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(72) Inventor: **Tellatin, Marilisa**
31030 Castello di Godego (TV) (IT)

(74) Representative:
Petraz, Gilberto Luigi et al
GLP S.r.l.
Piazzale Cavedalis 6/2
33100 Udine (IT)

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(71) Applicant: **Tellatin, Marilisa**
31030 Castello di Godego (TV) (IT)

(54) **Method and apparatus for preserving and packaging food products**

(57) Method to preserve and package food products, particularly pre-cut meat in slices or pieces or similar products, wherein a pack of a known volume containing the foodstuff to be packaged is filled with a gassy mixture of a suitably pre-determined composition and then sealed in such a manner as to define a condition of preservation in a modified atmosphere, the gassy mixture containing at least a gassy substance to inhibit the proliferation of bacterial flora contained in the foodstuff such as carbon dioxide (CO₂) or similar, the inhibiting gassy substance being mixed with azote or other appropriate gassy substance, the packaging taking place in conditions of constant temperature and defined values of weight and size of the foodstuff in ratio to the volume of the pack, the percentage content of inhibiting gassy substance in the gassy mixture introduced into the pack being correlated at least to the color of the

meat to be packaged.

Device to package food products, particularly pre-cut meat in slices or pieces or similar products, comprising a line feeding open tray-type containers (12), an assembly to feed a film (13), a vacuum chamber (14) inside which there are means to deliver a gassy filling mixture, sealing means arranged at outlet of said vacuum chamber (14), the device including means (16) to regulate the percentage quantity of inhibiting gassy substance in the gassy mixture and means (17) to regulate the delivery time of the mixture according to the absolute quantity of mixture to be delivered so as to obtain an excess quantity with respect to the free volume of the tray-type container (12), the means (16, 17) being governed by at least a measurement of the color of the meat (15) to be packaged.

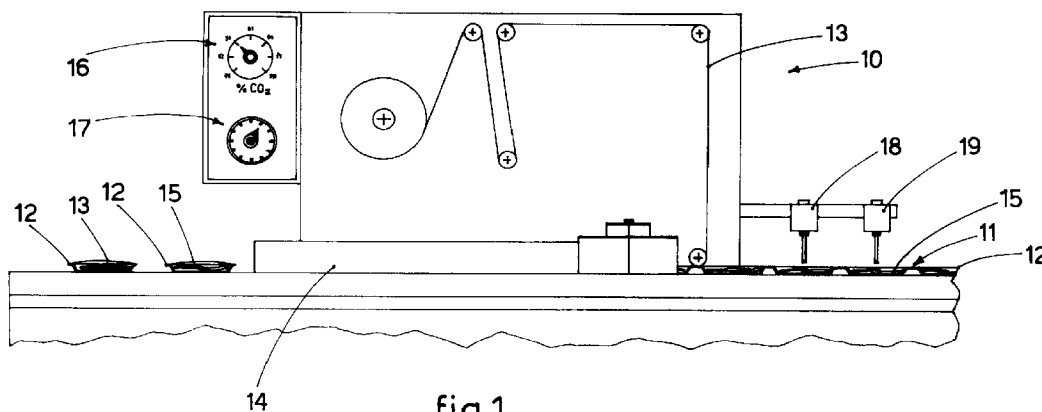


fig.1

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Description

FIELD OF THE INVENTION

[0001] This invention concerns a method to preserve and package food products, particularly pre-cut meat in slices or pieces or similar products, and the relative device as set forth in the respective main claims.

[0002] To be more exact, the invention is applied in processes of preserving, packaging and storing foodstuff, particularly meats used for foodstuffs, in order to guarantee these foodstuffs are preserved even for a prolonged period of time, and also to guarantee, in the second place, that the pack remains whole for the entire period it is preserved.

BACKGROUND OF THE INVENTION

[0003] It is well-known in the state of the art to use sealed packs inside which a modified atmosphere is created in order to ensure the correct preservation of packaged food products, whatever type they may be.

[0004] Normally, this modification of the atmosphere involves the introduction of carbon dioxide (CO₂) or other suitable gassy substances which, as they are progressively absorbed by the packaged foodstuff during the storage period preceding use, destroy or at least slow down the proliferation of bacteria and other micro-organisms which cause a rapid deterioration of the foodstuff.

[0005] The first problem in using preservation methods with a modified atmosphere is that every foodstuff has its own characteristics of absorption, which can vary a great deal according to the gassy substance used to inhibit the bacterial growth; therefore, the precise dosage of the mixture injected becomes extremely problematical if it is desired to obtain efficacious results which will be valid for a wide range of foodstuffs.

[0006] The characteristics of absorption depend above all on the type of foodstuff; however, even within the field of the same foodstuff, for example, meat, they vary by a very wide spectrum according to type, the cut chosen, the ambient conditions where the meat is preserved before packaging, the time since the animal was butchered, and so on.

[0007] It is therefore extremely difficult to determine the correct quantity of gassy substance to inhibit bacterial growth which is to be injected into the mixture according to the specific foodstuff to be packaged.

[0008] A second problem, more of an aesthetic/commercial nature than concerning the actual state of preservation with the foodstuff remaining wholesome, is that with the progressive reduction - due to absorption - in the quantity of gassy substance filling the empty space of the pack, there is a consequent progressive deformation of the flexible parts of the pack itself.

[0009] Normally the packs comprise a hard or substantially hard bottom, covered with a flexible film, and

so the progressive deformation causes aesthetic problems and consequently the problem of how the pack is presented to the potential purchaser; it also causes real problems of the preservation of the foodstuff, due to the fact that the film, as it becomes deformed, begins to wrap itself ever more tightly around the foodstuff, and exerts a pressure which can even lead to a leakage of liquid.

[0010] The European patent EP-B-368.116 substantially set itself the problem, of an aesthetic/commercial nature, of guaranteeing that the pack is whole even after the packaged foodstuff has absorbed the inhibiting gassy substance, by using dry ice introduced into the container before it is sealed.

[0011] Using dry ice to preserve foodstuffs, particularly meat, for a long period of time, has been known to the art for more than fifty years.

[0012] This document proposes to insert, inside the packaging wrapper, solid carbon dioxide, that is to say, cubes or scales of dry ice or carbon snow, in a quantity correlated to the characteristics of absorption of the specific foodstuff.

[0013] In this way, according to the document, the progressive sublimation of the dry ice, and the liberation of carbon dioxide in gassy form, is perfectly compensated for by the absorption of the foodstuff, constantly maintaining a condition of substantial equilibrium which, theoretically, should ensure that the pack remains whole.

[0014] However, this document says nothing about the actual procedures which lead to the definition of the quantity of carbon dioxide to be inserted into the pack before it is sealed; it says generically that the quantity is the same as that which can be absorbed by the foodstuff.

[0015] As anyone who deals scientifically with problems connected to food preservation knows, the parameters which lead to the definition of the absorbable quantity are extremely variable; consequently, it is impossible to make such an affirmation as if it were such a simple matter, it must be rigorously correlated to objective parameters which identify the foodstuff which is to be preserved.

[0016] For this reason, the document does not allow to draw conclusions about how to put this preservation method into practice or how to ensure an effective and prolonged preservation of the foodstuff.

[0017] Using dry ice also incurs an additional cost, since the cube-forming machine has to be inserted into the line, it increases the times of the cycle, the cube-forming machine is substantially unreliable in terms of precise quantities of carbon dioxide introduced, there is a danger of leakage inside the pack before sealing with a consequent modification of the parameters of the modified atmosphere and still other problems.

[0018] The present applicant has designed, tested and embodied this invention to solve all these problems, but especially to provide a solution which can be repeatedly applied in industry and which will guarantee analyt-

ically a longer duration in integral condition of a packaged foodstuff, particularly meat and similar.

SUMMARY OF THE INVENTION

[0019] The invention is set forth and characterized in the respective main claims, while the secondary claims describe other characteristics of the main embodiment.

[0020] The purpose of the invention is to obtain a method to preserve and package foodstuffs in general, and in particular pre-cut meats in slices or pieces or similar, which will analytically guarantee longer preservation times than those which are usually found in this field, ensuring that the bacterial flora remains limited to values considerably below those of the threshold limits imposed by the specific law.

[0021] The method proposed by the invention can be applied industrially in that it provides a direct correlation between the absorption of the gassy substance which inhibits bacterial growth and objective characteristics of the specific foodstuff to be packaged.

[0022] A further purpose of the invention is to ensure that the pack using flexible and/or deformable parts remains whole even after the foodstuff has absorbed part or all of the inhibiting gassy substance, until a condition of equilibrium is reached which is maintained for the entire period that the foodstuff is preserved.

[0023] It is also known that the absorption curve of a foodstuff has a slope which is very steep in the first period of preservation, in the order of 1÷2 days according to the type of foodstuff, and then has a substantially flat development for the rest of the period of preservation.

[0024] It is also known that environmental conditions, particularly the temperature, considerably influence the characteristics of preservation; for this reason the invention provides first of all to establish precise and set temperature conditions in the environment where the foodstuff is transported, preserved, cut, packaged and stored, and to correlate the packaging parameters in a modified atmosphere at least to these temperature conditions.

[0025] Another starting condition considered by the invention in defining the values which characterize the modified atmosphere of the pack is the size of the pack in relation to the size and weight of the foodstuff contained therein; these dimensions define a priori both the free volume of the pack which is to be filled with the gassy mixture, and also, as a general rule, the capacity of absorbing the carbon dioxide referred to the quantity of foodstuff.

[0026] According to a variant, the weight of every portion of foodstuff to be packaged is determined and the specific value of weight is used to determine the correct percentage of CO₂ to be inserted into the mixture.

[0027] According to the invention, the pack containing the foodstuff to be preserved, in an at least partly open condition, is introduced inside a chamber where a hard

vacuum is created in such a manner as to eliminate, within the desired values, the oxygen in the inner volume of the pack.

[0028] The free volume of the pack, that is to say, the volume not occupied by the foodstuff, in this case the slices or pieces of meat, is then filled with a gassy mixture consisting of specific and measured percentages of carbon dioxide (CO₂) and azote (N₂), or some other appropriate inert gas.

[0029] According to the invention, the percentage of carbon dioxide which makes up the mixture is at least correlated to an objective parameter which identifies the coloring of the meat to be packaged.

[0030] The present applicant has identified the precise correlation between the characteristics of absorption of carbon dioxide and the coloring of the meat; this correlation allows to associate a defined range of percentages of carbon dioxide to a defined and objective colorimetric classification.

[0031] According to the invention, according to colorimetric measurements carried out upstream of the packaging or, according to a variant, in line on the packaging machine itself by a measuring device supplied for this purpose, the meats to be packaged are classified into at least three color categories, and a specific range of percentages of carbon dioxide is paired with each of these categories (for example less intense, intense, very intense).

[0032] To give a concrete example: in the case of horse meats characterized by a less intense coloring, the percentage of carbon dioxide in the mixture introduced varies from a value of about 75% to a value of about 85%, and the percentage of azote varies accordingly.

[0033] In the case of horse meat characterized by intense coloring, the percentage of carbon dioxide in the mixture introduced varies from a value of about 65% to a value of about 75%.

[0034] In the case of horse meat characterized by very intense coloring, the percentage of carbon dioxide in the mixture introduced varies from a value of about 55% to a value of about 65%.

[0035] Within this range of variation in the percentage of carbon dioxide based on the coloring, the invention provides to identify other parameters which characterize the specific foodstuff so as to identify the precise quantity to introduce.

[0036] A first parameter which the invention uses is the acidity of the meat to be packaged.

[0037] As the acidity of the meat increases, which can vary mainly according to the state of preservation of the piece before packaging, the invention provides to adjust the percentage of carbon dioxide towards the lower limit of the range as defined above; vice versa, as the acidity of the meat decreases, the adjustment is made towards the upper limit of the range.

[0038] Another parameter which the invention takes into account in defining the precise value of carbon diox-

ide to be used in the mixture is the time interval since the meat was butchered.

[0039] In fact, the applicant has discovered that the longer the time since the meat was butchered, the less capacity it has of absorbing CO₂ and therefore, for this reason, a lesser percentage of carbon dioxide must be inserted into the mixture.

[0040] The age of the animal also affects the absorption rate, as an older animal absorbs less CO₂ and therefore the gassy mixture introduced into the pack needs a lower percentage of carbon dioxide.

[0041] Other parameters which can influence the absorption capacity, which cannot, however, be interpreted objectively but are based on experience and the packer's ability to discriminate, are those relating to the shape of the meat, or if the meat is more or less fatty, more or less thick, has more or less nerves, etc.

[0042] According to another feature of the invention, once the correct percentage of the gassy mixture has been identified, a determined quantity of the mixture is inserted, in excess of the free volume of the pack, so as to create a condition of overpressure inside the pack which is then sealed.

[0043] This excess quantity, which has an upper constraint due to the sealing limits of the covering film which closes the pack, is proportionate to the percentage content, as determined above, of carbon dioxide in the mixture.

[0044] Due to the absorption of the carbon dioxide by the foodstuff, the excess quantity is progressively reduced until, when absorption is complete, it reaches a condition of equilibrium wherein the volume of the residual gassy mixture is substantially equal to the free volume of the pack.

[0045] This condition ensures that, during the whole time the foodstuff is preserved, the covering film does not collapse at all with respect to the pack, thus guaranteeing that the pack is maintained in a completely whole condition.

[0046] The excess quantity of mixture with respect to the free volume of the pack is calculated according to the percentage ratio CO₂/N₂ of the mixture, in that only the carbon dioxide is progressively absorbed by the foodstuff while the absolute quantity of azote remains constant.

[0047] For this reason, a greater percentage of carbon dioxide in the mixture, based on calculations, is correlated to a greater quantity of excess mixture with respect to the free volume of the pack, so that the condition of equilibrium, when the absorption of the carbon dioxide by the foodstuff is complete, is in every case respected.

[0048] In practice, it is possible to obtain the excess quantity either by increasing the time the nozzles deliver the mixture into the vacuum and filling chamber, or by adjusting on each occasion the quantity of mixture delivered by the nozzles.

[0049] According to the invention, the covering film

used to seal the pack has a color suitable to screen the light so as to reduce the oxidising effect which the light has during the preservation period.

5 BRIEF DESCRIPTION OF THE DRAWINGS

[0050] The attached Figures are given as a non-restrictive example and show a preferential embodiment of the invention as follows:

Fig. 1 is a part view, shown in diagram form, of a possible packaging line for food products used in the method according to the invention;

Fig. 2 shows a finished pack emerging from the line shown in Fig. 1;

Fig. 3 is a graphical illustration of the classification into three color bands of meat, a percentage range of carbon dioxide being associated with each of the three bands.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

[0051] The packaging device 10 for food products is shown in diagram form in Fig. 1; it comprises a line to feed a strip 11 of open tray-type containers 12, with which a flexible transparent film 13 is associated; the transparent film 13 is appropriately colored and is sealed to the containers 12 so as to seal the pack.

[0052] The example refers to pre-cut meat 15 in slices, but the invention can be applied equally well to meat in pieces or to any other type of perishable foodstuff which is packaged in portions.

[0053] The foodstuff is packaged in an environment with a controlled temperature, for example at around 4°C; it is also necessary to control the temperature conditions during the preservation period before the foodstuff is packaged, when the foodstuff is sliced and when it is stored after packaging, in that these temperature conditions affect the preservation of the foodstuff.

[0054] The tray-type containers 12, of a known volume, are individually filled with the desired quantity, also of known weight and volume, of slices of meat 15 and the transparent film 13 is laid thereon.

[0055] Before entering the vacuum chamber 14 the film 13 is cut into sheets and pre-stuck to two or three edges of the tray-type container 12, which is then cut from the strip 11.

[0056] Inside the vacuum chamber 14 the air contained in the tray-type container 12 is extracted to eliminate the oxygen.

[0057] Also inside the vacuum chamber 14, the gassy mixture (CO₂ + N₂) which constitutes the modified atmosphere wherein the slices of meat 15 are preserved is introduced into the tray-type container 12.

[0058] The vacuum chamber 14 in its general structure is of a type known to the art.

[0059] The gassy mixture can be introduced in its final composition by means of nozzles connected to a mixer or by means of separate nozzles connected to the respective containers of CO₂ and N₂ gas.

[0060] The composition of the gassy mixture is adjusted by means of the instrument 16, acting only on the CO₂ or on both the components; this sets the percentage of carbon dioxide which constitutes the mixture.

[0061] A timer 17 serves to adjust the delivery time of the nozzles, inside the vacuum chamber 14, according to the absolute quantity of gassy mixture to be introduced; the absolute quantity is calculated in such a manner that it is more than the free volume of the tray-type container 12, so as to compensate the progressive absorption of carbon dioxide by the foodstuff during the whole period of preservation.

[0062] The excess quantity of mixture introduced with respect to the free volume of the tray-type container 12 is correlated to the percentage of carbon dioxide which makes up the mixture.

[0063] The setting of the percentage quantity of carbon dioxide which makes up the mixture is carried out, on each occasion, by the adjustment instrument 16.

[0064] In the method according to the invention this percentage quantity is correlated to a factor of colorimetric identification of the specific meat to be packaged, given the same values of packaging temperature and weight of the meat in proportion to the volume of the tray-type container 12.

[0065] According to the invention, the meat, in this case horse meat, is subdivided into three color classes, respectively less intense, intense and very intense.

[0066] Each of the three classes is identified by the following colorimetric parameters, as defined by the modified CIE classification (Commission Internationale de l'Eclairage), where L* represents luminosity while a* and b* represent the chromatic coordinates:

less intense color: L* = > 34

a* = < 18

b* = > 4

intense color: L* = < 34, > 30

a* = > 20

b* = > 4, < 5.5

very intense color: L* = < 30

a* = < 18, > 20

b* = > 5.5

[0067] The limits of the three classes are shown graphically in Fig. 3.

[0068] Each colorimetric class is associated, according to the invention, with a defined percentage range of carbon dioxide in the gassy mixture used to fill the package.

[0069] In the case of the class defined as the less intense color, the percentage of carbon dioxide varies within the 75÷85 range; in the class defined as the

intense color, it varies within the 65÷75 range, and in the class defined as very intense it varies within the 55÷65 range.

[0070] These percentage quantities are commensurate to the characteristics of absorption of the specific meat and are those estimated as optimum so that, even when the foodstuff has absorbed all the carbon dioxide which it is able to absorb, the quantity of carbon dioxide required to ensure the preservation of the foodstuff for a prolonged period, up to 20 days and more, will remain in the modified atmosphere of the sealed tray-type container 12.

[0071] In the case of meats other than horse meat, the method according to the invention provides to classify beef in the band corresponding to the intense color horse meat, that is, with a percentage of carbon dioxide in the 65÷75 range; pork and poultry (chicken, turkey and suchlike) on the contrary are comparable with horse meat of a less intense color and the percentage values of carbon dioxide employed with this type of meat vary in the 75÷85 range.

[0072] The percentage value within the ranges defined above is set manually by the worker with the adjuster 16 according to other identification parameters of the slices of meat, such as the pH of the meat, the time since the meat was butchered, the age of the animal, the conformation of the meat (with more or less fat, more or less nerves, etc.) ; to a large extent this also depends on the packer's experience and ability to discriminate.

[0073] According to the variant shown in Fig. 1, upstream of the vacuum chamber 14 there is an instrument 18 to instantaneously measure the color and an instrument 19 to instantaneously measure the pH of the specific slices of meat 15 to be packaged.

[0074] The instruments 18 and 19 are connected, by means of a processing and command unit, to the device 16 to adjust the percentage of carbon dioxide; they automatically condition the setting thereof according to the instantaneous measurements.

[0075] In other words, once the starting conditions have been defined according to the data known about the specific meat to be packaged such as the type of meat, the cut selected, the age of the animal, the time between butchering and packaging, the ambient conditions of the environment where the meat is sliced and preserved, and once a presumed percentage value has been set, the color and the pH of the specific slices of meat 15 are monitored in line before sealing.

[0076] The data is sent to the processing and command unit which sets the exact percentage value of carbon dioxide to be introduced into the mixture according to one and/or another of the said values.

[0077] The adjustment of the percentage quantity of carbon dioxide also influences the timing of the delivery which, as explained before, is functionally connected to the percentage composition of the gassy mixture.

[0078] In fact, the excess quantity with which the tray-

type container 12 is filled with respect to its free volume is a function of the percentage of CO₂ which makes up the mixture, inasmuch as only the CO₂ is absorbed by the foodstuff.

[0079] The excess quantity is calculated so that, when absorption is complete, apart from a residual absorption which endures for the whole period of preservation but which is negligible, a substantial parity is reached between the volume of the gassy mixture and the free volume of the tray-type container 12.

[0080] The sealed tray-type container 12 emerging from the device 10 has the film 13 slightly puffed up due to the said excess quantity (Fig. 2).

[0081] Most of the carbon dioxide is absorbed in the first 1÷2 days of preservation, when 90÷95% of the CO₂ which can be absorbed by the foodstuff is absorbed; as absorption progresses, the swelling of the film is progressively reduced until it is substantially eliminated, thus ensuring that the pack is maintained aesthetically integral for the remaining period of preservation.

[0082] The higher the quantity of CO₂ in the mixture, the higher the excess quantity to be added with respect to the free volume of the tray-type container 12. The value of the excess quantity is in any case constrained by the limits to which the film 13 can be sealed to the edges of the tray-type container 12.

[0083] According to a variant, the film 13 is of the type which is appropriately colored so that it constitutes a filter for the deleterious action of the light and so as to prevent the premature oxidation of the foodstuff contained in the pack.

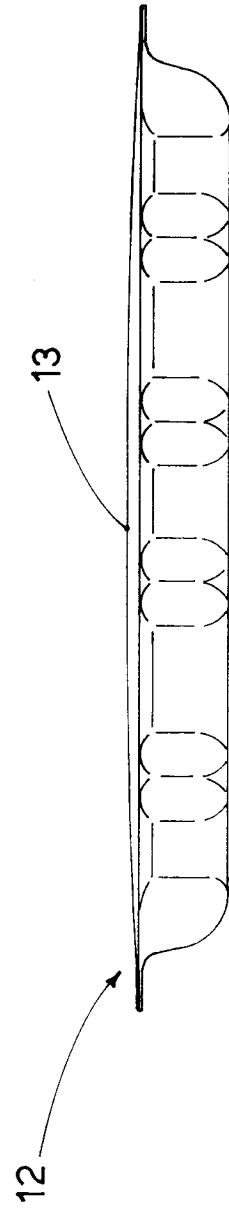
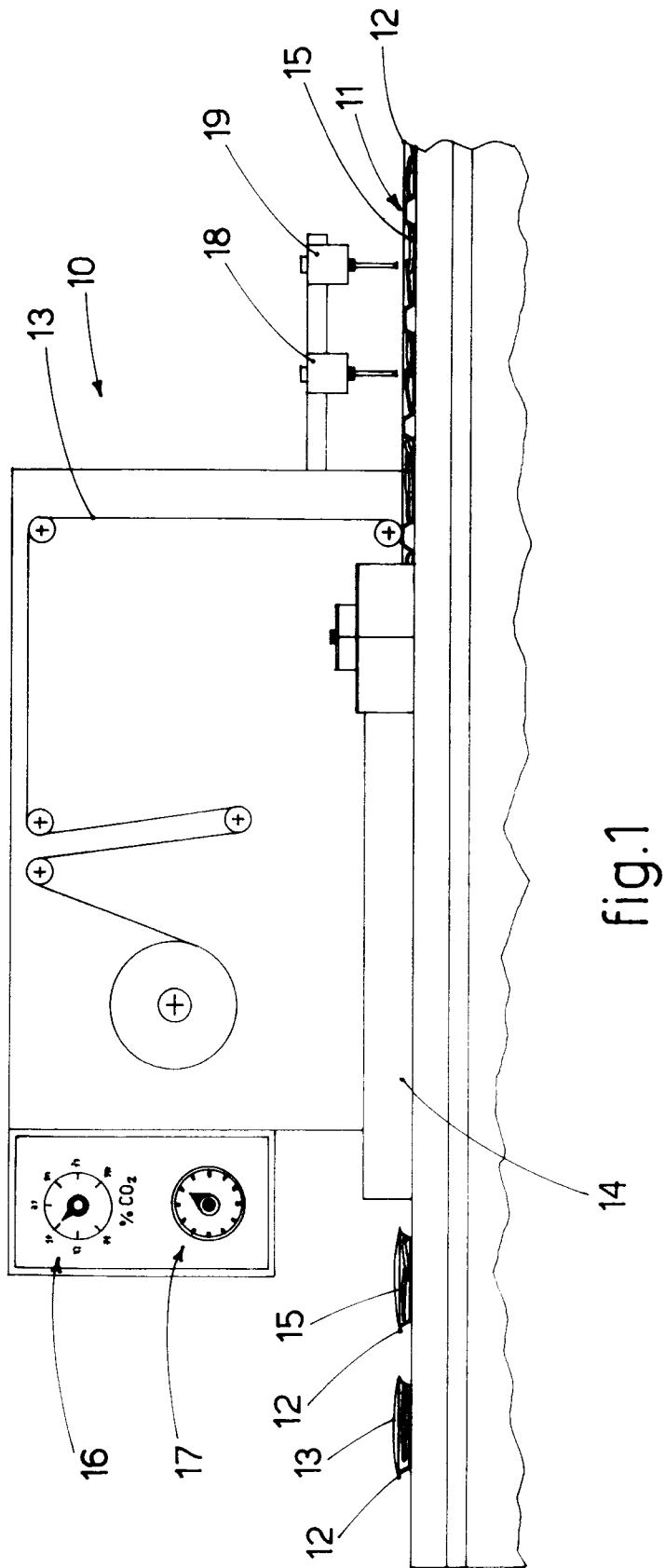
Claims

1. Method to preserve and package food products, particularly pre-cut meat in slices or pieces or similar products, wherein a pack of a known volume containing the foodstuff to be packaged is filled with a gassy mixture of a suitably pre-determined composition and then sealed in such a manner as to define a condition of preservation in a modified atmosphere, the gassy mixture containing at least a gassy substance to inhibit the proliferation of bacterial flora contained in the foodstuff such as carbon dioxide (CO₂) or similar, the inhibiting gassy substance being mixed with azote or other appropriate gassy substance, the packaging taking place in conditions of constant temperature and defined values of weight and size of the foodstuff in ratio to the volume of the pack, the method being characterized in that the percentage content of inhibiting gassy substance in the gassy mixture introduced into the pack is correlated at least to the color of the meat to be packaged.
2. Method as in Claim 1, characterized in that it provides to divide the meat into at least three classes of color identification, a defined range of percentages of inhibiting gassy substance in the gassy mixture being paired with each of the classes.
3. Method as in Claim 2, characterized in that, at least for horse meat, for the less intense coloring the range of percentages of inhibiting gassy substance in the gassy mixture varies from 75 to 85.
4. Method as in Claim 2, characterized in that, at least for horse meat, for the intense coloring the range of percentages of inhibiting gassy substance in the gassy mixture varies from 65 to 75.
5. Method as in Claim 2, characterized in that, at least for horse meat, for the very intense coloring the range of percentages of inhibiting gassy substance in the gassy mixture varies from 55 to 65.
6. Method as in any claim hereinbefore, characterized in that within the percentage ranges based on the coloring of the meat, the exact percentage value of the inhibiting gassy substance is correlated to the value of the pH of the meat, a reduction of the percentage value corresponding to a greater pH.
7. Method as in any claim hereinbefore, characterized in that within the percentage ranges based on the coloring of the meat, the exact percentage value of the inhibiting gassy substance is correlated to the time between butchering and packaging of the meat, a reduction of the percentage value corresponding to a longer time interval.
8. Method as in any claim hereinbefore, characterized in that within the percentage ranges based on the coloring of the meat, the exact percentage value of the inhibiting gassy substance is correlated to the age of the animal from which the meat is obtained, a reduction of the percentage value corresponding to a greater age of the animal.
9. Method as in any claim hereinbefore, characterized in that the gassy mixture is introduced inside the pack in a greater quantity than the free volume of the pack after the foodstuff has been inserted, the excess quantity being correlated to the percentage value of the inhibiting gassy substance which makes up the mixture.
10. Method as in Claim 9, characterized in that the excess quantity is calculated in such a manner that, when the packaged foodstuff has completely absorbed the inhibiting gassy substance, the quantity of residual gassy substance corresponds substantially to the free volume of the pack.
11. Method as in any claim hereinbefore, characterized in that it provides to perform, in line and upstream of

the sealing step, an operation of color measurement and/or an operation to measure the pH of the foodstuff to be packaged, the measurements being sent to the device to adjust the quantity of inhibiting gassy substance so as to set the correct values according to the said measurements. 5

12. Device to package food products, particularly pre-cut meat in slices or pieces or similar products, comprising a line feeding open tray-type containers (12), an assembly to feed a film (13), a vacuum chamber (14) inside which there are means to deliver a gassy filling mixture, sealing means arranged at outlet of said vacuum chamber (14), the device being characterized in that it includes means (16) to adjust the percentage quantity of inhibiting gassy substance in the gassy mixture and means (17) to adjust the delivery time of the mixture according to the absolute quantity of mixture to be delivered so as to obtain an excess quantity with respect to the free volume of the tray-type container (12), the means (16, 17) being governed by at least a measurement of the color of the meat (15) to be packaged. 10 15 20
13. Device as in Claim 12, characterized in that it comprises a device (18) to instantaneously measure the color of the meat to be packaged, the device (18) governing the means (16) to adjust the quantity of inhibiting gassy substance comprising the gassy mixture and the means (17) to time delivery. 25 30
14. Device as in Claims 12 or 13, characterized in that it comprises a device (19) to instantaneously measure the pH of the meat to be packaged, the device (19) governing the means (16) to adjust the quantity of inhibiting gassy substance comprising the gassy mixture and the means (17) to time delivery. 35
15. Device as in any claim from 12 to 14 inclusive, characterized in that the gassy mixture is delivered inside the tray-type container (12) already mixed by nozzles connected to a mixer device. 40
16. Device as in any claim from 12 to 14 inclusive, characterized in that the individual gassy substances which make up the gassy mixture are delivered separately by specific nozzles connected to respectively feeder devices. 45 50

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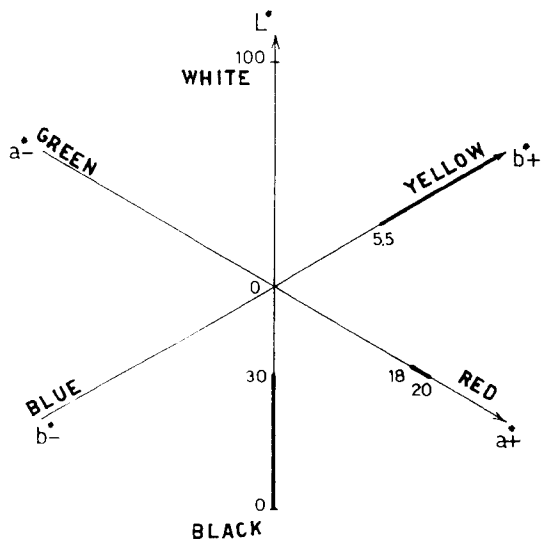
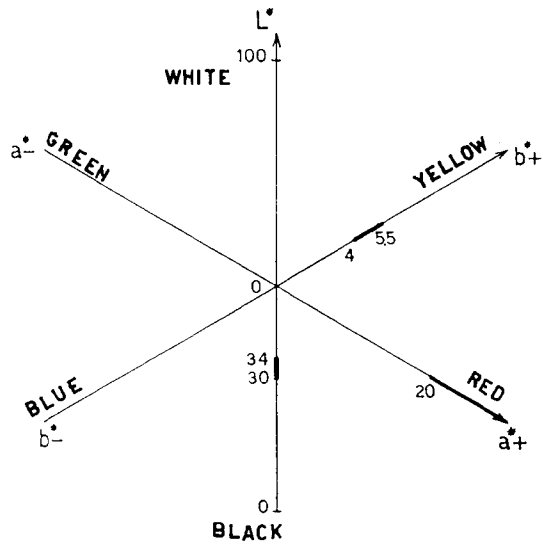
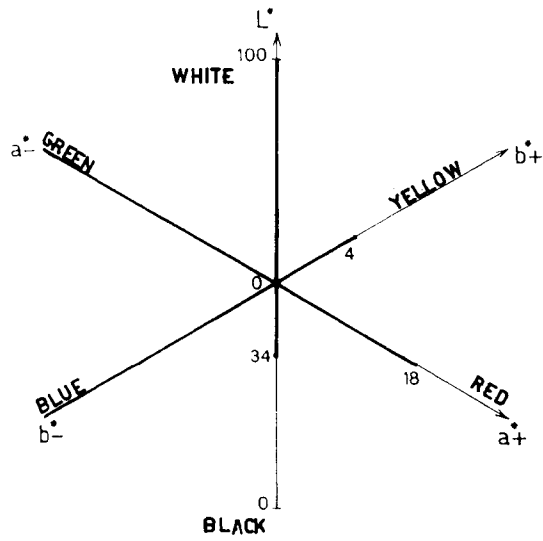


fig.3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 10 0601

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
D,A	EP 0 368 116 A (VALLE SPLUGA) 16 May 1990 * claims 1-13; figure 6 *	1,12	B65B25/06
A	WO 96 08424 A (TRIGON INDUSTRIES) 21 March 1996 * page 5; claims 1-9 *	1,12	
A	WO 85 00339 A (ATMOSPHERE PACKAGING) 31 January 1985 * page 15, paragraph 1 * * page 17, paragraph 2; figure 5 *	1,12	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11 May 1999	Examiner Grentzius, W
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)

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

EP 99 10 0601

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 The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-05-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 368116 A	16-05-1990	AT 84757 T	15-02-1993
		AU 622236 B	02-04-1992
		AU 4455489 A	31-05-1990
		CA 2002411 A	08-05-1990
		DD 294223 A	26-09-1991
		DK 107190 A	04-11-1990
		FI 90224 B	30-09-1993
		GR 3007200 T	30-07-1993
		IE 65522 B	01-11-1995
		US 5731023 A	24-03-1998
		US 5737905 A	14-04-1998
WO 9608424 A	21-03-1996	NZ 264453 A	26-06-1998
		AU 686453 B	05-02-1998
		AU 3487295 A	29-03-1996
		BR 9508945 A	06-01-1998
		CA 2199744 A	21-03-1996
		DE 69507958 D	01-04-1999
		EP 0781242 A	02-07-1997
		HU 77039 A	02-03-1998
		JP 10505565 T	02-06-1998
		PL 319124 A	21-07-1998
WO 8500339 A	31-01-1985	AT 41128 T	15-03-1989
		AU 572175 B	05-05-1988
		AU 3154884 A	07-02-1985
		BR 8407320 A	23-09-1986
		EP 0176514 A	09-04-1986
		JP 60501805 T	24-10-1985
		US 4685274 A	11-08-1987