



(12) **EUROPEAN PATENT APPLICATION**  
published in accordance with Art. 153(4) EPC

(43) Date of publication:  
**10.06.2020 Bulletin 2020/24**

(51) Int Cl.:  
**D03D 13/00 (2006.01)**

(21) Application number: **17919851.0**

(86) International application number:  
**PCT/ES2017/070559**

(22) Date of filing: **31.07.2017**

(87) International publication number:  
**WO 2019/025643 (07.02.2019 Gazette 2019/06)**

(84) Designated Contracting States:  
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**  
Designated Extension States:  
**BA ME**  
Designated Validation States:  
**MA MD**

(71) Applicant: **IDE Automotive España S.L.**  
**08830 Sant Boi de Llobregat Barcelona (ES)**

(72) Inventor: **HERMANN, Otto**  
**08830 Sant Boi de Llobregat (ES)**

(74) Representative: **Elzaburu S.L.P.**  
**Miguel Angel 21, 2nd floor**  
**28010 Madrid (ES)**

(54) **MANUFACTURED TEXTILE ITEM**

(57) Manufactured surface-fixing textile item made of woven knitted fabric, comprising a textile support formed by a first lower weft thread configured to fold into a plurality of equal loops, to form a succession of areas of peaks and valleys, regularly spaced without the form of a continuous fabric; a second weft thread set to retract into loops of different wing lengths to arrange the longer

wing loops above the valley areas of the first weft thread and interlace the shorter wing loops with the loops of the first weft thread; and a third joining weft thread is configured to fold into equal loops to interweave the loops of the first lower weft thread with the loops of the second upper filling weft thread.

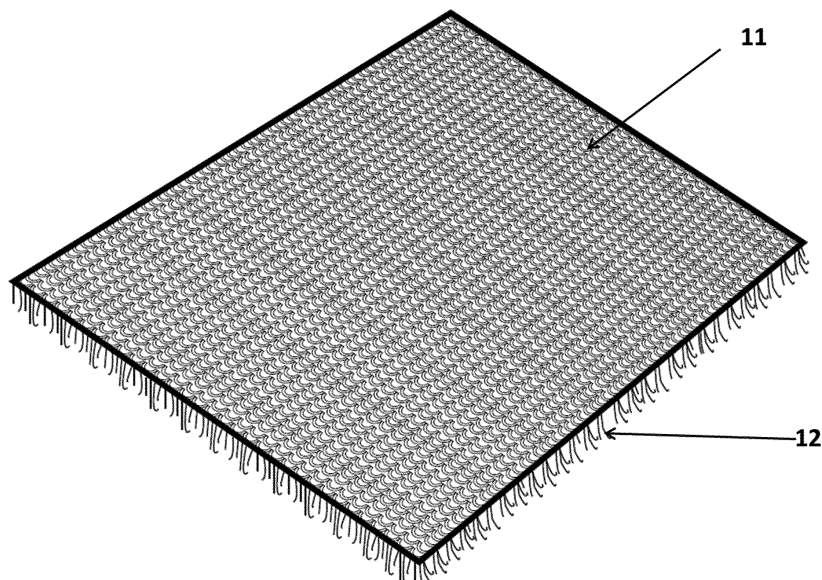


Fig. 1

## Description

### Object

[0001] The present invention relates to a manufactured surface-fixing textile item made of woven knitted fabric capable of maintaining a certain position when it comes into mutual contact with a fabric.

### State of the Art

[0002] The use of mats to cover and protect floors inside motor vehicles such as a carpet mat is known in the state of the art.

[0003] Car mats have two faces. One face is in contact with the sole of the vehicle user's shoes and, from an aesthetic point of view, they have to provide an aesthetic and practical aspect to the interior of the vehicle. The second face is located close to the vehicle floor to provide safety to the vehicle driver.

[0004] Car mats have mechanical anchoring means to fix them into certain positions; i.e., car mats are fixed in a constant position, by means of two mechanical fixing points. However, they do not prevent the mat from moving, from wrinkling, due to the force that is exerted when feet are moved on the mat when two or three pedals are operated repeatedly.

[0005] These wrinkles can cause folds in the mats that are an inconvenience and a problem for the safety of the driver, mainly, and for the comfort of the rest of the users.

[0006] Consequently, there is a need to immobilise objects that are transported inside the vehicle and that are not part of the original trim. This objective is not only directed at the mats of the vehicle, but also at all the objects that are placed in the passenger compartment and, also, inside the trunk or loading surface of the vehicle.

### Summary

[0007] The present invention seeks to solve one or more of the disadvantages set forth above by means of a manufactured surface-fixing textile item as defined in the claims.

[0008] The manufactured surface-fixing textile item made of woven knitted fabric, comprising a textile support formed by a plurality of parallel weft threads, one next to the other, wherein a protruding weft thread is interwoven configured to provide an anti-slip feature.

[0009] The manufactured item of woven knitted fabric, is a mesh that is formed horizontally and is composed of a series of parallel weft threads that develop along the fabric horizontally.

[0010] The textile support comprises a first lower weft thread configured to fold into a plurality of equal loops, to form a succession of areas of peaks and valleys, regularly spaced without the form of a continuous fabric; a second filling weft thread set to retract into loops of dif-

ferent wing lengths to arrange the longer wing loops above the valley areas of the first weft thread and interlace the shorter wing loops with the loops of the first weft thread; and a third joining weft thread is configured to fold into equal loops to interweave the loops of the first lower weft thread with the loops of the second upper filling weft thread.

[0011] The second upper thread is also developed along the woven knitted fabric horizontally in a "ω" shape. And the third upper weft thread also develops along the

woven knitted fabric horizontally in a meander-like "2" shape.

[0012] The fourth protruding weft thread is configured to run along the fabric horizontally, and to retract into loops (31) arranged parallel to the longer wing loops of the second upper weft thread. They are cut by the head of the loop to form discrete separate winged sections and the feet of the loops of the fourth protruding weft thread parallel to the loops of the first lower weft thread are interlaced by woven knitted fabric simultaneously to the first, second and third weft thread.

[0013] The manufactured surface-fixing textile item is made of a woven knitted fabric that comprises a protruding part that provides it with an anti-slip feature, so that when the manufactured textile item is superimposed on a tangled fabric such as a felt, a mat, a flannel, a non-woven cloth, a plush and/or dense fabric or similar, it is capable of being held in a predetermined position.

[0014] In one embodiment the second supporting upper weft thread is configured to be retracted into loops of different wing lengths so that a loop of longer wing length is adjacent, on both sides of it, to two loops of shorter wing length; the second upper thread is configured to run above the first lower thread so that one loop of the first lower thread is arranged adjacent, on both sides of the same loop, to two loops of greater wing length of the second upper thread respectively and, additionally, the same loop of the first lower thread is interwoven with a loop of lesser wing length of the second upper thread; the third joining weft thread is configured to interlace the loops of the first lower weft thread, the second upper weft thread and the fourth outer weft thread with an anti-slip feature.

[0015] It should be noted that the number of loops in the fourth outer weft thread is twice the number of loops in the first lower weft thread so that the loops in the fourth outer weft thread are arranged parallel to the loops in the first lower weft thread and the loops with the longest wing length in the second upper weft thread; the loops in the fourth weft thread being interlaced parallel to the loops in the first lower weft thread by the loops with the shortest wing length in the second upper weft thread.

[0016] The loop heads of the fourth outer weft thread, which are parallel to the loops of the second upper weft thread, are cut through the loop head to form two separate winged sections, which protrude from the layer of second upper support weft thread to provide the anti-slip

feature.

**[0017]** The protruding wing sections have a wing length greater than the wing length of a continuous head loop of the fourth outer weft thread.

**[0018]** The fourth outer weft thread comprises a plurality of continuous head loops and discontinuous or sectioned head loops arranged alternately, i.e. a continuous head loop is adjacent, on both sides, to discontinuous head loops.

**[0019]** The wing sections of part of the loops of the fourth outer weft thread are those which provide the anti-slip feature by mutual contact with the corresponding face of a woven or non-woven product, arranged below the manufactured surface-fixing textile item, so that the manufactured textile item remains in a predetermined or constant position.

**[0020]** The ends of the wing sections of the fourth outer weft thread have straight, curved or similar ends. When the corresponding faces of the manufactured textile item and the product, respectively, are brought together so that they touch each other, the wing sections of the fourth outer weft threads cling to the corresponding face of the product to provide resistance to a pushing force, i.e. effective resistance to slipping; maintaining the determined position of the overlapping item above the product.

**[0021]** The manufactured textile item is formed in woven knitted fabric where the textile item is flexible and elastic, and is formed by weaving flexible weft threads, so that a base layer is formed attached to the knitted fabric which includes a plurality of wing sections of separate weft thread protrusions, evenly distributed and protruding from the corresponding face of the manufactured textile item to provide it with the anti-slip feature.

**[0022]** The protruding wing sections serve as fastening elements of the manufactured surface-fixing textile item, which extend in the orthogonal direction of the weft threads of the manufactured textile item.

### Brief description of the drawings

**[0023]** A more detailed explanation is given in the following description and is based on the attached figures:

Figure 1 shows a perspective view of a manufactured textile item made of woven knitted fabric and formed from a plurality of weft threads parallel to each other, which are interlaced to form a textile support with a weft thread protruding from it to provide an anti-slip feature to the manufactured textile item;

Figure 2 shows, schematically, in a plan view how the weft threads are interwoven parallel to each other according to a mode of embodiment of the textile support of the manufactured textile item;

Figure 3 shows the parts into which any one loop of a weft thread of the woven knitted fabric is divided from the textile support of the manufactured textile

item; and

Figure 4 shows, schematically, in a plan view how the weft threads are interwoven parallel to each other according to an alternative mode of embodiment of the textile support of the manufactured textile item.

### Description

**[0024]** In relation now to Figure 1 which shows a manufactured surface-fixing textile item made in woven knitted fabric, formed from a plurality of parallel weft threads, one next to the other, that are interlaced to form the textile support 11 with a protruding weft thread 12 that provides it with an anti-slip feature.

**[0025]** In relation now to Figures 2 and 3, textile support 11 of the manufactured textile item comprises a plurality of weft threads 12, 21, 22, 23; where a first lower weft thread 21, running along the fabric horizontally, is configured to retract into a plurality of equal loops 31, in the form of a succession of peaks and valleys, regularly spaced so as not to form a continuous fabric, a second upper filling weft thread 22 being provided to overlap the loops 31 of the first lower weft thread 21.

**[0026]** The second upper thread 22 also runs along the fabric horizontally, being configured to retract into loops 31 of different wing lengths 33, so that a loop 31 of greater wing 33 length is adjacent, on both sides of it, to two loops 31 of lesser wing 33 length, in a "ω" shape.

**[0027]** The second upper weft thread 22 is configured to run over the first lower weft thread 21, so that a loop 31 of the first lower weft thread 21 is arranged adjacent, on both sides of the same loop 31, to two loops 31 of greater wing 33 length than the second upper weft thread 22 and, additionally, the same loop 31 of the first lower weft thread 21 is interlaced with a loop 31 of lesser wing 33 length than the second upper filling weft thread 22.

**[0028]** In order to increase the union of the first lower weft thread 21 with the second upper weft thread 22, a third joining weft thread 23 is provided, which develops along the fabric horizontally, which is configured to fold in equal trajectory loops 31 in a "S"-like meander, to interweave the loops 31 of the first lower weft thread 21 with the loops 31 of the second upper filling weft thread 22.

**[0029]** In summary, all loops 31 of the first lower weft threads 21 are interlaced to a predetermined number of loops 31 of the second upper filling weft threads 22 and all loops 31 of the third joining weft thread 23 are interlaced to all loops of the second upper filling weft threads 22 and all loops 31 of the first lower weft threads 21.

**[0030]** A fourth outer weft thread 12 with anti-slip feature, running along the fabric horizontally, is configured to retract into loops 31 of equal dimensions to the loops 31 of the first lower weft thread 21; where the number of loops 31 of the fourth outer weft thread 12 is equal to the number of loops 31 of the second upper weft thread 22,

so that the loops 31 of the fourth outer weft thread 12 arranged parallel to the loops 31 with longer wing 33 lengths than the second upper weft thread 22, are cut by the head 32 of the loop 31 to form two discrete weft threads 33 separated and interlaced by woven knitted fabric simultaneously to the first, second and third weft threads 21, 22, 23.

**[0031]** The wings 33 protrude from one side of the textile support 11 to provide the anti-slip feature to the manufactured textile item.

**[0032]** The loops 31 of the third joining weft thread 23 cooperate mechanically with the loops 31 of the shorter wing 33 length of the second upper filling weft thread 22 to interlace or attach the continuous loops 31 of the fourth outer weft thread 12 to the loops 31 of the first lower weft thread 21, to form the continuous textile support 11 of the manufactured textile item, shown in Figures 1 and 2. The dimensions of the manufactured textile item 11 can be as desired and produced by the machine used to form the manufactured textile item.

**[0033]** Therefore, in order to interlace the first and second weft threads 21, 22 the third weft threads 23 are provided, which cooperate mechanically with the loops 31 of shorter wing 33 length of the second filling weft threads 22 to join the first, second and fourth weft threads 21, 22, 12.

**[0034]** From the above it is clear that the number of loops 31 in a second weft thread 22 is equal to the number of loops 31 in a third weft thread 23 and this number of loops 33 is higher than the number of loops in the first weft thread 21; in particular, the first weft thread has half as many loops 31 as the second weft thread 22 or the third weft thread 23.

**[0035]** The heads 32 of the loops 33 of the fourth outer weft thread 12, which are parallel to the loops 31 with longer wing 33 lengths than the second upper weft thread 22, are cut to form protruding wing 33 sections whose wing 33 length is greater than the wing 33 length of a continuous head 32 loop 31 of the fourth outer weft thread 23.

**[0036]** The fourth outer weft thread 23 comprises a plurality of loops 31 with a continuous head 32 and loops 31 with a discontinuous or sectioned head 32 arranged alternately, i.e. a loop 31 with a continuous head 32 is adjacent, on both sides, to loops 31 with a discontinuous head 32.

**[0037]** The wing 33 sections protruding from the fourth outer weft thread 12 provide the anti-slip feature by mutual contact with one side of the product arranged underneath the textile support 11 manufactured textile item.

**[0038]** The manufactured textile item comprises a plurality of protruding wing 33 sections arranged to form a protruding part, belonging to the fourth outer weft thread 23, which protrude from the corresponding face of the textile support 11 to come into mutual contact with the upper face of the product, so that the manufactured textile item remains in a predetermined or constant position when a thrust is exerted, regardless of the direction in

which the thrust is exerted, on all protruding wing 33 sections, all folded up on the same side against the bottom of the textile support 11 of the manufactured textile item, as a result of the protruding wing 33 sections clinging to the upper face of the product.

**[0039]** The protruding wing 33 sections of the manufactured textile item do not offer resistance to a separation force applied to the manufactured textile item to separate it from the upper face of the product.

**[0040]** The ends of the wing 33 sections of the fourth outer weft thread 12 have straight, curved ends in different directions. When the lower and upper sides of the manufactured textile item and product, respectively, are brought together so that they touch each other, the wing 33 sections of the outer weft thread 12 strands are entangled to provide effective slip resistance; the position of the manufactured textile item 11 on the product is maintained.

**[0041]** The manufactured textile item 11 is formed in woven knitted fabric where the manufactured textile item 11 is flexible and elastic, and is formed by weaving flexible weft threads, so that the textile support 11 is formed in woven knitted fabric that includes a plurality of separate weft thread wing 33 sections, evenly distributed and protruding from one side of the textile support 11 to provide the anti-slip or anchoring feature to the vehicle product.

**[0042]** The manufactured textile item without openings or holes is configured to be attached, in physical contact, to the upper face of the mat-type or similar product.

**[0043]** The weft threads 12, 21, 22, 23 can be monofilament or a plurality of filaments.

**[0044]** The manufacturing process of the manufactured textile item involves folding the protruding wing 33 sections in a direction orthogonal to the direction of development of the weft thread in the direction of the head of the weft thread loop 31; by applying a flat object against the protruding wing sections to fold them, for example, all simultaneously on the same side.

**[0045]** The manufactured textile item is made of monofilament to increase the grip effect, provided by the protruding wing sections when in mechanical contact with the woven or non-woven product on which the manufactured textile item is located.

**[0046]** In relation now to Figure 4, an alternative embodiment of the textile support 11 of the manufactured textile item shows in a valley area extended from the first lower weft thread 21, in which a greater number of loops 31 of greater wing 33 length than the second filling upper filling weft thread 22 are arranged to overlap it above the loops 31 of the first lower weft thread 21.

**[0047]** Also, the textile support 11 of the manufactured textile item shows in an extended peak area of the first lower weft thread 21, in which a larger number of loops 31 of smaller wing 33 length than the second upper filling weft thread 22 are arranged to overlap the loops 31 of the first lower weft thread 21, so that the number of loops 31 to which the fourth outer weft thread 12 is interlaced is reduced to form the protruding wing 33 sections to

reduce the density of protruding wings per cm<sup>2</sup>, and thus provide less slip resistance.

[0048] Consequently, the density of protruding wings per cm<sup>2</sup> is a function of the extension of the valley and peak areas of the first lower weft thread 21.

[0049] In addition, the grip of the protruding wing 33 sections increases if the outer fourth weft thread 12 is multifilament; presenting greater density per cm<sup>2</sup>. The total length of the protruding wing 33 is between 4 and 10 mm so that it protrudes from the face of the textile support by 2 and 5 mm.

[0050] Weft threads 12, 21, 22, 23 shall be selected from the following materials: nylon, polyamides, polyester, polypropylene, polyethylene, animal fibres or plant fibres or a mixture thereof.

[0051] Each single filament or yarn has a thickness ranging from 0.02 mm to 0.5 mm and has an elastic hardness between 35A to 90A or similar and compatible scale. Flexible threads are synthetic or natural yarns selected from the group comprising nylon, polyamides, polyester, polypropylene, polyethylene, animal fibres or plant fibres or mixtures of these fibres.

[0052] The different types of weft threads can be made from the same type of material or in combination with different types of materials.

[0053] The manufactured surface-fixing textile item is configured to be firmly attached to a woven or non-woven product; it is not useful in itself; it is elastic and flexible in order to well cover the face of the product to which it is attached, regardless of the concave or convex or geometrically complicated shape or shapes of the product.

[0054] The pattern of the woven knitted fabric of the manufactured textile item is repeated throughout the length and width of the same item, thus allowing fabrics of different widths and elongations to be produced.

[0055] The separate protruding wing 33 sections are arranged to be further processed into fabric, to form rounded ends by passing the manufactured textile item through a tunnel furnace (not shown) to heat and melt the free ends of the protruding wing sections. Alternatively, the free ends of the protruding wing 33 sections are subjected to heat and compression to deform the ends to form hooks.

[0056] To summarise, the manufactured textile item offers an anti-slip surface fixing material that has been structured to have wing 33 sections, made of woven knitted fabric to provide the anti-slip effect, which when they come into contact with selected products of the following materials such as felts, mats, flannels, plush fabrics, which have a looped or tangled structure, adhere to them.

[0057] In addition, the wing 33 sections are tightly knit with the weft threads that form the woven knitted fabric of the manufactured textile item and have better grip and slip resistance when in contact with woven or non-woven products of looped or tangled structure.

## Claims

1. Manufactured surface-fixing textile item made of woven knitted fabric, comprising a textile support (11) formed by a plurality of parallel weft threads, side by side, into which a protruding weft thread (12) is woven to provide an anti-slip feature; **characterised in that** the textile support (11) comprises a first lower weft thread (21) configured to retract into a plurality of equal loops (31), to form a succession of areas of peaks and valleys, regularly spaced apart without forming a continuous fabric; a second upper filling weft thread (22) configured to retract into loops (31) of different weft lengths (33) in order to arrange the loops of longer wing (33) length above the valley areas of the first lower weft thread (21) and to interlace the loops (31) of shorter wing (33) length with the loops (31) of the first lower weft thread (21); and a third joining weft thread (23) is configured to retract into equal loops (31) to interlace the loops (31) of the first lower weft thread 21 with the loops (31) of the second upper weft thread (22).
2. Manufactured textile item according to Claim 1; **characterised in that** the second upper weft thread (22) develops along the woven knitted fabric horizontally in a "ω" shape.
3. Manufactured textile item according to Claim 1; **characterised in that** the third upper weft thread (23) develops along the woven knitted fabric horizontally in a meander-like "2" shape.
4. Manufactured textile item according to Claim 1; **characterised in that** the fourth protruding weft thread (12), configured to run along the fabric horizontally, is configured to retract into loops (31) arranged parallel to the loops (31) with longer wing (33) lengths than the second upper weft thread (22), are cut by the head (32) of the loop (31) to form discrete separate winged sections (33) and the feet of the loops (31) of the fourth protruding weft thread (12) parallel to the loops (31) of the first lower weft thread (21) are interwoven by woven knitted fabric simultaneously to the first, second and third weft thread (21, 22, 23).
5. Manufactured textile item according to Claim 1; **characterised in that** the weft threads (12, 21, 22, 23) that form the textile support (11) are monofilament threads.
6. Manufactured textile item according to Claim 1; **characterised in that** the weft threads (12, 21, 22, 23) that form the textile support (11) are multifilament threads.
7. Manufactured textile item according to Claims 5 and

6; **characterised in that** the weft threads (12, 21, 22, 23) that form the textile support (11) are a mixture of monofilament and multifilament threads.

8. Manufactured textile item according to Claims 5 and 6; **characterised in that** the weft threads (12, 21, 22, 23) that form the textile support (11) are selected synthetic or natural threads of the group comprising nylon, polyamides, polyester, polypropylene, polyethylene, animal fibres or plant fibres or mixtures of these fibres.

15

20

25

30

35

40

45

50

55

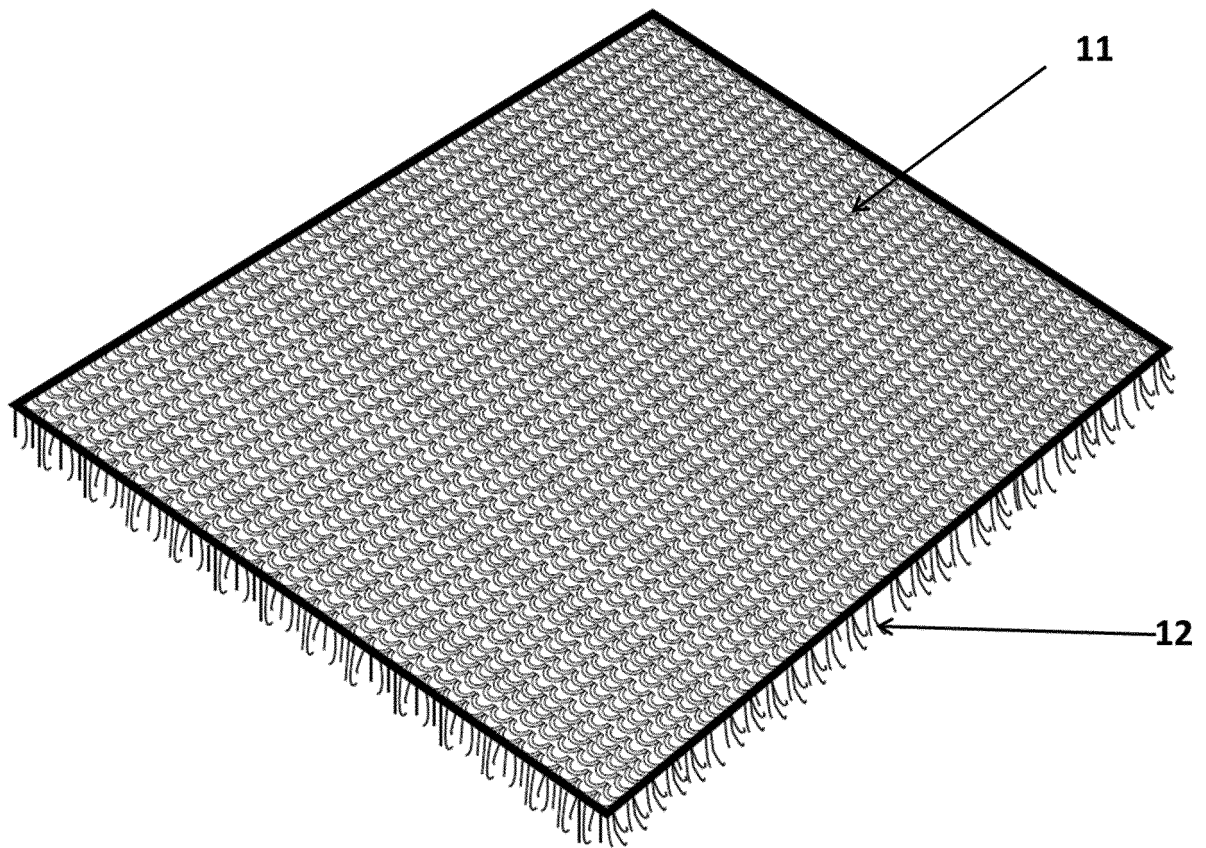


Fig. 1

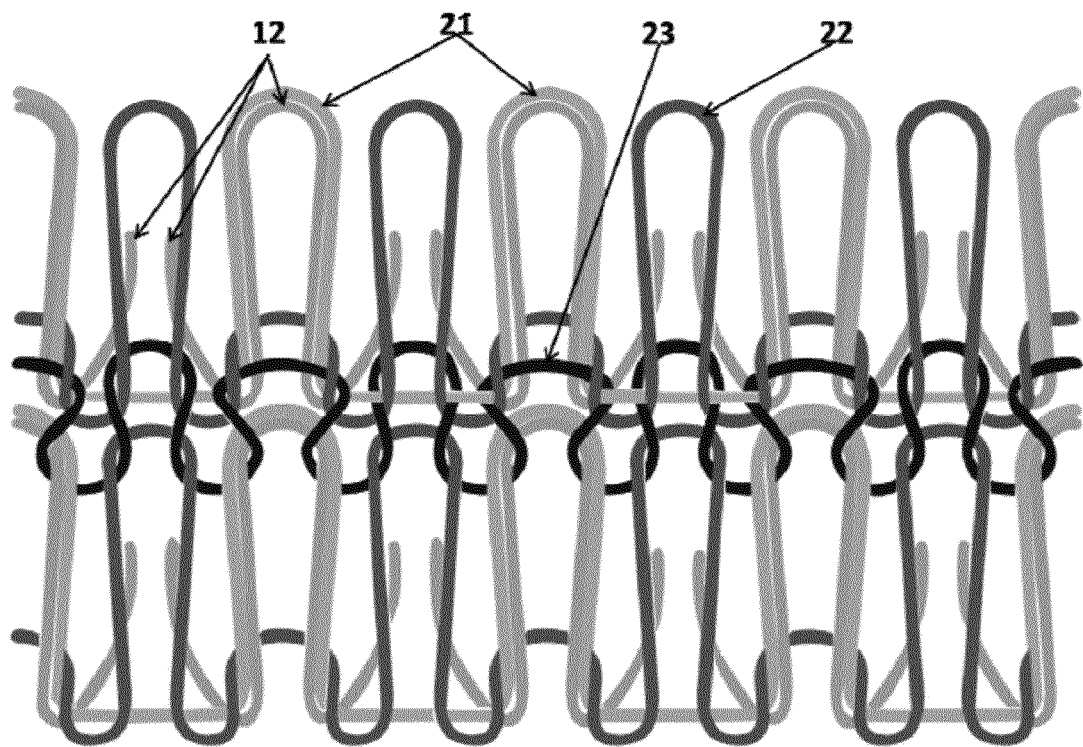


Fig. 2



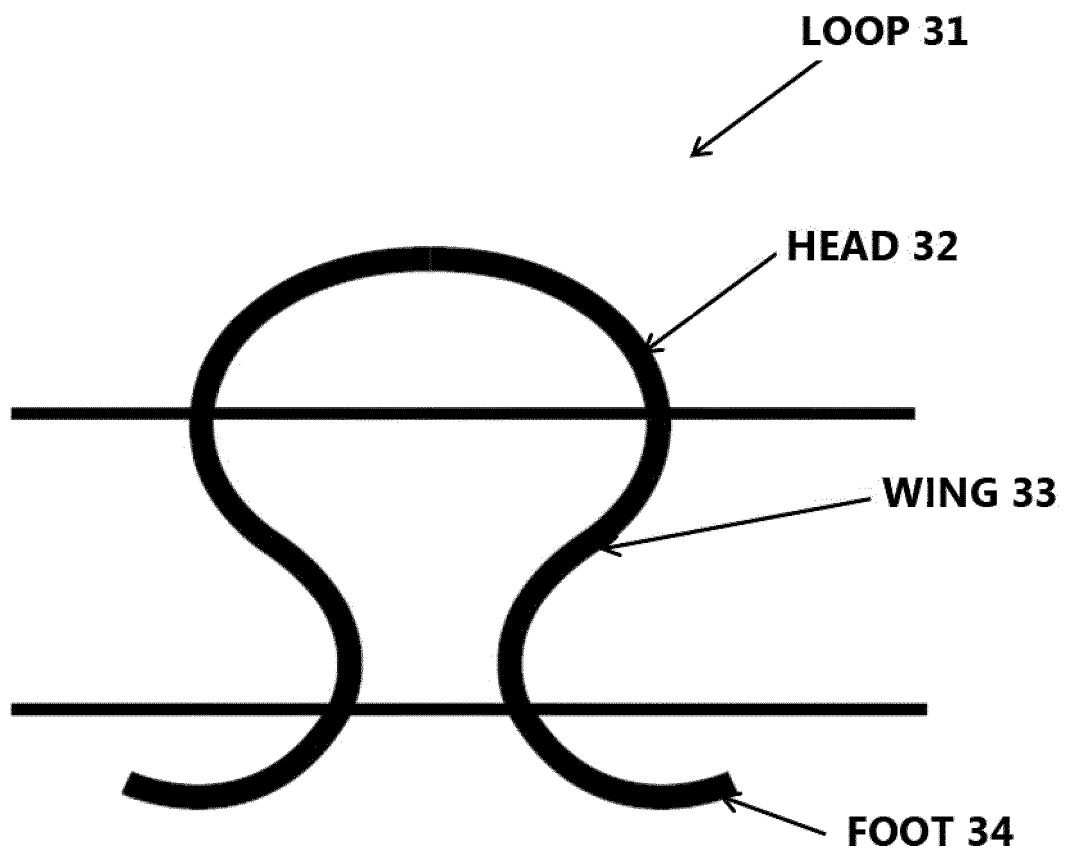


Fig. 3

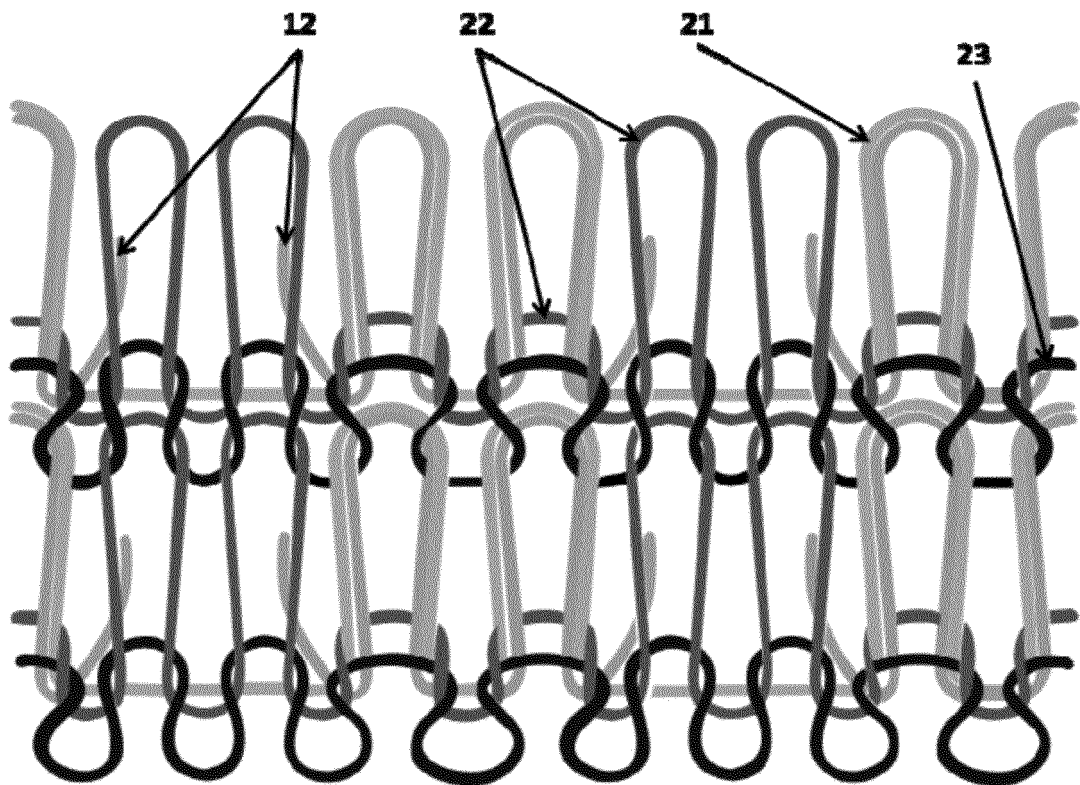


Fig. 4

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/ES2017/070559

## A. CLASSIFICATION OF SUBJECT MATTER

**D03D13/00** (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
**D03D**

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**EPODOC, INVENES, WPI**

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 102975406 A (ZENG YANLIN) 20/03/2013, the whole document.	1-8
X	CN 202968920U U (ZENG YANLIN) 05/06/2013, the whole document.	1-8
A	US 2012096690 A1 (CHOU CHAO-MU) 26/04/2012, the whole document.	1-8

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance.	
"E" earlier document but published on or after the international filing date	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"O" document referring to an oral disclosure use, exhibition, or other means.	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other documents, such combination being obvious to a person skilled in the art
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search  
**26/01/2018**

Date of mailing of the international search report  
**(31/01/2018)**

Name and mailing address of the ISA/

Authorized officer  
R. Reyes Lizcano

OFICINA ESPAÑOLA DE PATENTES Y MARCAS  
Paseo de la Castellana, 75 - 28071 Madrid (España)  
Facsimile No.: 91 349 53 04

Telephone No. 91 3495527

Form PCT/ISA/210 (second sheet) (January 2015)

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2017/070559

Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
CN102975406 A	20.03.2013	CN102975406B B	11.11.2015
CN202968920U U	05.06.2013	NONE	
US2012096690 A1	26.04.2012	TW201216887 A	01.05.2012
		TWI432151B B	01.04.2014
		DE102011116244	10.05.2012
		A1	12.07.2012
		DE102011116244	
		A8	