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(54) Title: EASY DISPENSABILE WET WIPE

(57) Abstract: The present invention relates to a wipe dispensing system comprising a dispensing container (2) having a dispensing opening (4) and stacks of nonwoven wet wipes (1) therein to provide an easy single wipe dispensability. These characteristics can be provided by the combination of dispensing container (2) having an opening (4) and prepared stacks of wet wipes (1) having desired surface-to-surface adhesion between adjacent ones which can be modulated by the choice of raw material, manufacturing process, embossing and bonding methodologies. The general purpose cleaning wet wipes (1) of the present invention can be used as baby wipe, moist toilet paper, facial tissue, make up removal wipe or cleaning wipes.

EASY DISPENSABILE WET WIPE

FIELD OF THE INVENTION

The field of the present invention relates to a dispensing container having a dispensing opening and stacks of wet wipes therein providing single-handed and one-at-a-time dispensing of wet wipes without the need of special machine equipment and incorporation of specific chemicals.

BACKGROUND OF THE INVENTION

The advancements in technology and products have widen the scope of our perception and we have realized that time is the valuable thing we will ever have in this world. Therefore, people try to save time during cleaning and disinfecting of surfaces, face, hands, and even removing make-up, changing a diaper on a baby so that we have even tried to save our time during dispensing of a wet wipe from a dispensing container.

Many attempts have been made in order to fulfill the time saving expectations of the customers by designing single-handed and one-at-a-time dispensing of wet wipes which is highly demandable when the other hand of the consumer is required to be simultaneously occupied for other activities. This situation is very common during changing the diaper of a baby in which one hand of the consumer is occupied for holding and maintaining the baby in a steady position while the other hand is occupied for dispensing a wet wipe from the dispensing container.

Wet wipes are provided within the dispensing container having a dispensing opening typically in a folded stacked configuration in order to enable easy storage and transportation. In the stacks, wet wipes are commonly arranged as in c-folded, z-folded configuration in which wet wipes are interleaved with the adjacent ones. However, stacking of wet wipes may lead to sticking of adjacent wipes upon dispensing and thus, multiple wipe dispensation occurs that increases the cost of the operation. Until today, consumer cannot handle single wipe dispensation in an easy, comfortable and repeatable way by using one hand, thus activities like diaper changing becomes an annoying and time consuming one. As a result, sticking of wet wipes compromise single wipe dispensation from the container, thus in turn compromises the appeal of the product to the consumer.

Poor or multiple dispensing of wet wipes is caused by sheet-to-sheet adhesion which can be attributed to several factors like compression or sticking of wet wipes, attractive interactions

between substrate material and lotion. When the wipes are folded, sheet-to-sheet adhesion can be observed as adherence of wipes to itself or to-one another. Besides folding, tight packaging of wet wipes increase the sheet-to-sheet adhesion. Wipes are packaged in a dispensing container tightly to prevent disintegration of stacks and/or individual wipes during production, storage and transportation. Thus, compression of wipes increases the adherence of adjacent wipes upon resting which makes difficult dispensing of multiple wet wipes. Wet wipe dispensation problem is a known phenomenon.

WO2010116315 addresses to a solution of sheet-to-sheet adhesion problem by using organopolysiloxane derived anti adhesion component in wipe lotion. This application seems to reduce sheet-to-sheet adhesion but it suffers from the use of additional chemical component into the lotion which leads to a costly product. Besides, the uniform distribution of the lotion cannot be maintained throughout the stack and the lotion deposits at the bottom part of the stack which compromises the single wipe dispensability.

There remains a need to provide single-handed and one-at-a-time dispensing of wet wipes from dispensing container.

SUMMARY OF THE INVENTION

In the view of the above mentioned problems with existing wet wipes, the present invention produces wet wipes (1) via spunbond nonwoven web forming technology which eliminates the need of neither the specific folding arrangements nor the incorporation of specific chemicals.

It is an object of the present invention is to provide single-handed and one-at-a-time dispensing of wet wipes (1) without the need of specific machine arrangements and the incorporation of specific chemicals.

The present invention provides wet wipe (1) having improved dispensability as indicated in the following embodiments.

The present invention relates to single handed and one-at-a-time wet wipe dispensing system which facilitates the easy and single wipe dispensation from the stack of wet wipes within the dispensing container (2).

The present invention provides a dispensing container (2) comprising a top and a bottom wall, said top wall having an opening (4) through which wet wipes (1) can be picked up singularly with such a low force which enables single handed and one-at-a-time dispensing.

The present invention relates to wet wipes (1) for general purpose cleaning which can be used as baby wipe, moist toilet paper, facial tissue, makeup removal wipe, cleaning wipes and the like.

BRIEF DESCRIPTION OF DRAWINGS

Fig.1. Top view of dispensing container (2) having a closure system (3) with dispensing opening

Fig.2. Top view of dispensing container (2) having a closure system (3)

Fig.3. View of Z-folded wet wipe

Fig.4. View of nonwoven fabric structure representing total wet wipe area and emboss area in an embodiment of the present invention

Wherein;

1. Wet wipe

2. Dispensing Container

3. Closure system

4. Dispensing opening

5. Wet wipe area

6. Emboss area

DETAILED DESCRIPTION OF THE INVENTION

The term “nonwoven fabric” is used to describe the fibers which are held together by a process of bonding to form a nonwoven fabric.

The term “fiber” is used to describe the structure that is used to form nonwoven fabric.

The term “one-at-a-time dispensing” is used to refer to single wipe dispensation from the stack of wet wipes (1) within the dispensing container (2). The terms one-at-a-time dispensing and/or single pick-up are used interchangeably in the context of the present invention.

The term “stack” and/or “stacked wet wipes” and/or “stacked configuration” are used to describe any collection of wet wipes (1) having plurality of surface-to-surface interfaces between adjacent ones.

The term “container” is used to describe any receptacle or enclosure for holding and/or keeping the stack(s) of wet wipes. The container (2) of the present invention has a dispensing opening (4) for the dispensing of wet wipes (1).

The term “liquid composition” is used to describe any composition in liquid form which is in contact with the surface of the wet wipe (1). The term “lotion” and “liquid composition” are used interchangeably in the context of the present invention. The mentioned liquid composition can be aqueous or alcohol based or in the form of an emulsion of water in oil or oil in water.

In the following detailed description of the invention, the aspects of the invention are utilized in the accompanying drawings and examples which should serve for understanding the present invention and should not be limiting.

The present invention is related to a wet wipe (1) for general purpose cleaning such as, but not limited to baby wipe, moist toilet paper, facial tissue, makeup removal wipe or cleaning wipes.

According to the present invention, single wipe dispensation can be achieved by reduced sheet-to-sheet adhesion between adjacent wipes. Said sheet-to-sheet adhesion can be modulated via the physical and/or mechanical properties of the nonwoven fabrics used in wet wipe (1) production in order to enable wet wipe (1) maintaining its desirable characteristic like softness, absorbency, single wipe dispensation and strength.

Suitable physical and/or mechanical properties of the wet wipes (1) for single wipe dispensation is accomplished via the choice of raw material, manufacturing process, embossing and bonding methodologies.

Since the selection of raw material that used in formation of nonwoven fabrics affects the performance of web structures, the raw material is selected to be hydrophobic to provide reduced adhesion between adjacent wipes. The nonwoven fabric of the present invention can be prepared from fibers or filaments of different materials either synthetic or natural origin such as polyolefin, polypropylene, polyethyleneteraphthalate, polyamide, polyester, polyacrylic, PVC, cellulose acetate, polyethylene or cellulosic fibers. In one embodiment of the present invention, synthetic fibers and preferably, polyester, polypropylene or any combinations or blends of those fibers and more preferably, polypropylene fibers are used. Synthetic fibers are utilized due to low production cost; ease of processing, and for new and more exacting applications.

Commercially available wet wipes (1) are mostly prepared by spunlace method which is based on the hydroentangling of fibers into a staple web. Whereas thermoplastic and cellulosic fibers are entangled to achieve high absorbency, softness, strength, resistance to abrasion at low cost. Besides, the due to the presence of staple fibers in the spunlace structure, sheet-to sheet adhesion between adjacent wipes is high which makes single wipe dispensability problematic.

The manufacturing method employed for the production of nonwoven wet wipe (1) of the present invention is chosen in a way as to provide desired adhesion between adjacent wipes to improve single wipe dispensability. The nonwoven fabric of the present invention is produced by spun bonding method. Spunbond technology applied with suitable raw material is critical in terms of many aspects like cost of manufacturing, ease of production and enhanced properties of the product. Spun bonding process is based on extrusion of multiplicity of continuous thermoplastic polymer strands thorough a multiplicity of die orifices in downward direction onto a moving surface. These extruded strains are collected in randomly distributed mode which are then bonded together to provide integrity to the resultant nonwoven fabric. The spunbond structure gives the product high strength, good abrasion resistance and reduced surface-to-surface adhesion between adjacent wipes. In the spunbonding process, continuous filaments can be formed into web in one direction which improves the production speed.

In one embodiment of the present invention, the nonwoven wet wipe (1) can be comprised of one or plurality of layers of material. These layers can be identical and/or different in terms of composition and/or manufacturing methodologies.

In one embodiment, nonwoven wet wipe (1) of the present invention is formed of at least one layer, preferably is formed of a single layer. In one embodiment, the single layer of the present invention comprise of spunbond material preferably wherein spunbond nonwoven web comprising substantially monofilament polypropylene fibers.

In another embodiment of the present invention, the wet wipe (1) has a basis weight of greater than 20 g/m^2.

The spunbond wet wipe (1) of the present invention comprising monofilament polypropylene fibers comprises fibers having fiber denier between 1.3 and 2.5. In a preferred embodiment the fiber denier of wet wipe is between 1.3 and 1.8. Wet wipes obtained with fibers having denier less than 1.3 prevents single wipe dispensability. On the other hand wet wipe obtained with fibers having denier more than 2.5 enables single wipe dispensability but increase cost of manufacturing and product therefore not preferred.

Nonwoven fabrics comprise fibers which are bonded by using different bonding techniques in order to prevent disintegration and falling off the fibers. These techniques can be mechanical bonding, chemical bonding or thermal bonding. In the present invention, a spunbond nonwoven wet wipe comprising monofilament polypropylene fibers are bonded thermally or mechanically to form said spunbond wet wipe, preferably thermally bonded with emboss calender.

Spun bonded nonwoven fabric of the present invention are bonded via thermal bonding with application of emboss roll which is used as hot calender to make specific design patterns on the nonwoven fabric.

The physical and mechanical properties of nonwoven fabrics can be modulated by embossing process which defines the strength and softness of nonwoven structures.

The calender pattern can be described by bonding area, height of bonding points, number of bonding points formed by pins, shape of bonding points; temperature and pressure of rollers are other parameters related with emboss rolling.

In one embodiment of the present invention, monofilament polypropylene fibers are thermally bonded with emboss calender wherein the temperature of the emboss calender is set in the range of 130-175° C. The pressure of emboss roll is set in the range of 50-100N/mm. If the applied embossing temperature is higher than 175°C, fibers forming the nonwoven fabric are fused to each other in a way which makes them impossible to separate. Additionally, if the

applied embossing pressure is higher than 110N/mm, formed nonwoven fabrics become deformed in embossing points. Those fabrics can be teared and deformed during dispensation and thus, can't be used properly.

Emboss area (6) of the nonwoven fabric is described by taking into consideration of bonding and nonbonding area. The nonwoven fabrics are bonded at discrete points to make the product softer, more flexible and strong. By this way, friction between adjacent wipes is reduced and thus, single wipe dispensability from the stack is enabled.

In another embodiment, the nonwoven wet wipe (1) of the present invention has an emboss area (6) between %5 to % 25, preferably between %8 to % 16 of the total wet wipe area that enhances the softness of the product without compromising the strength and pilling resistance. If the bonding area is higher than 25%, the nonwoven fabric becomes stiff thereby, single wipe dispensability will be reduced. On the other hand, if the bonding area is lower than 5%, the strength of the nonwoven fabric is decreased, and wet wipes (1) can be deformed during product dispensation from the stack.

In a further embodiment of the present invention, nonwoven wet wipe (1) of the present invention has an emboss pattern of closed geometric structures of round and/or oval shaped forms wherein the forms can have round, oblong or polygonal shapes wherein round shaped emboss pattern is preferred. Closed geometric structures of round and/or oval shaped form are utilized to make the product soft and bulk while retaining its strength and pilling resistance.

In an embodiment of the present invention, the wet wipe (1) made of spunbond nonwoven web is treated after bonding with an aqueous lotion comprising organic fats having surfactant portion and dried. Said aqueous lotion may have 96% concentration. Obtained nonwoven web after drying may have an Oil Pick Up (OPU) value of 0,21% around. Oil Pick Up value is defined as weight percentage of fatty acids remaining on the fibers of nonwoven web after drying. Oil Pick Up value can be measured by weighing nonwoven web before and after hydrophilic lotion treatment and weight difference gives the OPU value.

According to the present invention, the single wipe dispensability can be improved by modulating the dimensions and shape of the nonwoven wet wipes (1) and dispensing container (2) having dispensing opening (4).

According to the present invention, the nonwoven wet wipes (1) can be stacked and then stored in a dispensing container (2) which can be in a rigid and/or flexible structure of plastic

tub, bag or pouch shaped packages, wherein the dispensing container (2) can be disposable and/or non-disposable, preferably the container (2) of the present invention is flexible and disposable.

The container (2) of the present invention can be prepared of any shape like rectangular, square, cylinder, cuboid. The shape of the container (2) can be determined according to the intended use, nature, shape and dimensions of the wet wipes.

In one embodiment of the present invention, wet wipes (1) are in Z-folded configuration and interleaved with at least one adjacent wipe. In another embodiment of the present invention, nonwoven wet wipes (1) may have an area of between 50 cm^2 to 1000 cm^2 in Z-folded state. In an example of the present invention, wet wipe (1) of the area (5) of 304 cm^2 is applied.

Commercially available wet wipes (1) are mostly prepared by spunlace fabrics comprised of staple fibers which are believed to increase the surface-to-surface adhesion between adjacent wipes. The basis weights of nonwoven fabrics of the commercially available wet wipes (1) may range from 30 gsm to 90 gsm with stable fibers having denier between 3 gsm to 30 gsm.

The dispensing container (2) of the present invention has a closure system (3) having an opening (4) of from 5,0 cm^2 to 40,0 cm^2 wherein the dispensing opening (4) can be in round, rectangular, square, oblong shape, preferably in rounded shape. The dispensing opening (4) of the container (2) can be rigid and/or flexible and it is prepared in a way as to keep its shape during use. Additionally, the dispensing opening (4) of the present invention should not have sharp corners and edges in order to avoid hurting of the consumers' fingers.

The nonwoven wet wipe (1) of the present invention is typically coated or impregnated with a liquid composition. The present invention, wet wipe (1) allows the application of various type of lotion compositions without compromising the single dispensability of wet wipe (1) from dispensing container (2). Therefore, any lotion composition can be applied throughout the stacks of wet wipes (1). Besides, spun bond nature of the wet wipe (1) prevents settling down of the lotion at the base while keeping homogeneous distribution of the lotion throughout the stacks. Commercially widespreadly available spunlace wet wipes (1) may allow the lotion collecting at the bottom of the packaging by storing.

The liquid composition can be applied non-uniformly or uniformly to one or both surface of the wet wipe (1) of the present invention wherein the non-uniform lotion application refers

that the amount and application pattern of it can be varied. The lotion can be applied by the manufacturing process through spraying, sprinkling, printing, coating or extruding.

PREPARATION METHOD OF DISPENSING CONTAINER (2) HAVING PLURALITY OF STACKED WET WIPES (1)

The dispensing container (2) comprising a plurality of stacked spun bonded nonwoven wet wipes (1) of the present invention can be obtained via the process comprising the steps,

- Polypropylene homopolymer is melt extruded, followed by spinning by spinnerets to form filament fibers,
- Melt extruded and spinned filaments are laid on the conveyor belt from the spinnerets, and bonded thermally between hot calenders to form the web,
- Formed web is treated with a hydrophilic treatment solution to obtain hydrophilic web structure after drying,
- Said hydrophilic webs are stacked, treated with lotion and cut
- Stacked wet wipes (1) are packaged in a dispensing container (2) having a closure system (3) with dispensing opening (4)

The production of dispensing container (2) having plurality of stacked spunbonded nonwoven wet wipes (1) is disclosed in examples with further details below.

EXAMPLE 1: Production Of Present Invention Packaged Wet Wipes (1) Comprising Dispensing Container (2) with Plurality of Stacked Spun bonded Nonwoven Wet Wipes (1) Within

The dispensing container (2) comprising a plurality of stacked spun bonded nonwoven wet wipes (1) of the present invention can be obtained via the process comprising the steps,

- Polypropylene homopolymer is melt extruded, followed by spinning by spinnerets having denier thickness of 1.3 to 2.5 to form filament fibers,
- Melt extruded and spinned filaments are laid by spunbond process on the conveyor belt from the spinnerets and bonded thermally between hot calenders having the temperatures between 130 to 175° C to form the web,
- Formed web is treated with a hydrophilic treatment solution to obtain hydrophilic web and dried at elevated temperatures.
- Obtained hydrophilic webs are folded in Z configuration interleaving each other and stacked, treated with lotion and cut.

- Stacked wet wipes (1) are packed in a dispensing container (2) having a closure system (3) with a dispensing opening (4) of 5,0 to 8,0 cm^2 and having a closure system (3)

Said lotion is comprised of monopropylene glycol (humectant), phenoxyethanol (antimicrobial), ethylhexylglycerin (preservative), PEG-40 hydrogenated castor oil (emulsifier), Tetrasodium EDTA (chelant), citric acid (pH regulator) and water.

The spunbond wet wipe (1) of present invention are packed in a dispensing container (2) having a dispensing opening (4) and in use, spunbond nature of the present invention enables the single wipe dispensability even after multiple dispensing. Wet wipes (1) of the present invention is dispensed from the dispensing container (2) 10 times and in each case, each wipe (1) dispense singularly and multiple dispensation is not observed.

However, when commercially available spunlace wet wipes (1) is dispensed from dispensing container (2) 10 times, after third dispensation single wipe dispensability is not achieved and multiple dispensations is observed.

CLAIMS

1. A dispensing container (2) comprising a plurality of stacked wet wipes (1) in said container (2) comprising a top and a bottom wall, said top wall having dispensing opening (4) through which wet wipes can be picked up with such a low force which enables an all singularly pick up each time, wherein said wet wipes (1) are made of spunbond nonwoven web comprising substantially monofilament polypropylene fibers having a fiber denier of between 1.3 to 2.5.

2. A dispensing container (2) comprising a plurality of stacked wet wipes (1) according to claim 1, wherein said spunbond nonwoven wet wipe (1) is formed of at least one layer, preferably of a single layer.

3. A dispensing container (2) comprising a plurality of stacked wet wipes (1) according to claim 1, wherein said spunbond nonwoven wet wipe (1) has a weight of greater than 20 g/m2.

4. A wet wipe made of spunbond nonwoven web according to claim 1, wherein said nonwoven web is thermally or mechanically, preferably thermally bonded with emboss calender.

5. An embossed spunbond nonwoven wet wipe (1) according to claim 4, wherein said embossed spunbond wipe (1) has an emboss area (6) of between %5 to % 25, preferably between %8 to % 16 of the total wet wipe area (5).

6. An embossed spunbond nonwoven wet wipe (1) according to claim 4, wherein said embossed spunbond wipe (1) has an emboss pattern of closed geometric structures of round and/or oval shaped forms.

7. A wet wipe (1) made of spunbond nonwoven web according to claim 1, wherein said nonwoven web comprises of organic acid treated fibers having an Oil Pick Up value of around 0,21% by weight.

8. A spunbond nonwoven wet wipe (1) according to claim 1, wherein said wet wipes (1) are in Z-folded configuration and interleaved with at least one adjacent wipe.

9. A spunbond nonwoven wet wipe (1) comprising monofilament polypropylene fibers according to claim 1, wherein said wet wipes (1) have area (5) of 50 cm2 to 1000 cm2 in Z-folded state.

10. A dispensing container (2) comprising a plurality of wet wipes (1) according to claim 1, wherein said container (2) comprises a dispensing opening (4) in round, rectangular, square or oblong shape.

11. A process for producing a dispensing container (2) comprising a plurality of stacked wet wipes (1) according to preceding claims comprising the steps,

- Polypropylene homopolymer is melt extruded, followed by spinning by spinnerets to form filament fibers,
- Melt extruded and spinned filaments are laid on the conveyor belt from the spinnerets,
  and bonded thermally between hot calenders to form the web,
- Formed web is treated with a hydrophilic treatment solution to obtain hydrophilic web structure after drying,
- Said hydrophilic webs are stacked, treated with lotion and cut,
- Stacked wet wipes (1) are packaged in a dispensing container (2) having a closure system (3) with dispensing opening

12. A process for producing a dispensing container (2) comprising a plurality of stacked wet wipes (1) according to claim 1 and claim 10, comprising the steps;

- Polypropylene homopolymer is melt extruded, followed by spinning by spinnerets having denier of 1.3 to 1.8 to form filament fibers,
- Melt extruded and spinned filaments are laid by spunbond process on the conveyor belt from the spinnerets and bonded thermally between hot calenders having the temperatures between 130 to 175°C to form the web,
- Formed web is treated with a hydrophilic treatment solution to obtain hydrophilic web and dried at elevated temperatures.
- Said hydrophilic webs are folded in Z-configuration interleaving each other and stacked, treated with lotion and cut by rotary blades,
- Stacked wet wipes (1) are packed in a dispensing container (2) having a closure system (3) with a dispensing opening (4) of 5,0 to 40,0 cm2.

13. A dispensing container (2) comprising a plurality of stacked wet wipes (1) according to preceding claims, wherein said dispensing container (2) can have a rigid and/or flexible structure of plastic tub, bag or pouch shaped packages.

14. A dispensing container (2) comprising a plurality of stacked wet wipes (1) according to preceding claims, wherein said dispensing container (2) can be disposable and/or non-disposable.

15. A spunbond nonwoven wet wipe (1) comprising monofilament polypropylene fibers according to preceding claims wherein said wet wipe (1) can be used as baby wipe, moist toilet paper, facial tissue, makeup removal wipe or cleaning wipes.

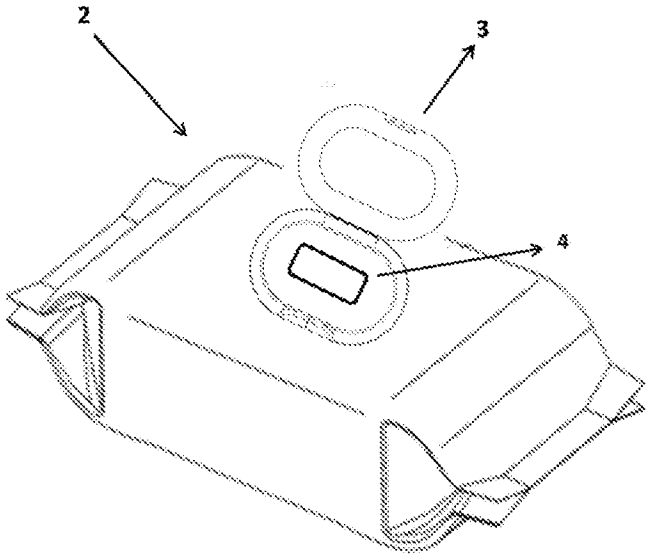

Fig.1.

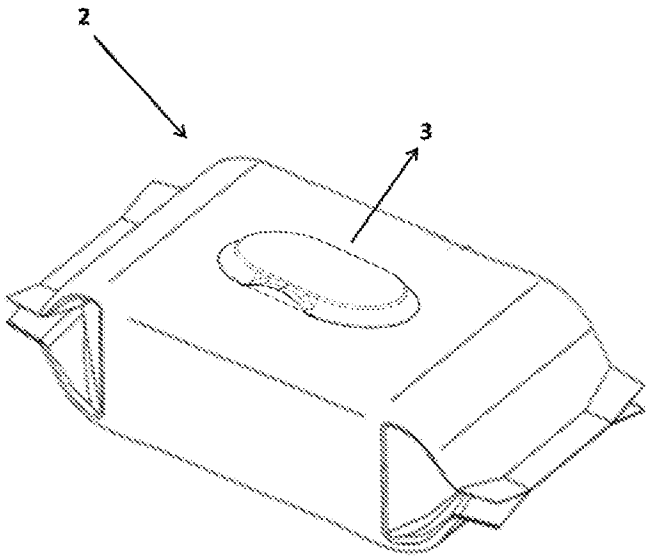

Fig. 2.

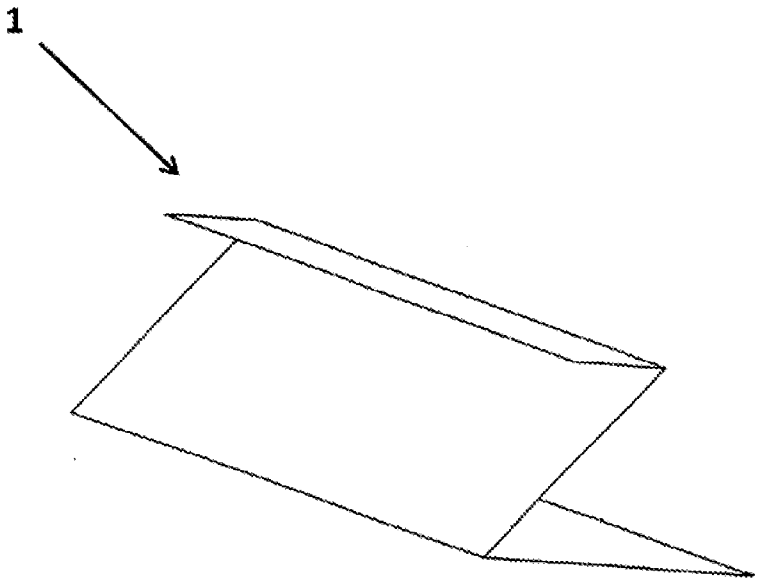

Fig. 3.

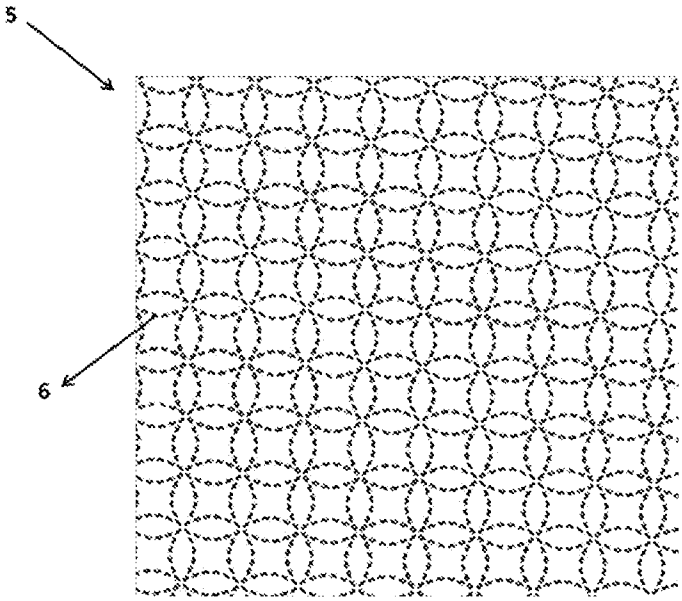

Fig. 4.