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(54) Title: COMPRESSION GARMENT INCORPORATED WITH FAR-INFRARED (FIR) EMITTING PARTICLES

(57) Abstract: A compression garment having embedded far-infrared (FIR) particles which the garment comprises at least two distinct zones each of which is adapted to surround and achieve a compressive effect, when worn, to a targeted body area of a user, one of the zones being able to achieve a compressive effect within a first pressure range to one targeted area and another of the zones being able to achieve a compressive effect within a second pressure range which is different to the first pressure range to another targeted area.

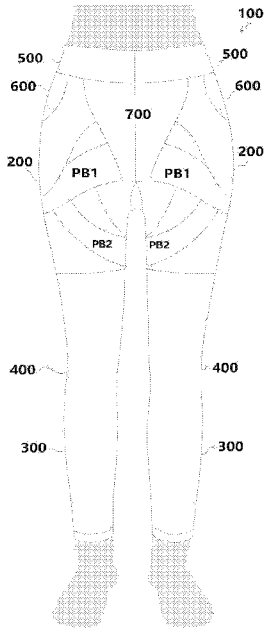

Fig. 1

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COMPRESSION GARMENT INCORPORATED WITH FAR-INFRARED (FIR) EMITTING PARTICLES

FIELD OF TECHNOLOGY

The present invention relates generally to a shape enhancing garment and, more specifically a compression garment incorporated with far-infrared (FIR) emitting particles.

BACKGROUND OF THE INVENTION

Compression garments provide support for wearer who have poor circulation. For example, compression garments worn on the legs can help prevent deep vein thrombosis and reduce swelling. In order to support the body, many compression garments are required to be worn for a long period of time. However, compression garments are usually made of thick and rough fabrics. This may cause discomfort or skin allergies upon prolonged usage. Further, in order to achieve compression effect on targeted area, some compression garments may require extra help in wearing. This may be inconvenient to some wearer. The present invention provides an improved garment which solves the aforementioned drawbacks. Advantageously, the present invention incorporates FIR emitting particles into the garment to enhance circulation of wearer.

SUMMARY OF THE INVENTION

One object of the present invention is to provide a compression garment having pressurized zones for enhancing body shape of targeted area.

Another object of the present invention is to provide a compression garment which is body fitting and convenient to wear.

Another object of the present invention is to provide a compression garment incorporated with FIR emitting particles for enhancing circulation of a wearer.

At least one of the preceding objects is met, in whole or in part, by the present invention, in which one of the embodiments of the present invention is a compression garment having embedded far-infrared (FIR) particles which the garment comprises at least two distinct zones each of which is adapted to surround and achieve a compressive effect, when worn, to a targeted body area of a user, one of the zones being able to achieve a compressive effect within a first pressure range to one targeted area and another of the zones being able to achieve a compressive effect within a second pressure range which is different to the first pressure range to another targeted area.

At least one of the preceding objects is met, in whole or in part, by the present invention, in which another embodiment of the present invention is a compression garment having embedded far-infrared (FIR) particles which the garment comprises a plurality of distinct zones each of which is adapted to surround and achieve a compressive effect, when worn, to a targeted body area of a user, one of the zones being able to achieve a compressive effect within a first pressure range to one targeted area and another of the zones being able to achieve a compressive effect within a second pressure range, which is different to the first pressure range, to another targeted area and a further zone intermediate the first and second zones able to achieve a compressive effect within a further pressure range which is different to either of the first or second pressure ranges.

In another embodiment, the further pressure range of the intermediate zone is lower than the pressure range of either of the other zones.

In one embodiment, the compression garment is a pair of leggings (100) having embedded far-infrared (FIR) particles which the leggings comprises at least two distinct zones each of which is adapted to surround and achieve a compressive effect, when worn, to legs of a

user, comprising: an upper pressurized zone (200); and a lower pressurized zone (300), wherein the lower pressurized zone (300) has a higher pressure than the upper pressurized zone (200).

In another embodiment, the compression garment is a pair of leggings (100) having embedded far-infrared (FIR) particles which the leggings comprises at least two distinct zones each of which is adapted to surround and achieve a compressive effect, when worn, to legs of a user, comprising: an upper pressurized zone (200); a lower pressurized zone (300); and a middle pressurized zone (400), wherein the lower pressurized zone (300) has a higher pressure than the upper pressurized zone (200) whereas the middle (400) pressurized zone has a pressure lower than either the upper or the lower pressurized zone.

In both embodiments, the compression garment is configured with diamond knitting pattern.

In both embodiment, the compression garment is derived from a polymeric blend comprising nylon, polyurethane, and far infrared (FIR) emitting particles impregnated therein.

Preferably, the polymeric blend comprises 85 to 90 wt% of nylon, and 10 to 15 wt % of polyurethane.

More particularly, the nylon comprises 40 to 45 % of FIR emitting particles impregnated therein.

Preferably, the FIR emitting particles are zirconia, titanium, silica, or a combination of any two or more thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a front view of an exemplary embodiment of the present invention.

Fig. 2 is a rear view of Fig. 1.

Fig. 3 is a side view of an exemplary embodiment of the present invention with labelled pressurized zones.

DETAILED DESCRIPTION OF THE INVENTION

This invention relates to a compression garment for the limbs. For example, leggings, sleeves, or the like. More particularly, the garment is designed for improving body fluid circulation, mobility support, and also provides body shaping function.

Exemplary, non-limiting embodiments of the invention will be disclosed. However, it is to be understood that limiting the description to the preferred embodiments of the invention is merely to facilitate discussion of the present invention and it is envisioned that those skilled in the art may devise various modifications without departing from the scope of the appended claim.

According to Fig. 1, the compression garment is a pair of leggings (100) which snugly fits from the waist to ankle and exhibits compression on the wearer's skin.

In the preferred embodiment, the pants (100) is derived from fabric which is breathable, stretchable, and having heat-retaining characteristics. Preferably, the fabric is derived from a polymeric blend comprising nylon, polyurethane, and far infrared (FIR) emitting particles impregnated therein. More particularly, the polymeric blend comprises 85 to 90 wt% of

nylon, and 10 to 15 wt % of polyurethane. Further, the nylon comprises 40 to 45 % of FIR emitting particles impregnated therein. The FIR emitting particles can be selected from zirconia, titanium, silica, or a combination of any two or more thereof. An exemplary material known under a trade mark of Kodenshi® can be used, but not limited thereto. Additives such as anti-odour agent, anti-bacterial agent, or the like can be further incorporated into the fabric. The use of the aforementioned fabric enhancing body fluid circulation due to as the FIR emitting particles increases body temperature of a wearer. Upon configuring the fabric with compression features, the leggings (100) provides body supporting and shaping function.

On top of the intrinsic stretchability of the material, knitting technique also plays a vital role in enhancing breathability and stretchability so as to ease daily activites of a wearer. In the present invention, fabric with diamond knitting pattern is preferably used. Extra layers of fabrics can be used to render pressurized zones on the pants. More particularly, the additional fabric used has relatively smaller size or circumference thereby creating a tightness or 'push in' effect upon wearing. Alternatively, some part of the pants are thicker to create a 'tuck in' effect upon wearing. For example, the waist and abdomen area.

In accordance to the aforementioned, the leggings (100) are formed by joining fabric pieces belong to different body areas. There are limb pieces (left and right), a waist piece, pelvic pieces (left and right), a crotch piece, and buttocks pieces (left and right). Pressurized zones are selectively configured on the aforementioned pieces to support muscle movement as well as keeping the body in shape. More particularly, each piece can be configured with one or more pressurized zones with one or a combination type of patterns, such as rectangular, zig-zag, 'X' shape, 'V' shape, or more.

According to Fig. 3, the leggings (100) comprises an upper pressurized zone (200), and a lower pressurized zone (300), wherein the lower pressurized zone (300) has a higher pressure than the upper pressurized zone (200). Such configuration provides a compression

and 'push up' effect as shown by arrow in Fig. 3. Advantageously, the leggings (100) further comprises a middle pressurized zone (400) wherein the middle (400) pressurized zone has a pressure lower than either the upper or the lower pressurized zone. Such configuration provide unobstructed mobility at the knee area.

More particularly, the upper pressurized zone (200) comprises includes an upper thigh zone (201) and a mid-thigh zone (202). Preferably, the upper pressurized zone (200) has a compression level from 9 to 11 mmHg (12 hpa to 15 hpa). More particularly, the upper thigh zone (201) has a compression level from 8 to 11 mmHg (11 hpa to 15 hpa) while the mid-thigh zone (202) has a compression level from 8 to 11 mmHg (11 hpa to 15 hpa). As shown on Fig. 1, the upper thigh zone (202) has a pressurized band (PB1) extending from crotch area (700) to outer side of the thigh area. More particularly, the pressurized band (PB1) at the upper thigh zone (202) has a width between 3.0 to 6.5 cm. Further, the mid-thigh zone (202) has a pressurized band (PB2) extending across the outer side of upper thigh zone (202) to inner side of the thigh area. More particularly, the pressurized band (PB2) at the mid-thigh zone (202) has a width between 3.0 to 4.5 cm. In view of the above and further referring to Fig. 1, the pressurized zones at the upper pressurized zone (200) appears in a zig-zag pattern.

Referring to Fig. 3, the lower pressurized zone (300) includes a calf zone (301); an upper ankle zone (302); and an ankle zone (303). Preferably, the lower pressurized zone (300) has a compression level from 13.50 to 16.50 mmHg (18 hpa to 22 hpa). More particularly, the calf zone (301) has a compression level from 9.7 to 12.7 mmHg (13 hpa to 17 hpa), the upper ankle zone (302) has a compression level from 15.7 to 18.7 mmHg (21 hpa to 25 hpa), and the ankle zone (303) has a compression level from 18 to 21 mmHg (24 hpa to 28 hpa).

The middle pressurized zone (400) refers to the knee area having a compression level from 7.5 to 10.5 mmHg (10 hpa to 14 hpa). Compression at the middle pressurized zone (400)

provides unobstructed mobility while the upper (200) and lower pressurized zones (300) provides compression effect on a wearer's leg.

In the preferred embodiment, there are also waist area (500), pelvic area (600), crotch area (700). Preferably, these areas are configured with thicker fabrics to create a 'tuck in' effect. More particularly, the waist area (500) is wholly surrounded by a pressurized band having a width between 5.0 to 6.0 cm.

In another preferred embodiment, the compression garment further comprising an under buttocks area (800) at the back, wherein the under buttocks area (800) is configured to have thinner fabrics than the adjacent upper pressurized zones (200), so that when worn, a "push-up" effect is created on the buttocks area.

The present invention may be embodied in other specific forms without departing from its essential characteristics. The described embodiments are to be considered in all aspects only as illustrative and not restrictive. The scope of the invention is, therefore indicated by the appended claims rather than by the foregoing description. All changes, which come within the meaning and range of equivalency of the claims, are to be embraced within their scope.

CLAIMS

1. A compression garment having embedded far-infrared (FIR) particles which the garment comprises at least two distinct zones each of which is adapted to surround and achieve a compressive effect, when worn, to a targeted body area of a user, one of the zones being able to achieve a compressive effect within a first pressure range to one targeted area and another of the zones being able to achieve a compressive effect within a second pressure range which is different to the first pressure range to another targeted area.

2. A compression garment having embedded far-infrared (FIR) particles which the garment comprises a plurality of distinct zones each of which is adapted to surround and achieve a compressive effect, when worn, to a targeted body area of a user, one of the zones being able to achieve a compressive effect within a first pressure range to one targeted area and another of the zones being able to achieve a compressive effect within a second pressure range, which is different to the first pressure range, to another targeted area and a further zone intermediate the first and second zones able to achieve a compressive effect within a further pressure range which is different to either of the first or second pressure ranges.

3. A compression garment as claimed in claim 2 wherein the further pressure range of the intermediate zone is lower than the pressure range of either of the other zones.

4. The compression garment as claimed in any one of the preceding claims is configured with diamond knitting pattern.

5. The compression garment as claimed in any one of the preceding claims is derived from a polymeric blend comprising nylon, polyurethane, and far infrared (FIR) emitting particles impregnated therein.

6. The compression garment according to claim 5, wherein the polymeric blend comprises 85 to 90 wt% of nylon, and 10 to 15 wt % of polyurethane.

7. The compression garment according to claim 6, wherein the nylon comprises 40 to 45 % of FIR emitting particles impregnated therein.

8. The compression garment as claimed in any one of the preceding claims, wherein the FIR emitting particles are zirconia, titanium, silica, or a combination of any two or more thereof.

9. A leggings (100) having embedded far-infrared (FIR) particles which the leggings comprises at least two distinct zones each of which is adapted to surround and achieve a compressive effect, when worn, to legs of a user, comprising: an upper pressurized zone (200); and a lower pressurized zone (300), wherein the lower pressurized zone (300) has a higher pressure than the upper pressurized zone (200).

10. A leggings (100) having embedded far-infrared (FIR) particles which the leggings comprises at least two distinct zones each of which is adapted to surround and achieve a compressive effect, when worn, to legs of a user, comprising: an upper pressurized zone (200); a lower pressurized zone (300); and a middle pressurized zone (400), wherein the lower pressurized zone (300) has a higher pressure than the upper pressurized zone (200) whereas the middle (400) pressurized zone has a pressure lower than either the upper or the lower pressurized zone.

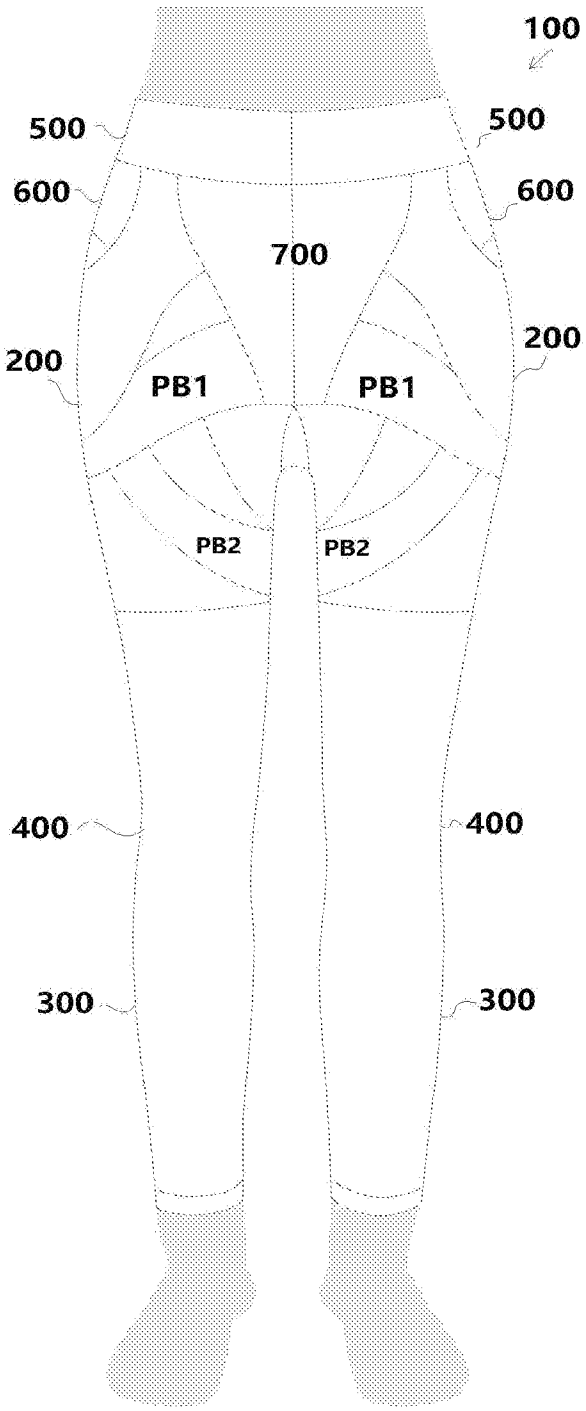

Fig. 1

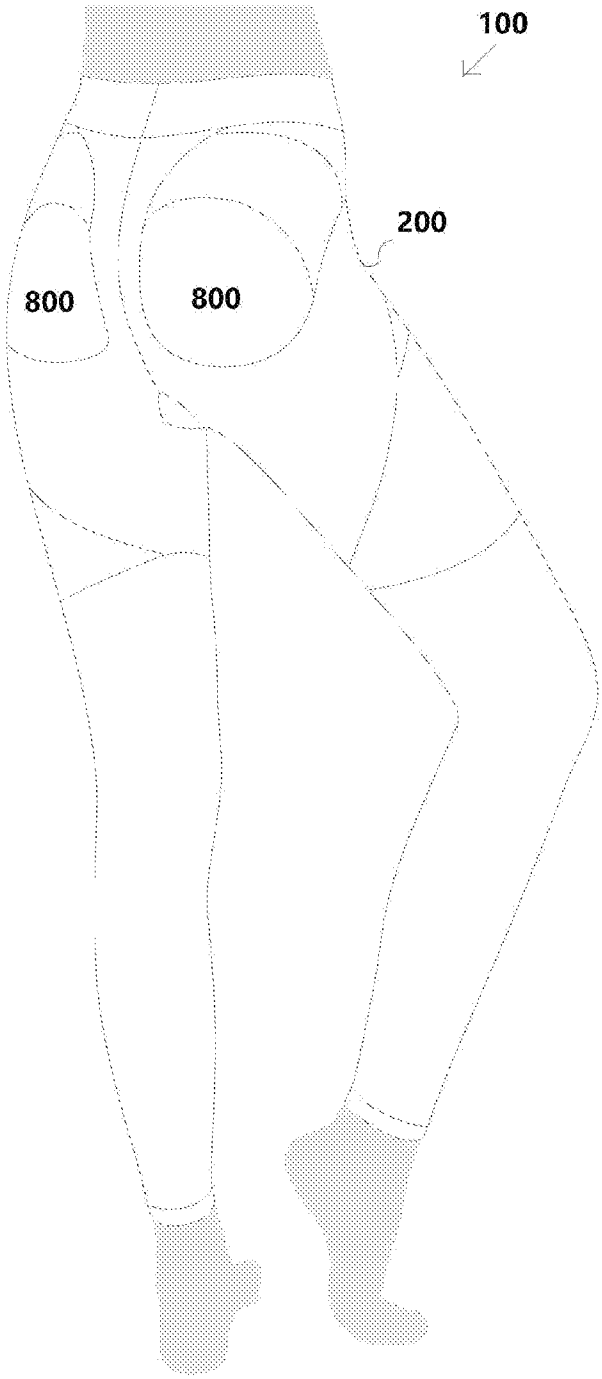

Fig. 2

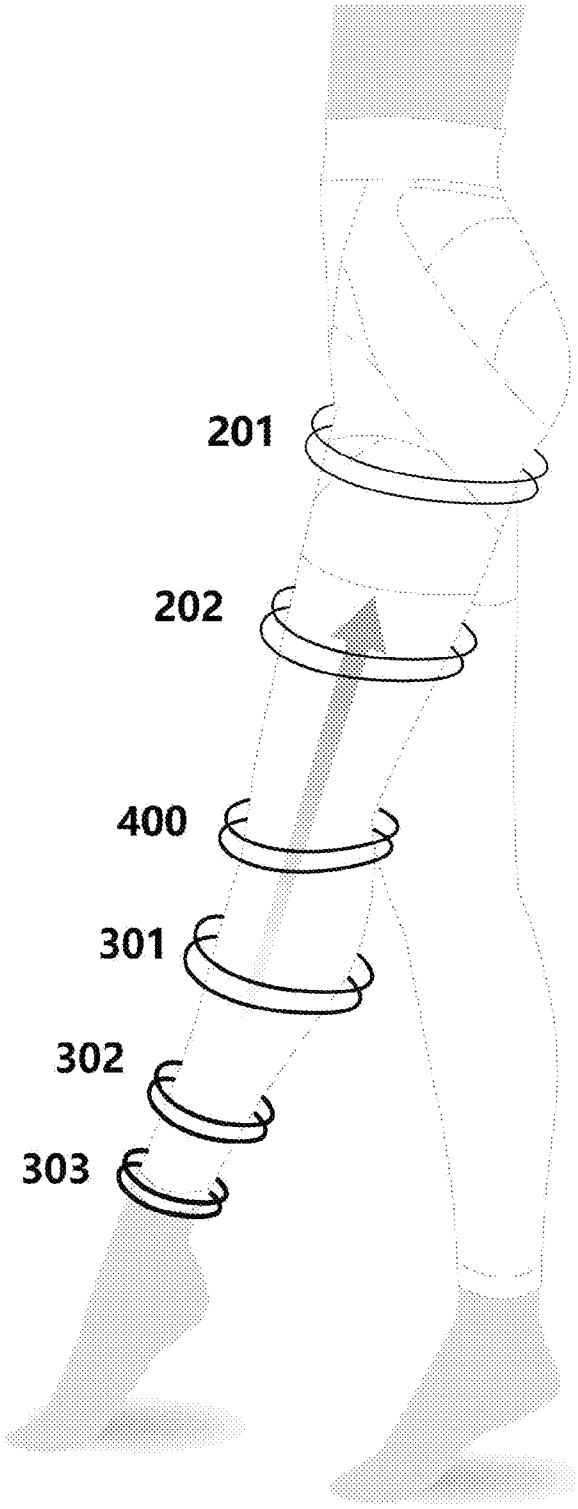

Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/MY2019/050080

A. CLASSIFICATION OF SUBJECT MATTER

A41B 11/00 (2006.01) A61N 5/06 (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)

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, WPI, PATENW: A61N5/0613, A61N2005/066, A61N2005/0645, A61F13/08, A41B11/003, A61N5/06, A41D2400/38, A61H2207/00, A61H2209/00, & keywords (twin, double, compress, constrict, zone, area, section, stocking, hose, hosiery, infrared) & like terms; Citing and Cited document; **Espacenet**: keywords (sock, garment, legging) & like terms; **Google Patents**: A61F13/08, A41B11/003, A61N5/06; Applicant/ Inventor name search conducted on Espacenet, AusPat, and internal databases provided by IP Australia.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

[X] Further documents are listed in the continuation of Box C

[X] See patent family annex

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"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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Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		International application No. **PCT/MY2019/050080**
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	US 20160338417 A1 (NIKE, Inc.) 24 November 2016 Abstract; figures 1-2; para [0025], [0029], [0042], [0045]	1-4, 9-10
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INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/MY2019/050080**

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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End of Annex

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