
|-----------|------------------------------------------------------------------------------------------------------|-----------------------|
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| A         | US 4703765 A (E.H. PAULES ET AL), 3 November 1987<br>(03.11.1987), whole document<br><br>--<br>----- | 1-11                  |

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

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Date of the actual completion of the international search

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Cited literature, if any, will be enclosed in paper form.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

30/08/2008

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