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(54) **CONTROL METHOD FOR A PACKAGING MACHINE AND ASSOCIATED PACKAGING MACHINE**

(57) The invention relates to a control method and an associated packaging machine. A continuous cover film (3) made of a plastic material and a continuous base film (1) which is formed by at least a first layer (1.1) of cellulosic material and a second layer (1.2) made of a plastic material arranged on the first layer (1.1) and attached to said first layer (1.1) and comprising at least one cut (2) are supplied to sealing station of the machine, in a forward movement direction. Said cover film (3) is sealed to the second layer (1.2) of said base film (1) in the sealing station, and then a stretching of at least the part of the cover film (3) that is on the cut (2) of the base film (1) is caused.

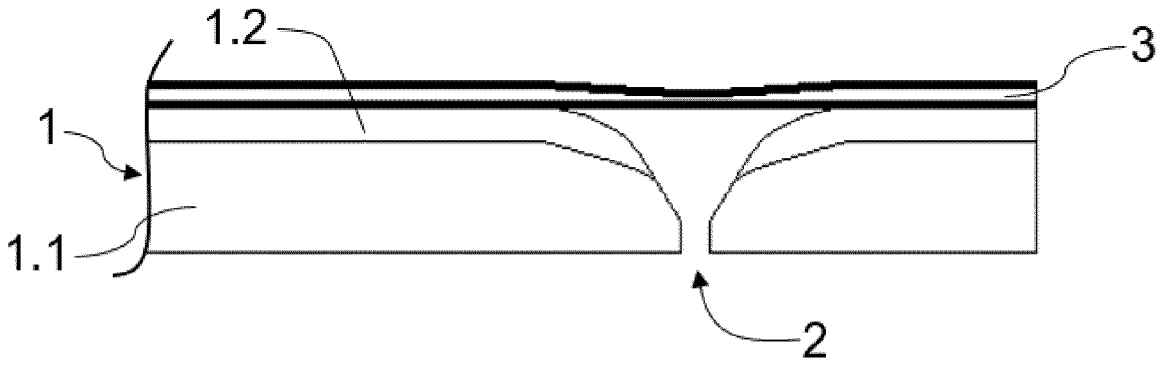

Fig. 5

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Description

TECHNICAL FIELD

[0001] The present invention relates to control methods for packaging machines, particularly to control methods suitable for packaging machines adapted to generate easy-open packages, and with packaging machines adapted to generate easy-open packages.

PRIOR ART

[0002] In product packaging machines, there are supplied a continuous base film on which there is arranged a product to be packaged and a continuous cover film which is arranged on said base film and said product and sealed to said base film, the product thus being packaged between the two films. After said sealing, a cut is made to separate the package from the continuous films sealed to one another, obtaining an individual package with the packaged product.

[0003] Some packages are easy-open packages, getting their name from the fact that they are easy for the user to open. Some types of easy-open packages comprise a piece of cover film protruding from the base film, such that the user pulls on said piece to open the package, causing the cover film to detach from the base film, thus enabling access to the packaged product. The drawback of this type of easy-open packages is that excess cover film is required, which may increase the cost of said package.

[0004] As a result, easy-open packages of another type, devoid of excess cover film, are also known. In these cases, the base film has a cut or tear which implies a physical separation of a piece of the base film from the rest of the base film. Since the cover film is sealed to the entire base film, including said piece, said piece also remains in the final package. The user pulls on that piece and causes the cover film to detach from the rest of the base film (the cover film detaches together with this piece), thus enabling access to the packaged product.

[0005] EP0748746A1 discloses a packaging machine comprising base film feeding means configured for supplying a base film; cover film feeding means configured for supplying a cover film; a sealing station configured for receiving the cover film and the base film in a forward movement direction of the films, in a standby position, and for sealing the cover film to the base film, in a sealing position; a cutting unit arranged downstream of the feeding means and configured for making at least one cut in the base film supplied by the base film feeding means; and conveyance means configured for holding at least one of said films downstream of the sealing station, in a horizontal holding plane, and for causing a forward movement of the films now sealed by the actuation thereof.

DISCLOSURE OF THE INVENTION

[0006] The object of the invention is to provide a control method for a packaging machine and an associated packaging machine, as defined in the claims.

[0007] A first aspect of the invention relates to a control method for a packaging machine. In the method, a continuous cover film made of a plastic material and a continuous base film are supplied to a sealing station of the machine, in a forward movement direction. The base film is formed by at least a first layer of cellulosic material and a second layer made of a plastic material arranged on the first layer and attached to said first layer, and said base film comprises at least one cut, extending at least partially along the thickness of both layers. The cover film is sealed to the second layer of said base film in the sealing station. As a result of the cut, the package that is finally generated is an easy-open package.

[0008] Furthermore, a stretching of at least the part of the cover film that is on the cut of the base film is caused in the method once said cover film has been sealed to the base film.

[0009] The purpose of the sealing between the cover film and the base film is for the cover film to adhere onto the second layer of plastic material of the base film. However, due to the presence of the cut in the base film, part of the cover film coinciding above said cut runs the risk of being introduced in said cut, adhering to the side of said second layer and, in some cases, even to the first layer. This may cause, when opening the final package, the second layer of the base film to separate from the first layer together with the cover film and a user therefore not being able to access the packaged product in a simple and direct manner. This occurs particularly in those cases using a base film with at least one layer of cellulosic material, such as cardboard for example, and with a layer of plastic material attached to said layer of cellulosic material, as in this case, where sometimes, when pulling on the piece of base film which is separated or almost separated from the rest of the base film as a result of the cut, the problem that arises is that the cover film does not detach from said layer of plastic material but rather said layer is what detaches from the layer of cellulosic material, with the product therefore being inaccessible for the user between the cover film and the second layer of the base film.

[0010] With the proposed method, the risk of this happening is eliminated or at least largely reduced, because as a result of the stretching of the cover film after being sealed to the base film, part of said cover film is prevented from remaining introduced in the cut, or at least it remains introduced to a lesser extent compared with not causing said stretching.

[0011] A second aspect of the invention relates to a packaging machine. The machine comprises base film feeding means configured for supplying a base film, cover film feeding means configured for supplying a cover film, a sealing station configured for receiving the cover

film and the base film in a forward movement direction of the films, in a standby position, and for sealing the cover film to the base film, in a sealing position, a cutting unit arranged between the base film feeding means and the sealing station and configured for making at least one cut in the base film supplied by the base film feeding means, conveyance means configured for holding at least one of said films downstream of the sealing station, in a horizontal drive plane, and causing a forward movement of the films, now sealed by the actuation thereof, and a control unit configured for causing an intermittent actuation of the conveyance means and, with each actuation of the conveyance means, for said actuation means to cause a forward movement of the films of a given forward movement length.

[0012] The machine further comprises actuation means arranged downstream of the sealing station and comprising at least a first actuation tool capable of being displaced between a standby position, in which it is arranged above or below the drive plane on the path of the films, and an actuation position, in which it goes beyond the drive plane and acts in an actuation area on the path of the films, downstream of the sealing station.

[0013] The first actuation tool is arranged, in relation to the path of the base film, in a position that depends on the arrangement of the cutting unit and on said given forward movement length when it is in the actuation position. Therefore, when there are films sealed to one another in the actuation area and when said first actuation tool is actuated so as to transition to the actuation position, said first actuation tool causes the stretching of the cover film arranged on the cut of the base film which is in said actuation area.

[0014] The advantages described for the method are also obtained with the machine.

[0015] These and other advantages and features of the invention will become apparent in view of the figures and detailed description of the invention.

DESCRIPTION OF THE DRAWINGS

[0016]

Figure 1 schematically shows a simplified elevational view of a first embodiment of the packaging machine according to the invention, with a cover film and a base film.

Figure 2 is a simplified plan view of the machine of Figure 1, without the conveyance means.

Figure 3 shows an elevational section view of the base film depicted in section A-A of Figure 2.

Figure 4 shows an elevational section view of the base film and the cover film depicted in section B-B of Figure 2.

Figure 5 shows an elevational section view of the base film and the cover film depicted in section C-C of Figure 2.

Figure 6 shows a simplified perspective view of the actuation means of an embodiment of the machine of the invention.

Figure 7 shows a simplified elevational view of the actuation means of Figure 6, in a standby position.

Figure 8 shows a simplified elevational view of the actuation means of Figure 6, in an actuation position.

DETAILED DISCLOSURE OF THE INVENTION

[0017] A first aspect of the invention relates to a control method suitable for a packaging machine 100 such as the one depicted by way of example in Figure 1.

[0018] In the method, a continuous cover film 3 made of a plastic material and a continuous base film 1 are supplied to a sealing station 104 of the machine 100, in a forward movement direction A. Preferably, an intermittent forward movement of said films 1 and 3 is caused in the method during the supply thereof, the displacement of a given forward movement length L of said films 1 and 3 in each forward movement being caused.

[0019] The films are preferably wound on respective reels and are supplied that way from said reels (hence they are continuous films, contrary to film portions or sheets). The base film 1 that is supplied is formed by a plurality of layers of material and, particularly, by at least a first layer 1.1 of cellulosic material and a second layer 1.2 of plastic material arranged on the first layer 1 and attached to said first layer 1, as depicted in Figure 3. The attachment between layers 1.1 and 1.2 can be performed by means of sealing or gluing, for example. The base film 1 further comprises at least one cut 2 in the form of a through cut (along the entire thickness of the base film 1), slit (extending along part of the thickness of the base film 1), or orifice. When the cut 2 is a slit, it preferably extends along the entire thickness of the second layer 1.2 and along part of the thickness of the first layer 1.1, and when the cut 2 is a cut or an orifice, it extends along the entire thickness of the second layer 1.2 and along the entire thickness of the first layer 1.1. Therefore, in general, said cut 2 preferably extends along the entire thickness of the second layer 1.2 and along at least part of the thickness of the first layer 1.1, preferably also along the entire thickness of said first film 1.1. The cut 2 serves for the resulting package to be an easy-open package, which allows the cover film 3 to easily detach and enable access to the packaged product in a simple manner. The cut 2 will therefore be at one end of the resulting package, centered or at one of its edges, for example, and does not have to have any specific shape. Diverse types of cuts for easy-open packages are well known in the sector, such as the one described in EP0748746A1, for example,

therefore no further description is provided in that respect.

[0020] Preferably, the method further comprises making the cut 2 in the base film 1, and said cut 2 is made before supplying said base film 1 to the sealing station 104. Said cut 2 can be made in the machine 100 itself, or the base film 1 may reach said machine 100 with said cut 2 already made.

[0021] The base film 1 and the cover film 3 are supplied to the sealing station 104 such that said cover film 3 is above said base film 1 and facing the second layer 1.2 of the base film 1, and the cover film 3 is sealed to said second layer 1.2 of the base film 1 in said sealing station 104. Though not depicted in the figures, the product to be packaged is arranged on the base film 1 before said base film 1 reaches the sealing station 104, such that the cover film 3 is arranged on said product and, after the sealing between said films 1 and 3, the product is packaged between said films 1 and 3.

[0022] As a result of the sealing between the films 1 and 3, it is possible for part of the cover film 3 to be introduced in the cut 2, as depicted by way of example in Figure 4. This may cause problems when trying to open the final package generated, as described above. In the method, to avoid this problem, at least in large measure, a stretching of at least the part of the cover film 3 that is on the cut 2 of the base film 1 is caused once said cover film 3 has been sealed to the base film 1 (to the second layer 1.1 of the base film 1), ensuring at least in large measure that part of said cover film 3 does not remain introduced in said cut 2, as depicted in Figure 5, which subsequently allows opening the final resulting package without the described problems. The stretching is preferably performed outside the sealing station 104 (downstream of the sealing station 104).

[0023] The base film 1 comprises a first film area 1.3 downstream of the alteration in the forward movement direction A and a second film area 1.4 upstream of the alteration in said forward movement direction A. To cause the stretching of at least the part of the cover film 3 that is on the cut 2, a relative displacement is caused between said first film area 1.3 and said second film area 1.4. Since the cover film 3 is sealed to both film areas 1.3 and 1.4, said relative displacement causes a stretching of said cover film 3, at least in the part of said cover film 3 which is between the two film areas 1.3 and 1.4 (which is the part of said cover film 3 that is on the cut 2 of the base film 1).

[0024] To cause the relative displacement between the film areas 1.3 and 1.4, preferably the upward or downward displacement of at least one of the film areas 1.3 and 1.4 of the base film 1 with respect to the other one of said film areas 1.3 and 1.4 is caused, obtaining the effect depicted in Figure 4 by way of example. To that end:

- pushing is exerted on the cover film 3 which is on the cut 2 or at least one of the film areas 1.3 and 1.4, in a downward direction; and/or
- the cut 2 (or below the cut 2) or at least one of the film areas 1.3 and .14 of the base film 1 is pushed, in an upward direction.

[0025] Therefore, the following options are possible: exerting a pushing pressure in an upward or downward direction on the cut 2; exerting a pushing pressure in an upward or downward direction on only the first film area 1.3, the displacement of said first film area 1.3 in said upward or downward direction with respect to the second film area 1.4 being caused; exerting a pushing pressure in an upward or downward direction on only the second film area 1.4, the displacement of said second film area 1.4 in said upward or downward direction with respect to the first film area 1.3 being caused; exerting a pushing pressure in the same upward or downward direction in both areas of the film 1.3 and 1.4, the displacement of said film area 1.3 and 1.4 in said direction being caused; and exerting a pushing pressure in an upward or downward direction on the first film area 1.3 and exerting a pushing pressure in an opposite direction on the second film area 1.4. In this latter case, therefore, the displacement of the first film area 1.3 in a downward direction and the displacement of the second film area 1.4 in an upward direction or the displacement of the first film area 1.3 in an upward direction and the displacement of the second film area 1.4 in a downward direction is caused.

[0026] In some embodiments in which pressure is exerted on only one of the film areas 1.3 and 1.4, the other one of the film areas 1.3 and 1.4 is kept in position, pressing it against a surface or holding it with a tool by way of a clamp, for example.

[0027] The upward and downward directions are preferably vertical and opposite one another.

[0028] A second aspect of the invention relates to a packaging machine 100, such as a thermoforming packaging machine. The machine 100 is suitable for enabling implementation of the proposed control method, so it can comprise any configuration and/or embodiment necessary for enabling implementation of the different configurations and/or embodiments of said method. The machine 100 is furthermore configured for generating easy-open packages.

[0029] The machine 100 comprises base film feeding means 101 configured for supplying a base film 1, cover film feeding means 103 configured for supplying a cover film 3, a sealing station 104 configured for receiving the cover film 3 and the base film 1 in a forward movement direction of one of the films 1 and 3, in a standby position, and for sealing the cover film 3 to the base film 1, in a sealing position, and a cutting station 107 downstream of the sealing station 104 and configured for cutting the films 1 and 3 and obtaining individual packages as a result. The base film 1 and the cover film 3 follow a specific respective path in the machine 100, said path being the same one once they have been sealed together.

[0030] The machine 100 further comprises a cutting unit 102 arranged between the base film feeding means

101 and the sealing station 104 and configured for making at least one cut 2 in the base film 1 supplied by the base film feeding means 101. The cut 2 can be as described above. The machine further comprises conveyance means 108 configured for holding at least one of said films 1 and 3 downstream of the sealing station 104, in a horizontal drive plane P, and for causing a forward movement of the films 1 and 3, now sealed by the actuation thereof, and a control unit 106 configured for acting on the conveyance means 108 and causing the intermittent actuation of the conveyance means 108, with each actuation causing said films 1 and 3 to move forward a given forward movement length L. The conveyance means 108 can be conventional and comprise, for example, a chain on each side of the films 1 and 3, actuators above and below the films 1 and 3 for gripping and driving said films 1 and 3, or a combination of both.

[0031] The machine 100 further comprises actuation means 105 arranged downstream of the sealing station 104 and comprising at least a first actuation tool 105.1 capable of being displaced between a standby position and an actuation position. The actuation means 105 are furthermore upstream of the cutting station 107. In the standby position, the first actuation tool 105.1 is arranged above or below the drive plane P, and in the actuation position, said first actuation tool 105.1 goes beyond the drive plane P, acting on an actuation area of the path of the films 1 and 3. Therefore, when there are films 1 and 3 in the machine 100, the first actuation tool 105.1 acts on the films 1 and 3 sealed to one another. When it is in the actuation position, said first actuation tool 105.1 is arranged in a position that depends on the arrangement of the cutting unit 102 and on the given forward movement length L on the path of the base film 1, such that when it is actuated, the first actuation tool 105.1 causes the stretching of the cover film 3 arranged on the cut 2 of the base film 1 by acting on said films 1 and 3.

[0032] The first actuation tool 105.1 is arranged such that when it transitions to the actuation position, said first actuation tool 105.1 acts in the actuation area the center of which is at a distance with respect to the cutting unit 102 equal to an integer multiple of the given forward movement length L on the path of the base film 1, said actuation area comprising a length equal to or less than 20% of said given forward movement length L on said path. A relative displacement between the film areas 1.3 and 1.4 of the base film 1 which are on the sides of the cut 2 is thereby ensured in the machine 100, the stretching of the cover film 3 being caused at least in the part which is on said cut 2.

[0033] In some embodiments, the actuation means 105 of the machine 100 comprise only one actuation tool 105.1. In other embodiments, the actuation means 105 of the machine 100 comprise, in addition to the first actuation tool 105.1, a second actuation tool 105.2 arranged downstream or upstream of the first actuation tool 105.1 in the forward movement direction A, said second actuation tool 105.2, like the first actuation tool 105.1, being capable of being displaced between a standby position, in which it is arranged above or below the drive plane P, and an actuation position, in which it goes beyond the drive plane P and acts in the actuation area.

[0034] In the actuation means 105 comprising two actuation tools 105.1 and 105.2, said actuation tools 105.1 and 105.2 are arranged such that each of them acts on an opposite side of the center of the actuation area, i.e., one of said actuation tools 105.1 and 105.2 acts downstream of the center and the other one of said actuation tools 105.1 and 105.2 acts upstream of said center with respect to the forward movement direction A. Preferably both actuation tools 105.1 and 105.2 are actuated by one and the same actuator of the actuation means 105.

[0035] The actuation means 105 comprising two actuation tools 105.1 and 105.2 may comprise different configurations. For example:

- In a first configuration, the first actuation tool 105.1 is configured for being arranged above the drive plane P and the second actuation tool 105.2 is configured for being arranged below said drive plane P, when they are in the standby position, and they are configured for being displaced in opposite directions to transition to the respective actuation position. For example, the first actuation tool 105.1 is displaced in a downward direction and the second tool is displaced in an upward direction.
- In a second configuration, shown by way of example in Figures 6 to 8, both the first actuation tool 105.1 and the second actuation tool 105.2 are configured for being arranged above the drive plane P, when they are in the standby position. Preferably the first actuation tool 105.1 is configured for moving forward a greater length than the second actuation tool 105.2, when they transition to the respective actuation position (see Figure 8), such that the second actuation tool 105.1 grips the films 1 and 3 against a support surface 105.30 in order to hold them while the first actuation tool 105.1 pushes said films 1 and 3 to produce the stretching of the cover film 3. In these cases, the actuation means 105 may comprise a support 105.3 comprising the support surface 105.30, and said support 105.3 further comprises a groove 105.31 for allowing the actuation of the first actuation tool 105.1.

[0036] The control unit 106 is configured for causing the synchronized and/or coordinated displacement of the actuation means 105, of the sealing station 104, of the cutting unit 102, the cutting station 107, and of the conveyance means 108.

Claims

1. Control method for a packaging machine, in which a continuous cover film (3) made of a plastic material

and a continuous base film (1) comprising at least one cut (2) extending along at least part of its thickness are supplied to a sealing station (104) of the machine (100), in a forward movement direction (A), and said cover film (3) is sealed to said base film (1) in the sealing station (104), **characterized in that** the base film (1) that is supplied is formed by at least a first layer (1.1) of cellulosic material and a second layer (1.2) of plastic material arranged on the first layer (1.1) and attached to said first layer (1.1), a stretching of at least the part of the cover film (3) that is on the cut (2) of the base film (1) being caused in the method once said cover film (3) has been sealed to the base film (1).

2. Control method according to claim 1, wherein to cause the stretching of the cover film (3), a relative displacement is caused between a first film area (1.3) of the base film (1) which is downstream of the cut (2) in the forward movement direction (A) and a second film area (1.4) of the base film (1) which is upstream of the cut (2) in said forward movement direction (A).

3. Control method according to claim 2, wherein the upward or downward displacement of at least one of the film areas (1.3, 1.4) of the base film (1) is caused in order to generate the relative displacement between said film areas (1.3, 1.4).

4. Control method according to claim 2 or 3, wherein to cause the relative displacement between the film areas (1.3, 1.4) of the base film (1), the part of the cover film (3) that is on the cut (2) is pushed in a non-horizontal direction, or at least one of said film areas (1.3, 1.4) is pushed in a non-horizontal direction.

5. Control method according to claim 4, wherein to cause the relative displacement between the first film area (1.3) and the second film area (1.4) of the base film (1), the two film areas (1.3, 1.4) of the base film (1) are pushed, said pushing causing the displacement of the first film area (1.3) in a downward direction and the displacement of the second film area (1.4) in an upward direction or the displacement of the first film area (1.3) in an upward direction and the displacement of the second film area (1.4) in a downward direction.

6. Control method according to claim 4, wherein to cause the relative displacement between the first film area (1.3) and the second film area (1.4) of the base film (1), only one of the film areas (1.3, 1.4) of the base film (1) is pushed, said pushing causing the displacement of said film area (1.3, 1.4) in an upward or downward direction.

7. Control method according to claim 6, wherein to cause the relative displacement between the first film area (1.3) and the second film area (1.4) of the base film (1), one of the film areas (1.3, 1.4) of the base film (1) is pushed, and the other film area (1.3, 1.4) of the base film (1) is kept stationary.

8. Control method according to any of claims 1 to 7, wherein an intermittent forward movement of the base film (1) and of the cover film (3) is caused, said films (1, 3) being displaced a given length in each forward movement.

9. Control method according to any of claims 1 to 8, wherein the cut (2) is generated in the base film (1) before supplying said base film (1) to the sealing station (104).

10. Packaging machine comprising base film feeding means (101) configured for supplying a base film (1); cover film feeding means (103) configured for supplying a cover film (3); a sealing station (104) configured for receiving the cover film (3) and the base film (1) in a forward movement direction (A) of the films (1, 3), in a standby position, and for sealing the cover film (3) to the base film (1), in a sealing position; a cutting unit (102) arranged downstream of the base film feeding means (101) and configured for making at least one cut (2) in the base film (1) supplied by the base film feeding means (101); conveyance means (108) configured for holding at least one of said films (1, 3) downstream of the sealing station (104), in a horizontal drive plane (P), and for causing a forward movement of the films (1, 3), now sealed by the actuation thereof; and a control unit (106), **characterized in that** the machine (100) further comprises actuation means (105) arranged downstream of the sealing station (104) and comprising at least a first actuation tool (105.1) capable of being displaced between a standby position, in which it is arranged above or below the drive plane (P) on the path of the films (1, 3), and an actuation position, in which it goes beyond the drive plane (P) and acts in an actuation area on the path of the films (1, 3), the control unit (106) being configured for causing an intermittent actuation of the conveyance means (108) and, with each actuation of the conveyance means (108), for said conveyance means (108) to cause a forward movement of the films (1, 3) having a given forward movement length (L), and the first actuation tool (105.1) being arranged in a position that depends on the arrangement of the cutting unit (102) and on said given forward movement length (L) on the path of the base film (1) when said first actuation tool (105.1) is in the actuation position, such that when there are films (1, 3) sealed to one another in the actuation area and when the first actuation tool (105.1) is actuated so as to transition to the actuation position, said first actuation tool (105.1)

causes the stretching of the cover film (3) arranged on the cut (2) of the base film (1) which is in said actuation area.

11. Packaging machine according to claim 10, wherein, the first actuation tool (105.1) is arranged such that upon transitioning to the actuation position, it acts in the actuation area the center of which is at a distance with respect to the cutting unit (102) equal to an integer multiple of the given forward movement length (L) on the path of the base film (1), said actuation area comprising a length equal to or less than 20% of said given forward movement length (L) on said path.

12. Packaging machine according to claim 11, wherein the actuation means (105) comprise at least a second actuation tool (105.2) arranged downstream or upstream of the first actuation tool (105.1) in the forward movement direction (A) and capable of being displaced between a standby position, in which it is arranged above or below the drive plane (P) on the path of the films (1, 3), and an actuation position, in which it goes beyond the drive plane (P) and acts in an actuation area on the path of the films (1, 3), the first actuation tool (105.1) being configured for being arranged above or below the drive plane (P) in the standby position and the second actuation tool (105.2) being configured for being arranged on the opposite side as the first actuation tool (105.1), with respect to the drive plane (P), in the standby position, and the first actuation tool (105.1) and the second actuation tool (105.2) being configured for each acting on one side of the center of the actuation area on the path of the films (1, 3).

13. Packaging machine according to claim 11, wherein the actuation means (105) comprise at least a second actuation tool (105.2) arranged downstream or upstream of the first actuation tool (105.1) in the forward movement direction (A) and capable of being displaced between a standby position, in which it is arranged above or below the drive plane (P) on the path of the films (1, 3), and an actuation position, in which it goes beyond the drive plane (P) and acts in an actuation area on the path of the films (1, 3), the first actuation tool (105.1) being configured for being arranged above or below the drive plane (P) and the second actuation tool (105.2) being configured for being arranged on the same side with respect to the drive plane (P) as the first actuation tool (105.1), in the standby position, being the actuation tools (105.1, 105.2) arranged such that each act on one side of the center of the actuation area upon transitioning to the respective actuation position.

14. Packaging machine according to claim 12 or 13, wherein the actuation means (105) comprise a support (105.3) arranged on the opposite side with respect to the drive plane (P) as the second actuation tool (105.2) in the standby position, facing said second actuation tool (105.2) when said second actuation tool (105.2) is in the actuation position, and arranged such that it limits the displacement of the second actuation tool (105.2) when said second actuation tool (105.2) is displaced to the actuation position.

15. Packaging machine according to any of claims 10 to 14, wherein the control unit (106) is configured for causing the synchronized and/or coordinated displacement of the actuation means (105), of the sealing station (104), of the cutting unit (102), and of the conveyance means (108).

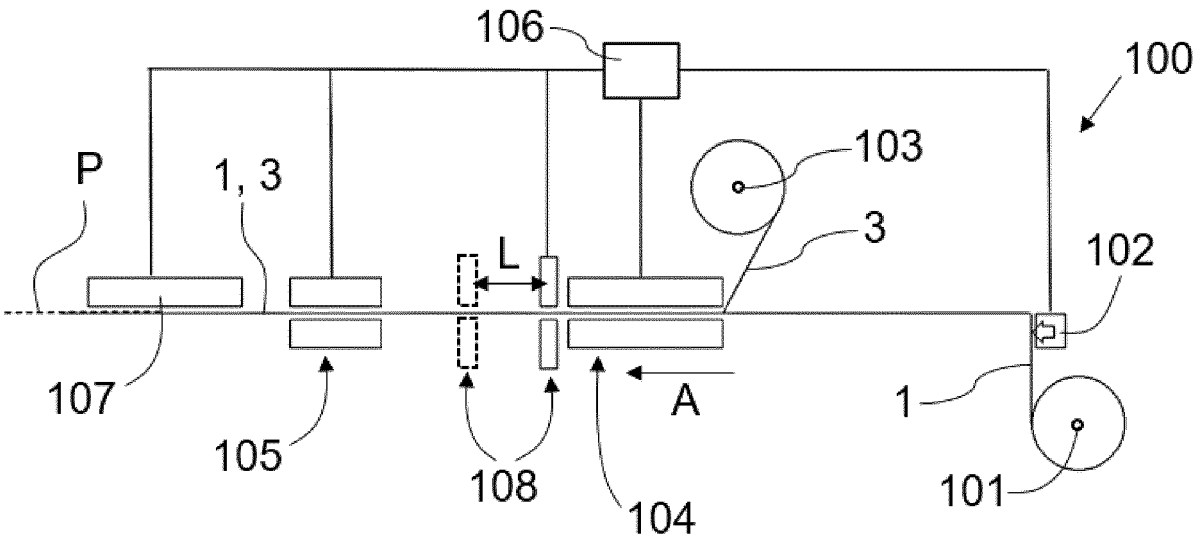
106
100
P
1, 3
103
3
L
102
107
105
108
104
A
1
101

Fig. 1

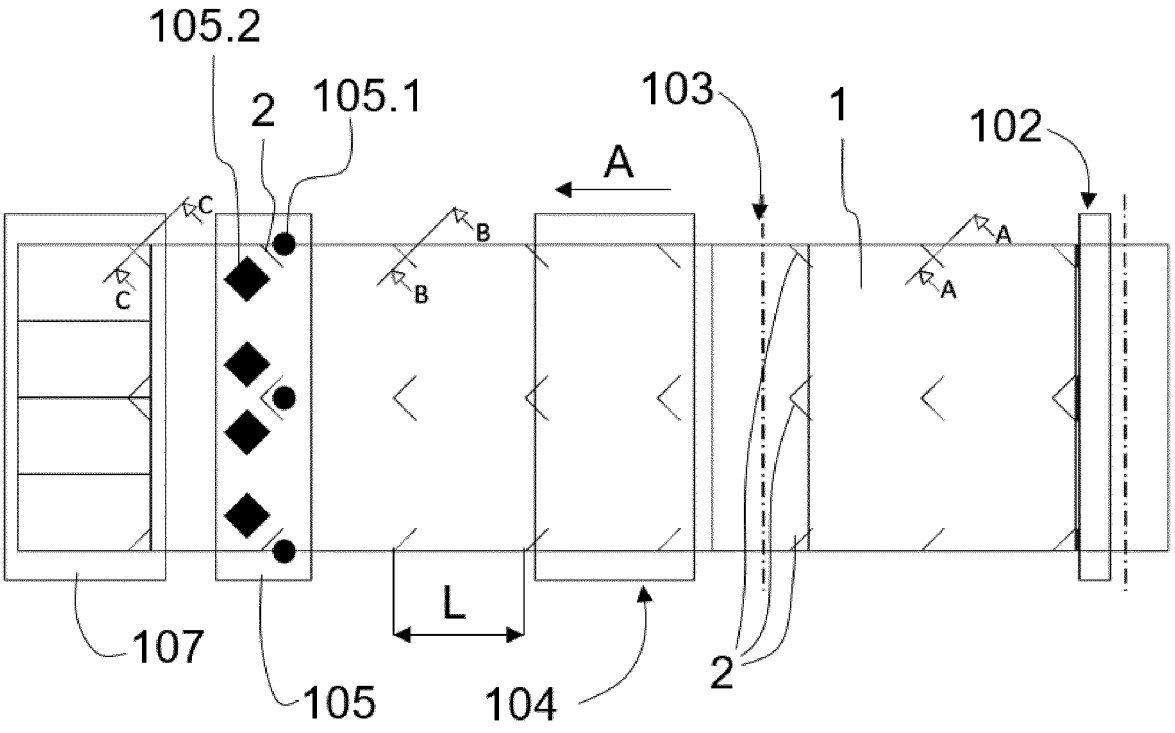
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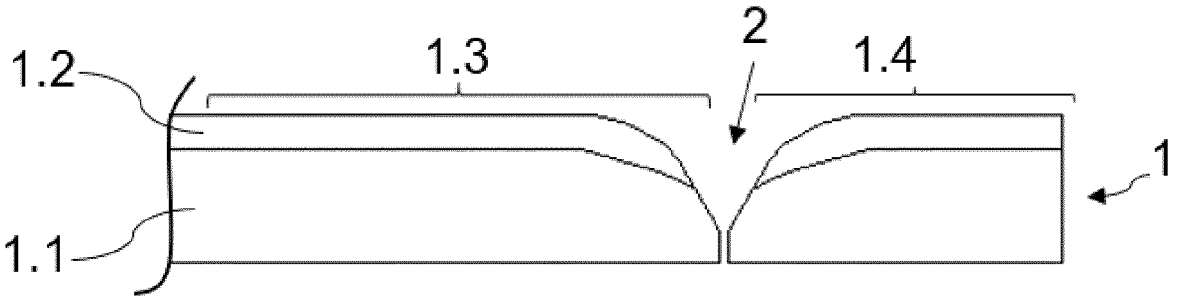
Fig. 2



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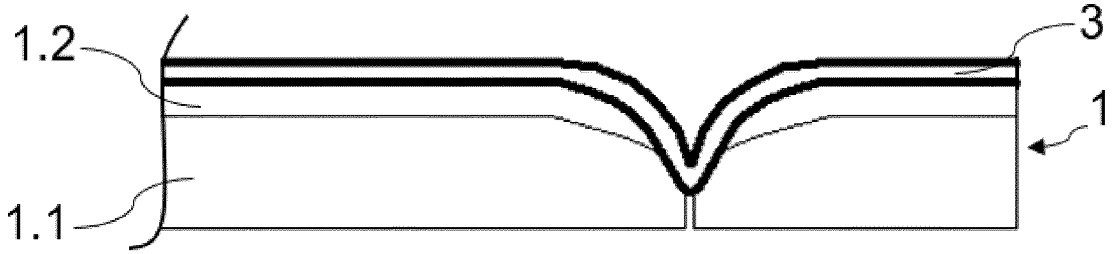
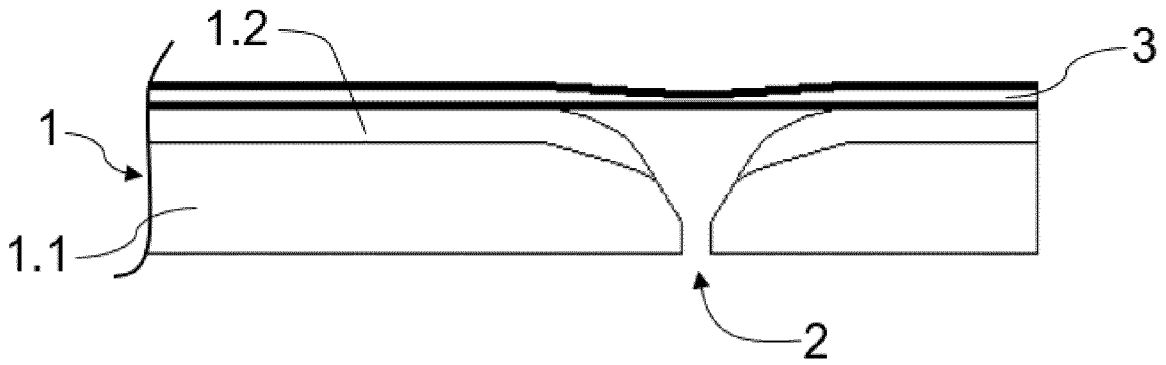


Fig. 4



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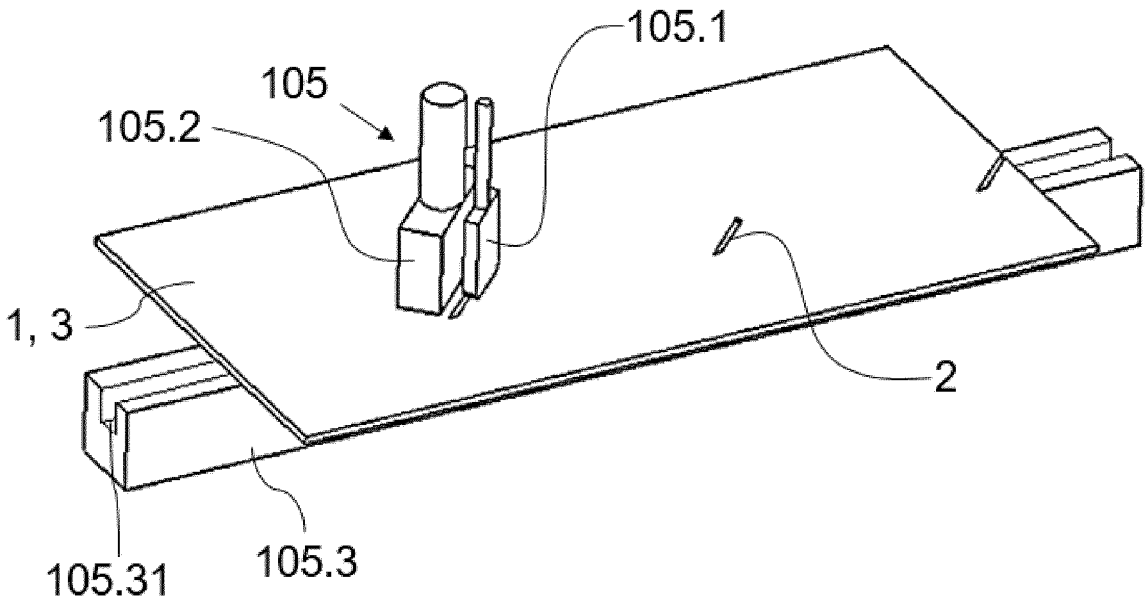
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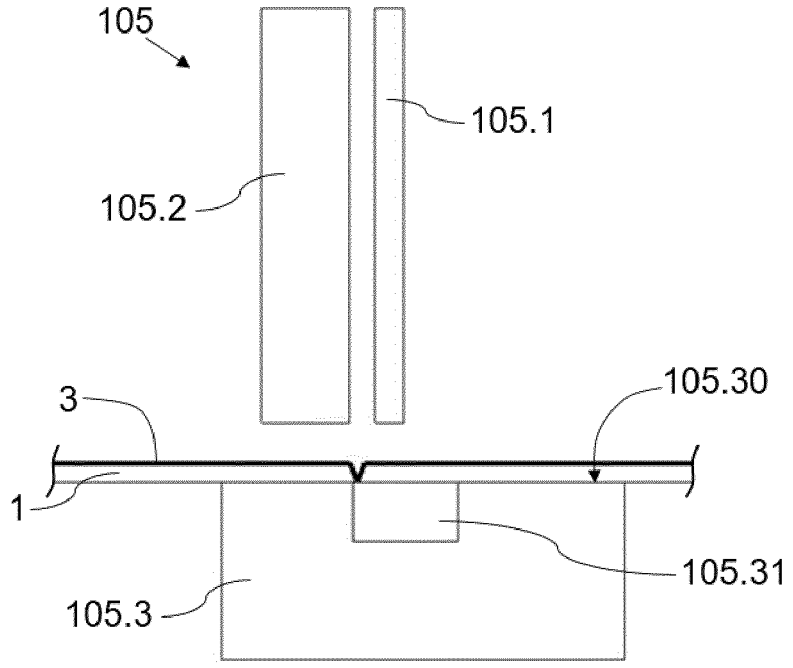
105.3

Fig. 6


105
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105.30
3
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105.31
105.3

Fig. 7

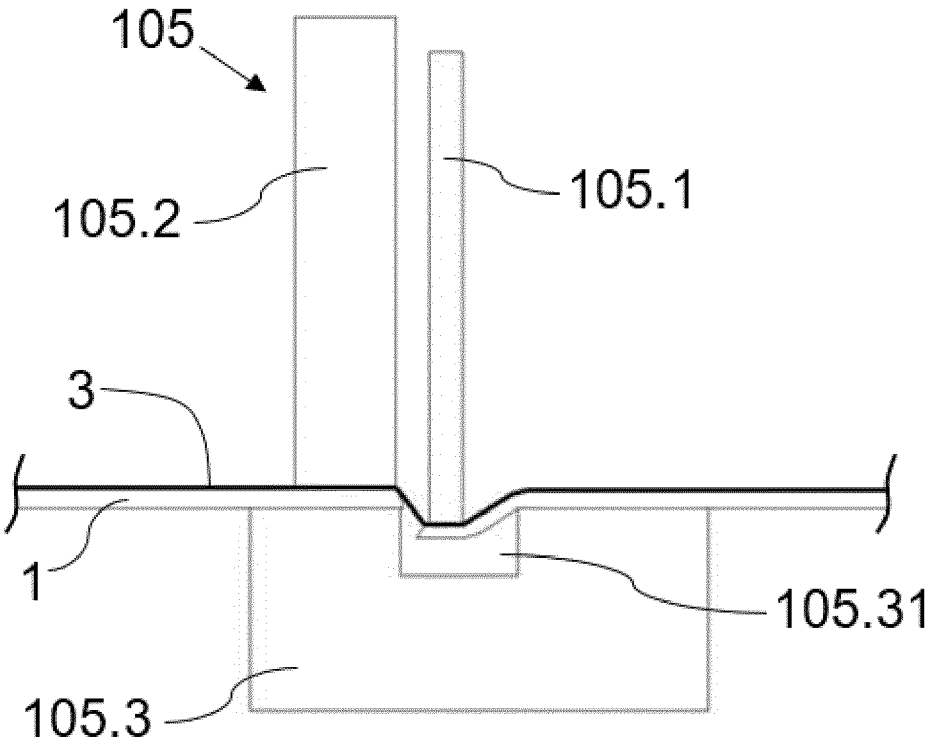

Fig. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 22 38 2236

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2017/157885 A1 (OCHSMANN JANNIS [DE] ET AL) 8 June 2017 (2017-06-08) * column 0041 *	1	INV. B65B41/00 B32B3/26 B32B27/10
A	US 2017/320649 A1 (HASHIMOTO MIKU [JP]) 9 November 2017 (2017-11-09) * the whole document *	1	
A	WO 2011/003567 A2 (TETRA LAVAL HOLDINGS & FINANCE [CH]; TOFT NILS [SE]; PERSSON AAKE [SE]) 13 January 2011 (2011-01-13) * the whole document *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65B B32B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	25 August 2022	Ungureanu, Mirela

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25-08-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2017157885 A1	08-06-2017	AU 2015286974 A1	12-01-2017
		BR 112017000220 A2	16-01-2018
		CN 106470832 A	01-03-2017
		DE 102014010016 A1	14-01-2016
		EP 3166782 A1	17-05-2017
		ES 2719580 T3	11-07-2019
		JP 6397985 B2	26-09-2018
		JP 2017529256 A	05-10-2017
		PL 3166782 T3	30-08-2019
		TR 201906226 T4	21-05-2019
		US 2017157885 A1	08-06-2017
		WO 2016005241 A1	14-01-2016
US 2017320649 A1	09-11-2017	AU 2016213482 A1	17-08-2017
		BR 112017016317 A2	12-06-2018
		CA 2975368 A1	04-08-2016
		CN 107207143 A	26-09-2017
		EP 3287390 A1	28-02-2018
		JP 5858413 B1	10-02-2016
		JP 2016145076 A	12-08-2016
		KR 20170104572 A	15-09-2017
		KR 20190073609 A	26-06-2019
		US 2017320649 A1	09-11-2017
		WO 2016121594 A1	04-08-2016
WO 2011003567 A2	13-01-2011	CN 102470626 A	23-05-2012
		EP 2451637 A2	16-05-2012
		ES 2751978 T3	02-04-2020
		JP 5860806 B2	16-02-2016
		JP 2012532044 A	13-12-2012
		US 2012103856 A1	03-05-2012
		WO 2011003567 A2	13-01-2011

EPO FORM P0459

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Patent documents cited in the description

- EP 0748746 A1 **[0005] [0019]**