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(71) Applicant: **Ulma Packaging Technological Center, S. Coop**
20560 Oñati (Gipuzkoa) (ES)

(72) Inventors:
- **Izquierdo Ereño, Eneko**
  20560 Oñati (ES)
- **Arregi Arambarri, Nicolás**
  20560 Oñati (ES)
- **Arbulu, Ormaechea, Nerea**
  20560 Oñati (ES)

(74) Representative: **Igartua, Ismael**
Galbaian S.Coop.
Polo de Innovación Garaia
Goiru Kalea 1 - P.O. Box 213
20500 Arrasate-Mondragón (ES)

(54) **Skin packaging machine**

(57) Skin packaging machine comprising a sealing member (1) that acts on a product (4) wrapped by a lower film (2) and an upper film (3), and which seals or closes the films (2, 3) to each other around the product (4) in order to vacuum-package said product (4) between both films (2, 3), and control means for causing the sealing member (1) to move in order to package the product (4). The sealing member (1) defines at least one inner space where the product (4) to be vacuum-packaged is disposed wrapped at least partially by the two films (2, 3), and comprises at least one longitudinal first wall, a longitudinal second wall and a transverse wall between which the inner space is defined, and an opening facing the transverse wall.

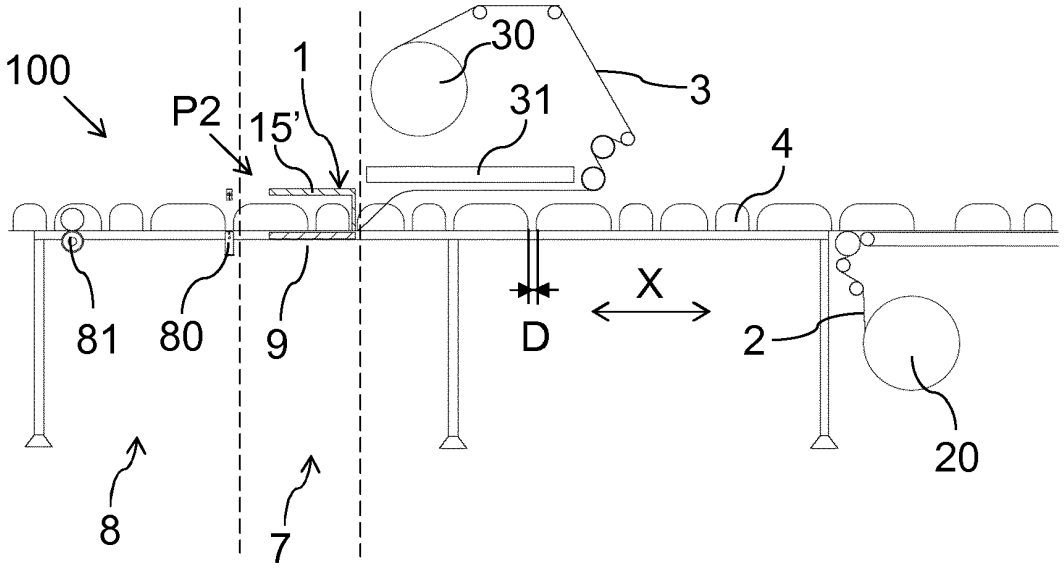

FIG. 1

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Description

TECHNICAL FIELD

[0001] The invention relates to a machine for packaging products, of the type in which the product is vacuum-wrapped between two thermoplastic films that adapt to its shape and are sealed around it, and which is known as a skin packaging machine.

PRIOR ART

[0002] The technique in which a product (or products) is vacuum-wrapped between two films of thermoplastic material that adapt to its shape is known as skin packaging, and is a technique that is already known. As a result, the product is protected from external agents and generally the food products retain better the possible liquids of the product, thereby delaying the development of microbes, which means they have a longer useful life and create the possibility of displaying the package in a vertical manner, for example.

[0003] In a skin package, the product is generally disposed on a first film or lower film, and is wrapped by a second film or upper film. In a sealing station both films are then joined or bonded around the product. Both films must be compatible with each other to enable the sealing, or they may be impregnated with a lacquer to enable their sealing. The sealing station generally comprises a mould and a lower tool where the mould is supported, and at least the mould performs a vertical movement, so that when the product between the two films is disposed beneath the mould, the mould descends and the product is housed in its interior.

[0004] In the sealing an upper first vacuum is generally performed through the mould, which causes the deformation of the upper film towards the walls of the mould, which may also be heated to heat the upper film even more and enable the subsequent sealing of the films. A second vacuum is then generated between the upper and lower film where the product is housed, leaving the product without any air around it. Generally this second vacuum is formed by the lower tool, which is set up to perform the vacuum between the sides of the lower and upper film, or through holes formed beforehand in the lower film for such a purpose. Finally, the pressure is increased between the walls of the mould and the upper film and the pressure of the second vacuum is reduced (both operations may be performed one after the other or simultaneously) with the purpose of said film adapting to the contour of the product and thermosealing to the lower film all along the surface in contact with the lower film, thanks to pressure and heat, the product being closed hermetically between the two films. This process may also be accompanied by a vertical movement of the lower tool, which may also heat the lower film to enable sealing between both films around the contour of the product.

[0005] Skin packaging is performed in packaging machines adapted for such a purpose. A skin packaging machine comprises a loading station where the products to be packaged are disposed on the lower film, a preheating station where the upper film is heated, a sealing station where the upper film is bonded to the lower one by means of a sealing mould and a lower tool, the products being vacuum-packaged, and a cutting station, next to the sealing station, where the excess film is cut from the already packaged products by means of cutting tools, the individual packages being obtained.

[0006] Skin packaging machines generally advance the product in an intermittent manner, the product being static in each operation and being moved a constant distance in each advance.

[0007] The document EP 1594744 B1 discloses a skin packaging machine. The products reach a sealing station where they are vacuum packaged between two films by means of a dome-shaped mould.

BRIEF DISCLOSURE OF THE INVENTION

[0008] It is the object of the invention to provide a skin packaging machine, as described in the claims.

[0009] The skin packaging machine comprises a sealing member that acts on a product wrapped by a lower film and an upper film to close or bond the films to each other around the product and thereby vacuum-package said product between both films, and control means for causing the sealing member to move in order to package the product.

[0010] The sealing member defines at least one inner space where the product to be vacuum-packaged is disposed wrapped at least partially by the two films, and comprises at least one longitudinal first wall, a longitudinal second wall and a transverse wall between which the inner space is defined, and an opening facing the transverse wall.

[0011] Thanks to the characteristics of the sealing member it is possible to package products of different sizes without having to change the sealing member every time that the size of the product changes, which makes the machine more versatile. The duration of the process is also reduced, as it is not necessary to perform an upper vacuum operation in order to vacuum-bond the product, so that the speed of the machine is increased. Furthermore, the amount of film to be used may be reduced by supplying in an equidistant manner the products to be packaged, by adjusting the distance between the products to as little as possible, due to the fact that regardless of the size of the products, the opening of the sealing member allows their size to be adapted, so that when the sealing member is applied on a product said sealing member does not collide with a previous product that is larger in size.

[0012] These and other advantages and characteristics of the invention will be made evident in the light of the drawings and the detailed description thereof.

DESCRIPTION OF THE DRAWINGS

[0013]

Figure 1 shows a schematic view of an embodiment of the machine of the invention.

Figure 2 shows a schematic perspective view of a sealing member of a first embodiment of the machine.

Figure 3 shows a schematic perspective view of a sealing member of a second embodiment of the machine of the invention.

Figure 4 shows a schematic perspective view of a sealing member of a third embodiment of the machine of the invention.

Figure 5 shows a lateral cross-sectional view of a sealing member of the fourth embodiment of the machine of the invention, with an upper wall and a membrane expanded and adapted to the shape of the product.

Figure 6 shows a lower schematic perspective view of a sealing member of a fourth embodiment of the machine of the invention.

Figure 7 shows a lateral cross-sectional view of a sealing member of the fourth embodiment of the machine of the invention.

Figure 8 shows a schematic perspective view of a sealing member of a fifth embodiment of the machine of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0014] Figure 1 shows a schematic embodiment, by way of example, of a skin packaging machine 100. A skin packaging machine 100 is adapted to vacuum-package products 4. Generally, the product 4 is wrapped between a lower film 2 and an upper film 3, which are bonded to each other around the product 4 so that said product 4 is vacuum-wrapped, and in a vacuum operation a vacuum is generated between both films 2 and 3. The films 2 and 3 are wound on respective reels 20 and 30. Prior to this the upper film 3 may be heated by means of a heating plate 31 or equivalent member, as the lower film 2.

[0015] A skin packaging machine 100 comprises transport means, not shown in the figures, in order to transport the upper film 3 and the lower film 2 on which the products 4 to be packaged are disposed, a sealing station 7 where the products 4 are vacuum-packaged, and a cutting station 8, next to the sealing station 7, where the excess film 2, 3 is cut from the already-packaged products 4 originating from the sealing station 7. The transport means can correspond, for example, with pincers that hold and move the films 2 and 3, thereby moving said product 4, although they can correspond with another equivalent device or member, or even with a conveyor belt, a multi-belt conveyor or a positioning belt that supplies the products 4 to the machine 100 in a continuous or in an intermittent manner.

[0016] The machine 100 comprises a sealing member 1 and a sealing tool 9 in the sealing station 7, and the product 4 reaches the sealing station 7 disposed between both films 2 and 3. The film 2 is disposed on the sealing tool 9, which can comprise a substantially flat shape or another shape adapted to the sealing member 1 and which may also be heated, and the sealing member 1 acts on the product 4 wrapped by the films 2 and 3 to vacuum-package said product 4 between both films 2 and 3. The sealing member 1 moves towards the sealing tool 9, both cooperating with each other in order to package the product 4 between the films 2 and 3, and a vacuum operation is then performed to create a vacuum between both films 2 and 3. The machine 100 also comprises control means, not shown in the figures, to cause the movement of the sealing member 1 to package the product 4, and cutting means in the cutting station 8 to cut the film 2, 3 which exceeds from the already-packaged product 4 originating from the sealing station 7.

[0017] The sealing member 1 defines at least one inner space 10 where the product 4 to be packaged is disposed, wrapped by the two films 2 and 3, and comprises at least one longitudinal first wall 11, a longitudinal second wall 12 facing the longitudinal first wall 11, and a transverse wall 13 of the sealing member 1 disposed between both longitudinal walls 11 and 12, defining the inner space 10 between said walls 11, 12 and 13. The walls 11, 12 and 13 exert pressure on the films 2 and 3, forming a sealed closure and bonding them to each other. As a result, the vacuum between both films 2 and 3 can be created correctly so that the upper film 3 adapts to the contour of the product 4 and is bonded to the lower film 2 all along the surface in contact with said films 2 and 3, thanks to pressure and heat, the product 4 being vacuum-packaged between the two films 2 and 3. The sealing member 1 also comprises an opening 14 between both longitudinal walls 11 and 12 and facing the transverse wall 13.

[0018] If a product 4 that is smaller than the previously packaged product 4 is to be packaged, in the machines in the prior art the sealing member must be replaced by a sealing member that is adapted to the dimensions of the product to be packaged, or the new product disposed at a distance sufficiently large so that the sealing member does not collide with the previously packaged product, which involves, among other things, an excessive use of film, and is not always possible either. With a sealing member 1 such as the one proposed, this drawback is solved and the machine 100 can package products 4 of different sizes using a sealing member 1 (without it having to be replaced by another one of a different size), without

the risk of the sealing member 1 colliding with a previously packaged product 4 and thereby preventing the packaging of the new product 4, for example. In addition, as the risk of the sealing member 1 colliding with the previously packaged product 4 is removed, the distance between the different products 4 can be optimised to ensure reduced use of film 2, 3.

[0019] The machine 100 also comprises detection means, not shown in the figures, which detect the length of the product 4 to be packaged before the product 4 reaches the sealing station 7, and which are connected to the control means, the control means thereby being capable of synchronising the movement of the transport means and the sealing member 1 according to the length detected, in order to package said product 4. The detection means may correspond, for example, with a camera.

[0020] In the machine 100 of the invention a distance of separation D between two adjacent products 4 can also be optimised to reduce the amount of film 2, 3 required, so that the products 4 can access the sealing station 7 with a constant distance of separation D being maintained between two adjacent products 4 regardless of the length of each product 4. Subsequently it is possible to load a product 4 in the machine 100 in a manual or automated manner. When the product 4 is loaded in an automated manner the machine 100 comprises a loading system that may correspond with an automatic handling device, with an automatic positioning system (a multi-belt conveyor or a positioning device), or with an equivalent device or member, for example, which load the products 4 in a continuous or in an intermittent manner in the machine 100, and the detection means detect at least the size and the distance between at least two adjacent products 4, the control means acting on the loading system to ensure that the product 4 is supplied in the machine 100 with a preset minimum distance of separation D.

[0021] The products 4 can be supplied intermittently or continuously. When they are supplied intermittently, the advance of the transport means may be variable, depending on the length of the product 4 to be packaged, or constant. If the advance is variable, the sealing member 1 moves from a rest position to a bonding position P2 to bond the films 2 and 3 to each other with the product 4 in their interior, this movement being vertical. In the bonding position P2 the sealing member 1 cooperates with the sealing tool 9 to bond the films 2 and 3 to each other. Once the sealing has been completed the sealing member 1 moves back to its rest position, and the cycle is performed once more for the following product 4. If the advance is constant, the sealing member 1 moves in a advance direction X to be adapted to the different lengths of the different products 4, in the sense of advance of the product 4 or in the opposite sense as required. The horizontal movement is performed from the rest position, and moves vertically to the bonding position P2 when the sealing member 1 is on the product 4 to be packaged, so that the transverse wall 13 bonds the films 2 and 3 to each other, between said product 4 and the next one to be packaged. The sealing member 1 then detaches from the sealing tool 9 and returns to the rest position or to the horizontal position required to package the next product 4. The control means have the function of synchronising the movements of the transport means and the sealing member 1 to perform the sealing correctly, in all cases.

[0022] When the products 4 are supplied in a continuous manner, the sealing member 1 moves from the rest position to the bonding position P2 vertically, and then moves in the advance direction X in the sense of advance of the product 4, accompanying the product 4 so that the sealing is performed correctly. It then returns to the rest position and the operation is repeated so that the next product 4 may be packaged. The control means have the function of synchronising the movements of the transport means and the sealing member 1 to perform the sealing correctly, in all cases.

[0023] In a first embodiment of the machine 100, the sealing member 1 corresponds with a sealing mould 1 and comprises a substantially U-lying shape, as shown in Figure 2. When the sealing member 1 moves towards the sealing tool 9, the product 4 is disposed in a sealed space defined by the inner space 10 and the previously packaged product 4, thereby enabling the sealing of the films 2 and 3 around the product 4 by means of at least one lower vacuum and heat.

[0024] In a first configuration of the first embodiment the transverse wall 13 of the sealing member 1 is fixed in relation to the longitudinal walls 11 and 12.

[0025] In a second configuration of the first embodiment, the transverse wall 13 of the sealing member 1 is mobile in relation to the longitudinal walls 11 and 12. The second configuration is adapted for the case in which the products are supplied in an intermittent manner with a constant advance, and instead of moving the sealing member 1 in the advance direction X to be adapted to the different lengths of the different products 4, the control means cause the movement in the advance direction X of the transverse wall 13 and cause the movement of the sealing member 1 only vertically.

[0026] In a second embodiment of the machine 100 the sealing member 1 comprises, in addition to the walls 11, 12 and 13, at least one intermediate longitudinal wall 19 that is disposed between the longitudinal walls 11 and 12, which comprises a length substantially equal to the length of the longitudinal walls 11 and 12, and which is substantially parallel to the longitudinal walls 11 and 12, as shown in the example of Figure 3. With the intermediate longitudinal wall 19 the sealing member 1 defines at least two inner spaces 10 disposed in parallel, a product 4 being disposed in each inner space 10 in order to be vacuum-packaged between both films 2 and 3. As a result, two or more products 4 may be packaged simultaneously in a single machine 100. The inner spaces 10 are separated from each other by intermediate longitudinal walls 19, the sealing member 1 comprising a sub-

stantially inverted E shape when it defines two inner spaces 10 and so on.

[0027] In a first configuration of the second embodiment, the intermediate longitudinal walls 19 are connected to the transverse wall 13 and said walls 19 and 13 are fixed in relation to the longitudinal walls 11 and 12.

[0028] In a second configuration of the second embodiment, the transverse wall 13 is mobile in relation to the longitudinal walls 11 and 12 in the advance direction X, as is the case in the second configuration of the first embodiment. In this case the intermediate longitudinal walls 19 may be connected to the transverse wall 13 and move in conjunction with it, or they may be fixed in relation to the longitudinal walls 11 and 12, the sealing member 1 comprising a transverse wall 13 for each inner space 10 in this latter case.

[0029] In a third embodiment of the machine 100 the sealing member 1 comprises, in addition to the walls 11, 12 and 13, at least one additional transverse wall 18 that is disposed transversally between the longitudinal walls 11 and 12, which comprises a length substantially equal to the length of the transverse wall 13, and which is substantially parallel to the transverse wall 13, as shown in the example of Figure 4. With the additional transverse wall 18 the sealing member 1 defines at least two inner spaces 10 disposed in series, a product 4 being disposed in each inner space 10 to be vacuum-packaged between both films 2 and 3. As a result, two or more products 4 may be packaged simultaneously in a single machine 100. The inner spaces 10 are separated from each other by additional transverse walls 18.

[0030] In a first configuration of the third embodiment, the additional transverse wall 18 is mobile in relation to the longitudinal walls 11 and 12 in the advance direction X, as is the case in the second configuration of the first embodiment with the transverse wall 13. The transverse wall 13 is fixed in relation to the longitudinal walls 11 and 12.

[0031] In a second configuration of the third embodiment, the additional transverse wall 18 is connected without freedom of movement to the longitudinal walls 11 and 12, and the transverse wall 13 is mobile in relation to the longitudinal walls 11 and 12 in the advance direction X, as is the case in the second configuration of the first embodiment.

[0032] In a third configuration of the third embodiment, the transverse walls 13 and 18 are mobile in relation to the longitudinal walls 11 and 12, independent to each other, the sealing member 1 thereby being adapted to the different lengths of the different products 4 to be packaged without said sealing member having to move in the advance direction X.

[0033] In the three embodiments described and in any of their respective configurations, the sealing member 1 may additionally comprise an upper wall 15' that may also be heated.

[0034] In the three embodiments described and in any of their respective configurations, additionally the sealing member 1 may also comprise an upper member, not shown in the figures, which covers the inner space 10 and which is flexible so it may be adapted to the shape of the product 4 and thereby adapt the upper film 3 to said shape, reducing the volume of air that is extracted in the vacuum operation and enabling the sealing between both films 2 and 3, as a result of which the sealing time is reduced. The upper member may correspond with a sponge or with an expandable membrane 50, for example. Figure 5 shows an example of a sealing member 1 according to the first embodiment, with an upper wall 15' and an expanded membrane 50 adapted to the shape of the product 4.

[0035] Depending on the size and the shape of the product (or products) to be packaged, it may be sufficient to use a sealing member 1 such as the one described for the first embodiment, for the second embodiment and for the third embodiment, in particular in packaging products 4 of a reduced size. However, when the products 4 to be packaged are large or comprise irregular shapes, the sealing members 1 described in the three preceding embodiments are not optimal for packaging these types of products 4, due mainly to the fact that a more efficient vacuum operation must be performed in the sealing station 7 so that the films 2 and 3 are properly adapted to the shape of the product 4 to be packaged, generally an upper vacuum on the upper film 3.

[0036] In a fourth embodiment of the machine 100, the sealing member 1 is similar to that of the first embodiment, though it also comprises an upper wall 15 and a transverse moving wall 16 that is substantially parallel to the transverse wall 13, as shown by way of example in Figure 6. The inner space 10 is delimited in this case by the walls 11, 12, 13, 15 and 16 and is thus closed in a sealed manner, so that an upper vacuum may be formed on the upper film 3 in the inner space 10 in order to package the product 4. The transverse moving wall 16 is adapted to move in the advance direction X, moving closer to or away from the transverse wall 13 to reduce or increase the volume of the inner space 10, reducing or increasing the distance between the walls 13 and 16 and thereby adapting the length of the inner space 10 to the length of the product 4 to be packaged. The sealing member 1 comprises sealing means 17 shown by way of example in Figure 7, between the transverse moving wall 16, the corresponding longitudinal wall 11 and 12 and the upper wall 15, so that between the walls 11, 12, 15 and 16 a sealed closure is generated. The sealing means 17 are connected to the transverse moving wall 16 and move in conjunction with said transverse moving wall 16, and in their preferred embodiment are adapted to be enlarged or inflated when the transverse moving wall 16 is in the necessary position for thereby ensuring the sealed closure. The upper wall 15 comprises a length substantially equal to the length of the longitudinal walls 11 and 12.

[0037] In the fourth embodiment the control means also cause the movement of the transverse moving wall

16 according to the length of the product 4 to be packaged, the inner space 10 thereby being adapted to each product 4. As is the case in the three aforementioned embodiments, in the fourth embodiment the machine 100 may package products 4 of different sizes using a single sealing member 1 (without it having to be replaced with another of a different size), without the risk of the sealing member 1 colliding with a previously packaged product 4 and thereby preventing the packaging of the product 4, the moving wall 16 only moving when necessary. In addition, in removing the risk of the sealing member 1 colliding with the previously packaged product 4 the distance between the different products 4 may be optimised to obtain a reduced use of film 2, 3.

[0038] In a first configuration of the fourth embodiment of the machine 100, the sealing member 1 comprises a shape similar to that of the sealing member 1 of the third embodiment but also including an upper wall 15, and more specifically corresponds with the first configuration of the third embodiment with the difference that it also includes the upper wall 15 and that only one product 4 may be packaged each time instead of two in series, as an upper vacuum is required, which is only possible in the inner space 10 defined between the walls 11, 12, 13, 15 and 16.

[0039] In a second configuration of the fourth embodiment of the machine 100, the sealing member 1 is equal to that of the first configuration but the transverse wall 13 may also move in relation to the longitudinal walls 11 and 12 in the advance direction X, in one sense or another. The second configuration is adapted for the case in which the products 4 are supplied in an intermittent manner with a constant advance, and instead of moving the sealing member 1 in the advance direction X in order to adapt it to the different lengths of the different products 4, the control means cause the movement in the advance direction X of the transverse wall 13 and cause the movement of the sealing member 1 only vertically. The transverse walls 13 and 16 may also move independently to each other, depending on the length of the product 4 to be packaged.

[0040] In a third configuration of the fourth embodiment of the machine 100, the sealing member 1 is equal to that of the first configuration but comprises a plurality of transverse moving walls 16, so that a plurality of products 4 may be packaged in series (as many products 4 as transverse moving walls 16). The sealing member 1 defines a plurality of inner spaces 10 disposed in series and separated by the transverse moving walls 16. The transverse moving walls 16 may also move independently to each other, depending on the length of the corresponding product 4 to be packaged. The control means have the function of controlling the movements of the transverse moving walls 16.

[0041] In a fourth configuration of the fourth embodiment of the machine 100, the sealing member 1 is equal to that of the third embodiment but the transverse wall 13 may also move in relation to the longitudinal walls 11 and 12 in the advance direction X, in one sense or the other. The fourth configuration, as is the case in the second, is adapted for the case in which the products 4 are supplied in an intermittent manner with a constant advance, and instead of moving the sealing member 1 in the advance direction X in order to adapt it to the different lengths of the different products 4, the control means cause the movement in the advance direction X of the transverse wall 13 and cause the movement of the sealing member 1 only vertically. The transverse walls 13 and 16 may also move independently to each other, depending on the length of the products 4 to be packaged.

[0042] In a fifth embodiment of the machine 100 the sealing member 1 is similar to that of the fourth embodiment, in any of its configurations, but it also comprises at least one intermediate longitudinal wall 19 that is disposed between the longitudinal walls 11 and 12, which comprises a length substantially equal to the length of the longitudinal walls 11 and 12, and which is substantially parallel to the longitudinal walls 11 and 12, as shown by way of example in Figure 8. With the intermediate longitudinal wall 19 the sealing member 1 defines at least two inner spaces 10 disposed in parallel, the product 4 being disposed in each inner space 10 in order to be vacuum-packaged between both films 2 and 3. As a result, two or more products 4 may be packaged simultaneously in a single machine 100.

[0043] In a first configuration of the fifth embodiment, the intermediate longitudinal walls 19 are connected to the transverse wall 13 and said walls 19 and 13 are fixed in relation to the longitudinal walls 11 and 12.

[0044] In a second configuration of the fifth embodiment, the transverse wall 13 is mobile in relation to the longitudinal walls 11 and 12 in the advance direction X, as is the case in the second configuration of the first embodiment. In this case the intermediate longitudinal walls 19 may be connected to the transverse wall 13 and move in conjunction with it, or they may be fixed in relation to the longitudinal walls 11 and 12, the sealing member 1 comprising a transverse wall 13 for each inner space 10 in this latter case.

[0045] In the fifth embodiment, in any of its embodiments, the transverse moving wall 16 may move in relation to the intermediate longitudinal walls 19 in the advance direction X.

[0046] In embodiments four and five the sealing member 1 may also comprise an upper member, not shown in the figures, which covers at least the upper part of the inner space 10 and which is adapted to the shape of the product 4 to be packaged when the sealing member 1 acts on the product 4 to package it. The upper member may correspond with a sponge or with an expandable membrane, for example, and is disposed beneath the upper wall 15, generally connected to the upper wall 15.

[0047] In any of the embodiments of the machine 100, the machine 100 also comprises a cutting station 8 as described, with cutting means. The cutting means may correspond to a laser, a water jet, a cutting wire or an

equivalent member that is supported in a movement device on X-Y axes or equivalent and, controlled by the control means, they may move along the contour of the product 4 to remove the excess film 2, 3 of the product 4 once it has been vacuum-packaged in the sealing station 7. In this case the detection means may also be adapted to detect the shape of the product 4 to be packaged, in addition to its length, and the control means control the movement of the cutting tool 80 according to the shape detected. Instead of using the same detection means to detect the length of the products 4 and their shape, the machine 100 may comprise additional detection means for detecting the shape, which are disposed between the sealing 7 and cutting 8 stations. As a result, a package adapted to the shape of the product 4 is obtained, or even a package adapted to the shape of the product 4 along a specific contour and another area with a different predetermined format, such as an area for the labelling of the product 4 for example.

[0048] The cutting means may comprise, instead of the laser, the water jet or the cutting wire, a transverse cutting tool 80 and a longitudinal cutting tool 81, a rectangular package being obtained as a result. The longitudinal cutting tool 81 is in charge of removing the excess film 2, 3 from the sides of the package, while the transverse cutting tool 80 is in charge of removing the excess film 2, 3 on the front of the package. The cutting tools 80 and 81 may be fixed or they may move in the advance direction X according to the length of the package, in one direction or another, depending on whether the supply of the products to the sealing station 7 is continuous, intermittent with constant advance, or intermittent with variable advance.

[0049] In another embodiment not shown in the figures, the sealing member 1 corresponds with a sponge or flexible membrane that adapts to the shape of the product, the walls 11, 12 and 13 corresponding with surfaces of the sponge or membrane. These surfaces have at least one area that is sufficiently rigid to form a sealed closure between the films 2 and 3 when the sealing member 1 cooperates with the sealing tool 9 to package a product 4.

Claims

1. Skin packaging machine comprising a sealing member (1) that acts on a product (4) wrapped by a lower film (2) and an upper film (3) in order to bond the films (2, 3) to each other around the product (4) and thereby vacuum-package said product (4) between both films (2, 3), and control means for causing the sealing member (1) to move in order to package the product (4), **characterised in that** the sealing member (1) defines at least one inner space (10) where the product (4) to be vacuum-packaged is disposed wrapped at least partially by the two films (2, 3), and comprises at least one longitudinal first wall (11), a longitudinal second wall (12) and a transverse wall (13) between which the inner space (10) is defined, and an opening (14) between both longitudinal walls (11, 12) and facing the transverse wall (13).

2. Machine according to claim 1, wherein the sealing member (1) comprises a plurality of inner spaces (10) in series in relation to a advance direction (X), the sealing member (1) comprising, between the two longitudinal walls (11, 12), at least one additional transverse wall (18) that comprises a length substantially equal to the length of the transverse wall (13) and which extends parallel to the transverse wall (13), each two adjacent inner spaces (10) being separated from each other by means of an additional transverse wall (18) and at least one of the transverse walls (13, 18) being mobile in relation to the longitudinal walls (11, 12) in the advance direction (X) according to the length of the products (4) to be packaged.

3. Machine according to any of the preceding claims, wherein the sealing member (1) comprises an upper wall (15') that can be heated.

4. Machine according to claim 1, wherein the sealing member (1) also comprises an upper wall (15) that covers the space delimited between the longitudinal walls (11, 12) and the transverse wall (13), and a transverse moving wall (16) that is substantially parallel to the transverse wall (13), which is disposed between the longitudinal walls (11, 12), and which is movable in relation to the longitudinal walls (11, 12) in the advance direction (X), moving closer to or away from the transverse wall (13) according to the length of the product (4) to be packaged, the inner space (10) being defined between the longitudinal walls (11, 12), the transverse walls (13, 16) and the upper wall (15) and the length of the inner space (10) being adapted according to the length of the product (4) to be packaged by means of the movement of the transverse moving wall (16).

5. Machine according to claim 4, wherein the sealing member (1) comprises sealing means (17) between each longitudinal wall (11, 12) and the corresponding moving wall (16), which are attached to the moving wall (16) and move in conjunction with said moving wall (16), and which are adapted to be enlarged or inflated when the moving wall (16) is in the required position.

6. Machine according to claims 4 or 5, wherein the sealing member (1) comprises a plurality of inner spaces (10) in series in relation to the advance direction (X), the sealing member (1) comprising, for each inner space (10), a transverse moving wall (16), each inner space (10) being delimited longitudinally between two transverse moving walls (16) or between a trans-

verse moving wall (16) and the transverse wall (13).

7. Machine according to any of the preceding claims, wherein the sealing member (1) comprises a plurality of inner spaces (10) in parallel in relation to a advance direction (X), the sealing member (1) comprising, between the two longitudinal walls (11, 12), at least one intermediate longitudinal wall (19) that comprises a length substantially equal to the length of the longitudinal walls (11, 12) and which extends parallel to the longitudinal walls (11, 12), each two adjacent inner spaces (10) being separated from each other by means of an intermediate longitudinal wall (19).

8. Machine according to claim 7, wherein the transverse wall (13) is mobile in relation to the longitudinal walls (11, 12) in a advance direction (X), the control means causing the movement of the transverse wall (13) according to the length of the product (4) to be packaged at each time, the intermediate longitudinal wall (19) being attached to the transverse wall (13) and the intermediate longitudinal wall (19) moving in conjunction with the transverse wall (13).

9. Machine according to any of claims 1 to 7, wherein the transverse wall (13) is mobile in relation to the longitudinal walls (11, 12) in a advance direction (X), the control means causing the movement of the transverse wall (13) according to the length of the product (4) to be packaged at each time.

10. Machine according to any of the preceding claims, wherein the sealing member (1) also comprises an upper member that covers at least the upper part of the inner space (10) and which is adapted to the shape of the product (4) to be packaged when the sealing member (1) acts on the product (4) to package it.

11. Machine according to any of the preceding claims, comprising detection means that are communicated to the control means and which detect at least the length of the product (4) to be packaged before said product (4) is in an inner space (10) defined by the sealing member (1).

12. Machine according to claim 11, comprising a sealing station (7) where the sealing member (1) is disposed and transport means that transport the products (4) to the sealing station (7), the sealing member (1) being fixed in the machine (100) with freedom of vertical movement, it being moved vertically between a rest position and a bonding position (P2) to package the products (4), the control means being adapted to cause the movement of the sealing member (1) and to cause the actuation of the transport means according to the detected length of the corresponding product (4).

13. Machine according to claim 12, comprising a sealing station (7) where the sealing member (1) is disposed and transport means that transport the products (4) to the sealing station (7), the sealing member (1) being adapted to move vertically and horizontally between a rest position and a bonding position (P2) to package the products (4), the control means being adapted to cause the actuation of the transport means and to cause the sealing member (1) to move according to the detected length of the corresponding product (4).

14. Machine according to claims 12 or 13, comprising a cutting station (8) with cutting means adapted to cut the film (2, 3) which exceeds from an already packaged product (4), the detection means also being adapted to detect the shape of the contour of the packaged product (4) or of the product (4) to be packaged, and the control means being adapted to act on the cutting means so that they cut the film (2, 3) which exceeds around the corresponding product (4) according to the shape of the contour of the detected product (4).

15. Machine according to claims 12 or 13, comprising a cutting station (8) with cutting means adapted to cut the film (2, 3) which exceeds from an already-packaged product (4), and additional detection means disposed between the sealing station (7) and the cutting station (8) to detect the shape of the contour of the packaged product (4) or of the product (4) to be packaged, and the control means being adapted to act on the cutting means so that they cut the film (2, 3) which exceeds around the corresponding product (4) according to the shape of the contour of the detected product (4).

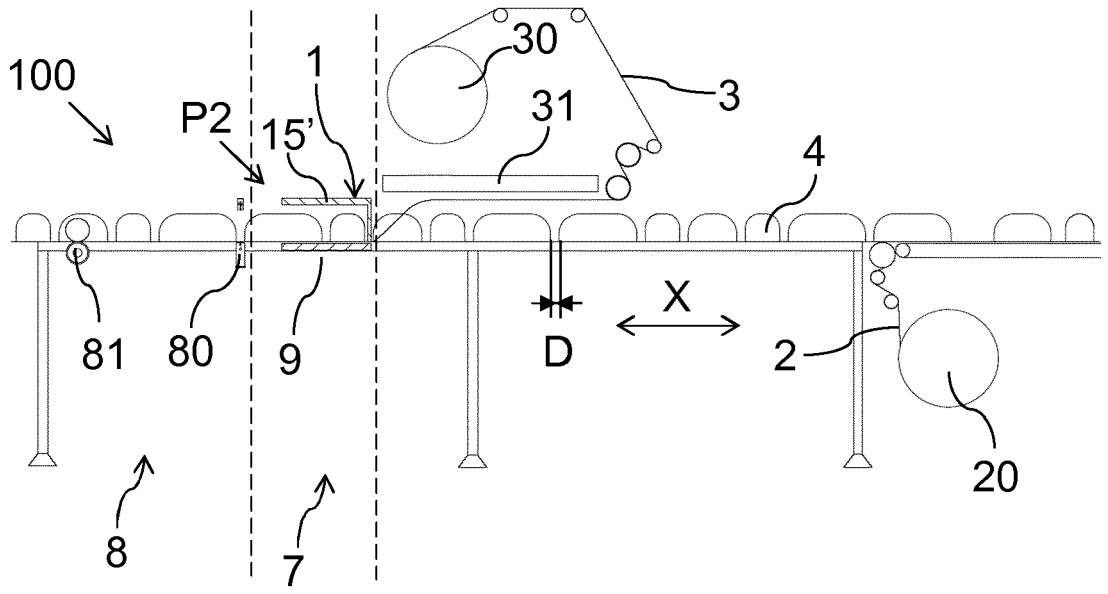

FIG. 1

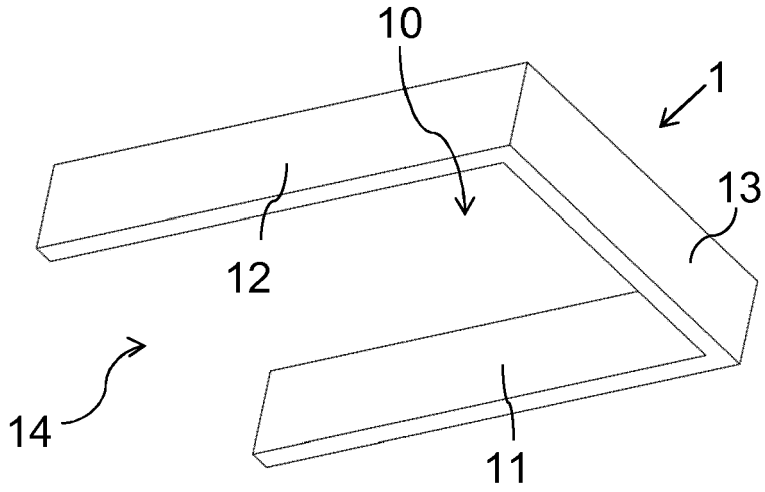

FIG. 2

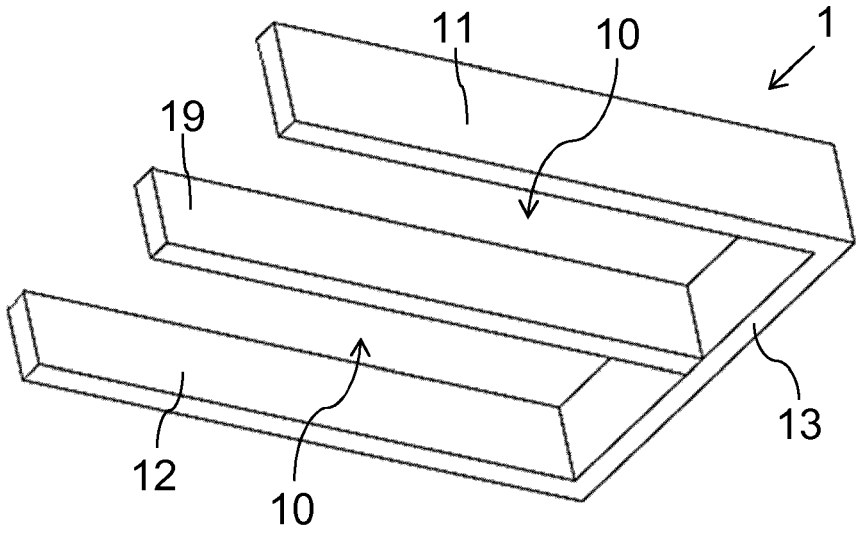

FIG. 3

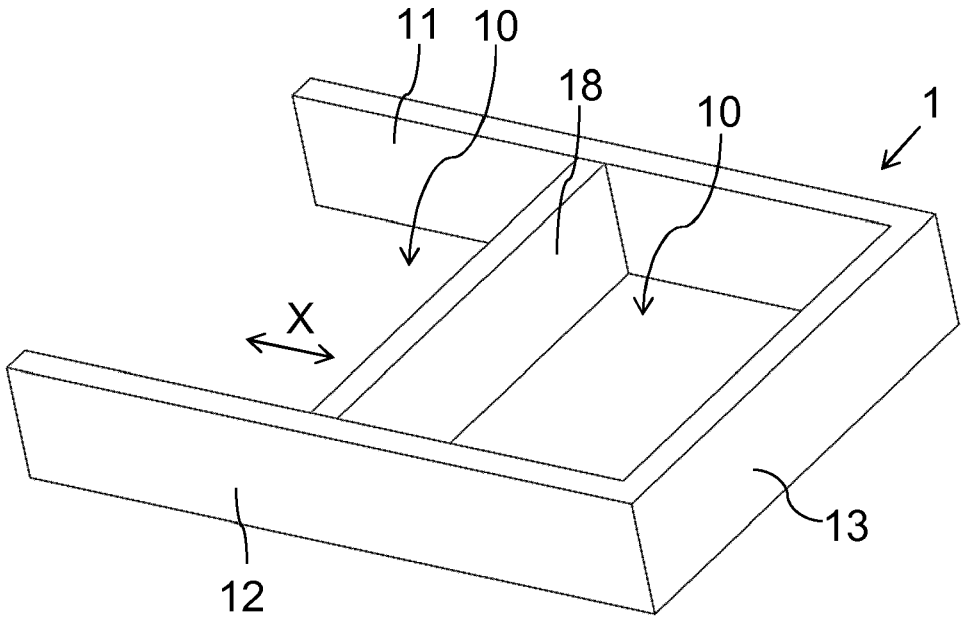

FIG. 4

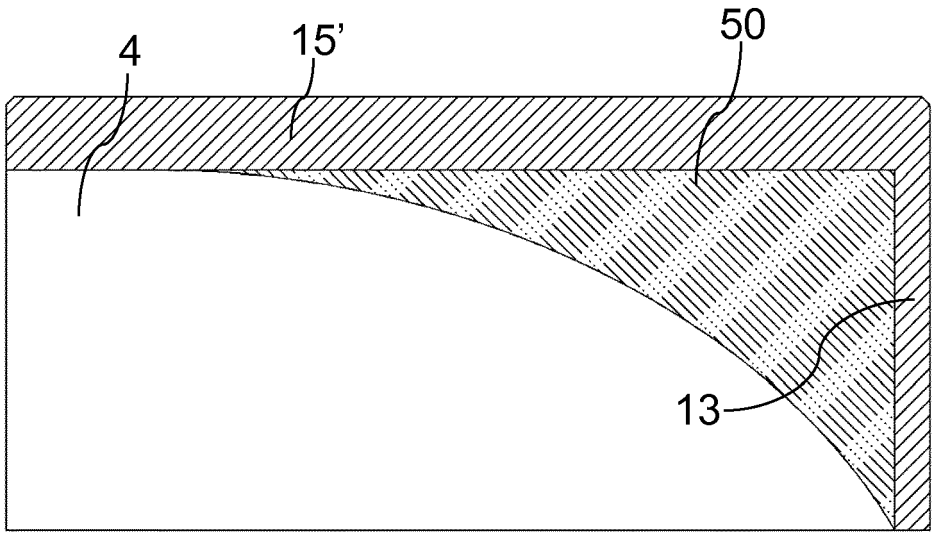

FIG. 5

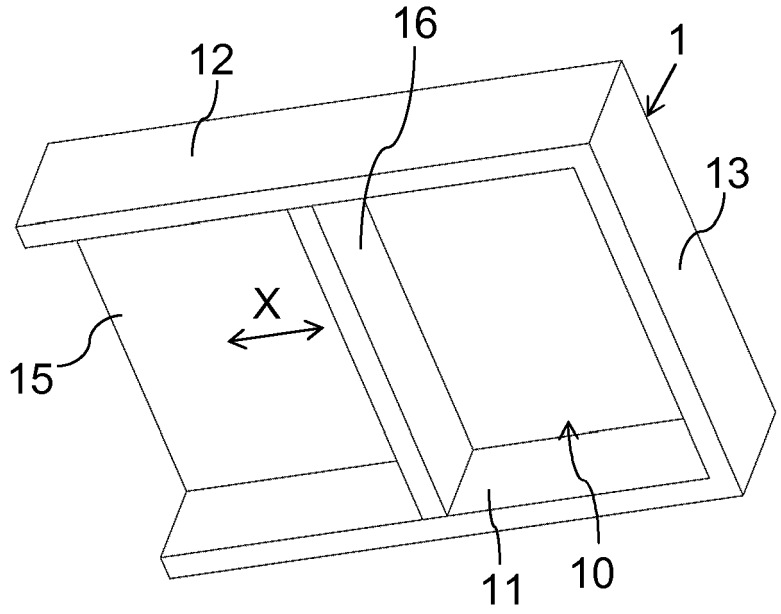

FIG. 6

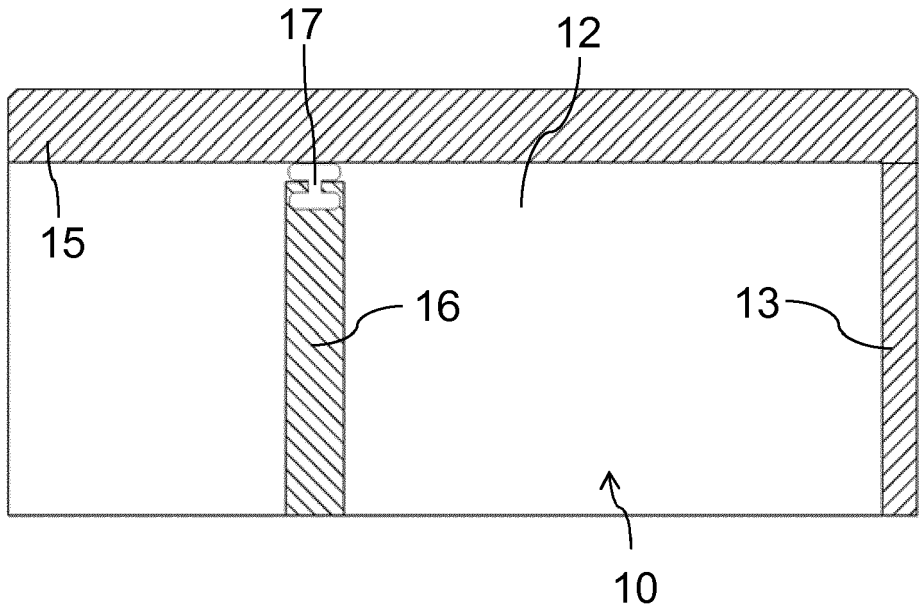

FIG. 7

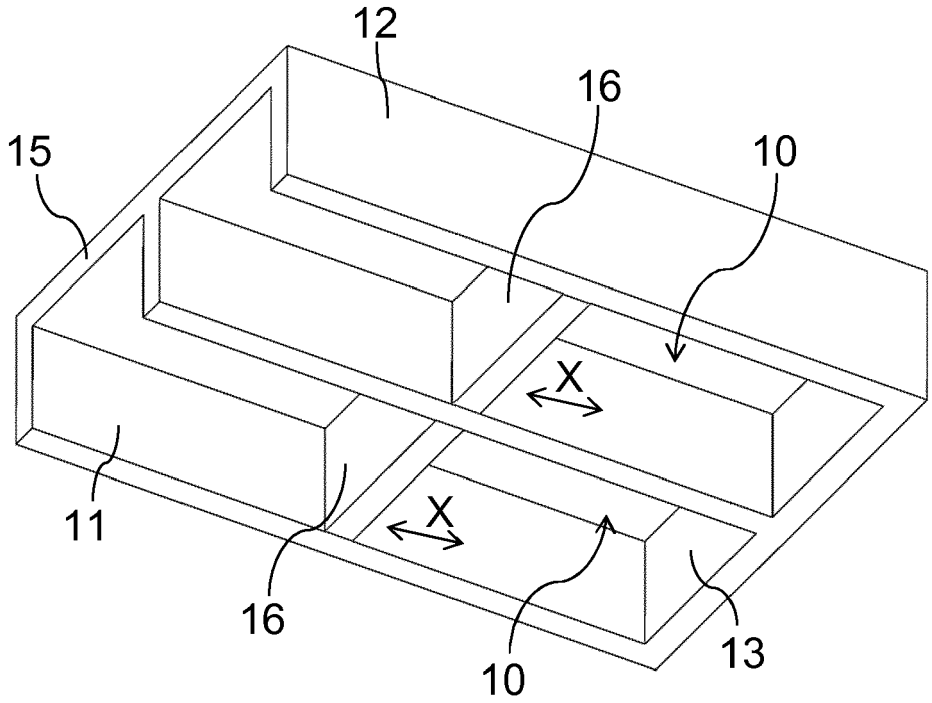

FIG. 8

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EUROPEAN SEARCH REPORT

Application Number
EP 12 38 2316

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 3 740 237 A (GRINDROD P ET AL) 19 June 1973 (1973-06-19) * figure 6 * -----	1,10,11	INV. B65B9/04 B65B11/52 B65B59/00 B65B51/10

TECHNICAL FIELDS SEARCHED (IPC)

B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	12 February 2013	Ungureanu, Mirela

CATEGORY OF CITED DOCUMENTS

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12-02-2013

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US 3740237 A	19-06-1973	NONE	

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- EP 1594744 B1 **[0007]**