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(54) **SKIN PACKAGING MACHINE**
HAUTVERPACKUNGSMASCHINE
MACHINE DE CONDITIONNEMENT SOUS PEAU

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Description

TECHNICAL FIELD

[0001] The present invention relates to skin packaging machines, by means of using a first film and a second film between which products are packaged.

PRIOR ART

[0002] The use of skin packaging machines supplying a first film on which products to be packaged are arranged and are then covered by a second film adhered to the first film by means of applying heat and pressure, for example, is well known. Packaging of this type is known also as skin packaging because it uses two films that are attached to one another around the contour of the product, one of which takes the form of the product, and is disclosed, for example, in patent document WO2015011076A1 belonging to the same applicant.

[0003] The skin packaging of products is well known in the food industry for packaging meats, fish, cheese, ready-made meals and the like. During skin packaging, the product to be packaged is usually placed on a first film or on trays previously formed in said first film by way of supports in the packaging machine itself. Then said supports, with the products on them, are arranged in a sealing station, where they are covered with a second film. The second film is generally pre-heated in the packaging machine before being introduced in the sealing station to increase its deformation capacity, and once it is arranged in the sealing station it is brought towards the walls of the sealing station by vacuum for greater heating and softening. Then the vacuum on the film is released to cause the film to cover the entire product and adhere to the surface of the support not covered by the product, thereby forming a skin around the product and on the support.

[0004] In machines of this type, conveyor means generally guide the bottom film along its entire path in the machine, and to that end the conveyor means hold said bottom film and cause it to move. A common way of holding said film is by means of clamps which laterally hold and move the bottom film in the forward direction, such that when said conveyor means move forward (operated by a chain, for example), the clamps drag the bottom film, causing it to move forward.

[0005] Additionally, proximate to the holding surface of the clamps, perforations are made in the bottom film that are used to apply the vacuum between the top film and the bottom film through same, such that the holding surface of the clamps is outside the sealing station and the perforations are arranged inside the sealing station, in the space where the products to be packaged are located. When the top film is arranged on the bottom film in the sealing station, pins are introduced through said perforations to assure they are open and to generate a vacuum between both films, while at the same time said

pins tense the top film while it is brought towards the walls of the sealing station, said tensing being for preventing subsequent creasing. When the top film has reached the suitable temperature in contact with the walls of the sealing station, it is aerated or positive pressure is applied on said top film, such that the vacuum generated between both films makes it easier to seal the two films along the perimeter of the product and cause the top film to adapt to the contour of the product during the sealing operation.

10 The perforated zone of the bottom film is then separated from the rest of the bottom film and disposed of. The same occurs with the part of the top film that is arranged on said zone. This entails a considerable amount of material to be disposed of (the zone held by the clamps and the zone in which the holes have been made).

15 **[0006]** Patent document WO2014180823A1 discloses a packaging machine which intends to minimize the material to be disposed of. To that end, additional elements like those discussed above, for example, for supporting the bottom film (or the top film) are not used in the sealing station, such that it is not necessary to use excess film on which these additional elements would act. Before the sealing station, the bottom film is supported by conveyor means at its ends (coinciding with the flaps of the final package or final tray), and after the sealing station the conveyor means hold said ends of the bottom film (now furthermore having the top film adhered thereto) again. Although with this solution it is not necessary to use additional material for supporting the films in the sealing station, the fact that the films are not held in the sealing station entails the need to use greater top film thicknesses to achieve suitable sealing, makes it necessary to perforate the inside of the package (the bottom film) to optimize sealing between both films and prevent creases and/or bubbles, and as the final package has been previously secured by its own flaps means, said holding can mark or damage said final package, which is not allowable and renders said solution to be unsuitable in many cases.

20 **[0007]** Other packaging machines according to the preamble of claim 1 are known from US 2006/230708 A1, US 2009/288367 A1 and WO 2014/166940 A1.

DISCLOSURE OF THE INVENTION

45 **[0008]** The object of the invention is to provide a skin packaging machine as defined in the claims.

[0009] The skin packaging machine comprises a first feeding station for supplying a first continuous film in a forward direction of the machine, a second feeding station for supplying a second continuous film in the forward direction and above the first film, and a sealing station which is configured for receiving both films and comprising an upper tool pressing on said films for sealing both films to one another. The upper tool comprises:

- a closed holding contour pressing on the films and delimiting the area of said films being sealed to one

another,

- a heating surface delimited by the holding contour and facing said area corresponding to the second film,
- heating means for heating the heating surface, and
- suction means for bringing the second film towards said heating surface for heating it.

[0010] The sealing station further comprises a sealing gasket attached to the holding contour for preventing direct contact of the upper tool with the films when said upper tool presses on them. The sealing gasket comprises, on each side with respect to the forward direction, an operation zone with a notched configuration which is facing the space delimited by said sealing gasket, such that when the second film is brought towards the heating surface for heating, the second film tends to tense up towards the heating surface in the notch-free areas of the operation zone, becoming deformed, whereas the notches limit said deformation, thereby preventing with said limitation early contact between said second film, particularly in the zones of the notch-free area of the sealing gasket, and said heating surface which could damage said second film while at the same time certain deformation is allowed. Particularly, deformation of the second film in a notch-free area of the sealing gasket is limited by the notches of said sealing gasket adjacent to said notch-free area.

[0011] Therefore, when the second film is brought towards the heating surface for being heated, said second film tends to tense up as a result of the notched configuration of the sealing gasket (particularly in the notch-free areas), becoming deformed, without the need to incorporate additional elements to perform said tensing up, whereas the actual configuration of the sealing gasket also limits said deformation (as a result of the notches) for preventing early contact between said second film and the heating surface of the upper tool. Without this notched configuration of the sealing gasket, the entire second film would tend to become deformed towards the heating surface, without limitations and without achieving suitable tension for preventing creases in the final package, for which reason it would be necessary to include additional elements such as pins, for example, which are inserted through the first film for tensing up the second film, and said additional elements would have to be arranged within the space delimited by the holding contour, which would require increasing said space, and therefore the area of the films delimited by said holding contour, for generating packages of the same size.

[0012] Therefore, with the proposed solution the need to incorporate said additional elements is eliminated, or should they be needed due to the features of the second film, allows incorporating said elements beneath the notch-free areas of the sealing gasket, the area of the films necessary for one and the same package size being reduced, the amount of material to be used for one and the same package size therefore being reduced, with the

savings that this entails and the subsequent drop in packaging process costs.

[0013] Since the process of deforming the second film requires certain time in order to adapt to the contour of the sealing station and to heat the area of the second film facing the heating surface, the second film would in this case experience excess heat, at least at the point where it first came into contact with the heating surface, causing greater deformation of said point, which could damage the film, which is a risk that has been avoided with the proposed solution. Therefore, this drawback is solved without additionally requiring the material of the second film to go beyond the holding contour over the sides, the required material of the second film being reduced and the amount of said second film to be disposed of accordingly being reduced.

[0014] This solution is particularly furthermore advantageous the thinner the second film is, because the less thick it is the more ductile it will be as it heats up and is therefore brought towards the heating surface more quickly, which would increase the risk of early contact with the heating surface. Therefore, this solution allows using less thick films acting like a second film, which also reduces the amount of material used and the packaging process cost.

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

DESCRIPTION OF THE DRAWINGS

[0016]

Figure 1 shows a schematic view of an embodiment of the proposed skin packaging machine.

Figure 2a is a partial section view of an upper tool and a lower tool of the sealing station of the machine of Figure 1, tightly holding the films between them during sealing, in which the second film in the zone of a notch-free area of the sealing gasket is depicted by means of a continuous line, and the same second film in the zone of a notch of said sealing gasket is depicted by means of a discontinuous line.

Figure 2b is a partial, perspective, section view of an upper tool and a lower tool of the sealing station of the machine of Figure 1, tightly holding the films between them during sealing (the second film is not depicted).

Figure 2c is a side section view of the tools of the sealing station of the machine of Figure 1, tightly holding the films between them during sealing (the second film is not depicted).

Figure 3 shows a sealing gasket of the sealing station of the machine of Figure 1.

Figure 4a shows a perspective view of a package generated in the machine of Figure 1, in the form of a tray, with a packaged product.

Figure 4b shows a side view of the tray of Figure 4a, with the packaged product.

DETAILED DISCLOSURE OF THE INVENTION

[0017] Figure 1 shows a schematic view of an embodiment of the skin packaging machine 100. The machine 100 is suitable for packaging products P arranged between a first continuous film 10 and a second continuous film 20 sealed to one another around the perimeter of the product P arranged between both by means of heat, and these are then cut for generating individual packages with a product P packaged therein. In some of the drawings the products P are not depicted for the sake of clarity.

[0018] Continuous must be interpreted as the films 10 and 20 being supplied without pre-cuts, i.e., without having been previously cut to the sizes required for the final package. Therefore, the films 10 and 20 can be stored in the form of reels, for example, and can be gradually unwound from the corresponding reel to be supplied.

[0019] The machine 100 comprises a first feeding station 1 for supplying the first continuous film 10 in a forward direction A of the machine 100, a second feeding station 2 for supplying the second continuous film 20 in the forward direction A and above the first film 10, and a sealing station 3 which is configured for receiving both films 10 and 20 in said forward direction A, with the second film 20 above the first film 10, and for sealing them together using heat. Previously, particularly before the first film 10 is fed into the sealing station 3, the products P to be packaged are arranged on said first film 10 in a specific manner.

[0020] The skin packaging machines 100 work intermittently, one sealing operation being performed in the sealing station 3 every machine cycle. Once a cycle is performed and the films 10 and 20 are stationary, said films 10 and 20 are made to move in the forward direction A a specific distance to perform a new machine cycle. In every machine cycle, one product P is packaged in its corresponding package in the sealing station 3, or a plurality of products P can be packaged simultaneously (each one in a corresponding package). For this last case, the products P are arranged on the first film 10 before entering the sealing station 3, forming a line in the forward direction A (or a plurality of parallel lines), a plurality of products P being located in the sealing station 3 in one and the same machine cycle.

[0021] The sealing station 3 comprises an upper tool 3.1 depicted in Figures 2a, 2b and 2c, pressing on the films 10 and 20 and being supported on a lower tool 3.2 to apply said pressure, both films 10 and 20 being tightly held between both tools 3.1 and 3.2 during sealing. The upper tool 3.1 comprises at least:

- one closed holding contour 3.10 pressing on the films 10 and 20 during sealing, and delimiting the area of said films 10 and 20 to be sealed together in every cycle of the machine 100,
- one heating surface 3.4 delimited by the holding contour 3.10 and facing said area corresponding to the second film 20,
- heating means (not depicted in the drawings) for heating the heating surface 3.4, and
- suction means for bringing the second film 20 towards said heating surface 3.4 for heating, said heating surface 3.4 comprising a plurality of holes 3.41 that are part of the suction means and through which said second film 20 is brought towards said surface 3.4.

[0022] The suction means further comprise an actuator not depicted in the drawings, causing said suction through said holes 3.41. Suction means for this purpose in skin packaging machines 100 are already known, so neither their operation nor their configuration will be described in detail. Likewise, heating means are also known and can be, for example, resistances configured for heating said heating surface 3.4 when required.

[0023] The sealing station 3 further comprises a sealing gasket 3.12 which is attached to the holding contour 3.10 for preventing direct contact of the upper tool 3.1 and the films 10 and 20 during sealing, said films 10 and 20 therefore being protected from heat in the holding contour 3.10, and this is shown by way of example in Figure 3. On the sides with respect to the forward direction A, the sealing gasket 3.12 comprises an operation zone 3.5 with a notched configuration which is facing the space delimited by said sealing gasket 3.12, such that when the second film 20 is brought towards the heating surface 3.4 for being heated, the second film 20 tends to tense up through the notch-free areas 3.51 of the operation zone 3.5 towards the heating surface 3.4, becoming deformed, whereas the notches 3.52 limit said deformation, thereby preventing early contact between said second film 20 and said heating surface 3.4, particularly in the zones of the notch-free area 3.51. The second film 20 tenses up and becomes deformed through said notch-free areas 3.51, and the notches 3.52 prevent early contact between said deformed part of the second film 20 and the heating surface 3.4 in the zone of the sealing station 3 that is arranged on the notch-free areas 3.51, thereby preventing the second film 20 from heating up too much in said zones prone to early contact, and due to its ductility caused by a higher temperature, causing damage to in the second film 20. Preferably, the two operation zones 3.5 are the same and symmetrical with respect to the forward direction A.

[0024] The operation zone 3.5 therefore comprises a succession of notch-free areas 3.51 and of notches 3.52 distributed in the forward direction A. The distribution of the notch-free areas 3.51 in the corresponding operation zone 3.5 and in the forward direction A is homogenous,

the distribution of the notches 3.52 in said operation zone 3.5 and in the forward direction A therefore also being homogenous. Preferably, the length of all the notch-free areas 3.51 is the same in the forward direction A, and the length of the notches 3.52 is also the same in the forward direction A, although the length of one notch-free area 3.51 does not have to be the same length as one notch 3.52. The value of lengths can depend on different factors, such as the material, the properties or the thickness of the second film 20, for example.

[0025] The length of the notch-free areas 3.51 and the length of the notches 3.52 in the forward direction A are related to the deformation to be applied on the second film 20 and to the limitation of said deformation, respectively. The length of the notch-free areas 3.51 is long enough to cause said deformation and short enough to prevent early contact between said second film 20 and the heating surface 3.4. In turn, the length of the notches 3.52 is long enough to prevent early contact between said second film 20 and the heating surface 3.4 and short enough to allow deformation of the second film 20.

[0026] The width of the notch-free areas 3.51 and the width of the notches 3.52 in a direction transverse to the forward direction A are related to the deformation to be applied on the second film 20 and to the limitation of said deformation, respectively. The width of the notch-free areas 3.51 is big enough to cause said deformation and small enough to prevent early contact between said second film 20 and the heating surface 3.4. In turn, the width of the notches 3.52 is big enough to prevent early contact between said second film 20 and the heating surface 3.4 and small enough to allow deformation of the second film 20.

[0027] The thickness (height) of the sealing gasket 3.12 in the zones corresponding with the notch-free areas 3.51 and the thickness of said sealing gasket 3.12 in the zones corresponding with the notches 3.52 are related to the deformation to be applied on the second film 20 and to the limitation of said deformation, respectively. The thickness in the zones corresponding with the notch-free areas 3.51 is big enough to cause said deformation and small enough to prevent early contact between said second film 20 and the heating surface 3.4. In turn, the thickness of said sealing gasket 3.12 in the zones corresponding with the notches 3.52 is big enough to prevent early contact between said second film 20 and the heating surface 3.4 and small enough to allow the deformation of the second film 20. Preferably, the thickness of the sealing gasket 3.12 is homogenous (the same) around its entire perimeter.

[0028] Preferably, the length, width and thickness of the sealing gasket 3.12 in the zone corresponding with the notch-free areas 3.51 and the length, width and thickness of the sealing gasket in the zone corresponding with the notches 3.52 are related to the deformation to be applied on the second film 20 and to the limitation of said deformation, respectively, and said lengths, widths and thicknesses are related to one another to allow said de-

formation and to prevent said early contact between the second film 20 and the heating surface 3.4.

[0029] In some cases, the second film 20 can be exposed to a heating process before entering the sealing station 3, in which case the machine 100 comprises a pre-heating station (not depicted in the drawings) with heating means, such as a heating plate for example, arranged upstream from said sealing station 3 in the forward direction A. The need for heating the second film 20 in the sealing station 3 decreases as it starts from a higher temperature in said sealing station 3 compared to the case in which it is lacking said prior heating plate.

[0030] The films 10 and 20 are supplied in the forward direction A intermittently, such that in every machine cycle a first specific area of the second film 20 is exposed to the heat of the heating plate and a second area of said second film 20 is sealed to the first film 10 in the sealing station 3. In the following cycle, said first area is arranged in the sealing station, becoming a second area sealed to the first film 10. Due to the configuration of the heating plate and the supply direction of the second film 20 to the zone where it is heated by said heating plate, the end that is farthest downstream in the forward direction A of the second film 20 is no longer heated before entering the sealing station 3, such that it is shrink-wrapped and introduced in the sealing station 3 with a lower temperature than the rest of the second film 20. In the following cycle, in which said end will be the end that is farthest downstream in the forward direction A of the second film 20 being sealed to the first film 10 in the sealing station 3, said end is less hot and has a lower risk of adhering to the heating surface 3.4, and it also has a lower risk of creased being generated therein due to the shrink-wrapping process to which it was previously subjected. The higher the temperature of the second film 20, the more ductile it is, such that since said end is at a lower temperature, the rest of the second film 20 is more ductile and more easily and more quickly brought towards the heating surface 3.4, for which reason there is no risk of said end adhering to said heating surface 3.4 too soon.

[0031] For this reason, for these cases each operation zone 3.5 of the sealing gasket 3.12 can comprise a length that is smaller than the total length of said sealing gasket 3.12, each operation zone 3.5 extending in the forward direction A from the entrance into the sealing station 3 to a specific intermediate point. The operation zone 3.5 of the sealing gasket 3.12 therefore corresponds with the zone of the sealing station 3 where the second film 20 is provided with a higher initial temperature. As a result, the zone of the sealing gasket 3.12 associated with the less hot end of the area of the second film 20 to be sealed to the first film 10 in the sealing station 3 is not notched, but nevertheless since it is less hot, it does not present the risk of adhering to the heating surface 3.4 when not wanted, and since it was previously subjected to a shrink-wrapping process, the risk of generating creases in the package is eliminated.

[0032] In the embodiment of the machine 100 shown

in the drawings, the first feeding station 1 comprises a cutting station 13 upstream from the sealing station 3 in the forward direction A, with at least one cutting tool which is suitable for generating at least one opening (not depicted in the drawings) in the first film 10, to later in the sealing station 3 generate a vacuum in the space existing between the area of the two films 10 and 20 delimited by the holding contour 3.10. If a plurality of products P is going to be simultaneously packaged in the sealing station 3, each one in its own package, this opening serves to generate a simultaneous vacuum in all the packages. Naturally, if instead of one opening more openings are made (both if only one product P is packaged and if a plurality of products P is simultaneously packaged), the vacuum is generated more quickly, and in some cases more efficiently. The sealing station 3 therefore receives the first film 10 with said opening and comprises vacuum means (not depicted in the drawings) for applying a vacuum between the two films 10 and 20 through said opening (in the mentioned space), during the sealing of said films 10 and 20, such that the product P arranged in said space is vacuum packaged.

[0033] The cutting tool is configured such that, or arranged such that in the machine 100 such that, the opening made on the first film 10 coincides with a notch-free area 3.51 of the operation zone 3.5 of the sealing gasket 3.12 of the sealing station 3 during the sealing of the two films 10 and 20. The aforementioned vacuum is thereby generated without having to make the opening at a point that will pertain to the final package and would therefore have to comply with a series of requirements (closed later) and would affect the appearance of the package. Furthermore, unlike what occurs in the prior art where to generate said vacuum without the necessary opening affecting the final package, said opening is made on the sides of the films 10 and 20 outside the holding contour 3.10; here, said films 10 and 20 do not required being acted on beyond said holding contour 3.10, and it is therefore not necessary to increase the width of said films 10 and 20 beyond said holding contour 3.10 for this purpose. This allows reducing the generated remnant 60 of the films 10 and 20, remnant 60 being understood as the material from said films 10 and 20 that is subsequently eliminated or disposed of, with the subsequent material and cost savings. Preferably, the remnant 60 is collected in a collecting station 6.

[0034] Preferably, the cutting tool is configured for making an opening for each of the notch-free areas 3.51 of the operation zone 3.5 of the sealing gasket 3.12 of the sealing station 3, although it is sometimes not necessary to make one opening for each of the notch-free areas 3.51.

[0035] In the embodiment of the machine 100 shown in the drawings, the final packages in which the products P are packaged can be trays 4 covered by a cover film. The trays 4 are generated from the first film 10, and the cover film is generated from the second film 20. Each tray 4 comprises a base 40 on which the product P is

arranged, a flap 41 surrounding the base 40 at a different height and a wall 42 joining the flap 41 with the base 40, as depicted by way of example in Figures 4a and 4b, which show a final package (in the form of a tray) with a packaged product P. Therefore, in said embodiment the first feeding station 1 comprises a feeder 11 supplying the first continuous film 10 from a reel of film for example, and a forming station 12 downstream from the feeder 11 in the forward direction A. The forming station 12 is configured for generating a plurality of cavities 15 in the first film 10 in the forward direction A, as the first film 10 moves forward in said forward direction A, in one or more parallel lines, each cavity 15 being associated with a tray 4. The sealing station 3 is downstream from the forming station 12 in the forward direction A, such that said sealing station 3 receives said first film 10 already formed (with the cavities 15). The cutting tool is preferably upstream from the forming station 12 in the forward direction A, but it could also be downstream from the forming station 12, between said forming station 12 and the sealing station 3, in said forward direction A.

[0036] In the embodiment shown in the drawings, the machine 100 further comprises a separating station 5 arranged downstream from the sealing station 3 in the forward direction A, and configured for cutting the films 10 and 20 already sealed to one another and with the product P therein, thereby generating individual packages (each with its corresponding product P). The transverse and/or longitudinal cuts required for obtaining individual packages, depending on how the products P are packaged (in a single line in the forward direction A or in a plurality of parallel lines) are made in the separating station 5.

[0037] Each final package therefore comprises a tray 4 like the one discussed above (in the particular case that the final packages are of the tray type), with a cavity 15 and a flap 41 around said cavity 15. The forming station 12 is configured for forming a cavity 15 such that a width of the first film 10 extending from the lateral end of the first film 10 to the lateral end of said cavities 15 is left unformed, and the sealing station 3 is configured so that the sealing gasket 3.12 is supported on said non-formed zone for sealing the two films 10 and 20 to one another. Particularly, the sealing gasket 3.12 is supported on a part of said non-formed zone that is located more outwardly than the part that will later be the flap 41 of the corresponding tray 4. Acting on a zone of the films 10 and 20 that will later become part of an individual package, i.e., the flap 41, is avoided, which prevents marking said flap 41. In some cases, the zone that will become the flap 41 of a final tray 4 is also formed, so in these cases the sealing gasket 3.12 is supported on the non-formed zone. Therefore, in the embodiment shown in the drawings the configuration of the holding contour 3.10 and the configuration of the forming station 12 are related and comply with related parameters for the correct packaging of products P in said machine 100. Furthermore, the opening (or openings) made by the cutting tool is also

located outside the flap of each tray 4, such that the vacuum of the package can be generated without the appearance of the tray 4 being affected as a result.

[0038] Additionally, the sealing station 3 can comprise additional elements not depicted in the drawings in the form of pins, for example, to assure the opening of the openings of the first film 10 while generating the vacuum between the first film 10 and the second film 20, and/or to tense up the second film 20 as it is brought towards the heating surface 3.4. Said additional elements are arranged in the lower tool 3.2 of the sealing station 3 below the notch-free areas 3.51 of the sealing gasket 3.12 of the upper tool 3.1, such that they are introduced through the openings of the first film 10 in the space of the notch-free areas 3.51 of the sealing gasket 3.12 and perform their function without generating a larger amount of remnant 60 of films 10 and 20.

Claims

1. Skin packaging machine comprising a first feeding station (1) for supplying a first continuous film (10) in a forward direction (A) of the machine (100), a second feeding station (2) for supplying a second continuous film (20) in the forward direction (A) and above the first film (10), and a sealing station (3) which is configured for receiving both films (10, 20) and which comprises an upper tool (3.1) pressing on the films (10, 20) to seal them together, the upper tool (3.1) comprising a closed holding contour (3.10) pressing the films (10, 20) during the sealing and delimiting the area of said films (10, 20) being sealed, a heating surface (3.4) delimited by the holding contour (3.10) and facing said area corresponding to the second film (20), heating means for heating the heating surface (3.4), and suction means for bringing the second film (20) towards said heating surface (3.4) for heating, the sealing station (3) further comprising a sealing gasket (3.12) attached to the holding contour (3.10) for preventing direct contact between the upper tool (3.1) and the films (10, 20) when said upper tool (3.1) presses on them, **characterized in that** the sealing gasket (3.12) comprises, on each side with respect to the forward direction (A), an operation zone (3.5) with a notched configuration which is facing the space delimited by said sealing gasket (3.12), such that when the second film (20) is brought towards the heating surface (3.4) for heating it, the second film (20) tends to tense up in the notch-free areas (3.51) of the operation zone (3.5), becoming deformed, whereas the notches (3.52) of the operation zone (3.5) limit said deformation, thereby preventing early contact between said second film (20) and said heating surface (3.4).
2. Machine according to claim 1, wherein the length of the notch-free areas (3.51) and the length of the

notches (3.52) in the forward direction (A) are related to the deformation to be applied on the second film (20) and to the limitation of said deformation, respectively, the length of the notch-free areas (3.51) being long enough to cause said deformation and short enough to prevent early contact between said second film (20) and the heating surface (3.4), and the length of the notches (3.52) being long enough to prevent early contact between said second film (20) and the heating surface (3.4) and short enough to allow deformation of the second film (20).

3. Machine according to claim 1 or 2, wherein the width of the notch-free areas (3.51) and the width of the notches (3.52) in a direction transverse to the forward direction (A) are related to the deformation to be applied on the second film (20) and to the limitation of said deformation, respectively, the width of the notch-free areas (3.51) being big enough to cause said deformation and small enough to prevent early contact between said second film (20) and the heating surface (3.4), and the width of the notches (3.52) being big enough to prevent early contact between said second film (20) and the heating surface (3.4) and small enough to allow deformation of the second film (20).
4. Machine according to the preceding claim, wherein the width of the notch-free areas (3.51) of the corresponding operation zone (3.5) in the direction transverse to the forward direction (A) is homogenous, the width of all the notch-free areas (3.51) being the same in the direction transverse to the forward direction (A) and the width of all the notches (3.52) being the same in the direction transverse to the forward direction (A).
5. Machine according to any of the preceding claims, wherein the width of the notches (3.52) of the operation zone (3.5) in a direction transverse to the forward direction (A) is the same as the width of the sealing gasket (3.12) outside the operation zone (3.5).
6. Machine according to any of the preceding claims, wherein the thickness of the sealing gasket (3.51) in the zone corresponding to the notch-free areas (3.51) and the thickness of the sealing gasket (3.51) in the zone corresponding to the notches (3.52) in a direction transverse to the forward direction (A) are related to the deformation to be applied on the second film (20) and to the limitation of said deformation, respectively, the thickness associated with the notch-free areas (3.51) being big enough to cause said deformation and small enough to prevent early contact between said second film (20) and the heating surface (3.4), and the thickness associated with the notches (3.52) being big enough to prevent early

contact between said second film (20) and the heating surface (3.4) and small enough to allow deformation of the second film (20).

7. Machine according to claim 6, wherein the thickness of the sealing gasket (3.12) is homogenous around its entire perimeter. 5
8. Machine according to any of the preceding claims, wherein the length, width and thickness of the sealing gasket (3.12) in the zones corresponding to the notch-free areas (3.51) and the length, width and thickness of said sealing gasket (3.12) in the zones corresponding to the notches (3.52) are related to the deformation to be applied on the second film (20) and to the limitation of said deformation, respectively, said lengths, widths and thicknesses being related to one another to allow said deformation and to prevent said early contact between the second film (20) and the heating surface (3.4). 10
9. The machine according to any of the preceding claims, wherein the distribution of the notch-free areas (3.51) of the corresponding operation zone (3.5) in the forward direction (A) is homogenous, the length of all the notch-free areas (3.51) being the same in the forward direction (A) and the length of all the notches (3.52) being the same in the forward direction (A). 15
10. Machine according to any of the preceding claims, wherein each operation zone (3.5) of the sealing gasket (3.12) comprises a length that is smaller than the total length of said sealing gasket (3.12) on the corresponding side, each operation zone (3.5) extending in the forward direction (A) from the entrance into the sealing station (3) with respect to said forward direction (A). 20
11. Machine according to claim 10, comprising a pre-heating station upstream from the sealing station (3) in the forward direction (A) for pre-heating the second film (20) before being supplied to said sealing station (3), the operation zone (3.5) of the sealing gasket (3.12) corresponding with the zone of the sealing station (3) where the second film (20) is provided with a higher initial temperature. 25
12. Machine according to any of the preceding claims, wherein the first feeding station (1) comprises a cutting station (13) upstream from the sealing station (3) in the forward direction (A), having a cutting tool which is suitable for generating at least one opening in the first film (10), the sealing station (3) comprising vacuum means for applying a vacuum between the two films (10, 20) through said opening, during the sealing of said films (10, 20), the cutting tool being configured so that, or arranged in the machine (100) 30

such that, the opening made on the first film (10) coincides with a notch-free area (3.51) of the operation zone (3.5) of the sealing gasket (3.12) of the sealing station (3), during the sealing of the two films (10, 20). 35

13. Machine according to claim 12, wherein the cutting tool is configured for making an opening for each of the notch-free areas (3.51) of the operation zone (3.5) of the sealing gasket (3.12) of the sealing station (3). 40
14. Machine according to claim 12 or 13, wherein the sealing station (3) comprises at least one additional element arranged in a lower tool (3.2) configured for being introduced through at least one opening made by the cutting tool on the first film (10). 45
15. Machine according to any of claims 12 to 14, wherein the first feeding station (1) comprises a feeder (11) supplying the first continuous film (10) and a forming station (12) downstream from the feeder (11) in the forward direction (A), the forming station (12) being configured for generating a plurality of cavities (15) in the first film (10) in the forward direction (A), in one or more parallel lines, the machine (100) comprising a separating station (5) arranged downstream from the sealing station (3) in the forward direction (A) and configured for cutting the films (10, 20) and thereby generating individual packages comprising a tray (4) with a cavity (15) and a flap (41) around the cavity (15), the forming station (12) being configured for forming a cavity (15) such that a width on the sides of the first film (10) extending from the lateral end of said cavity (15) to the end of the first film (10) is left unformed, and the sealing station (3) being configured so that the sealing gasket (3.12) is supported on the films (10, 20) beyond the flap (41), towards the outer side of said films (10, 20), during the sealing of the two films (10, 20). 50

Patentansprüche

1. Skin-Verpackungsmaschine mit einer ersten Zuführstation (1) zum Zuführen einer ersten Endlosfolie (10) in einer Vorwärtsrichtung (A) der Maschine (100), einer zweiten Zuführstation (2) zum Zuführen einer zweiten Endlosfolie (20) in der Vorwärtsrichtung (A) und über der ersten Folie (10) und einer Versiegelungsstation (3), die zur Aufnahme beider Folien (10, 20) konfiguriert ist und ein oberes Werkzeug (3.1) umfasst, das auf die Folien (10, 20) drückt, um sie miteinander zu versiegeln, wobei das obere Werkzeug (3.1) eine geschlossene Haltekontur (3.10) umfasst, die während des Versiegelns und Begrenzens des Bereichs der zu versiegelnden Folien (10, 20) auf die Folien (10, 20) drückt, eine Heiz- 55

- fläche (3.4), die durch die Haltekontur (3.10) begrenzt ist und dem Bereich entsprechend der zweiten Folie (20) zugewandt ist, Heizmittel zum Erwärmen der Heizfläche (3.4) und Saugmittel, um die zweite Folie (20) zum Erwärmen in Richtung der Heizfläche (3.4) zu bringen, wobei die Versiegelungsstation (3) ferner eine an der Haltekontur (3.10) angebrachte Dichtung (3.12) umfasst, um einen direkten Kontakt zwischen dem oberen Werkzeug (3.1) und den Folien (10, 20) zu verhindern, wenn das obere Werkzeug (3.1) auf sie drückt, **dadurch gekennzeichnet, dass** die Dichtung (3.12) auf jeder Seite in Bezug auf die Vorwärtsrichtung (A) eine Betriebszone (3.5) mit einer eingekerbten Konfiguration umfasst, die dem durch die Dichtung (3.12) begrenzten Raum zugewandt ist, sodass, wenn die zweite Folie (20) zum Erwärmen zur Heizfläche (3.4) gebracht wird, die zweite Folie (20) dazu neigt, sich in den kerbfreien Bereichen (3.51) der Betriebszone (3.5) zu spannen und dadurch zu verformen, während die Kerben (3.52) der Betriebszone (3.5) die Verformung begrenzen und dadurch einen Frühkontakt zwischen der zweiten Folie (20) und der Heizfläche (3.4) verhindern.
2. Maschine nach Anspruch 1, wobei die Länge der kerbfreien Bereiche (3.51) und die Länge der Kerben (3.52) in Vorwärtsrichtung (A) jeweils mit der auf die zweite Folie (20) anzuwendenden Verformung bzw. der Begrenzung der Verformung in Zusammenhang stehen, wobei die Länge der kerbfreien Bereiche (3.51) lang genug ist, um die Verformung zu bewirken, und kurz genug, um den Frühkontakt zwischen der zweiten Folie (20) und der Heizfläche (3.4) zu verhindern, und die Länge der Kerben (3.52) lang genug ist, um den Frühkontakt zwischen der zweiten Folie (20) und der Heizfläche (3.4) zu verhindern, und kurz genug, um die Verformung der zweiten Folie (20) zu ermöglichen.
 3. Maschine nach Anspruch 1 oder 2, wobei die Breite der kerbfreien Bereiche (3.51) und die Breite der Kerben (3.52) in einer Richtung quer zur Vorwärtsrichtung (A) jeweils mit der auf die zweite Folie (20) anzuwendenden Verformung bzw. der Begrenzung der Verformung in Zusammenhang stehen, wobei die Breite der kerbfreien Bereiche (3.51) groß genug ist, um die Verformung zu bewirken, und klein genug, um den Frühkontakt zwischen der zweiten Folie (20) und der Heizfläche (3.4) zu verhindern, und die Breite der Kerben (3.52) groß genug ist, um den Frühkontakt zwischen der zweiten Folie (20) und der Heizfläche (3.4) zu verhindern, und klein genug, um die Verformung der zweiten Folie (20) zu ermöglichen.
 4. Maschine nach dem vorhergehenden Anspruch, wobei die Breite der kerbfreien Bereiche (3.51) der entsprechenden Betriebszone (3.5) in der Richtung quer zur Vorwärtsrichtung (A) homogen ist, wobei die Breite aller kerbfreien Bereiche (3.51) in Richtung quer zur Vorwärtsrichtung (A) gleich ist und die Breite aller Kerben (3.52) in Richtung quer zur Vorwärtsrichtung (A) gleich ist.
 5. Maschine nach einem der vorhergehenden Ansprüche, wobei die Breite der Kerben (3.52) der Betriebszone (3.5) in einer Richtung quer zur Vorwärtsrichtung (A) gleich der Breite der Dichtung (3.12) außerhalb der Betriebszone (3.5) ist.
 6. Maschine nach einem der vorhergehenden Ansprüche, wobei die Dicke der Dichtung (3.51) in der Zone, die den kerbfreien Bereichen (3.51) entspricht, und die Dicke der Dichtung (3.51) in der Zone, die den Kerben (3.52) in einer Richtung quer zur Vorwärtsrichtung (A) entspricht, jeweils mit der auf die zweite Folie (20) anzuwendenden Verformung bzw. der Begrenzung der Verformung in Zusammenhang stehen, wobei die den kerbfreien Bereichen (3.51) zugeordnete Dicke groß genug ist, um die Verformung zu bewirken, und klein genug, um den Frühkontakt zwischen der zweiten Folie (20) und der Heizfläche (3.4) zu verhindern, und die den Kerben (3.52) zugeordnete Dicke groß genug ist, um den Frühkontakt zwischen der zweiten Folie (20) und der Heizfläche (3.4) zu verhindern, und klein genug, um Verformung der zweiten Folie (20) zu ermöglichen.
 7. Maschine nach Anspruch 6, wobei die Dicke der Dichtung (3.12) um ihren gesamten Umfang herum homogen ist.
 8. Maschine nach einem der vorhergehenden Ansprüche, wobei die Länge, Breite und Dicke der Dichtung (3.12) in den Zonen, die den kerbfreien Bereichen (3.51) entsprechen, und die Länge, Breite und Dicke der Dichtung (3.12) in den Zonen, die den Kerben (3.52) entsprechen, jeweils mit der auf der zweiten Folie (20) anzuwendenden Verformung bzw. mit der Begrenzung der Verformung in Zusammenhang stehen, wobei die Längen, Breiten und Dicken miteinander in Zusammenhang stehen, um die Verformung zu ermöglichen und den Frühkontakt zwischen der zweiten Folie (20) und der Heizfläche (3.4) zu verhindern.
 9. Maschine nach einem der vorhergehenden Ansprüche, wobei die Verteilung der kerbfreien Bereiche (3.51) der entsprechenden Betriebszone (3.5) in Vorwärtsrichtung (A) homogen ist, wobei die Länge aller kerbfreien Bereiche (3.51) in Vorwärtsrichtung (A) gleich ist und die Länge aller Kerben (3.52) in Vorwärtsrichtung (A) gleich ist.
 10. Maschine nach einem der vorhergehenden Ansprü-

che, wobei jede Betriebszone (3.5) der Dichtung (3.12) eine Länge aufweist, die kleiner als die Gesamtlänge der Dichtung (3.12) auf der entsprechenden Seite ist, wobei sich jede Betriebszone (3.5) in Vorwärtsrichtung (A) vom Eingang in die Versiegelungsstation (3) in Bezug auf die Vorwärtsrichtung (A) erstreckt.

11. Maschine nach Anspruch 10, umfassend eine Vorheizstation in Vorwärtsrichtung (A) vor der Versiegelungsstation (3) zum Vorheizen der zweiten Folie (20), bevor sie der Versiegelungsstation (3) zugeführt wird, wobei die Betriebszone (3.5) der Dichtung (3.12) der Zone der Versiegelungsstation (3) entspricht, in der die zweite Folie (20) mit einer höheren Anfangstemperatur versehen wird.

12. Maschine nach einem der vorhergehenden Ansprüche, wobei die erste Zuführstation (1) in Vorwärtsrichtung (A) vor der Versiegelungsstation (3) eine Schneidstation (13) umfasst, die ein Schneidwerkzeug aufweist, das zum Erzeugen mindestens einer Öffnung in der ersten Folie (10) geeignet ist, wobei die Versiegelungsstation (3) Vakuummittel zum Anlegen eines Vakuums zwischen den beiden Folien (10, 20) durch die Öffnung während des Versiegeln der Folien (10, 20) umfasst, wobei das Schneidwerkzeug so konfiguriert oder in der Maschine (100) so angeordnet ist, dass die auf der ersten Folie (10) gebildete Öffnung während des Versiegeln der beiden Folien (10, 20) mit einem kerbfreien Bereich (3.51) der Arbeitszone (3.5) der Dichtung (3.12) der Versiegelungsstation (3) zusammenfällt.

13. Maschine nach Anspruch 12, wobei das Schneidwerkzeug konfiguriert ist, um für jeden der kerbfreien Bereiche (3.51) der Betriebszone (3.5) der Dichtung (3.12) der Versiegelungsstation (3) eine Öffnung zu bilden.

14. Maschine nach Anspruch 12 oder 13, wobei die Versiegelungsstation (3) mindestens ein zusätzliches Element aufweist, das in einem unteren Werkzeug (3.2) angeordnet ist, das so konfiguriert ist, dass es durch mindestens eine durch das Schneidwerkzeug gebildete Öffnung auf der ersten Folie (10) eingeführt werden kann.

15. Maschine nach einem der Ansprüche 12 bis 14, wobei die erste Zuführstation (1) eine Zuführvorrichtung (11) aufweist, die die erste Endlosfolie (10) zuführt, und in Vorwärtsrichtung (A) eine Formungsstation (12) nach der Zuführvorrichtung (11), wobei die Formungsstation (12) zum Erzeugen einer Vielzahl von Hohlräumen (15) in der ersten Folie (10) in Vorwärtsrichtung (A) in einer oder mehreren parallelen Linien konfiguriert ist, wobei die Maschine (100) eine Trennstation (5) aufweist, die in Vorwärtsrichtung (A)

nach der Versiegelungsstation (3) angeordnet und zum Schneiden der Folien (10, 20) konfiguriert ist und dadurch einzelne Verpackungen erzeugt, die eine Schale (4) mit einem Hohlraum (15) und eine Klappe (41) um den Hohlraum (15) herum umfassen, wobei die Formungsstation (12) zum Bilden eines Hohlraums (15) so konfiguriert ist, dass sich eine Breite an den Seiten der ersten Folie (10), die sich vom seitlichen Ende des Hohlraums (15) bis zum Ende der ersten Folie (10) erstreckt, ungeformt bleibt und die Versiegelungsstation (3) so konfiguriert ist, dass die Dichtung (3.12) während der Versiegelung der beiden Folien (10, 20) auf der Folie (10, 20) über die Klappe (41) hinaus in Richtung der Außenseite der beiden Folien (10, 20) gestützt wird.

Revendications

- Machine de conditionnement sous peau comprenant un premier poste d'alimentation (1) pour fournir un premier film continu (10) dans une direction avant (A) de la machine (100), un deuxième poste d'alimentation (2) pour fournir un deuxième film continu (20) dans la direction avant (A) et au-dessus du premier film (10) et un poste de scellage (3) conçu pour recevoir les deux films (10, 20) et qui comprend un outil supérieur (3.1) appuyant sur les films (10, 20) pour les sceller ensemble, l'outil supérieur (3.1) comprenant un contour de maintien fermé (3.10) pressant les films (10, 20) pendant le scellage et délimitant la zone desdits films (10, 20) en cours de scellage, une surface chauffante (3.4) délimitée par le contour de maintien (3.10) et faisant face à ladite zone correspondant au deuxième film (20), des moyens de chauffage pour chauffer la surface chauffante (3.4) et des moyens d'aspiration pour amener le deuxième film (20) vers ladite surface chauffante (3.4) pour chauffage, le poste de scellage (3) comprenant en outre un joint d'étanchéité (3.12) fixé au contour de maintien (3.10) pour empêcher le contact direct entre l'outil supérieur (3.1) et les films (10, 20) lorsque ledit outil supérieur (3.1) appuie dessus, **caractérisée en ce que** le joint d'étanchéité (3.12) comprend, de chaque côté par rapport à la direction avant (A), une zone de travail (3.5) avec une configuration encochée qui fait face à l'espace délimité par ledit joint d'étanchéité (3.12), de sorte que lorsque le deuxième film (20) est amené vers la surface chauffante (3.4) pour le chauffer, le deuxième film (20) a tendance à se tendre dans les zones sans encoche (3.51) de la zone de travail (3.5), en se déformant, alors que les encoches (3.52) de la zone de travail (3.5) limitent ladite déformation, empêchant ainsi un contact précoce entre ledit deuxième film (20) et ladite surface chauffante (3.4).

- Machine selon la revendication 1, dans laquelle la

- longueur des zones sans encoche (3.51) et la longueur des encoches (3.52) dans la direction avant (A) sont liées à la déformation à appliquer sur le deuxième film (20) et à la limitation de ladite déformation, respectivement, la longueur des zones sans encoche (3.51) étant suffisamment longue pour provoquer ladite déformation et suffisamment courte pour empêcher un contact précoce entre ledit deuxième film (20) et la surface chauffante (3.4) et la longueur des encoches (3.52) étant suffisamment longue pour empêcher un contact précoce entre ledit deuxième film (20) et la surface chauffante (3.4) et suffisamment courte pour permettre la déformation du deuxième film (20).
3. Machine selon la revendication 1 ou 2, dans laquelle la largeur des zones sans encoche (3.51) et la largeur des encoches (3.52) dans une direction transversale à la direction avant (A) sont liées à la déformation à appliquer sur le deuxième film (20) et à la limitation de ladite déformation, respectivement, la largeur des zones sans encoche (3.51) étant suffisamment grande pour provoquer ladite déformation et suffisamment petite pour empêcher un contact précoce entre ledit deuxième film (20) et la surface chauffante (3.4) et la largeur des encoches (3.52) étant suffisamment grande pour empêcher un contact précoce entre ledit deuxième film (20) et la surface chauffante (3.4) et suffisamment petite pour permettre la déformation du deuxième film (20).
 4. Machine selon la revendication précédente, dans laquelle la largeur des zones sans encoche (3.51) de la zone de travail correspondante (3.5) dans la direction transversale à la direction avant (A) est homogène, la largeur de toutes les zones sans encoche (3.51) étant identique dans la direction transversale à la direction avant (A) et la largeur de toutes les encoches (3.52) étant identique dans la direction transversale à la direction avant (A).
 5. Machine selon l'une quelconque des revendications précédentes, dans laquelle la largeur des encoches (3.52) de la zone de travail (3.5) dans une direction transversale à la direction avant (A) est identique à la largeur du joint d'étanchéité (3.12) à l'extérieur la zone de travail (3.5).
 6. Machine selon l'une quelconque des revendications précédentes, dans laquelle l'épaisseur du joint d'étanchéité (3.51) dans la zone correspondant aux zones sans encoche (3.51) et l'épaisseur du joint d'étanchéité (3.51) dans la zone correspondant aux encoches (3.52) dans une direction transversale à la direction avant (A) sont liées à la déformation à appliquer sur le deuxième film (20) et à la limitation de ladite déformation, respectivement, l'épaisseur associée aux zones sans encoche (3.51) étant suffisamment grande pour provoquer ladite déformation et suffisamment petite pour empêcher un contact précoce entre ledit deuxième film (20) et la surface chauffante (3.4) et l'épaisseur associée aux encoches (3.52) étant suffisamment grande pour empêcher un contact précoce entre ledit deuxième film (20) et la surface chauffante (3.4) et suffisamment petite pour permettre la déformation du deuxième film (20).
 7. Machine selon la revendication 6, dans laquelle l'épaisseur du joint d'étanchéité (3.12) est homogène sur tout son périmètre.
 8. Machine selon l'une quelconque des revendications précédentes, dans laquelle la longueur, la largeur et l'épaisseur du joint d'étanchéité (3.12) dans les zones correspondant aux zones sans encoche (3.51) et la longueur, la largeur et l'épaisseur dudit joint d'étanchéité (3.12) dans les zones correspondant aux encoches (3.52) sont liées à la déformation à appliquer sur le deuxième film (20) et à la limitation de ladite déformation, respectivement, lesdites longueurs, largeurs et épaisseurs étant liées les unes aux autres pour permettre ladite déformation et pour empêcher ledit contact précoce entre le deuxième film (20) et la surface chauffante (3.4).
 9. Machine selon l'une quelconque des revendications précédentes, dans laquelle la répartition des zones sans encoche (3.51) de la zone de travail correspondante (3.5) dans la direction avant (A) est homogène, la longueur de toutes les zones sans encoche (3.51) étant identique dans la direction avant (A) et la longueur de toutes les encoches (3.52) étant identique dans la direction avant (A).
 10. Machine selon l'une quelconque des revendications précédentes, dans laquelle chaque zone de travail (3.5) du joint d'étanchéité (3.12) comprend une longueur qui est inférieure à la longueur totale dudit joint d'étanchéité (3.12) du côté correspondant, chaque zone de travail (3.5) s'étendant dans la direction avant (A) à partir de l'entrée dans le poste de scellage (3) par rapport à ladite direction avant (A).
 11. Machine selon la revendication 10, comprenant un poste de préchauffage en amont du poste de scellage (3) dans la direction avant (A) pour préchauffer le deuxième film (20) avant d'être alimenté vers ledit poste de scellage (3), la zone de travail (3.5) du joint d'étanchéité (3.12) correspondant à la zone du poste de scellage (3) où le deuxième film (20) est doté d'une température initiale plus élevée.
 12. Machine selon l'une quelconque des revendications précédentes, dans laquelle le premier poste d'alimentation (1) comprend un poste de coupe (13) en

amont du poste de scellage (3) dans la direction avant (A), comportant un outil de coupe adapté pour générer au moins une ouverture dans le premier film (10), le poste de scellage (3) comprenant des moyens de mise sous vide pour appliquer un vide entre les deux films (10, 20) à travers ladite ouverture, pendant le scellage desdits films (10, 20), l'outil de coupe étant conçu ou disposé dans la machine (100) de telle sorte que l'ouverture pratiquée sur le premier film (10) coïncide avec une zone sans encoche (3.51) de la zone de travail (3.5) du joint d'étanchéité (3.12) du poste de scellage (3), pendant le scellage des deux films (10, 20).

13. Machine selon la revendication 12, dans laquelle l'outil de coupe est conçu pour pratiquer une ouverture pour chacune des zones sans encoche (3.51) de la zone de travail (3.5) du joint d'étanchéité (3.12) du poste de scellage (3).

14. Machine selon la revendication 12 ou 13, dans laquelle le poste de scellage (3) comprend au moins un élément supplémentaire disposé dans un outil inférieur (3.2) conçu pour être introduit à travers au moins une ouverture réalisée par l'outil de coupe sur le premier film (10).

15. Machine selon l'une quelconque des revendications 12 à 14, dans laquelle le premier poste d'alimentation (1) comprend un chargeur (11) alimentant le premier film continu (10) et un poste de formage (12) en aval du chargeur (11) dans la direction avant (A), le poste de formage (12) étant conçu pour générer une pluralité de cavités (15) dans le premier film (10) dans la direction avant (A), dans une ou plusieurs lignes parallèles, la machine (100) comprenant un poste de séparation (5) disposé en aval du poste de scellage (3) dans la direction avant (A) et conçu pour couper les films (10, 20) et générer ainsi des emballages individuels comprenant un plateau (4) avec une cavité (15) et un rabat (41) autour de la cavité (15), le poste de formage (12) étant conçu pour former une cavité (15) de telle sorte qu'une largeur sur les côtés du premier film (10) s'étendant à partir de l'extrémité latérale de ladite cavité (15) jusqu'à la fin du premier film (10) soit laissée sans forme et le poste de scellage (3) étant conçu de telle sorte que le joint d'étanchéité (3.12) soit supporté sur les films (10, 20) au-delà du rabat (41), vers la face externe desdits films (10, 20), pendant le scellage des deux films (10, 20).

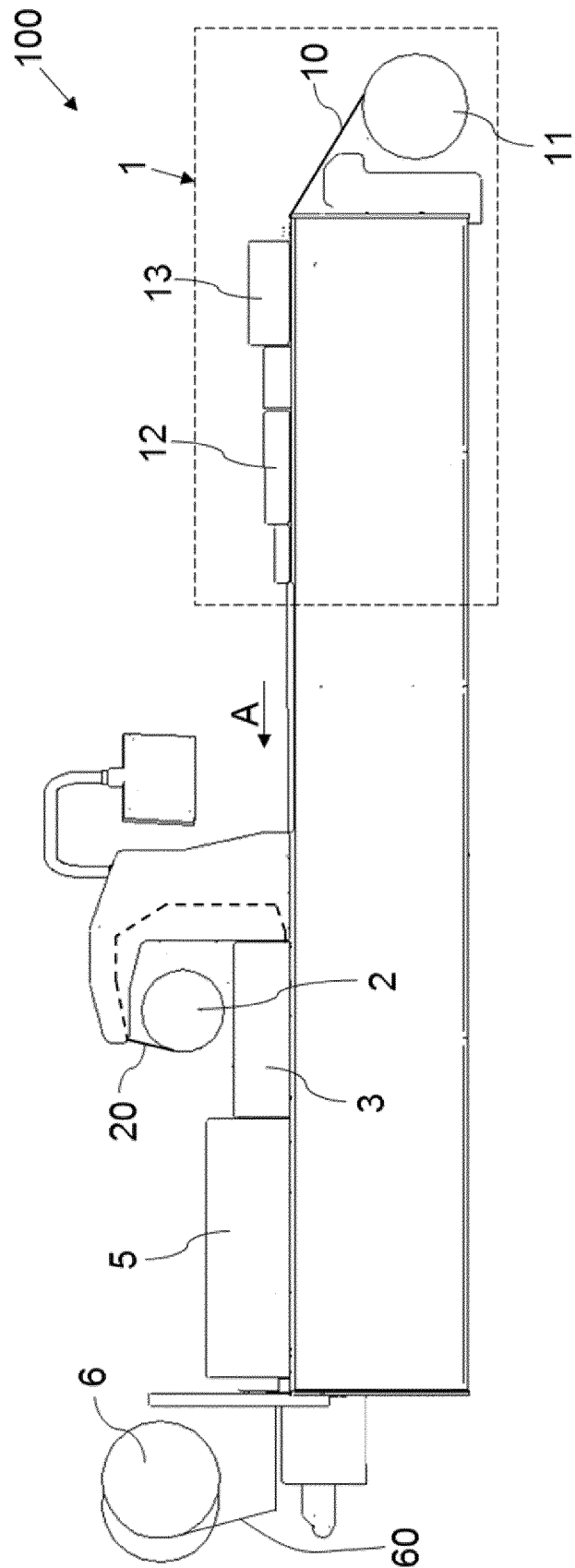


Fig. 1

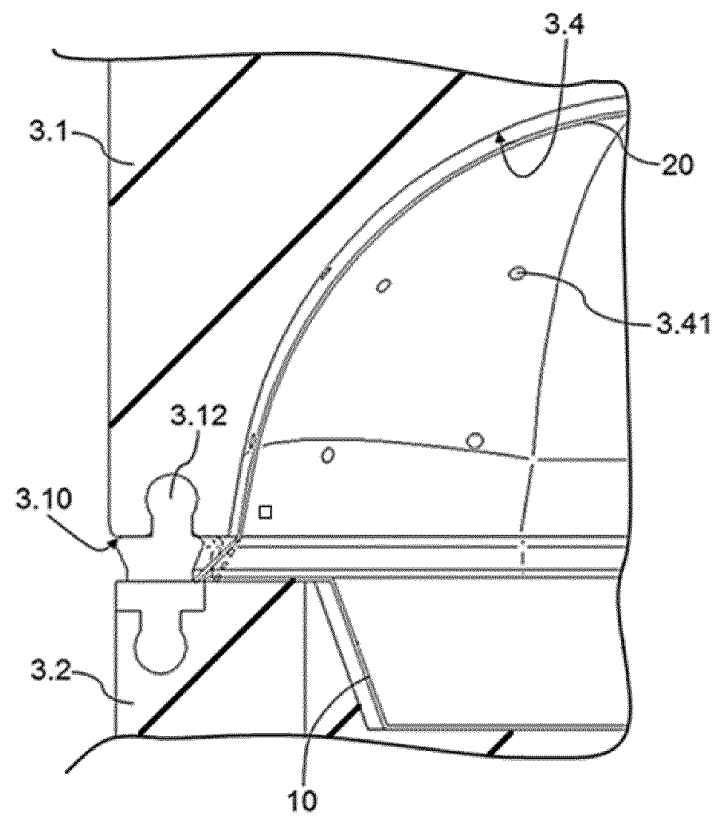


Fig. 2a

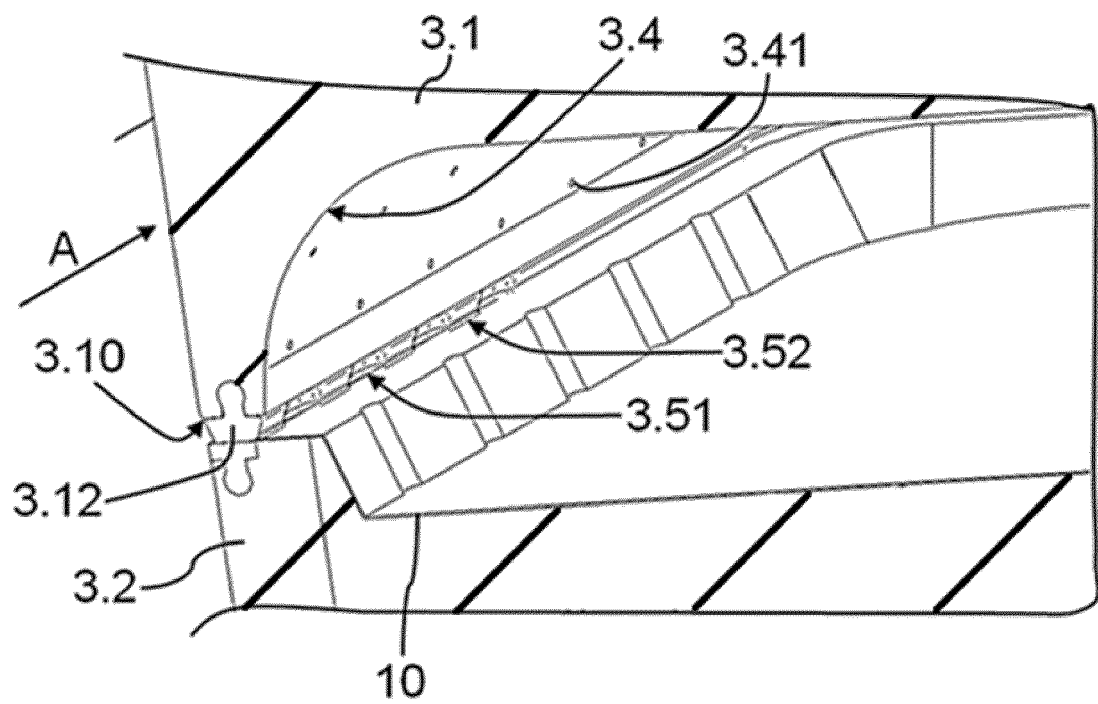


Fig. 2b

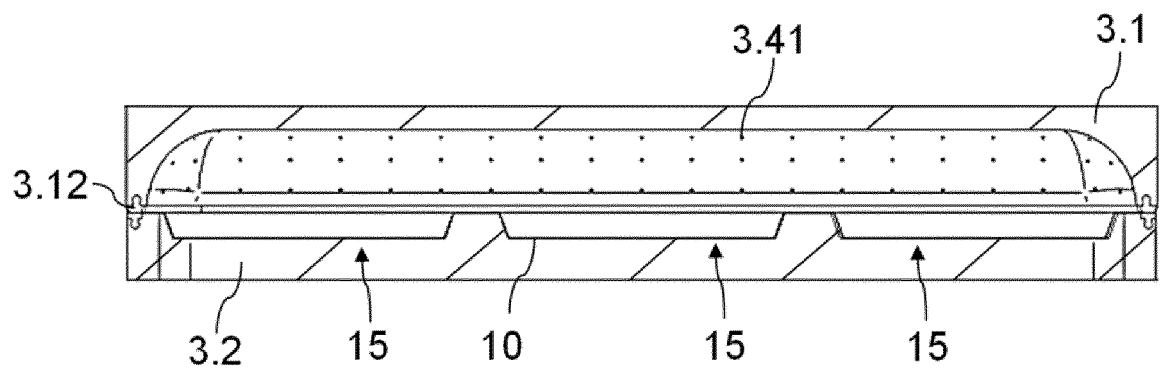


Fig. 2c

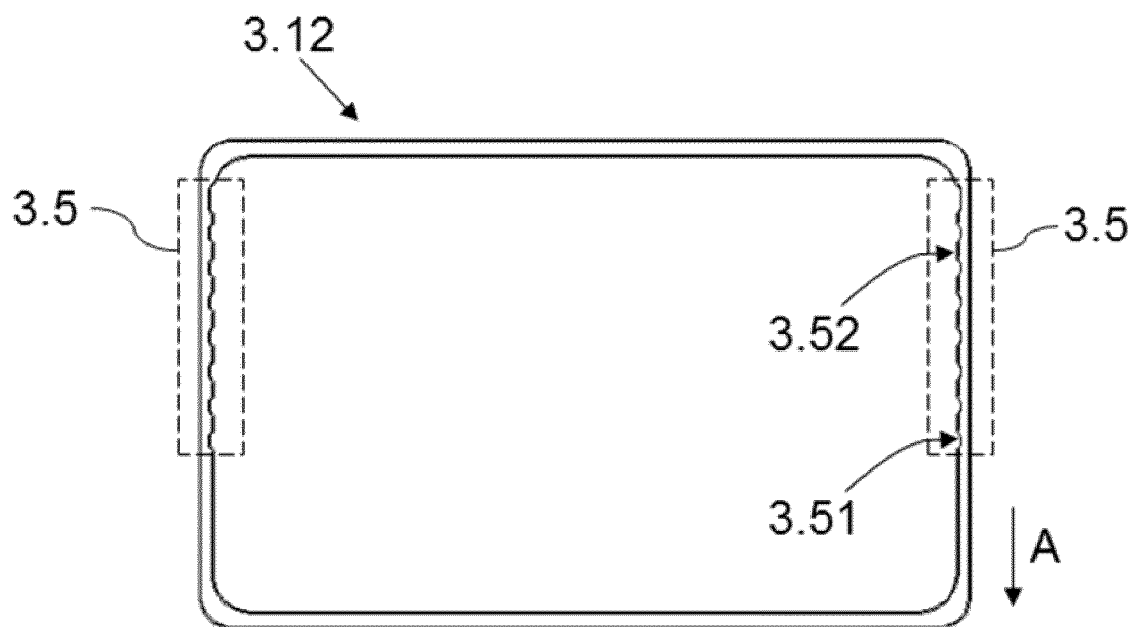


Fig. 3

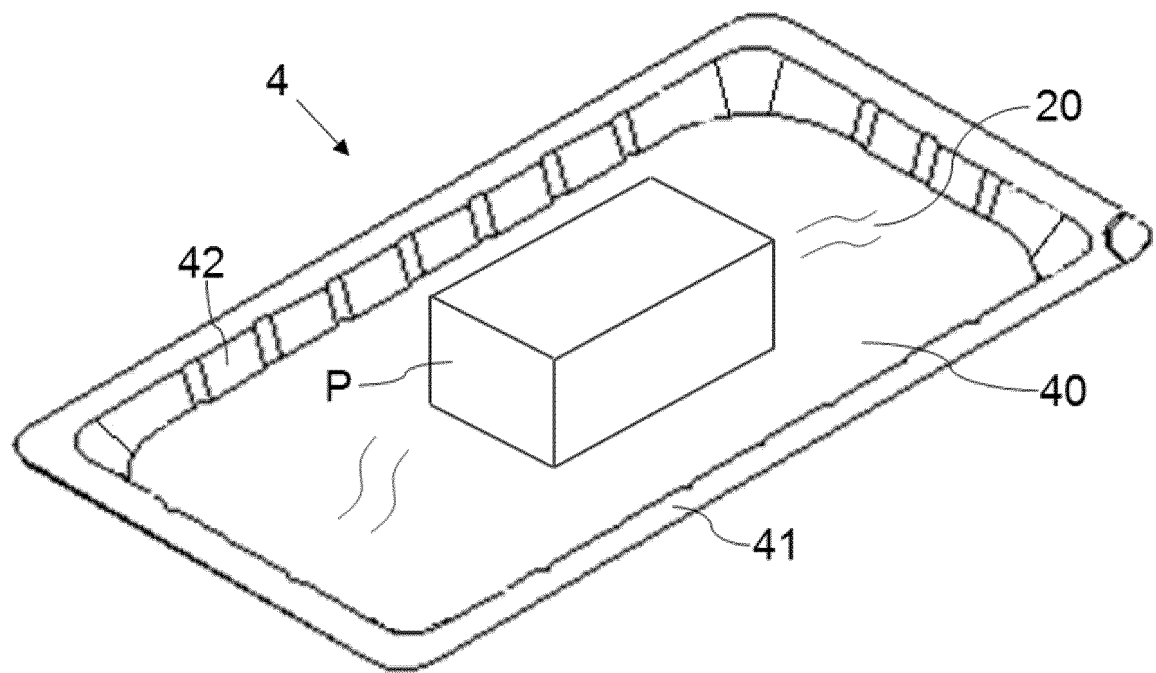


Fig. 4a

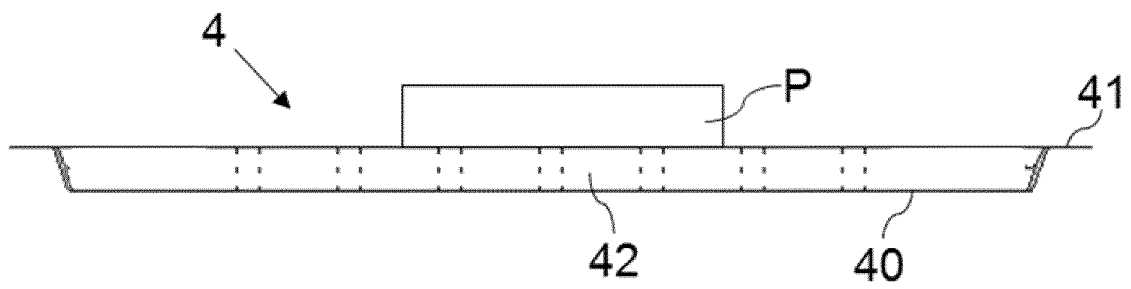


Fig. 4b

REFERENCES CITED IN THE DESCRIPTION

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