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(54) **PACKAGING BAG**

VERPACKUNGSBEUTEL

SAC D'EMBALLAGE

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Description

[0001] This invention relates to a packaging bag. The packaging bag is made of an envelope of at least one enclosing element made of polymer material and the envelope is having a plurality of perforation holes. The packaging bag is especially suited for accomodating goods which have damageable surfaces and require air ventilation. Such goods may be agricultural products.

[0002] Packaging is a crucial element in almost all industries where goods have to be transported, stored or presented. One of the most commonly used forms of packaging is the bag. Therefore there exist a vast number of types of packaging products in form of bags, optimized for the various applications.

[0003] The variety is stretching over all characteristics of the bags like the materials e.g. natural or synthetic materials, types e.g. meshes or closed surfaces, forms, stability, sizes, colors or additional features like various types of handles, carrying straps or stabilizing features. Three examples for the state of the art are schematically shown in Fig. 1a to Fig. 1c.

[0004] Fig. 1a shows a mesh packaging bag 1 made of a mesh 2. It is apparent that the product 3 is visible from the outside. Fig. 1b shows a plastic packaging bag 4 of the same type, wherein this bag 4 is made of a material with a closed and opaque surface 5 and therefore the goods inside the bag are not visible. The bags 1, 4 in Fig. 1a and Fig. 1b are closed with a single clip 6. Fig. 1c shows a bag 7 wherein the form of the bag 7 in the filled situation is not defined by the goods 2 inside the bag, but by structures provided to the bag 7. Additionally the bag 7 consists of two areas; i.e. a lower area 8, where the enclosing material is opaque, and a second area 9 wherein the enclosing material is transparent. Additionally this bag 7 comprises a handle 10 in form of an opening in the enclosing material.

[0005] The packaging products in the form of bags 1, 4, and 7 in Fig. 1a to 1c are most commonly made of synthetic materials mainly for cost and weight reasons by using a closed film of the material and then forming the bag. Such bags do not allow adequate air or cooling circulation in their interior, resulting in the poor preservation of the packed foods. The same situation occurs in case of increased heat that may be trapped inside the bag and spoil perishable agricultural products.

[0006] The packaging products available in the form of mesh overcome these ventilation problems since they have an air circulation enabling surface and allow good air ventilation for example for food. However, meshes present significant disadvantages, since the mesh is in contact with the packed good. When the mesh is produced, it undergoes yarn hardening in order to obtain higher tensile strength. Goods that are in direct contact with the mesh rub against the hard yarn and their outer surface is often destroyed. In many cases, rubbing also causes an aesthetic and cleanliness problem, as in the case of onions packed in mesh bags. The mesh destroys

the skin of onions that falls off and litters during transport or storage of the mesh bag. This problem is not limited to food, but applies to every good having surfaces that can be scratched are damaged by the mesh material.

[0007] Apart from the food air circulation problem, bags with closed surfaces possess the advantage that information can be printed on them, which can be very well seen and depicts a benefit regarding information provision, product recognition or advertisements. However closed surface bags have the disadvantages, such as the non-visible good condition. On the shelves of the stores, the buyers might prefer to see the good stored in the bag in its actual condition before purchasing it. In most cases, the abovementioned bags are not transparent and therefore the good cannot be seen.

[0008] Again, the mesh bags can overcome this disadvantage of non-visible good condition, but only at the costs of a bad readability of information on the mesh. Therefore often information containing media are attached to the meshes. Additionally mesh bags cannot be used for small goods, which would fall through the mesh.

[0009] WO 2007/026183 describes a packaging means for providing a fresh grocery good that is placed in the packaging means. In one embodiment it is realized as a bag furnished with a moisture absorbent insert and sealed air-tightly under vacuum, wherein the packaging means includes a vacuum foil clinging to the good, and a fenestrated moisture impermeable layer, e.g. a perforated foil separating the good and the moisture absorbent insert from one another.

[0010] US 5171593 discloses a ventilated package film with a band of microperforations to envelope goods like blueberries or raspberries, which are placed in containers. The film is used to envelop the whole container.

[0011] US 2002/110290 A1 discloses a bag for holding hot food products is provided with pairs of arcuate vents such that hot moist air may escape from the bag to keep food held within fresh. The arcuate vent pairs are randomly placed in certain areas of the body of the bag such that structural strength in the bag is not lost yet hot moist air is allowed to escape. In a preferred embodiment, the bag is made of plastic and has handles defined in the front and rear panels of the bag, such that the gussets, or sides, of the bag are not perforated by handles and the bag presents a neat appearance when it is open and full of product.

[0012] US 6 478 156 B1 discloses a headerless pack of thermoplastic film bags having weak bag to bag seals to make said pack and a teardrop like shaped supporting opening whereby said pack is supported on a dispenser rod through said opening and a single bag can easily be removed by pulling down on said bag thereby breaking said seals and tearing through said opening.

[0013] FR 2837470 and FR2381673 disclose packaging bags which are part of the prior art.

[0014] The problem to be solved with the invention is it to overcome the above mentioned disadvantages of bags corresponding to the prior art.

[0015] The object of the present invention is solved by a bag according to claim 1.

[0016] The present invention is directed to provide an optimized packaging bag wherein the above mentioned advantages of the meshes and the above mentioned advantages of bags with closed surfaces are combined in one product. Such a bag allows adequate preservation, transport and storage of packed goods while offering an aesthetic and functional product. The bag may be realized as a low cost product with a very broad application range through its flexibility to be adapted to the application.

[0017] The bag corresponding to this invention offers a superior combination of beneficial characteristics to the state of the art bags. It provides great elasticity and resistance to rupture and wear and has an aesthetic appearance, since the perforated shell, of which the bag is made of, maintains substantially its shape and initial form without tear when force applied by the good it contains. It further allows air circulation in its interior retaining the good's humidity, liberating the heat trapped in the bag to the environment and allowing the appropriate cooling of the good.

[0018] The packaging bag comprises an envelope with a plurality of perforation holes, wherein said envelope comprises at least one enclosing element made of a polymer film of at least one layer, wherein said perforation holes are distributed on at least a part of said enclosing element, wherein the enclosing element has at least one joint and wherein at least parts of the surfaces of said enclosing element and said joint defines an inner chamber of said bag.

[0019] The envelope may consist of more than one enclosing element which are joint to each other together defining the inner chamber of the bag. Such a solution with more than one element may be especially suited for bags with more complex forms or where enclosing elements made of different materials are used. This allows an adaptation of the appearance of the packaging bag to the application.

[0020] The packaging bag comprises an envelope with a plurality of perforation holes, wherein said envelope comprises at least one enclosing element made of a polymer film of at least one layer, wherein said perforation holes are distributed on at least a part of said enclosing element, wherein said enclosing element has at least one joint, and wherein at least parts of the surfaces of said enclosing element and said joint define an inner chamber of said bag. The enclosing element comprises at least two perforation-areas with the plurality of perforation holes, each of the perforation-areas forming a straight band and reaching over the entire length of the envelope. The enclosing element further comprises at least two non-perforation-areas without perforation holes and each of the non-perforation-areas forming a straight band and reaching over the entire length of the envelope, and the perforation- and the non-perforation-areas forming together said inner chamber of the bag, wherein said

perforation-areas and said non-perforation-areas are forming a hose base element by a further joint reaching over at least a part of length of the envelope, and wherein each perforation-area is adjacent to two non-perforation-areas and each non-perforation-area is adjacent to two perforation-areas and wherein one opening of said hose base element is closed by said joint.

[0021] The envelope may consist of one enclosing element. In this embodiment the enclosing element is joined with itself forming the envelope defining an inner chamber of the bag.

[0022] The enclosing element may be a substantially rectangular film as base element. A bag comprising a substantially rectangular film as base element has the advantage that the base element may be easily manufactured with standard tooling as a part of a larger substantially rectangular film and then the base elements for different bags may be cut out off the larger substantially rectangular film without material loss. The substantially rectangular enclosing elements joint together forming the envelope have together preferably a width between 0,2 m to 1,2 m.

[0023] The packaging bag comprises a perforated envelope which is made of a polymer film material being soft and not "hurting" the packed good by destroying or damaging the skin of the goods or peeling off the good's skin and therefore not littering the storage area.

[0024] This innovation significantly improves especially the agricultural products packaging problem with respect to friction, appearance and preservation of packed goods. The main intention is the packaging for agricultural goods, but the application of the invention is not restricted to such goods.

[0025] The openings of the perforation holes have a drop-shaped form.

[0026] The oval or rectangular openings, which are not part of the invention, have preferably a minor axis length between 0.2 mm and 4 mm and major axis length between 2 mm and 8 mm. The drop-shaped openings preferably have comparable opening areas to the above given numbers for the oval openings. Preferably the individual openings should have uniform opening areas.

[0027] The number of perforation holes may vary due to the polymer film material property, the density of the perforation holes, the application purpose, the weight of the goods, the ventilation need or the requested appearance.

[0028] The perforation holes may be located only on parts of the enclosing element or in case that more than one enclosing element is used, some of the enclosing elements may be perforated and other may not be perforated.

[0029] The envelope of the bag may offer visibility to its interior, since the polymer film may be semitransparent or transparent. Even if the enclosing element according to this invention is opaque or colored or printed the envelope of the bag may offer visibility to its interior due to the perforation holes. Furthermore the polymer film

material of the enclosing element may be selected to be recyclable and environment-friendly. The bag may be provided without handle or with a handle. The handle may be part of the polymer film forming the enclosing element made and the bag therefore can then be easily carried and stored.

[0030] The polymer film consists of at least one polymer layer, but may consist as well of more than one polymer layer flatly connected to each other forming a multilayer polymer system. The fixation of the different layers to each other may be achieved by welding, thermal binding, gluing, laminating or any other fixation method and the fixation may be over the full area of the layers or in some areas of the layers.

[0031] The polymer film may have areas with different numbers of layers and the thickness of the polymer film varies preferably from 30 μm to 120 μm .

[0032] The properties of the enclosing element, such as polymer material, additives to the polymer, number of layers, thickness of layers, perforation hole distribution, size of perforation holes, density of holes, color of layers, and other relevant properties may be freely chosen to address the needs of the specific application. Requirement of the application, which can be addressed with such a property selection, may be the level of required air circulation, the required water vapor permeability, the required stability of the film, the size of the good, abrasion properties of the good, the design of the package, expected transparency of the film or expected printability of information on the bag.

[0033] Processes such as electrical discharge perforation, laser perforation, stamping perforation, hot stamping perforation or hot needle perforation may create the perforation holes. The form of the openings may change after the perforation process due to any further process manufacturing steps or due to usage of the packaging bags such as heavy goods filled in the bag creating stress within the enclosing element.

[0034] The perforation process is preferably applied on the polymer film or on subassemblies of the polymer film having more than one layer or to the individual layers positioned one above the other in a way that the perforation holes of one layer is above the perforation holes of the layer below for a majority of perforation holes. It is as well possible that some layers might not be perforated if their constitution allow for a required permeability and visibility.

[0035] The enclosing element may be opaque, partially transparent or transparent. Partially transparent is having the meaning that only part of visible light is transmitted through the film. The transparency may be defined by the layer of the polymer film or other transparency impacting materials contained in at least one of the layers or on the surface one or more layers. Such materials may be colors or printing chemicals for example ink or ground coat. The transparency of the enclosing element may differ in different areas of the enclosing element.

[0036] The material of the layer of the polymer film pref-

erably is Polyethylene, High Density Polyethylene or Linear Low Density Polyethylene. One layer of the polymer film may as well be made of other synthetic materials such as Low Density Polyethylene, Ethylene Vinyl Acetate, Polyvinylchloride, Polyamide or copolymers of said polymers or combinations of said polymers or copolymers.

[0037] For polymer films consisting of more than one layer the material of the individual layers may differ. Preferably the layer forming the insight of the bag may consist of Linear Low Density Polyethylene.

[0038] For bags consisting of more than one enclosing element the material of the individual enclosing elements may differ.

[0039] Additives such as plasticizer, polycarbonate, iridic or colors may be incorporated into at least one layer of the polymer film.

[0040] The plurality of perforation holes in the envelope may be distributed on part or over the entire area of the enclosing element. Preferably the perforation openings on the enclosing element form a stripe or stripes of perforation holes. The individual openings within those stripes are preferably equidistant and preferably the stripes are formed of lines of perforation holes.

[0041] The perforation openings on the enclosing element may be positioned forming patterns. These patterns may be logos, images, words or letters. Further the same pattern may be repeated on one enclosing element or different patterns may exist on one enclosing element.

[0042] At least one layer of the polymer film of the enclosing element may be printable or inscribable on at least one surface. Preferably this surface is a surface of the enclosing element. The surface may be directed away from the inner chamber of the bag. This allows for providing any type of printed or handwritten information on at least one surface of at least one layer. Therefore the material defining the information may be incorporated insight the polymer film and therefore this information is protected from external influences like rubbing or chemicals. The printable and inscribable area may only be a part of the enclosing element. The information may for example display company logos, product information, and advertisement.

[0043] At least an area of the enclosing element of the bag may show a printing. This printing may display logos, images, drawings, letters or words.

[0044] The printing may be applied prior to or after the application of the perforation process and it may be applied to the polymer film prior to forming the envelope or to the enclosing element after forming the envelope.

[0045] A polymer film forming the enclosing element preferably has in this embodiment a substantially rectangular form as base element.

[0046] The further joint preferably reaches over the entire length of the envelope.

[0047] The further joint may be completely positioned in one of the non-perforated or perforated areas. Preferably it is positioned in one of the non-perforated areas.

[0048] The joint for closing one opening of the hose and defining together with at least parts of the surfaces of the enclosing element an inner chamber may be realized with various configurations how areas of the enclosing element are positioned and joint with each other.

[0049] In one embodiment the joint has specific configuration in which the enclosing element is joint with itself. In this specific joint configuration the joint is comprising a first and a second section of the joint each with at least four layers of said enclosing element wherein in at least a subsection of said first section the two inner layers of the joint are of material of a first perforation-area and wherein in at least a subsection of said second section the two inner layers of the joint are of material of a second perforation-area.

[0050] The joint may completely or partially close the opening.

[0051] The bag may be completely closed by a joint.

[0052] All joints forming the envelope of the bag may be generated by welding, thermal binding, gluing, laminating or with joining elements such as staplers are sewing yarn.

[0053] The goods may be positioned inside the bag during the manufacturing process of the envelope. This may be realized by wrapping the enclosing element around the goods and adding the joints. Alternatively the envelope is formed then the goods are located inside and then the bag is closed on the open side of the envelope.

[0054] The packaging bag according to this invention may be provided with a handle or a hanger for hanging the bag to a holding means such as a hook.

[0055] Therefore the packaging bag may comprise at least one handle or at least one hanger, wherein said handle or said hanger is an opening in the polymer film.

[0056] Hereinafter, the invention is described in more detail by means of the drawings wherein

Figures 1a, 1b and 1c show schematic drawings for three state of the art bags for goods packaging;

Figures 2a and 2b are schematic drawings of representative forms of packaging bags;

Figure 3 is a schematic drawing of a more complex packaging bag corresponding to the invention;

Figure 4a and 4b are schematic drawings of packaging bags corresponding to the invention with perforation holes only a part of the enclosing element;

Figures 5a, 5b, and 5c are schematic drawings of packaging bags corresponding to the invention with examples of information provided on the packaging bags;

Figure 6 is a schematic drawing of a packaging bag;

Figure 7 is a schematic perspective drawing of a

packaging bag open on one side of the envelope;

Figure 8 is a schematic perspective drawing of a packaging bag completely closed;

Figure 9a and 9b are schematic drawings of a bag with a rectangular base element and the corresponding hose;

Figure 10a to 10d are schematic drawings of configurations of the joint for forming a hose

Figure 11a and 11b are perspective schematic drawings describing the formation of the joint for closing the opening of the hose

Figure 12a and 12b are top-down views of configurations for closing the opening of the hose corresponding to embodiments of the invention;

Figure 13 shows a perforation machine;

Figure 14 shows the discharge process for perforating;

Figure 15 shows the perforation process.

[0057] Fig. 2a and 2b are depicting two packaging bags. The bags consist of a perforated polymer film with a plurality of perforation holes 11 over the entire surface of the bag. The enclosing element 12 in Fig. 2a is opaque, thus, the goods 3 inside the bag are only visible through the perforation holes 11. In the embodiment shown Fig. 2b the enclosing element 12 is fully transparent and therefore the goods 3 are visible through both the polymer film of the enclosing element 12 and the perforation holes 11. The main function of the holes 11 is allowing the air circulation and thermal ventilation. These bags have one opening that is closed with a clip 6.

[0058] The form of the bag may as well be more complex as shown in Fig. 3 and may have means 14, 15, 16 contributing to the form of the bag as well in the filled state. These means may be stiffener elements, folds, reinforcing elements. The bags may keep its shape even under external forces. The form stability may be as well achieved by using materials and stabilizing elements being elastic such that the bag returns back in the original form, after external forces like carrying or piling are removed. In the embodiment shown in Fig. 3 the bag has perforation holes 11, an opaque enclosing element 12 and a handle 10 in form of an opening in the enclosing element. This handle may have any form. One example would be at least one hole with the function of a hanger to hang the bag to a hook. Embodiment in Fig. 3 has a cubic base form. however embodiment in Fig. 3 may be folded along the fold 15 and therefore may be flat in the folded state.

[0059] Additionally the perforation holes 11 may cover

only parts of the bag. The form of the perforated areas can be freely selected such as forming company or product logos. In the same manner the non-perforated areas may have specific forms to represent for example company or product logos. As well the non-perforated areas are positively impacting the stability of the bags and thus offer another parameter to provide an optimized bag. In a preferred embodiment shown in Fig. 4a the partially perforated film area 17 and the non-perforated area 18 form stripes. The pattern of the holes on the film may be regular or the holes may be randomly distributed. In a preferred embodiment the perforation holes are forming lines of holes along the long axis and rows along the short axis of the film, but in each consecutive row the holes are displaced along the short axis by half a period. In Fig. 4c the base pattern of the perforated areas are triangles 19.

[0060] The bags have drop-shaped openings of the perforation holes 11 as schematically shown in Fig. 2 to Fig. 4 of a size for which the round portion of the drop has a diameter of approximately 0.3 mm to 7 mm. The size and the density of the openings are freely selectable dependent on the packaged good requirements. In cases where only the ventilation is a relevant feature of the bag, smaller holes might be used, but in case that it is of major importance that the goods can be seen inside the package larger holes or a high density of holes may be more appropriate.

[0061] Fig. 5a to Fig. 5c show embodiments of the bag corresponding to the invention with information provided on the bag. The perspective shown is a frontal view on a bag, comprising an enclosing element 12, two areas with perforation holes in form of a stripe 17 and one area without perforation holes in form of a stripe 18, wherein an information 20 is positioned on the non-perforated area 18. In Fig. 5a this information 20 is an image, in Fig. 5b it is a text, and in Fig. 5c the information 20 is image and text and in this embodiment the information is displayed on the perforated areas 17. Every combination is possible for the positioning of the information 20 and it may as well reach over different type of areas.

[0062] In another embodiment the bag consists of two sides and one side is perforated and the second side non-perforated with or without printing. This has the advantage that in case such a product is lying in a shop, the customer may see all the information on the front side, while the ventilation is ensured through the perforation holes on the back-side.

[0063] Fig. 6 shows another schematic drawing of a bag. The bag is provided with at least one enclosing element 12 in this case with two enclosing elements 12a and 12b. The two enclosing elements are joint with two joints 21 and 22 along the length of the bag and closed on the lower end with another joint 23. With this joint 23 and the enclosing elements 12a and 12b an envelope 24 is formed defining an inner chamber 25 and having an opening 26 on the top of the envelope. At least a part of an enclosing element 12b is perforated with a plurality

of perforation holes 11. The perforation holes may be on the front-side and/or on the back-side of the bag. It notes that the joint 23 does not necessarily be on the edges of the enclosing elements and therefore some of the polymer film may be external material 27 of the enclosing elements. Depending on the formation of the joint 23 this material 27 may be located inside the inner chamber 25.

[0064] Fig. 7 shows another packaging bag. This bag comprises one enclosing element 12 with a substantially rectangular film as base element 36 as it is shown in Fig. 9a. This rectangular film is closed with a joint 28 along the length L of the envelope by joining the edges of the film 28a and 28b as well shown in Fig. 9a. With this joint 28 a hose 37 is formed as shown in Fig. 9b with four areas 30, 31, 32, and 33 of the enclosing element. In a specific embodiment there are two perforation-areas 31, 33 with perforation holes 11 and two non-perforation-areas 30, 32 without perforation holes that are positioned opposite to each other by separating the perforated areas by non-perforated areas. Thus, perforation-areas 31, 33 are adjacent to two non-perforation areas 30, 32 and vice versa. In this specific embodiment the two areas 30a and 30b in Fig. 9a are joint to become the area 30. By closing the hose 37 along the width W of the envelope on the edge 34 with a joint 34, an inner chamber 25 is defined. In this embodiment the bag has one filling opening 25 on top of the envelope.

[0065] The perforation holes may as well be positioned on the front-side area 30 and/or the back-side area 32. Any combination of perforation holes on the four areas 30, 31, 32, 33 are further embodiments of the invention.

[0066] In another embodiment this opening on top of the envelope is closed with another joint 35 as shown in Fig. 8.

[0067] In an embodiment of a bag with one opening 25 goods may be entered, but it is as well possible to directly form the bag around the goods during the packaging of the goods. It may be as well beneficial to sell the bags in a completely closed state and then open it before usage.

[0068] As shown in Fig. 10a the joint 28 may be inside the areas 30a and 30b, then the joint may have different configurations. Three embodiments are shown in Fig. 10b to Fig. 10c. The two areas 38 and 39 not being part of the envelope may be located inside the inner chamber 25 as depicted in Fig. 10b, in the external periphery 40 as it is defined by being outside the inner chamber 25 as depicted in Fig. 10c. It is as well possible that one area 38 is inside the inner chamber 25 and the second area 39 being in the external periphery 40 as shown in Fig. 10d.

[0069] A preferred configuration for closing the openings in the hose 37 along the joint 34 is shown in Fig. 11a and 11b. In this case formation of the joint may be explained by moving a central part 41 of the two perforated areas 31, 33 of the hose 37 in the direction to each other. Then a fold 42 is formed. With this fold the rims 43, 44, 45, and 46 are laying one besides the other the two rims 44 and 45 of the perforation-areas being the two inner layers. Joining these layers for example with welding or

thermal binding leads to the joint 34 and 35.

[0070] The advantage is that the perforation-areas are not exposed to the periphery, when the bag is folded and therefore the interior of the bag is better protected against dirt from outside as long as the bag is stored in the folded status.

[0071] The resulting top-down view on this fold for the joint 35 is shown in Fig. 12a and 12b for two different embodiments. The joint 34 may be formed in the same way. The joint 35 may be separated in different subsections 47, 48. In at least two of the subsections 47, 48 the layers 43, 44, 45 and 46 are arranged as described above. In these sub sections 47, 48 the layers are preferably fixed to each other forming the joint 35. Between the two sections 47 and 48, the areas 30 and 32 may be not fixed to the other layer forming an opening 49 from the inner chamber 25 to the external periphery 40. This is shown in Fig. 12a. In another embodiment the areas 30 and 32 are partially fixed to each other. Therefore the width of opening may differ. The opening may have advantages that during the folding process air may exit through this opening or it may be even used as opening for pulling the layers 30 and 32 apart. Fig. 12b shows an embodiment where the two layers 32 and 30 are completely closed through a joint 50 being part of the joint 35.

[0072] The rectangular base elements is preferably cut out of rolls of an extended length and a width between 0,2 m and 1,2 m.

[0073] In a preferred embodiment the perforation process is applied to the polymer film as shown in Fig. 13. A non-perforated film 51 forming a roll is passed with the use of an axial system through a perforation machine 52. In this specific case an electrical discharge perforation machine is shown, but as well other methods like laser perforation, stamping perforation or hot needle/nail perforation could be conducted. After the perforation the perforated film 53 can again be provided in form of a roll. However it would be possible to have the bag forming or even the packaging machine directly attached to the perforation machine. In a packaging machine a preprinted and ready to use polymer film could be used.

[0074] The discharge perforation process is depicted in Fig. 14a and Fig. 14b. By applying a high voltage between sharp nails of a transmitter 54a and the nails of a receptor 54b a voltaic arc is generated. Is a polymer film 51 located between the transmitter and receiver nails, a hole is formed in the polymer film between the opponent nails. The perforation may be conducted by creation of multiple simultaneous electrical discharges. The size of the holes depends upon the applied voltage. By variation of the number of nails and their distribution over the width of the film, the local density of the holes and their total number can be determined. In Fig. 14b the nails 54 are equally distributed while in Fig. 14 a only some areas of the film become perforated.

[0075] Not only one row of nails 54 can be used in such a perforation machine 52, but as well several rows. This is shown in Fig. 15a and 15b. The nails 54 are located

on rods 55. The number of rods 55 may be freely chosen. The rods are located above and below the path for the polymer film 51 - only one side is shown in Fig. 15a and 15b the film. The rods may be positioned vertically to the long axis of the polymer film 4. The number of nails 54 and their distribution is not fixed, therefore as shown in Fig. 15a partially perforated stripes 17 and non-perforated stripes 18 or as shown in Fig. 15b fully perforated films 53 may be obtained. Fig. 15c as a Detail A of Fig. 15b shows that the location of the nails 54 on one rod relative to the location on the second rod determines the final pattern for example by the distance 55 of the rods and the horizontal distance 56 of the nails.

[0076] In another embodiment the numbers of nails per rod are the same, but by individually addressing the nails the positioning of the holes can be controlled. The drop-shape of the holes is a result of the movement of the polymer film during the perforation process. In cases where the film transport is stopped during perforation, the holes become symmetric to have a circular, oval or more rectangular shape.

Claims

1. A packaging bag comprising an envelope (24) with a plurality of perforation holes (11), wherein said envelope (24) comprises at least one enclosing element (12) made of a polymer film of at least one layer; said perforation holes (11) are distributed on at least a part (17) of said enclosing element; the enclosing element (12) has at least one joint (23, 34); and at least parts of the surfaces of said enclosing element (24) and said joint (23, 34) define an inner chamber (25) of said bag; the enclosing element (12, 36) comprising at least two perforation-areas (31, 33) with the plurality of perforation holes (11), each of the perforation-areas (31, 33) forming a straight band (17) and reaching over the entire length of the envelope (24); the enclosing element (12, 36) comprising at least two non-perforation-areas (30, 32) without perforation holes and each of the non-perforation-areas (30, 32) forming a straight band (18) and reaching over the entire length of the envelope; the perforation- and the non-perforation-areas (30, 31, 32, 33) forming together said inner chamber (25) of the bag, wherein said perforation-areas (31, 33) and said non-perforation-areas (30,32) are forming a hose base element (37) by a further joint (28) reaching over at least a part of the length of the envelope (24); wherein each perforation-area (31,33) is adjacent to two non-perforation-areas (30,32) and each non-perforation-area (30,32) is adjacent to two perforation-areas (31,33); and

wherein one opening of said hose base element (37) is closed by said joint (34);

characterized in that the openings of said perforation holes (11) have a drop-shaped form.

2. The packaging bag according to claim 1 wherein said envelope (24) comprises one enclosing element (12).
3. The packaging bag according to any of claims 1 or 2 wherein said enclosing element (12) comprises a substantially rectangular film as base element (36).
4. The packaging bag according to any of the preceding claims, wherein said enclosing element (12) is opaque or partially transparent or transparent.
5. The packaging bag according to any of the preceding claims, wherein said enclosing element (12) of said polymer film is of at least one layer of Polyethylene, Low Density Polyethylene, High Density Polyethylene, Linear Low Density Polyethylene, Ethylene Vinyl Acetate, Polyvinylchloride, Polyamide or co-polymers of said polymers or combinations of said polymers or co-polymers.
6. The packaging bag according to any the preceding claims, wherein said layer of said polymer film includes materials such as plasticizer, polycarbonate, iridic or colors.
7. The packaging bag according to any of the preceding claims, wherein the perforations holes (11) in said parts of said polymer film forms stripes of perforation holes (17).
8. The packaging bag according to any of the preceding claims, wherein said perforation holes (11) form a geometrical pattern (19), logos, images, letters or words.
9. The packaging bag according to any of the preceding claims, wherein said layer of said polymer film is printable or inscribable on at least one surface.
10. The packaging bag according to any of the preceding claims, wherein an area (17,18) of the enclosing element shows a printing (20).
11. The packaging bag according to claim 1, wherein said further joint (28) is located within one of the non-perforation-areas (30, 32); and

said opening of said hose base form (37) is closed by said joint (34) with a first and a second section (47, 48) each with at least four layers (43, 44, 45, 46) of said enclosing element wherein in at least a sub-section of said first section (47) the two inner layers (44, 45) of the joint (34) are of material of a first perforation-area and wherein in at least a sub-section of said second section (48) the two inner layers of the joint (34) are of material of a second perforation-area.

12. The packaging bag according to any of the preceding claims further comprising at least one handle (10) or at least one hanger, wherein said handle or said hanger is an opening in the enclosing element (12).

Patentansprüche

1. Verpackungsbeutel umfassend eine Hülle (24) mit einer Vielzahl von Perforationslöchern (11), wobei die Hülle (24) wenigstens ein umschließendes Element (12), hergestellt aus einem Polymerfilm mit mindestens einer Schicht, umfasst, wobei die Perforationslöcher (11) auf mindestens einem Teil (17) des umschließenden Elements verteilt sind, wobei das umschließende Element (12) mindestens eine Verbindungsfuge (23, 34) umfasst und wenigstens Teile der Oberfläche des umschließenden Elementes (12) und der Verbindungsfuge (23, 34) eine innere Kammer (25) des Beutels definieren, wobei das umschließende Element (12, 36) mindestens zwei perforierte Bereiche (31, 33) mit der Vielzahl von Perforationslöchern (11) umfasst, wobei jeder der perforierten Bereiche (31, 33) ein gerades Band (17) bildet und über die gesamte Länge der Hülle (24) reicht, wobei das umschließende Element (12, 36) mindestens zwei nicht perforierte Bereiche (30, 32) ohne Perforationslöcher umfasst und wobei jeder der nicht perforierten Bereiche (30, 32) ein gerades Band (18) bildet und über die gesamte Länge der Hülle reicht, wobei die perforierten und die nicht perforierten Bereiche (30, 31, 32, 33) zusammen die innere Kammer (25) des Beutels bilden, wobei die perforierten Bereiche (31, 33) und die nicht perforierten Bereiche (30, 32) durch eine weitere Verbindungsfuge (28), welcher über mindestens einen Teil der Länge der Hülle (24) reicht, ein Schlauch-Basis-Element (37) bilden, wobei jeder perforierte Bereich (31, 33) benachbart ist zu zwei nicht perforierten Bereichen (30, 32) und jeder nicht perforierte Bereich (30, 32) benachbart ist zu zwei perforierten Bereichen (31, 33) und wobei eine Öffnung des Schlauch-Basis-Elements (37) verschlossen ist durch die Verbindungsfuge (34),

dadurch gekennzeichnet, dass die Öffnungen der Perforationslöcher (11) eine tropfenförmige Form aufweisen.

2. Verpackungsbeutel nach Anspruch 1, wobei die Hülle (24) ein umschließendes Element (12) umfasst. 5
3. Verpackungsbeutel nach Anspruch 1 oder 2, wobei das umschließende Element (12) eine im Wesentlichen rechteckige Folie als Basiselement (36) umfasst. 10
4. Verpackungsbeutel nach einem der vorhergehenden Ansprüche, wobei das umschließende Element (12) opak oder teilweise transparent oder transparent ist. 15
5. Verpackungsbeutel nach einem der vorhergehenden Ansprüche, wobei das umschließende Element (12) aus der Polymerfolie aus mindestens einer Schicht aus Polyethylen, Polyethylen geringer Dichte, Polyethylen hoher Dichte, Polyethylen mit linear geringer Dichte, Vinylacetatethylen, Polyvinylchlorid, Polyamid oder Copolymeren der genannten Polymere oder Kombinationen der genannten Polymere oder Copolymeren besteht. 20
6. Verpackungsbeutel nach einem der vorhergehenden Ansprüche, wobei die Schicht der Polymerfolie Materialien wie Plastizierer, Polycarbonate, Iridiumhaltige Zusammensetzungen oder Farben umfasst. 30
7. Verpackungsbeutel nach einem der vorhergehenden Ansprüche, wobei die Perforationslöcher (11) in den Teilen der Polymerfolie Streifen von Perforationslöchern (17) bilden. 35
8. Verpackungsbeutel nach einem der vorhergehenden Ansprüche, wobei die Perforationslöcher (11) geometrische Muster (19), Logos, Bilder, Buchstaben oder Wörter formen. 40
9. Verpackungsbeutel nach einem der vorhergehenden Ansprüche, wobei die Schicht der Polymerfolie an mindestens einer Oberfläche bedruckbar oder beschreibbar ist. 45
10. Verpackungsbeutel nach einem der vorhergehenden Ansprüche, wobei ein Bereich (17, 18) des umschließenden Elementes eine Bedruckung (20) zeigt. 50
11. Verpackungsbeutel nach Anspruch 1, wobei die weitere Verbindungsfuge (28) angeordnet ist innerhalb einer der nicht perforierten Bereiche (30, 32) und die Öffnung des Schlauch-Basis-Elements (37) verschlossen ist durch die Verbindungsfugen (34) mit einem ersten und zweiten Bereich (47, 48), jeder mit 55

mindestens vier Lagen (43, 44, 45, 46) des umschließenden Elementes, wobei in mindestens einem Unterbereich des ersten Bereichs (47) die beiden inneren Lagen (44, 45) der Verbindungsfuge (34) aus Material eines ersten perforierten Bereiches bestehen und wobei in wenigstens einem Unterbereich des zweiten Bereiches (48) die beiden inneren Lagen der Verbindungsfuge (34) aus Material des zweiten perforierten Bereiches bestehen.

12. Verpackungsbeutel nach einem der vorhergehenden Ansprüche, weiter umfassend mindestens einen Handgriff (10) oder mindestens einen Aufhänger, wobei der Handgriff oder der Aufhänger eine Öffnung im dem umschließenden Element (12) ist.

Revendications

1. Sac d'emballage comprenant une pochette (24) avec plusieurs perforations (11), étant précisé que la pochette (24) comprend au moins un élément d'enveloppement (12) composé d'un film polymère d'au moins une couche ; 25
 - que les perforations (11) sont réparties sur une partie (17) au moins de l'élément d'enveloppement ;
 - que l'élément d'enveloppement (12) comporte au moins un joint (23, 34) ; et
 - que des parties au moins des surfaces de l'élément d'enveloppement (12) et le joint (23, 34) définissent une chambre intérieure (25) du sac ;
 - l'élément d'enveloppement (12, 36) comprenant au moins deux zones perforées (31, 33) avec lesdites perforations (11), chacune des zones perforées (31, 33) formant une bande droite (17) et s'étendant sur toute la longueur de la pochette (24) ;
 - l'élément d'enveloppement (12, 36) comprenant au moins deux zones non perforées (30, 32) sans perforations, chacune des zones non perforées (30, 32) formant une bande droite (18) et s'étendant sur toute la longueur de la pochette ;
 - les zones perforées et non perforées (30, 31, 32, 33) formant ensemble la chambre intérieure (25) du sac, étant précisé que les zones perforées (31, 33) et les zones non perforées (30, 32) forment un élément de base tubulaire (37) grâce à un autre joint (28) qui s'étend sur une partie au moins de la longueur de la pochette (24) ;
 - que chaque zone perforée (31, 33) est voisine de deux zones non perforées (30, 32) et que chaque zone non perforée (30, 32) est voisine de deux zones perforées (31, 33) ; et
 - qu'une ouverture de l'élément de base tubulaire (37) est fermée par le joint (34) ;**caractérisé en ce que** les ouvertures des perforations (11) présentent la forme de gouttes.
2. Sac d'emballage selon la revendication 1, étant pré-

- cisé que la pochette (24) comprend un élément d'enveloppement (12).
3. Sac d'emballage selon l'une quelconque des revendications 1 ou 2, étant précisé que l'élément d'enveloppement (12) comprend un film globalement rectangulaire comme élément de base (36). 5
 4. Sac d'emballage selon l'une quelconque des revendications précédentes, étant précisé que l'élément d'enveloppement (12) est opaque ou en partie transparent ou transparent. 10
 5. Sac d'emballage selon l'une quelconque des revendications précédentes, étant précisé que l'élément d'enveloppement (12) en film polymère est constitué par au moins une couche de polyéthylène, de polyéthylène basse densité, de polyéthylène haute densité, de polyéthylène linéaire basse densité, d'éthylène vinyle acétate, poly(chlorure de vinyle), de polyamide ou de copolymères desdits polymères ou de combinaisons desdits polymères et ou copolymères. 15 20
 6. Sac d'emballage selon l'une quelconque des revendications précédentes, étant précisé que la couche de film polymère contient des matériaux comme un plastifiant, du polycarbonate, une substance iridique ou des couleurs. 25 30
 7. Sac d'emballage selon l'une quelconque des revendications précédentes, étant précisé que les perforations (11) prévues dans lesdites parties en film polymère forment des bandes de perforations (17). 35
 8. Sac d'emballage selon l'une quelconque des revendications précédentes, étant précisé que lesdites perforations (11) forment un motif géométrique (19), des logos, des images, des lettres ou des mots. 40
 9. Sac d'emballage selon l'une quelconque des revendications précédentes, étant précisé que la couche de film polymère est apte à être imprimée ou à recevoir une inscription sur au moins une surface. 45
 10. Sac d'emballage selon l'une quelconque des revendications précédentes, étant précisé qu'une zone (17, 18) de l'élément d'enveloppement présente une impression (20). 50
 11. Sac d'emballage selon la revendication 1, étant précisé que l'autre joint (28) se trouve à l'intérieur de l'une des zones non perforées (30, 32) ; et que l'ouverture de la forme de base tubulaire (37) est fermée par le joint (34) avec des première et seconde sections (47, 48) qui comportent chacune au moins quatre couches (43, 44, 45, 46) dudit élément d'enveloppement, étant précisé que dans au moins

une sous-section de la première section (47), les deux couches intérieures (44, 45) du joint (34) se composent du matériau d'une première zone perforée, et que dans au moins une sous-section de la seconde section (48), les deux couches intérieures du joint (34) se composent du matériau d'une seconde zone perforée.

12. Sac d'emballage selon l'une quelconque des revendications précédentes, comprenant également au moins une poignée (10) ou au moins un élément de suspension, étant précisé que ladite poignée ou ledit élément de suspension est constitué par une ouverture dans l'élément d'enveloppement (12).

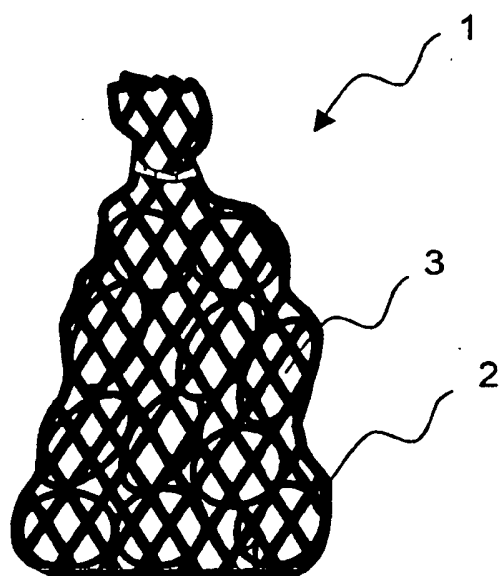


Fig. 1a

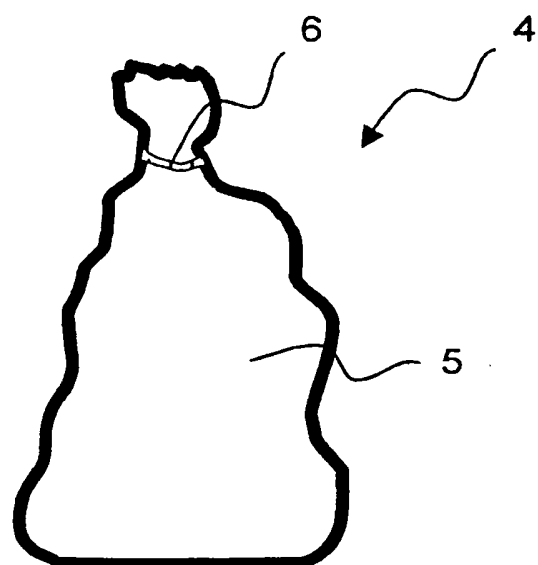


Fig. 1b

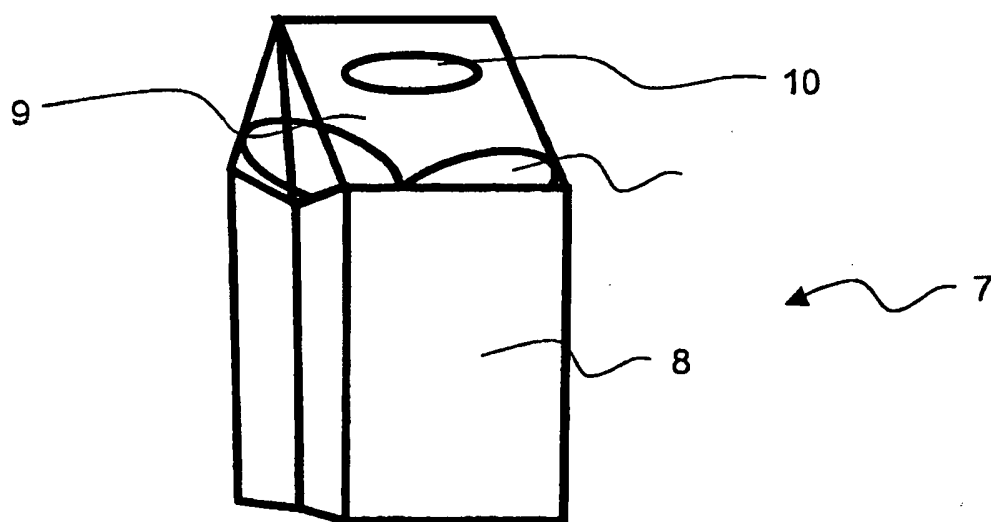


Fig. 1c

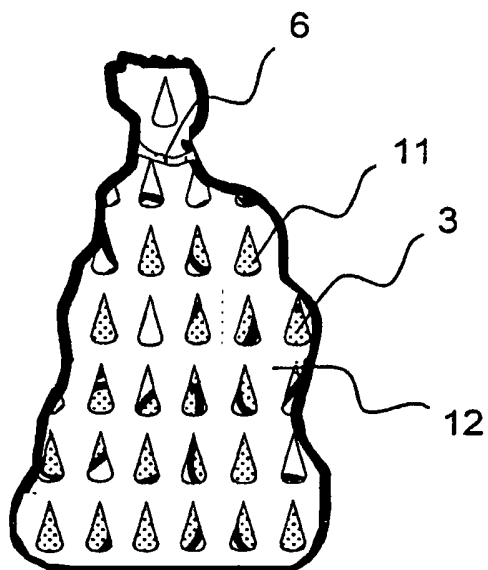


Fig. 2a

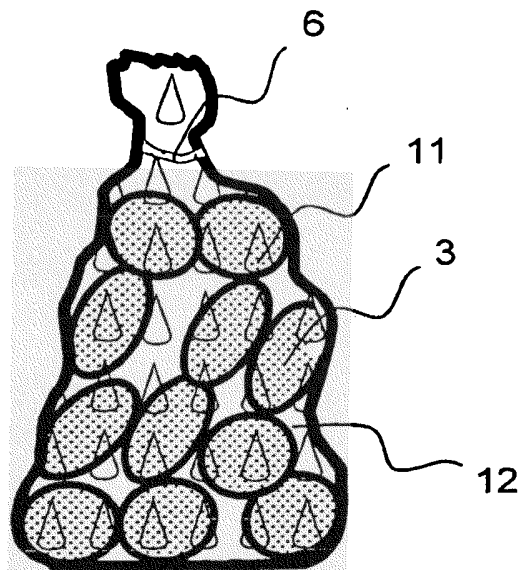


Fig. 2b

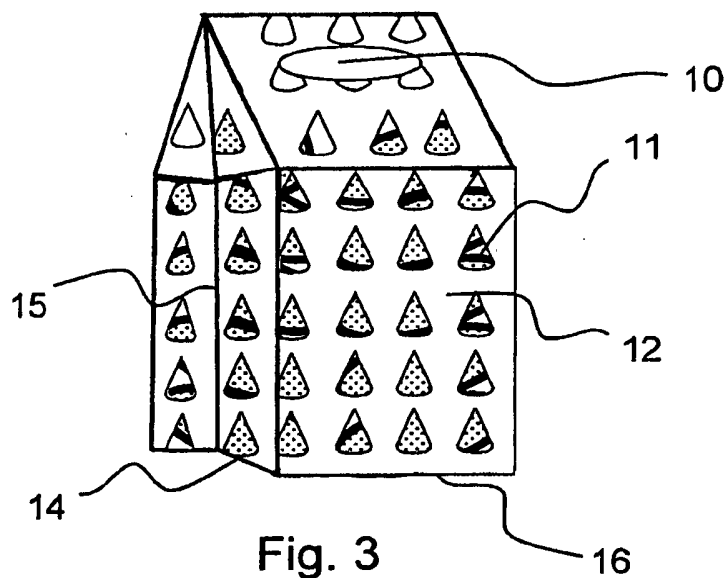


Fig. 3

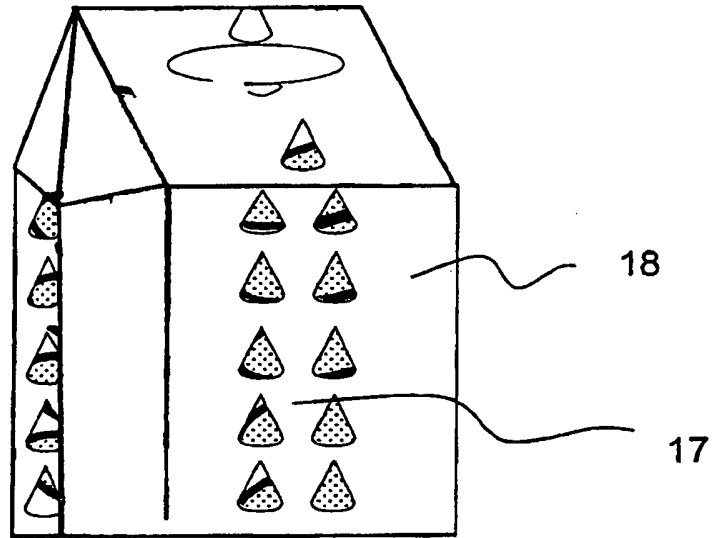


Fig. 4a

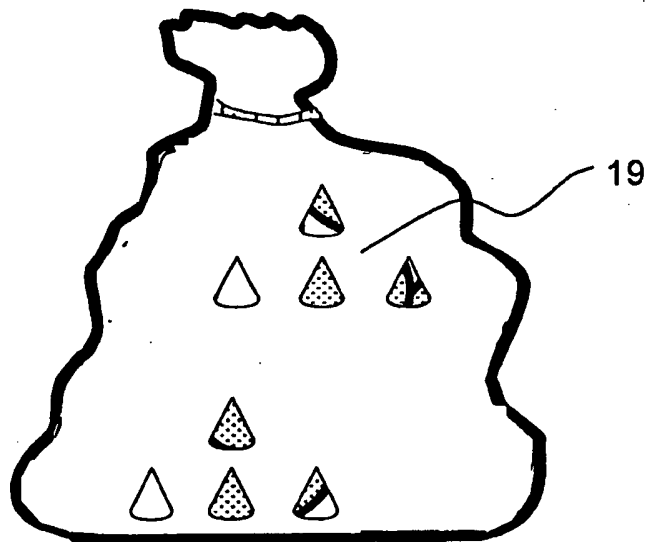


Fig. 4b

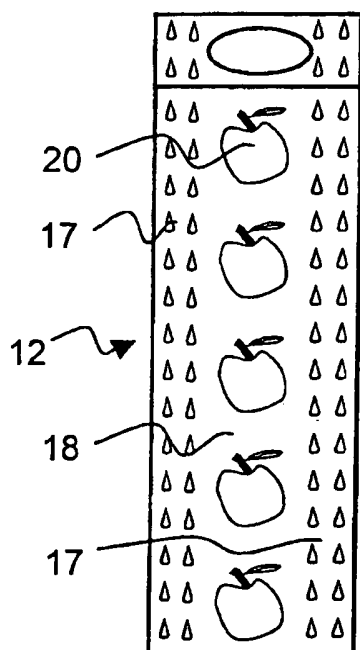


Fig. 5a

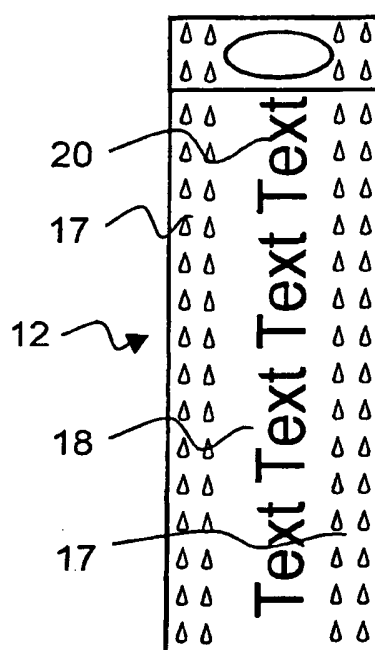


Fig. 5b

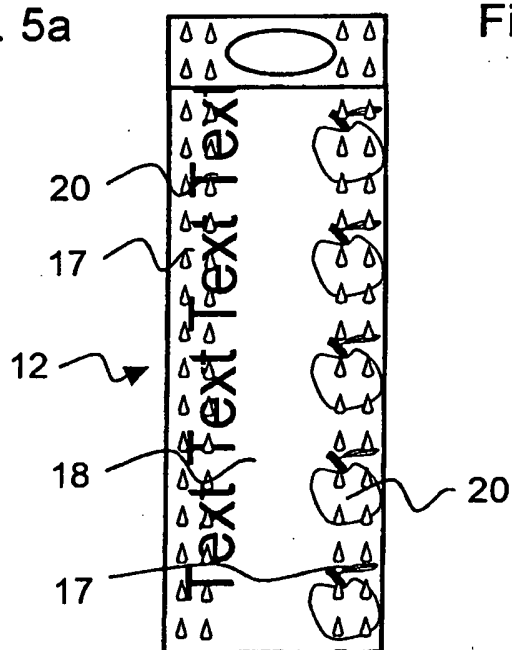


Fig. 5c

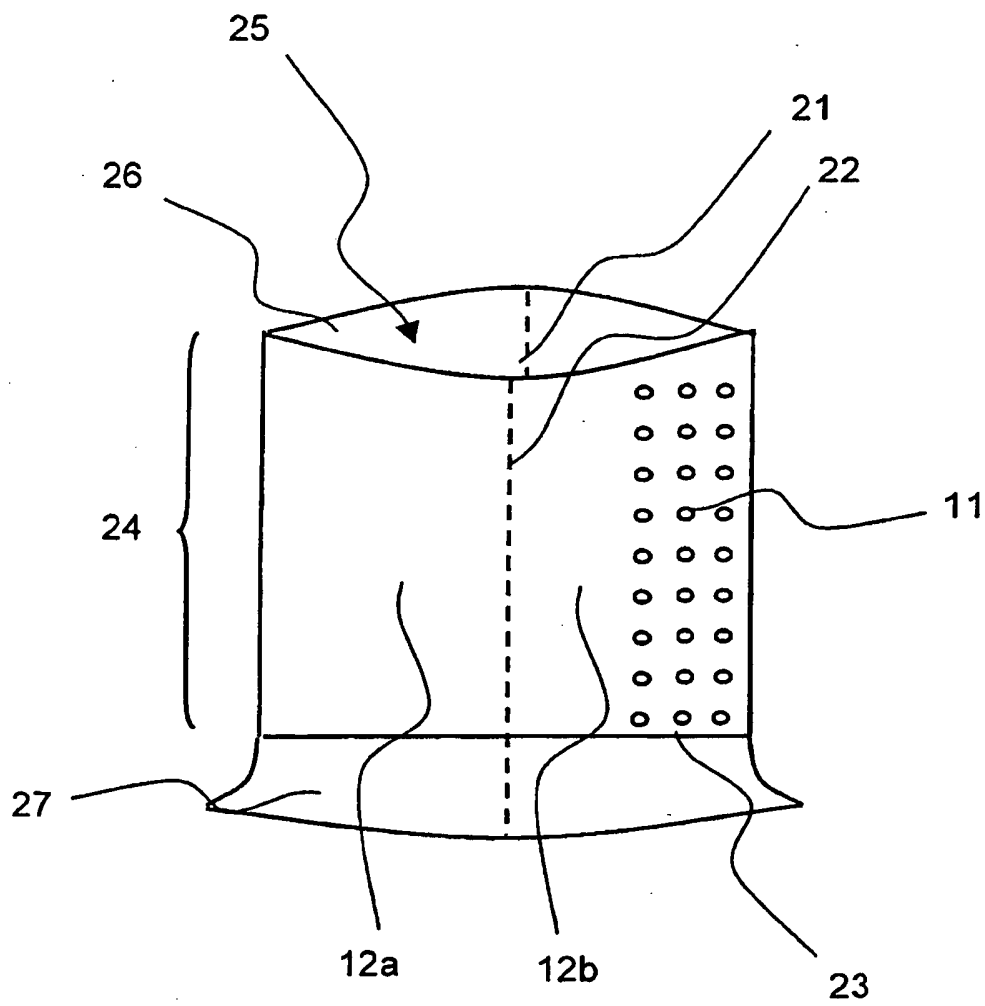


Fig. 6

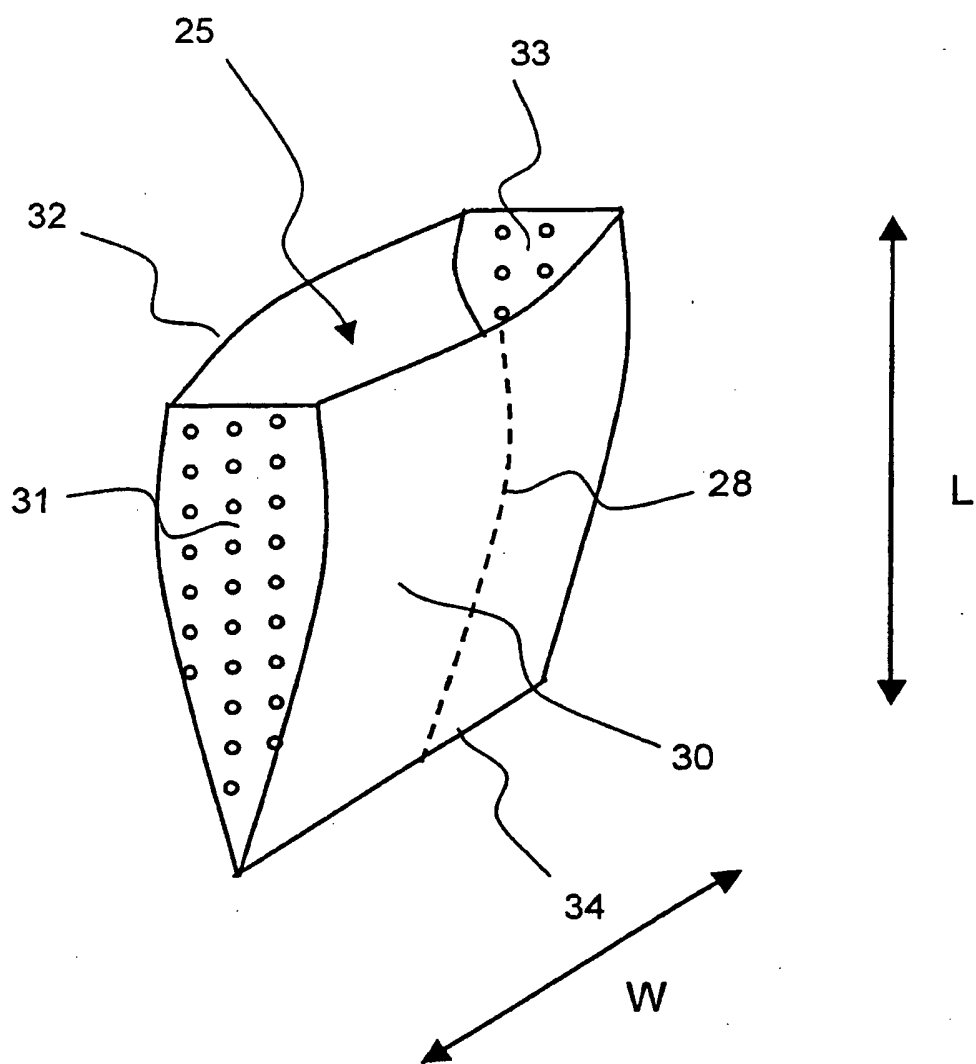


Fig. 7

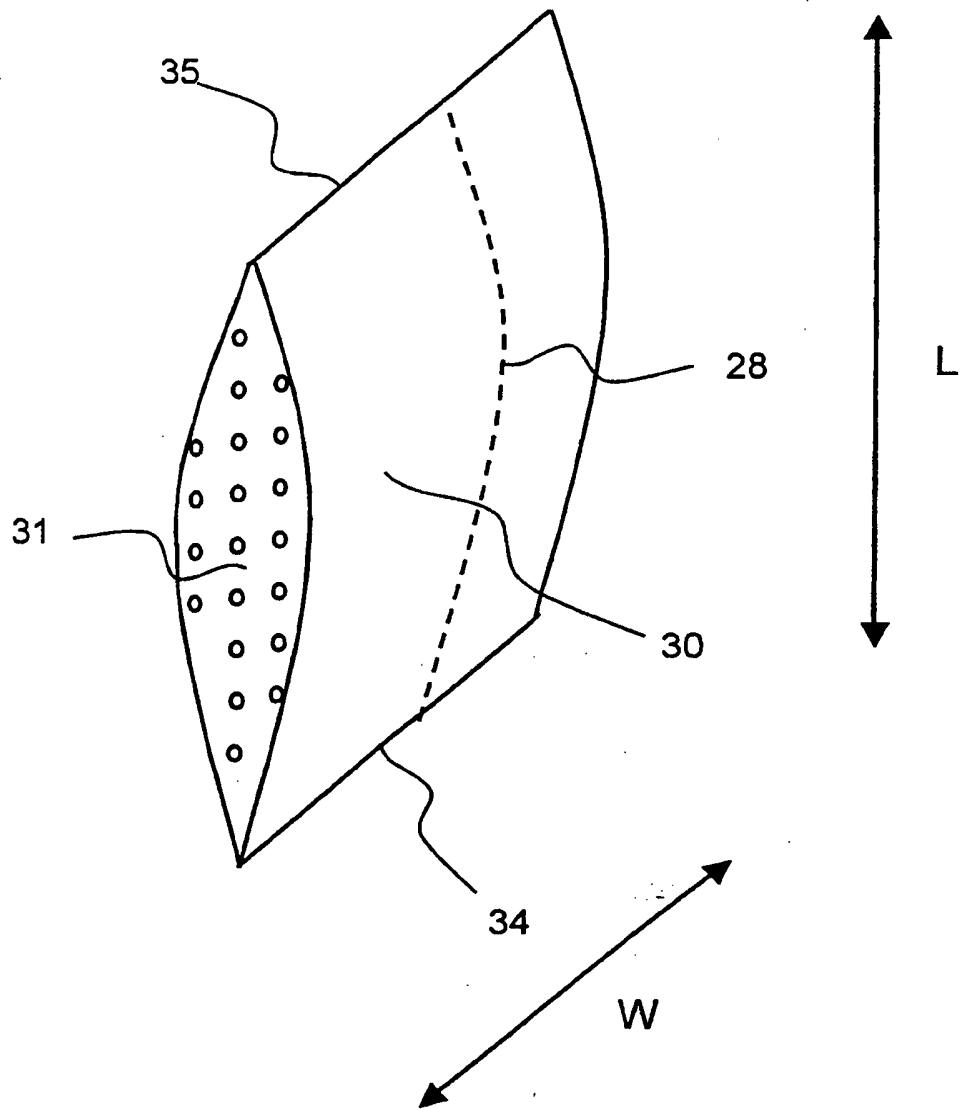


Fig. 8

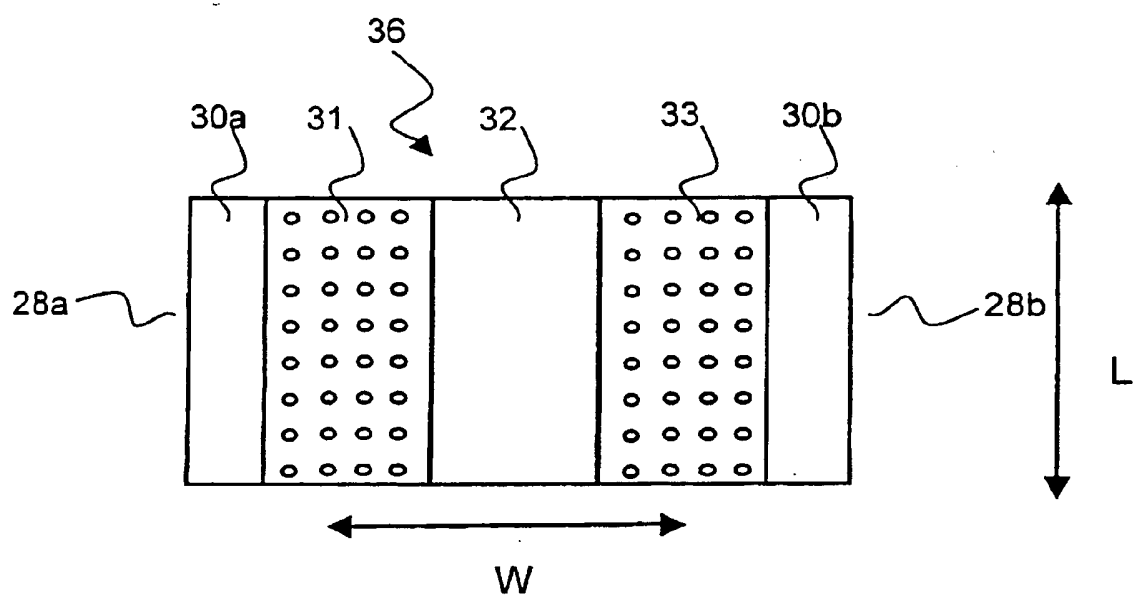


Fig. 9a

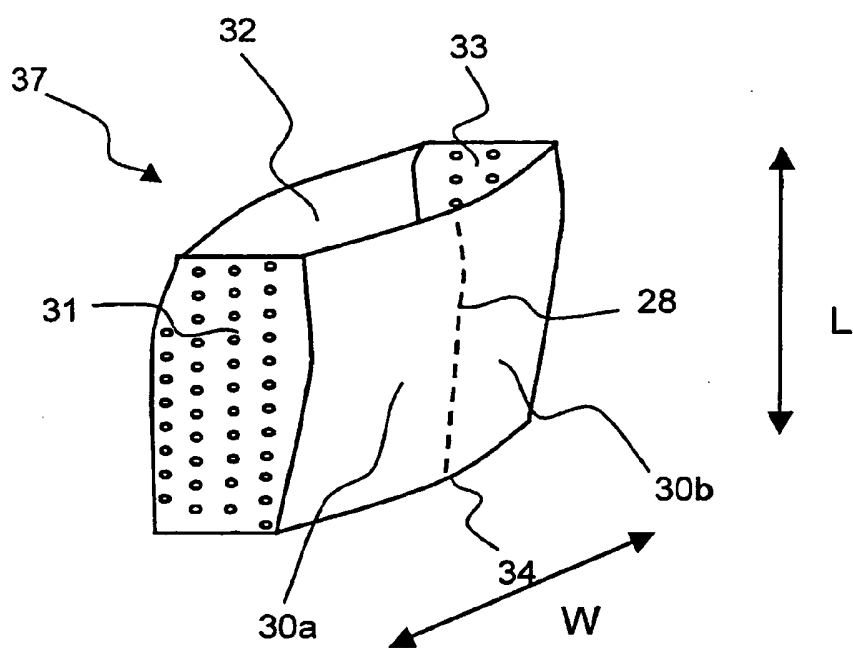
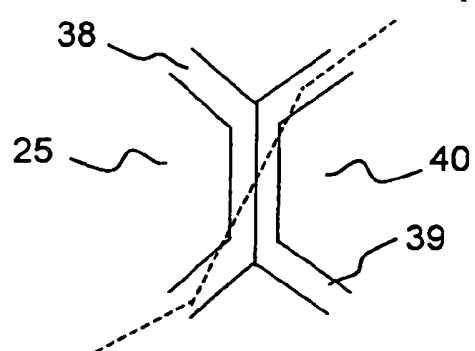
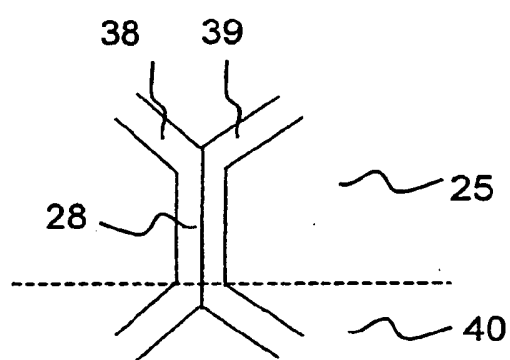
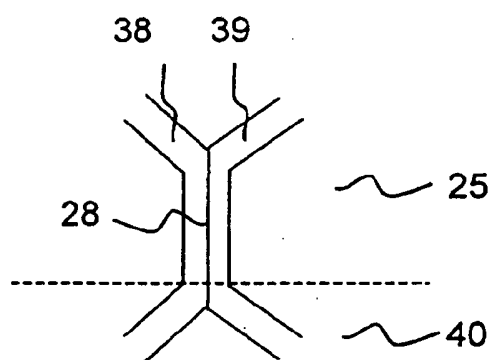
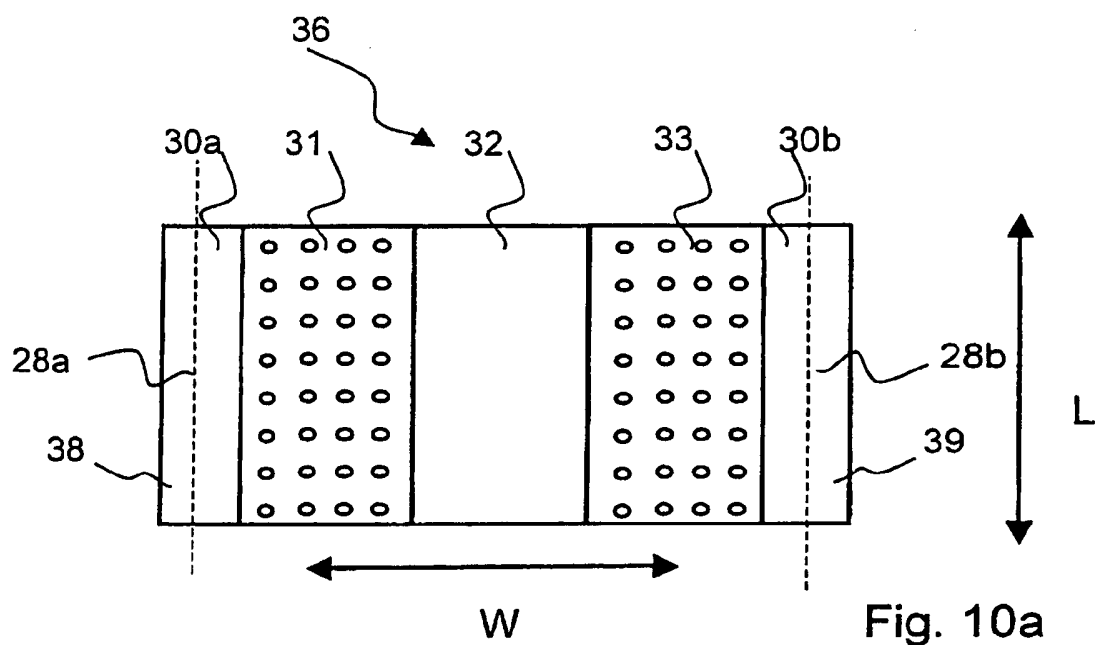


Fig. 9b



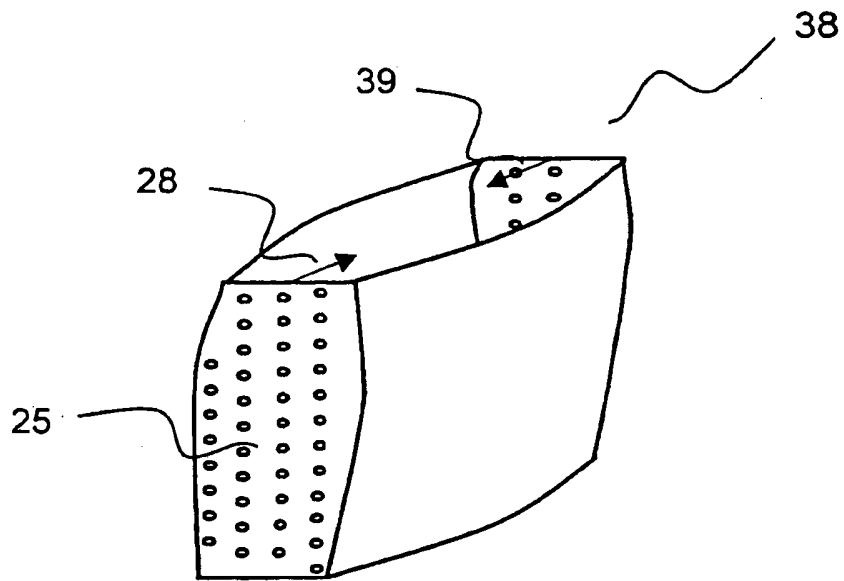


Fig. 11a

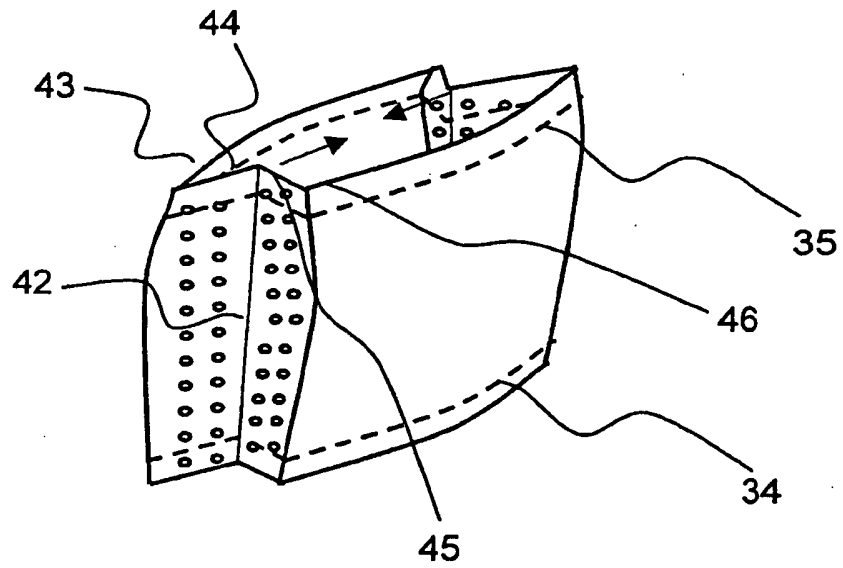


Fig. 11b

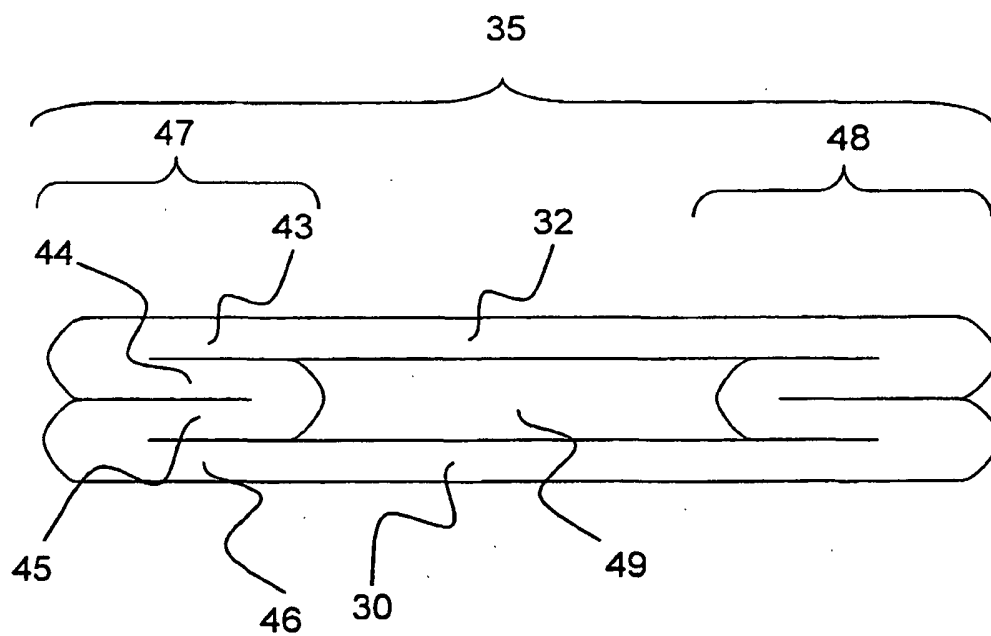


Fig. 12a

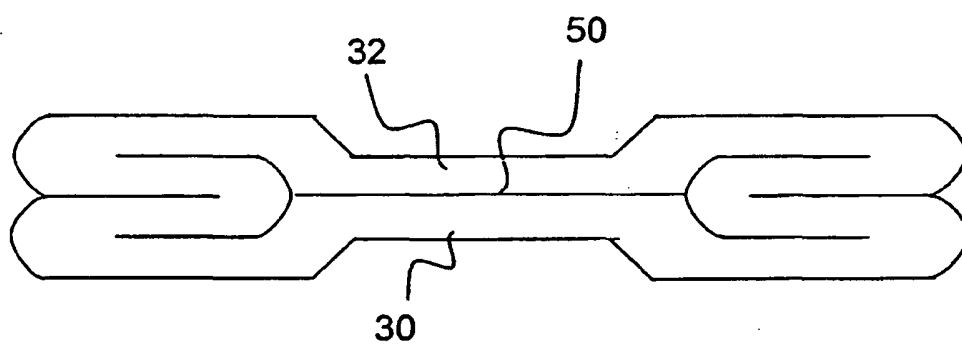
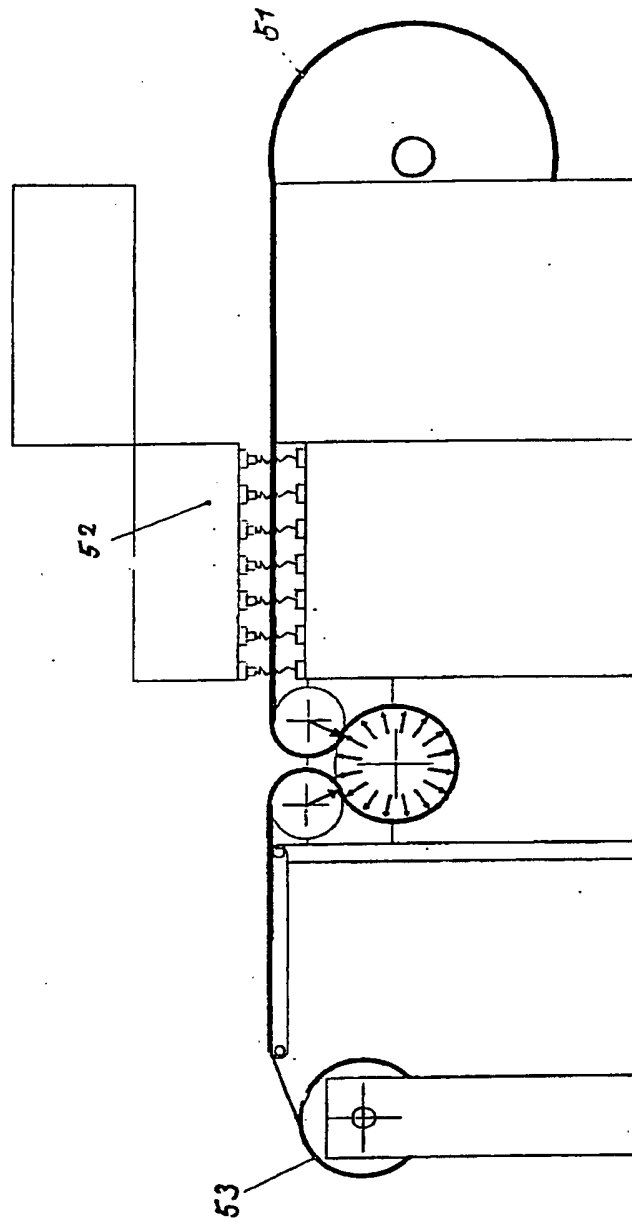


Fig. 12b



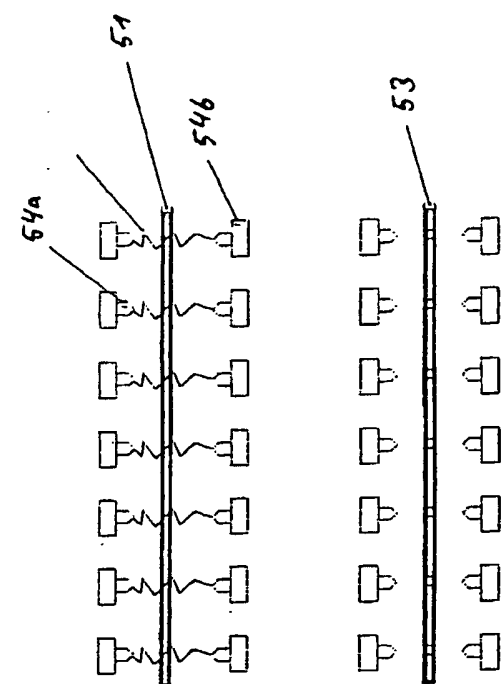


Fig. 14b

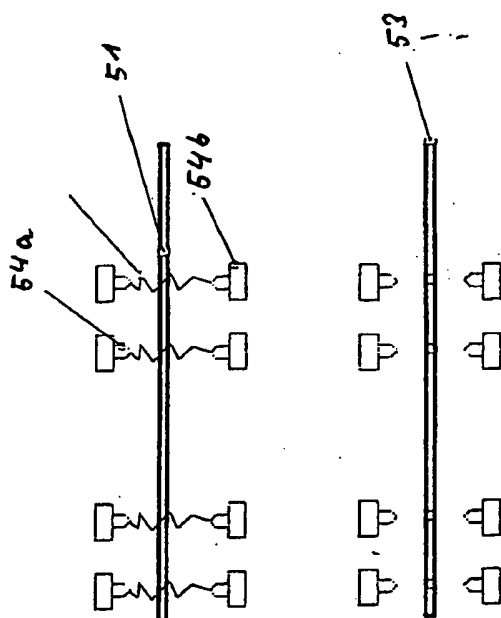


Fig. 14a

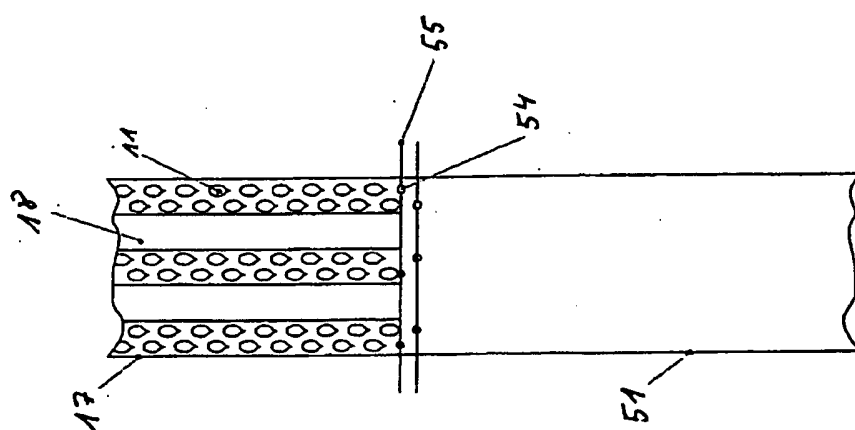


Fig. 15a

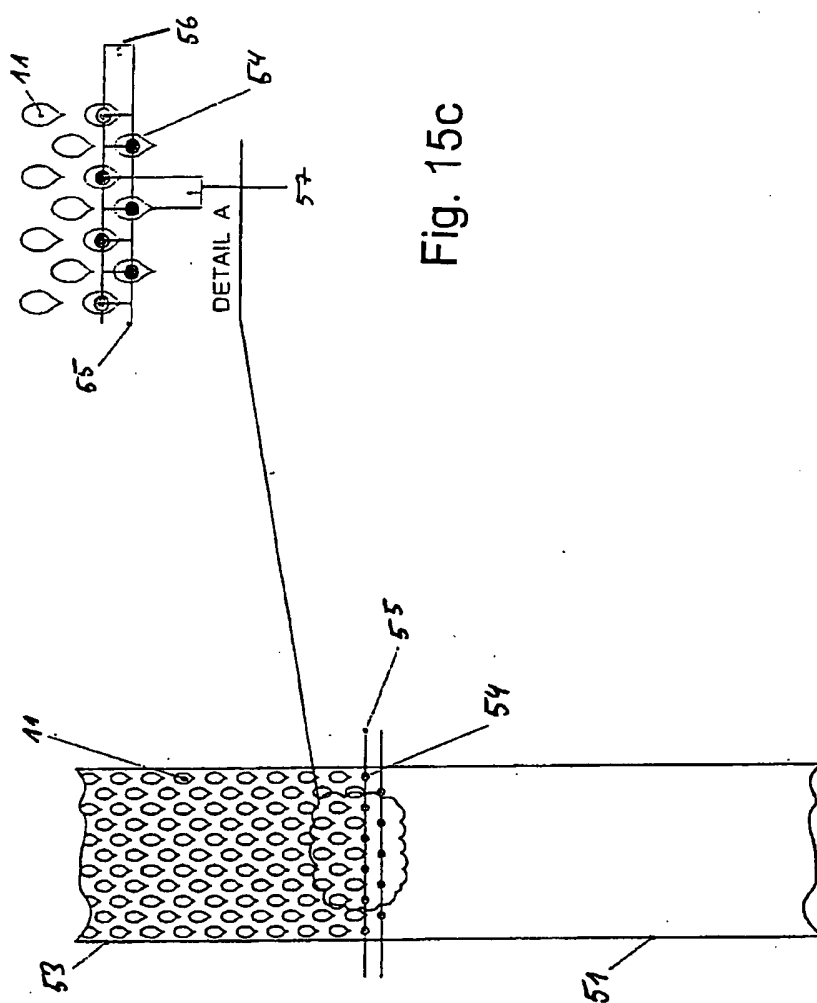


Fig. 15b

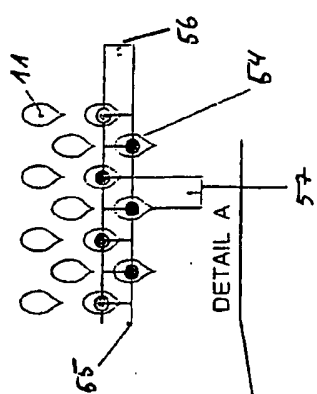


Fig. 15c

REFERENCES CITED IN THE DESCRIPTION

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713371/DO

SZABADALMI IGÉNYPONTOK

1. Csomagoló zsák, amely tartalmaz egy burkolatot (24) több perforációs lyukkal (11),

amely burkolat (24) magában foglal legalább egy rétegnyi polimer fóliából készült körülzáró elemet (12);

amely perforációs lyukak (11) a körülzáró elemnek legalább egy részén (17) vannak elosztva;

a körülzáró elemnek (12) van legalább egy varrata (23, 34); és

a körülzáró elem (24) felületeinek legalább a részei és a varrat (23, 34) a zsák egy belső kamráját (25) határolja:

a körülzáró elem (12, 36) magában foglal legalább két perforációs területet (31, 33) a több perforációs lyukkal (11), mindegyik perforációs terület (31, 33) egy egyenes sávot (17) képez, és a burkolat (24) teljes hosszán terjed ki;

a körülzáró elem (12, 36) magában foglal legalább két nem-perforációs területet (30, 32) perforációs lyukak nélkül, és mindegyik nem-perforációs terület (30, 32) egy egyenes sávot (18) képez, és a burkolat teljes hosszán terjed ki;

a perforációs és a nem-perforációs területek (30, 31, 32, 33) együtt képezik a zsák belső kamráját (25), amely perforációs területek (31, 33) és nem-perforációs területek (30, 32) egy további varrat (28) révén egy tömlős alapelemet (37) képeznek, amely a burkolat (24) hosszának legalább egy részén terjed ki;

továbbá mindegyik perforációs terület (31, 33) szomszédos két nem-perforációs területtel (30, 32), és mindegyik nem-perforációs terület (30, 32) szomszédos két perforációs területtel (31, 33) határos; és

a tömlős alapelem (37) egyik nyílását a varrat (34) zárja le;

azzal jellemezve, hogy a perforációs lyukak (11) nyílásainak csepp alakú formája van.

2. Az 1. igénypont szerinti csomagoló zsák, amelyben a burkolat (24) egy körülzáró elemet (12) foglal magában.

3. Az 1. vagy a 2. igénypont szerinti csomagoló zsák, amelyben a körülzáró elem (12) egy lényegében téglalap alakú fóliát foglal magában alapelemként (36).

4. Az előző igénypontok bármelyike szerinti csomagoló zsák,

amelyben a körülzáró elem (12) átlátszatlan vagy részben átlátszó vagy átlátszó.

5. Az előző igénypontok bármelyike szerinti csomagoló zsák,

amelyben a polimer fóliából való körülzáró elem (12) legalább egy réteg polietilén, kis sűrűségű polietilén, nagy sűrűségű polietilén, lineáris kis sűrűségű polietilén, etilén-vinil-acetát, polivinil-klorid, poliamid, vagy az említett polimerek kopolimerei, vagy az említett polimerek vagy kopolimerek kombinációi.

6. Az előző igénypontok bármelyike szerinti csomagoló zsák,

amelyben a polimer fóliából való réteg magában foglal olyan anyagokat, mint lágyítószer, polikarbonát, irídiumtartalmú anyagok vagy színezékek.

7. Az előző igénypontok bármelyike szerinti csomagoló zsák,

amelyben a perforációs lyukak (11) a polimer fólia említett részeiben perforációs lyukak (17) csúkjait képezik.

8. Az előző igénypontok bármelyike szerinti csomagoló zsák,

amelyben a perforációs lyukak (11) logók, képek, betűk vagy szavak geometrikus mintáját (19) képezik.

9. Az előző igénypontok bármelyike szerinti csomagoló zsák,

amelyben a polimer fólia említett rétege legalább egy felületen nyomtatható vagy írható.

10. Az előző igénypontok bármelyike szerinti csomagoló zsák,

amelyben a körülzáró elem egy területén (17, 18) nyomtatás (20) látható.

11. A 1. igénypont szerinti csomagoló zsák, amelyben

a nem-perforációs területek (30, 32) egyikén belül további varrat (28) helyezkedik el; és

a tömlős alapforma (37) említett nyílását a varrat (34) egy első és egy második szakasszal (47, 48) zárja le, mindegyikük a körülzáró elem legalább négy rétegével (43, 44, 45, 46), továbbá az első szakasznak (47) legalább egy rész-szakaszán a varrat (34) két belső rétege (44, 45) olyan anyagú, mint az első perforációs terület, és a második szakasznak (48) legalább egy rész-szakaszán a varrat (34) két belső rétege olyan anyagú, mint a második perforációs terület.

12. Az előző igénypontok bármelyike szerinti csomagoló zsák, amely magában foglal továbbá legalább egy fogót (10) vagy legalább egy akasztót, amely fogó vagy akasztó egy nyílás a körülzáró elemben (12).

(A meghatalmazott)

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