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(54) **GEOTEXTILE KNITTED WICKING FABRIC**

(57) The present subject matter relates to a geotextile wicking fabric (100) which comprises a plurality of warp strands of a wicking fiber and a plurality of weft strands of the wicking fiber. The plurality of warp strands is oriented perpendicular to the plurality of weft strands and the plurality of warp strands is knitted with the plurality of weft strands. The wicking fiber having a non-circular or non-oval cross-section, comprises a wicking yarn of synthetic polymer composed of polyamides, a multifilament polypropylene yarn, and a Polyester yarn in a ratio of 1.4: 4.1: 1, wherein the proportion varies by up to 20 %, meaning 17% to 25.5% synthetic polymer composed of polyamides, 50.7% to 76% multifilament polypropylene yarn and 12.3% to 18.4% of polyester yarn as part of the total fabric weight.

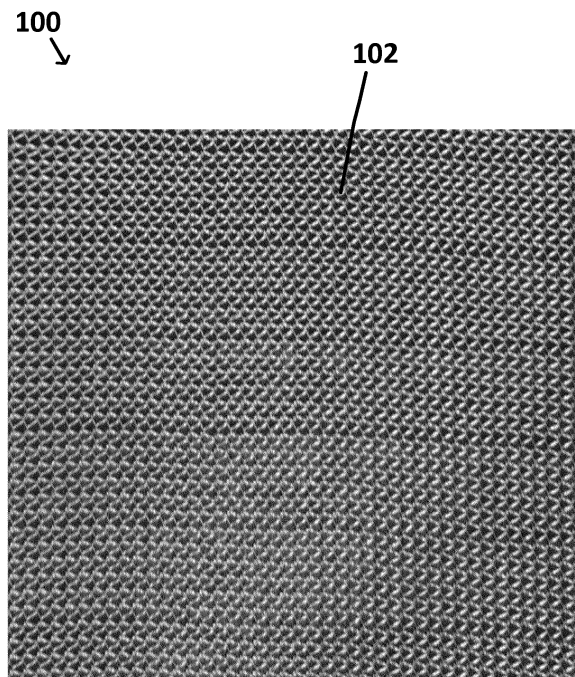


Figure-1A

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Description

TECHNICAL FIELD

5 **[0001]** The present subject matter relates, in general, to geosynthetics and, particularly, to a quick dry geotextile wicking fabric.

BACKGROUND

10 **[0002]** Geosynthetics having a variety of configurations are commonly used in various civil applications and each configuration-geonets, geosynthetic clay liners, geomembranes, geotextiles, and others has the potential to yield significant advantages in the field of geotechnical and environmental engineering design.

[0003] Geotextiles are permeable materials which, when employed in conjunction with soil, possess the capability to perform a range of functions, such as reinforcement, protection, and drainage. Geotextiles exhibit impressive durability.

15 Typically composed of Polypropylene or Polyester, geotextile fabrics have two basic forms: woven and nonwoven.

[0004] Geotextiles are employed in various geotechnical applications, including but not limited to the construction of road and railway embankments, and coastal protection structures. Geotextiles are designed to fulfill one or more essential functions within the above-mentioned applications. These functions include filtration for the removal of impurities and particles from the soil or water; drainage to enable efficient removal of excess water; separation of soil layers to prevent the mixing or contamination of different soil types; reinforcement to enhance the structural integrity and load-bearing capacity of the construction; and stabilization to ensure the overall stability and longevity of the structure.

20 **[0005]** A geotextile wicking fabric, also commonly referred to as a wicking geotextile, is a specialized type of geosynthetic material designed to manage and control moisture within various geotechnical and civil engineering applications. The geotextile wicking fabric is engineered to efficiently transport and distribute moisture, primarily by capillary action or wicking, throughout its structure. Unlike traditional geotextiles that may simply filter, separate, or reinforce, the geotextile wicking fabric actively deals with water, making it particularly useful in areas where effective moisture management is crucial.

25 **[0006]** The key feature of the geotextile wicking fabric is its ability to draw water away from saturated or moisture-laden areas and distribute it to drier zones, which helps to regulate groundwater levels and reduces the risk of soil erosion or instability.

BRIEF DESCRIPTION OF THE FIGURES

30 **[0007]** The detailed description is described with reference to the accompanying figures. In the figures, the left-most digit(s) of a reference number identifies the figure in which the reference number first appears. The same numbers are used throughout the drawings to reference like features and components.

Fig. 1A illustrates a front view of a geotextile wicking fabric, according to an embodiment of the present subject matter.

40 Fig. 1B illustrates a back view of the geotextile wicking fabric, according to an embodiment of the present subject matter.

Fig. 2 illustrates an implementation of the geotextile wicking fabric in roadway construction, according to an embodiment of the present subject matter.

Fig. 3A-3C illustrates a wicking fabric's cross-sections according to an embodiment of the present subject matter.

45 Fig. 4 illustrates a schematic cross-sectional view of a trafficked surface construction including the geotextile wicking fabric disposed between an aggregate layer and a subgrade soil layer.

[0008] The figures are not necessarily to scale, and the size of some parts may be exaggerated to more clearly illustrate the example shown. Moreover, the drawings provide examples and/or implementations consistent with the description; however, the description is not limited to the examples and/or implementations provided in the drawings.

DESCRIPTION OF EMBODIMENTS

[0009] The present subject matter relates to a geotextile wicking fabric.

50 **[0010]** As discussed earlier, geotextiles are used in the construction of roadways and other trafficked surfaces to provide functions, such as separation of soil from aggregate; filtration to protect a drainage or aggregate layer from soil or fines intrusion; and stabilization by promoting load distribution through aggregate layers.

[0011] Conventional geotextiles, including wicking geotextiles are typically formed as a woven fabric, which may fulfill these three primary functions. The geotextile wicking fabric is commonly referred to as a wicking geotextile. The wicking

geotextiles are a type of geosynthetic material which are designed to manage and control moisture and have applications in the various fields of geotechnical and civil engineering. The geotextile wicking fabric efficiently transports and distributes moisture throughout its structure, by capillary action or wicking.

[0012] While such woven geotextiles generally do serve to aid drainage, the woven geotextiles can become clogged with fine soil particles over time which reduces their ability to allow water to pass through. Clogging of the woven geotextiles can lead to poor drainage and surface water ponding. Further, the woven geotextiles may degrade over time which impacts their ability to provide reinforcement and separation between layers of soil or aggregate. Woven geotextiles may also experience a decline in performance due to environmental factors which can impact the stability and drainage of roadways and pavements.

[0013] In order to function as intended, proper installation of the woven geotextiles is very crucial. Woven geotextiles require complex installation procedure to provide the necessary reinforcement and separation between layers of the soil or aggregate. Woven geotextiles are susceptible to obstruction from sediments, organic residues, plant roots, fungi, algae, viscous petrochemical compounds, and slimes. These potential blockages can adversely impact the functionality of the geotextiles. Consequently, it is important to consider these factors in order to maintain optimal performance.

[0014] Further, there are many challenges faced during the installation of the woven geotextiles such as uneven surface preparation can create difficulties, as the woven geotextile needs a stable and smooth foundation to function effectively. Also, the moving and shifting of the woven geotextile during installation is another major challenge faced during the installation process.

[0015] Ensuring seam integrity and adequate overlap is also crucial as this may impact the desired reinforcement. Further, installing woven geotextile in wet conditions has additional challenges, as moisture can impact the material's performance and adherence to the surface. Moreover, environmental conditions such as temperature and exposure to sunlight can impact the longevity and effectiveness of the woven geotextile. Compatibility of the woven geotextile with the other construction materials is also an important factor to consider.

[0016] Further, high-quality woven geotextiles are relatively expensive and require regular maintenance and inspection to ensure their proper functioning. Furthermore, not all woven geotextiles are suitable for every roadway and pavement application. With the variation in soil type, traffic load, and environmental conditions, the choice of woven geotextile also varies.

[0017] Also, the woven geotextiles have a low permeability which makes them suitable for use in only filtration and moderate drainage applications.

[0018] The present subject matter relates to a knitted geotextile wicking geotextile that addresses the above-described shortcomings associated with the woven geotextiles.

[0019] The present subject matter is related to a geotextile wicking fabric which comprises a plurality of warp strands of a wicking fiber and a plurality of weft strands of the wicking fiber. The plurality of warp strands is oriented perpendicular to the plurality of weft strands and the plurality of warp strands are knitted with the plurality of weft strands. The wicking fiber comprises a wicking yarn of synthetic polymer composed of polyamides, a multifilament Polypropylene Yarn, and a Polyester yarn in a ratio of 1.4: 4.1: 1, wherein the proportion varies by up to 10 %. In an example, the proportion varies by up to 20%.

[0020] In an embodiment, the disclosed geotextile wicking fabric comprises warp and weft strands of the wicking fiber, and the warp strands are oriented perpendicular to the weft strands and the warp strands are knitted with the weft strands. The disclosed geotextile fabric is made using a weft insert warp knitting method, wherein the weft strands, which run horizontally, are inserted into the warp strands which run vertically to form an interlocking pattern. A weft insert warp knitting machine is used for manufacturing the geotextile wicking fiber. Multiple wrapped beams are loaded onto the machine and traverse through knitting elements. The fiber in the machine direction is supplied from the beams, while the fiber in the cross-machine direction is sourced from a weft insert creel. These fiber interlock with the wrap knitting fiber. This interlocking ensures the coordination and integration of the different components of the fabric.

[0021] The interlocking creates a strong and durable fabric with a distinctive open mesh-like pattern that provides enhanced filtration and drainage properties. The disclosed structure of the geotextile has a high permeability, and the open mesh-like pattern provides efficient water flow and prevents clogging. Further, the geotextile fabric produced through the weft insert warp knitting method has a higher tensile strength and durability due to the interlocking pattern and provides an improved fabric that can withstand substantial loads which ensures longer life and lesser maintenance of the geotextile wicking fabric.

[0022] The knitted geotextile wicking fabric is easier to handle and install, as its structure itself facilitates proper positioning and alignment. This results in cost savings and installation time.

[0023] Furthermore, since the disclosed geotextile fabric has non-round and non-oval cross sections, this increases the capillary action and wicking performance of the wicking fiber. This helps in keeping the surface drier by efficiently drawing out the water from the structure through the wicking fiber. Also, the disclosed cross-sections provide a larger surface area which provides efficient moisture absorption and distribution. Thus, the disclosed composition and structure of the geotextile wicking fabric provide a quick dry geotextile which is manufactured by a weft insert warp knitting process from

high-tenacity multifilament Polypropylene Yarn, wicking yarn of synthetic polymer composed of polyamides, and Polyester yarn to provide superior reinforcement strength, drainage properties, and soil interaction integrated with high soil retention and wicking capabilities. In an example, the synthetic polymer composed of polyamides can be textured Nylon 6.

[0024] The present subject matter is further described with reference to the accompanying figures. It should be noted that the description and figures merely illustrate the principles of the present subject matter. It is thus understood that various arrangements may be devised that, although not explicitly described or shown herein, encompass the principles of the present subject matter. Moreover, all statements herein reciting principles, aspects, and examples of the present subject matter, as well as specific examples thereof, are intended to encompass equivalents thereof.

[0025] Although embodiments for methods and systems for the present subject matter have been described in a language specific to structural features and/or methods, it is to be understood that the present subject matter is not necessarily limited to the specific features or methods described. Rather, the specific features and methods are disclosed as exemplary embodiments for the present subject matter.

[0026] In accordance with embodiments of the present subject matter, Figure 1A illustrates a front view of a geotextile wicking fabric 100, and Figure 1B illustrates a back view of the geotextile wicking fabric. The geotextile wicking fabric as shown in Figure 1A and 1B is a sheet like structure which may be placed underneath the roadways or pavements during construction. The geotextile fabric produced through the weft insert warp knitting method has a higher tensile strength and durability due to the interlocking pattern formed in multiple directions.

[0027] Before installation of the geotextile wicking fabric 100, the site is prepared to ensure that surface is adequately compacted and is free from debris, rocks, and sharp objects that could damage the geotextile wicking fabric. The geotextile wicking fabric is in the form of rolled geotextile sheets, so initially the geotextile sheets are unrolled and placed on the surface. The placement of the geotextile sheet is such that the face having the wicking fiber is in contact with the surface for efficient water drainage. The geotextile wicking fabric 100 as shown in the Figure 1A and 1B comprises a top front surface 102, and a bottom back surface 104, where the bottom back surface 104 is the wicking fiber surface which is in contact with the surface. Further, aggregate or base material, as per the requirement of the roadways or the pavements to be constructed, is placed on top of the geotextile wicking fabric 100. By doing so, the aggregate and the surface is separated by the geotextile wicking fabric 100. The surface is also commonly referred to as 'subgrade', which is the prepared earth surface on which the pavement or the roadways is built. Further, a compaction process is performed using appropriate compaction equipment to achieve the required density. After the geotextile wicking fabric 100 and the aggregate or the base material are in place, a final top surface layer of the pavement or roadway is created. In an example, the final top surface layer can be made of Asphalt, concrete, aggregate, Bitumen, gravel, etc.

[0028] Further, as shown in Figure 1A and Figure 1B, the top front surface 102, and the bottom back surface 104 are made of a plurality of warp strands of the wicking fiber, and a plurality of weft strands of the wicking fiber. These figures clearly show that the weft strands run horizontally across the geotextile wicking fabric and are inserted into the warp strands which run vertically to form an interlocking pattern to form an interlocking pattern which creates a strong and durable fabric with a distinctive open mesh-like pattern that provides enhanced filtration and drainage properties. The open mesh-like pattern formed on the surfaces of the geotextile wicking fabric 100 provides efficient water flow and prevents clogging.

[0029] The wicking fiber of the geotextile wicking fabric 100 comprises wicking yarn of synthetic polymer composed of polyamides, multifilament Polypropylene Yarn, and Polyester yarn in a ratio of 1.4: 4.1: 1. The wicking fabric is composed of 21.3%, 63.3%, and 15.4% of wicking yarn of synthetic polymer composed of polyamides, multifilament Polypropylene Yarn, and Polyester yarn, respectively. In an example, these proportions may vary by upto 20%. The mass per unit area (Input) may vary according to quality. In an example, Table 1 below shows a composition of the geotextile wicking fabric 100.

Table 1

Raw Material	Input	Tolerance	Ratio %
Multifilament Polypropylene Yarn	342 g	± 20 %	63.3
Nylon-6/Synthetic Polymer composed of polyamides Wicking Yarn	115 g	± 20 %	21.3
Polyester Yarn	83 g	± 20 %	15.4
Total	540 g	± 20 %	

[0030] As mentioned in the above paragraph, the proportion here refers to the relative amount of percentage of each raw material used in the composition of the geotextile wicking fabric. Specifically, it describes how much of each of synthetic polymer composed of polyamides, multifilament Polypropylene Yarn, and Polyester yarn is present as part of the total fabric weight.

[0031] The variation of $\pm 20\%$ in the input proportion allows for some flexibility in the exact amount of each material used, depending upon manufacturing conditions or specific quality requirements.

[0032] In an example embodiment, the total weight of the geotextile fabric is approximately 540 grams. The multifilament Polypropylene Yarn component which generally weighs 342 grams, may vary by $\pm 20\%$, which may fall in a range of 273.6 grams to 410.4 grams. Similarly, the synthetic polymer composed of Polyamide component, which has an input weight of 115 grams, may vary within a range of 92 grams to 138 grams. Further, the Polyester yarn component, which generally weighs 83 grams, may vary from 66.4 grams to 99.6 grams. Hence, the wicking fabric may be composed of 50.7% to 76% multifilament Polypropylene Yarn, 17% to 25.5% synthetic polymer composed of polyamides, and 12.3% to 18.4% polyester yarn.

[0033] The table below shows the lab test results for the wicking fabric:

Table 2

Properties	Test Method	Unit	Design Value	Test Results
Water Flow Rate	ASTM D-4491	gal/min/sf (l/min/sm)	50 (2,037)	70/2874
AOS	ASTM D-4751	US Std. Sieve (mm)	40 (0.425)	40 / (0.300)
Pore Size 050	ASTM D-6767	microns	85	88
Pore Size 095	ASTM D-6767	microns	195	298
Wet Front Movement, vertical direction, 11 minutes	ASTM C-1559	inches	6	8
Wet Front Movement, vertical direction, 20 minutes	ASTM C-1559	inches	7	10
Wet Front Movement, horizontal direction, 950 minutes	ASTM C-1559	inches	75	85

[0034] In an example, the synthetic polymer composed of polyamides, multifilament Polypropylene Yarn, and Polyester yarn have the following tensile strength and elongation:

- Synthetic polymer composed of Polyamides: Tensile Strength - 6.12 kgs; Elongation - 22%
- Multifilament Polypropylene Yarn: Tensile Strength - 14.4 kgs; Elongation - 20%
- Polyester yarn: Tensile strength - 1.12 kgs; Elongation - 35%

[0035] The composition of the wicking fiber offers significant advantages, such as the wicking yarn of synthetic polymer composed of polyamides efficiently transports moisture away from the earth's surface on which the pavement or the roadways are built. The wicking yarn of synthetic polymer composed of polyamides along with the hydrophobic nature of the multifilament Polypropylene Yarn, and a Polyester yarn, ensures the quick draining or wicking away of the excess water from the geotextile wicking fabric 100. This moisture management is crucial for maintaining the stability of the soil. Further, the synthetic polymer composed of polyamides has a high tensile strength. Therefore, its combination with the multifilament Polypropylene Yarn, and Polyester yarn results in a strong and durable geotextile wicking fabric 100 which is capable of withstanding the stresses and loads experienced in the roadways and pavements. The combination of wicking yarn of synthetic polymer composed of polyamides, a multifilament Polypropylene Yarn, and a Polyester yarn provides a geotextile wicking fabric 100, with a balance of properties that makes it suitable for use in roadways and pavement construction.

[0036] The wicking fibers of the present invention comprise wicking channels for wicking away the moisture from the surface. The disclosed wicking fiber can be made of any polymeric material which has high tensile strength and is insoluble in the fluid which is to be contacted with the capillary channels formed within in one example.

[0037] The disclosed wicking fiber has a permittivity of at least 0.5 sec^{-1} determined by American Society for Testing and Materials (ASTM) D4491. In context of the present invention, the permittivity is used as a measure of the wicking fiber's ability to transport moisture or fluids. A higher permittivity value indicates that the fiber can rapidly absorb and transmit liquids. Further, the wicking fiber has a flow rate of at least 50 gallons per minute per square foot or approximately 2037 liters per minute per square meter. This flow rate signifies the exceptional ability of the wicking fiber to facilitate the rapid movement of liquids or fluids. The disclosed wicking fiber provides a swift passage to the liquid or fluids passing through it.

[0038] The disclosed wicking fiber has an apparent opening size (AOS) of 0.425 mm determined by ASTM D4751. The AOS is a critical parameter for assessing a fiber's filtration and permeability capabilities. An AOS of 0.425 mm indicates that the wicking fabric has a well-defined pore structure which provides efficient passage to the fluid. Furthermore, the

disclosed wicking fiber has a specific pore size as determined by ASTM D6767. The pore size values (O_{50}) and (O_{95}) of the wicking fiber are at least 85 microns and at least 195 microns, respectively. These values indicate the range of diameter of the pore sizes within the wicking fiber structure. The O_{50} pore size value represents the pore size at which 50% of the pores are smaller and O_{95} represents the pore size at which 95% of the pores are smaller. The provided pore sizes effectively control the flow of liquid and filter particles having sizes larger than the mentioned pore sizes. O_{95} pore size allows only 5% of the particles to pass with test value of 195 microns and O_{50} pore size allows 50% of the particles i.e. smaller bead size which is about 85 microns.

[0039] In accordance with embodiments of the present subject matter, Fig. 2 illustrates an implementation of the geotextile wicking fabric in roadway construction 200. This figure shows a top permeable layer 202, which is typically constructed using materials such as Asphalt, concrete, or other suitable paving materials. The top permeable layer 202 serves as a visible, load-bearing surface that traffic interacts with. The permeable nature of this layer prevents ponding on the road surface. The choice of material for the top permeable layer 202 is critical, as it significantly adds to the road's surface properties, like permeability, skid resistance, smoothness, performance in different weather conditions, etc. Further, a bedding layer 204 is positioned beneath the top permeable layer 202. Bedding layer 204 acts as an intermediate support layer. This layer provides essential support and acts as an intermediate barrier between the top permeable layer 202 and the underlying layers. The bedding layer 204 distributes the load, and promotes even weight distribution which contributes to the road's structural stability. Following this, there is a base course layer 206 which provides additional structural support. The base course layer 206 further provides additional load-bearing capacity and helps in distributing the traffic loads evenly. A geotextile wicking fabric layer 208 is positioned beneath the base course layer 206 to provide additional structural support. The geotextile wicking fabric layer 208 plays a vital role in facilitating essential functionalities such as efficient moisture management, soil separation, and structural reinforcement. The bottommost layer is a subgrade layer 210, which serves as an underlying ground support, forming the basis for the road structure.

[0040] Excess water on the road surface infiltrates through the various layers of the road construction until it reaches the geotextile wicking fabric layer 208. As discussed earlier, the top permeable layer 202 is usually permeable to allow water to pass through and reach the bedding layer 204 which is situated just below the top permeable layer 202. The excess water further penetrates through the bedding layer 204 to the base course layer 206 which is made of permeable aggregates. The excess water passes through the base course layer 206 to the geotextile wicking fabric layer 208.

[0041] The geotextile wicking fabric layer 208 receives the excess water that penetrates through the base course layer 206. The geotextile wicking fabric 208 is made of wicking fibers to rapidly absorb and transport water in both the directions, vertically and horizontally. In an example, the disclosed wicking fiber can move moisture or water vertically at a rate of at least 6 inches in 11 minutes and 7 inches in 20 minutes. Due to this, the water is rapidly drawn up and distributed across the geotextile wicking fabric layer 208. Further, in an example, in the horizontal direction, the geotextile wicking fabric can transport moisture at a rate of at least 75 inches in 950 minutes. This ensures that the excess water and moisture is efficiently distributed across the geotextile wicking fabric layer 208.

[0042] In accordance with embodiments of the present subject matter Fig. 3A-3C illustrates the cross-section of the wicking yarn. The wicking fabric may have a variety of different cross-sectional shapes to enhance the liquid's active capillary movement of liquid along its length. These cross-sectional shapes may include shapes like a non-round shape, a non-rectangular shape, a non-circular shape, a non-oval shape, a non-flat shape, a lobular shape, an irregular shape, a multichannel shape, or a trilobal shape. The cross-sectional shape of the wicking yarn provides a large surface area which promotes a large adhesion tension. Due to large adhesion tension, there is an increase in the attraction between liquids and the wicking yarn which ultimately increases the wicking capabilities of the geotextile.

[0043] In an embodiment, the geotextile wicking fabric is structured through a knit construction that enables the formation of multiple layers within the geotextile. These layers maintain a flat and planar configuration when the geotextile is placed on a level surface. This characteristic contributes to the stability and consistent performance of the geotextile. The layers within the geotextile are distinct and separate from each other. Each layer is independent and does not merge or blend with the adjacent layers. Due to this, each layer can perform its intended function effectively without any interference from the other layer.

[0044] In one exemplary aspect, the geotextile wicking fabric can be used for controlling erosion and water in the roadways. For example, Figure 4 illustrates an example roadway which includes a trafficked surface 402, one or more layer of aggregate 406 such as a layer of compacted crushed stone, and a layer of subgrade soil 408. In some embodiment, the trafficked surface 402 may be a paved road surface, a path or sidewalk surface, or the like. The geotextile wicking fabric 410 is placed between the subgrade soil layer 408 and the layer of the aggregate 406, precisely spanning a vertex or elevated point of the subgrade soil layer 408. The wicking yarn of the geotextile wicking fabric then transports the fluid toward the outer sides of the trafficked surface 402.

[0045] In an embodiment, the knitted geotextile wicking fabric transports moisture by capillary action across the geotextile wicking fabric which changes the moisture characteristics of the adjacent soil. The disclosed knitted geotextile wicking fabric may provide functions such as separation, filtration, and stabilization in the construction of roadways. The geotextile wicking fabric prevents the intermixing of two incompatible materials such as soil and aggregate over time. For

example, the geotextile wicking fabric prevents the intrusion of the soil layer into the aggregate layer due to dynamic loading. Similarly, the disclosed geotextile wicking fabric also prevents the aggregate layer from the intrusion of soil or other fine materials. Issues related to stability and loss of support may be caused due to the fine materials such as clay which can reduce friction within the layer of aggregate. The geotextile wicking fabric also reduces the pressure on the subgrade soil as it modifies the load distribution through the aggregate layer.

[0046] Although the subject matter has been described in considerable detail with reference to certain examples and implementations thereof, other implementations are possible. As such, the present disclosure should not be limited to the description of the preferred examples and implementations contained therein.

Claims

1. A geotextile wicking fabric (100) comprising:

a plurality of warp strands of a wicking fiber;
 a plurality of weft strands of the wicking fiber;
 wherein the plurality of warp strands is oriented perpendicular to the plurality of weft strands and the plurality of warp strands are knitted with the plurality of weft strands, and
 wherein the wicking fiber comprises a wicking yarn of synthetic polymer composed of polyamides, a multifilament Polypropylene Yarn, and a Polyester yarn in a ratio of 1.4: 4.1: 1, wherein the proportion varies by upto 20 %.

2. The wicking fabric (100) as claimed in claim 1, wherein the wicking fabric has a non-circular or non-oval cross-section.

3. The wicking fabric (100) as claimed in claim 2, wherein a cross-section of the wicking yarn is multichannel, trilobar, or pillow.

4. The wicking fabric (100) as claimed in claim 1, wherein the wicking fiber has a permittivity of at least 0.5 sec^{-1} determined by American Society for Testing and Materials (ASTM) D4491.

5. The wicking fabric (100) as claimed in claim 1, wherein the wicking fiber has a flow rate of at least 50 ($\geq 2,037$) gal/min/sf (l/min/sm) determined by ASTM D4491.

6. The wicking fabric (100) as claimed in claim 1, wherein the wicking fiber has an apparent opening size (AOS) of 0.425 mm determined by ASTM D4751.

7. The wicking fabric (100) as claimed in claim 1, wherein the wicking fiber has a pore size (O_{50}) of at least 85 microns determined by ASTM D6767.

8. The wicking fabric (100) as claimed in claim 1, wherein the wicking fiber has a pore size (O_{95}) of at least 195 microns, determined by ASTM D6767.

9. The wicking fabric (100) as claimed in claim 1, wherein the wicking fiber has a wet front movement in a vertical direction of at least 6 Inches in 11 minutes, determined by ASTM C1559.

10. The wicking fabric (100) as claimed in claim 1, wherein the wicking fiber has a wet front movement in a vertical direction of at least 7 inches in 20 minutes, determined by ASTM C1559.

11. The wicking fabric (100) as claimed in claim 1, wherein the wicking fiber has a wet front movement in a horizontal direction of at least 75 inches in 950 minutes, determined by ASTM C1559.

12. The wicking fabric (100) as claimed in claim 1, wherein the plurality of warp strands are knitted with the plurality of weft strands using a weft insert warp knitting method.

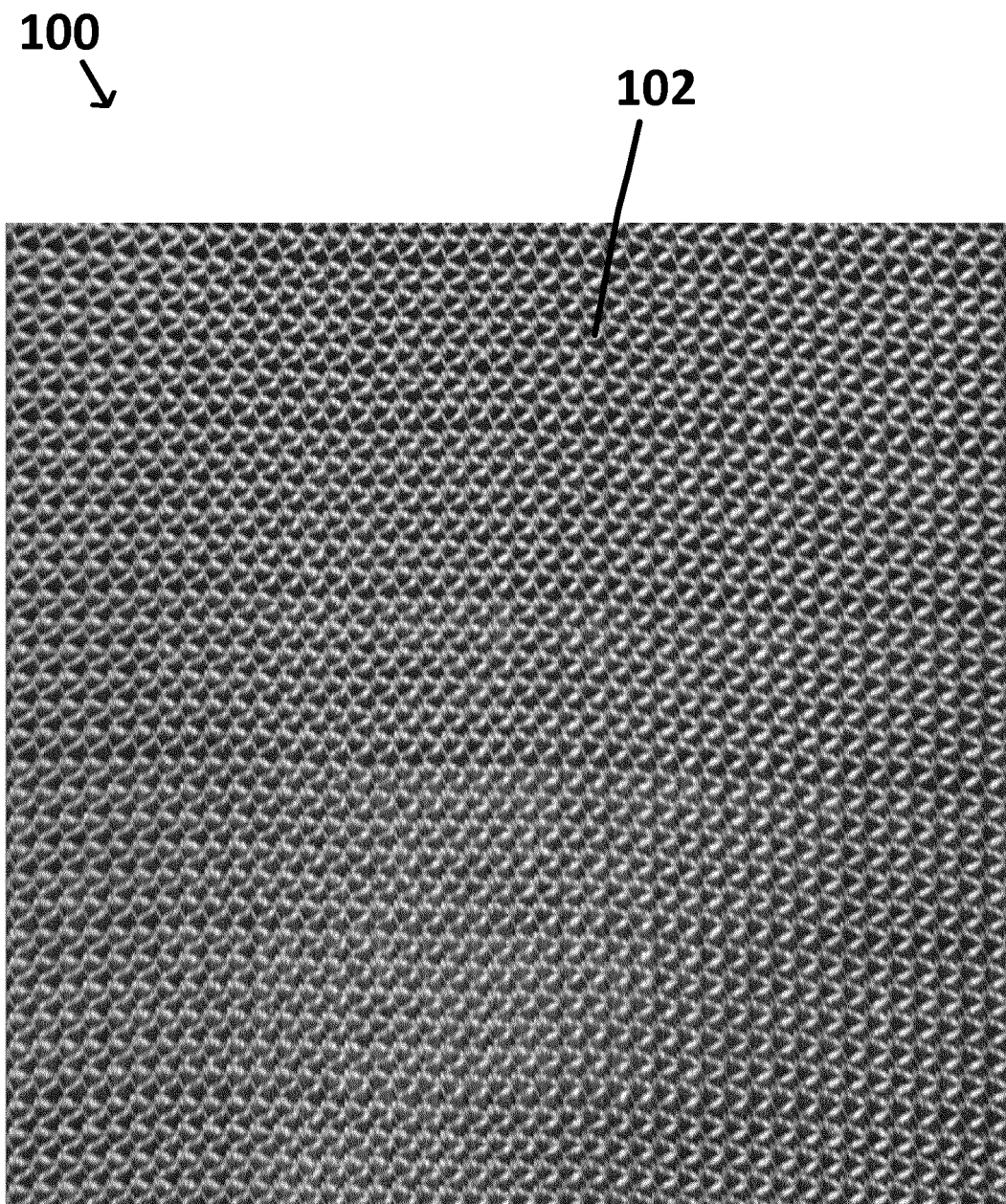


Figure-1A

100
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104

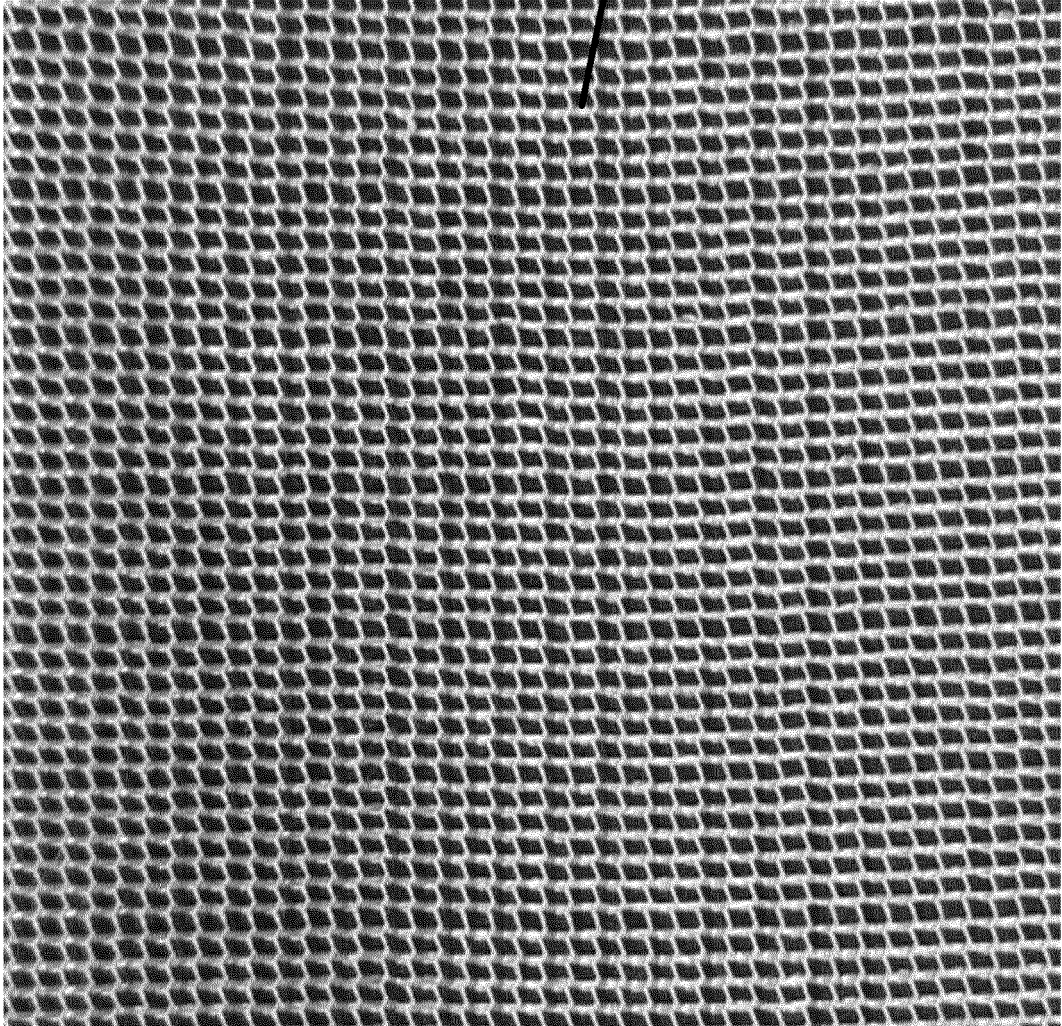


Figure-1B

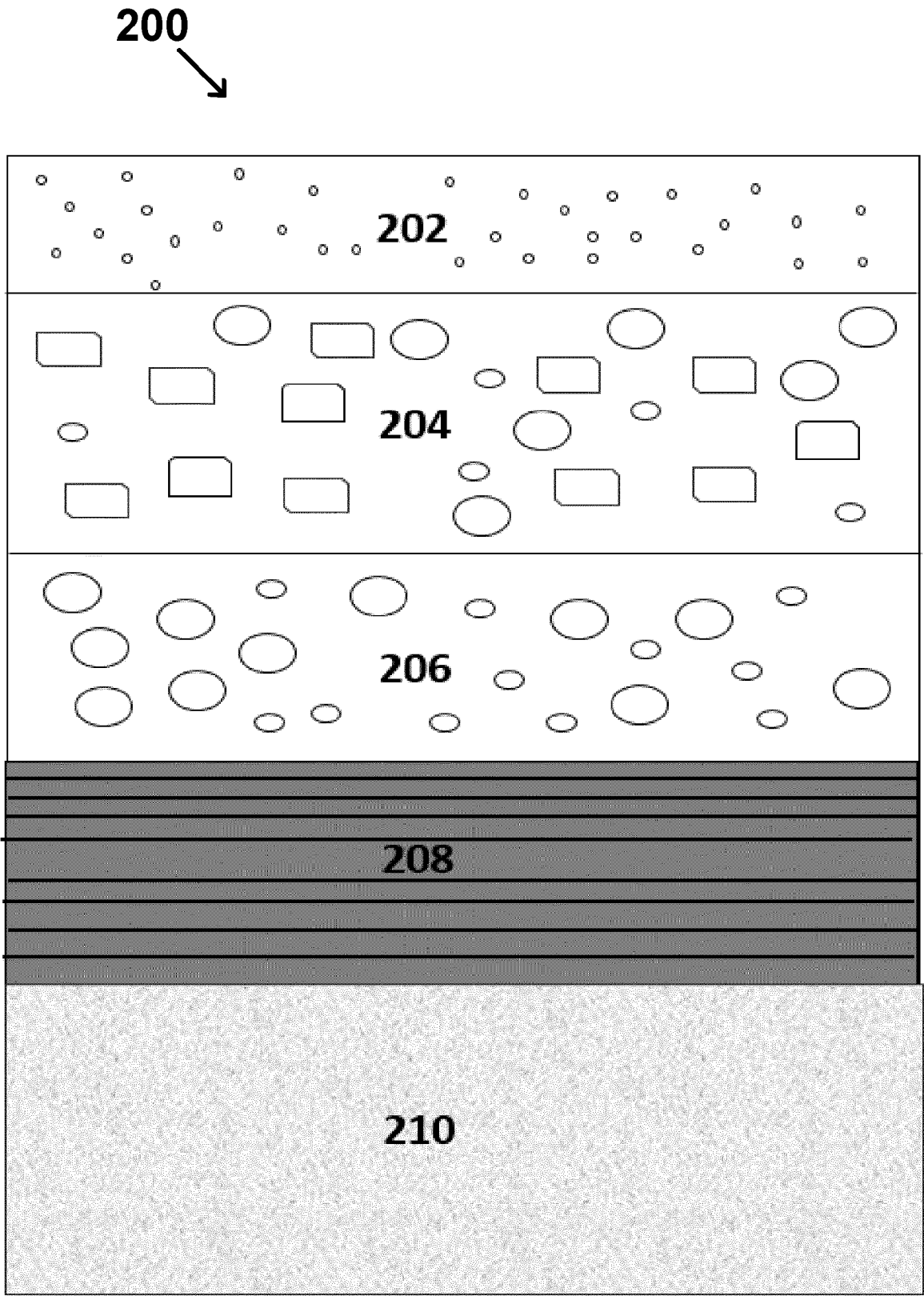


Figure-2

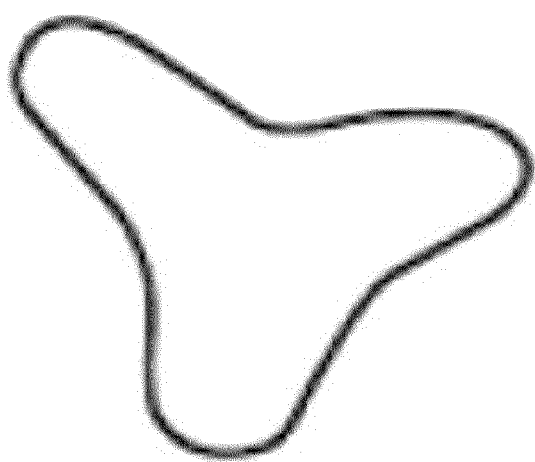


Figure-3A

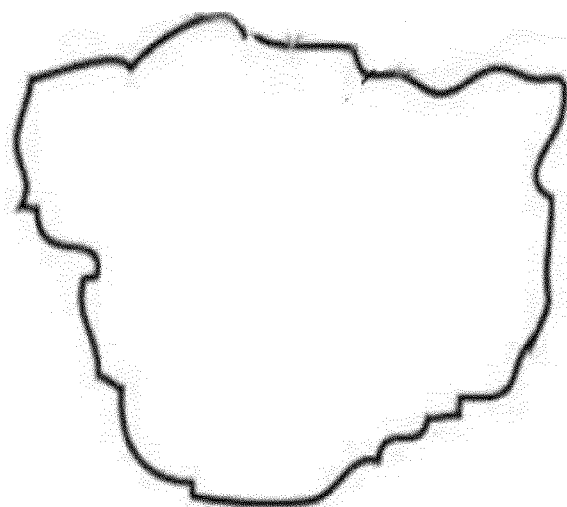


Figure-3B

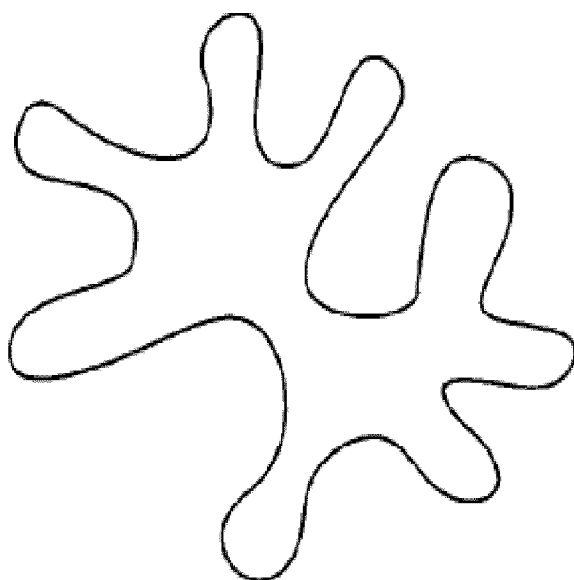


Figure-3C

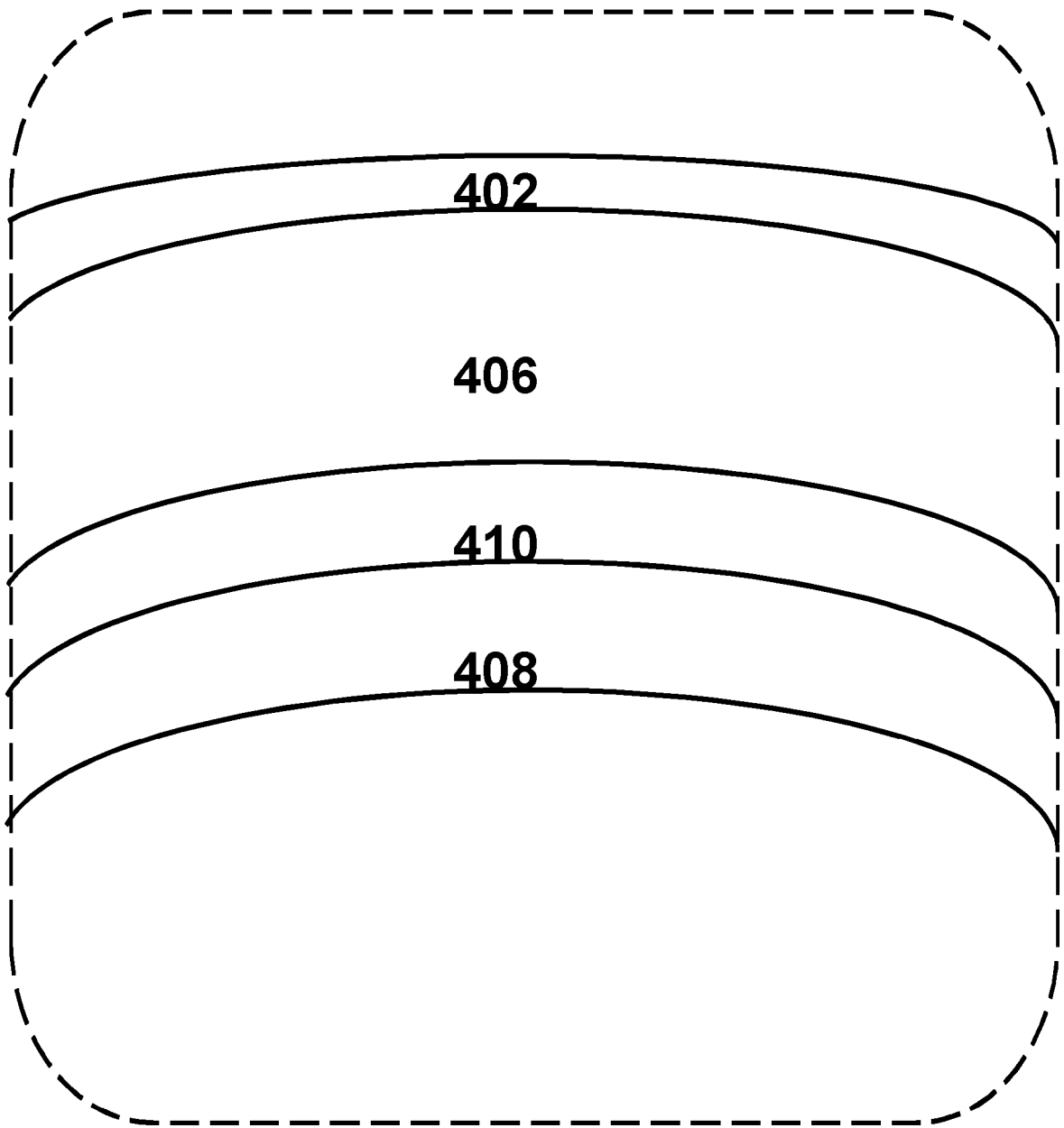


Figure-4



EUROPEAN SEARCH REPORT

Application Number

EP 24 20 1164

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2010/044881 A1 (TENSAR INTERNAT CORP [US]; WYNN JONATHAN R [GB]; THOMPSON JOHN [GB]) 22 April 2010 (2010-04-22) * page 11, line 3 - page 15, line 18; claims 1, 3, 5-7, 10, 11, 25; figures 2-5; examples 1, 2 * * page 24, lines 3-20 * -----	1,4-8,12	INV. D04B21/16
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Place of search		Date of completion of the search	Examiner
Munich		28 February 2025	Sterle, Dieter
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X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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