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(54) **FORMAT DISPENSER, BAG GENERATOR AND HEAT SEALER**

(57) - A format dispenser, bag generator and heat sealer that makes it possible to dispense both formats and bags and, in both cases, in different customized sizes comprising:

- A feeding subsystem (1) having an area for arranging spools (2).
- A circulation subsystem (4) formed by rollers (5) that drag the material.
- A transverse heat-sealing and cutting subsystem (6) that transversely cuts and heat-seals the material.
- A lateral heat-sealing subsystem (7) when wanting to obtain a bag.
- An external transverse output and heat-sealing subsystem (8).
- A control and actuation subsystem (9).

It makes it possible to alternately dispense formats and bags, allowing the user to select the desired format without unnecessary waste, and also has a final element that makes it possible to finish sealing the bags once they have been filled.

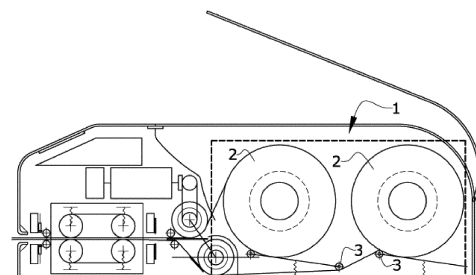


FIG.1

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Description

Technical field

[0001] The object of the present invention, as established in the title of the invention, is a format dispenser, bag generator and heat sealer that makes it possible to dispense both formats and bags and in both cases in different sizes and heatsealable materials, as well as those composed of paper and biopolymers, polymers and plastics.

[0002] The present invention is characterised by the special design and configuration of each and every one of the pieces that form part of the invention, such that a multifunctional dispenser, generator and heat sealer is achieved that makes it possible to obtain both different sizes and formats and bags. Such that the necessary technical requirements to obtain both products are reduced to a single consumable in the work and storage space thereof.

[0003] Therefore, the present invention falls within the field of stand-alone formatdispensing, bag-generating and heat-sealing machines.

Background art

[0004] Dispensers that are only used to obtain multi-format material are currently available on the market. This method allows the customer to obtain greater flexibility and optimisation in the production of the material, as opposed to the supply of pre-cut material that sometimes does not adapt correctly to the size of the product, entailing both material and economic loss.

[0005] Furthermore, bag dispensers that allow the bags to be manually created and sealed also exist.

[0006] Manual heat sealers that allow the material to be welded by applying heat thereto are also available on the market.

[0007] However, these three independent actions are not known to co-exist in the food sector, due to which the invention proposes unifying them in such a manner as to give the user different advantages, such as a reduction in the number of devices and optimisation of the material, which is reduced to a single consumable in the work and storage space. Similarly, it frees up the horizontal walls and can be arranged vertically if desired.

[0008] It also happens that in format and bag dispensers there is no possibility of selecting a customised product size.

[0009] Therefore, the object of the present invention is to develop a machine that alternately dispenses, generates and heat-seals customised formats and bags of different sizes, without unnecessary waste, such as that described below and set out in its essentiality in the first claim.

Summary of the invention

[0010] The object of the present invention is set out in its essentiality in the independent claim and the different embodiments are set out in the dependent claims.

[0011] The object of the present invention is a format dispenser, bag generator and heat sealer that enables the alternating dispensing of formats and bags, customization of the desired size of the product and final heat-sealing thereof. All these features are set out in a single multifunctional compact and versatile unit.

[0012] The format dispenser, bag generator and heat sealer comprises:

- A feeding subsystem wherein the spools that will feed the production are arranged. This subsystem is formed by lateral anchors that retain a mandrel of the spool and ensure the proper containment thereof. Additionally, there is a tensioning subsystem in the lower part formed by tubulars that exert force thereon and keep the material tensioned.
- A circulation subsystem, which is the set of mechanisms that enable the circulation of the material coming from the spools towards the cutting and heat-sealing system. It is made up of rollers that pull the material towards other, smaller rollers. When the format is dispensed, only the roller that stretches the front spool is activated, but when the option to generate a bag is selected, the system is fully activated and exerts a backward or forward movement to create a flange of approximately 5 mm that will facilitate the opening of the bag.
- A transverse heat-sealing and cutting subsystem containing the elements that cross-section and heat-seal the material.
- A lateral heat-sealing subsystem that seals the sides when wanting to obtain a bag. Otherwise, when dispensing formats this system is not activated, i.e. the welders are separated from the material so as not to intervene or modify the product.
- An external transverse output and heat-sealing subsystem located at the mouth of the machine through which the product exits and remains clamped without falling completely outwards, waiting to be collected by the user. It is also the place where the sealing of the bag is completed.
- A control and actuation subsystem which, in addition to comprising electronic processing means, also has switches and buttons to actuate the machine.

[0013] The described features make it possible to achieve:

- A reduction in the number of devices, consequently favouring the optimisation of the material, which is reduced to a single consumable in the work and storage space.
- Free up horizontal walls and arrange vertically, if de-

sired.

- Versatility in the alternating dispensation of format and bags, in customised sizes that make it possible to adjust the amount of material to that desired by the user.
- Prevent unnecessary waste.
- A single compact and versatile unit having multiple functionalities.

[0014] Unless indicated otherwise, all the technical and scientific elements used herein have the meaning usually understood by a person ordinarily skilled in the art to which this invention belongs. In the practice of the present invention, methods and materials similar or equivalent to those described herein may be used.

[0015] Throughout the description and the claims, the word "comprises" and its variants do not intend to exclude other technical features, additives, components or steps. For the persons skilled in the art, other objects, advantages and features of the invention will be apparent partly from the description and partly from the practice of the invention.

Brief description of drawings

[0016] As a complement to the description being made and for the purpose of helping to make the characteristics of the invention more readily understandable, in accordance with a preferred practical embodiment thereof, said description is accompanied by a set of drawings which, by way of illustration and not limitation, represent the following.

Figure 1 shows the format dispenser, bag generator and heat sealer, wherein the feeding subsystem is marked.

Figure 2 shows the machine, wherein the location of the recirculation subsystem is indicated.

Figure 3 shows the transverse heat-sealing and cutting machine and area.

Figure 4 shows the lateral heat-sealing area.

Figure 5 shows the external transverse output and heat-sealing area.

Figure 6 shows the control and actuation subsystem.

Description of embodiments

[0017] In view of the figures, a preferred embodiment of the proposed invention is described below.

[0018] In figure 1 it can be observed that the format dispenser, bag generator and heat sealer comprises:

- A feeding subsystem (1) having an area for arranging production feeding spools (2). It also has tensioning means (3) formed by tubulars that exert force thereon and keep the material tensioned.
- A circulation subsystem (4) arranged immediately after the feeding subsystem and formed by rollers

(5) that drag the material towards other, smaller rollers. When the format is dispensed, the only roller actuated is that which stretches the front spool, but when the bag-generating option is selected, all the mechanisms of the circulation subsystem are fully activated and the two spools are stretched. In turn, the rollers exert a backward or forward movement to create a flange of approximately 5 mm that will facilitate the opening of the bag.

- A transverse heat-sealing and cutting subsystem (6) arranged at the output of the circulation subsystem (4) and where the elements that transversely heat-seal and cut the material are located.
- A lateral heat-sealing subsystem (7) arranged immediately after the transverse heat-sealing and cutting subsystem (6) that heat-seals the sides when wanting to obtain a bag. Otherwise, this system is not actuated when dispensing formats, i.e. the welders are separated from the material so as not to intervene or modify the product.
- An external transverse output and heat-sealing subsystem (8) arranged at the output of the lateral heat-sealing subsystem (7), which is located at the mouth of the machine through which the product exits and remains clamped without falling completely outwards. It is also the place where the sealing of the bag is completed, i.e. where a thermowelding element is located.
- A control and actuation subsystem (9) which, in addition to comprising electronic processing means, has the switches and buttons for actuating the machine.

[0019] In the feeding subsystem (1), the spools (2) are introduced through the upper part of the machine, which is protected by a lid that may be made of a transparent material in order to be able to see the remaining material, or may be made of an opaque material and observed through a window. Once the consumable is introduced in the machine, the consumable must be inserted on the lateral anchorage system that retains the spool mandrel and ensures that it is properly contained regardless of the machine's position.

[0020] When feeding the machine with the consumable, the rear spool must firstly be inserted so that the material can be fed into the circulation subsystem. Next, the front spool is inserted.

[0021] The elements that cut and heat-seal the material may consist of a guillotine and a pressure, temperature and time system, for example, a heating element that applies heat by means of conductive materials such as Teflon. It is envisaged that these two elements can be innovated with other methods, in addition to vibration systems such as ultrasound. They have the advantage of combining the two functions of cutting and heat-sealing in a single element, as well as allowing the material to be modified without physically touching it. This is a very interesting feature that prevents wearing of the cutting

and heat-sealing elements and at the same time avoids inaccuracies that can damage the production of the product.

[0022] When a bag is obtained, the lateral heat-sealing is formed by two circular welders that apply heat to the material and allow it to be thermo-welded to form the bag. This system can be innovated by using other methods that make it possible to obtain the same result in the fixation of the material, such as ultrasound.

[0023] The external transverse output and heat-sealing system is the place where the sealing of the bags is completed when they have previously been filled, due to the fact that there is a transverse heat sealer that is only actuated automatically when the internal sensor detects that the bag is being introduced from the exterior to the interior of the machine. Once the bag is inside, the heat sealer clamps the material and transmits heat thereto for a certain period of time. Once the bag is finished, it will stop clamping it and the user can retrieve it.

[0024] The control unit (9) comprises an on/off switch (10) which is located, in a possible form of embodiment, on one of the sides of the dispenser, next to the power socket (11). The actuation commands are buttons which are located on the front of the machine, next to the screen. The buttons (13) are divided mainly into two principal categories: the format and the bag, wherein each group of categories has three different buttons for selecting standard sizes. The control unit also makes it possible to customise the size of the product and the temperature and time of the heat sealers.

[0025] Each category is formed by three different buttons that correspond to the three standard sizes that the machine can dispense: small, medium and large. A manual selection system can also be activated at will wherein temperature and time can be regulated. These manual changes can be made both in formats and in bags.

[0026] The nature of the present invention having been sufficiently described, as well as its implementation, it is stated that, within its essentiality, it could be implemented in other embodiments which may differ from the preferred embodiment in matters of detail and that will fall within the scope of this patent provided its fundamental principle is not altered, changed or modified.

Claims

1. A format dispenser, bag generator and heat sealer, **characterized in that** it comprises:

- A feeding subsystem (1) having with an area in which to arrange production feeding spools (2). It also has tensioning means (3) formed by tubulars that exert force thereon and keep the material tensioned.
- A circulation subsystem (4) arranged immediately after the feeding subsystem and formed by rollers (5) that drag the material towards oth-

er, smaller rollers. When the format is dispensed, only the roller that stretches the front spool is actuated, but when the option for generating a bag is selected, the system is fully activated.

- A transverse heat-sealing and cutting subsystem (6) arranged at the output of the circulation subsystem (4) and wherein the elements that transversely cut and heat-seal the material are located.

- A lateral heat-sealing subsystem (7) arranged immediately after the transverse heat-sealing and cutting subsystem (6) that heat-seals the sides when wanting to obtain a bag, otherwise this system is not actuated when dispensing formats, i.e. the welders are separated from the material in order not to intervene or modify the product.

- An external transverse output and heat-sealing subsystem (8) arranged at the output of the lateral heat-sealing subsystem (7), which is located at the mouth of the machine through which the product exits and is clamped without completely falling outwards.

- A control and actuation subsystem (9) which, in addition to comprising electronic processing means, has the switches and buttons for actuating the machine.

2. The format dispenser, bag generator and heat sealer, according to claim 1, **characterized in that** the elements that transversely cut and heat-seal comprise a guillotine and welding through a pressure, temperature and time system, with a resistor that applies heat to conductive elements such as Teflon.

3. The format dispenser, bag generator and heat sealer, according to claim 1, **characterized in that** the elements that transversely cut and heat-seal comprise vibration systems such as ultrasound that perform the two cutting and heat-sealing functions in a single system, in addition to allowing the material to be modified without physically touching it.

4. The format dispenser, bag generator and heat sealer, according to any of the preceding claims, **characterized in that** the lateral heat sealing is formed by two circular welders that apply heat to the material and allow it to be thermowelded to form the bag.

5. The format dispenser, bag generator and heat sealer, according to any of claims 1 to 3, **characterized in that** lateral heat sealing is performed by means of ultrasound.

6. The format dispenser, bag generator and heat sealer, according to any of the preceding claims, **characterized in that** the control and actuation subsys-

tem (9) comprises an on/off switch (10) located on one of the sides of the dispenser, next to a power socket (11), wherein the actuation commands are buttons located on the front part of the machine, next to the screen, and the buttons (13) are also divided into two main categories: the format and the bag, wherein each category comprises three buttons for selecting different dimensions.

7. The format dispenser, bag generator and heat sealer, according to claim 6, **characterized in that** the control unit also comprises manual selection means whereby temperature and time is regulated. These manual changes can be made both in formats and in bags.

Amended claims under Art. 19.1 PCT

1. A format dispenser, bag generator and heat sealer, **characterized in that** it comprises:

- A feeding subsystem (1) having with an area in which to arrange production feeding spools (2) wherein the feeding subsystem has tensioning means (3) formed by tubulars that exert force and keep material tensioned.
- A circulation subsystem (4) arranged immediately after the feeding subsystem and formed by rollers (5) that drag the material towards other, smaller rollers.
- A transverse heat-sealing and cutting subsystem (6) arranged at the output of the circulation subsystem (4) and wherein elements that transversely cut and heat-seal the material are located.
- A lateral heat-sealing subsystem (7) arranged immediately after the transverse heat-sealing and cutting subsystem (6)
- A transverse output and heat-sealing subsystem (8) arranged at the output of the lateral heat-sealing subsystem (7), wherein the transverse output and heat-sealing subsystem (8) is located at mouth of the machine through which the product exits and the product is clamped by the mouth without falling outwards.
- A control and actuation subsystem (9) which, in addition to comprising electronic processing means, has the switches and buttons for actuating the machine.

2. The format dispenser, bag generator and heat sealer, according to claim 1, **characterized in that** the elements that transversely cut and heat-seal comprise a guillotine and welding through a pressure, temperature and time system, with a resistor that applies heat to conductive elements such as Teflon.

3. The format dispenser, bag generator and heat sealer, according to claim 1, **characterized in that** the elements that transversely cut and heat-seal comprise vibration systems such as ultrasound that perform the two cutting and heat-sealing functions in a single system, in addition to allowing the material to be modified without physically touching it.

4. The format dispenser, bag generator and heat sealer, according to any of the preceding claims, **characterized in that** the lateral heat sealing is formed by two circular welders that apply heat to the material and allow it to be thermowelded to form the bag.

5. The format dispenser, bag generator and heat sealer, according to any of claims 1 to 3, **characterized in that** lateral heat sealing is performed by means of ultrasound.

6. The format dispenser, bag generator and heat sealer, according to any of the preceding claims, **characterized in that** the control and actuation subsystem (9) comprises an on/off switch (10) located on one of the sides of the dispenser, next to a power socket (11), wherein the actuation commands are buttons located on the front part of the machine, next to the screen, and the buttons (13) are also divided into two main categories: the format and the bag, wherein each category comprises three buttons for selecting different dimensions.

7. The format dispenser, bag generator and heat sealer, according to claim 6, **characterized in that** the control unit also comprises manual selection means whereby temperature and time is regulated. These manual changes can be made both in formats and in bags.

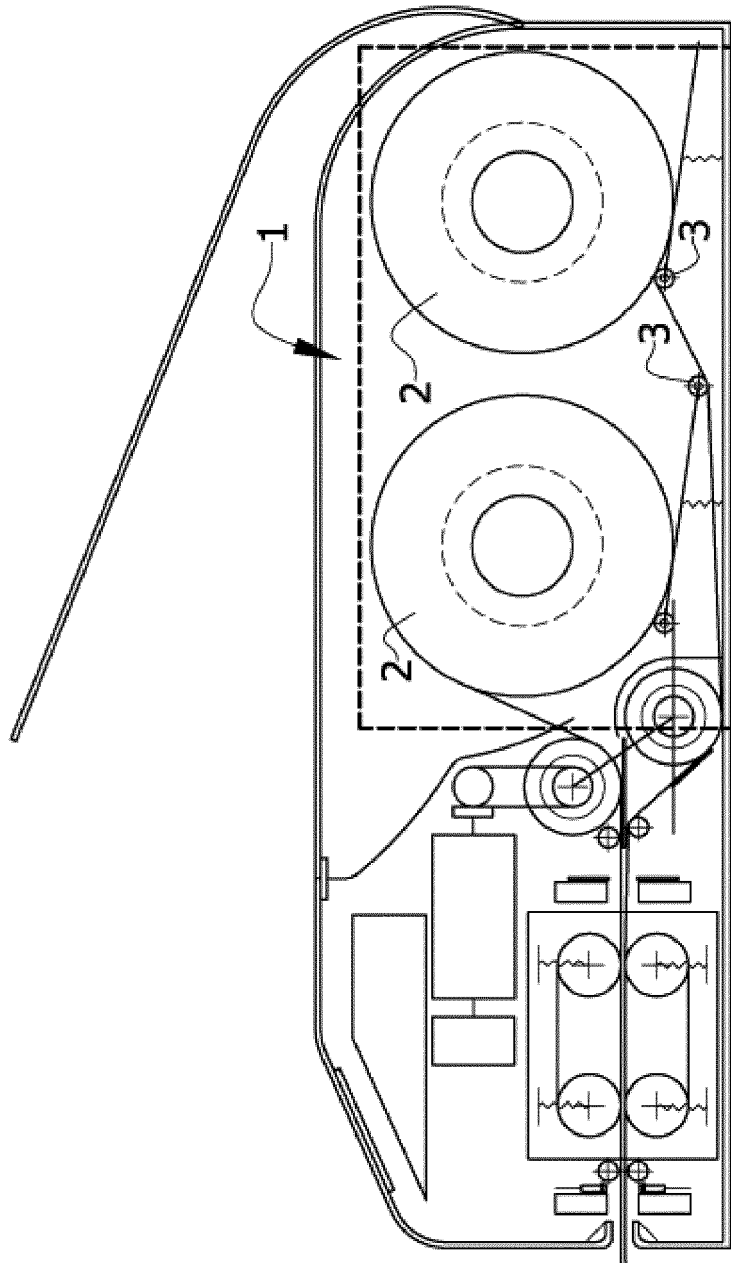


FIG.1

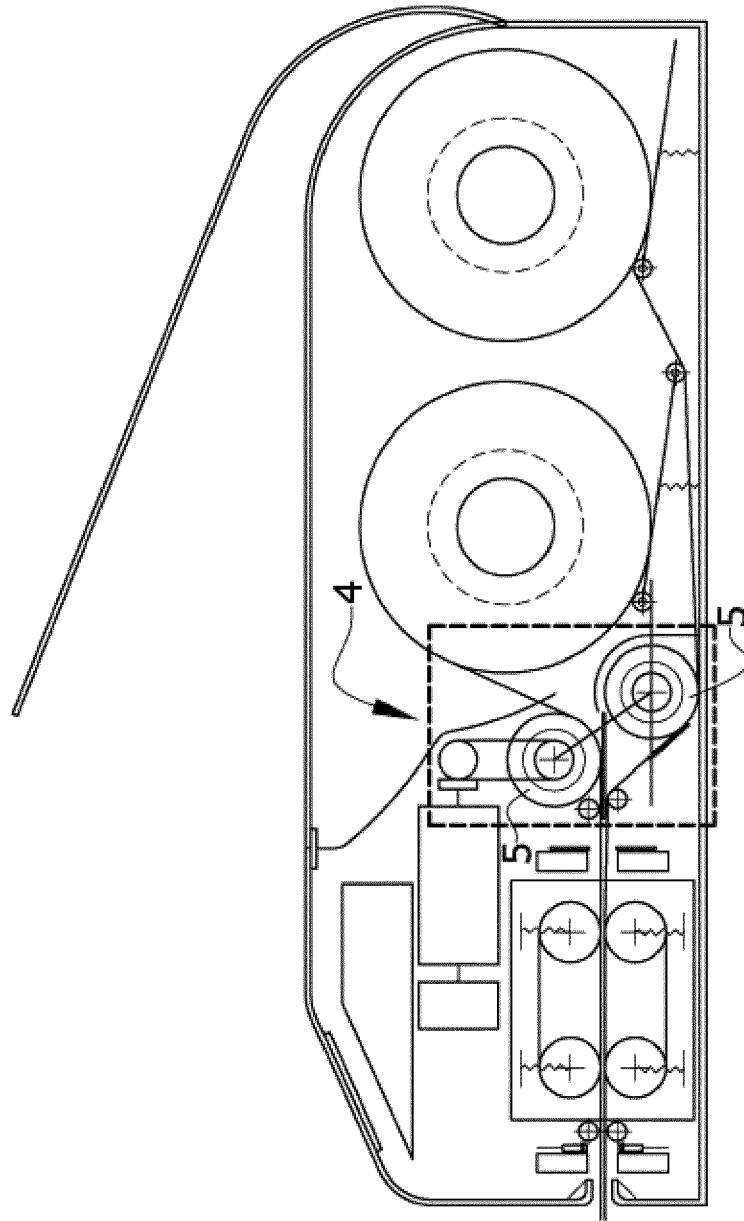


FIG. 2

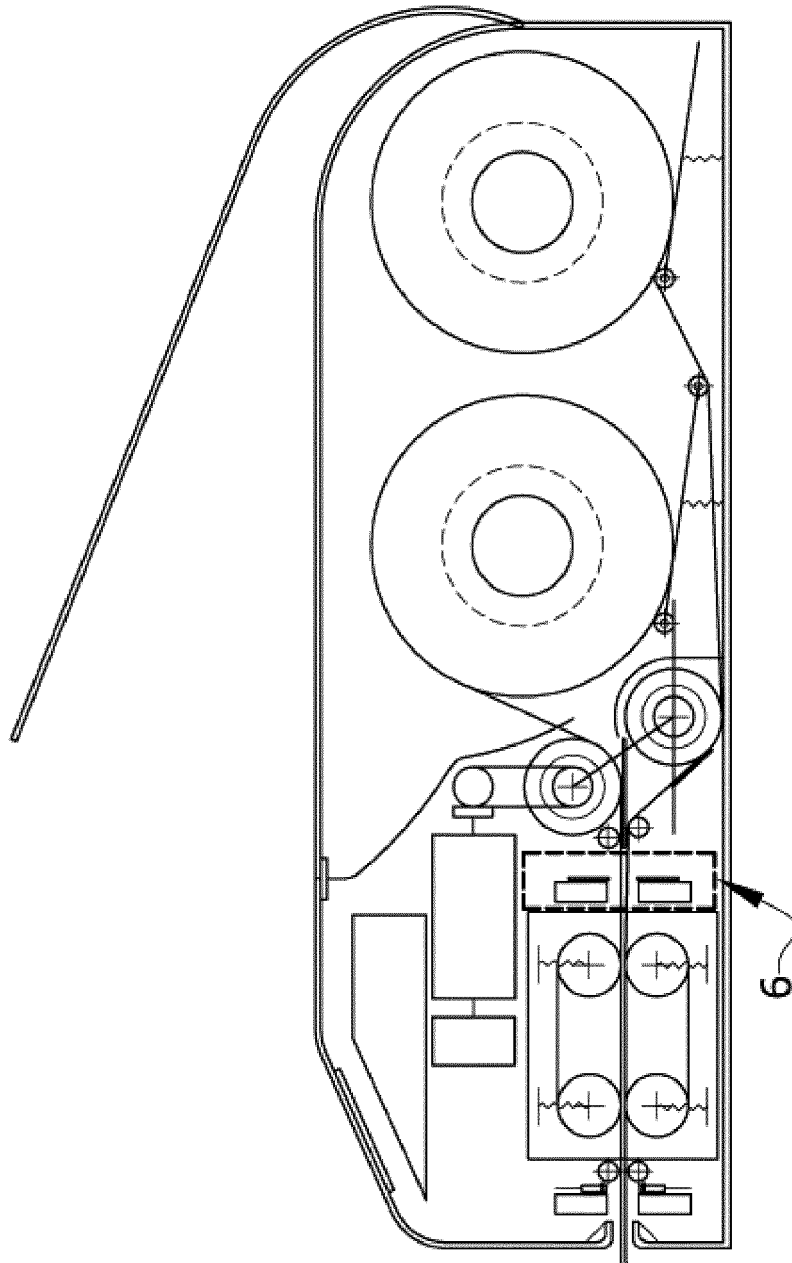


FIG.3

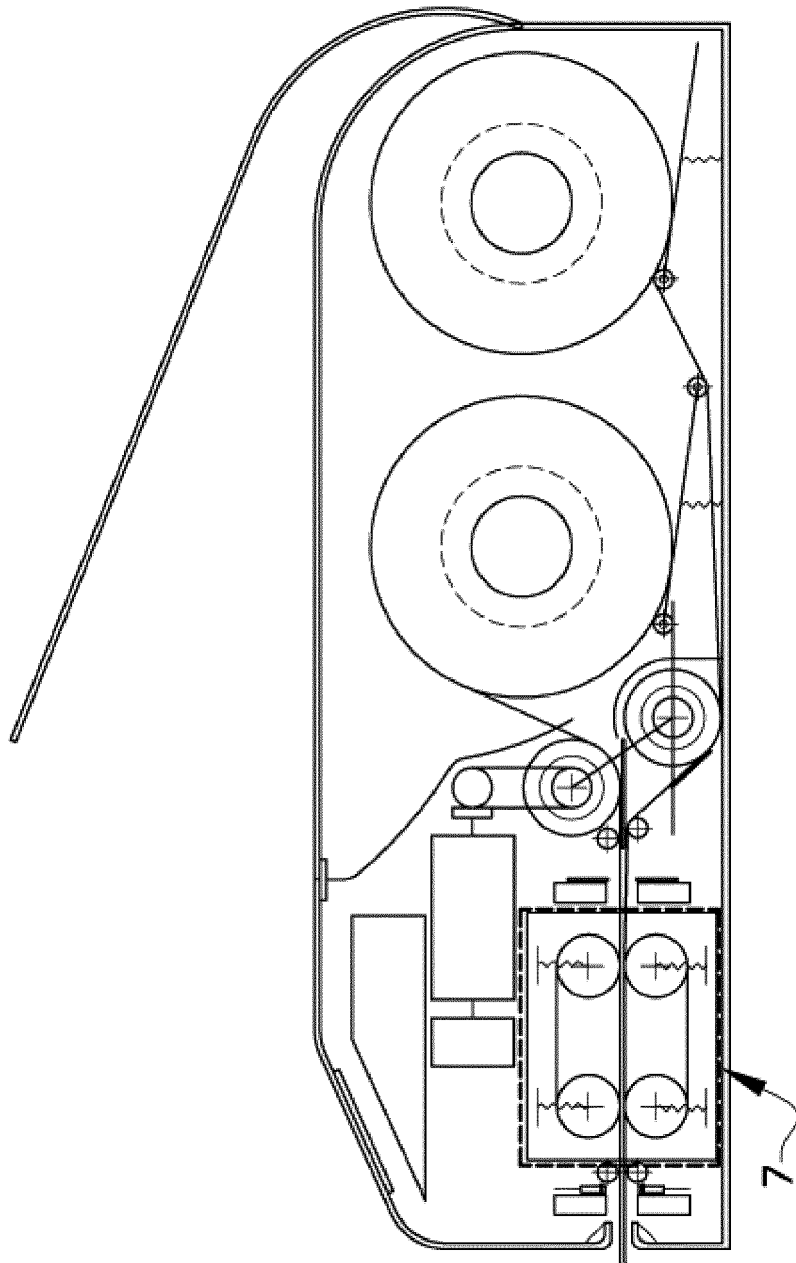


FIG. 4

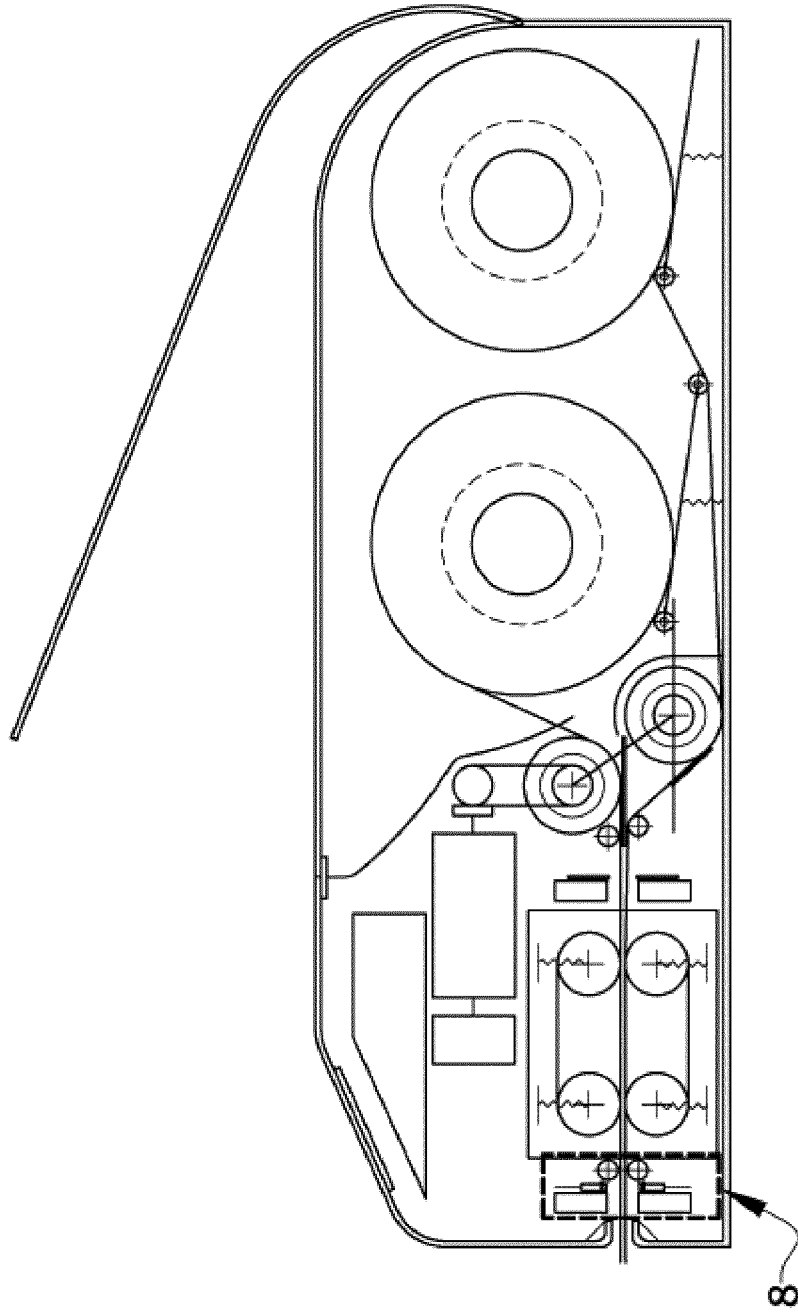


FIG. 5

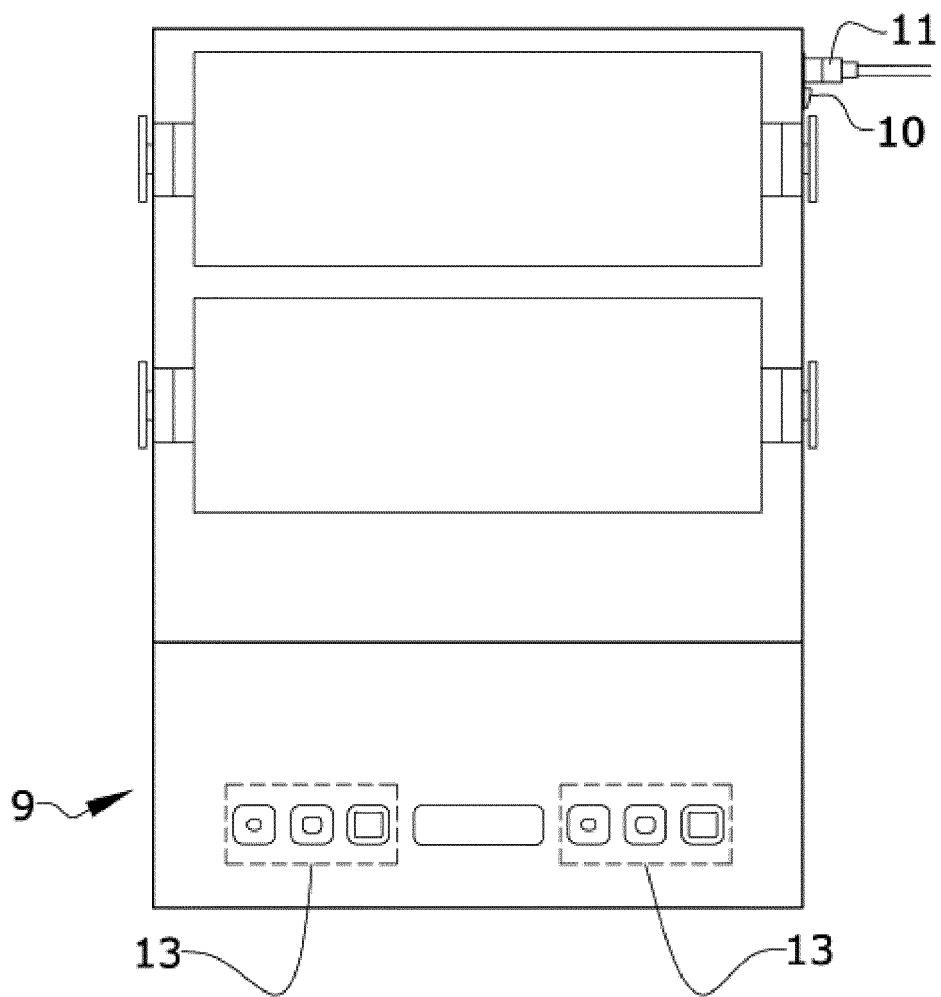


FIG.6

INTERNATIONAL SEARCH REPORT

International application No
PCT/ES2021/070613

A. CLASSIFICATION OF SUBJECT MATTER

INV. B31B70/00 B31B70/10 B31B70/16 B31B70/64 B65B51/14
B65H16/00 B31B155/00 B31B160/10

ADD.

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)

B31B B65B B29C B65H

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

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 025 383 A (FERRIGNO ALBERT R) 24 May 1977 (1977-05-24) column 3, line 35 - column 8, line 21; figures 1-4, 8	1-7
A	US 2004/132599 A1 (COLLA TIZIANO [CH]) 8 July 2004 (2004-07-08) figure 1	1-7
A	CN 207 242 111 U (SHANGHAI GENLAI FOOD CO LTD) 17 April 2018 (2018-04-17) figure 1	1-7
A	US 2 125 758 A (WATERS HARRY F) 2 August 1938 (1938-08-02) figures 1, 2	1-7

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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Date of the actual completion of the international search

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20/04/2022

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/ES2021/070613

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US 2125758	A	02-08-1938	NONE	
