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(71) Applicant: **ILAPAK Research & Development S.A.**
CH-6926 Montagnola (CH)

(72) Inventor: **Levy, Roger S.**
6815 Melide TI (CH)

(74) Representative: **Faraggiana, Vittorio**
Ingg. Guzzi & Ravizza S.r.l.
Via Vincenzo Monti 8
20123 Milano (IT)

(54) Device for packaging products in a modified atmosphere

(57) A device for packaging products comprising means (17) for forming a tube of plastic film (13) around a sequence of products (14) to be packaged and means (16) for horizontal advancing of said tube of film with said products to transverse welding means (19) of the tube for forming a sequence of closed bags containing products, characterised in that it comprises sealing means (18) suitable for choking the tube of film at the height of at least a conditioning tube (20) arranged inside the tube of film upstream of the welding means, the conditioning tube being connected to atmosphere conditioning means upstream of the sealing means and being provided with a port (22) for conditioning the atmosphere inside the tube of film downstream of the sealing means.

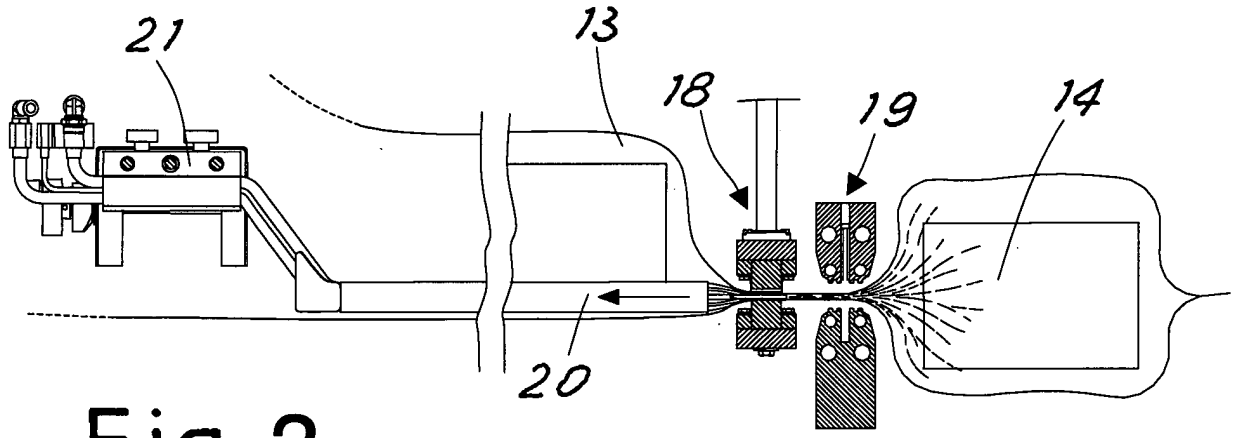

Fig. 3

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Description

[0001] The present invention relates to a horizontal device for packaging articles in a modified atmosphere.

[0002] In the prior art devices are made for packaging products in a modified atmosphere that in use form a tube of plastic film inside which the items to be packaged are arranged in sequence.

[0003] The tube of film, with the products therein, is made to advance on a conveying plane, above which a bell system is lowered intermittently that is intended to achieve the closing weld of each individual package in a suitably conditioned atmosphere inside a bell.

[0004] These packaging devices, nevertheless, have considerable constructional complexity and high installation costs.

[0005] The general object of the present invention is to remedy the aforementioned drawbacks by providing a device for packaging in a modified atmosphere that has a simple structure and is satisfactorily economical.

[0006] The object of the present invention is to give a valid alternative to vacuum packaging. It is situated halfway between MAP (modified-atmosphere packaging) and vacuum packaging, combining the benefits of the one (vacuum packaging) with the significantly lower costs of the other (MAP).

[0007] The technique has never been applied to horizontal packaging machines, where starting from a single reel of film and by means of special gas or air delivery and aspiration means a package is obtained with a residual volume that is very near zero.

[0008] This enables the same result, combined with the use of special films, to be obtained in terms of shelf life as from a vacuum packaging machine, with easily imaginable economic savings on the cost of the packaging materials, savings on the packaging system, reduction in labour (inasmuch as the process is on a line and automatic) and not least the absence of handling by operators, which is typical and necessary in vacuum packaging (possible contamination of the product is thus avoided), nevertheless leaving the versatility of the machine unaltered.

[0009] In view of this object it was decided to make a device according to the invention for packaging products comprising means for forming a tube of plastic film around a sequence of products to be packaged and means for horizontal advancing of said tube of film with said products to transverse welding means of the tube for forming a sequence of closed bags containing products, characterised in that it comprises sealing means suitable for choking the tube of film at the height of at least a conditioning tube arranged inside the tube of film upstream of the welding means, the conditioning tube being connected to atmosphere conditioning means upstream of the sealing means and being provided with a port for conditioning the atmosphere inside the tube of film downstream of the sealing means.

[0010] In order to make the explanation of the innovative principles of the present invention and the advantages thereof with respect to the prior art clearer, a possible embodiment applying these principles will be disclosed below with the help of attached drawings by way of example. In the drawings:

- figure 1 is a general perspective view of the device according to the invention,
- figure 2 is a schematic longitudinal section view of the device in a first phase of a packaging cycle,
- figure 3 is a schematic longitudinal section view of the device in a second phase of a packaging cycle,
- figure 4 is a schematic longitudinal section view of the device in a third phase of a packaging cycle.

[0011] With reference to the figures, in figure 1 there is shown a device 11 for packaging products in a modified atmosphere made according to the invention.

[0012] The device 11 comprises means 17 for forming a tube of plastic film 13 inside which there is arranged a sequence of products 14 to be packaged.

[0013] The means 17 (shown schematically in the figure) forms the tube of film 13 from a reel of a ribbon of film 12 and may comprise, for example, a pair of rollers suitable for welding together the two longitudinal end edges of the ribbon 12 for carrying out the longitudinal end welding of the tube of film 13.

[0014] The means 17 is made according to techniques known in the field of horizontal packaging machines and will not therefore be disclosed in further detail.

[0015] The products 14 are supplied in sequence inside the tube of film 13 by means of known supplying means of the products (not shown in the figure).

[0016] The tube of film 13, with the products 14 integral to it arranged in the inside thereof, is made to advance longitudinally horizontally in the direction indicated by the arrow 30, using advancing means 16. The advancing means 16, which is also shown schematically in the figure, is of the type known to those skilled in the art and might comprise, for example, a belt or chain conveyor, arranged horizontally.

[0017] The tube of film 13 is made to advance in a continuous manner to the transverse welding means 19 of the tube of film, intended to form at each advancing step of the tube 13 a transverse welding closure for forming a sequence of closed bags, each containing a product 14. Downstream of the welding means 19 there is shown a finished package 15 containing a product 14.

[0018] The welding means 19 comprises two welding blades 24, perpendicular to the advancing direction of the tube of film 13. Associated with the blades 24, there may be cutting means of the bag that has just been formed according to techniques that are known in the field. At each welding, the blades 24 form both the rear transverse welding of a bag and the front transverse welding of the next bag.

[0019] According to the invention, as well shown in figures 2 to 4, the device 11 comprises sealing means 18

for choking the tube of film 13 at the height of the conditioning tubes 20 arranged inside the tube of film upstream of the welding means 19 with respect to the advancing direction 30.

[0020] The sealing means 18, as shown in the figure, comprises a pair of ribs 23 arranged perpendicularly to the axis of the tube of film 13, advantageously parallel and near to the welding blades 24. The ribs 23 are suitable for being pressed against one another with the interposition of the tube of film and of two conditioning tubes 20 inside the tube of film, so that the atmosphere inside the tube of film downstream of the sealing means is accessible only through the conditioning tubes. The two ribs 23 that are movable between a remote position for the passage of the products and a near position to be pressed together with interposing of the tube of film 13 and of the conditioning tube 20. In the remote position, the ribs are sufficiently spaced apart to move the product into the space between the two ribs.

[0021] Advantageously, the ribs at the portions in mutual contact are covered with resilient material (for example rubber) to improve the seal.

[0022] Each of the conditioning tubes 20 (in the figure two are shown, but there could be just one of them) is provided with a conditioning port 22 arranged immediately downstream of the sealing means 18 with respect to the direction 30, for conditioning the atmosphere inside the tube of film 13 downstream of the ribs 23 when the latter are in operation to provide a seal.

[0023] Upstream of the sealing means 18, at the end opposite the conditioning port 22, the tubes 20 are connected to general atmosphere conditioning means (not shown in the figure), for example an aspiration pump, a device for delivering desired gases, a general vacuum source, etc.

[0024] In an embodiment of the invention, the ribs may have recesses at the passage point of the conditioning tubes 20 to improve the transverse seal of the tube 13. The tubes 20, on the other hand, have a flattened shape at the height of the ribs 23 in order not to interfere noticeably with the formation of the seal.

[0025] At each advancing step of the tube 13 a product 14 near the transverse welding closure 25 of the tube of film 13 goes beyond the welding means 19, as shown in figure 2.

[0026] The two ribs 23 thus close to form a seal transversely to the tube of film, so that the atmosphere downstream of the ribs 23 is accessible only through the tube 20 (see figure 3). In this situation, the conditioning means is driven that is connected upstream of the tubes 20 for conditioning the atmosphere inside the future bag, for example by aspirating and creating the (at least partial) vacuum.

[0027] Once the desired conditioning has been achieved, the blades 24 close to form the closing welding and to cut the thus completed package (see figure 4).

[0028] The sequential driving means of the sealing means and of the welding means in the modes disclosed previously are shown schematically in figure 1 and are indicated by reference number 31. This driving means is made according to known techniques and will not therefore be disclosed in further detail.

[0029] Advantageously, the device 11 also comprises means 21 for adjusting the position of the conditioning tubes 20, for example so as to move the two tubes 20 near or away in function of the dimension of the products 14 to be packaged. The product 14 is thus made to advance into the space comprised within the two tubes 20. The means 21, advantageously, supports the conditioning tubes upstream of the point in which the tube of film 13 is formed.

[0030] It should be noted that each tube 20 can comprise in the inside thereof even several conditioning conduits, each one of which can be used with different functions, for example one for aspirating and another for delivering desired conditioning gases inside the package at the moment of the closure thereof.

[0031] As already mentioned, the tube of film with the products therein is made to advance in a continuous manner. The welding blades 24, the ribs 23 and the conditioning tubes are horizontally movable, so as to move integrally with the tube of film during the phase of conditioning and closing of the package. After welding, the unit retreats by a step with respect to the tube of film to perform closure of the following bag.

[0032] At this point, it is clear that the objects of the invention have been achieved.

[0033] A device has in fact been made for packaging products in a conditioned atmosphere, which device is provided with a simple, functional and satisfactorily economical structure. Naturally, the above disclosure of an embodiment applying the innovative principles of the present invention is given by way of example of such innovative principles and must not therefore be taken to limit the claims made herein.

Claims

1. Device for packaging products comprising means (17) for forming a tube of plastic film (13) around a sequence of products (14) to be packaged and means (16) for horizontal advancing of said tube of film with said products to transverse welding means (19) of the tube for forming a sequence of closed bags containing products, **characterised in that** it comprises sealing means (18) suitable for choking the tube of film at the height of at least a conditioning tube (20) arranged inside the tube of film upstream of the welding means, the conditioning tube being connected to atmosphere conditioning means upstream of the sealing means and being provided with a port (22) for conditioning the atmosphere inside the tube of film downstream of the sealing means.

2. Device according to claim 1, **characterised in that**

said sealing means (18) comprises two ribs (23) that are transverse to the tube and movable between a remote position for the passage of the products and a near position to be pressed together with interposing of the tube of film (13) and of the conditioning tube (20).

3. Device according to claim 1, **characterised in that** the conditioning means comprises a vacuum source and/or desired conditioning gas source.

4. Device according to claim 2, **characterised in that** the portions of the ribs intended for mutual contact are formed of resilient material.

5. Device according to claim 2, **characterised in that** said ribs (23) are virtually rectilinear arranged perpendicularly to the tube of film.

6. Device according to claim 2, **characterised in that** the transverse welding means (19) comprises two sealing blades (24) parallel to the sealing ribs (23).

7. Device according to claim 1, **characterised in that** the port (22) of the conditioning tube is arranged immediately downstream of the sealing means (18).

8. Device according to claim 1, **characterised in that** said conditioning tube (20) is parallel to the tube of film (13).

9. Device according to claim 1, **characterised in that** with said transverse welding means (19) transverse cutting means is associated for separating the closed bags from the tube of film.

10. Device according to claim 1, **characterised in that** said transverse welding means (19) is arranged immediately downstream of the sealing means.

11. Device according to claim 1, **characterised in that** there are two said conditioning tubes (20).

12. Device according to claim 11, **characterised in that** it comprises means (21) for adjusting the reciprocal position of the conditioning tubes in a direction that is transverse to the tube.

13. Device according to claim 1, **characterised in that** the conditioning tubes (20) comprise an aspiration conduit and a delivery conduit of a desired atmosphere.

14. Device according to claim 1, **characterised in that** said advancing means comprises a horizontal conveyor having a conveying surface on which the tubes of film with the products in the inside thereof rest.

15. Device according to claim 14, **characterised in that** the conditioning tubes are arranged to the side of the products in the tube of film.

16. Device according to claim 2, **characterised in that** it comprises sequential driving of the sealing means and of the welding means after the passage of a product into the tube of film to insulate with the sealing means the portion of tube containing the product, conditioning the atmosphere in this portion of tube and subsequently closing the portion of tube by means of welding so as to make the package.

17. Device according to claim 1, **characterised in that** the tube of film and the products therein are advanced in a continuous manner, the sealing means, the transverse welding means and conditioning tubes being horizontally movable so as to be integral with the tube of film during conditioning of the atmosphere and closing of the bag.

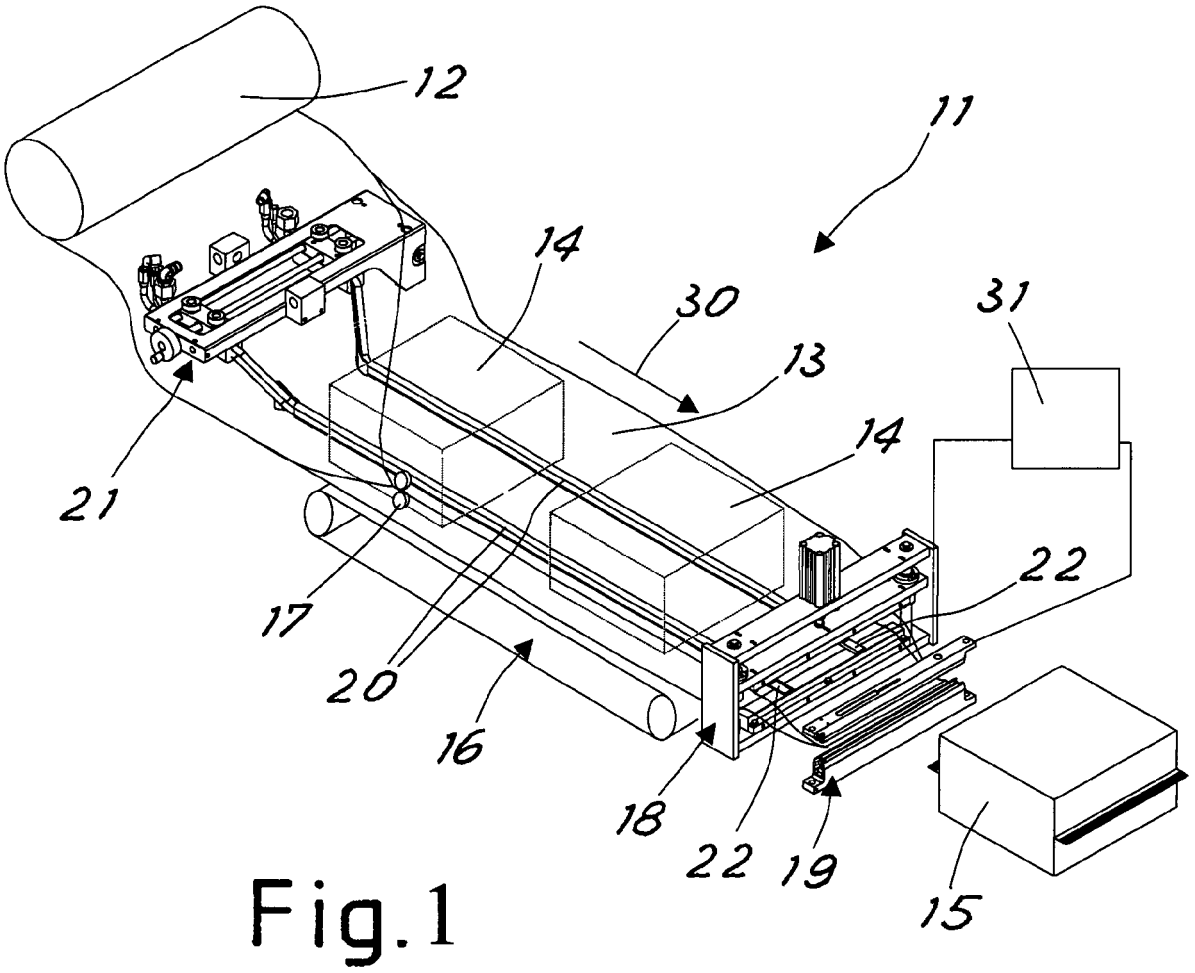

Fig.1

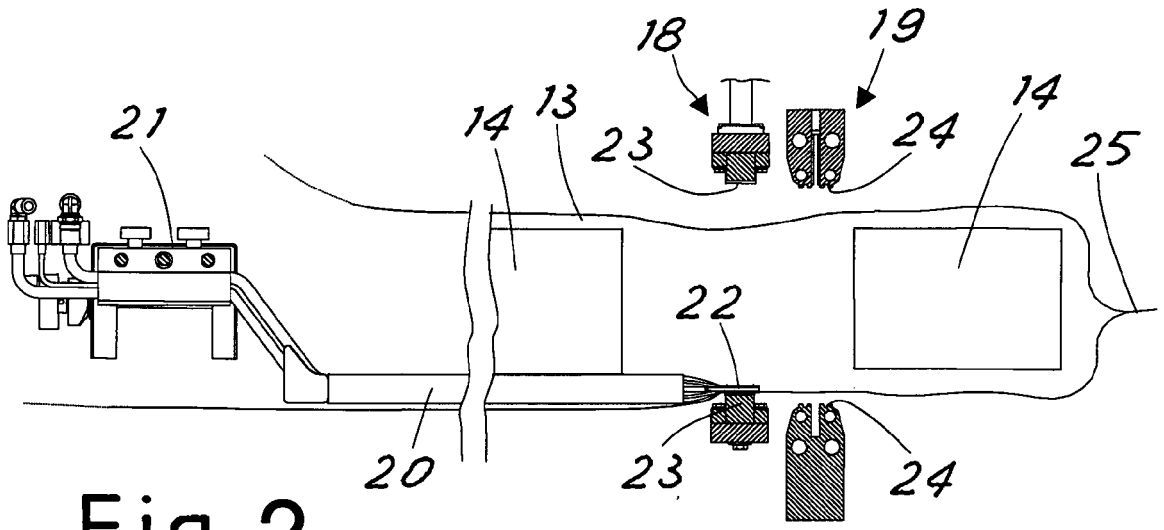

Fig. 2

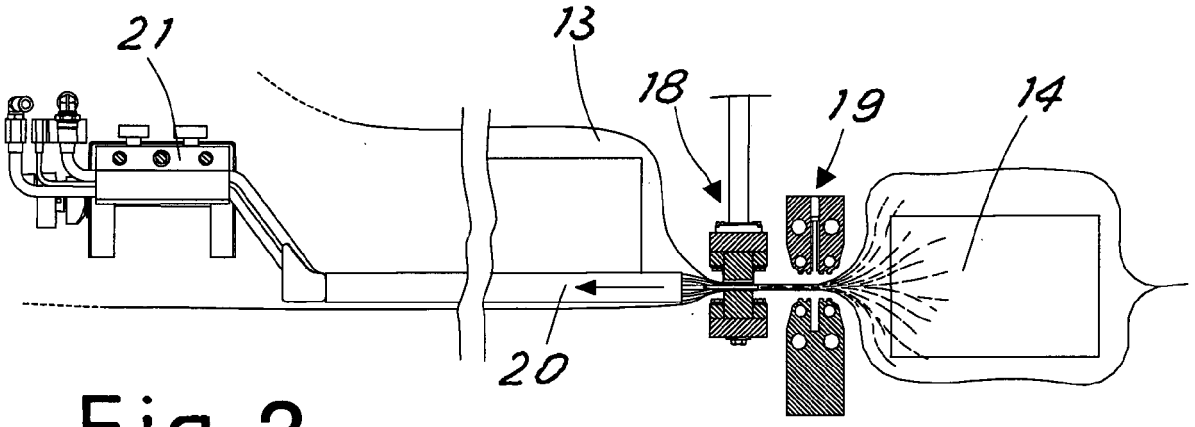

Fig. 3

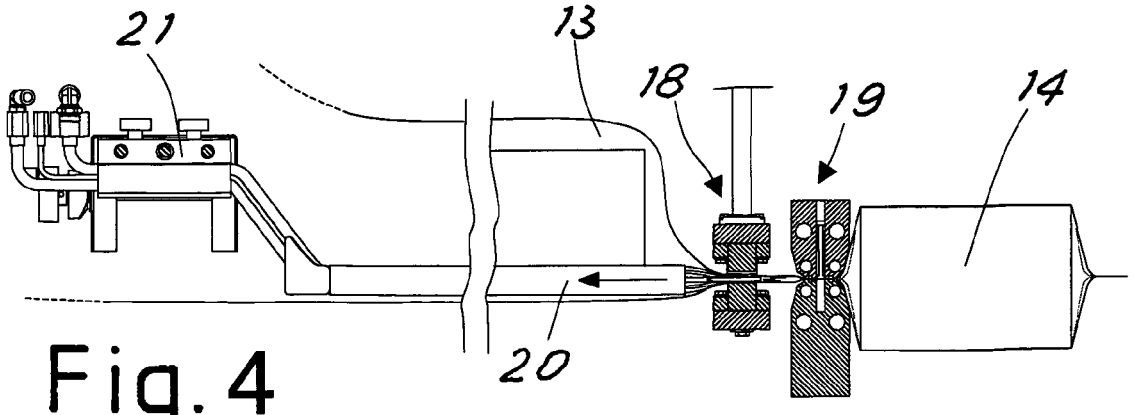

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 06 00 6340

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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TECHNICAL FIELDS SEARCHED (IPC)

B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	15 May 2006	Vigilante, M

CATEGORY OF CITED DOCUMENTS

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