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(54) **A DEVICE FOR PROTECTION OF THE HIPS**

HÜFTSCHUTZVORRICHTUNG

DISPOSITIF DE PROTECTION DES HANCHES

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Description

Field of the Invention

[0001] The present invention relates to a device for protection of the hips of the human body comprising a belt part arranged to surround the human body at least in the area of the hip, which at least is partly made of an elastic material having a inner surface and an outer surface, and hip protection means.

Background Art

[0002] Protection of the hips has become increasingly important due to the fact that the number of hip fractures as a consequence of falling has increased over the years. Osteoporosis is believed to be one of the main reasons for hip fractures. Even though osteoporosis and hip fractures may occur in the entire population, the hip fractures are most common in the elderly part of the population, where osteoporosis is also most common.

[0003] The instant injury, permanent injury and post-effects caused by the hip fractures are also seen to be more serious for the elderly population due to the fact that the strength and elasticity of the bones decrease throughout the years as a result of a reduction of the mineral density of the bone and weakening of the bone structure.

[0004] Furthermore, the flexibility and mobility of persons suffering from osteoporosis are decreased. In addition, this risk group of persons is often advised to exercise in order to strengthen the musculature as well as improve their balance and thereby minimise the risk of falling, whereby the risk of hip fractures is likewise minimised. Therefore, during exercise they need protection of especially the hip, so they do not fear falling during the exercise and therefore refrain from doing it or even injure the hip by falling during the activity.

[0005] Another risk group for hip fractures are persons who attend rehabilitation after e.g. an operation, being confined to a bed for a long time or a period limited mobility because of any kind of psychical damages. This group lacks the ability of moving on their own and therefore may be exposed to falls during the exercises in the rehabilitation center.

[0006] A Danish group of researchers has proven that hip protector means with energy dispersing materials protecting the greater trochanter decreases the number of hip fractures compared to persons with no hip protection by up to 53%. By the diversion of the impact to the surrounding area, the released energy is transferred to the soft tissue and muscles surrounding the greater trochanter and subsequently transferred further on to the femoral bone. ["Effect of the external hip protectors on hip fractures", J.B. Lauritzen, et al, The Lancet Vol 341, Jan 2, 1993]. Energy dispersing hip protector means for protection of the greater trochanter are for instance known from WO 95/19154.

[0007] The most common method to fixate the hip protector means is to incorporate the hip protector means in underpants. By fixation of the hip protector means in underpants it is ensured that the protector means are centred over the greater trochanter when the pants are positioned correctly. Such a garment with hip protector means, which is known from for instance US 6,195,809, US 4,807,301 and WO 96/20615, can be difficult for persons of the above mentioned risk groups to put on and take off during changing of clothes, while going to the toilet or other similar activities.

[0008] A different way of fixing the hip protector means is by sticking the hip protector means directly to the skin over the greater trochanter, a so-called self-sitting protection. The protectors can be difficult to put on, so that the protectors are placed correctly over the greater trochanter and so that they will not fall off during an activity were moisture is generated between the skin and the protectors.

[0009] Neither the underpants with hip protectors nor the self-sitting protection are suitable to use in rehabilitation centres. Both protections are difficult to put on and take off due to the fact that undressing is needed in both incidents. Furthermore, because both protections are worn directly on the skin at great number of protections as well as washing procedures are needed for hygiene considerations.

[0010] Additionally, some users prefer to wear their own underwear and others dislike the feeling of something being glued to or adhering to their skin.

[0011] By wearing underpants having protection means or self-sitting protectors an increase of the proportions of the hip is obtained. Due to the fact that this protection is worn beneath clothes and the proportion of the hips is increased, the wearer often feels less attractive, wherefore some persons refrain from wearing the hip protection during public activities. In some cases, the person's clothes will no longer fit, when a person begins to wear hip protectors beneath the clothes.

[0012] Additionally, when wearing the above mentioned protection during an activity heat is confined between the body and the protection, and both kinds of protection are worn beneath some clothing and therefore not easily detached for temporary cooling. This unpleasant heat generated during the activity may refrain persons from wearing the underpants with protector means or self-sitting hip protector means.

[0013] Also in some of the mentioned research studies, compliance has been an issue to some of the participants. Some participants have not wished to wear the protector means for different reasons, and the same has been the case in the daily life, with some of the potential users in the risk groups, who have decided not at all to use, or no longer to use hip protector means.

[0014] Some potential users do not consider themselves being so much at risk that they are willing to wear hip protectors all the time. There is thus a need for hip protectors that they can put on easily when they feel par-

ticular at risk, i.e. during exercise, while cleaning, while walking the dog, during other physical activity, at night when going to the bathroom, in the winter when it can be slippery, etc. and take of as easily afterwards.

[0015] For these and other reasons many persons in the risk groups mentioned are choosing not to wear hip protector means of the known types, even though they are statistically exposed to hip fractures from falling. As an example of this, in the research referred to above, the persons who fractured their hips during the trial period for different reasons did not wear the underpants with hip protector means and therefore were not protected, when they fell and fractured their hip.

[0016] In general whenever a person of the risk groups mentioned above is active, there is a need for a hip protection, which protects the human body of the wearer sufficiently in the case of e.g. falling. Furthermore, a need for the protection to be easily attached before an activity and detached after the end of the activity without limiting the wearer during the activity, and which will give the human body the same protection as the pants with protection means, so that more persons will protect themselves when they are most exposed.

[0017] There is thus a need for a protection of the hip during an activity of the human body, which is easily attached before and detached after the activity.

[0018] Furthermore, there is a need for a protection, which can transport the heat out from the human body produced during such activity.

[0019] Additionally, there is a need for a protection, which can be worn during the nightly visit to the toilet, e.g. put on before leaving the bedside and taken off when back in the bed again, so that no removal of tight fitting underpants and therefore the risk of falling during the undressing of the underwear is reduced and the hips can be protected, even during the toilet visit.

[0020] There is also a need to offer a hip protector that is aesthetically pleasing, comfortable to wear and suitable to use during activity, that may be worn on top of normal clothes. This could contribute to convincing people in the risk groups that it is acceptable to wear hip protectors and to show them.

[0021] Finally, there is a need for a hip protection that is suitable for use in rehabilitation situations, which is easy to put on, easy to adjust in size, and can be worn by different patients without hygiene issues.

Summary of the Invention

[0022] An object of the present invention is to overcome wholly or partly the above disadvantages and drawbacks of the prior art. More specifically, it is an object to provide a device for the protection of the hips of a human body in case of falling, which is easily attached before an activity, and easily detached when the activity is finished, and which protection will remain securely in place during the activity and not limit the activity of the wearer of the hip protection.

[0023] Furthermore, it is an object of the present invention to provide a device which can remain securely in place during an activity and which may provide a secure fixation of the protection means.

[0024] Additionally, it is an object of the present invention to provide a device which is easily put on, positioned correctly and fastened by an elderly person.

[0025] An additional object of the present invention is to provide a protection of the hip which is easy to produce.

[0026] The above objects, together with numerous other objects, advantages and features, which will become evident from the below description, are accomplished by a solution in accordance with the present invention by a device for protection of the hips of a human body, in which the inner surface at least partly comprises friction enhancing means to ensure that the hip protection means stay securely in place over the greater trochanters.

[0027] Hereby, a protection of the hip by means of a device surrounding the wearers hip area with the protection means is obtained, and which device will remain in place during an activity and during a potential fall, without, the device limiting the wearer of the hip protector device during the activity. The device is further easily attached before an activity and likewise easily detached after.

[0028] Furthermore, the device may fit a certain range of sizes of the human body because of the elasticity of the material or adjustment means, and the device further fits wearers with different body shapes due to the fact that the device is mainly fastened by friction between the inner surface of the device and the surface of the wearers body or clothes with the aid of the friction enhancing means.

[0029] During use, the friction enhancing means of the inner surface ensures that the device, when worn, cannot slide upwards, downwards or sideways during an activity, by which the protection means during the activity is kept in the right position over the greater trochanter.

[0030] Advantageously, according to the invention the friction enhancing means may comprise a structured surface. The friction between the surface of the wearers skin or clothes and the inner surface of the device is enhanced because the surface is barbed by the structure of the surface. It is hereby obtained that the structured inner surface of the device can engage with the outer surface of the wearers skin or clothes and by differently structured surfaces of the inner surface of the hip protector device, the hip protector device may fit different kinds of surfaces of the wearer, e.g. from the skin to underwear and outdoor clothing.

[0031] Expediently according to the invention, the friction enhancing means may be adapted to increase the friction in the vertical or/and the horizontal direction of the device, preferably in both directions.

[0032] In another preferred embodiment according to the invention the structured surface may comprise a plurality of substantially lateral circumferential beads. By these beads it is obtained that the device essentially is hindered from moving either upwards or downwards,

when the wearer of the device is active.

[0033] Additionally, the structured surface comprises a plurality of beads substantially perpendicularly to the surrounding direction of the device according to an embodiment of the present invention. By beads in this direction it is achieved that the hip protector device is not moved in the circumferential direction of the wearer when active.

[0034] Furthermore, the structured surface may comprise a plurality of projections according to a preferred embodiment of the present invention. By a plurality of projections it is obtained to enhance the friction between the inner surface of the device and the wearers surface is enhanced, and the projections may be made in different patterns.

[0035] According to the present invention the friction enhancing means may comprise friction enhancing material on the inner surface of the device, such as e.g. textile-based, rubber, silicone, elastane, neoprene or the like materials. By using friction enhancing material, friction in all directions is achieved and the friction enhancing means will hereby prevent the device from moving upwards, downwards and sideways.

[0036] In another preferred embodiment according to the invention the belt part may have at least one of the properties breathable, cushioning, moisture transporting, supporting or isolating. Hereby is obtained that one or more properties may be built into the device.

[0037] Furthermore, in an additional preferred embodiment according to the invention the belt part may be made of a cushioning, elastic material, such as spacer fabric, laminated textile or foam material, such as neoprene or the like, or a combination thereof. Especially these materials have proven expedient to provide a device, wherein one or more properties may be incorporated.

[0038] Advantageously, in another preferred embodiment according to the invention the device may comprise locking means, such as loops/hooks, button/buttonholes, hook/eye, press studs or buckles etc. The possibility for a person to easily put on or remove the device while sitting down is hereby achieved, e.g. before activity, rehabilitation, in bed or the like.

[0039] In an embodiment of the present invention the protection means may be made of a rigid, semi-rigid or softer material proven to be able to prevent hip fractures.

[0040] According to another embodiment of the present invention the belt part may comprise receiving means, which have been adapted to keep the protection means securely in place and which receiving means are either open or closed. By open receiving means it is achieved that the hip protection means may be removed before washing, if they are of a type that does not stand the particular washing method. By a incorporating closed receiving means, the protection means are always secured in the device and cannot be forgotten to be put in the device, e.g after washing.

[0041] Advantageously, the belt part may comprise protection means for protection of the coccyx or the lower part of the spine. It is hereby obtained that both the hip, the coccyx and/or the lower part of the spine are protected to some extent by the same device.

[0042] Additionally, according to the invention the width of the hip protector device in the direction perpendicular to the surrounding direction may at least correspond to the height of the protection means in the area of the hip, so as to keep the protection means securely in place.

Brief Description of the Drawings

[0043] The invention and its many advantages will be described in more detail below with reference to the accompanying schematic drawing, which for the purpose of illustration show some non-limiting embodiments and in which

Fig. 1 shows in perspective a device according to the invention,
Fig. 2 shows in perspective the device with a plurality of substantially lateral circumferential beads on the inner surface of the device according to an embodiment of the invention,
Fig. 3 shows in perspective another embodiment of the inner surface of the device according to the invention,
Fig. 4 shows in perspective the device with both protection of the hip and the coccyx,
Fig. 5 shows in perspective the device as a pull-on device,
Fig. 6 shows the structured inner surface with a plurality of projections, and
Fig. 7 shows a cross sectional view of the belt part according to one embodiment of the invention.

[0044] All the figures are highly schematical and not necessarily to scale, and they show only parts which are necessary in order to elucidate the invention, other parts have been omitted or merely suggested.

Description of the Preferred Embodiments

[0045] Fig. 1 shows a device 1 for protection of a hip of the human body according to the invention, in which a belt part 10 has been arranged to surround the human body at the height of the hips. The belt part 10 is at least partly made of an elastic material and is further provided with an inner surface 2, an outer surface 3 and hip protection means 4. Furthermore, the inner surface comprises at least partly friction enhancing means to ensure that the hip protection means 4 stay in place, which is illustrated by a dotted line in Fig. 1. The hip protection means are here shown as implemented in the elastic material of the belt part 10, but may also be fastened on the outside of the belt part 10 or on the inside of the belt part 10.

[0046] Furthermore, the device 1, shown in Fig. 1, have

a height a in the area of the hip which at least is the same height b of the hip protection means. In this embodiment the height a is larger than that of b. The device furthermore comprises an anatomically shaped form, i.e. a cutting out at the bottom of the device towards the legs of the wearer of the device so to allow sitting down comfortably as well as give space to the movement of the legs during activity.

[0047] Advantageously, the protection means 4 are made of a rigid, semi rigid or softer material, which has been proven to give adequate protection of the hips in case of a fall.

[0048] As shown in Fig. 2 the friction enhancing means may according to an aspect of the present invention comprise a structured surface 5, which may be in form of a plurality of substantially lateral circumferential beads 5. Each bead is mechanically engaging with the surface of the persons skin or clothes, so as to keep the device and the protection means from moving either upwards, downwards or sideways during activity. Within the inventive idea the inner surface of the device may be ribbed, ridged, corrugated, grooved, wavy or the like, in order to provide the necessary friction between the wearer and the inner surface of the device.

[0049] According to another preferred embodiment of the present invention the structured surface 2 may comprise a plurality of beads 5 substantially perpendicular to the surrounding direction of the device 1 (not shown). These beads 5 ensure that the device 1 and the protection means 4 remain in place in the circumferential direction of the person wearing the device 1. In Fig. 3 is shown a check pattern in a further embodiment of the present invention so that both direction is incorporated in the friction enhancing means, whereby the device and the protection means 4 remain in the right position given by the person when putting on the device 1. The matter is that a securely fixation of the device and thereby of the protection means is obtained.

[0050] Furthermore, in Fig. 3 is shown an adjustable closure means, by the belt part 10 overlaps in the area above the cut area 9. The overlap is shown by the dotted line 11. The adjustable closure means 8 may for instance be hooks/loops placed adjacent to each other, thereby achieving a possibility for fitting the belt part 10 within a specific range to different wearers or different layers of clothes worn by the wearer.

[0051] A structured surface, comprising a plurality of substantially lateral circumferential beads, a plurality of projections or other friction enhancing structure may all be manufactured in the same process as the elastic material used for the belt part, for instance by knitting. By this, it is obtained that at least one process may be avoided in comparison with friction enhancing means, which is made in a subsequent treatment of the inner surface of the device.

[0052] Advantageously, the belt part 10 may further comprise protection means 7 for protection of the coccyx of the human body shown by a dotted line in Fig. 4. By which the device 1, besides providing a protection of the hips, also comprises a protection of the coccyx, so as to prevent fractures of the human body being caused by falls.

[0053] The devices 1 shown in Figs. 1 to 4 are all shown as comprising locking means 8. In Fig. 1 the locking means are shown by a dotted line 8 in order to indicate locking means such as loops/hooks. In Fig. 2 the locking means are shown as two press studs 8. In Fig. 3 the locking means are shown by a dotted line, so as to indicate locking means such an adjustable loops/hooks closure 8. The device may as well be locked by buttons/buttonholes, hook/eye, buckles or the like. Additionally, the locking means may be adjustable, so the device may be tightened more or less and adjusted to fit different body sizes within a certain range. When putting the device on a person, the device 1 is opened by unlocking the locking means 8 and subsequently placing the hip protector device around the body, so that the hip protection means 4 are placed over the greater trochanter, and finally the device 1 is locked by connecting the locking means 8 arranged on the opposite sides of the ends of an open device 1.

[0054] In Fig. 5 the device 1 is shown as a closed cylinder, which is put on by pulling it over the head or the feet of the wearer and placed around the body, with the hip protection means placed over the greater trochanter. The devices shown in Figs. 1 to 4 may in other embodiments be produced as a closed cylinder instead of a lockable device, in which the friction enhancing means and the elastic material of the device provide the fixation of the device in the right position over the hip of the human body during activity. In spite of the disadvantages in more complicated mounting, this embodiment may be preferred by some users, as the lack of closing means 8 would make the device less bulky.

[0055] The structured surface may further advantageously comprise a plurality of projections 6, as shown by example in Fig. 6. This structure may also be combined with the beads 5 mentioned above.

[0056] In Fig. 7 is shown a cross sectional view taken through a belt part according to the invention. By this embodiment a zig-zag cross sectional configuration is shown which in expedient manner have a high friction.

[0057] The friction enhancing means 5, 6 may according to an advantageous aspect of the present invention exist in the form of a friction enhancing material on the inner surface 2, such as e.g. textile based, rubber, silicone, elastane, neoprene, or the like materials. According to the inventive idea the inner surfaces may in that case either be plane or structured.

[0058] Furthermore, according to an additional preferred embodiment the belt part 10 may have at least one of the properties breathable, cushioning, moisture transporting, supporting or isolating, such as warming or cooling, so that the device 1 is comfortable to wear during a more or less demanding activity.

[0059] Advantageously, the belt part 10 is made of a

cushioning, elastic material, such as spacer fabric, laminated textile or foam material, such as neoprene or the like or a combination thereof.

[0060] Advantageously, the friction enhancing means and/or friction enhancing material may be knitted into a spacer fabric, which comprises several important properties such as elasticity, cushioning, breathable and support. Cushioning is especially important between the hip protection means and the wearer, when rigid or semi-rigid hip protection means are used, in order not to discomfort the user or create pressure marks.

[0061] According to the present invention the protection means 4 may be centred over the greater trochanter, and a further protection may be centred over the coccyx, which is often also exposed during a fall.

[0062] Furthermore the device 1 may have an outer surface 3 with a smooth design, to ease the movement of clothes over the device, when the wearer chooses to wear the device underneath some of his or her clothing.

[0063] Advantageously, in a preferred embodiment of the present invention the inner surface comprises material, which is comfortable to wear for the person. It is hereby obtained that if the wearer chooses to use the device directly on the skin the device would be more pleasant to wear against the skin.

[0064] The device according to the invention is especially expedient when being used by active elderly persons, persons having osteoporosis or persons attending rehabilitation.

[0065] In a preferred embodiment of the present invention the device 1 may comprise hydrophobic materials. It is hereby achieved that the device may be used regardless of the weather.

[0066] Finally the invention further relates to a method for producing a device as outlined previously by knitting the belt part with integrated friction enhancing means.

[0067] Advantageously, the knitting process may use elastane in some areas and not in other areas of for instance a spacer fabric, whereby tension differences are obtained throughout the knitted spacer fabric so as a zigzag structure may be achieved.

[0068] Although the invention above has been described in connection with preferred embodiments of the invention, it will be evident for a person skilled in the art that several modifications are conceivable without departing from the invention as defined by the following claims.

Claims

1. A device (1) for protection of the hips of the human body comprising a belt part (10) arranged to surround the human body at least in the area of the hips, which at least is partly made of an elastic material having an inner surface (2) and an outer surface (3), and hip protection means (4), **characterised in that** the inner surface at least partly comprises friction enhancing means (5) to ensure that the hip protection means (4) stay securely in place over the greater trochanters.

2. A device (1) as claimed in claim 1, wherein the friction enhancing means are adapted to increase the friction in the vertical or/and the horizontal direction of the device.

3. A device (1) as claimed in claim 1 or 2, wherein the friction enhancing means comprises a structured surface (5).

4. A device (1) as claimed in claim 3, wherein the structured surface comprises a plurality of substantially lateral circumferential beads (5).

5. A device (1) as claimed in claim 3, wherein the structured surface comprises a plurality of projections (6).

6. A device (1) as claimed in claims 1 to 5, wherein the friction enhancing means comprise friction enhancing material on the inner surface (2), such as e.g. textile-based materials, rubber, silicone, elastane, neoprene or the like material.

7. A device (1) as claimed in claims 1 to 6, wherein the belt part (10) possesses at least one of the properties breathable, cushioning, moisture transporting, supporting or isolating.

8. A device (1) as claimed in claims 1 to 7, wherein the belt part is made of an elastic material, such as knitted fabric, spacer fabric, laminated textile or foam material, such as neoprene or the like, or a combination thereof.

9. A device (1) as claimed in claims 1 to 8, wherein the device comprises locking means, such as loops/hooks, button/buttonhole, hook/eye, press studs or buckles.

10. A device (1) as claimed in claims 1 to 9, wherein the protection means (4) are made of a rigid, semi-rigid or soft material.

11. A device (1) as claimed in claims 1 to 10, wherein the belt part (10) comprises receiving means (7), which is adapted to keep the protection means (4) in place and which receiving means are either open or closed.

12. A device (1) as claimed in claims 1 to 11, wherein the belt part (10) comprises protection means for protection of the coccyx and/or lower part of the spine.

13. Use of a device (1) as claimed in claims 1 to 12 by active elderly persons, persons having osteoporosis

or persons attending rehabilitation.

14. A method for producing the belt part (10) of the device (1) as claimed in claims 1 to 12, **characterised by** the step of knitting the belt part (10) with integrated friction enhancing means.

Patentansprüche

1. Vorrichtung (1) zum Schutz der Hüften eines menschlichen Körpers mit einem Gürtelteil (10), welcher so angeordnet ist, dass er den menschlichen Körper wenigstens im Bereich der Hüften umgibt, wobei das Gürtelteil (10) zumindest teilweise aus einem elastischen Material mit einer Innenseite (2) und einer Außenseite (3) gebildet ist, und mit einer Hüftschutzeinrichtung (4),
dadurch gekennzeichnet,
dass die Innenseite zumindest teilweise eine Reibungserhöhungseinrichtung (5) aufweist, durch welche die Hüftschutzeinrichtung (4) sicher im Bereich des Trochanter major (großer Rollhügel) gehalten ist.

2. Vorrichtung (1) nach Anspruch 1, wobei die Reibungserhöhungseinrichtung zur Erhöhung der Reibung in vertikaler und/oder horizontaler Richtung der Vorrichtung ausgebildet ist.

3. Vorrichtung (1) nach Anspruch 1 oder 2, wobei die Reibungserhöhungseinrichtung eine strukturierte Oberfläche (5) aufweist.

4. Vorrichtung (1) nach Anspruch 3, wobei die strukturierte Oberfläche eine Vielzahl von im Wesentlichen lateral in Umfangsrichtung verlaufenden Wülsten (5) aufweist.

5. Vorrichtung (1) nach Anspruch 3, wobei die strukturierte Oberfläche eine Vielzahl von Vorsprüngen (6) aufweist.

6. Vorrichtung (1) nach einem der Ansprüche 1 bis 5, wobei die Reibungserhöhungseinrichtung ein Reibungserhöhungsmaterial wie beispielsweise auf Textil basierende Materialien, Gummi, Silicon, Elastan, Neopren oder ähnlichen Materialien, auf der Innenseite (2) aufweist.

7. Vorrichtung (1) nach einem der Ansprüche 1 bis 6, wobei das Gürtelteil (10) wenigstens eine der folgenden Eigenschaften aufweist: atmungsaktiv, polsternd, feuchtigkeitstransportierend, abstützend oder isolierend.

8. Vorrichtung (1) nach einem der Ansprüche 1 bis 7, wobei das Gürtelteil aus einem elastischem Material wie Maschenware, Textilabstandsstrukturen, laminierte Textilien oder Schaummaterial, wie Neopren oder dergleichen, oder einer Kombination aus diesen gebildet ist.

9. Vorrichtung (1) nach einem der Ansprüche 1 bis 8, wobei die Vorrichtung eine Arretiereinrichtung wie Maschen/Haken, Knöpfe/Knopflöcher, Haken/Ösen, Druckknöpfe oder Schnallen aufweist.

10. Vorrichtung (1) nach einem der Ansprüche 1 bis 9, wobei die Schutzeinrichtung (4) aus einem steifen, halbsteifen oder weichen Material gebildet ist.

11. Vorrichtung (1) nach einem der Ansprüche 1 bis 10, wobei das Gürtelteil (10) eine Aufnahmeeinrichtung (7) aufweist, welche zum Halten der Schutzeinrichtung (4) an entsprechender Stelle ausgebildet ist und welche Aufnahmeeinrichtung entweder offen oder geschlossen ist.

12. Vorrichtung (1) nach einem der Ansprüche 1 bis 11, wobei das Gürtelteil (10) eine Schutzeinrichtung zum Schutz des Steißbeins und/oder eines unteren Teils der Wirbelsäule aufweist.

13. Verwendung einer Vorrichtung (1) nach einem der Ansprüche 1 bis 12 bei aktiven älteren Personen, Personen mit Osteoporose oder Personen in der Rehabilitation.

14. Verfahren zur Herstellung des Gürtelteils (10) der Vorrichtung (1) nach einem der Ansprüche 1 bis 12, **gekennzeichnet durch** den Schritt des Strickens des Gürtelteils (10) mit integrierter Reibungserhöhungseinrichtung.

Revendications

1. Dispositif (1) pour la protection des hanches d'un corps humain comprenant une partie de sangle (10) agencée pour entourer le corps humain au moins dans la région des hanches, qui est au moins partiellement réalisée avec un matériau élastique ayant une surface interne (2) et une surface externe (3), et des moyens de protection de hanche (4), **caractérisé en ce que** la surface interne comprend au moins partiellement des moyens améliorant le frottement (5) pour garantir que les moyens de protection de hanche (4) restent fixement en place sur les grands trochanters.

2. Dispositif (1) selon la revendication 1, dans lequel les moyens améliorant le frottement sont adaptés pour augmenter le frottement dans la direction verticale ou/et horizontale du dispositif.

3. Dispositif (1) selon la revendication 1 ou 2, dans lequel les moyens améliorant le frottement comprennent une surface structurée (5).

4. Dispositif (1) selon la revendication 3, dans lequel la surface structurée comprend une pluralité de bourrelets circonférentiels (5) sensiblement latéraux.

5. Dispositif (1) selon la revendication 3, dans lequel la surface structurée comprend une pluralité de saillies (6).

6. Dispositif (1) selon les revendications 1 à 5, dans lequel les moyens améliorant le frottement comprennent un matériau améliorant le frottement sur la surface interne (2) tel que par exemple des matériaux à base de textile, du caoutchouc, de la silicone, de l'élasthanne, du néoprène ou un matériau similaire.

7. Dispositif (1) selon les revendications 1 à 6, dans lequel la partie de sangle (10) possède au moins l'une des propriétés de respirabilité, d'amortissement, de transport d'humidité, de support ou d'isolation.

8. Dispositif (1) selon les revendications 1 à 7, dans lequel la partie de sangle est réalisée avec un matériau élastique, tel qu'un tissu tricoté, du tissu en 3D, du textile stratifié ou un matériau en mousse, tel que du néoprène ou similaire, ou leur combinaison.

9. Dispositif (1) selon les revendications 1 à 8, dans lequel le dispositif comprend des moyens de blocage, tels que des boucles/crochets, un bouton/une boutonnière, un crochet/un oeillet, des boutons pression, ou des boucles.

10. Dispositif (1) selon les revendications 1 à 9, dans lequel les moyens de protection (4) sont réalisés avec un matériau rigide, semi-rigide ou souple.

11. Dispositif (1) selon les revendications 1 à 10, dans lequel la partie de sangle (10) comprend des moyens de réception (7), qui sont adaptés pour maintenir les moyens de protection (4) en place et lesquels moyens de réception sont ouverts ou fermés.

12. Dispositif (1) selon les revendications 1 à 11, dans lequel la partie de sangle (10) comprend des moyens de protection pour la protection du coccyx et/ou la partie inférieure de la colonne vertébrale.

13. Utilisation d'un dispositif (1) selon les revendications 1 à 12 par des personnes âgées actives, des personnes atteintes d'ostéoporose ou des personnes en rééducation.

14. Procédé pour produire la partie de sangle (10) du dispositif (1) selon les revendications 1 à 12, **caractérisé par** l'étape consistant à tricoter la partie de sangle (10) avec des moyens améliorant le frottement intégrés.

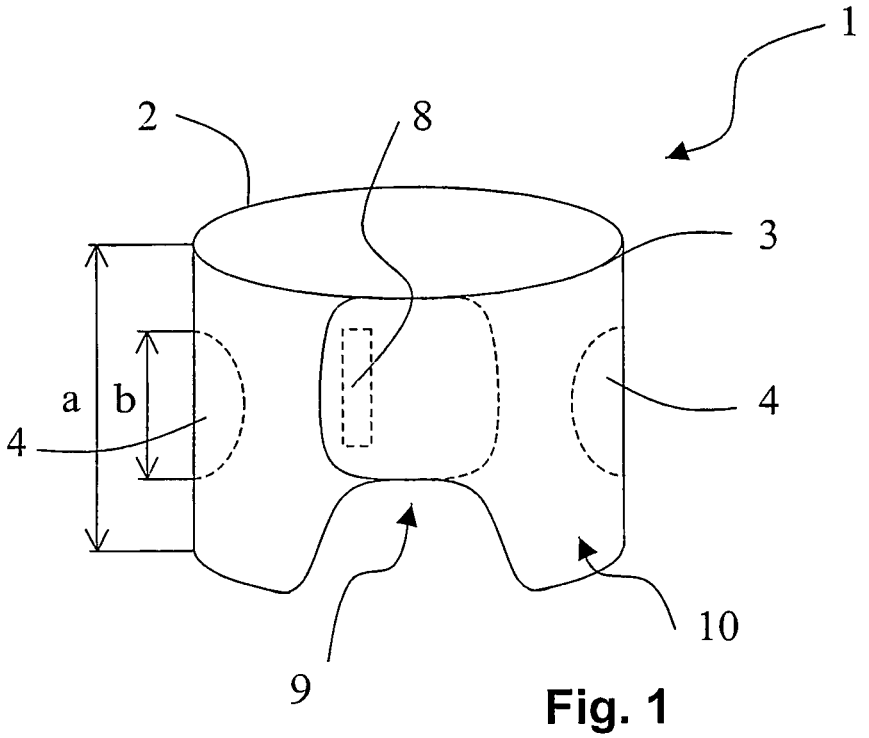

Fig. 1

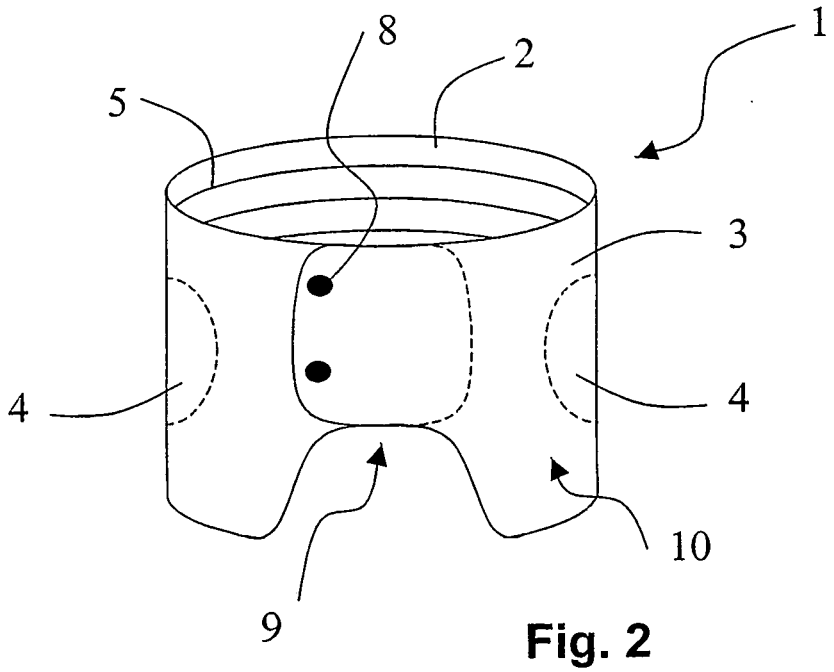

Fig. 2

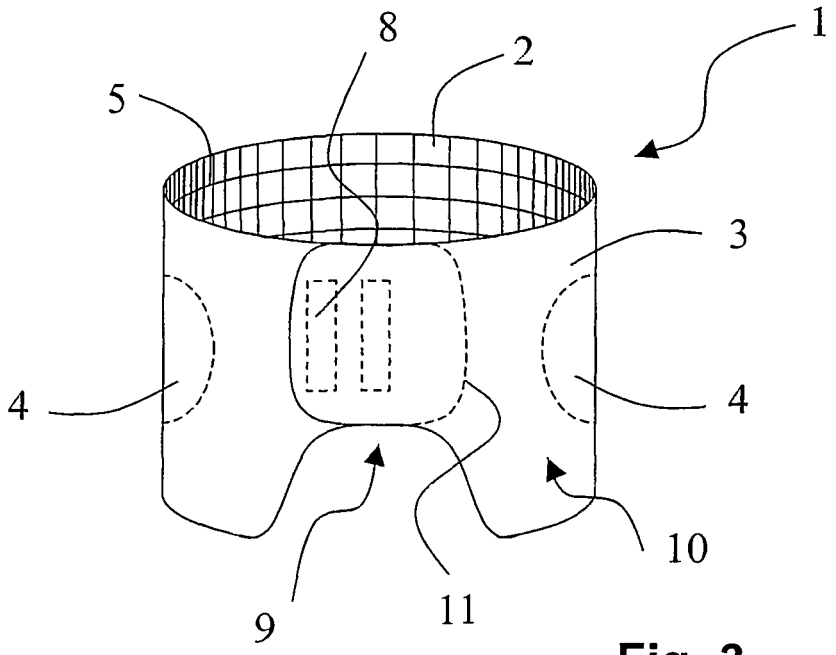

Fig. 3

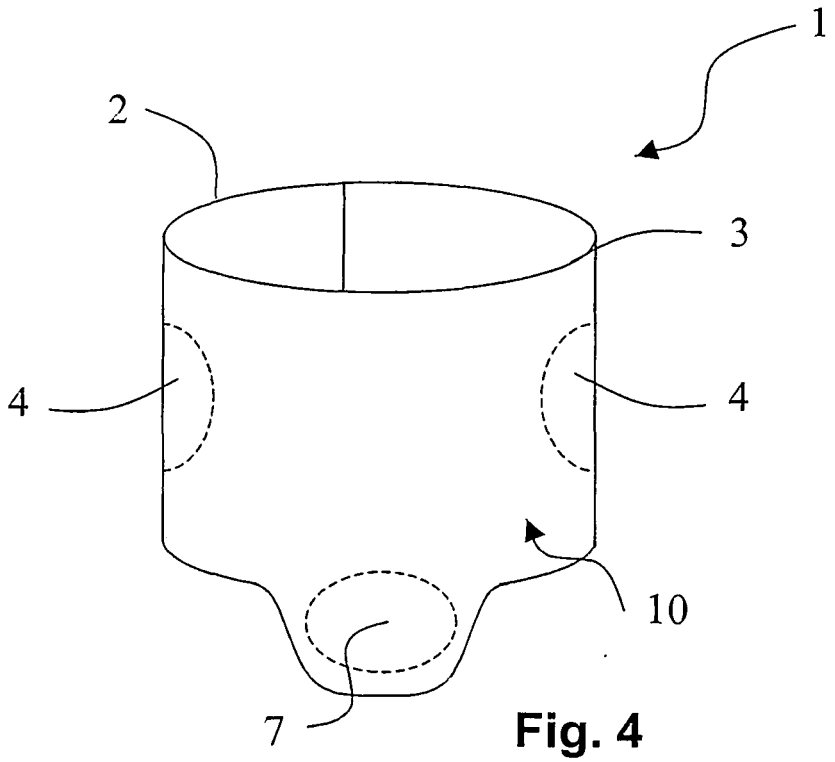

Fig. 4

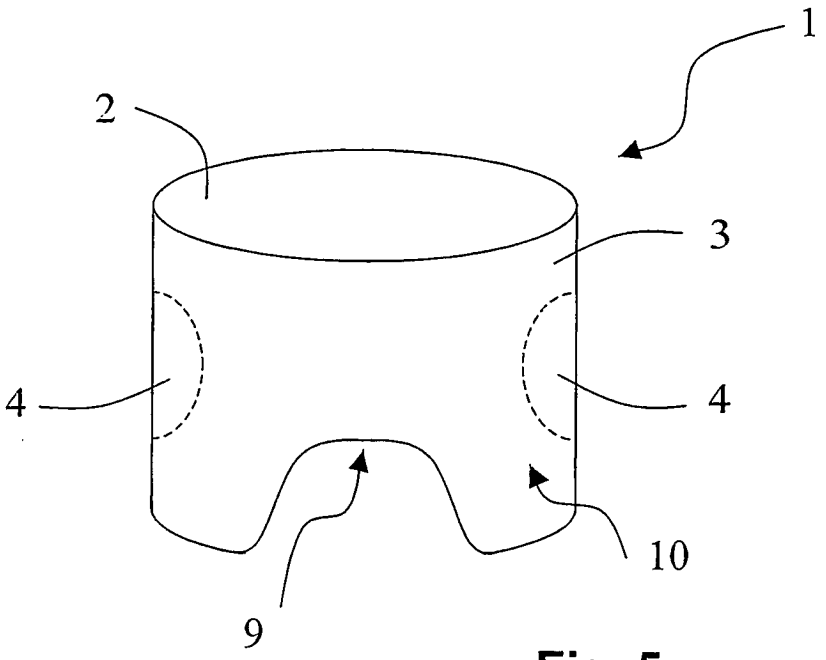

Fig. 5

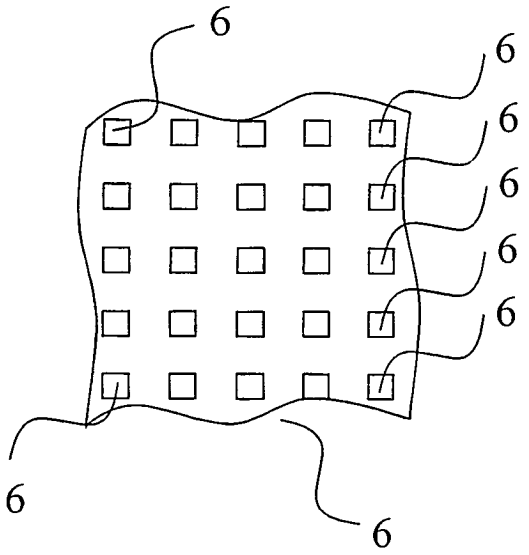

Fig. 6

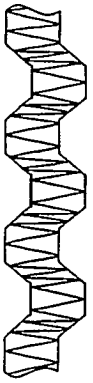

Fig. 7