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(54) Title: A PIECE OF FOOTWEAR

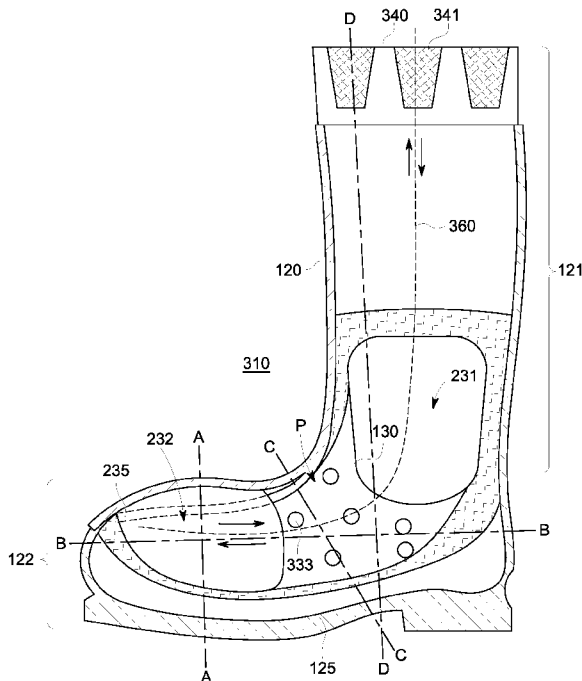


FIG. 3

(57) Abstract: A piece of footwear (310) that comprises a cover (120) forming a shaft (121) and a foot portion (122), a structure (130) inside the cover attached to the cover configured to at least partly surround the user's foot and to hold the foot against an inner bottom (125) of the piece of footwear, and a ventilation channel (360) extending from the shaft (121) to the foot portion (122), the ventilation channel (360) passing said structure (130) via a space arranged in between the cover (120) and the structure (130).

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A PIECE OF FOOTWEAR

TECHNICAL FIELD

5 The present invention generally relates to footwear.

BACKGROUND ART

This section illustrates useful background information without admission of any technique described herein representative of the state of the art.

10

Footwear, for example a rubber boot, should be reasonably tightly fitted against a foot to ensure sufficient ease of walking, running or marching. However, a problem with a tightly fitting piece of footwear is that moisture generated through sweating easily remain within the piece of footwear. Where the ground conditions (water
15 pools, soft mud, wet ground, etc.) call for good waterproof properties, a tight fit of a boot, for example, causes difficulties in moisture evacuation especially during intensive physical activity.

SUMMARY

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It is an object of the present invention at least to mitigate the above-identified problem.

According to a first example aspect of the invention there is provided a piece of
25 footwear for a foot of a user, comprising:

a cover forming a shaft and a foot portion of the piece of footwear;

a structure inside the cover attached to the cover configured to at least partly surround the foot and to hold the foot against an inner bottom of the foot portion of the piece of footwear; and

30 a ventilation channel within the piece of footwear extending from the shaft to the foot portion, the ventilation channel passing the structure via a space arranged in between the cover and the structure.

The inner bottom of the foot portion may be an interior side of the piece of footwear's bottom (sole). In certain example embodiments, the cover is an elastic cover. In certain example embodiments, the cover consists of the shaft and the foot portion. In certain example embodiments, the foot portion comprises a flat
5 bottom section (sole) under the foot, and an upper part. In certain example embodiments, the upper part and the shaft are formed of a membrane-type elastic shell.

In certain example embodiments, the parts of the cover have an adequate
10 stiffness allowing the cover as a whole to return into a basic form (neutral position) when not subjected to external deforming forces. In certain example embodiments, the shaft ends in between the ankle and knee.

In certain example embodiments, the structure is configured to form a passage for
15 the foot to pass through into its place within the piece of footwear.

The structure may have a relatively small surface area. In certain example
embodiments, the structure forms a pressing zone configured to press the foot
against the inner bottom. In certain example embodiments, the pressing zone is
20 located at an ankle and/or instep or where the ankle and instep meet. The pressing zone may be with an external tightener, for example, a sticker fastener or shoelace tightener at the outer surface of the cover.

In certain example embodiment, there ventilation channel is configured to provide
25 air exchange. The cover of the piece of footwear may be configured to form mechanical forces to cause air to flow within the ventilation channel.

In certain example embodiments, the ventilation channel extends from the foot
portion all the way up to the "mouth" (upper end) of the shaft of the piece of
30 footwear. In certain embodiments, the ventilation channel is formed by the space (cavity) between the outer cover and the foot (with or without socks) and by the space (cavity) between the structure and the outer cover in those places where the foot is attached to the foot portion of the cover by said structure. In certain

example embodiments, the ventilation channel, due to the elasticity and the adequate stiffness of the cover, deforms and alters its volume (thus forming a mechanical force) in a continuous manner under the influence of the movements of the leg and/or foot when walking, running, skiing or marching. This results in a continuous movement of the air within the ventilation channel (cavity) and in a continuous exchange of air with the outside atmosphere. A ventilation effect is achieved where, in the ventilation channel, the inside air is mixed with the outside air thus reducing (compared to a situation without ventilation) the moisture content in the inside air. This air mix of reduced moisture content (but with a moisture content higher than that of the surrounding atmosphere) is evacuated by the ventilation effect of the deformations and volume changes of the ventilation channel, and new low-moisture air enters instead into the ventilation channel, there being thus a continuous air mixing and evacuation of moisture from inside of the piece of footwear to the outside atmosphere. The moisture rate and intensity of the air exchange and thus moisture evacuation is directly proportional to the intensity of the movements of the leg and thus the physical activity of the foot.

The ventilation procedure in certain example embodiments is comparable in its mechanical and thermodynamic aspects to the breathing with lungs (the incoming and outgoing air pass through the same channel/cavity as with all vertebrate lungs). Accordingly, in certain example embodiments, the piece of footwear is configured to provide primitive vertebrate lung-type breathing.

In certain example embodiments, the ventilation channel, at the point of the structure, is formed in the outside of the structure on the side of the piece of footwear. In certain example embodiments, one side or both sides of the piece of footwear, at the point of the structure, comprise a by-pass bulge in the cover. The by-pass bulge provides a route for the by-passing ventilation channel at this point. The bulge may be subtle from the outside, i.e., it may be barely noticeable from the outside of the piece of footwear. The ventilation channel may have a mouth (or a set of apertures, depending on the implementation) only in an upper portion of the shaft. Accordingly, the moisture (moist air) travelling from the foot portion exits to the outside air through the mouth, and replacement air, from the outside of the

piece of footwear, enters the ventilation channel through the same mouth (set of apertures). The regular mouth of the shaft can form the said mouth. In addition or alternatively, the shaft can comprise one or more specific apertures, said one or more specific apertures functioning as exit and entry points for moisture and replacement air, respectively.

In certain example embodiments, the ventilation channel is generally limited by the user's leg and the cover. In certain example embodiments, the channel is formed directly between the cover and the leg of the user, except at the point of the structure, the channel instead or in addition is formed between the structure and the cover. The cover here may mean an inner surface of the cover.

In certain example embodiments, the width of the ventilation channel conforms to the width of the piece of footwear. In certain example embodiments, the ventilation channel along the piece of footwear is substantially as wide as the piece of footwear.

In certain example embodiments, the width of the ventilation channel throughout the length of the piece of footwear is generally about the same as the inner width of the piece of footwear (the width of the ventilation channel in the largest transverse dimension is about the same as the inner width of the piece of footwear in the same dimension). In certain example embodiments this means that the width of the ventilation channel is in the same range or scale as the inner width of the piece of footwear. In certain example embodiments, the width of the ventilation channel in its largest transverse direction is greater than half of the inner width of the cover in the same dimension.

In certain example embodiments, the space arranged in between the cover and the structure has a width comparable to the width of the piece of footwear in the point in question to form a broad channel.

In certain example embodiments, the ventilation channel extends to a toes area of the piece of footwear. In certain example embodiments, the ventilation channel

extends along the whole length of the piece of footwear, i.e., from the mouth of the piece of footwear to the point of the tips of the toes. The ventilation channel is broad so that there is effective ventilation.

- 5 In certain example embodiments, the structure is located at the area of an ankle or instep or at the area in which the ankle and instep meet.

In certain example embodiments, the structure is at least partly air-permeable. The structure may have apertures in a portion that is against the foot. The structure
10 may be configured to tightly surround the foot. It may have apertures in the portion tightly surrounding the foot. The material of the structure may be flexible. The material itself may be air-permeable or impermeable.

In certain example embodiments, the structure inside the (outer) cover is attached
15 to the cover in one or more points. In certain example embodiments, the structure is fixed into the inner bottom of the cover. In certain example embodiments, the structure is fixed into a side or both sides of the inner bottom. In addition or instead, the structure in certain example embodiments is fixed into an area of the cover covering an ankle or instep of the user.

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In certain example embodiments, the structure comprises a toes area support which is configured to at least partly surround the toes of the user and to support the toes of the user. Similarly as the other part(s) of the structure, the toes area support may be at least partly air-permeable, for example, through apertures.

25

In certain example embodiments, the ventilation channel extends in the toes area into a space arranged in between the toes area support and the cover. The ventilation channel in between the toes area support and the cover may be substantially as wide as the piece of footwear at that point.

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In certain example embodiments, the piece of footwear comprises a loose shaft to increase air flow within the ventilation channel in the pace of movement of the leg of the user. In certain example embodiments, the loose shaft is deformable

deforming in the pace of movement of the leg of the user (as he/she walks, runs or skies).

5 The piece of footwear may be waterproof. It may be airtight. It may be a boot or a rubber boot. The cover in certain example embodiments is of material which in itself does not sufficiently draw away moist air.

10 The structure may be fixedly attached to the cover: the structure may be either an organic part of the piece of footwear, or a structure detachably attached to the cover, for example, by snap fasteners.

In certain example embodiments, the structure is configured to hold the foot against an inner bottom of the foot portion directly or through an insole.

15 In certain example embodiments, the piece of footwear is configured to prevent sticks and snow from entering the shaft of the piece of footwear. In certain example embodiments, this is achieved by tightening the mouth of the shaft against the leg and by covering the mouth (or the set of apertures) in the upper portion of the shaft by a breathing fabric.

20

In certain example embodiments, the ventilation channel extends throughout the whole length of the piece of footwear and the ventilation channel is broad enough so that moist air is replaced by dry air from the outside. In certain example
25 embodiments, the piece of footwear is configured to remove moist air through mixing with dry air so that the level of moist within the piece of footwear converges to the level of moist outside of the piece of footwear.

In the context of this application the term leg comprises the following parts: upper leg, knee, lower leg, ankle, and foot. The term foot comprises the following parts:
30 instep, heel, arch, and toes.

Different non-binding example aspects and embodiments of the present invention have been illustrated in the foregoing. The embodiments in the foregoing are used

merely to explain selected aspects or steps that may be utilized in implementations of the present invention. Some embodiments may be presented only with reference to certain example aspects of the invention. It should be appreciated that corresponding embodiments may apply to other example aspects as well.

BRIEF DESCRIPTION OF THE DRAWINGS

Some example embodiments of the invention will be described with reference to the accompanying drawings, in which:

10

Fig. 1 shows a sectional view of a piece of footwear in accordance with an example embodiment;

Fig. 2 shows a structure in accordance with an example embodiment;

Fig. 3 shows a side view of a piece of footwear in accordance with an example embodiment;

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Figs. 4-8 show sectional views of the piece of footwear of Fig. 3;

Fig. 9 shows a front view of a piece of footwear in accordance with an example embodiment;

Fig. 10 shows a top view of the piece of footwear of Fig. 9;

20

Fig. 11 shows a side view of the piece of footwear of Fig. 9;

Fig. 12 shows a side view of a piece of footwear in accordance with another example embodiment;

Fig. 13 shows a sectional view of the piece of footwear of Fig. 12; and

Fig. 14 shows yet another example embodiment.

25

DETAILED DESCRIPTION

In the following description, like reference signs denote like elements or steps.

Fig. 1 shows a sectional view of a piece of footwear 110 in accordance with an example embodiment. The piece of footwear 110 may be a boot or a rubber boot. It may be waterproof. And, it may be airtight.

30

The piece of footwear 110 comprises a cover 120 forming a shaft 121 and a foot

portion 122. The piece of footwear further comprises a structure 130 inside the cover attached to the cover configured to at least partly surround a user's foot 150 and to hold the foot against an inner bottom 125 of the foot portion of the piece of footwear 110.

5

The structure 130 (or the structure together with the cover 120) forms a pressing zone P configured to press the foot 150 against the inner bottom 125. In certain example embodiments, the pressing zone P is located at an ankle and/or instep or where the ankle and instep meet. The pressing zone may be with an optional
10 external tightener, for example, a sticker fastener or shoelace tightener at the outer surface of the cover as shown in the following description with reference to Figs. 12-14.

The piece of footwear 110 further comprises a ventilation channel extending from
15 the shaft 121 to the foot portion 122, the ventilation channel passing the structure 130 via a space arranged in between the cover 120 and the structure 130. This is further illustrated in the following description.

Fig. 2 shows an example of the structure 130 in accordance with an embodiment.
20 In certain example embodiments, the structure 130 is at least partly air-permeable. The structure 130 has at least one opening at its side at an ankle area or lower leg area and/or at least one opening at its side/upper surface of a foot area, although in certain other embodiments one or more of the openings may be covered or replaced by a mesh. The example structure 130 shown in Fig. 2 has openings 231
25 at its sides at an ankle area or lower leg area (above the ankle in a vertical direction). The structure 130 further has openings 232 at its side/upper surface of a foot area. The placement and number of the openings depend on the embodiment.

30 Depending on the embodiment, the structure 130 may tightly surround the foot on the sides of the foot and/or on the top surface of the foot at the pressing zone P to keep the foot against the inner bottom of the piece of footwear. The material of the structure 130 is flexible in an embodiment. The material itself may be air-

permeable or impermeable.

The structure 130 may have moist evacuation apertures in the portion(s) touching the foot (tightly surrounding the foot). The apertures may be separate macro-scale
5 apertures made into the material (as shown in Fig. 3) and/or they may be micro-scale apertures of the used air-permeable material itself.

The structure 130 is open from to top so as to allow the user's foot to fit through.

10 Fig. 3 shows a piece of footwear comprising the type of structure 130 shown in Fig. 2. The structure 130 may be fixedly attached to the cover 120: the structure 130 may be either an organic part of the piece of footwear 310, or a structure fixedly attached to the cover 120, for example, by glueing. Or the structure 130 may be detachably attached to the cover 120, for example, by snap fasteners. In
15 yet other embodiments, the structure is fixedly attached in some points and detachably attached in other points.

The structure 130 inside the (outer) cover 120 is attached to the cover 120 in one or more points. In certain example embodiments, the structure is fixed into the
20 inner bottom 125 of the cover. In certain example embodiments, the structure is fixed into a side or both sides of the inner bottom 125. In addition or instead, the structure in certain example embodiments is fixed into an area (pressing zone P) of the cover 120 covering an ankle or instep of the user. In addition or instead, the structure in certain example embodiments is attached to the cover at a point above
25 the opening(s) 231.

The moist evacuation apertures 333 mentioned in the foregoing in the portion(s) of the structure 130 touching the foot are shown in Fig. 3.

30 The structure 130 shown in Figs. 2 and 3 comprises a toes area support 235 which is configured to at least partly surround the toes of the user and to support the toes of the user. Similarly as the other part(s) of the structure 130, the toes area support may be at least partly air-permeable, for example, through apertures

similar to the apertures 333.

The cover 120 comprises the shaft 121 and the foot portion 122. The shaft 121 ends in between the ankle and knee. The piece of footwear 310 comprises a mouth 340 at the upper end of the shaft 121 through which the user's foot may be pushed into the piece of footwear 310. A ventilation channel 360 extends within the piece of footwear 310 from the shaft 121 to the foot portion 122. In the embodiment of Fig. 3, the ventilation channel 360 extends from the foot portion 121 all the way up to the upper end of the shaft 121 (i.e., mouth 340). The ventilation channel is generally formed by a space (cavity) between the outer cover 120 and the foot (with or without socks) except that in places of the structure 130 the ventilation channel passes the structure 130 via a space (cavity) arranged in between the cover 120 and the structure 130. The ventilation channel 360 provides evacuation of moisture from inside of the piece of footwear to the outside atmosphere.

Moisture generated by the user's foot (or leg) is evacuated into the ventilation channel 360 from the surface of the foot (leg) through socks (if used). In places of the structure 130 where the structure touches the foot moist is evacuated into the ventilation channel 360 through the apertures in the structure 130. A broad continuous ventilation channel 360 from a toes area of the piece of footwear 130 to the mouth 340 is formed. The ventilation channel 360 may have, along the length of the piece of footwear 310, a width that is practically the same as (or only a bit less than) the width of the piece of footwear itself.

In alternative embodiments, where the mouth 340 of the piece of footwear is tight, the shaft 121 can comprise at its upper end one or more specific apertures 341, for example covered by air-permeable fabric, functioning as the ventilation channel 360 endpoint (through which moisture can exit and replacement air enter the channel 360).

The ventilation channel 360 is further described in the following sectional views taken at sections A – A (Fig. 4), B – B (Fig. 5), C – C (Fig. 6), and D – D (Fig. 7).

Fig. 4 shows a sectional view along section A – A of Fig. 3. The ventilation channel 360 at this point extends from the area of the toes 451 of the user via the apertures 232 and openings 333 into a cavity arranged in between the toes area support 235 of the structure 130 and the cover 120.

Fig. 5 shows a sectional view along section B – B of Fig. 3. The ventilation channel 360 at this point extends along the cavity above the toes as shown in Fig. 4 as well as along a cavities formed at the side of the piece of footwear in between the cover 120 and the structure 130. These cavities may form a common cavity. The cavities may be formed by using a cover material of adequate stiffness by arranging respective bulges 523 into the cover 120.

Fig. 6 shows a sectional view along section C – C of Fig. 3 at the point of the pressing zone P. The ventilation channel 360 at this point extends along the cavities (shown in Fig. 5) formed at the side of the piece of footwear in between the cover 120 and the structure 130. The moisture from the foot at this point can be evacuated into the channel 360 through the apertures 333 in the structure 130.

Fig. 7 shows a sectional view along section D – D of Fig. 3. The ventilation channel 360 extends along a cavity formed in between the cover 120 and the structure 130 and, in an upper part of the shaft 121, along a cavity formed directly between the cover 120 and the user's leg (not shown).

Fig. 8 shows a sectional view of the piece of footwear of Fig. 3 taken at section E – E as depicted in Fig. 7. The arrows show an evacuation route of moist air towards outside air along the channel 360 formed at this point in between the cover 120 and the structure 130.

The cover 120 may be an elastic cover. In certain example embodiments, the cover consists of the shaft 121 and the foot portion 122. The foot portion 122 comprises a flat bottom section (sole) under the foot, and an upper part. In certain

example embodiments, the upper part and the shaft 121 are formed of a membrane-type elastic shell.

5 In certain example embodiments, the parts of the cover 120 have an adequate stiffness allowing the cover 120 as a whole to return into a basic form (neutral position) when not subjected to external deforming forces. The shaft 121 may be a loose shaft.

10 The air exchange in the type of the piece of footwear 110, 310 described in the preceding can be enhanced especially in embodiments in which the shaft 121 is loose and has a stiffness causing it to return into a basic form after being subjected to an external deforming force.

15 Fig. 9 shows a piece of footwear 910 of the type of the footwear 110, 310 described in the preceding. The ventilation channel 360 within the piece of footwear 910 extends from the foot portion all the way up to the "mouth" (upper end) of the shaft of the piece of footwear. The ventilation channel 360, again, is formed by the space (cavity) between the outer cover 120 and the foot (with or without socks) 150 and by the space (cavity) between the structure 130 and the
20 outer cover 120 in those places where the foot 150 is attached to the foot portion 122 of the cover by said structure 130. The ventilation channel 360, due to the elasticity and the adequate stiffness of the cover 120, deforms and alters its volume (thus forming a mechanical force) in a continuous manner under the influence of the movements of the leg and/or foot 150 when walking, running or
25 marching. This results in a continuous movement of the air within the ventilation channel (cavity) 360 and in a continuous exchange of air with the outside atmosphere. A ventilation effect is achieved where, in the ventilation channel 360, the inside air is mixed with the outside air thus reducing the moisture content in the inside air. This air mix of reduced moisture content (but with a moisture content
30 higher than that of the surrounding atmosphere) is evacuated by the ventilation effect of the deformations and volume changes of the ventilation channel 360, and new low-moisture air enters instead into the ventilation channel 360 via the mouth 340 and/or specific apertures 341, there being thus a continuous evacuation of

moisture from inside of the piece of footwear 910 to the outside atmosphere. The moisture rate and intensity of the air exchange and thus moisture evacuation is directly proportional to the intensity of the movements of the leg and thus the physical activity of the foot.

5

The ventilation procedure in this embodiment is comparable in its mechanical and thermodynamic aspects to the breathing with lungs (the incoming and outgoing air pass through the same channel/cavity as with all vertebrate lungs). Accordingly, the piece of footwear 910 provides vertebrate lung-type breathing.

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Figs. 10 and 11, respectively, show a top view and side view of the upper end of the piece of footwear 910 of Fig. 9. The piece of footwear 910 may be configured to prevent sticks and snow from entering the shaft 121 of the piece of footwear. This is achieved by tightening the mouth 340 of the shaft against the leg 150 with an elastic band 942 around the mouth 340 and by covering the apertures 341 by a breathing fabric.

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Fig. 12 shows a side view of a piece of footwear 1210 in accordance with another example embodiment, and Fig. 13 shows a sectional view along section D – D of Fig. 12. This embodiment otherwise corresponds to the foregoing embodiments except that in this embodiment the pressing force at the pressing zone P which keeps the foot against the inner bottom 125 is adjustable. The structure 130 is fixed to an external tightener 1370, for example, a sticker fastener, a belt fastener or a shoelace tightener at the outer cover 120 as depicted in Fig. 13. The external tightener 1370 when tightened at different positions provides varying pressing force thereby allowing different foot sizes to fit into the same piece of footwear.

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Fig. 14 shows yet another example embodiment. In this embodiment, the adjustment of the pressing force is achieved by providing insoles 1481, 1482 of different thicknesses.

30

Various embodiments have been presented. It should be appreciated that in this document, words comprise, include and contain are each used as open-ended

expressions with no intended exclusivity.

The foregoing description has provided by way of non-limiting examples of particular implementations and embodiments of the invention a full and informative
5 description of the best mode presently contemplated by the inventor for carrying out the invention. It is however clear to a person skilled in the art that the invention is not restricted to details of the embodiments presented in the foregoing, but that it can be implemented in other embodiments using equivalent means or in different combinations of embodiments without deviating from the characteristics of the
10 invention.

Furthermore, some of the features of the afore-disclosed embodiments of this invention may be used to advantage without the corresponding use of other features. As such, the foregoing description shall be considered as merely
15 illustrative of the principles of the present invention, and not in limitation thereof. Hence, the scope of the invention is only restricted by the appended patent claims.

CLAIMS:

1. A piece of footwear for a foot of a user, comprising:
 - a cover forming a shaft and a foot portion of the piece of footwear;
 - 5 a structure inside the cover attached to the cover configured to at least partly surround the foot and to hold the foot against an inner bottom of the foot portion of the piece of footwear; and
 - a ventilation channel within the piece of footwear extending from the shaft to the foot portion, the ventilation channel passing the structure via a space
 - 10 arranged in between the cover and the structure.
2. The piece of footwear of claim 1, wherein the ventilation channel is generally limited by the user's leg and the cover.
- 15 3. The piece of footwear of any preceding claim, wherein the width of the ventilation channel throughout the length of the piece of footwear is generally about the same as the inner width of the piece of footwear.
4. The piece of footwear of any preceding claim, wherein the channel extends to
- 20 a toes area of the piece of footwear.
5. The piece of footwear of any preceding claim, wherein the structure is located at the area of an ankle or instep or at the area in which the ankle and instep meet.
- 25 6. The piece of footwear of any preceding claim, wherein the structure is at least partly air-permeable.
7. The piece of footwear where the structure is fixed into the inner bottom of the
- 30 cover.
8. The piece of footwear of any preceding claim, wherein the structure comprises a toes area support which is configured to at least partly surround the toes of

the user and to support the toes of the user.

5 9. The piece of footwear of claim 8, wherein the ventilation channel extends in the toes area into a space arranged in between the toes area support and the cover.

10. The piece of footwear of any preceding claim, comprising a loose shaft to increase air flow within the ventilation channel in the pace of movement of the leg of the user.

10

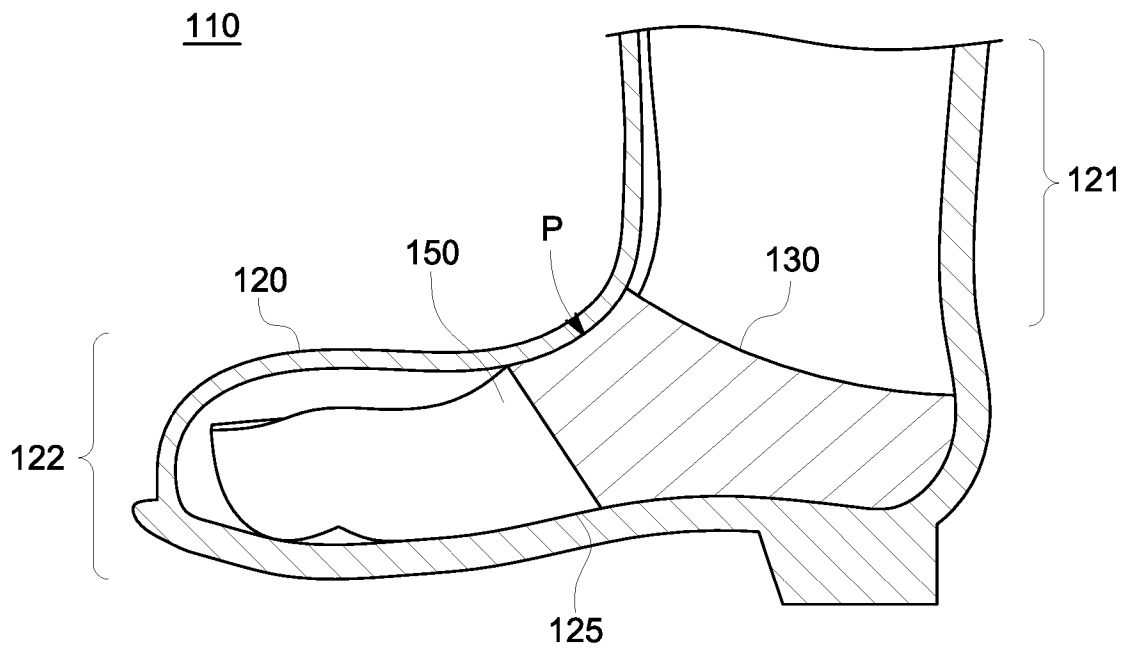


FIG. 1

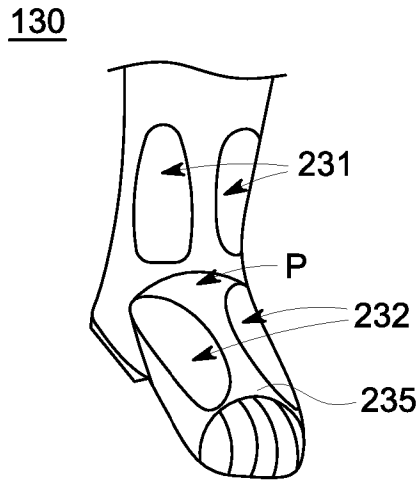


FIG. 2

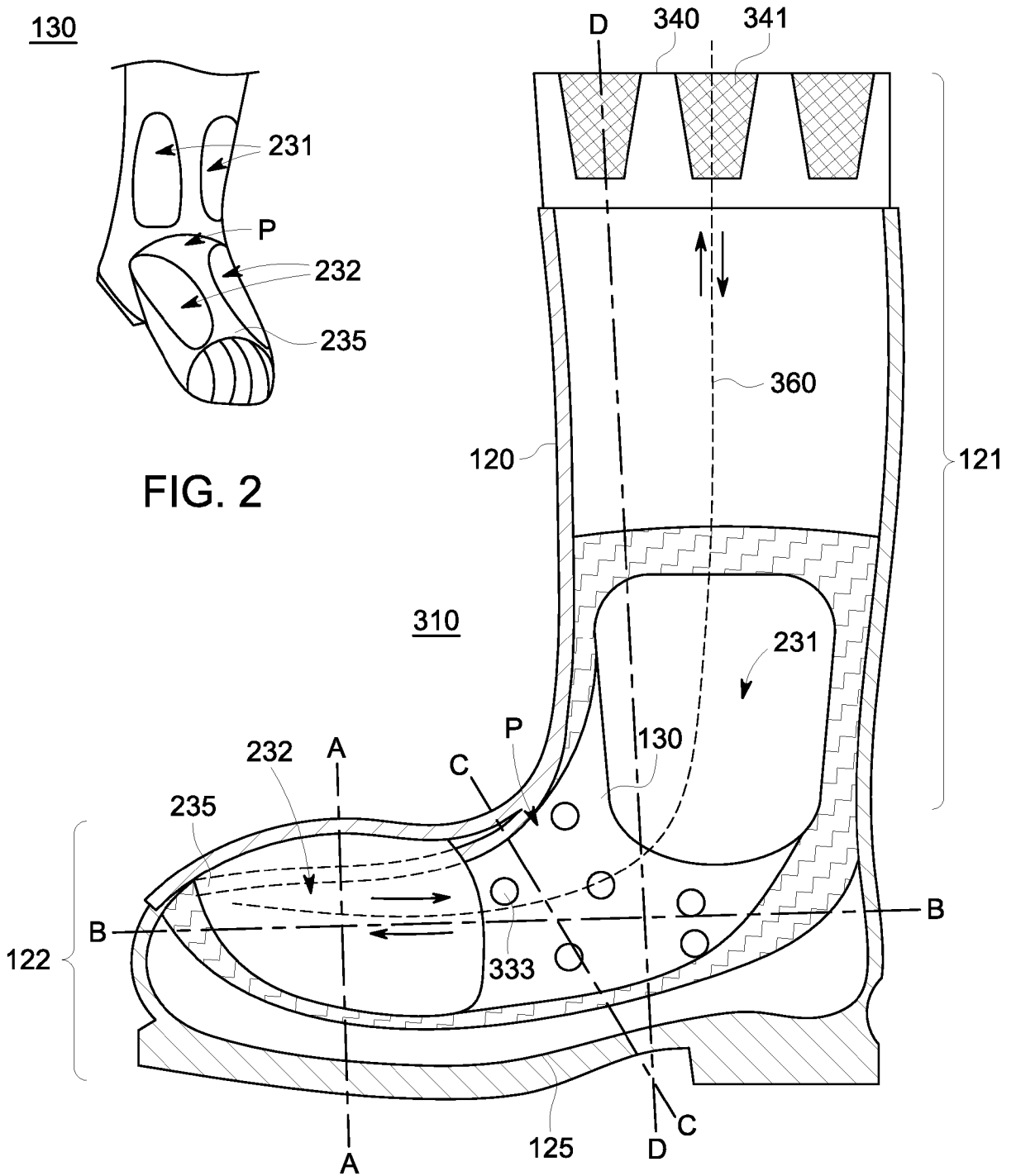


FIG. 3

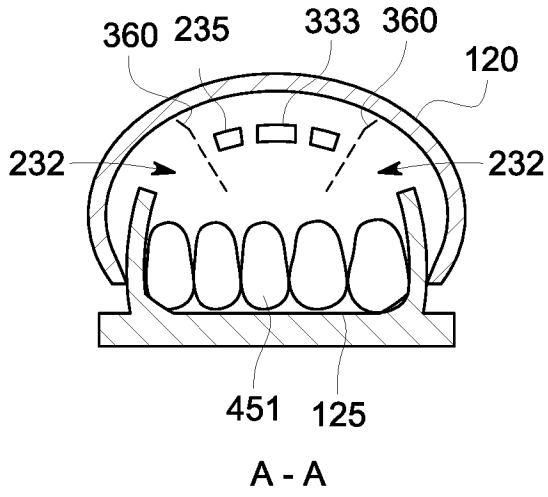


FIG. 4

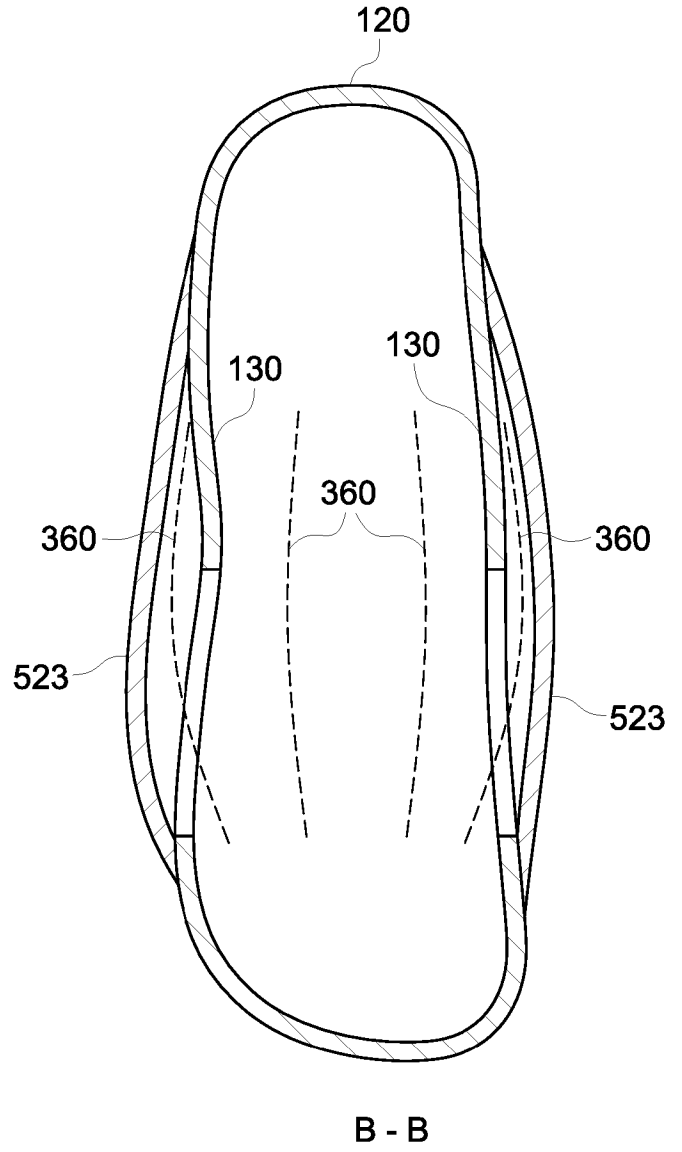


FIG. 5

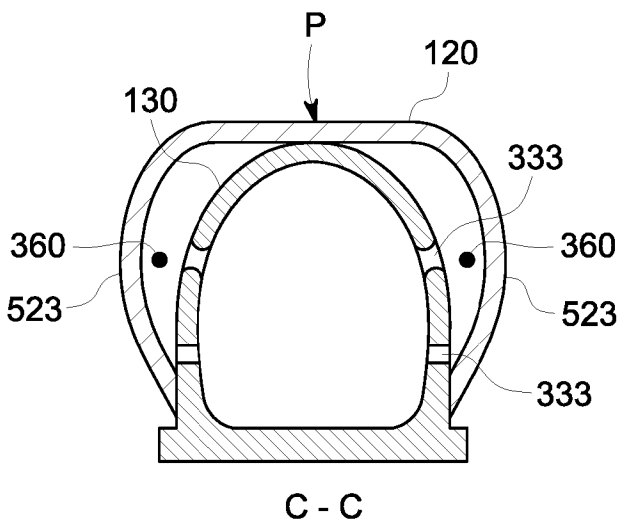
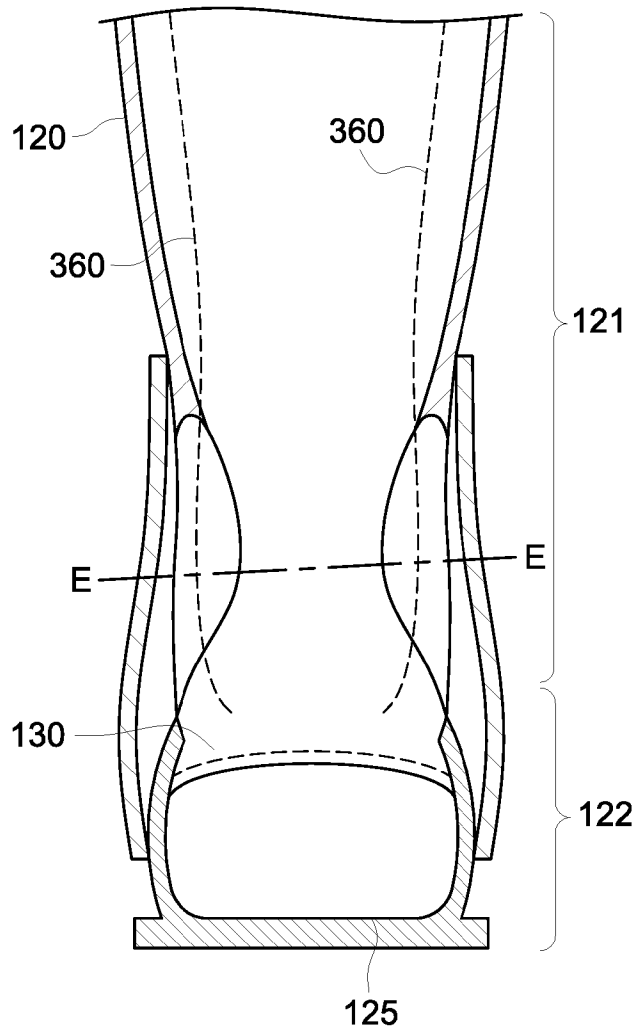
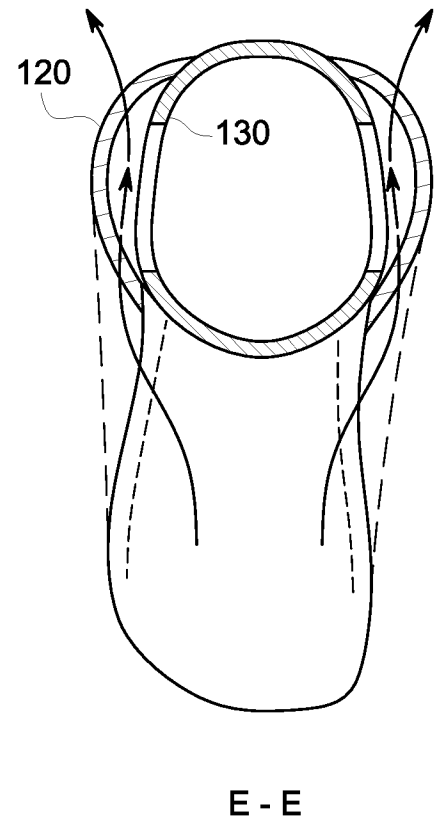


FIG. 6 SUBSTITUTE SHEET (Rule 26)



D - D
FIG. 7



E - E
FIG. 8

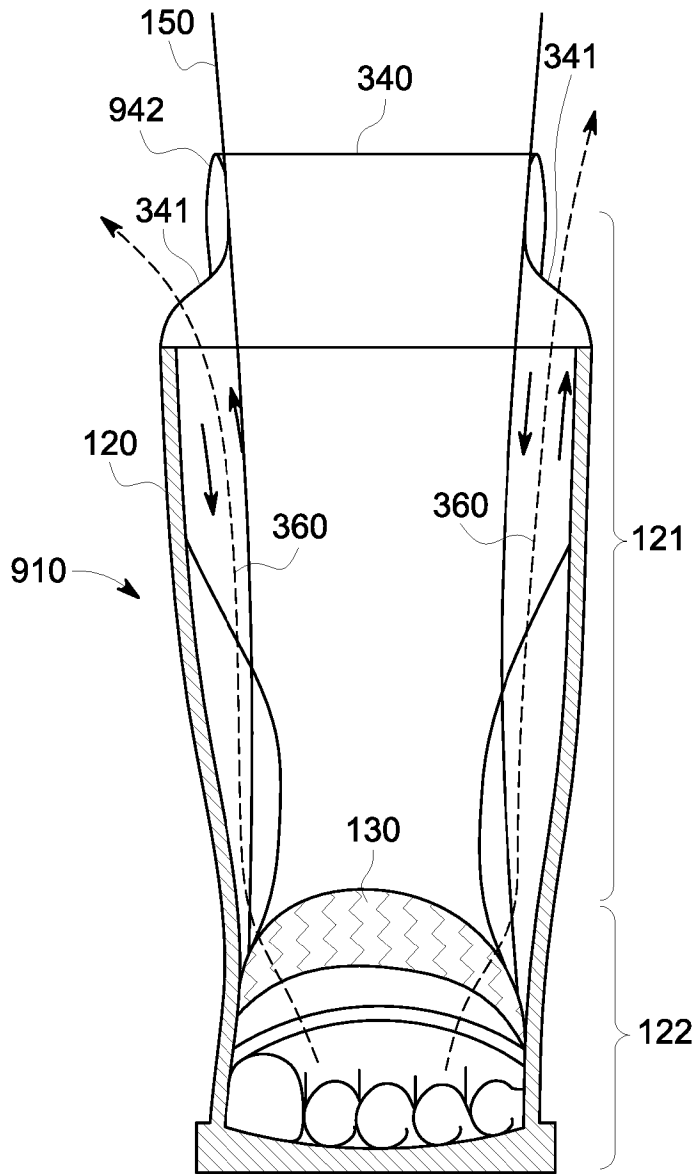


FIG. 9

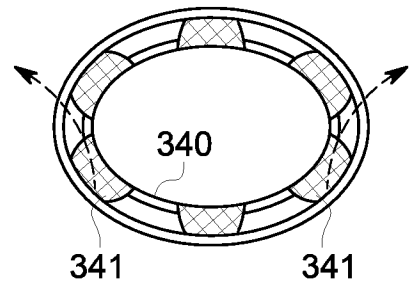


FIG. 10

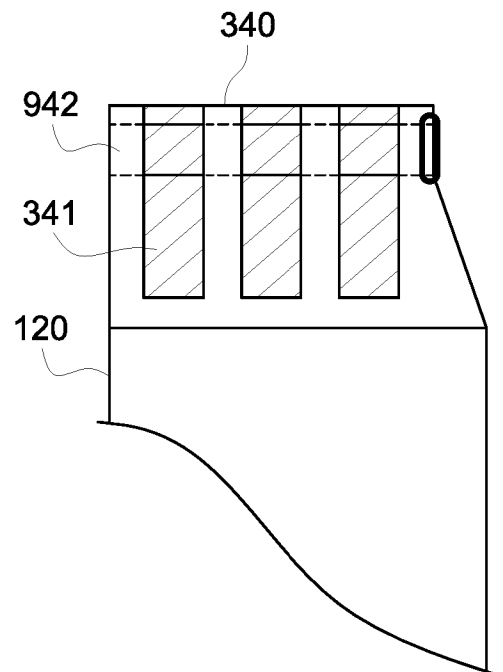


FIG. 11

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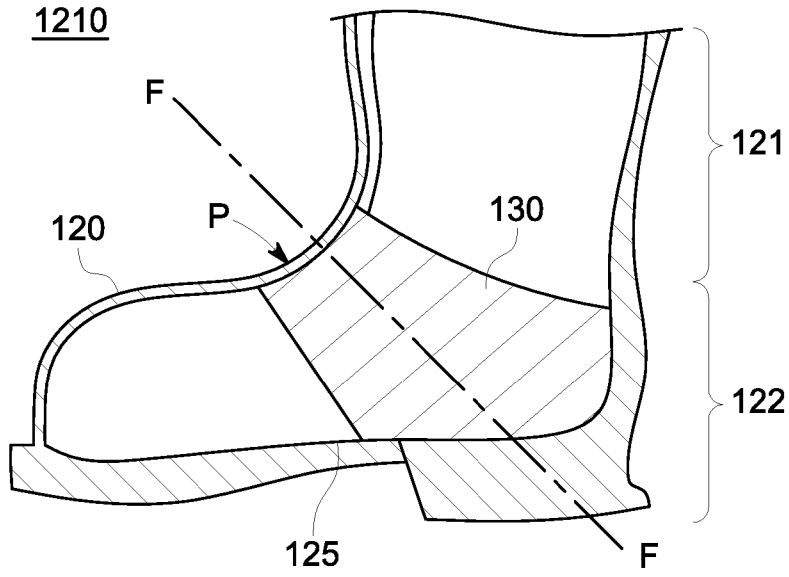


FIG. 12

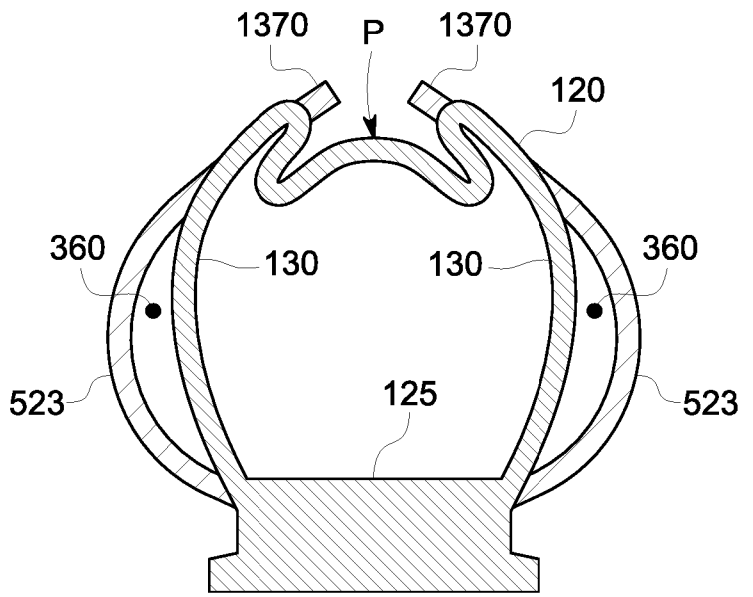


FIG. 13

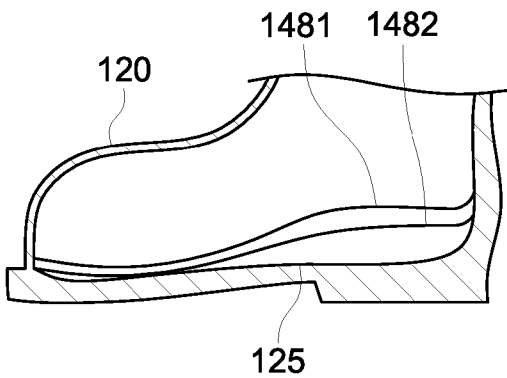


FIG. 14

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI2016/050160

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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)

IPC: A43B, A43C

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

FI, SE, NO, DK

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

EPO-Internal & translations from Thomson Reuters and IPPH/SIPO, WPIAP, XP3GPP, XPAIP, XPESP, XPETSI, XPI3E, XPIEE, XPIETF, XPIOP, XPMISC, XPRD, INSPEC, TDB, NPL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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 Further documents are listed in the continuation of Box C.
 See patent family annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance	"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
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"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

25 May 2016 (25.05.2016)

Date of mailing of the international search report

27 May 2016 (27.05.2016)

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INTERNATIONAL SEARCH REPORT

International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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IPC

A43B 7/06 (2006.01)**A43B 7/20** (2006.01)**A43B 19/00** (2006.01)**A43B 3/02** (2006.01)**A43B 7/14** (2006.01)**A43B 23/08** (2006.01)**A43B 23/28** (2006.01)

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International application No.
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