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(54) Title: PRESSOTHERAPY SYSTEM AND PRESSOTHERAPY SUIT

(57) Abstract: A pressotherapy system (10) comprising a suit (11) to be applied in a pressotherapy process to be used in an erect standing position and while walking; said suit (11) comprises an abdominal band (14) joined to leg sleeves (12) and a plurality of air chambers (17, 18) inside said abdominal band (14) and said leg sleeves (12); said pressotherapy system (10) comprising means for inflating and deflating said air chambers (17, 18).
"PRESSOTHERAPY SYSTEM AND PRESSOTHERAPY SUIT"

DESCRIPTION

Technical field

The present invention relates to a pneumatic pressotherapy system and a pneumatic pressotherapy suit that make it possible to improve the performance of conventional prior art pressotherapy systems.

Background art

As is known, pneumatic pressotherapy is a technique known since the 1950s. It is based on the application of pressure exerted by inflatable elements on edematous tissues, for the purpose of obtaining a reduction in the volume of the limb through an increase in blood and lymph drainage in centripetal direction. The methods with which this pressure is applied greatly influence the result obtained: the type of apparatus used, the compression sequence and the pressure applied are only some of the parameters that must be taken into consideration to ensure a therapeutic response adequate for the clinical stage of the pathology and for the tolerability of the patient.

In general, pneumatic pressotherapy systems provide for the use of single inflatable elements to be applied to parts of the patient lying on a bed. For example, there are used elements to be applied to the feet, leg sleeves that surround the whole leg from ankle to thigh, a band that surrounds the buttocks and groin, a band that surrounds the torso at abdominal level, arm sleeves. Each inflatable element has internal air chambers in contact with the body, the inside of which is in fluid dynamic connection, by means of suitable ducts, with a compressor and an electronic management and control unit.

The pressure present inside the inflatable elements is transmitted to the surface of the skin equally in all points and in all directions, in accordance with Pascal's law.

The draining effect is obtained only if this pressure is applied in such a manner as to determine a pressure gradient in distal-proximal direction (sequential compression) and if compression phases are alternated with release phases (intermittent compression).

Pressotherapy has different experimentally proven effects, including an
increase of venous and lymphatic flow rate, the release of beneficial substances, and beneficial effects on edemas.

More in particular, with regard to the increase in venous and lymphatic flow rate, it has been discovered that the pressure applied produces a decrease in the caliber of venous and lymphatic vessels in the area subjected to compression but also, due to the movement of fluids, a distension of the vessels in the area immediately downstream; the overall effect is an increase in the velocity of blood flow inside the venous vessels and of lymphatic flow inside the lymphatic collectors. In practice, the effect is based on a physical action that acts on the venous and lymphatic circulation, causing it to become more efficient and consequently improving the most frequent aesthetic conditions: cellulite, fluid retention, etc.

Moreover, the tensile and stretching forces generated in the area subjected to distension produce, as physiological response of the endothelial cells, the release of substances with antithrombotic, profibrinolytic and vasodilatory action.

Moreover, with regard to edema, the pressure applied circumferentially to the skin is transmitted to the subcutaneous tissues, causing an increase in interstitial pressure; this modifies the transmural pressure producing a reduction of filtration and an increase in capillary reabsorption, with a reduction of the interstitial lymphatic load. Analogously, the increase in interstitial pressure promotes the absorption of interstitial fluids toward the inside of the initial lymphatic capillaries, increasing the initial lymphatic flow. Ultimately, pneumatic pressotherapy produces both a reduction in lymphatic load and an increase in lymphatic flow, with consequent reduction of edema.

Object and summary of the invention

The object of the present invention is to develop a pressotherapy system which allows improved effects to be obtained on the patient relative to prior art pressotherapy systems.

Another important object of the present invention is to develop a pressotherapy system which allows the beneficial effects of pressotherapy to be achieved more rapidly relative to prior art pressotherapy systems.
A further important object of the present invention is to provide a pressotherapy system which allows further benefits to be obtained relative to the benefits that can be obtained with prior art pressotherapy systems.

These and other objects, which will be more apparent below, are achieved in accordance with the provisions of the appended claims.

According to a first aspect, the invention relates to a pressotherapy system, comprising a suit to be applied in a pressotherapy process to be used in an erect standing position and while walking.

Preferably, this suit comprises an abdominal band joined to leg sleeves, a plurality of air chambers inside said abdominal band and said leg sleeves, and means for inflating and deflating said air chambers; the system provides for the performance of pressotherapy, by means of the suit, while walking.

Preferably, the leg sleeves extend only to above the knee.

It can be said that in practice the invention provides for a suit to be applied to allow pressotherapy to be performed in an erect standing position and while walking. Appropriately, the suit contains a certain number of air chambers, for example 14, 15, 16 or more, and is composed of a suitably high abdominal band, for example 30 cm, with a suitable circumference, for example 150 cm, joined to leg sleeves on the front part, where the ducts for inflating and deflating the air chambers are grouped. The suit is closed at the back with Velcro.

The leg sleeves comprise the buttocks and thighs, and only extend to above the knee.

Wearing this suit, pressotherapy is associated simultaneously with walking, and therefore the metabolic process of lipolysis is accelerated to a greater extent relative to conventional pressotherapy, producing greater benefits for venous and lymphatic drainage, as it makes use of the action of the foot and calf muscles, which are free.

According to another aspect, the invention relates to a pressotherapy suit that can be used in the system as presented above.

Brief description of the drawings

Further characteristics and advantages of the invention will be more
apparent from the description of a preferred, but not exclusive, embodiment illustrated by way of non-limiting example in the accompanying drawings, wherein:

Fig. 1 represents a schematic view of a user who is using the system according to the invention;

Fig. 2 represents a schematic front view of a user who is wearing a pressotherapy suit according to the invention;

Fig. 3 represents a schematic front view of a pressotherapy suit according to the invention, with the belt open;

Fig. 4 represents a schematic back view of a pressotherapy suit according to the invention, with the belt open;

Fig. 5 represents a schematic top view of a pressotherapy suit according to the invention, open laterally and without the belt;

Fig. 6 represents a schematic sectional view of a portion of suit according to the invention, wherein the inner lining, the outer lining and an air chamber are visible;

Fig. 7 shows a schematic front view of a portion of the leg sleeves according to the invention, wherein a leg sleeve is cross sectioned to show the inner components.

**Detailed description of an embodiment of the invention**

With reference to the aforesaid figures, a system for pressotherapy is indicated as a whole with the number 10.

This system provides for a suit 11 to be applied in a pressotherapy process. This suit 11 corresponds, for example, to a pair of short pants above the knee of the user, which thus comprise a pair of leg sleeves 12 extending from above the knee to join in the crotch area 13 of the pants, and an abdominal band 14 joined to the leg sleeves 12.

For example, the abdominal band 14 extends on the front part of the suit from a groin band 12A below (delimited by dash-dotted lines; these lines are purely indicative of an area and must not be interpreted as limiting) which extends from the crotch 13 to the end of the pubic area, in practice at the start of the abdomen. This groin band 12A extends both forward and backward and
therefore surrounds the user. The abdominal band 14 extends upward and is
dimensioned to extend to an area at the height of the ribs, and in any case to
cover the abdomen of the user. In practice, the leg sleeves end with this groin
band, and therefore the leg sleeves 12 comprise, when the suit is worn, the
thighs and the buttocks of the user.

The term front part (or simply front) is intended as the part of suit on the
side of the user corresponding to the stomach area, while the term rear part is
intended as the part of suit on the side of the user corresponding to the back
area. The term lateral part is intended as the side of the suit corresponding to
the side of the user, i.e. between the front and back parts.

Leg sleeves 12 and abdominal band 14 are in one piece, i.e. represent a
single garment to be worn (the suit). This means that the leg sleeves 12 and
abdominal band 14 are joined to each other.

Preferably, from the groin band 12A, on the rear part of the suit, a lumbar
band 15 extends upward, for example for a height substantially equivalent to
that of the abdominal band 14, which covers the lumbar area of the user when
the suit is worn.

Naturally, the indications of physical parts of the user such as knee,abdomen, abdominal, lumbar, ribs, groin, buttocks, thighs, etc. refer to parts of
a suit constructed for a given medium size of user and must not be considered
limiting. For example, when a user who is smaller than medium size wears a
suit of larger size, the various elements will not be exactly in the body positions
indicated above; for example, the leg sleeves may be slightly below the knee
and the abdominal band may end above the ribs.

To perform pressotherapy, inside the leg sleeves, abdominal band and
lumbar band there are respectively present a plurality of air chambers 17A, 17B,
17C (for the leg sleeves), 18A, 18B (for the abdominal band) and 18C, 18D (for
the lumbar band); the air chambers of the leg sleeves will generically be
referred to below also only with the number 17, while the air chambers of the
lumbar and abdominal band will generically be referred to below also only with
the number 18.

The air chambers 17 and 18 are operatively connected, through ducts 19,
with means 20 to inflate and deflate said air chambers, according to the prior art, which comprise, for example, a compressor integrated in an electronic management and control unit 21 of the system. The arrangement of the air chambers 17 and 18 will be explained in more detail below.

Preferably, the suit 11, or the pair of pants, has two longitudinal separations 22 which extend upward, vertically dividing each leg sleeve 12, with the related portion of suit above, into two parts (for example, see Figs. 3 and 5).

Along flaps 22A of these two parts, and/or in proximity thereof, there are present means 23 for reversible connection of the same flaps 22A. For example, these reversible connection means 23 comprise complementary strips of Velcro.

Therefore, the leg sleeves with abdominal band can be opened and closed easily to facilitate the step of putting on the suit.

Preferably, these longitudinal separations 22 are produced on the two sides of the suit (or of the pants), and extend from the bottom of the leg sleeve 12 upward, along the whole of the leg sleeves, including the groin band, separating the abdominal band 14 from the lumbar band 15 (in practice, the two portions of suit above the groin band divided by the separations 22 comprise at least the central portions of the respective lumbar band 15 and abdominal band 14).

In other embodiments, these longitudinal separations 22 can be produced on the rear part of the suit, or on the front part.

In this example, along the abdominal band 14 there are present elements to adjust the overlapping position of the closing flaps 22A, for example Velcro inserts 22B, so that the user can adjust the dimensions of the "circumference" of the part of the suit relating to the waist. Therefore, the lumbar and abdominal bands with respective air chambers may overlap in the joining area produced by the Velcro, depending on how "tightly" the user adjusts the suit.

Preferably, the structure of the suit is composed of an outer lining 24, an inner lining 25, stitched to each other so as to define between them pockets 26 for housing the air chambers 17 and 18 (for example, see Fig. 6).

For example, for each leg sleeve, there are present two air chambers 17
arranged at different heights along the same leg sleeve, in succession from bottom to top, a first air chamber 17A arranged at the lower edge of the leg sleeve, so as to be positioned immediately above the knee when the suit is worn, and a second air chamber 17B immediately above the first chamber (which can optionally overlap the chamber 17A for a brief portion thereof). When the suit is worn, these chambers preferably surround the leg of the user, optionally with the exclusion of gap areas relating to said longitudinal separations 22 (it is evident that the ends of these chambers may overlap each other if the user greatly overlaps the flaps 22A of the longitudinal separations).

5 Preferably, the second chamber 17B can end at a height in proximity of the crotch 13.

Appropriately, there is present a third air chamber 17C located on the front part of the suit, on the groin band, substantially corresponding to the groin of the patient, when the suit is worn.

10 Access to the air chambers 17A and 17B is, for example, produced by means of a cut (not shown in the figures) of the outer lining made in proximity of the respective flap 22A of the related longitudinal separation 22.

Inside the abdominal band 14 there are present air chambers 18A and 18B, preferably four in number. Analogously, there are present air chambers 18C and 18D, preferably four in number, in the lumbar band 15. These air chambers 18 extend in height preferably substantially for the whole of the height of the respective abdominal and lumbar bands.

15 Preferably, the ducts 19 that carry air to the central air chambers 18A can be directly connected to one another, so that the air enters the chambers 18A simultaneously. The same applies to the ducts that connect the pair of air chambers 18B, the pair of air chambers 18C and the pair of air chambers 18D.

Access to these chambers 18, i.e. in the related space between the inner lining 25 and the outer lining 24 of the suit, is obtained, for example, along the upper edge of both the lumbar and abdominal bands, for example by means of a zip that runs along the edge.

20 On the outer lining of the suit, at each air chamber 17 and 18, there are present connection points 27 of the ducts 19 (which are appropriately
composed of flexible tubes) with the same chambers. Preferably, in these connection points there are present valves 28, for the ingress and egress of air into and from the respective air chambers.

According to the invention, the system provides for use of the suit, i.e. the performance of pressotherapy, in an erect standing position and while walking.

Advantageously, the system comprises support means 16 of the suit 11 on the body of the patient at least in an erect standing position. These means prevent the suit, in relation to the force of gravity and to the movement of the user while walking, from slipping to the ground along the body of the user. For example, these support means 16 are obtained by means of adjustment of the amplitude of the circumference of the waist of the suit obtained by means of the connection means 23.

Preferably, the support means 16 comprise a belt 29 to be tightened around the waist of the patient. Preferably, this belt overlaps the abdominal band 14 and the lumbar band 15 to cover the connection points 27 of the ducts 19 to the air chambers 18 of the two bands. For example, the connection points 27 of the two abdominal 14 and lumbar 15 bands are located inside a central band 30 delimited between reversible fixing means of the belt 29 to the abdominal band, such as Velcro strips 30A on which the belt is reversible fixed, in a position such as to grip the waist of the user as required. Therefore, in this example the belt 29 has a dual function: that of helping to support the suit on the user and that of covering the connection points of the ducts and therefore also that of grouping these ducts together, maintaining the system more compact and thus facilitating walking.

It is therefore evident that the suit can also comprise grouping means of the ducts coming from the air chambers 17 and 18, which are indicated as a whole with 31. The belt 29 groups the ducts at the abdominal and lumbar bands, both on the front and on the back part of the suit.

Preferably, on each leg sleeve 17 there is present a longitudinal pocket 32, for example open at the top and which contains the connection points of the air chambers 17 and in which the connection ducts 19 of these air chambers are arranged. The inside of this pocket 32 is for example accessible by means
of an edge 32A thereof constrained, for example, through Velcro to the outer lining of the related leg sleeve. In this pocket 32 there is present, for example, an access to the third air chamber 17C.

The ducts exit from the pocket 32 and are passed under the belt. The bundle of all the ducts is then moved away from the suit (with the ducts leading to the compressor) and held together inside a sheath 33.

The support means 16 can also comprise suspenders 34, for example fastened to the upper edge of the suit (edges of the abdominal and lumbar bands).

Each leg sleeve 12 has stiffening means 35 of the "inner thigh" portion 12A (see Fig. 7), adapted to oppose the thrust of the air chambers 17A and 17B toward the outside of the leg sleeves. For example, these stiffening means 35 comprise a sheet (or several sheets or splints) made of rigid (or semi-rigid) material arranged between the outer lining 24 and the air chamber 17A (and/or 17B) at the inner thigh area 12A of the leg sleeve 12. This sheet 36 in any case has a certain degree of flexibility or in any case can be shaped, to be arranged between air chamber and lining maintaining a shape preferably adapted to surround the inner thigh.

It must be noted that the leg sleeves extend substantially to the knee. It is understood that it is the operative part of the leg sleeve that extends to the knee, i.e. the air chambers. Therefore, in preferred embodiments, the suit can be provided with cloth, woven or nonwoven fabric that extends from the leg sleeve from the knee area to the ankle, to produce long pants, with the fabric part from the knee to the ankle having no technical function (no air chambers are present), Therefore, walking is still possible.

As stated, the suit 11 allows pressotherapy to be performed in an erect standing position and while walking. It is the association of pressotherapy with walking on which the invention is based. In fact, it has been found that when pressotherapy and walking are performed simultaneously, they synergically produce a greater number of benefits than when these actions are performed singularly, benefits which are achieved in particularly short times.

These effects include a noteworthy reduction in venous pressure in the
ankles, the reduction in stasis and in the accumulation of interstitial fluids, stimulation of the production of nitric oxide by the endothelial cells, stopping of the inflammatory state of adipose tissue, actively combating edematous-fibrosclerotic panniculopathy (cellulite), return of triglycerides into the bloodstream making activation of lipolysis possible, acceleration of weight loss.

Moreover, the simultaneous association of pressotherapy with walking by means of the suit allows alleviation of muscle pain following sporting activities, caused by micro-lacerations of the muscles (repeated muscular work), preparation of the muscles prior to prolonged aerobic activity, optimal pre-training warm-up and the production a lymph draining action that facilitates muscle recovery after stress from sporting activity. Moreover, the simultaneous association of pressotherapy with walking by means of the suit allows a cool-down action to be obtained after training.

Further, this association promotes the elimination of lactic acid, decreasing muscle recovery time (in fact, lactic acid returns rapidly to the heart and, by means of the cardiac muscle fibers, is transformed rapidly into glucose).

Therefore, the invention also relates to a sports training method that provides for the use of a pressotherapy suit as claimed and for walking or running with said suit during a pressotherapy session.

Moreover, the simultaneous association of pressotherapy with walking by means of the suit allows the prevention of cardiovascular risks. In fact, by managing to act on excess weight, it is also possible to obtain prevention of some chronic diseases often associated, such as hypertension, diabetes mellitus and dyslipidemia, all factors involved in the increase of cardiovascular risk.

Further, the simultaneous association of pressotherapy with walking by means of the suit allows a redistribution of body fat to be obtained and consequently reduces a risk factor for cardiovascular diseases. In fact, the quantity of fat present in the abdominal cavity (central obesity) is closely linked to an increase in cardiovascular risk.

Fig. 1 also shows means 37 to allow walking. For example, these means 37 comprise a "treadmill", i.e. a means to allow walking while remaining
substantially in once place.

It is understood that the above description represents only non-limiting possible embodiments of the invention, which may vary in forms and arrangements without departing from the scope of the concept on which the invention is based. Any presence of reference numerals in the appended claims has the purpose of facilitating the reading thereof, with reference to the description above and to the accompanying drawings, and does not in any way limit the scope of protection.
CLAIMS

1) A pressotherapy system (10), comprising a suit (11) to be applied in a pressotherapy process to be used in an erect standing position and while walking.

2) The pressotherapy system according to claim 1, wherein said suit (11) comprises an abdominal band (14) joined to leg sleeves (12) and a plurality of air chambers (17, 18) inside said abdominal band (14) and said leg sleeves (12), said pressotherapy system (10) comprising means for inflating and deflating said air chambers (17, 18), said system providing for pressotherapy to be performed, through said suit (11), while walking.

3) The system according to claim 2, wherein said leg sleeves (12) comprise the buttocks and the thighs of the user.

4) The system according to claim 2 or 3, wherein said leg sleeves (12) extend only to above the knee.

5) The system according to one or more of claims 2 to 4, wherein said suit (11) is formed by a pair of short knee-length pants, which comprise said leg sleeves (12), said pants extending upward by means of said abdominal band (14), said air chambers (17, 18) being defined inside said pants and said abdominal band (14).

6) The system according to one or more of claims 2 to 5, wherein said suit (11) comprises a lumbar band (15) joined to said leg sleeves (12), inside which there are present a plurality of air chambers (18C, 18D) associated with said means for inflating and deflating said air chambers (18C, 18D).

7) The system according to one or more of the preceding claims, wherein said suit (11) has two longitudinal separations (22) which extend vertically for the whole of the height of the suit (11) and which divide each leg sleeve (12) and the related portion of suit (11) which from the leg sleeve (12) extends upward, into two parts, there being present means (23) for reversible connection of the flaps (22A) of said two parts to allow easy opening and closing of the suit (11) and facilitate the step of putting on the suit.

8) The system according to claim 7, wherein said longitudinal separations (22) are produced along the sides of the suit or on the rear part of
the suit or on the front part of the suit.

9) The system according to claim 7 or 8, wherein said two longitudinal separations (22) divide the part of the suit that extends upward from the leg sleeves (12) into two parts, a first containing at least the central portion of the abdominal band (14) and a second containing at least the central portion of the lumbar band (15).

10) The system according to one or more of the preceding claims, wherein each leg sleeve (12) has stiffening means (35) of the "inner thigh" portion (12A) thereof, adapted to oppose the thrust of the air chambers (17A, 17B), present in the same leg sleeve (12), toward the outside of the inner thigh of the leg sleeve.

11) The system according to claim 10, wherein said stiffening means (35) comprise a sheet (36) arranged between the outer lining (24) of the leg sleeve and the air chamber(s) (17A, 17B) at the inner thigh area (12A) of the leg sleeve (12).

12) The system according to one or more of the preceding claims, wherein said suit (11) comprises support means (16) of said suit (11) on the body of the patient at least in an erect standing position.

13) The system according to claim 12, wherein said support means (16) of said suit comprise a belt (29) to be tightened around the waist of the patient.

14) The system according to claim 7 or according to claim 7 and one or more of the preceding claims, wherein each leg sleeve (12) has at least two air chambers (17A, 17B) arranged at different heights along said leg sleeve (12), arranged to jointly surround substantially the whole of the thigh of the patient during use, optionally with the exclusion of gap areas relating to said longitudinal separations (22); preferably there being present for each leg sleeve (12) two said air chambers (17A, 17B) in succession from the bottom upward, starting from a position adjacent to the lower edge of the leg sleeve (12).

15) The system according to one or more of the preceding claims, wherein said leg sleeves (12) are joined in a common central crotch (13).

16) The system according to one or more of the preceding claims,
wherein said means (20) for inflating and deflating said air chambers (17, 18) comprise ducts (19) leading to said air chambers (17, 18) for the passage of air.

17) The system according to claims 13 and 16, wherein said belt (29) covers the connection points (27) of said ducts (19) to the air chambers (18) of said abdominal band (14).

18) The system according to claims 13 and 16, or 13 and 17, wherein said belt (29) covers the connection points (27) of said ducts (19) to the air chambers (18) of said lumbar band (15).

19) The system according to one or more of the preceding claims, comprising grouping means (31) of said ducts (19) coming from said air chambers (17, 18); preferably said grouping means (31) being provided on the front part of said suit (11).

20) The system according to one or more of claims 16 to 19, wherein said leg sleeves (12) comprise respective longitudinal pockets (32), open at the top to house part of the connection ducts (19) to the air chambers (17) present on the same leg sleeves (12).

21) The system according to one or more of claims 16 to 20, comprising valves (28) for the ingress and egress of air into and from said air chambers.

22) The system according to claim 21, wherein said valves (28) intercept said ducts (19).

23) The system according to one or more of the preceding claims, wherein said abdominal band (14) and said lumbar band (15) comprise a plurality of said air chambers (18) in succession along the extension of said bands.

24) The system according to one or more of the preceding claims, wherein each leg sleeve (12) has at least two air chambers (17A, 17B) arranged at different heights along said leg sleeve, adapted to substantially surround the whole of the thigh of the patient during use, with the exclusion of gap areas relating to longitudinal separations (22) produced along each leg sleeve and relating to part of the suit above, there being present for each leg sleeve (12) an air chamber (17C) located only in the front position, in a position
corresponding approximately to the groin area of the patient when the suit is worn.

25) The system according to claim 24, wherein for each leg sleeve (12) there are present two said air chambers (17A, 17B) in succession from the bottom upward, starting from a position adjacent to the lower edge of the leg sleeve (12) and a single air chamber (17C) for the groin area.

26) The system according to one or more of the preceding claims, comprising means (37) for walking while remaining in once place.

27) The system according to claim 21, wherein said means (37) for walking while remaining in once place comprise a "treadmill".

28) A pressotherapy suit (11) to be used in a pressotherapy system (10) according to one or more of the preceding claims.

29) A pressotherapy suit for pressotherapy to be performed in an erect standing position and while walking, comprising an abdominal band (14) joined to leg sleeves (12) and a plurality of air chambers (17, 18) inside said abdominal band (14) and said leg sleeves (12).

30) The suit according to claim 24, wherein said leg sleeves (12) comprise the buttocks and the thighs of the user.

31) The suit according to claim 24 or 25, wherein said leg sleeves (12) extend only to above the knee.

32) The suit according to one or more of claims 29 to 31, characterized by being formed by a pair short knee-length pants, which comprise said leg sleeves (12), said pants extending upward by means of said abdominal band (14), said air chambers (17, 18) being defined inside said pants and said abdominal band (14).

33) The suit according to one or more of claims 30 to 32, wherein said suit (11) comprises a lumbar band (15) joined to said leg sleeves (12), inside which there are present a plurality of air chambers (18C, 18D).

34) The suit according to one or more of claims 30 to 33, comprising two longitudinal separations (22) which extend vertically for the whole of the height of the suit (11) and which divide each leg sleeve (12) and the related portion of suit (11) which from the leg sleeve (12) extends upward, into two
parts, there being present means (23) for reversible connection of the flaps (22A) of said two parts to allow easy opening and closing of the suit (11) and facilitate the step of putting on the suit.

35) The suit according to claim 34, wherein said longitudinal separations (22) are produced along the sides of the suit or on the rear part of the suit or on the front part of the suit.

36) The suit according to claim 34 or 35, wherein said two longitudinal separations (22) divide the part of the suit that extends upward from the leg sleeves (12) into two parts, a first containing at least the central portion of the abdominal band (14) and a second containing at least the central portion of the lumbar band (15).

37) The suit according to one or more of claims 30 to 36, wherein each leg sleeve (12) has stiffening means (35) of the "inner thigh" portion (12A) thereof, adapted to oppose the thrust of the air chambers (17A, 17B), present in the same leg sleeve (12), toward the outside of the inner thigh of the leg sleeve.

38) The suit according to claim 37, wherein said stiffening means (35) comprise a sheet (36) arranged between the outer lining (24) of the leg sleeve and the air chamber(s) (17A, 17B) at the inner thigh area (12A) of the leg sleeve (12).

39) The suit according to one or more of claims 29 to 38, comprising support means (16) of said suit (11) on the body of the patient at least in an erect standing position.

40) The suit according to claim 39, wherein said support means (16) of said suit comprise a belt (29) to be tightened around the waist of the patient.

41) The suit according to claim 34 or according to claim 34 and one or more of claims 29 to 40, wherein each leg sleeve (12) has at least two air chambers (17A, 17B) arranged at different heights along said leg sleeve (12), arranged to jointly surround substantially the whole of the thigh of the patient during use, optionally with the exclusion of gap areas relating to said longitudinal separations (22); preferably there being present for each leg sleeve (12) two said air chambers (17A, 17B) in succession from the bottom upward, starting from a position adjacent to the lower edge of the leg sleeve (12).
42) The suit according to one or more of claims 29 to 41, wherein said leg sleeves (12) are joined in a common central crotch (13).

43) The suit according to one or more of claims 29 to 41, wherein said means (20) for inflating and deflating said air chambers (17, 18) comprise ducts (19) leading to said air chambers (17, 18) for the passage of air.

44) The suit according to claims 13 and 16, wherein said belt (29) covers the connection points (27) of said ducts (19) to the air chambers (18) of said abdominal band (14).

45) The suit according to claims 40 and 43, or 40 and 44, wherein said belt (29) covers the connection points (27) of said ducts (19) to the air chambers (18) of said lumbar band (15).

46) The suit according to one or more of claims 29 to 45, comprising grouping means (31) of said ducts (19) coming from said air chambers (17, 18); preferably said grouping means (31) being provided on the front part of said suit (11).

47) The suit according to one or more of claims 43 to 46, wherein said leg sleeves (12) comprise respective longitudinal pockets (32), open at the top to house part of the connection ducts (19) to the air chambers (17) present on the same leg sleeves (12).

48) The suit according to one or more of claims 43 to 47, comprising valves (28) for the ingress and egress of air into and from said air chambers.

49) The suit according to claim 48, wherein said valves (28) intercept said ducts (19).

50) The suit according to one or more of claims 29 to 49, wherein said abdominal band (14) and said lumbar band (15) comprise a plurality of said air chambers (18) in succession along the extension of said bands.

51) The suit according to one or more of claims 29 to 50, wherein each leg sleeve (12) has at least two air chambers (17A, 17B) arranged at different heights along said leg sleeve, adapted to substantially surround the whole of the thigh of the patient during use, with the exclusion of gap areas relating to longitudinal separations (22) produced along each leg sleeve and relating to part of the suit above, there being present for each leg sleeve (12) an
air chamber (17C) located only in the front position, in a position corresponding approximately to the groin area of the patient when the suit is worn.

52) The suit according to claim 51, wherein for each leg sleeve there are present two said air chambers (17A, 17B) in succession from the bottom upward, starting from a position adjacent to the lower edge of the leg sleeve (12) and a single air chamber (17C) for the groin area.

53) The use of a pressotherapy suit according to one or more of claims 29 to 52, during pressotherapy and while walking.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61H9/00
ADD.:

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)
A61H

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)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Category</th>
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<th>Relevant to claim No.</th>
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<td>X</td>
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<td>WO 03/030808 A1 (EGGER NORBERT [AT]) 17 April 2003 (2003-04-17) the whole document</td>
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Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent 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)
"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
"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
"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
"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 such documents, such combination being obvious to a person skilled in the art
"A" document member of the same patent family

Date of the actual completion of the international search

10 April 2013

Date of mailing of the international search report

19/04/2013

Name and mailing address of the ISA/
European Patent Office, P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Knoflacher, Nikolaus
### Box No. II  Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. **[X]** Claims Nos.: 53
   - because they relate to subject matter not required to be searched by this Authority, namely:
     
     The subject matter of claim 53 relates to the use of a pressotherapy suit. Such use has to be considered as method of treatment of the human body by therapy (Rule 39.1(iv) PCT).

2. **☐** Claims Nos.: because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. **☐** Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box No. III  Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. **☐** As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. **☐** As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. **☐** As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. **[X]** No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 

### Remark on Protest

- **☐** The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

- **☐** The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

- **☐** No protest accompanied the payment of additional search fees.
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<td>CA 2462229 Al</td>
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<td>DE 10149418 Al</td>
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<td>HU 0401757 A2</td>
<td>29-11-2004</td>
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<td>JP 4098238 B2</td>
<td>11-06-2008</td>
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<td></td>
<td>JP 2005504608 A</td>
<td>17-02-2005</td>
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