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(54) Device for detaching an envelope around an object

(57) Device for detaching an enveloping, particularly a foil, that is situated around an object (2), particularly a foil-ripened cheese, wherein the device comprises introduction means (31) for piercing the enveloping from an outside of the enveloped object at an introduction location for introducing a fluid at that location between the object and the enveloping, as well as first and second detaining means (9,34) for in between them detaining the enveloping.

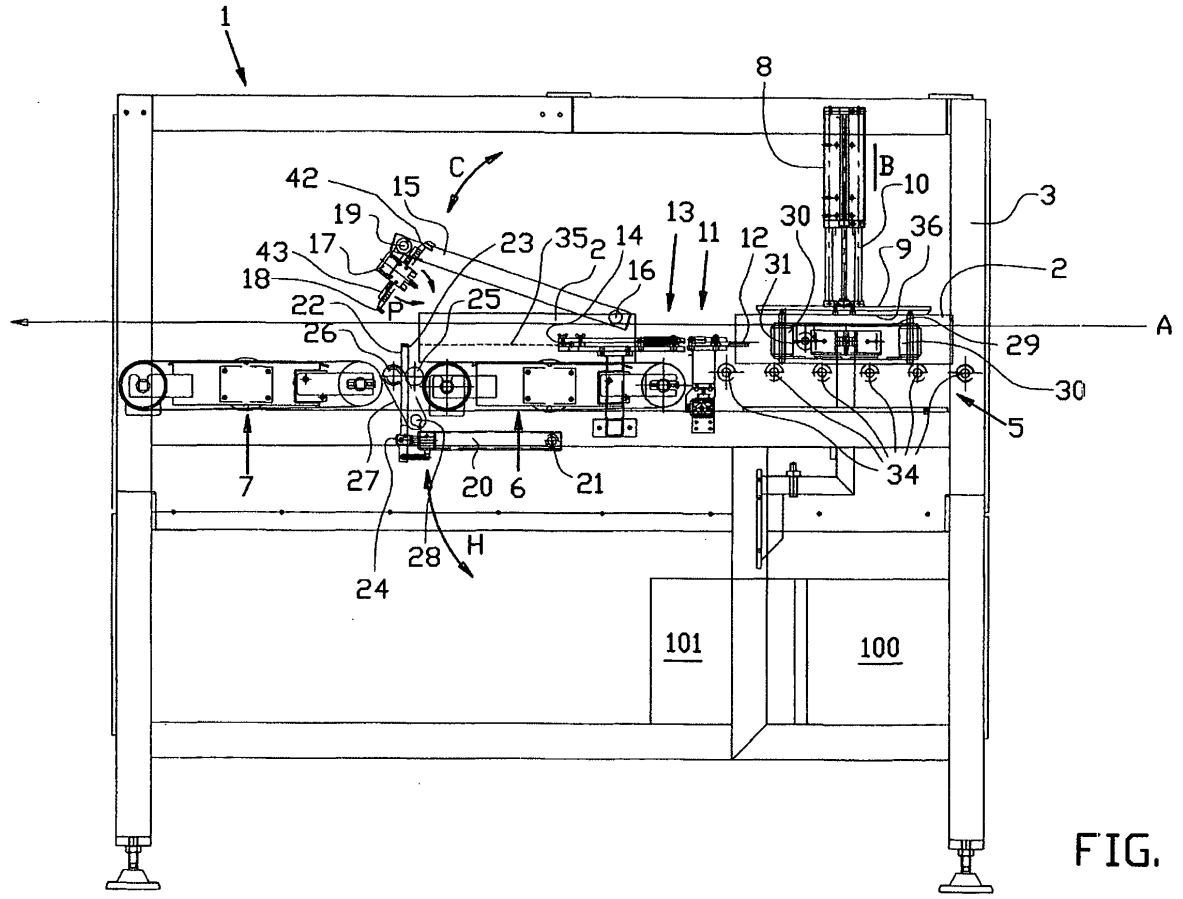

FIG. 1

EP 1 837 280 A1

Description

[0001] The invention relates to a device for detaching an enveloping, particularly a foil, situated around an object, particularly a foil-ripened cheese.

[0002] In case of foil-ripened cheese the foil is usually formed by a vacuum formed thin-walled rectangular synthetic tray into which the cheese is introduced, for instance by pouring, after which the tray is covered with a sheet of foil that is sealed closed at the upper edge of the tray. The cheese will strongly adhere to the foil in the course of the ripening process. When the foil has to be removed after the cheese has ripened for instance to be processed into slides, the foil first needs to be detached from the cheese in order to prevent that cheese is torn away by the foil and/or torn pieces of foil are left behind on the cheese.

[0003] A suitable device for detaching the foil around the cheese comprises piercing pins with which the foil is pierced in order to subsequently blow air in between the foil and the cheese. The foil will then bulge and partially detach from the cheese. The blow-up foil can subsequently be cut all round and removed from the cheese. A drawback of such a device, however, is that the thin-walled foil when being blown up tends to bulge excessively along predominantly one part, such as a top surface of the cheese that is free or not supported, whereas the foil hardly if at all detaches at corner areas of the cheese. When subsequently removing the foil pieces of cheese can still be torn away by the foil or torn pieces of foil are left behind on the cheese.

[0004] It is an object of the invention to provide a device for detaching an enveloping, particularly a foil, that is situated around an object, particularly a foil-ripened cheese, wherein the enveloping can be properly detached substantially around the object, particularly in its corner areas.

[0005] It is an object of the invention to provide a reliably operating device for detaching an enveloping, particularly a foil, that is situated around an object, particularly a foil-ripened cheese.

[0006] It is an object of the invention to provide a simple device for detaching an enveloping, particularly a foil, that is situated around an object, particularly a foil-ripened cheese.

[0007] It is an object of the invention to provide a device for detaching an enveloping, particularly a foil, that is situated around an object, particularly a foil-ripened cheese, wherein damage to the object when removing the enveloping can be prevented.

[0008] According to a first aspect the invention provides a device for detaching an enveloping, particularly a foil, that is situated around an object, particularly a foil-ripened cheese, wherein the device comprises introduction means for piercing the enveloping from an outside of the enveloped object at an introduction location for introducing a fluid at that location between the object and the enveloping, as well as first and second detaining means for in between them detaining the enveloping.

[0009] By detaining the enveloping by means of the detaining means introduced fluid can be redistributed between the object and the enveloping, particularly to the areas where this is necessary. Due to this redistribution the enveloping can really be detached around the object, particularly also in the corner areas of the object.

[0010] Preferably the first and/or second detaining means are movable towards and away from the object, wherein the device further comprises means for driving the first and/or second detaining means towards the object, preferably in a thrusting motion. The enveloping can quickly be detached from all around the object, without contact of the first and/or second detaining means all around the object being necessary.

[0011] Alternatively formulated the device can be adapted for detainingly pressing the enveloping by relative motion of the first or second detaining means after introducing the fluid, preferably in an accelerated motion.

[0012] Preferably the device is adapted for during introduction of fluid keeping or bringing the first and/or second detaining means at a distance from the object.

[0013] Movement of the object with respect to the first and second detaining means is counteracted when the first and second detaining means are operative in opposite direction.

[0014] In as regards construction simple embodiment, the detaining means detain the enveloping at a distance from the introduction location, preferably at another side than the one where the introduction location is located.

[0015] When the first and/or second detaining means are at least partially provided with a shape corresponding with the shape of the object, local excessive bulging of the enveloping when introducing the fluid can easily be counteracted.

[0016] When the first and/or second detaining means have an engagement part of which the main dimensions are smaller than the main dimensions of a side of the object detained by means of the engagement part, the edge areas of the detained side of the object can remain free as a result of which the enveloping can be properly detached there.

[0017] Preferably the first and/or second detaining means have flat press surfaces, such as plate surfaces which preferably are parallel to each other, so that block-shaped objects can be properly treated, such as for instance the in practice usual rectangular blocks of foil-ripened cheese wherein the foil around the cheese needs to be detached in order to counteract tearing of the foil. A plate surface is surface resembling a plate having a plane extending substantially continuously in two directions that are perpendicular to each other.

[0018] Objects of various dimensions can be processed by the device when the first and second detaining means are moveable towards each other.

[0019] Preferably the device is adapted for introducing the fluid after the first and/or second detaining means have detainingly engaged onto the enveloping, wherein

a pressure or force exerted on the enveloping by the detaining means is adjusted to a pressure or force exerted on the detaining means by an enveloping brought at fluid pressure, such that the enveloping detained can be lifted from the object. An advantage thereof is that the fluid when it is introduced is forced to first discharge parts of the enveloping that are pressed on, after which due to the adjusted pressure or force the pressed on parts of the enveloping can subsequently be detached in a controlled manner. Tearing the foil is thus counteracted.

[0020] The adjustment of the forces or pressures is simple when the pressure or force that is exerted on the enveloping by the detaining means is adjustable.

[0021] Alternatively or additionally the device is adapted for detainingly pressing the enveloping by relative motion of the first or second detaining means after introducing the fluid. The enveloping can be pulled away from the object in one pressing motion.

[0022] Preferably the introduction location is situated in a longitudinal direction of the object spaced apart from a front side of the object over a distance that is 10 to 30% of a length of the object in said longitudinal direction. An advantage of said asymmetrical position of the introduction location is that in case of objects having flat outer sides the detachment can be started outside of the middle of the flat outer sides, as a result of which the necessary pressure on the fluid can remain limited and bulging of the enveloping in the middle of the flat outer sides is counteracted.

[0023] Preferably the device comprises carrier means for carrying the object.

[0024] In a simple embodiment the carrier means provide the first or second detaining means, wherein preferably one of the first or second detaining means is stationary and the other of the first or second detaining means is able to move with respect to the stationary detaining means.

[0025] When the carrier means comprise a number of carrier members placed with intermediate space, the enveloping, despite the weight of the object, is able to move freely between the carrier members in order to be detached from the object.

[0026] The discharge can be carried out processwise when the carrier means are adapted for transporting the object through the device according to a transport path.

[0027] In that case the introduction means and the first and second detaining means can be situated at the first transport path.

[0028] Envelopings around objects of various dimensions can be detached from the objects when the introduction means are movable away from and towards the object.

[0029] The fluid can simply be brought in between the object and the enveloping when the introduction means comprise a hollow pin, wherein the hollow pin comprises a nozzle at a distal end. The hollow pin easily pierces the enveloping when the hollow pin tapers.

[0030] Damage to the object when pressing it can be prevented when the device comprises centring means for centring the object with respect to the first and second detaining means.

[0031] The position of the object with respect to the detaining means can be secured when the centring means comprise first and second stops that are mutually movable towards each other for clampingly centring the object.

[0032] In a simple embodiment the introduction means are provided at the centring means, so that the centring means and the introduction means can be simultaneously brought towards the object.

[0033] When the device furthermore comprises a pneumatic or hydraulic drive means for driving the first and/or second detaining means, the first and second detaining means are easy to move towards each other according to a straight line.

[0034] After detaching it from the object, the enveloping can be removed when the device comprises cutting means for cutting through the enveloping partially around the object.

[0035] The enveloping can be removed from the object by the device itself when the device comprises engagement means for engaging onto the at least partially cut-through enveloping and separating the enveloping and the object.

[0036] Removed envelopings can be collected when the device comprises removal means for removing the enveloping that is at least partially cut through all round and at least partially separated from the object.

[0037] In an effective embodiment the centring means, and/or cutting means, and/or the engagement means and/or the removal means are situated at the transport path.

[0038] Preferably the cutting means cut through the enveloping in transport direction. An advantage thereof is that the enveloping after cutting through remains one unity and as a result can be removed as a whole from the object, for instance by turning in one continuous motion. Such a turning motion can be effected when the engagement means comprise pins that are movable transverse to the transport direction from a position in the transport path to a position beyond the transport path, and which with a distal end are able to insert into the enveloping in a direction opposite the transport direction. In that case the pins are able to insert into the enveloping due to transport of the object through the device and subsequently pull away the enveloping from the object transverse to the transport direction.

[0039] In a simple embodiment the pins are provided at two arms that are situated opposite each other on either side of the transport path. The partially cut-through enveloping can thus be pulled away from the object from two sides simultaneously and at passage of the object be turned with respect to the object.

[0040] In that case the removal means can comprise two abutting rollers that are situated along the transport path, wherein the engagement means are adapted for

bringing the enveloping in between the rollers.

[0041] The invention further provides, according to a further aspect, a method for detaching an enveloping, particularly a foil, that is situated around an object, particularly a foil-ripened cheese, wherein the method comprises the following steps:

a) piercing the enveloping for providing an introduction location through the enveloping;
b) introducing a fluid between the object and the enveloping at the introduction location;
c) at several sides detaining the enveloping from the outside of the object.

[0042] By detaining the enveloping the fluid can be redistributed around the object in order to effect detachment of the enveloping around the object, particularly at the corner areas of the object and/or the enveloping.

[0043] Preferably detaining the enveloping from the outside of the object takes place prior to introducing fluid between the object and the enveloping at the introduction location. An advantage thereof is that the object when the enveloping is pierced can be held at a fixed position due to detaining it.

[0044] Preferably detaining the enveloping from the outside of the object takes place during introducing a fluid at the introduction location, wherein a force or pressure exerted during detaining is overcome by a force or pressure exerted by the enveloping put at fluid pressure. As a result the enveloping at the location of a press surface, while being counteracted thereby, can gradually be detached from the object, as a result of which tearing the enveloping is prevented.

[0045] When after introducing the fluid the detaining force or pressure on the enveloping is changed, the enveloping can also be detached beyond the detained part. In that case the detaining force or pressure is preferably increased, preferably for exerting a thrust or impact force in the direction of the object.

[0046] In an alternative or further development of the method the fluid is introduced prior to detaining the enveloping, so that when detainingly pressing the enveloping can simply be plunged into detaching.

[0047] The invention will be elucidated on the basis of a number of exemplary embodiments shown in the drawings, in which:

Figure 1 shows a front view of a device for detaching foil according to the invention;

Figure 2 shows a side view of the device according to figure 1; and

Figures 3A-D show a side view and figure 3E shows a front view of consecutive steps in detaching a foil around a block of cheese using the device according to figures 1 and 2.

[0048] The device 1 shown in figure 1 is suitable for detaching and subsequently removing foil that is tautly situated around a block of foil-ripened cheese. The foil is formed by a vacuum formed thin-walled rectangular synthetic tray into which the cheese is introduced, for instance by pouring, after which the tray is covered with a sheet of foil that is sealed closed at the upper edge of the tray. The cheese firmly sticks to the foil after a while. When the foil is removed from the cheese the thin-walled foil may tear. Moreover cheese may be left behind on the foil as a result of which the cheese is damaged, particularly at the edge areas of the cheese.

[0049] The device 1 has a frame 3 wherein in transport direction A consecutively a roller path 5, a first belt conveyor 6 and a second belt conveyor 7 are situated which are driven by electromotors that are not shown. The running course of the roller path 5 and the belt conveyor 6, 7 are aligned in transport direction A. Blocks of foil-packaged cheese 2 are situated on the roller path 5 and the first belt conveyor 6, which blocks of cheese in transport direction A are in consecutive stages of the defoiling process.

[0050] Above the roller path 5 the device 1 has a flat stamp 9 which is connected to the frame 3 by means of a telescopic suspension 8. The stamp 9 is movable in vertical direction away from and towards the roller path 5 by means of a pneumatic cylinder 10, wherein the stamp 9 in figure 1 is in its lowermost position. The stamp 9 has a rectangular press surface 36 of which the outer dimensions are smaller that the outer dimensions of an upper surface of a block of cheese 2.

[0051] On both sides of the roller path 5 a centring roller holder 29 is situated which by means of a gear rack mechanism are symmetrically movable with respect to each other in direction J transverse to the transport direction 4. In figure 2 the centring roller holders 29 are shown in side view, wherein of the gear rack mechanism only gear racks 37 are schematically shown with which the centring roller holders 29 are moved. Each centring roller holder 29 has a piercing pin 31 and two centring rollers 30 having two running surfaces at the ends. In figure 3A this is shown in side view. In the position of the centring roller holders 29 according to figure 2 the centring rollers 30 abut the side surfaces of the block of cheese 2. The piercing pins then pierce the foil at a distance with respect to the front side of the block of cheese 2 of approximately 1/5 part of the length (in transport direction A) of the block of cheese 2. At the ends of the piercing pins 31 a nozzle is formed which is connected to a compressor 101 with lines that are not shown. Figure 3B shows the nozzles 32 in detail.

[0052] As shown in figure 1 the device 1 has a transverse cutter 11 situated between the roller path 5 and the first belt conveyor 6. The transverse cutter 11 has a blade 12 that is movable in horizontal direction transverse to the transport direction A between extreme positions that are situated on either side beyond the roller path 5 and the belt conveyor 6. The height of the blade 12 of

the transverse cutter 11 with respect to the running surface of the roller path 5 is such that the blade 12 is able to cut through the foil at the front side of the block of cheese 2 halfway the height of the block of cheese 2. The motion of the blade 12 is ensured by a pneumatic cylinder that is not shown.

[0053] Longitudinal cutters 13 are situated on either side of the first belt conveyor 6. The longitudinal cutters 13 are each provided with a blade 14 that is situated at the same height as the blade 12 of the transverse cutter 11, so that at the longitudinal sides of the block of cheese 2 an incision is made in the extension of the cut made by the transverse cutter 11 when a block of cheese 2 is transported over the first belt conveyor 6, as a result of which a continuous cut is made in the foil in the front side and in the longitudinal sides.

[0054] At the upper side of the first belt conveyor 6 the device 1 has a first swivelling arm 15 that is attached to a shaft 16 that is bearing mounted so as to be rotatable to the frame 3. The shaft 16 is positioned horizontal and transverse to the transport direction A. At the free end the first swivelling arm 15 has a pneumatic gripper 17. The gripper 17 has an upper and lower holding jaw 42, 43. At the lower holding jaw 43 a series of pins 18 has been attached which in closed condition of the gripper 17 coincide with recesses in the upper holding jaw 42. The angle of the gripper 17 to the first swivelling arm 15 is adjustable by rotating the gripper 17 with respect to the swivelling arm 15 about shaft 19. The first swivelling arm 15 including gripper 17 is movable in direction C between the uppermost position in which the swivelling arm 15 is almost upright so that a block of cheese 2 on the first belt conveyor 6 is able to freely pass by the gripper 17, and a lowermost position in which the pins 18 of the opened gripper 17 are able to engage the foil of a block of cheese 2 above the cut of the transverse cutter 11. The swivelling motion of the first swivelling arm 15 is ensured by a pneumatic cylinder that is not shown.

[0055] At the bottom side of the first belt conveyor 6 the device 1 has a second swivelling arm 20 that is attached to a shaft 21 that is bearing mounted so as to be rotatable to the frame 3. The shaft 21 is positioned horizontal and transverse to transport direction 4. At the free end of the second swivelling arm 20 a pin holder 22 is situated to which a series of pins 23 has been attached. The pin holder 22 is able to hinge slightly resiliently about shaft 24. The second swivelling arm 20 with the pin holder 22 is movable in direction H between the uppermost position as shown in figure 1, in which the pins 23 are able to insert into a block of cheese 2 below the cut of the transverse cutter 11, and a lowermost position, in which a block of cheese 2 on the first belt conveyor 6 is able to freely pass by the pins 23. The swivelling motion of the second swivelling arm 15 is ensured by a pneumatic cylinder that is not shown.

[0056] Between the first belt conveyor 6 and the second belt conveyor 7 the device 1, considered in transport direction A, consecutively has a first and a second removal roller 25, 26 that are situated transverse to the transport direction A. Around the second removal roller 26 and a tensioning roller 28 at the lower side of the first and second belt conveyors 6, 7, a removal belt 27 is situated. The first and second removal roller 25, 26 have a mutually opposite direction of rotation, wherein the first removal roller 25 and the removal belt 27 abut. The rotation of the first and second removal roller 25, 26 is ensured by an electromotor that is not shown.

[0057] The device 1 has a control unit 100 for controlling the movements of the transport path 5, the first and second belt conveyor 6, 7, the stamp 9, the centring roller holders 29, the first and second swivelling arm 15, 20, the pneumatic gripper 17, the transverse and longitudinal cutters 11, 13, the removal rollers 25, 26 and the compressor 101.

[0058] The operation of the device is as follows.

[0059] The device 1 is brought in a starting position wherein the stamp 9 is moved to its uppermost position, the centring roller holders 29 are moved apart, and the first and second swivelling arm 15, 20 are swivelled to their uppermost position.

[0060] Subsequently a block of cheese 2 wrapped in foil is placed on the roller path 5 and is transported over the roller path by driving the rollers 34 in transport direction A until the block of cheese 2 is situated below the stamp 9 and between the centring roller holders 29. This is schematically shown in figure 3A. In the figures 3A-E the foil is indicated by reference number 33.

[0061] Subsequently, as shown in figure 3B, in this example the centring roller holders 29 are moved towards each other by the gear rack mechanism 37 in the direction D, as a result of which the centring rollers 30 engage onto the side walls of the block of cheese 2 wrapped in foil 33. The block of cheese 2 is then placed straight below the stamp 9, wherein the piercing pins 31 pierce the foil 33 halfway the height of the block of cheese 2. After piercing the nozzles 31 of the piercing pins 31 are situated within the foil 33.

[0062] Subsequently, as shown in figure 3C, the stamp 9 is brought in direction E to its lowermost position. The stamp 9 here exerts pressure on the foil 33 at the upper side of the block of cheese 2 by means of the press surface 36.

[0063] Subsequently, as shown in figure 3D, a fluid, in this example a gas, namely pressurised air, is brought in between the bock of cheese 2 and the foil 33 by nozzles 32. Due to the rectangular shape of the block of cheese 2, the largest outer surfaces being at the upper side and the lower side, the foil 33 bulges particularly at the upper side of the block of cheese as a result of which at the location of the bulge it detaches from the block of cheese 2. Bulging at the bottom side of the block of cheese 2 is limited in this case as the block of cheese with its bottom side is situated on the rollers 34. The pressure the stamp 9 exerts at the upper side of the block of cheese 2 on the foil is such that the stamp 9 in the direction F is able to slightly give away to the foil 33. This may for instance be

effected by the stamp's 9 own weight or by the (partial) release of the motion of the stamp 9 by letting off air from the pneumatic cylinder 10 by means of an adjustable valve. The stamp 9 giving away is adjusted to the elasticity or deformability of the foil 33, as a result of which the foil bulging at the edge areas of the block of cheese 2 is counteracted.

[0064] According to an advantageous, alternative method the stamp 9 may after the centring rollers 30 engage onto the side walls of the block of cheese, be placed in a position at a short distance above the block of cheese 2, parallel to the upper side of the cheese 2 as also shown in figure 3D. The stamp 9 then remains at the short distance above the block of cheese 2 during introducing compressed air, as a result of which the foil bulges in the direction of the stamp 9 in order to come to abut the stamp 9 over a large surface.

[0065] Subsequently according to the shown example and according to the alternative method, the piercing pins 31 are pulled out of the foil 33 by retracting the centring roller holders 29, after which the stamp 9, as shown in figure 3E, is forcefully pushed (back) according to arrow G to its lowermost position. The pushing (back) motion of the stamp 9 can also simultaneously take place with the retraction of the centring roller holder 29. The pressure exerted on the foil is adjusted such that the foil 33 at the side walls and along the edge areas, and between the rollers 34 of the roller path 5 becomes detached from the block of cheese 2 even before the foil 33 has deflated through the holes left in the foil 33 by the piercing pins 31.

[0066] In a next step the foil 33 is cut through by the transverse cutter 11 at the front side over the full width of the block of cheese 2. After cutting the stamp 9 is brought to its uppermost position and the block of cheese 2 is transported in transport direction A over the roller path 5 and the first belt conveyor 6, wherein the longitudinal cutters 13 at the longitudinal sides of the block of cheese 2 make an incision into the foil 33 in the extension of the transverse cut as shown with dotted line 35 in figure 1. After cutting the longitudinal sides the block of cheese 2 is transported against the pins 23 of the second swivelling arm 20, wherein the first swivelling arm 15 moves downwards with opened gripper 17. When the pins 23 have been inserted through the foil 33 at the front side of the block of cheese 2, the gripper 17 closes in direction P, as a result of which the holding jaws 42, 43 firmly engage the foil 33 by means of the pins 18 at the lower holding jaw 43.

[0067] Subsequently the first and second swivelling arm 15, 20 are moved to their uppermost and lowermost position, respectively, as a result of which the foil 33 at the front side of the block of cheese 2 is pulled loose. The foil 33 is then brought in between the removal rollers 25, 26 by the lower swivelling arm 20, as a result of which the foil 33 at the bottom side of the block of cheese 2 is pulled loose whereas the block of cheese 2 is transported onward to the second conveyor. Then the foil 33 is simultaneously pulled loose at the upper side. Finally, when the block of cheese 2 is situated at the second belt conveyor, the foil 33 is released by the gripper 17 and further removed by the rollers 25, 26.

Claims

1. Device for detaching an enveloping, particularly a foil, that is situated around an object, particularly a foil-ripened cheese, wherein the device comprises introduction means for piercing the enveloping from an outside of the enveloped object at an introduction location for introducing a fluid at that location between the object and the enveloping, as well as first and second detaining means for in between them detaining the enveloping.

2. Device according to claim 1, wherein the first and/or second detaining means are movable towards and away from the object, wherein the device further comprises means for driving the first and/or second detaining means towards the object, preferably in a thrusting motion.

3. Device according to any one of the preceding claims, adapted for detainingly pressing the enveloping by relative motion of the first or second detaining means after introducing the fluid, preferably in an accelerated motion.

4. Device according to claim 2 or 3, wherein the device is adapted for during introduction of fluid keeping or bringing the first and/or second detaining means at a distance from the object.

5. Device according to any one of the claims 2, 3 or 4, wherein the first and second detaining means are operative in opposite direction, and/or wherein the first and/or second detaining means have flat press surfaces, such as plate surfaces which preferably are parallel to each other, and/or wherein the first and second detaining means are moveable towards each other.

6. Device according to any one of the preceding claims, wherein the detaining means detain the enveloping at a distance from the introduction location, preferably at another side than the one where the introduction location is located.

7. Device according to any one of the preceding claims, wherein the first and/or second detaining means are at least partially provided with a shape corresponding with the shape of the object, and/or wherein the first and/or second detaining means have an engagement part of which the main dimensions are smaller than the main dimensions of the side of the object detained by means of the engagement part,

and/or wherein the first and/or second detaining means have an engagement part able to cover substantially a full surface of a side of the object to be detained with the engagement part.

8. Device according to any one of the preceding claims, wherein in a longitudinal direction of the object the introduction location is situated spaced apart from a front side of the object over a distance that is 10 to 30% of a length of the object in said longitudinal direction.

9. Device according to any one of the preceding claims, comprising carrier means for carrying the object, wherein the carrier means preferably provide the first and/or second detaining means, wherein preferably one of the first or second detaining means is stationary and the other of the first or second detaining means is able to move with respect to the stationary detaining means, wherein the carrier means preferably comprise a number of carrier members placed with intermediate space, wherein the carrier means preferably are adapted for transporting the object through the device according to a transport path, wherein the introduction means and the first and second detaining means are preferably situated at the first transport path, wherein preferably the first detaining means are movable above the transport path and the second transport means limit a bottom side of the transport path.

10. Device according to any one of the preceding claims, wherein the introduction means are movable away from and towards the object.

11. Device according to any one of the preceding claims, wherein the introduction means comprise a hollow pin, wherein the hollow pin comprises a nozzle at a distal end, wherein the hollow pin preferably tapers.

12. Device according to any one of the preceding claims, comprising centring means for centring the object with respect to the first and second pressing means, wherein the centring means preferably comprise first and second stops that are mutually movable towards each other for clampingly centring the object, wherein the introduction means preferably are provided at the centring means.

13. Device according to any one of the preceding claims, comprising cutting means for cutting through the enveloping partially around the object, wherein the device preferably comprises engagement means for engaging onto the at least partially cut-through enveloping and separating the enveloping and the object, wherein the device preferably comprises removal means for removing the enveloping that is at least partially cut through all round and at least partially separated from the object.

14. Device according to claim 12 or 13, wherein the centring means, and/or cutting means, and/or the engagement means and/or the removal means are situated at the transport path, wherein the cutting means preferably cut through the enveloping in transport direction, wherein the engagement means preferably comprise pins that are movable transverse to the transport direction from a position in the transport path to a position beyond the transport path, and which with a distal end are able to insert into the enveloping in a direction opposite the transport direction, wherein the pins preferably are provided at two arms that are situated opposite each other on either side of the transport path, wherein the removal means preferably comprise two abutting rollers that are situated along the transport path and wherein the engagement means are adapted for bringing the enveloping in between the rollers.

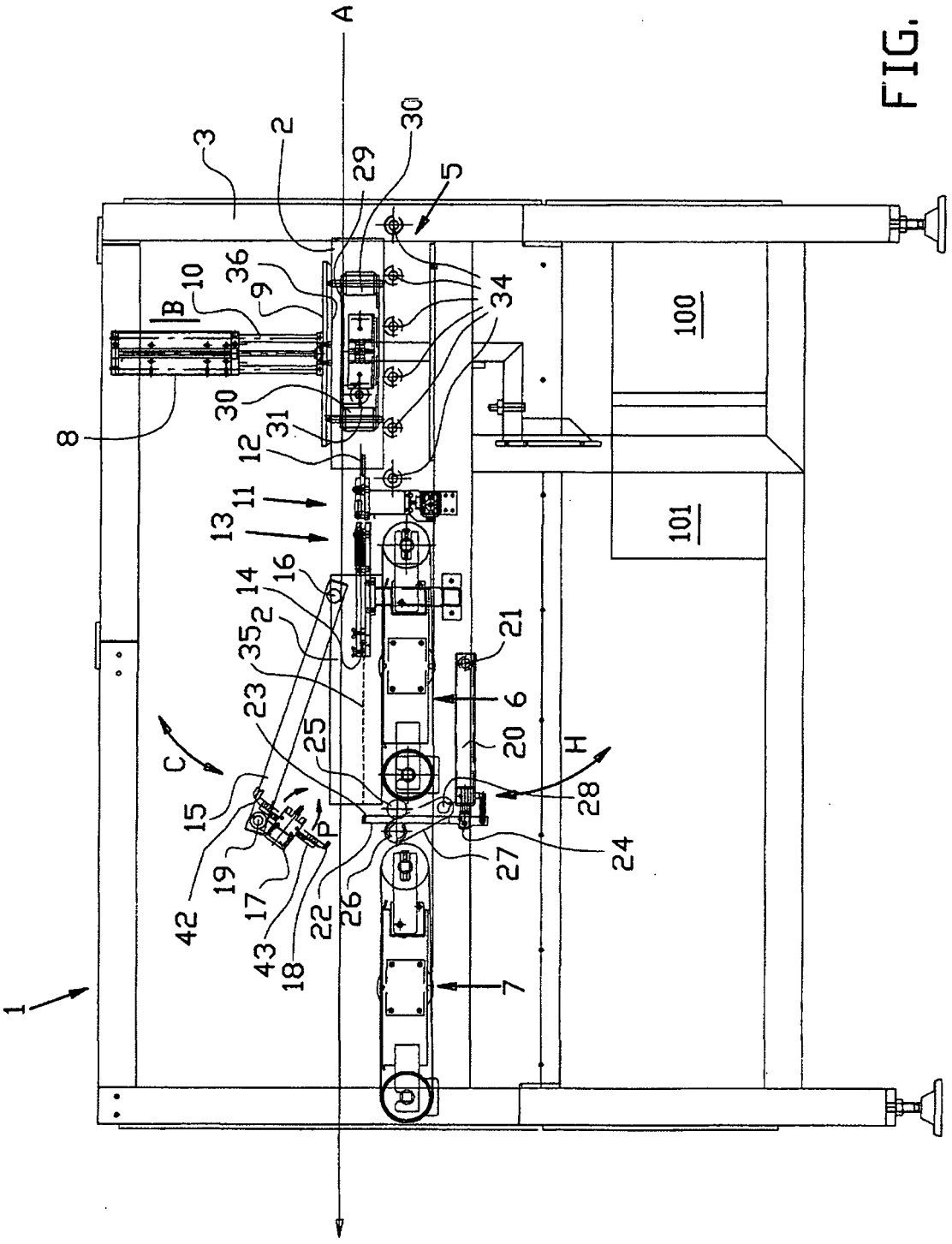
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FIG. 1

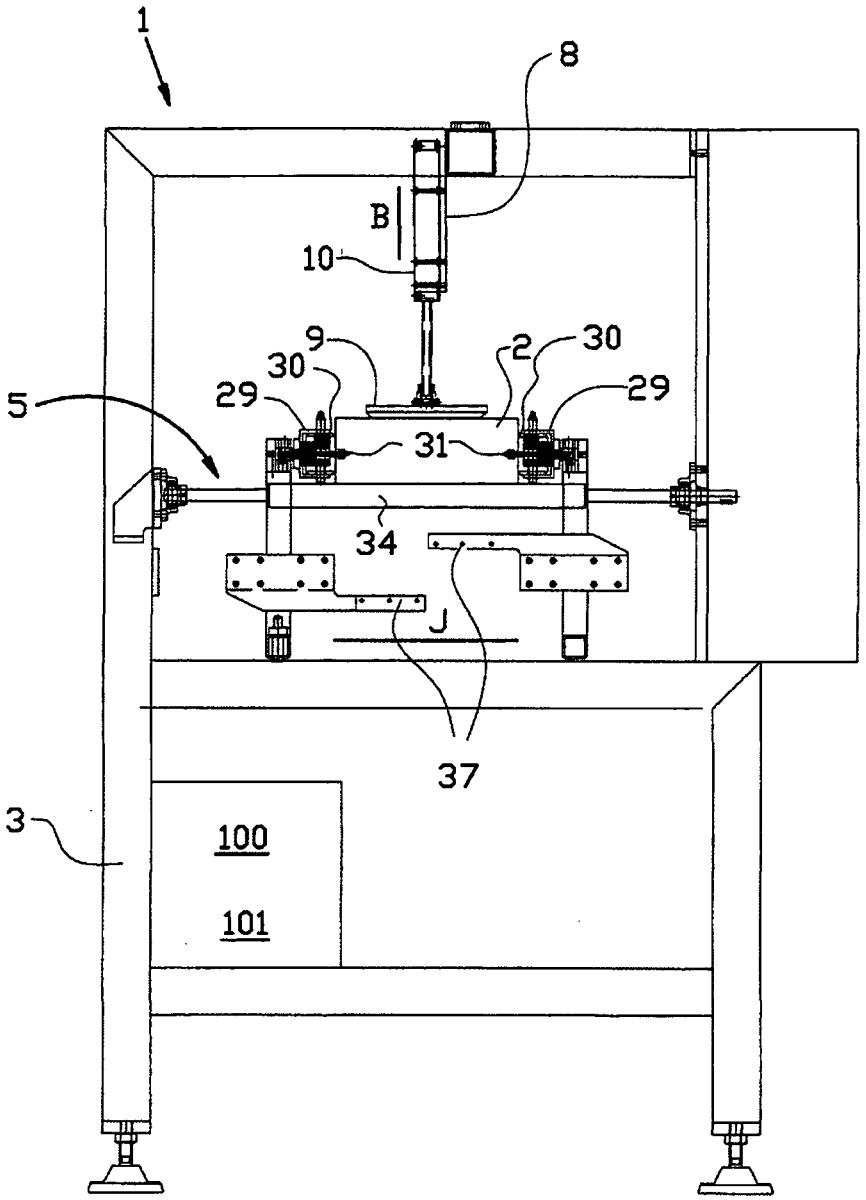

FIG. 2

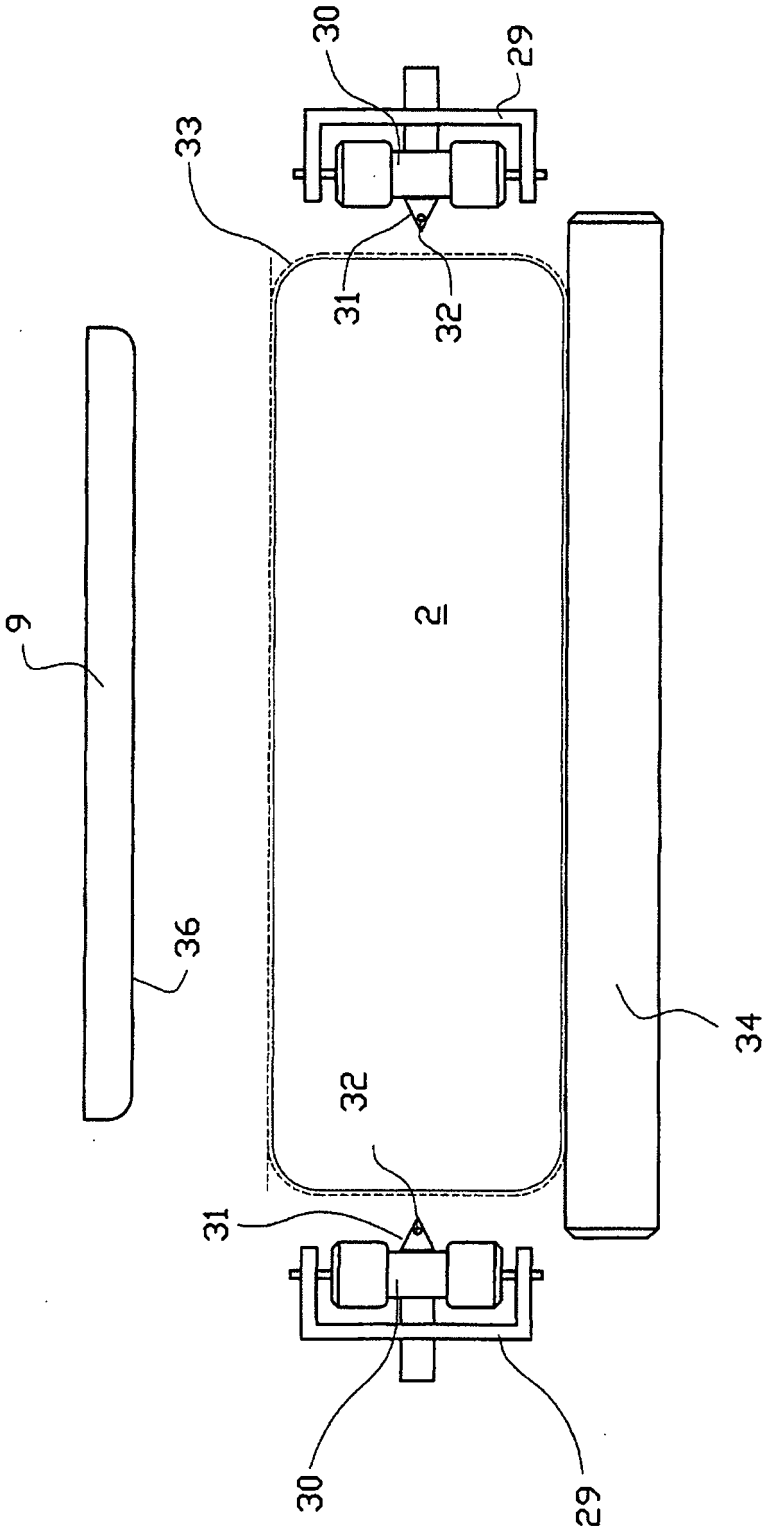

FIG. 3A

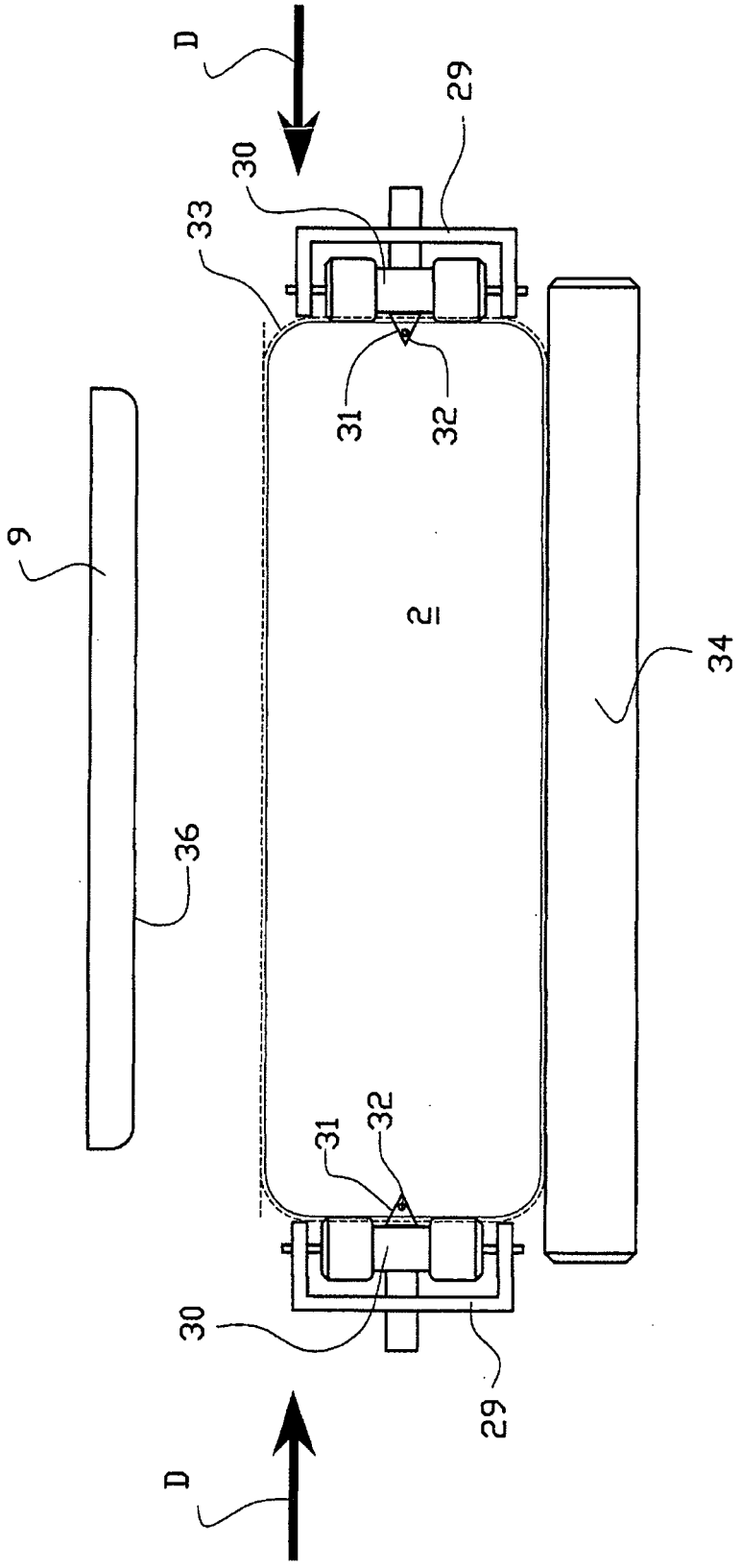

FIG. 3B

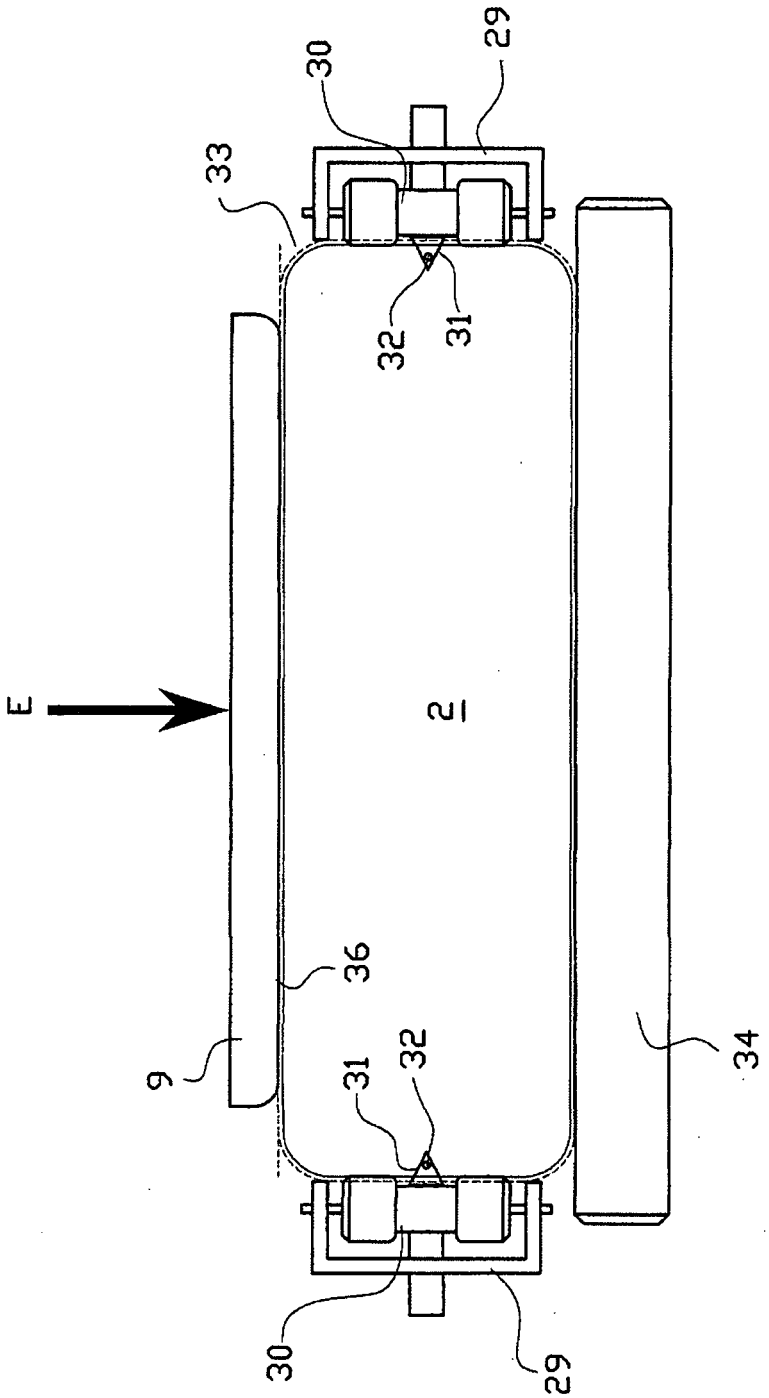

FIG. 3C

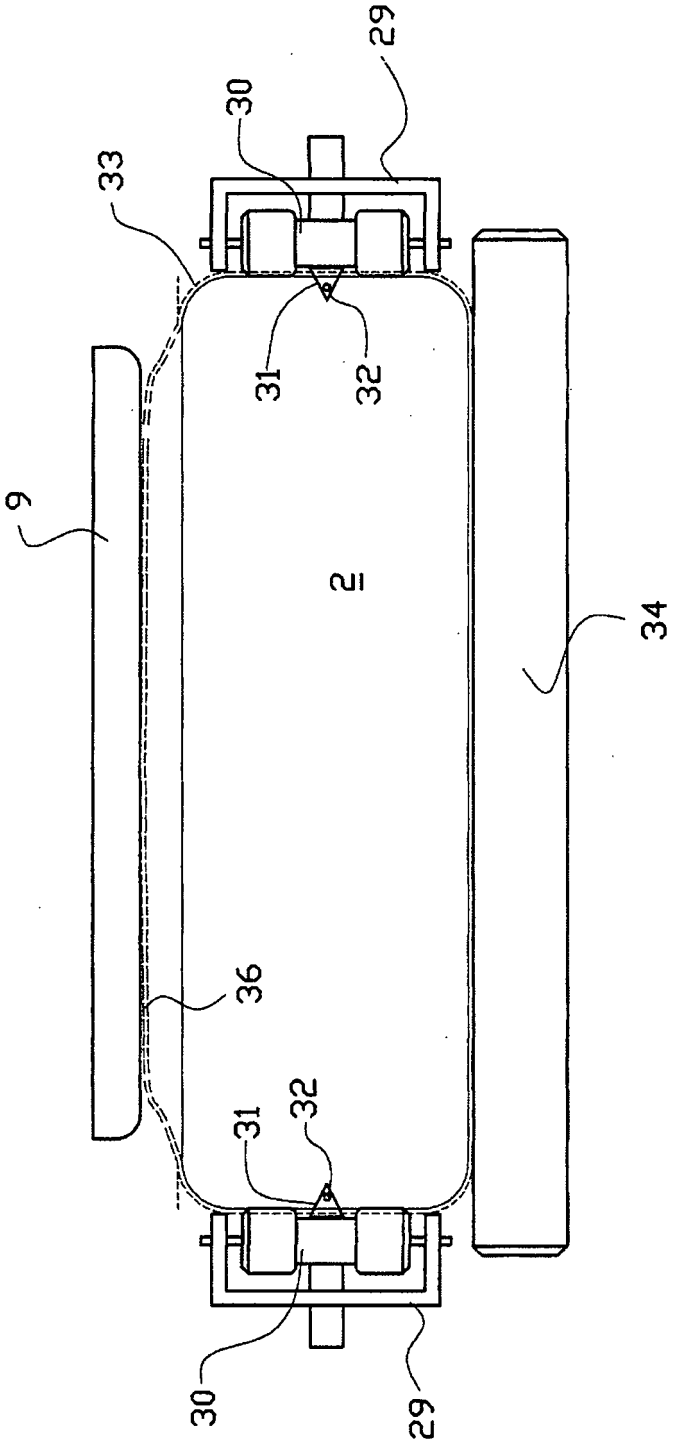

FIG. 3D

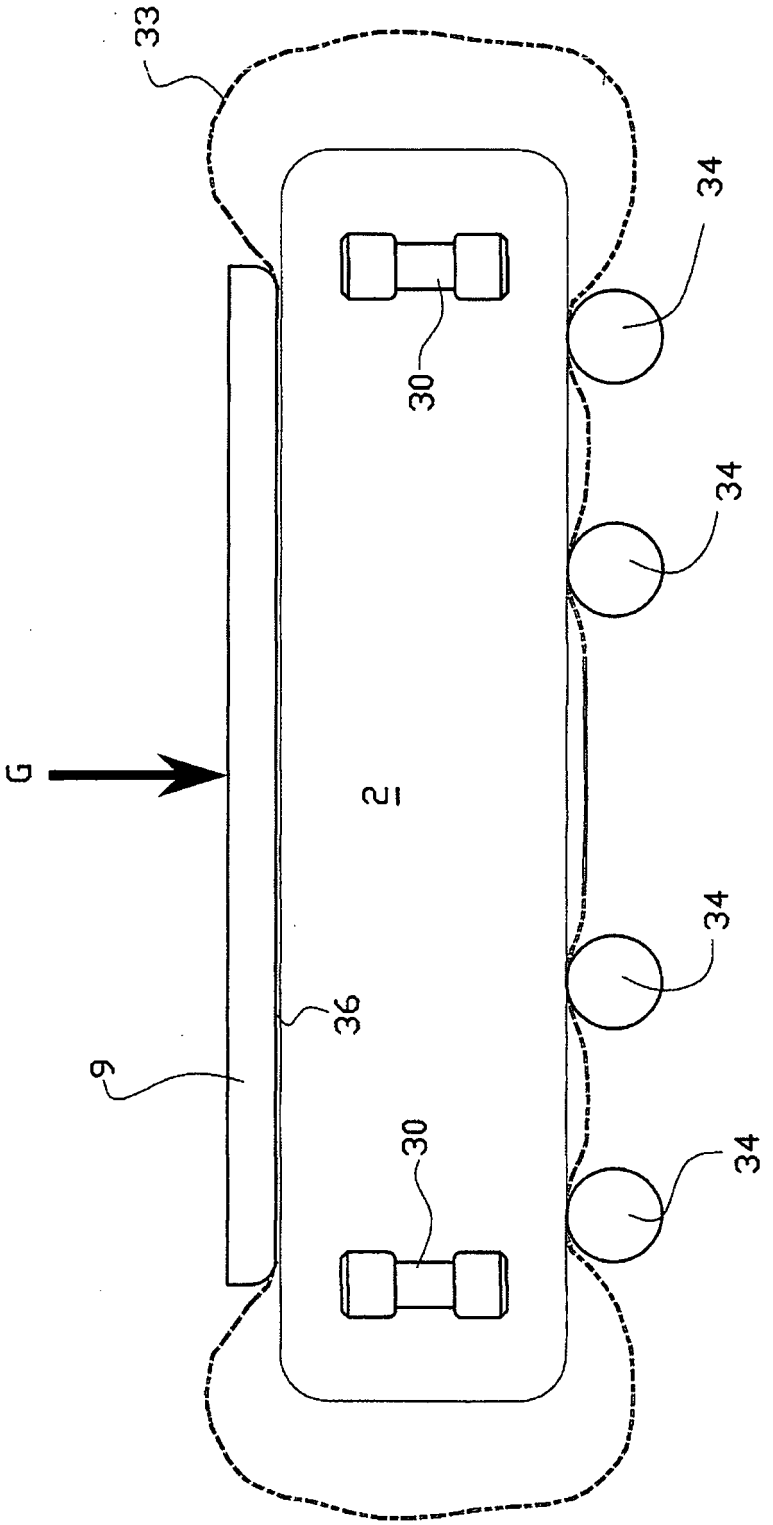

FIG. 3E

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EUROPEAN SEARCH REPORT

Application Number
EP 06 07 5713

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	DE 42 18 267 A1 (BRODHAG, ANGELIKA, 88175 SCHEIDEGG, DE) 9 December 1993 (1993-12-09) * column 3, lines 3-54; figures 4,5 * -----	1	INV. B65B69/00

TECHNICAL FIELDS SEARCHED (IPC)

B65B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	10 July 2006	Grentzius, W

CATEGORY OF CITED DOCUMENTS

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10-07-2006

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DE 4218267 A1	09-12-1993	NONE	