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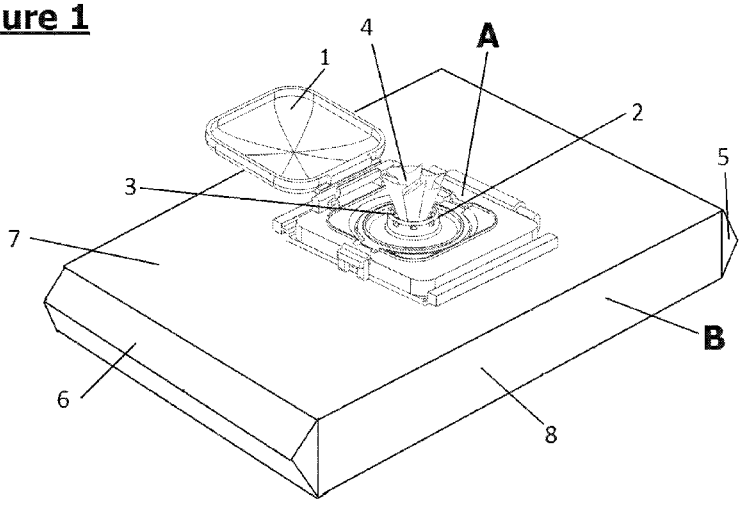
(54) **Title**: CONTAINER OF WIPES WITH 'FALLBACK PREVENT' DISPENSING NOZZLE

Figure 1



(57) **Abstract**: The invention relates to a container of wipes B with a dispensing nozzle 2. The nozzle 2 features an annular projection 14 which is built into a Rigid Flip Top (RFT) A. The inside of the nozzle 2 features inward facing spikes (not shown). The spikes are made from a flexible elastomer that enables the pointed end to move in an upward direction when subjected to upward pressures from say a wipe 4 being inserted into the nozzle 2. If downward forces act on the wipe after it has been inserted into the nozzle so as to force the wipe 4 back into the container B, the pointed ends of the spikes (not shown) dig into the wipe 4, forcing the pointed end of the spike or spikes (not shown) to move back to its original position. This action thereby forces the ends of spike or spikes to dig into the wipe 4 and also imposes space restrictions within the nozzle 2, both actions thereby impede wipe fall back.

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CONTAINER OF WIPES WITH 'FALLBACK PREVENT' DISPENSING NOZZLE

Field of the Invention

The present invention relates to a container of wipes with a dispensing nozzle.

Background of invention

It is well known to house wipes in containers and such containers are typically of two different varieties. The first type is a cylindrical housing made of relatively solid polypropylene material with a sealed end and an open end. An end cap is typically provided for the open end which features an aperture through which wipes are dispensed. The aperture is usually located in a recess in the end cap, and a sealing cap is generally provided which then seals the container.

The second type of container is generally that of the soft pack variety which are comprised of a flexible material like polyethylene, hermetically sealed at opposite ends and featuring a die-cut opening on its uppermost surface through which wipes are extracted from the pack.

Wipes are produced in various formats. Firstly they can be in the form of elongate continuous sheets of moistened or impregnated material with spaced lines of perforations dividing one sheet of material into hand-sized wipes or towelettes. The perforated sheet material is then generally in the form of rolls when stored within cylindrical containers, and wipes are generally

extracted from the central core of the roll when pulled through the aperture of the container. When stored in hermetically sealed soft packs, the perforated sheet material is generally folded into stacks and wipes are generally extracted from the top of the stack and pulled through the die-cut opening on the upper side of the hermetically sealed container. These folded stacks of perforated sheet material can also be stored in specially designed hard plastic containers featuring a hinged lid with an aperture built into it through which wipes are extracted from the container. As to both types of containers, in use when a wipe is withdrawn through the aperture or die cut opening, the narrowness of the aperture or die cut opening causes the material to rupture along the line of perforations between the wipe sheets, a single wipe is then released from the sheet of material, with the intention of leaving a tail of the next wipe projecting through the cap aperture for the next user to grasp.

Secondly wipes can be manufactured into individually cut sheets of moistened or impregnated material which are then generally stored within hermetically sealed containers in an interleaved folded format. Wipes are then extracted through the die cut opening of the soft pack from the top of the stack. Again, these interleaved, folded stacks of cut sheets can also be stored in specially designed hard plastic containers featuring a hinged lid with an aperture built into it through which wipes are extracted from the container. As the top wipe is extracted, the forces of viscosity between the end of the top wipe and the beginning of the trailing wipe is enough to pull the trailing wipe towards the die cut opening or aperture. The narrowness of the die cut opening or aperture then causes the first wipe to separate from the trailing wipe with the intention of leaving sufficient tail of the trailing wipe projecting through the opening for the next user to grasp.

The viscosity between the ends of the cut sheets can be purely a direct result of the liquid impregnate or can be enhanced by means of a mild adhesive applied to the ends of the cut sheets.

Thirdly wipes can be manufactured which are in the form of a discrete length of continuous sheets of moistened or impregnated material with spaced lines of perforations dividing one sheet of material into hand-sized sheets. Each of the ends of the discrete lengths are then connected together by way of a mild adhesive. The same principles as to extraction and wipe separation would apply as described concerning the first two types of wipe mentioned above.

Prior Art

An example of a container is described in German Offenlegungschrift DE-A1-40 06 987 (Penaten). The dispenser has an orifice through which sheets of material are pulled. Mention is made of the applications of such sheets or tissues and the various mixtures and types of liquid with which they may be impregnated.

There are three main problems associated with such containers. Often when a wipe is withdrawn from the container, the bond between the wipes, in this case the line of perforations, ruptures before the wipe is fully withdrawn through the cap aperture. This results in the tail of the next wipe being left inside the container. The result is that a user needs to remove the cap and feed the tail of the next wipe to be dispensed through the cap aperture.

Another problem being that the aperture or opening of the container fails to exact enough pressure as the wipes are extracted to cause the bond between the ends of the wipes to rupture. The wipes will then fail to separate into individual sheets resulting in a 'stream' of wipes being inadvertently extracted when only one was required.

A further problem was that wipes, which were intended to be moist, but if the container of wipes is stored and not used for a length of time, the wipes dry out due to wicking and because vapour can emerge from the container through the cap aperture or die cut opening.

International Patent Application Number WO-A1-2006/124429 (BKI Holding Corp) to some extent solved the third problem and provides a container for wipes having a centre pull feed arrangement for dispensing sheets, typically off a roll. The dispenser includes a tray that supports a web roll which removes excess moisture form a sheet that is being dispensed and returns moisture, by way of a wicking action, to the remaining sheets within the container.

Another dispenser is described in US Patent US-B-5 246 137 (James River Paper Company) discloses a device for dispensing individual sheets from a roll wherein the dispenser is in the form of a nozzle. However, it is not apparent how successful this device is at retaining moisture within the container, thereby ensuring that wipes, when dispensed are sufficiently wet.

US Patent US-B-6 328 252 (Georgia Pacific France) discloses a dispenser for wipes which are intended to unwind from the centre of a roll outwards towards

the of the roll. The container includes a nozzle that has a generally frusto-conical shape that is shaped and oriented to ease the introduction of as free end of a roll of wipes into and through the orifice. The dispenser shown is relatively complex and comprises a significant number of discrete and relatively complex moulded items.

Another container is described in US Patent US-B-6 186 374 (Seaquist Closures Foreign Inc), which discloses a container for dispensing wipes with a structure extending from the body of the container which defines a dispensing surface for directing a stream of wipes from the roll (housed within the container) to a nozzle region from where a single wipe may be torn.

The container has a lid which defines a passage through the lid. A flexible valve is provided through which wipes pass. The flexible valve has self sealing slits which flex in order to permit the passage of towels. However, there still remains the problem, when withdrawing wipes from the container, that either perforations rupture before the wipe is fully withdrawn or lines of perforations separating the wipes fail to rupture, resulting in a 'stream' of wipes being dispensed.

It is thus apparent that two conflicting requirements are present relating to how tight the wipes are gripped as they exit the container. On the one hand it is essential that the container remains as close to an hermetically sealed environment as possible, so as to ensure the wipes retain moisture; whereas on the other hand, too tight a grip on the wipes as they are being withdrawn, imparted by the dispensing orifice, either gives rise to unpredictable or premature tearing of the wipes.

Additionally, there must be a mechanism that allows free passage of the wipes to exit the container, one that exerts enough pressures to ensure that the wipes separate into single sheets leaving a tail for the next user to grasp, this same mechanism being able to actively prevent the tail of the wipe from slipping back into the container.

The invention overcomes the aforementioned problems and provides an improved dispenser which is cheap to fabricate and which is easy and reliable to operate.

Summary of the Invention

According to a first aspect of the invention there is provided a container of wipes with a dispensing nozzle comprising:

a) a housing containing wipes, the ends of said wipes being bonded together by way of the viscosity of the impregnate within the wipes or the frictional forces between the interleaved ends of the wipes or spaced lines of perforations dividing the sheet of material into wipes, and

b) a dispensing nozzle extending from the container which features an aperture, in use a wipe can be withdrawn through the aperture of the nozzle, the nozzle exerting sufficient gripping force on the wipe so as to apply a force of sufficient magnitude as to enable or promote the onset of rupturing the bond joining the wipe to a next adjacent wipe,

c) spikes or projections or some similar form of gripping means disposed on the inner surface of the nozzle that when in their first position, point generally

towards the centre of the aperture. These spikes or projections are preferably formed from the same material as the nozzle, one or more of the spikes or projections that point towards the centre of the aperture being of a design or structure such that the amount of pressure required to flex the spikes or projections to enable their ends to point in an upwards direction, their second position, is less than that required to flex the spikes or projections to enable their ends to point in a downwards direction, their third position.

When a wipe is inserted into and as a wipe passes through the nozzle and out of the container, part or all of the structure of said spikes or projections flexes such that said spike or projection is at a forward facing angle to the passage of the wipe, their second position. However, when downward forces are exerted on the wipe, the now forward facing end of said spike or projection which is essentially in a barbed position, exerts a greater level of pressure on the wipe because its end digs into the wipe thereby impeding the fall of the wipe back into the container. Also, as the spike or projection is forced back to its first position, the spike or projection reduces the space within the centre of the annular projection for the wipe to fall, which thereby further impedes the fall back of the wipe back into the container.

Fall back is further deterred by the very fact that greater pressure is required to flex the spikes or projections and force the ends into a downward facing angle, their third position, as compared to that required to flex them into a forward upward facing angle, their second position.

The nozzle can be formed from a flexible, elastomeric material or alternatively it could be formed from a less flexible polypropylene type material.

Ideally the nozzle is shaped and has enough elastomeric properties to grip the tail of the emerging wipe to prevent release of moisture from the inside of the container and to help prevent wicking of moisture from a wipe tail. The invention overcomes existing problems and drawbacks associated with dispensing wipes as the inventor has appreciated that there is an optimum friction force that needs to be applied. This friction force must be sufficiently small as not to damage (tear) towelettes or wipes at the onset of pulling, but to be sufficiently small to permit the towelette or wipe to be withdrawn. This friction is known as the coefficient of static friction. However, once a wipe is in motion and is being drawn through the orifice a different form of friction is in precedence. This is referred to as dynamic friction and is smaller than the coefficient of static friction. This is partly due to kinetics and partly due to the boundary established between the tissue and the aperture defined in the nozzle. However, the nozzle must still be able to exert sufficient gripping force on the wipe so as to apply a force of sufficient magnitude to enable or promote the onset of rupturing of the bonds that separate the wipes.

Preferably therefore the nozzle is also dimensioned such that any force pulling the wipe back into the container, biases the nozzle aperture into a contracted state, thereby, in conjunction with the action of the barbed spikes or projections and the greater force that is required to be exerted in order for the ends of the spikes or projections to flex into the third position, discouraging the wipe from falling back into its container thus avoiding the need to re-thread a tail of a wipe through the aperture.

Ideally the nozzle may feature just spikes or projections on its inner surface or a combination of ribs, pips, spikes, projections, raised or roughened region or other gripping means together.

Ideally ribs, pips, spikes, projections or any other raised or roughened region are formed integrally with the nozzle and ideally in a single shot injection moulding process.

Ideally ribs, pips, spikes, projections or gripping means or any other raised or roughened region may be formed in a pattern which is circularly symmetric or radially symmetric around the inner surface of the nozzle.

Ribs, pips, spikes, projections or any other raised or roughened region may be disposed in the form of a continuous spiral or at intervals so as to optimise grip.

The nozzle may be teat-shaped, or cone shaped and taper from a widened base to a tip, and an aperture is provided in the tip.

Alternatively the nozzle may be in the form of an annular projection with parallel sides and a tip, and an aperture provided in the tip.

In a further embodiment the nozzle wall, tapers in an inward direction from a widened base, and then curves outwards into an annular projection, the annular projection defining an aperture provided at the top of the walls of the annular projection. The nozzle having a widened base dome shape yields two major benefits. Firstly, the widened base dome shape gives the nozzle a

funnel-like structure which makes it easier for the user to feed the first wipe into the narrow annular projection of the nozzle. Secondly, the smooth manner by which the nozzle wall tapers from its dome shaped base and then curves outwards to form the annular projection tapers enables the wipes to enter the narrow annular projection from a stack more gracefully as they are extracted from their container. This is because as a wipe is extracted, the outsides of the wipes near the perimeter of the container are pulled towards the centre of the stack and form a conical shape prior to exiting the container through the narrow annular projection. By featuring smooth transition lines throughout its structure, the nozzle therefore enables the sections of the wipe on the outside sections of the stack to enter the restrictive, narrow annular projection more gradually, more smoothly, more gracefully. This thereby reduces the possible incidence for the wipe to separate prematurely. Should the wipe enter the annular projection from a more acute angle, the corner, at which the base of the annular projection is formed, could exert pressures on the moving wipe that result in premature separations of the wipes.

However a consequence of a dome structure is that the space between the outset of the annular projection and top of the stack of wipes is thereby increased, which could provide greater opportunity for the wipe to fall back into the container. The barbed action of the spikes or projections and their return to position 1 impedes the wipe from falling back thereby enabling the user to gain the advantages of easier feed of the first wipe and smoother passage of the wipe from the container without the same level of increased risk of the wipe falling back into it.

Preferably the nozzle projects beyond the outer surface of the container.

Preferably the spikes or projections, when in their first position, may form a valve-like structure that seals the container prior to the insertion of a wipe.

Preferably the spikes or projections may feature a hinge like point of weakness on their structure which acts as a sort of axis causing all or part of the structure of the spikes or projections between said point of weakness and the centre of annular projection to flex and thereby point generally inwardly and at an angle to the direction of the passage of the wipe.

Brief Description of the Figures

Embodiments of the invention will now be described with reference to the drawings in which:

Figure 1 shows a top view of a hermetically sealed dispensing container of wipes featuring a Rigid Flip Top (RFT) showing the location of the annular projection of a nozzle within the structure of the RFT, and a tail of a wipe protruding through the aperture of the nozzle.

Figure 2 shows cross sectional views of stacks of wipes within their containers

Figure 3 shows a cross section of a tub containing a roll of wipes

Figure 4 shows cross section views of nozzles featuring annular projections fixed to dome like structures and spikes and protrusions on the inner wall of the annular projection. Figure 4a shows the lower level spikes featuring a 'slit' point of weakness in position 1, Figure 4b shows the lower level spikes in position 2.

Figure 5 shows cross section views of nozzles featuring annular projections fixed to dome like structures and a single layer of spikes on the inner wall of

the annular projection. Figure 5a shows the spikes in position 1, their structure being such that angle 21 is greater than the angle 22, figure 4b shows the spikes in position 2.

Referring to Figure 1 there is shown a top view of a Rigid Flip Top (RFT) A attached to a hermetically sealed soft pack dispensing container of wipes B. The soft pack is generally cuboid, having two similar rectangular sides (only one side 8 being here visible), two ends 5, 6, and an upper face 7, and lower face 8 (not here visible). The soft pack contains a stack of wipes encapsulated by an outer covering of flexible, impermeable material, typically formed from a sleeve of material bonded at each of the ends 5, 6, so that the soft pack is hermetically sealed, apart from the opening through the RFT A.

The soft pack has an RFT A bonded to the upper face 7.

The RFT A has a central nozzle 2 (which conveniently could be circular) projecting beyond the outer surface of the container which is shown with the tail of a wipe 4 protruding through the aperture 3. The nozzles may be sealed using a sealing cap 1 here shown in open position.

Referring to Figure 2 there is shown cross section views of stacks of wipes within a container B. The container B (which conveniently is shown to be of cuboid shape), can be made from a soft flexible material or a less flexible polypropylene material.

The wipes 13 shown in Figure 2a are in a folded format. The individual wipes are here shown separated by lines of perforations 14. However the length of wipe material that is shown in the stack could feature some other method by

which the sheets are bonded together along all or part of its length, like a mild adhesive or bonded together due to the viscosity of liquid that impregnates the wipe material, or due to the friction between the interleaved sheets. The stack of wipes 13 could perhaps feature a combination of mild adhesive, lines of perforations or liquid impregnate viscosity or interleaved formation bonding the individual sheets together.

The wipes 13 shown in Figure 2b are in a folded, interleaved format 14, the back end of each individual wipe is interleaved with the front end of the trailing wipe. The interleave can be in the form of 'C' fold, 'Z' fold 'Quarter' fold or any other folded format as well known to those skilled in the art. As the top wipe is extracted from the container, the frictional action of the interleave connection between the wipes is enough to pull the trailing wipe towards the opening (not shown) of the container B. If the wipes are impregnated with a liquid, forces of viscosity between the ends of the wipes would further enhance the bond between them as would the addition of a mild adhesive applied to the ends of each individual wipe. The stack of wipes 13 could perhaps feature any combination of mild adhesive, lines of perforations or interleave connection bonding the individual sheets together.

Referring to Figure 3 there is shown a cross section view of a tub of wipes C. The tub is cylindrical in shape, features a removable cap 9 and contains a roll of wipes D.

The tub C has a central nozzle 2 (which conveniently is shown to be of conical shape), fixed to a recess 11 on the upper face 12 which is shown with the tail of a wipe 4 protruding through the aperture 3. The nozzle may be sealed

using a sealing cap (not shown). The nozzle 2 can be made from a flexible elastomeric material or a less flexible polypropylene or HDPE type of material. The roll of wipes D will typically feature lines of perforations 10 separating the roll into single sheets, and the wipe material will feed through the nozzle from the central core of the roll D. However the roll of wipes D could feature some other method by which the sheets are bonded together along all or part of its length, like a mild adhesive. The roll of wipes D could perhaps feature a combination of mild adhesive and lines of perforations bonding the individual sheets together.

The tub could be in the form of a more rigid housing, one that is either portable or alternatively fixed to a horizontal or vertical surface.

The nozzle may be in a form such that it can be retro-fitted to the housing or permanently bonded to it by way of a two shot mold process.

Referring to Figures 4a and 4b there are shown cross section views of a nozzle 2. The nozzle 2 is shown to feature an annular projection 14 attached to a dome shaped structure 15. The nozzle 2 could be fixed within a Rigid Flip Top (not shown) which itself would be fixed over the opening to a container of wipes (not shown) or the lid of a tube of wipes (not shown). The inside wall of the annular projection 14 features protuberances 16 and spikes 17. The spikes 17 feature a one-way hinge like point of weakness axis 18 resultant from a 'slit' 19 in the structure of the spike 17.

Figure 4a shows the spikes 17 in their first position, pointing inwards towards the centre of the nozzle. When upward pressure is applied to the pointed ends

of the spike 20, the slit 19, which extends to the axis of the spike 18, enables the pointed ends of the spike 20 to move upwards on its axis to its second position, that being upwards.

Figure 4b shows the spike 17 in its second position, pointed side of the spike 20 now being upright after being subject to upward pressures due to say, a wipe (not shown) being inserted into the nozzle. The axis 18 is on the upper section of the spike 17, therefore the pointed side can freely move upwards but requires extra force to move it further downwards from its first position.

The spike 17 is shown to feature a smooth curved lower section to minimize the impact on the passage of the wipe up through the annular projection 14 from the spike 17. As shown, the protuberances 16 also provide the pressures that bring about the onset of rupturing of the bonds between the wipes.

Should the wipe that has entered the annular projection 14 be subject to any downward pressures that could force the wipe to slip downwards, the pointed ends 20 of the spikes 17 would impact and dig into the falling wipe which would then force the pointed ends 20 of the spikes 17 to return towards their first positions. The return of the pointed ends 20 of the spikes 17 towards their first positions imposes space restrictions within the annular projection 14 which therefore curtails further fall of the wipe. The structure of the spike is such that the weakened section of the spike, the slit, has the effect that the amount of pressure to force the spikes into position 2 would thereby be less than the amount of pressure required to force the spikes into position 3 (not shown), spikes with their ends facing downwards, an opposite position to the

position the spikes would adopt as wipes pass out from the aperture from the container.

The annular projection 14 with protuberances 16 and spikes 17 on its inside wall and the dome like structure 15 to which the annular projection 14 is firmly attached could both be made from the same material. The domed shaping of the structure enables the wipes to feed more easily into the annular projection. The nozzle therefore has a relatively wide base which tapers radially inwardly and then smoothly curves upwards into the annular projection which terminates at the tip to provide an aperture for the wipes' exit. That material could be a flexible elastomer or a more rigid material like polypropylene or HTPE.

The annular projection 14 with protuberances 16 and spikes 17 could however be made from a flexible elastomer different materials, and the dome like structure 15 to which the annular projection 14 is firmly connected could be both made from a more rigid material like polypropylene or HTPE. Alternatively the various components of the dispensing nozzle could be made from a single flexible or more rigid material or the dispensing nozzle could be comprised of components made from a variety of flexible and more rigid materials built into the same dispensing nozzle structure.

The shape of the annular projection 14 is here shown to have parallel sides however it could be teat-like or conical or any regular or irregular shaped annular projection.

Referring to Figure 5 there is shown a cross section view of a nozzle 2. There features a nozzle 2 with a resilient aperture through which wipes can be withdrawn from the housing container. Before a wipe is inserted therein, the nozzle wall tapers inwards from a dome shaped widened base and then curves outwards into an annular projection, the resilient aperture being expandable to allow withdrawal of the wipes therethrough and biased towards a contracted state as a wipe is extracted through the aperture. Thereby in use, a wipe is withdrawn through the nozzle and separated by rupturing the bond joining the wipe to a next adjacent wipe as the nozzle contracts around the tail of the next adjacent wipe. The inside wall of the annular projection 14 features a single row of spikes 17 which are in their first position, pointing inwards towards the centre of the nozzle. The ends of the spikes in figure 5a could be below above or at the same level as the top of the annular projection, the bases of spikes being formed on the inside of the annular projection. The side view cross section of the spikes being largely of triangular shape though they could equally be of any shape that features a wider section at a point closer to its base that then tapers evenly or unevenly to a narrower apex. Because of the elastomeric nature of the material that comprises the spikes and the annular projection, upward pressure applied to the pointed ends of the spike 20 as a wipe (not shown) is inserted into the nozzle causes the spikes to flex in the general direction of the passage of the wipe and for the flexible walls of the annular projection to expand to allow passage of the wipe through the annular projection and out through the aperture.

The pointed ends of the spikes 20 would then be in an inward facing barbed position 2, at a forward facing angle to the passage of the wipes. Should forces prevent free passage of the wipe through the nozzle and cause the

wipe to fall back, the ends of the spike 20 would then dig into the wipe thus hindering fall back of the wipe into the container. The structure of the spike is such that the angle 21 is greater than the angle 22. Ideally, the angle 21 is greater than 90 degrees. This means that the amount of pressure to force the spikes into position 2 is thereby less than the amount of pressure required to force the spikes into position 3 (not shown), spikes with their ends facing downwards, opposite to the outwards passage of the wipes from the container.

Having spikes that form a valve-like arrangement, figure 5a, also confers two other benefits :

1) When the spikes are in position 1 prior to insertion of a wipe, figure 5a, the spikes help seal the pack in order to keep the wipes within the container moist.

2) When the spikes are in position 1, the pointed, tapering nature of the spikes means that they offer less resistance at the centre of the aperture and are easier to flex when pressure is applied at that point. The first wipe can therefore be fed through the aperture by applying pressure to the end of the wipe with the thumb or finger and then pushing said wipe through the weaker centre section of the valve-like formation of the flexible spikes. This is an easier way to feed a wipe through the nozzle rather than trying to 'thread' the tip of the first wipe through a maze of fixed pips, projections or raised regions deployed on the inside of the annular projection.

Being biased towards a contracted state, as a wipe is extracted through the aperture, once it separates from the next emerging adjacent wipe to which it is attached, the flexible walls of the nozzle then contract around the tail of the emerging wipe effectively sealing the pack thereby helping prevent moisture from escaping from the container.

Also helping seal the pack still further is the tendency for the material that comprises the emerging wipe to fill the gaps between the spikes when they are in their barbed position 2.

Again, the various components of the dispensing nozzle could be made from a single flexible or more rigid material or the dispensing nozzle could be comprised of components made from a variety of flexible and more rigid materials built into the same dispensing nozzle structure.

Claims

1. A housing container for wipes with a dispensing nozzle comprising:

a housing which in use receives wipes, said wipes being formed of sheets the ends of said wipes being releasably attached to each other in a series which are capable of being detached into separate wipes when subject to a separation force

the housing container has a dispensing nozzle which has an annular projection featuring an aperture, in use a wipe can be withdrawn from the housing container through the aperture of the nozzle, the nozzle exerting sufficient gripping force on the wipe so as to apply a force of sufficient magnitude as to enable or promote the separation of one wipe from its adjacent wipe,

one or more spikes, the side view vertical cross section shape of which are wider at a point closer to their base and then forming to a narrower apex, the lower angle of the base being less than 90 degrees, are deployed on the inner surface of the annular projection, the spike or spikes being able to flex between a first position and second position, the spike or spikes being aligned towards the direction of the extraction of the stream of wipes in the first position, allowing them to pass through the nozzle, the spike or spikes being generally pointing upwards and inwards in the second position, so as to prevent the fall back of the wipes through the nozzle.

2. A housing container for wipes according to claim 1 wherein the nozzle wall tapers inwards from a widened base and then curves outwards into an annular projection.

3. A housing container for wipes according to any previous claim wherein the widened base is in the form of a dome shaped structure.

4. A housing container for wipes according to any previous claim wherein the gripping force to separate the wipes is provided by the first set of spikes.

5. A housing container for wipes according to any previous claim wherein one or more of the spikes has its base on the inside surface of the annular projection, the lower angle of the base being less than 60 degrees, the upper angle of the base being more than 60 degrees such that it requires less force to flex the spike or spikes upwardly from their resting position than it takes to flex the spike or spikes in a downward direction from their resting position.

6. A housing container for wipes according to any previous claim wherein the upper angle of the base of the spike or spikes being more than 90 degrees.

7. A housing container for wipes according to any previous claim wherein the gripping force to separate the wipes is provided by a constriction element or elements spaced from the first set of spikes.

8. A housing container for wipes according to any previous claim wherein the gripping force to separate the wipes is provided by both the first set of spikes and a constriction element or elements spaced from the first set of spikes.

9. A housing container for wipes according to claims 7 and 8 wherein the constriction elements comprise a second fixed set of spikes.

10. A housing container for wipes according to any previous claim wherein first set of spikes are biased to return to the first position.

11. A housing container for wipes according to any previous claim wherein the wipes are releasably attached to each other by the adhesion or cohesion of a viscous substance.

12. A housing container for wipes according to any previous claim wherein the wipes are releasably attached to each other by a line of perforations.

13. A housing container for wipes according to any previous claim wherein the wipes are releasably attached to each other by frictional forces arising from being interleaved.

14. A housing container for wipes according to any previous claim wherein the wipes within the same housing are releasably attached to each other by way of any combination of the adhesion or cohesion of a viscous substance, perforations or by frictional forces arising from being interleaved.

15. A housing container for wipes according to any previous claim wherein the spikes are formed from the same material as the nozzle.

16. A housing container for wipes according to any previous claim wherein the spikes are formed from a flexible, elastomeric material.

17. A housing container for wipes according to any previous claim wherein the spikes are formed from a less flexible polypropylene material.

18. A housing container for wipes according to any previous claim wherein the spikes are formed with pointed ends at their apex.

19. A housing container for wipes according to any previous claim wherein the spikes are formed with rounded ends at their apex.

20. A housing container for wipes according to any previous claim wherein the nozzle wall is flexible, and has a first expanded state when the stream of wipes is being drawn out of the container, and a contracted state when the stream of wipes is no longer being drawn out of the container.

21. A housing container for wipes according to any previous claim wherein the constriction elements comprise ribs, pips, spikes, projections, protuberances, raised or roughened region or other gripping means.

22. A housing container for wipes according to any previous claim wherein the constriction elements and first set of spikes are formed integrally with the nozzle and ideally in a single shot injection moulding process.

23. A housing container for wipes according to any previous claim wherein the constriction elements and first set of spikes are formed in a pattern which

is circularly symmetric or radially symmetric around the inner surface of the nozzle.

24. A housing container for wipes according to any previous claim wherein the constriction elements and first set of spikes are formed in a pattern which is a continuous or interrupted spiral so as to optimise grip.

25. A housing container for wipes according to any previous claim wherein the nozzle is teat-shaped and tapers from a widened base to a tip, and an aperture is provided in the tip.

26. A housing container for wipes according to any previous claim wherein the nozzle is cone shaped and tapers from a widened base to a tip, and an aperture is provided in the tip.

27. A housing container for wipes according to any previous claim wherein the nozzle is in the form of an annular projection with parallel sides and a tip, and an aperture provided in the tip.

28. A housing container for wipes according to any previous claim wherein the nozzle projects beyond the outer surface of the container.

Figure 1

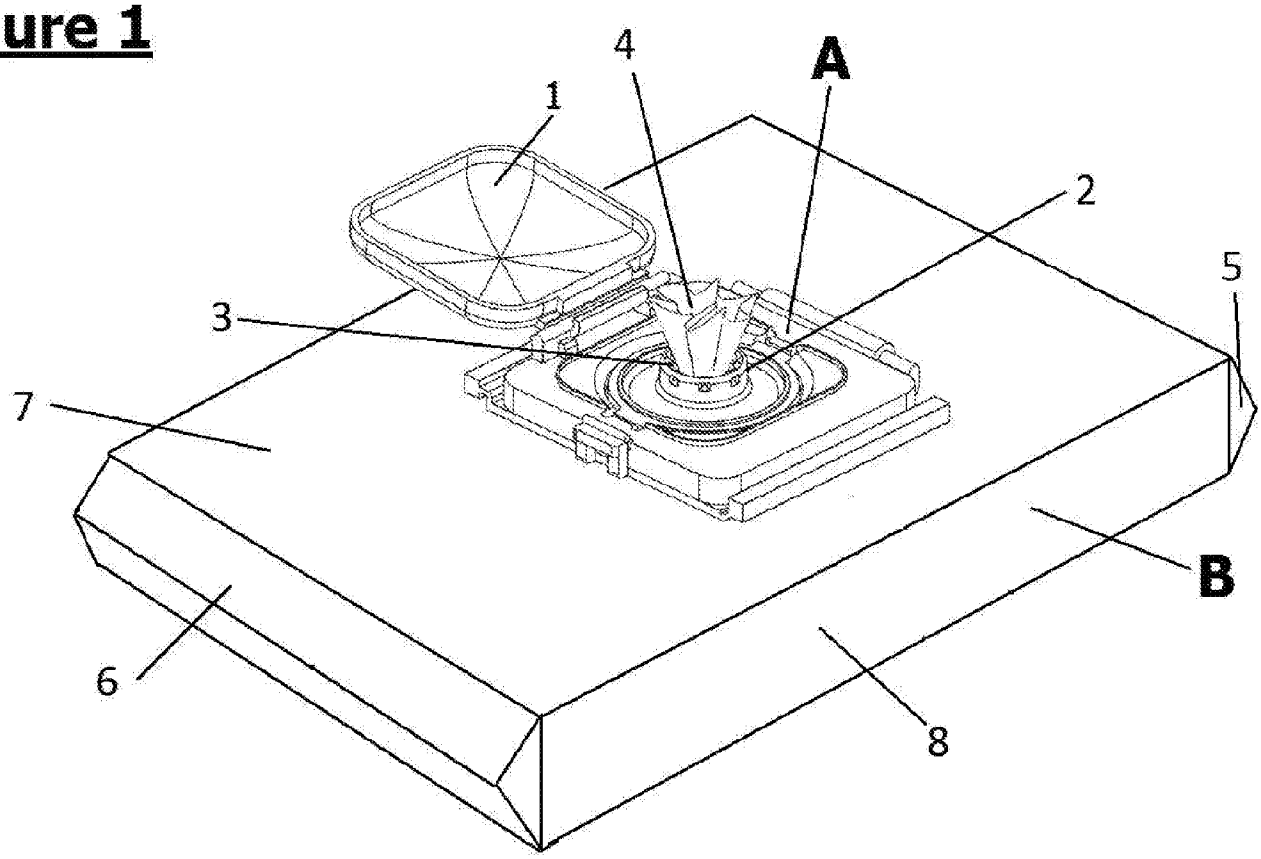

Figure 2a

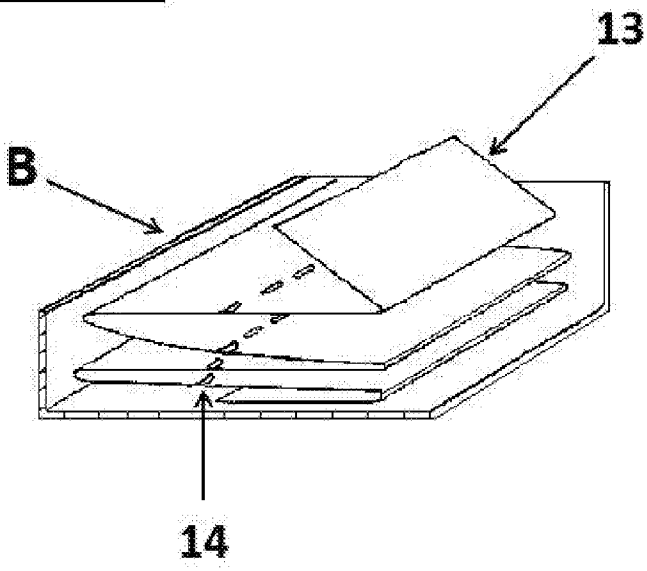

Figure 2b

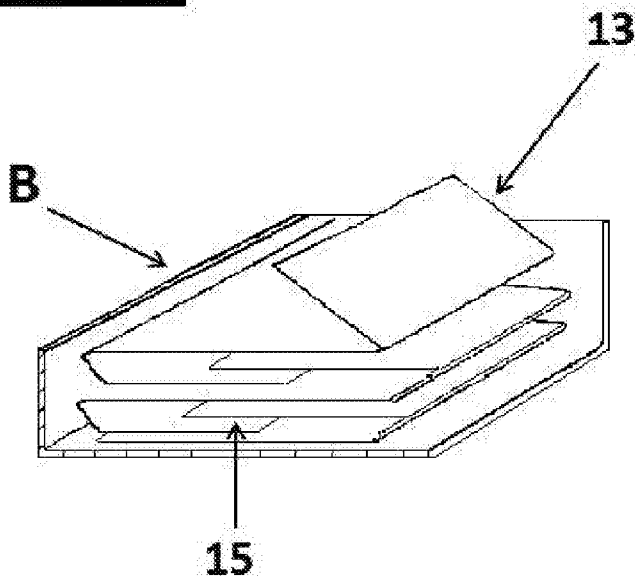

Figure 3

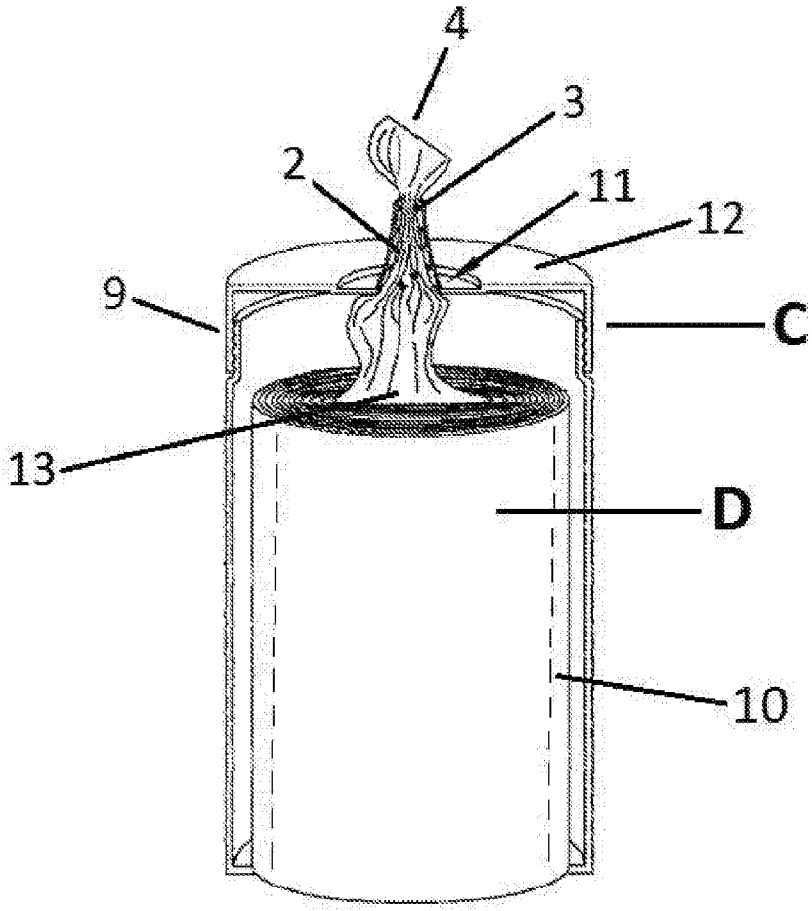

Figure 4a

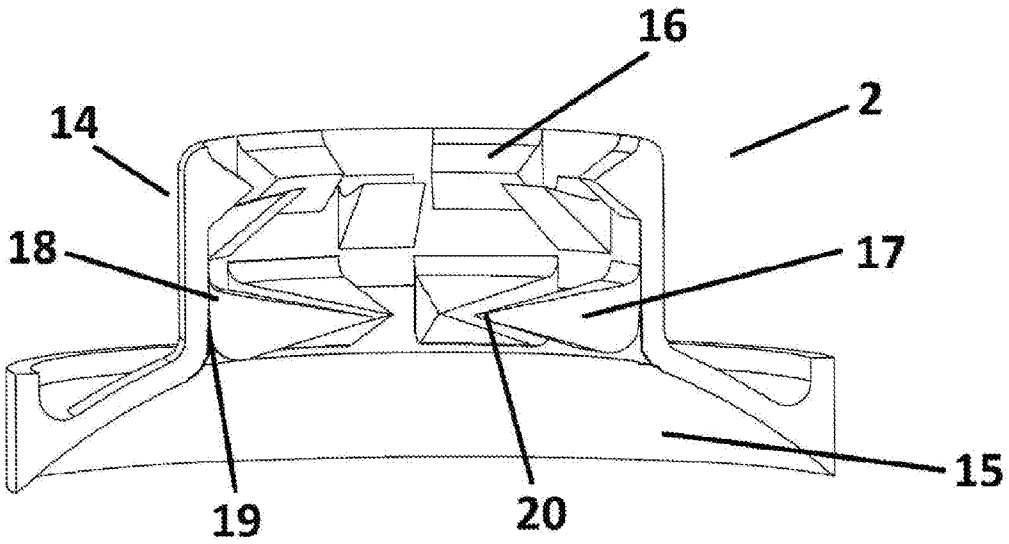

Figure 4b

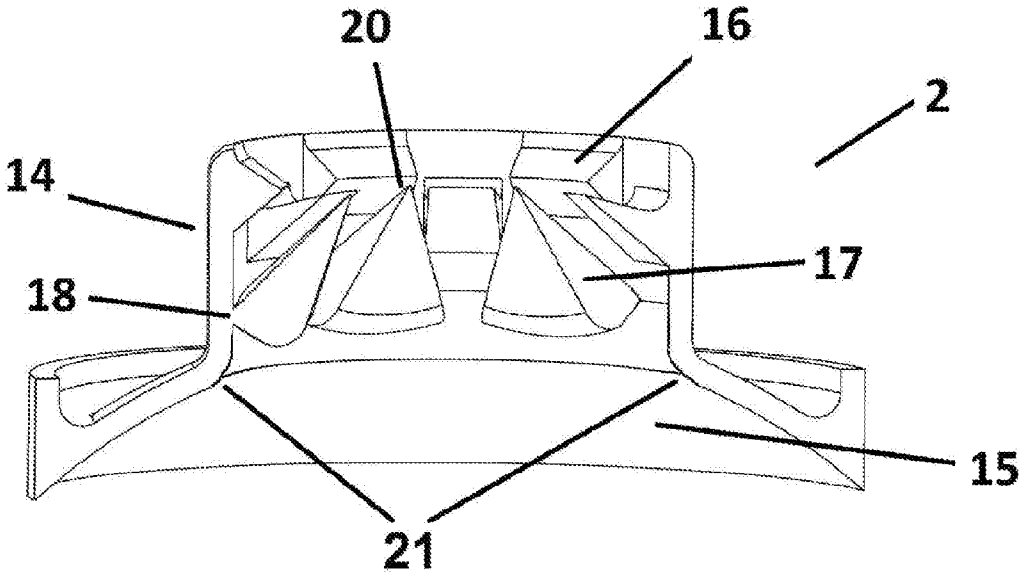

Figure 5a

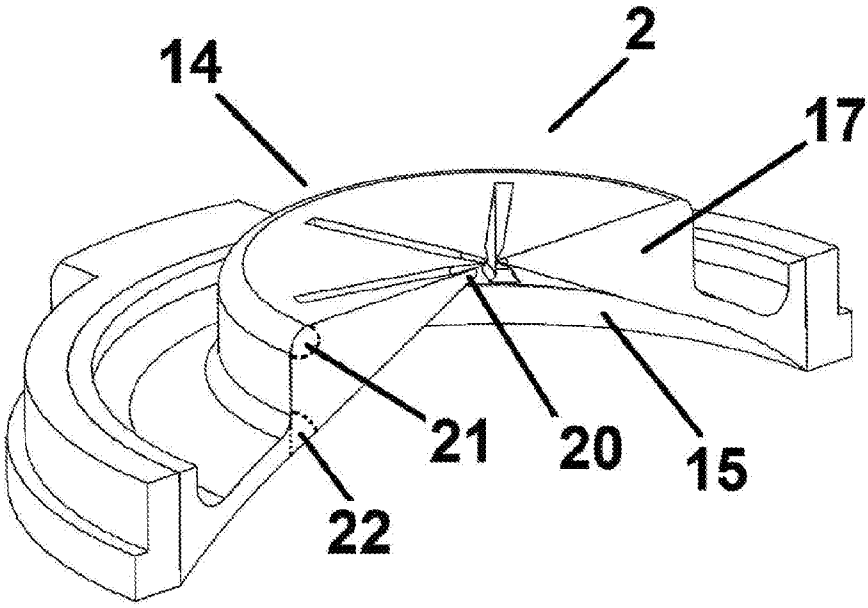

Figure 5b