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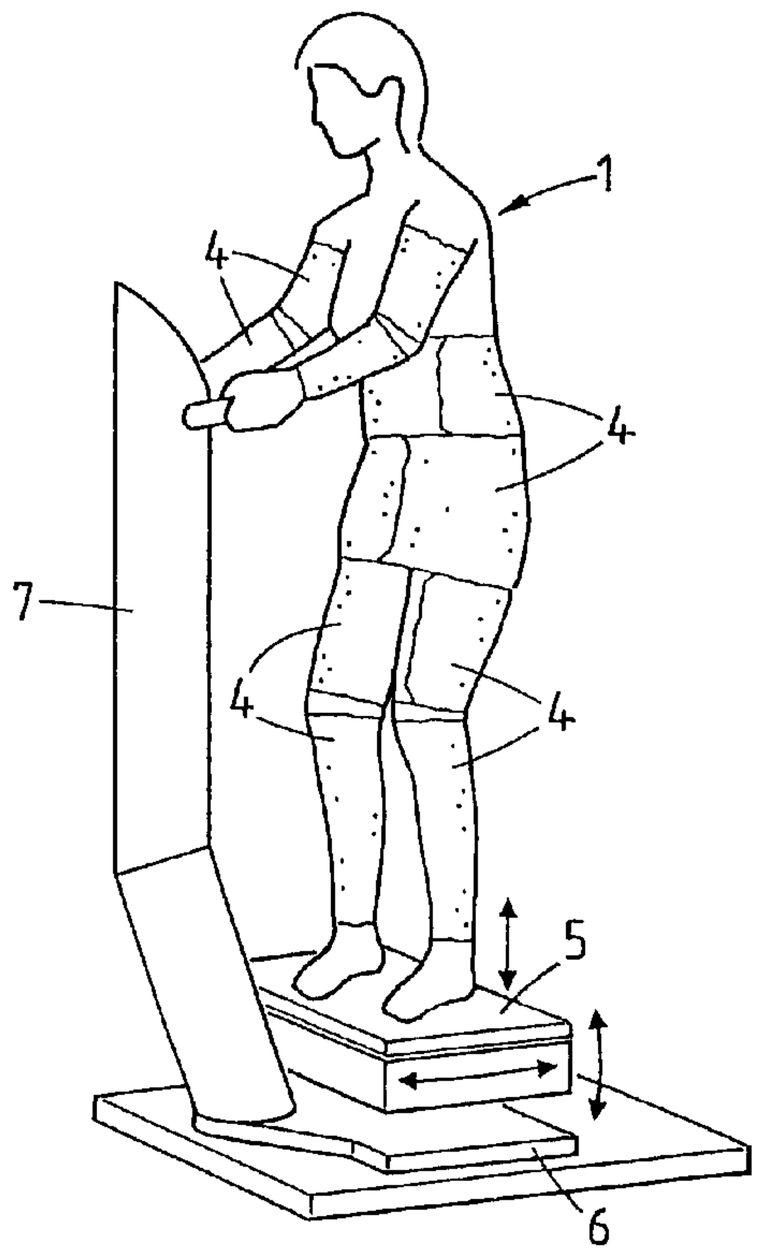
(54) Titre : PROCEDE ET DISPOSITIF POUR FAIRE PENETRER DES PRODUITS COSMETIQUES DANS LA PEAU
(54) Title: METHOD FOR INTRODUCING COSMETICS INTO THE SKIN



(57) Abrégé/Abstract:
The invention relates to a method for actively introducing moisturising substances and/or cosmetic active ingredients into the skin of the human body. Said method is characterised in that the skin is brought into contact with the substances and/or active ingredients and a compression element is applied. The tissue is then caused to vibrate. Compression dressings (4) or bandages can constitute the compression element. In order to cause the tissue to vibrate, the person stands on a vibrating support (5), or the muscles of said person are stimulated by electric stimulation.

ABSTRACT

The method for driving moisturising substances and/or cosmetic active ingredients into the skin of the human body of a person is characterised in that the skin is brought into contact with the substances and/or active ingredients and a compression element is applied, and the tissue is subsequently set into oscillation. The compression element may be formed by compression bandages (4) or compression wraps. The tissue may be set into oscillation in that the person locates himself on a vibrating support, or that the muscles of the person are stimulated by way of electro-stimulation.

METHOD FOR INTRODUCING COSMETICS INTO THE SKIN

[001] The invention relates to a method for driving moisturising and/or cosmetic active ingredients into the skin, the use of a compression bandage or a compression wrap in such a method, as well as to a device and means for driving moisturising and/or cosmetic active ingredients into the skin.

[002] It is known the apply creams, gels, lotions or oils which tauten and smooth the skin, onto the body. Cosmetic effects which are achieved with this may include a smoothing of the skin, a purifying of the tissue, and a combating of starbursts.

[003] The disadvantage with this is the fact that the permeation of larger quantities of cosmetic creams, gels, lotions or oils into the skin is a slow process, and the effect is accordingly slow and occurs in a weak manner. Furthermore, such products often contain for example strong irritants which are applied as an introduction agent for the active ingredients and achieve an intensive blood-circulation of the skin and the subcutaneous connective tissue. Strong irritants may however feel rather unpleasant.

[004] It is the object of the invention to alleviate this.

[005] The invention is based on the concept of actively introducing, thus driving in the moisturising substances and/or cosmetic active ingredients rather than letting them passively permeate.

[006] The invention therefore provides a method for driving in moisturising substances and/or cosmetic active ingredients, which overcomes the disadvantages of existing procedures, and which in particular acts in an efficient manner on large surfaces.

[007] This is effected in that the moisturising substances and/or cosmetic active ingredients are driven into the skin of a human body, in that the skin which is in contact with these substances is applied onto a compression element, wherein the compression element may bear such that an oscillating-out (in the context of outward oscillation) of the tissue is prevented.

[008] The oscillation is reflected back into the tissue on account of the compression element. The tissue is pressed against the compression element at least with the cycle of the excitation frequency, by which means substances to be introduced are driven in (almost "knocked in").

[009] The term "cosmetic active ingredient" is to be understood here in a broad context. In particular, it includes every substance which cosmetically effectively influences or which tautens the skin, purifying substances, but also moisturising substances, etc.

[0010] A "compression element" is to be understood as an element which is commonly cover-like, thus flat, flexible and at least partly enveloping, which may be applied tightly to tissue. The compression element often has a certain elasticity so that it may be stretched in a taut manner.

[0011] This method has basic advantages:

due to the fact that oscillation is excited in the tissue, the effect may be over a large area without having to operate with a great technical effort. In particular, means for exciting the oscillation need not be present over a large surface area or even on the whole surface of the tissue. It is sufficient to let the compression element bear on large surfaces of the tissue. This may be accomplished by large-surface, taut, elastic or non-elastic bandages or wraps. These bandages or wraps may furthermore be directly impregnated or laden with moisturising substances and/or active ingredients,

larger quantities may be worked into the skin on account of the active driving-in of the moisturising substances and/or cosmetic active ingredients,

it may be shown that the human body, when it is excited into oscillation at least in part regions, is automatically exercised. For example, when standing on a support oscillating in a three-dimensional manner, the body by reflex compensates movements of the support. The training effect which may be achieved with this is considerable. This is similarly the case with electro-stimulation. The method according to the invention thus almost without any additional effort, may be combined with a training method which of course one again reinforces the cosmetic effect (fat reduction and local muscle tautening).

the idea according to the invention, without further ado, permits an adaptation to the consistency of the tissue into which the moisturising substances and/or cosmetic active ingredients are to be driven in. It is known that very different oscillation may be excited, depending on the stress/loading of the tissue. For example, low frequency oscillation is possible with very flabby tissue (example: "flabby tummy"). The method according to the invention may thus be adapted to the respective person when required by way of adapting the excitation frequency.

[0012] The use of a compression bandage or compression wrap in such a method, as well as a device and a means for driving moisturising substances and/or cosmetic active ingredients into the skin is likewise the subject-matter of the invention.

[0013] The invention according to one embodiment makes use of the fact that a multitude of oscillations are activated with "random" oscillation excitations. The oscillations amongst other things are standing or progressive waves in the tissue of the body, and the progressive waves have different directions of wave propagation. Amongst the excited waves there are transverse waves formed along the surface, whose wavelength for example is shorter than a dimension of the surface area covered by the compression element. Such waves are hindered by the compression element and this compression element prevents deflections. At those locations at which a deflection would be effected with free oscillation, the tissue is pressed against the compression element and where appropriate is slightly compressed. This effects a driving of the substances to be introduced into the tissue.

[0014] The excitation of oscillation may be effected in that the person stands (or sits or lies) on a support which executes oscillation. It has been shown that the method acts particularly well if the support carries out oscillations in several directions. For example, one may use a product with which a plate oscillates in a three-dimensional manner. Oscillation with frequencies between 10 Hz and 150 Hz, for example between 20 Hz and 90 Hz, particularly between 30 Hz and 50 Hz have been ascertained to be favourable. A particular effect is achieved if the vibrations are not limited to a single regular oscillation, but run in several dimensions and possibly not in a strict periodical manner. The frequency as well as amplitude may be matched to requirements of a person, for example to the tautness of the tissue.

[0015] Methods for exciting vibrations in a support, for example a plate are known. They may for example be based on rotating eccentric distancers between the vibrating plate and a stationary base. The details of such methods are not described in detail here.

[0016] One may also electro-stimulate as an alternative or supplement to this type of oscillation excitation. A muscle contraction activity is excited by way of electro-stimulation. Here too, one may select the frequency, such that the desired oscillation to be excited is excited in a particularly intensive - almost resonant - manner, and/or that a particular training effect may be achieved.

[0017] Finally there is yet the possibility of oscillation by way of a belt vibration apparatus. Such may be applied on or at least partly next to a compression compress or compression wrap.

[0018] Embodiment examples of the invention are explained hereinafter in more detail by way of generally very schematic drawings. In the drawings there are shown in:

[0019] Figure. 1 - a person with various types of compression compresses;

[0020] Figure. 2 - a person with several compression wraps;

[0021] Figure 3 - a person on a vibrating support;

[0022] Figure 4 - the principle of the prevention of deflecting (outwardly moving) oscillation;

[0023] Figure 5 - a person with several compression compresses or wraps and with means for electro-stimulation.

[0024] The person represented in **Figure 1** is provided with compression elements 2.1, 2.2, 2.3, 2.4, 2.5 which bear in a taut manner. These may be manufactured using elastic elements which are known per se, but which have a relatively large modulus of elasticity and therefore tighten in a taut manner, or using other materials which are at least slightly elastic. Moisturising and/or cosmetically effective substances, possibly in a suitable solvent, are deposited below the compression compresses. As an alternative or to supplement this, the material of the bandages may also be impregnated with substances of this type. It is also possible to deposit several substances consecutively onto the skin.

[0025] Where appropriate (not represented), an outer covering which may for example be designed in a film-like manner is attached over the compress. This covering may likewise be tightened in a taut manner and further reinforce the effect of the compression bandage. Furthermore it may be essentially fluid-tight, and by way of this prevent pieces of clothing worn around the compress being soiled by substances with which the compress is impregnated or is soaked.

[0026] In **Figure 2**, the person instead of compression bandages wears compression wraps 3.1, 3.2, 3.3, 3.4. These are likewise designed such that they may bear on the skin of a person in a taut manner. They may for example, similarly to blood pressure collars, comprise a reversibly actuatable closure, for example a so-called Velcro-type closure or something similar. Such a closure too, with at least slightly elastic wrap material and if some force is applied as is required, permits the wrap to bear snugly on the tissue. The wraps may also comprise additional means with which the snug bearing/pressure on the tissue are further improved or reinforced. Such additional means may contain self-inflating pressure bodies or ones to be inflated in the inside of the wrap etc.

[0027] Wraps which are sleeve like and may be closed are represented in the drawing. Closed and even stocking-like wraps are conceivable, which, where appropriate, may be slipped over with a suitable aid, similar to support stockings. The bandages may have an external essentially fluid-tight and hard-wearing layer, which renders any separate external covering superfluous. They may however be supplemented by a separate outer sleeve similar to the compress.

[0028] If it is not required, a piece of clothing may be worn over the compresses/wraps and in both cases one may do away with the covering/the outer layer.

[0029] In **Figure 3**, the person 1 provided with compresses 4 stands on a three-dimensionally vibrating support, specifically a plate 5. The plate is attached on a stationary base 6. Drive means by way of which the plate is set onto oscillation in various directions of deflection (excursion) are located between the plate 5 and the base 6. Oscillation in the body of the person are excited by way of vibrations of the pate 5. The persons holds tight on an optional support column 7, so that he does not have to concentrate on keeping his balance.

[0030] The multitude of oscillations which is excited in an inhomogeneous tissue which seen mathematically has an irregular shape, may not be described in a simple manner. Generally however an oscillation condition may be approximated by a linear (that is a mathematically independent) superimposition of natural oscillations. It may therefore be illustrative to consider individual oscillations from the simultaneously excited multitude of oscillations by themselves. For illustration, oscillations are represented in the figure which correspond to transverse waves running along the surface of the tissue. For such waves, it is the case that the propagation speed and thus with a given excitation frequency also the distance between two "wave peaks" is proportional to the root of the stress of the tissue (as a force). This means that the more flabby the tissue, the slower do the waves propagate and thus the further apart are the "wave peaks".

[0031] The effect of the compression element with oscillatory excitation is shown very schematically in Figure 4. Both drawings of the Figure for illustration show the leg of a person standing on a vibrating support. In the right drawing, the person in each case wears a compress 11 preventing oscillations, and a sleeve 12 whilst the tissue may feely oscillate out in the right drawing. The free, deflecting (outwardly-moving) oscillation is represented by wave amplitudes 13 advancing in the arrow direction.

[0032] In the right drawing, the tissue may not oscillate in a deflecting manner on account of the compression element formed by the compression bandage or the compression wrap. If such a compression wrap bears on the tissue, this acts on such oscillations as follows: An oscillation of the tissue with deflection (here also called "oscillating out") is prevented. Instead, the tissue, roughly at those locations where deflection (excursion) would be present if no compression element were present, is pressed locally against the compression element and at the same time pressed together, and slightly compressed depending on the compressibility. The effect of this is to drive in the substances to be introduced, into the skin. Compressed locations 14 in the tissue are shown schematically in the figure.

[0033] Of course, compression elements have an influence on the design and propagation properties of the excited oscillations. This condition is not dealt with for simplifying the discussion serving merely for illustration by way of Figure 4.

[0034] It is not necessary for oscillations to be present which entail propagating deflections in the case that no compression element is present. "Standing waves" may just as easily be formed, similar to the oscillations which result with a cable which is clamped at both sides. As mentioned, the actual condition of oscillation may be seen in any case as a superposition of a multitude of possible oscillation conditions.

[0035] In **Figure 5** a person is represented who wears compression compresses (bandages) 21 which are shown very schematically, as well as likewise very schematically drawn electrodes 22 of an electro-stimulation apparatus. The electro-stimulation apparatus takes the place of the plate according to Figure 3 which is capable of vibration, and likewise serves for exciting oscillation in the tissue. The excitation of muscle contractions via electro-stimulation is known per se and will not be explained in detail here.

[0036] Instead of the plate capable of vibration and the electro-stimulation apparatus, yet other further means for exciting oscillation in a tissue is conceivable. What is important within the context of the invention is that the tissue itself is excited into oscillation, and specifically generally such that it oscillates on the whole surface of the compression compress or wraps and not only in a pointwise manner.

[0037] A means for driving in moisturising substances into the skin comprises the following constituents:

a means for exciting oscillation in a human tissue, for example a plate capable of vibration, or an electro-stimulation apparatus;

at least one compression bandage and/or wrap. A plate capable of compression may be provided with an outer, essentially fluid-tight covering;

preferably moisturising and/or cosmetically effective substances. These are either directly present in the bandage/wraps (i.e. the latter are at least partly impregnated with them) or they are provided in separate receptacles

possibly additional cover material, essentially fluid-tight, for example a film.

[0038] The moisturising and/or cosmetically effective substances may be present as gels, emulsions, creams, oils, lotions, etc. and have a broad combination of contained substances. Possible tissue- and skin-caring contents are known from cosmetics. They may contain water, oils and/or alcohols and at least some of the group of extracts from ginkgo leaves, ginseng roots,

macadamia, Malva sylvestris, mint, balm, marigold, algae, olives, avocado, horse chestnut, bladderwrack, stinging nettle, horsetail, jojoba oil, maize oil, almond oil, wheat germ oil, and further natural ingredients as well as synthetic active ingredients.

CLAIMS

1. A method for driving moisturising substances and/or cosmetic active ingredients into the skin of a human body, in which the skin is brought into contact with the substances and/or active ingredients, a compression element is applied, and tissue connected to the skin is set into oscillation.

2. A method according to claim 1, characterised in that the compression element is applied such that deflecting oscillation of the tissue is prevented.

3. A method according to claim 1 or 2, characterised in that a tautly tensioned elastic bandage (2.1-2.5) or wrap (3.1-3.4) is used.

4. A method according to claim 3, characterised in that a film is attached around the elastic bandage or wrap.

5. A method according to one of the preceding claims, characterised in that the tissue is set into oscillation, in that the human body is placed on an oscillating support (5).

6. A method according to one of the claims 1 to 4, characterised in that the tissue is excited into oscillation, in that a contraction activity of muscles is triggered by electro-stimulation.

7. A method according to one of the preceding claims, characterised in that means with which the tissue is excited into oscillation engage at a location of the body which is different to the location of the bearing compression element.

8. The use of a compression bandage or compression wrap for preventing deflecting oscillation, in a method according to one of the claims 1 to 7.

9. A device for driving in moisturising substances and/or cosmetic active ingredients into tissue of human bodies, comprising means for preventing deflecting oscillation of human tissue, as well as an outer, essentially fluid-tight cover.

10. A means for driving moisturising substances and/or cosmetic active ingredients into tissue of human bodies, comprising at least one compression bandage and/or compression wrap as well as an oscillation excitation apparatus with means for setting human tissue into oscillation.

11. A means according to claim 10, characterised in that the oscillation excitation apparatus comprises a support with electrically operable drive means, said drive means in operation exciting

the support into oscillation, wherein the drive means and support are designed such that a human may stand on the support when the oscillation excitation apparatus is in operation

12. A means according to claim 10, characterised in that the oscillation excitation apparatus is an electro-stimulation apparatus for stimulating contraction activity of muscles.

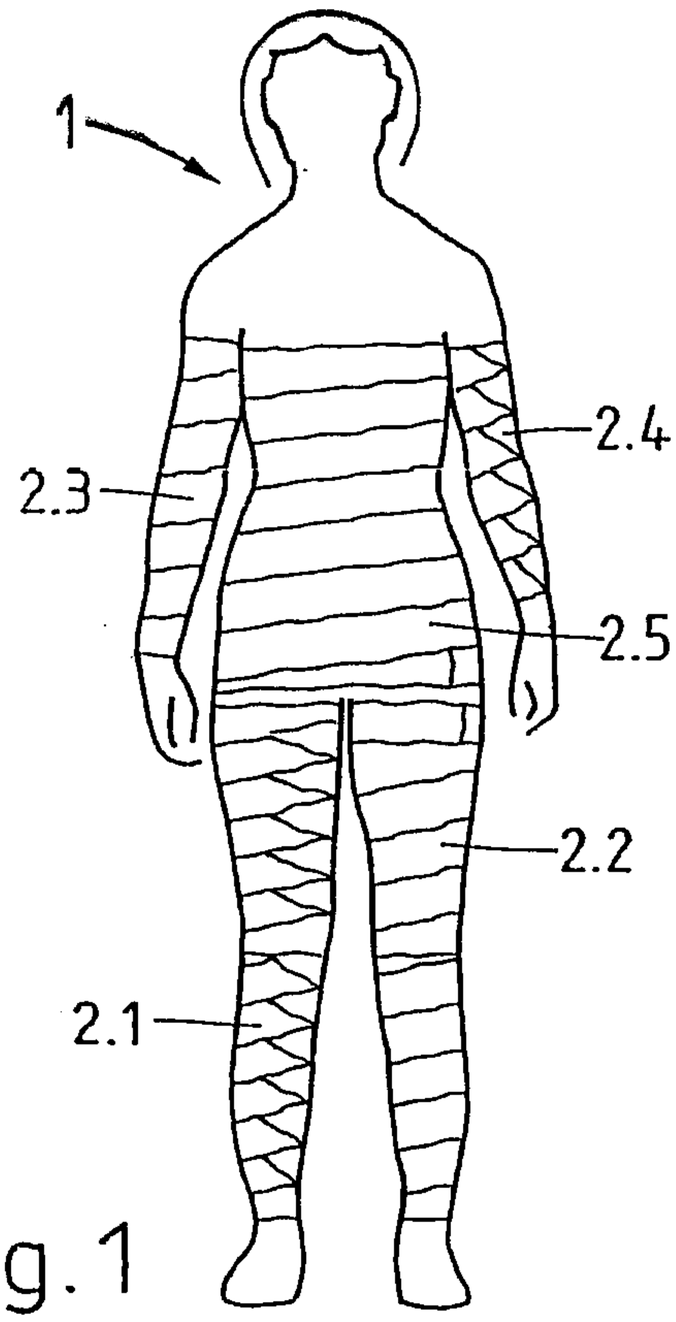


Fig.1

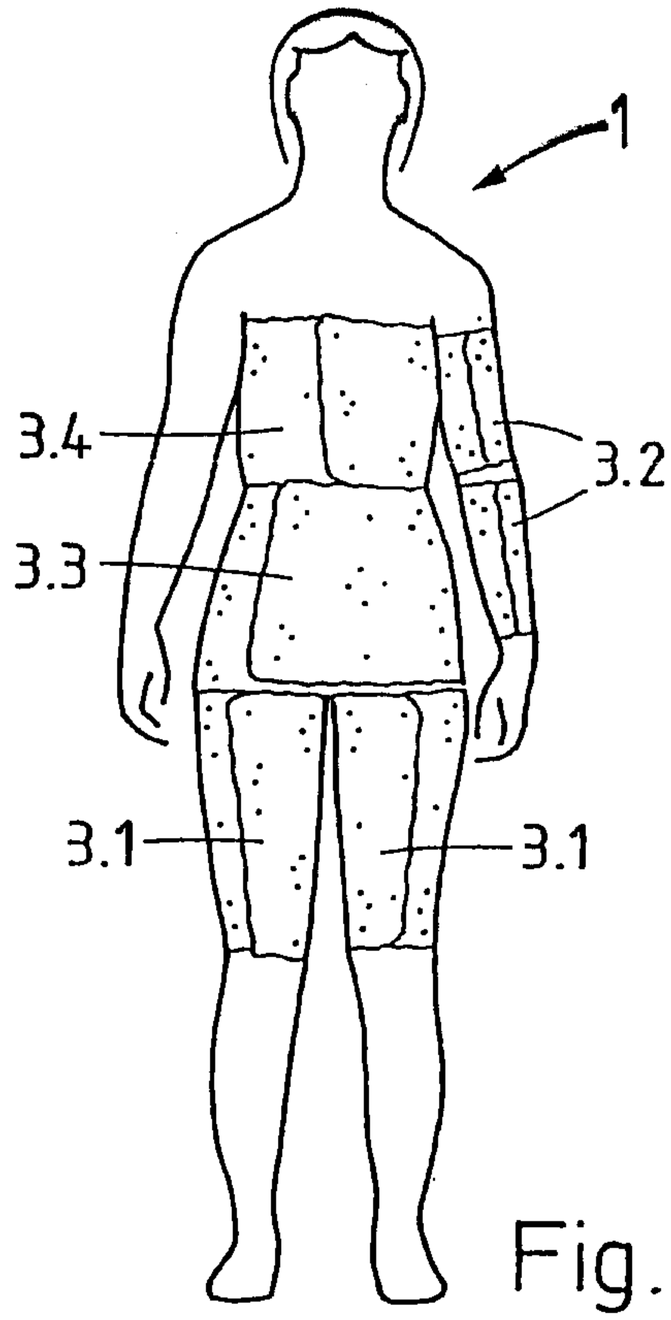


Fig.2

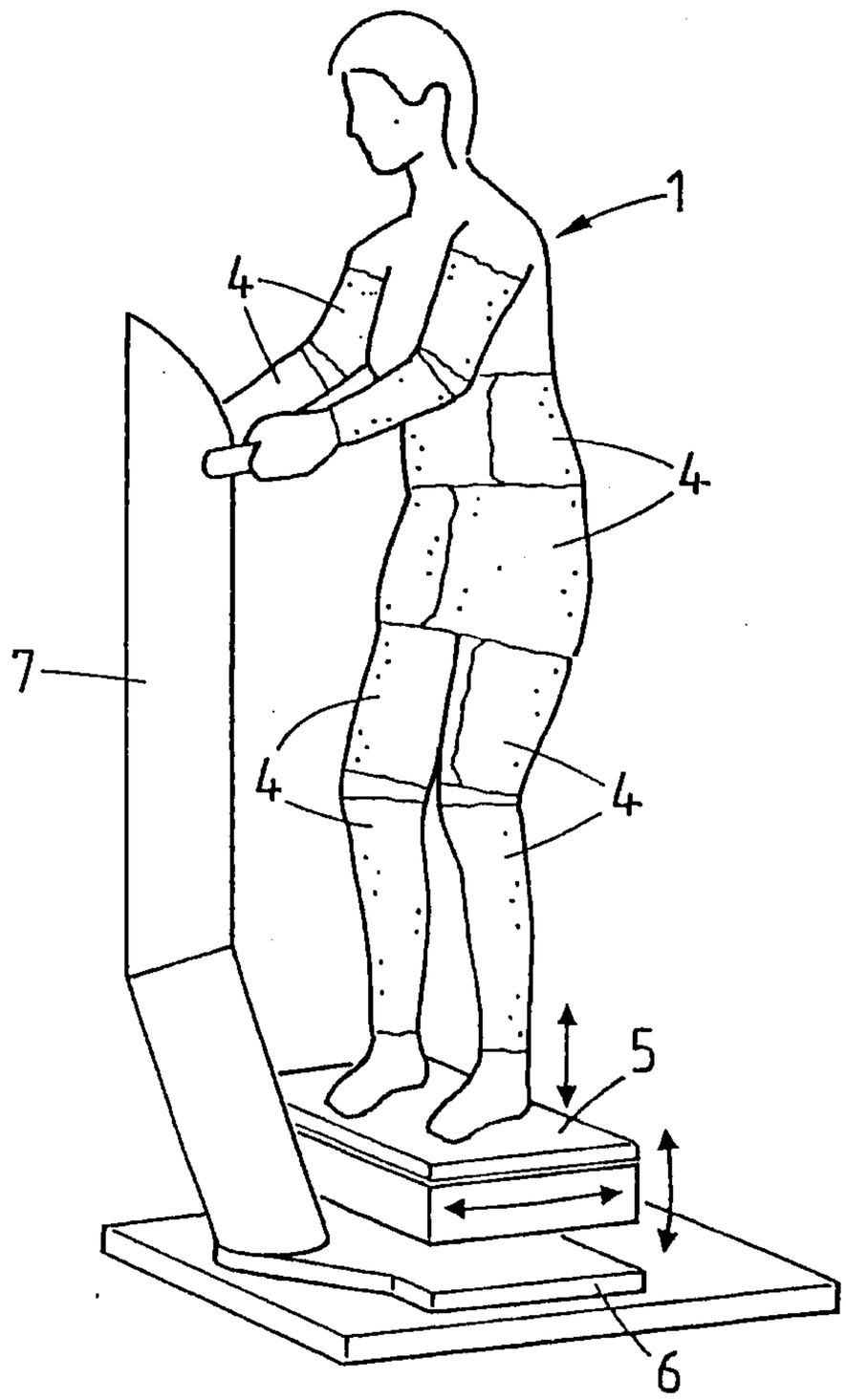
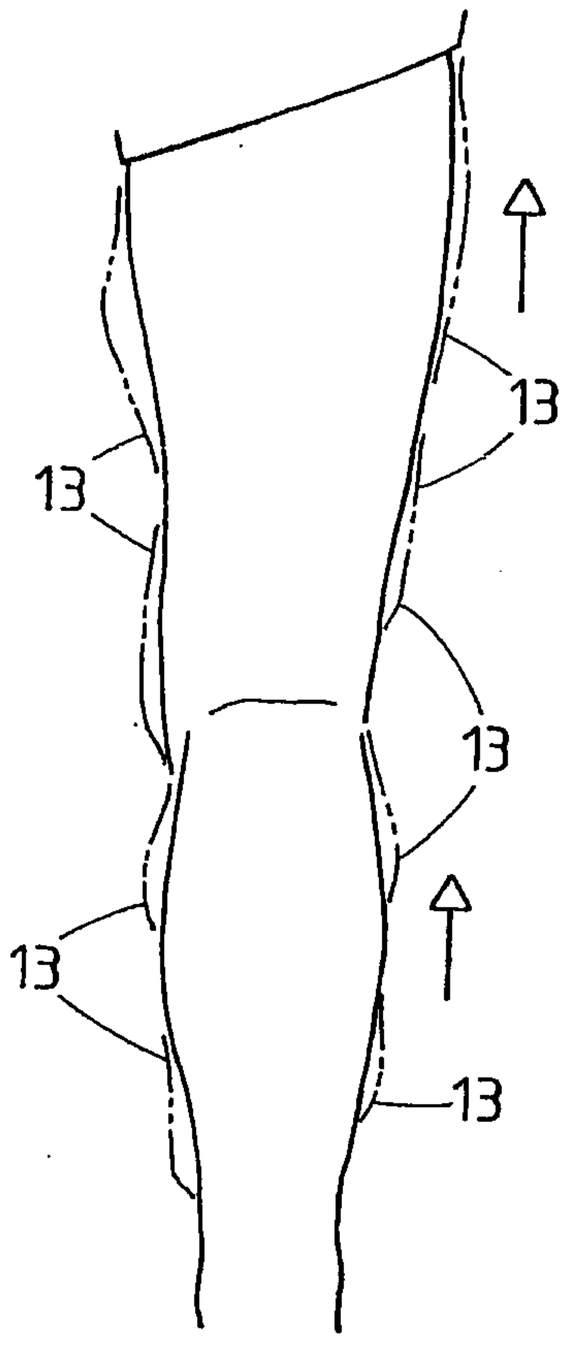


Fig.3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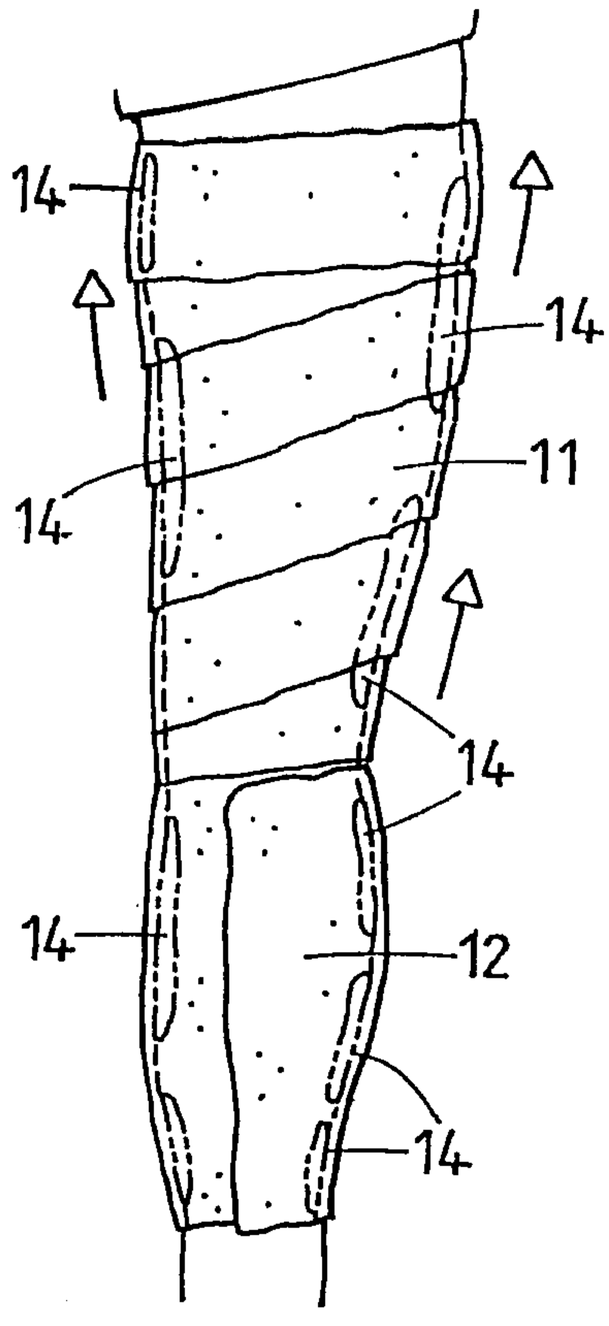
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Fig. 4

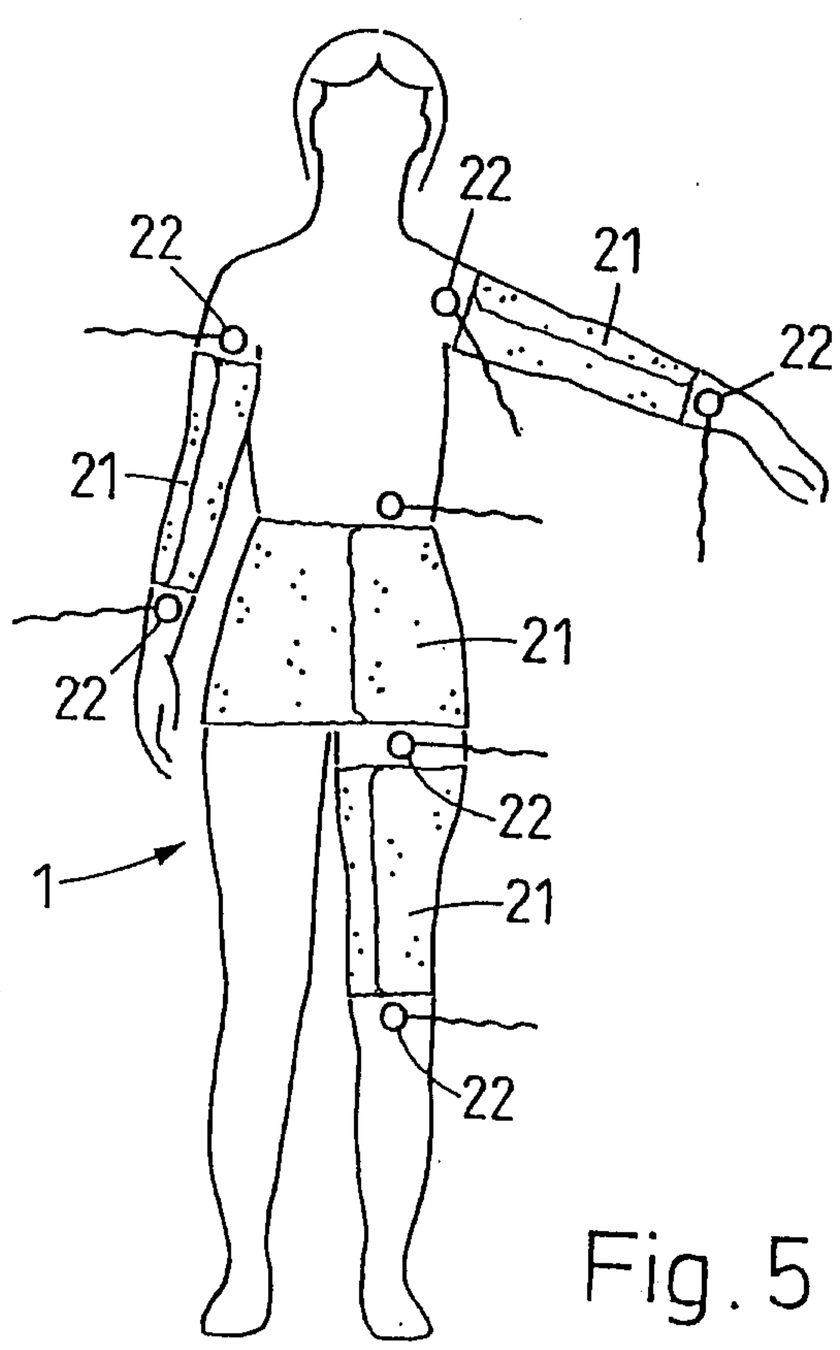
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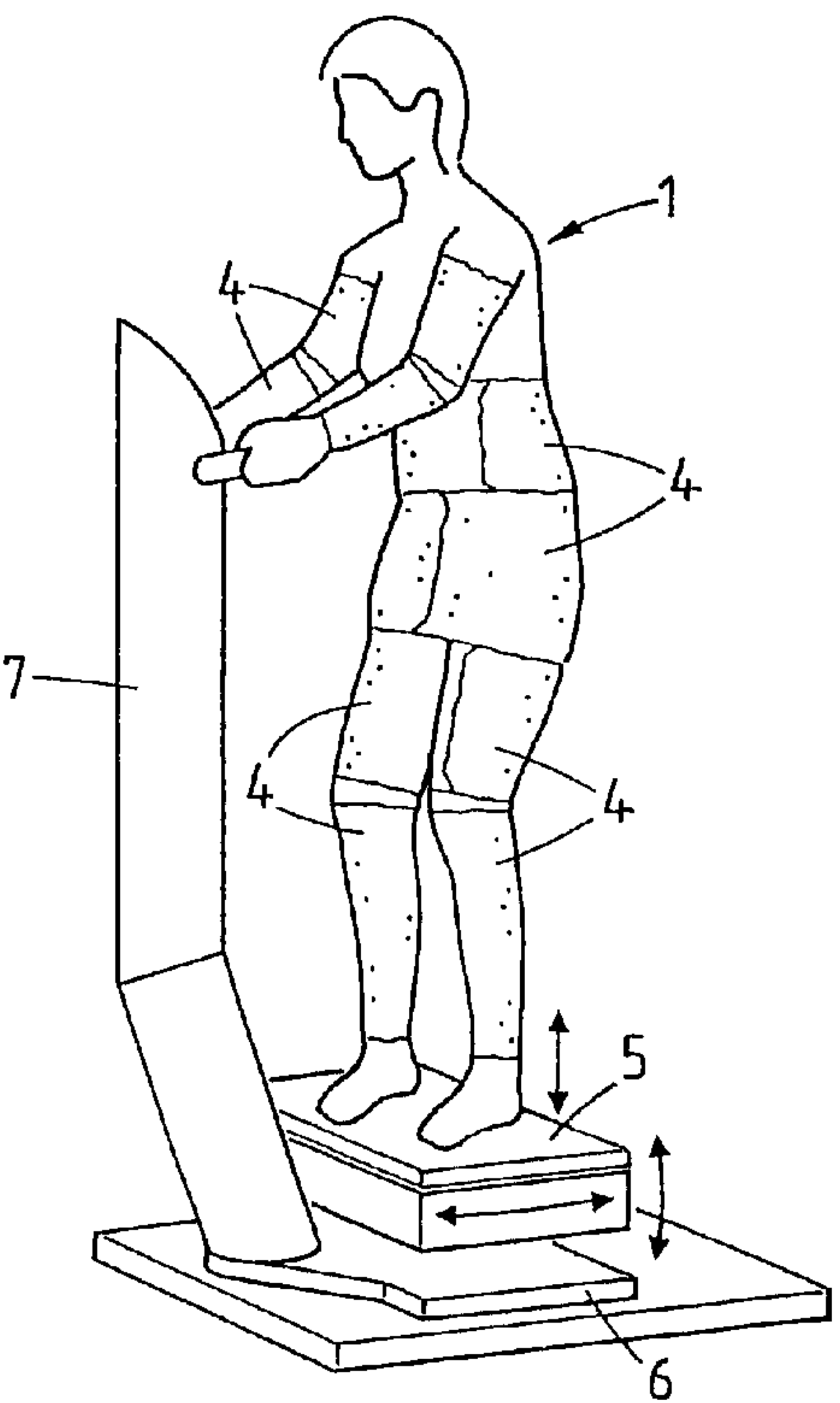
Fig. 5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