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(54) **MANUFACTURE OF A GARMENT AND SUCH A GARMENT**

HERSTELLUNG EINES KLEIDUNGSSTÜCKS UND EIN SOLCHES KLEIDUNGSSTÜCK

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Description

Background of the invention

[0001] The present invention concerns a method for manufacturing a clothing article for use with persons that have developed a hernia or are in danger of developing a hernia, preferably an ostomy hernia, which clothing article is made for exerting compression on the user and intended for being disposed around the lower part of the body of the user and made with a predefined size and shape. The invention furthermore concerns such a clothing article.

[0002] By hernia, as used in the present patent application, is understood an abnormal protrusion of an organ or parts thereof through the wall of a body cavity. With hernia is furthermore understood a bulging appearing around a site of operation, e.g. after an ostomy operation.

[0003] For persons suffering from hernia, it is important to use a bandage or clothing article that exerts compression against the skin in order that the hernia is kept in place inside. Such a bandage or clothing article may also be used as a preventive measure.

[0004] In particular for persons that have gone through an ostomy operation, and who subsequently have acquired an ostomy hernia, it is important to get a bandage or clothing article which exert compression in an area around the ostomy aperture. Furthermore, it is important that the ostomy aperture fits exactly to the type of ostomy bag used by each individual person, and which at the same time is correctly disposed in the clothing article. If the aperture in the clothing article is too narrow, it can be difficult to mount the ostomy bag, and if the aperture is too large, there will be a risk that the hernia or a part thereof is pressed out through the aperture.

[0005] A number of clothing articles are known where the required compression is produced by different belts and straps which are tightened by being taken on, or after the user has put the clothing article on. By having elastic bands extending in circumferential direction, desired compression can be established after the user having put on the clothing article. However, such products will be unsuitable for use with ostomy hernia, as the user can displace the ostomy aperture by tightening the belts, which can be critical. Furthermore, the belts are hard, rigid and thick and therefore difficult to mount, particularly for persons with weak fingers.

[0006] For persons with ostomy hernia, there are methods where clothing articles are tailored to the individual patient. Thus the clothing article is made individually according to the detailed measures of the patient. After the patient has been measured, a centre for the ostomy is determined. After that, data concerning the clothing article and the associated ostomy bag are sent to the producer who makes an individually tailored clothing article including an aperture for the ostomy in the bandage. As mentioned, it is important that this aperture, both with regard to size and to position, is correctly placed so that problems do not occur when the ostomy bag is passed out through the ostomy aperture of the clothing article.

[0007] Some of the prior art clothing articles for ostomy hernia are made in elastic material in which extra abdominal reinforcements are sewn for keeping the hernia in place. Furthermore, the edge of the ostomy aperture will be reinforced with an edge band, synthetics or other, so that the ostomy aperture is stable during use. Furthermore, the clothing article may internally be provided with a sewn reinforcement.

[0008] The prior art products with adjustable belts will clutter much under the clothing and are uncomfortable and may, as mentioned, be difficult to dispose correctly since there is a risk that the correct position of the ostomy aperture is not secured. The tailored products are also very little flexible since they are only suited for one person. The product is thus not suited for mass production by individual adaptation, such as feasible with the clothing articles based on using adjustable belts. The tailored product will furthermore be disadvantageous since it is adapted to a person with a given size. By weight increase or weight loss there will therefore be a need for making new clothing articles.

[0009] Moreover US 6 080 124 discloses a clothing article in the form of an abdominal postoperative binder which is made from inelastic material to exert mechanical compression on a patient. This binder is not flexible in making and adaptation and therefore it is not suited for mass production.

[0010] The reason for the present invention is a desire of only making one clothing article, preferably in the shape of a panty brief, for persons with hernia, irrespectively whether this is a common hernia or an ostomy hernia. Particularly it is desirable to make a clothing article which does not have the drawbacks of the prior art products, which is flexible in making and adaptation, and which therefore is suited for mass production. It is thus desirable to be able to produce clothing articles in a predefmed variation of size and shape which has anatomical adaptation to users with different size. Furthermore it is desirable to make a comfortable clothing article that establishes the required compression for the daily use of the person, and which additionally can be used as "measuring panty brief' for use in determining the centre of an ostomy when speaking of an ostomy hernia or other operation hernia.

[0011] The object of the present invention is to provide a clothing article, preferably in the form of a panty brief which is suited for mass production and which nevertheless is easy to put on, and which simultaneously is suited for persons that have developed a hernia or are in danger of developing a hernia, preferably an ostomy hernia, as there is provided a size and a shape providing a fit which even at small variations in body size and shape ensure correct compression and possibility of a correct and secure positioning of an ostomy aperture in the clothing article.

[0012] According to the invention, this is achieved with

a method of the kind mentioned in the introduction, which is peculiar in knitting a seamless tubular item, which is made with anatomic fit for establishing a firm yet elastic structure for producing compression of between 2,00 to 6,67 kPa (15 to 50 mmHg) within a previously selected area of the clothing article, and which provides an approximately constant compression within a certain range of users' sizes and shapes by knitting a high percentage of elastic yarns having a largely flat force - elongation characteristic, possibly in combination with a compact knitting structure and a firm, tight stitch pattern.

[0013] In a particular embodiment, the method includes a step for extending the material in the tubular item for establishing the firm yet elastic structure in a clothing article with desired fit.

[0014] In a particular embodiment, the method according to the invention may be peculiar by a step placing the tubular item on a form with a predefined size and shape for selective fixation of the item while located on the form.

[0015] The clothing article according to the invention is peculiar in that it is formed by a seamless, knitted, tubular item which is intended for being disposed around the lower body part of the user, and which is made with a firm yet elastic structure for forming a compression between 2,00 to 6,67 kPa (15 and 50 mmHg) within a preselected area of the clothing article in order to provide an anatomical fit, and which provides an approximately constant compression within a certain range of users' sizes and shapes, which compression is created by knitting a high percentage of elastic yarns having a largely falt force- elongation characteristic, possibly in combination with a compact knitting structure and a firm, tight stitch pattern.

[0016] The clothing article is preferably extended or fixed in order to be made with anatomical fit in the predefined size and shape. Furthermore, the clothing article is preferably peculiar in that the tubular item is sewn together at one end for forming a panty brief with a lower body part, groin area and leg openings.

[0017] By the invention there is thus created a clothing article that has an anatomical adaptation in size and shape with a variation which is selected in advance. It may be said that a clothing article is formed which in non-extended or 'slack' condition has a greater size, making it easier for the user to put on the clothing article, even if it has a compression which is necessary for supporting a hernia. The formed compressive area will preferably be formed on the front side of the clothing article.

[0018] According to the invention, it is thus possible to form a compressive area which can be used to prevent and/or secure a hernia, e.g. in connection with ostomy. The compression is created by knitting a high percentage of elastic yarns, e.g. elasthane, possibly in combination with a compact knitting structure and a firm, tight stitch pattern. Due to extension, the clothing article will become easier to put on since it is formed with a size which is 'greater' than a clothing article with corresponding properties for compression. Possibly, the clothing article is formed particularly larger in areas for buttocks and hips.

[0019] If the clothing article is to be used in connection with ostomy, the compression area is to have such nature that an aperture can be made on the relevant place without the material breaking, e.g. because of laddering. This is established by a suitable choice of knitting structure, edge covering, heat fixation or other sealing, e.g. by silicone or PU-film. With such techniques it is possible to avoid that the clothing article breaks when forming an ostomy aperture. Possibly the aperture is laced to ensure that the hernia is not partially penetrating out of the aperture.

[0020] If the clothing article is to be used for common hernia, for example hernia in the abdomen, no aperture formation is required. After measuring and testing the 'measuring panty brief on the patient, the latter is equipped with clothing articles with size and shape providing the correct anatomical fit and compression.

[0021] If speaking of a patient with ostomy hernia, a measurement of the patient will be performed in the first place, after which a clothing article with suitable shape and size is selected. After measuring the patient, a "measuring panty brief" in the shape of a clothing article that may have a particular pattern or network is selected. Localisation of the position of the ostomy aperture is established. The correct position and indication of size are sent to the producer who then adapts models of use of the clothing article by forming the ostomy aperture in the indicated position. It is thus possible to take a number of clothing articles with a predetermined size and shape and then provide these with an ostomy aperture in the correct position.

[0022] The user will then have a number of clothing articles in which the ostomy aperture is disposed correctly, and which is made with an elasticity providing the desired compression without need for sewing extra reinforcements, elastic bandages, bands or similar. The clothing article is thus suited for disposition directly on the body without cluttering too much or being uncomfortable, so that the user may have possibility of using his usual clothes upon them. Furthermore, the user may easily and rapidly order extra clothing articles without needing to show up for taking new measurement and for adapting the clothing article.

[0023] When the clothing article has been extended and possibly fixed in anatomic fit, it will exert correct compression in the areas, where it may be desired. Thus there is formed a firm contact pressure against the body, ensuring correct position of an ostomy aperture, irrespectively of the user being physically active. Thus there is no risk of the clothing article being displaced so that there is need for adjustments over the day. Due to the inherent elastic ability of the clothing article, there will be possibility of maintaining a fit, irrespectively of the user having a small loss of weight or increase in weight.

[0024] Since the clothing article is made without side seams, no local pressure actions occur which can be inconvenient for the user, and which can give rise to skin

injuries caused by the pressure forces occurring on the background of the compression in the product. In that connection it is to be mentioned that the compression used in the product may vary from 2,00 to 6,67 kPa (15 to 50 mmHg).

[0025] The clothing article according to the invention can be made by circular knitting on a body size machine or be made on a rectilinear knitting machine with two needle bars. The machines will preferably be controlled electronically, enabling possibility of variations in the choice of yam, knitting structure, stitch width, and, regarding the rectilinear knitting machine, inserting and taking out.

[0026] In that connection it is noted, that the rectilinear knitting machine is distinguished by the possibility of a better fit, as there is possibility of taking out/in and hereby form a shape in the basic item. However, the rectilinear knitting process is relatively slow compared with the circular knitting.

[0027] Circular knitting is distinguished by being made as a seamless product with a size corresponding to the circumference of the body. Hereby is produced a tubular item where variation of the yam composition over the height and circumference of the item may be established. Thus it is preferred to have a larger part of elastic yam in the part intended for use in the upper part of the item at the abdominal region of the user, while there is used a lesser part of elastic yarns in the lowermost part of the item. The lowermost part of the item may either be disposed opposite to the user's hips in an abdominal-support-like clothing article, or in a preferred embodiment, will become sewn together for forming a panty brief with lower body part area, groin area and leg openings. This sewing together may be performed before or after possible fixation of the clothing article on the form.

[0028] By making the clothing article as a panty brief, the clothing article is used as alternative for traditional fixation bandages in combination with usual panty briefs.

[0029] For persons having ostomy hernia, the clothing article will usually be positioned once a day, and due to the ostomy bag it will not be possible to take off the clothing article in connection with urination. Therefore, it is preferred that an opening is provided in the groin area of the panty brief so that there is no need for removing the clothing article for urination.

[0030] The clothing article in the form of a panty brief may be made with or without a fly.

[0031] When making the clothing article, it is possible to use different parts of elastic yarns over the height and circumference of the tubular item in order thereby to provide variation in fit as well as variation over the height of the tubular item.

[0032] According to a particular embodiment, elastic yarns, preferably elasthane, are used in a part between 15 and 60%, preferably between 30 and 50%, of the areas of the clothing article, which are to exert compression on the user's body. In other areas, e.g. the groin area in a panty brief, the share of elastic yarns will be substantially less, e.g. between 0 and 15%. Furthermore, it will be possible that these areas, as e.g. opposite the buttocks of the user, are formed with more loose knitting.

[0033] Alternatively, knitting with different yarns, e.g. thin yarns, or yarns that crimp less, may be applied. The fixation will hereby provide possibility of improving anatomical adaptation of the clothing article and thereby provide a more correct and secure positioning with compression against the user's body in the areas where there the need exists.

[0034] When manufacturing the clothing article, the compression area will typically be placed at one half of the tubular item, which is intended for disposition at the front side of the user. However, a compression in the area necessitates an annular elasticity in the entire circumference of the tubular item. However, the elasticity in the circumference of the tubular item will be affected in areas with compression. Thus there is established an extension and possibly a heat fixation within the compression area, so that a firm yet elastic structure is established in this area of the formed clothing article.

[0035] Putting on and taking off is of considerable importance to hernia patients. A significant part of hernia or ostomy patients will typically be elderly persons with reduced strength in the fingers. Therefore, it is important that the clothing article is easy to put on and take off. At the same time, it is important that the clothing article can provide the required compression while in use.

[0036] Until now, this has been achieved by using belts and straps which are tightened at or after applying the clothing article.

[0037] By a clothing article according to the invention, it is possible to facilitate putting on and taking off according to different methods. The clothing article may e.g. be provided with opening devices such as zippers, Velcro closer, snap fasteners etc. Alternatively, looser quality of the fabric in the buttock areas may be provided. Also, it is possible to make the clothing article with a readily extendible rubber band at the waist. This may either be knitted in or sewn on.

[0038] It is also possible to operate with reduced compression, e.g. in the back piece of the clothing article in relation to the compression area at the front side of the user. This may be established via the extension/heat fixation, or by varying yarns, knitting methods etc. It is also possible to make a clothing article in the shape of a panty brief without any kind of compression in the lower part. This may also be effected by the choice of yarns, knitting structure, or by reducing or omitting parts of elastic yarns or by sewing in a wedge that increases the leg width/groin width.

[0039] Practical experiments have shown good results in clothing articles where the compression area has the above elasthane shares, and where elasthane yam thickness is from 100 to 350 dtex, preferably from 150 to 250 dtex. The elasthane yam may be single thread or be braided with thin yarn (typically PA, PES, cotton or viscose).

[0040] The knitting structure in the compression area may be looping on all threads or traps on every other needle. The weight per square meter of the material will preferably be in a range between 250 and 450 g/m^2, particularly between 300 and 400 g/m^2. In other areas of the clothing article, the elasthane percentage will typically be less, the elasthane yam thickness the same or less, the knitting structure possibly more loose and the square meter weight typically lower thereby.

Description of the drawing

[0041] The invention will then be explained in more detail with reference to the accompanying schematic drawing, wherein:

Fig. 1 shows a first embodiment of a clothing article made by a method according to the invention,
Fig. 2 is a sectional view on the line II-II in Fig. 2,
Fig. 3 a view of a second embodiment of a clothing article made according to a method according to the invention,
Fig. 4 the third embodiment of a clothing article which is made by a method according to the invention,
Fig. 5 a curve showing in principle the relation between elongation measured in % and force in a clothing article made by a method according to the invention,
Fig. 6 a fourth embodiment of a clothing article made by a method according to the invention,
Fig. 7 a fifth embodiment of a clothing article made by a method according to the invention,
Fig. 8 a sixth embodiment of a clothing article made by a method according to the invention,
Fig. 9 a cross-section on the line IX-IX on Fig. 8,
Fig. 10 a seventh embodiment of a clothing article made by a method according to the invention, and
Fig. 11 an eighth embodiment of a clothing article made by a method according to the invention.

[0042] Fig. 1 shows a clothing article in the shape of panty brief 1. The panty brief includes a band 2, a lower body part area 3, a groin area 4 disposed between leg openings 5. The panty brief is seen from the front, and the panty brief includes a compression area 6.

[0043] In the shown embodiment, the compression area only includes the half part of the panty brief intended to be placed at the front side of the user, but for achieving a sufficient compression, alternatively it will be possible that the compression area 6 also includes the backpiece of the panty brief entirely or partly within the same area delimited within a same annular area 7 situated between the outer limits 8 and 9, respectively.

[0044] The compression is established by knitting in a very high part of elasthane which can occur in combination with a compact knitting structure and a firm stitch pattern. The illustrated panty brief 1 appears as a mass produced product which is ready for being provided with am ostomy aperture (not shown).

[0045] Fig. 2 shows that the panty brief is provided with a groin opening 10 disposed between two Velcro bands 11, 12. Alternatively, the opening 10 may be provided with snap fasteners or other reclosable devices.

[0046] Fig. 3 shows a second embodiment of panty brief 13. This embodiment differs from the embodiment shown in Fig. 1 by being provided with legs 14. In the shown embodiment, a wedge 15 has been sewn into the groin area 4 for providing good anatomical fit with consequent comfort for the user.

[0047] Fig. 4 shows a third embodiment of a panty brief 16 with high cutout for the leg openings 5. On the back side, an area 17 of a quality with looser knitting may be provided in order thereby to achieve fit for the user's buttocks and thereby good anatomical fit.

[0048] In order to achieved that the clothing articles are to be tailored to each individual user, it is important that the material of the clothing article has a curve including a largely flat force-elongation characteristic over a part of the curve pattern. This is illustrated in Fig. 5.

[0049] By attaining a flat curve pattern between force and elongation expressed by the elongation in percent, it is possible to achieve sufficient but not too high compression, even though lesser variations occur in the user's size. The user can thus undergo weight loss or weight increase within a certain interval without there being any appreciable effect on the force and thereby the compression exerted by the clothing article.

[0050] Furthermore, it will also be possible to make the clothing article in a limited number of different sizes and at the same time enable that different users within a certain size interval can use the same size of clothing article. Also, a clothing article with flat curve pattern between increase in force and elongation will make it possible to reduce the number of shapes, as compensation can be made for different anatomical shapes, e.g. narrow waist, heavy hips and thighs, or the opposite. Within different shapes, the clothing article will still exert an appropriate compression in the compression area of the clothing article.

[0051] Technically, it is possible to make the panty brief with shape adaptation by taking stitches in or out when using rectilinear knitting. Furthermore, it is possible to perform adjustment of knitting firmness and to use different knitting structures or to insert wedges, as e.g. indicated by the wedge 15 in Fig. 3 in order to achieve adaptation of the shape of the clothing article.

[0052] A curve pattern with a flat area for the force-elongation is achieved by using elasthane yarns and by choosing elasthane-thickness, elasthane-types and knitting patterns. The elasthane yarns may be single-threaded yarns or braided yarns.

[0053] Furthermore, the curve is established by complete or part fixation of the clothing article. By the fixation it is possible to change the pattern of the force-elongation

curve 18. By pre-stressing the clothing article, it is possible to reach a first point 19 more rapidly on the approximately flat part 20 of the curve 18. Then it is possible to increase elongation largely without changing the force/compression until a second point 21 is reached, which defines the second outer point of the largely flat curve section.

[0054] In Figs. 6 and 7 are illustrated a fourth and a fifth embodiment of a clothing article in the shape of a panty brief 22 and 23, respectively, which are made by a method according to the invention. In these embodiments are illustrated different means and properties of the panty briefs which facilitate taking them off and on. In the two embodiments, the reference number 24 illustrates opening means in the body part. These are shown disposed at one side outside the compression area. Alternatively, they may be provided in both sides of the panty brief. The opening means may include zippers, Velcro, snap fasteners, hooks, or other reclosable opening devices.

[0055] A more loose fabric quality in the buttock areas is indicated with the reference number 25. Looser fabric quality may e.g. be provided by different knitting structure, by heat fixation, by using longer stitches, or by other yam combination than the other part of the panty brief.

[0056] For further facilitating taking off and putting on, there may be used an easily extendible waist rubber band 26. This may either be knitted in or sewn on. The waist rubber band 26 may on the inner side be provided with anti-skid means, as e.g. a silicone pattern or be formed of yarns with a rubber-like surface. Hereby it becomes possible to achieve a waist rubber band that secures the panty brief, even though it is easily extendible. When the waist rubber band is thus "attached" to the body, the rubber band does not need to be very tight-fitting, facilitating taking the panty brief on and off. An upper area 27 may be produced with lower compression, or in this area there may possibly be used graduated elasticity from the waist to the upper end of the compression area. This is possible to provide by using other yarns than the yarns used in the compression area or by using looser knitting.

[0057] In order to facilitate putting on and taking off, it is possible to make a backpiece 28 with reduced compression relative to the compression area 6 at the front side of the panty brief. This difference may be established via heat fixation, by using different yarns or by looser knitting.

[0058] In the lower part 29 of the panty brief, at the backside and in the groin section, there may be used material without elasticity. This may e.g. be established by using other yarns, a different knitting structure, or with reduced or no use of elastic yarns in the area 29.

[0059] Alternatively, it is possible in sew in a wedge 30 largely corresponding to the wedge 15 which is mentioned in Fig. 3. The wedge 30 will increase the leg width/groin width and thereby facilitate putting on and taking off.

[0060] Fig. 8 shows a sixth embodiment of a panty brief 31 which is suited for a male user. As mentioned before, for ostomy patients it is cumbersome and inconvenient to have to take the panty brief down, e.g. in connection with urination. It is possible to manufacture the panty brief with an open bottom for facilitating using the lavatory. Alternatively, it is possible to provide a panty brief 31 which is provided with a fly 32 instead of the groin opening 10 illustrated in Figs. 1 and 2.

[0061] The centre pieces 33, 34 are knitted separately and sewn into the centrepiece of the panty brief with overlap 35. Hereby is created a horizontal fly opening 32 which is preferred since the transverse compression forces may have a tendency to deform/open a usual horizontal fly. This appears particularly from Fig. 9 that the centrepieces 33 and 34 are provided with rib edges 36 at the side of the fly opening 32. This contributes to keeping the fly opening closed and enables avoiding transverse seams at the fly opening.

[0062] Fig. 10 shows the seventh embodiment of a clothing article in the shape of a panty brief 37 provided with an opening 38 in the groin area 4 in order to enable urination without needing to pull the panty brief down.

[0063] Fig. 11 shows an eighth embodiment of a clothing article according to the invention in the shape of an abdominal belt 39. The abdominal belt 39 consists of a tubular item having a compression area 6 in the lower body part area at a position intended for being place at the front side of the user.

[0064] Different embodiments of clothing articles for use for persons with hernia are illustrated and explained above. Since a large number of persons that will be users of the clothing article also can have other age related disorders, it is possible to use clothing articles as a combination product. The panty brief can e.g. be used for napkin fixation on persons suffering from incontinence. Alternatively, the clothing article can be used for fixing hip protection shells for persons that suffer from osteopsathyrosis and with increased risk of hip fracture caused by falling.

Claims

1. Method for manufacturing a clothing article for use with persons that have developed a hernia or are in danger of developing a hernia, preferably an ostomy hernia, which clothing article is made for exerting compression on the user and intended for being disposed around the lower part of the body of the user and made with a predefined size and shape, **characterized by** knitting a seamless tubular item, which is made with anatomic fit for establishing a firm yet elastic structure for producing compression of between 2,00 to 6,67 kPa (15 to 50 mmHg) within a previously selected area of the clothing article, and which provides an approximately constant compression within a certain range of users' sizes and shapes by knitting a high percentage of elastic yarns having a largely flat force- elongation characteristic, possi-

bly in combination with a compact knitting structure and a firm, tight stitch pattern.

2. Method according to claim 1, **characterized by** a step for extending the material in the item or for selective fixation of the item while it is placed on a form with a predefined size and shape.

3. Method according to claims 1 or 2, **characterized by** a step for sewing together the tubular item for forming a panty brief with a lower body part area, groin area and leg openings.

4. Method according to claim 3, **characterized in that** the step for sewing together the tubular item for forming a panty brief with lower body part area, groin area and leg openings is performed optionally before or after the fixation step on the form.

5. Method according to claim 3 or 4, **characterized in that** in the groin area in the panty brief there is provided an aperture so that the user can relieve himself without taking off the panty brief.

6. Method according to any preceding claim, **characterized in that** the clothing article is made by circular knitting on a body size machine or a rectilinear knitting machine with two needle bars, the machines preferably being electronic controlled.

7. Method according to any preceding claim, **characterized in that** the extension or fixation is performed with varying intensity across the clothing article for establishing varied extension or elasticity and firmness in the article and thereby also varied compression when the clothing article is placed on a user.

8. Method according to any preceding claim, **characterized in that** elastic yarns, preferably elasthane, are used in a part between 15 and 60%, preferably between 30 and 50%, of the areas of the clothing article, which are to exert compression on the user's body.

9. Clothing article formed with a predefined size and shape for use with persons that have developed a hernia or are in danger of developing a hernia, preferably an ostomy hernia, **characterized in that** it is formed by a seamless, knitted, tubular item which is intended for being disposed around the lower body part of the user, and which is made with a firm yet elastic structure for forming a compression between 2,00 to 6,67 kPa (15 and 50 mmHg) within a preselected area of the clothing article in order to provide an anatomical fit, and which provides an approximately constant compression within a certain range of users' sizes and shapes, which compression is created by knitting a high percentage of elastic yarns having a largely flat force-elongation characteristic, possibly in combination with a compact knitting structure and a firm, tight stitch pattern.

10. Clothing article according to claim 9, **characterized in that** the tubular item is preferably extended or fixed in order to provide the anatomical fit.

11. Clothing article according to claim 9 or 10, **characterized in that** the tubular item is sewn together at one end for forming a panty brief with lower body part, groin area and leg openings.

12. Clothing article according to claim 9, 10 or 11, **characterized in that** it includes elastic yarns, preferably elasthane, in a part of between 15 and 60%, preferably between 30 and 50%, in the areas which in use are to exert compression on the user's body.

13. Clothing article according to claim 9 or 10, **characterized in that** in circumferential direction it has said material that displays a force/elongation curve including a largely flat curve pattern.

Patentansprüche

1. Verfahren zum Herstellen eines Kleidungsstücks zur Verwendung bei Personen, die sich einen Bruch zugezogen haben oder bei denen die Gefahr besteht, dass sie sich einen Bruch zuziehen, vorzugsweise einen Bruch bei künstlichem Darmausgang, wobei das Kleidungsstück hergestellt ist, um eine Kompression auf den Träger auszuüben und dazu gedacht ist, um um den unteren Körperteil eines Trägers angeordnet zu und in einer bestimmten Größe und Form hergestellt zu sein,
dadurch gekennzeichnet, dass
ein nahtloser schlauchförmiger Gegenstand gestrickt wird, der in einer anatomischen Passform hergestellt ist, um eine feste aber elastische Struktur zum Erzeugen einer Kompression zwischen 2,00 bis 6,67 kPa (15 bis 50 mmHg) in einem zuvor ausgewählten Bereich des Kleidungsstücks zu bilden und der eine annähernd konstante Kompression in einem bestimmten Bereich an Größen und Formen der Träger bietet, indem ein hoher Prozentsatz Elastikgarn eingestrickt ist, das größtenteils eine flache Kraft-DehnungsCharakteristik aufweist, möglicherweise in Kombination mit einer kompakten Strickstruktur und einem festen engen Maschenmuster.

2. Verfahren gemäß Anspruch 1,
gekennzeichnet durch einen Schritt zum Dehnen des Materials in dem Gegenstand oder für eine ausgewählte Fixierung des Gegenstands, während er auf einer Form in einer bestimmten Größe und Form angeordnet ist.

3. Verfahren gemäß den Ansprüchen 1 oder 2, **gekennzeichnet durch** einen Schritt des Zusammennähens des schlauchiormigen Gegenstands zum Bilden einer kurzen Hose mit einem unteren Körperteilbereich, einem Leistenbereich und Beinöffnungen.

4. Verfahren gemäß Anspruch 3, **dadurch gekennzeichnet, dass** der Schritt des Zusammennähens des sehlauchförmigen Gegenstands zum Bilden einer kurzen Hose mit einem unteren Körperteilbereich, einem Leistenbereich und Beinöffnungen optional vor oder nach dem Fixierungsschritt auf der Form ausgeführt wird.

5. Verfahren gemäß Anspruch 3 oder 4, **dadurch gekennzeichnet, dass** im Leistenbereich der kurzen Hose eine Öffnung ausgebildet ist, so dass der Träger sich erleichtern kann, ohne die kurze Hose auszuziehen.

6. Verfahren gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Kleidungsstück durch kreisförmiges Stricken auf einer Body-Size-Maschine oder einer Flachstrickmaschine mit zwei Nadelleisten hergestellt ist, wobei die Maschinen vorzugsweise elektronisch gesteuert werden.

7. Verfahren gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Dehnung oder Fixierung mit unterschiedlicher Intensität im Kleidungsstück zum Errichten unterschiedlicher Dehnung oder Elastizität und Festigkeit in dem Gegenstand und **dadurch** auch mit unterschiedlicher Kompression ausgeübt wird, wenn das Kleidungsstück von einem Träger anzogen ist.

8. Verfahren gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** Elastikgarne, vorzugsweise Elasthan, in einem Anteil zwischen 15 und 60% verwendet werden, vorzugsweise zwischen 30 und 50%, in den Bereichen des Kleidungsstücks, die eine Kompression auf den Körper des Trägers ausüben sollen.

9. Kleidungsstück, das in einer bestimmten Größe und Form ausgebildet ist, zur Verwendung bei Personen, die sich einen Bruch zugezogen haben oder bei denen die Gefahr besteht, dass sie sich einen Bruch zuziehen, vorzugsweise einen Bruch bei künstlichem Darmausgang, **dadurch gekennzeichnet, dass** es durch einen nahtlose, gestrickten, schlauchförmigen Gegenstand ausgebildet ist, der dazu gedacht ist, um um den unteren Körperteil eines Trägers angeordnet zu sein und der aus einer festen aber elastischen Struktur zum Erzeugen einer Kompression zwischen 2,00 bis 6,67 kPa (15 bis 50 mmHg) in einer zuvor ausgewählten Fläche des Kleidungsstücks hergestellt ist und eine anatomische Passform aufweist und der eine annähernd konstante Kompression in einem bestimmten Bereich an Größen und Formen der Träger ausübt, wobei die Kompression durch Einstricken eines hohen Prozentsatzes Elastikgarn erzeugt wird, das größtenteils eine flache Kraft- DehnungsCharakteristik aufweist, möglicherweise in Kombination mit einer kompakten Striekstruktur und einem festen engen Maschenmuster.

10. Kleidungsstück gemäß Anspruch 9, **dadurch gekennzeichnet, dass** der schlauchförmige Gegenstand vorzugsweise gedehnt oder fixiert ist, um die anatomische Passform bereitzustellen.

11. Kleidungsstück gemäß Anspruch 9 oder 10, **dadurch gekennzeichnet, dass** der schlauchförmige Gegenstand an einem Ende zusammengenäht ist, um eine kurze Hose mit einem unteren Körperbereich, einem Leistenbereich und Beinöffnungen zu bilden.

12. Kleidungsstück gemäß einem der Ansprüche 9, 10 oder 11, **dadurch gekennzeichnet, dass** es Elastikgarne, vorzugsweise Elasthan, in einem Anteil zwischen 15 und 60% enthält, vorzugsweise zwischen 30 und 50%, in den Bereichen des Kleidungsstücks, die dazu dienen, eine Kompression auf den Körper des Trägers auszuüben.

13. Kleidungsstück gemäß Anspruch 9 oder 10, **dadurch gekennzeichnet, dass** es in einer Umfangsrichtung das Material besitzt, das eine Kraft-/DehnungsKurve darstellt, einschließlich eines größtenteils flaschen Kurvenmusters.

Revendications

1. Procédé pour fabriquer un article vestimentaire destiné à être utilisé avec des personnes qui présentent une hernie ou un risque de développer une hernie, de préférence une hernie de stomie, ledit article vestimentaire étant réalisé pour exercer une compression sur l'utilisateur et destiné à être disposé autour de la partie inférieure du corps de l'utilisateur et réalisé avec une taille et une forme prédéfinies, **caractérisé en ce qu'**on tricote un article tubulaire sans jointure, auquel on confère une forme anatomique pour rétablir une structure ferme mais élastique pour appliquer une compression entre 2,00 et 6,67 kPa

(15 à 50 mmHg) dans une zone préalablement choisie de l'article vestimentaire, et d'appliquer une compression approximativement constante dans une certaine gamme de tailles et de formes d'utilisateurs, par tricotage d'un pourcentage élevé de fibres élastiques ayant une caractéristique force/élongation largement plane, éventuellement en combinaison avec une structure tricotée compacte et un motif de couture serré ferme.

2. Procédé selon la revendication 1, **caractérisé par** une étape destinée à mettre en extension le matériau dans l'article ou à établir une fixation sélective de l'article alors qu'il est placé sur une forme avec une taille et une forme prédéterminées.

3. Procédé selon les revendications 1 ou 2, **caractérisé par** une étape consistant à coudre ensemble l'article tubulaire pour former un slip avec une zone correspondant à la partie inférieure du corps, une zone inguinale et des ouvertures pour les jambes.

4. Procédé selon la revendication 3, **caractérisant ce que** l'étape consistant à coudre ensemble l'article tubulaire pour former un slip avec une zone correspondant à la partie inférieure du corps, une zone inguinale et des ouvertures pour les jambes est exécutée en option avant ou après l'étape de fixation sur la forme.

5. Procédé selon la revendication 3 ou 4, **caractérisé en ce que** dans la zone inguinale dans le slip est prévue une ouverture, de sorte que l'utilisateur peut se soulager sans enlever le slip.

6. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'article vestimentaire est réalisé par tricotage circulaire sur une machine à taille corporelle ou sur une machine de tricot rectiligne avec deux barres à aiguilles, les machines étant de préférence à commande électronique.

7. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'extension ou la fixation est exécutée avec une intensité variable sur l'ensemble de l'article vestimentaire pour établir une extension ou une élasticité variable ainsi qu'une fermeté variable dans l'article et par conséquent également une compression variable quand l'article vestimentaire est placé sur un utilisateur.

8. Procédé selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'on utilise des fils élastiques, de préférence en élasthane, à proportion entre 15 et 60 %, de préférence entre 30 et 50 % des zones de l'article vestimentaire qui sont destinées à exercer une compression sur le corps de l'utilisateur.

9. Article vestimentaire formé avec une taille et une forme prédéfinies et destiné à être utilisé avec des personnes qui présentent une hernie ou qui risquent de développer une hernie, de préférence une hernie de stomie, **caractérisé en ce qu'**il est formé par un article tricoté et tubulaire sans jointure destiné à être disposé autour de la partie inférieure du corps de l'utilisateur, et qui est réalisé avec une structure ferme mais élastique pour établir une compression entre 2,00 et 6,67 kPa (15 et 50 mmHg) dans une zone présélectionnée de l'article vestimentaire afin de réaliser une adaptation anatomique, et qui applique une compression approximativement constante dans une certaine gamme de tailles et de formes d'utilisateurs, ladite compression étant créée en tricotant un pourcentage élevé de fils élastiques ayant une caractéristique force/élongation largement plane, éventuellement en combinaison avec une structure tricotée compacte et avec un motif de couture serrée ferme.

10. Article vestimentaire selon la revendication 9, **caractérisé en ce que** l'article tubulaire est de préférence mis en extension ou fixé afin d'assurer l'adaptation anatomique.

11. Article vestimentaire selon la revendication 9 ou 10, **caractérisé en ce que** l'article tubulaire est cousu à une extrémité pour former un slip avec une partie destinée à couvrir la partie inférieure du corps, une zone inguinale et des ouvertures pour les jambes.

12. Article vestimentaire selon la revendication 9, 10 ou 11, **caractérisé en ce qu'**il inclut des fils élastiques, de préférence en élasthane, à proportion entre 15 et 60 %, de préférence entre 30 et 50 %, dans les zones qui sont destinées en utilisation à exercer une compression sur le corps de l'utilisateur.

13. Article vestimentaire selon la revendication 9 ou 10, **caractérisé en ce qu'**il comprend, en direction circonférentielle, ledit matériau qui présente une courbe force/élongation qui inclut un motif de courbe largement aplatie.

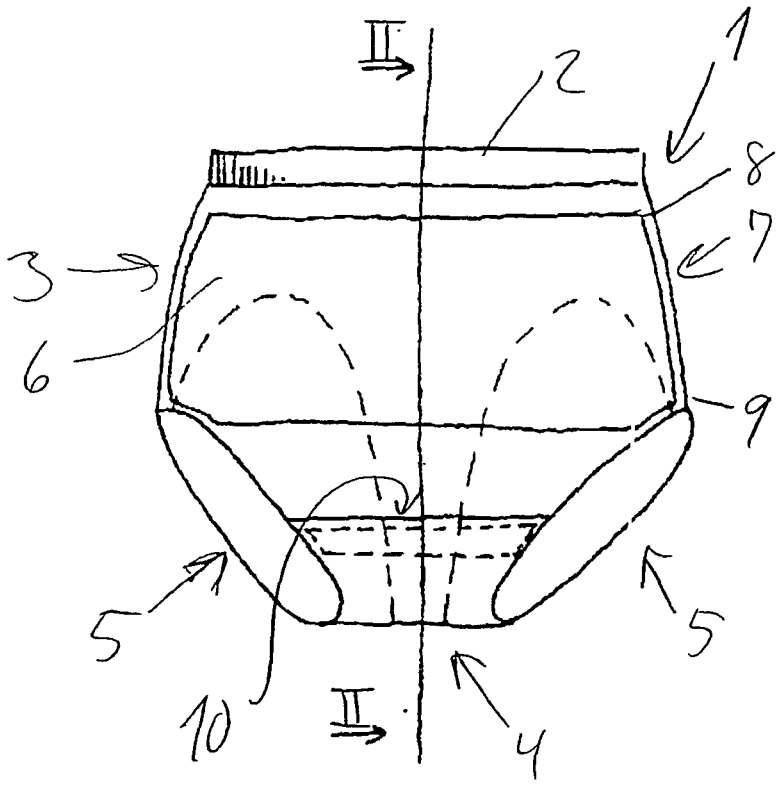


Fig. 1

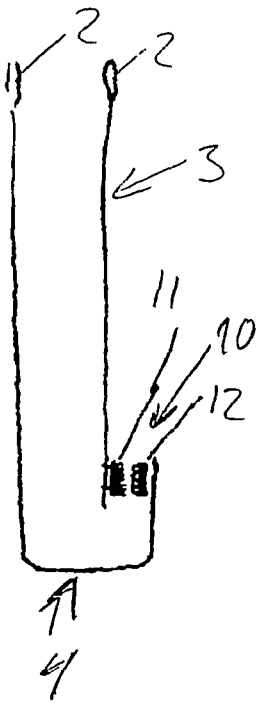


Fig. 2

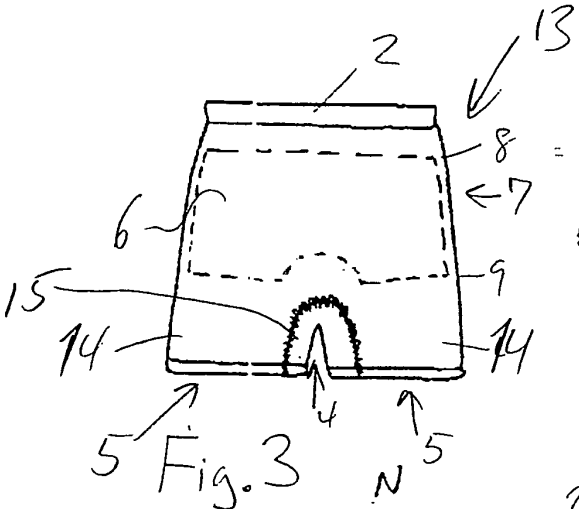


Fig. 3

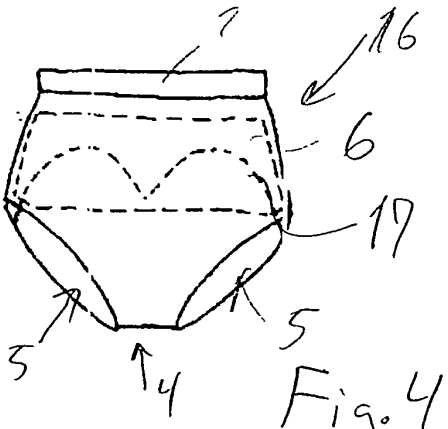


Fig. 4

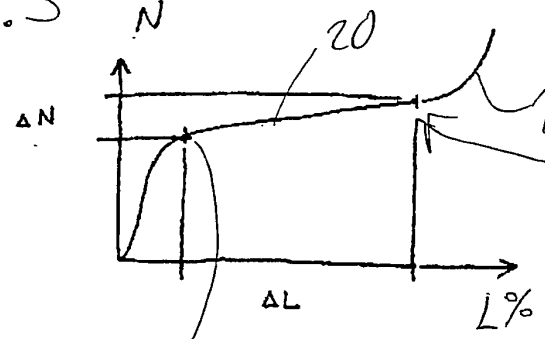


Fig. 5

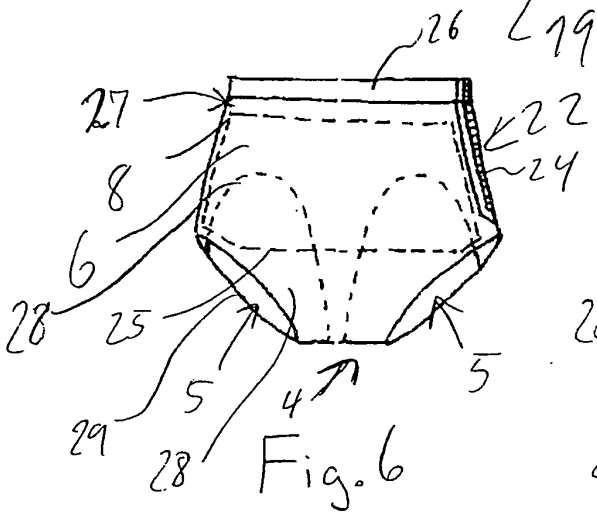


Fig. 6

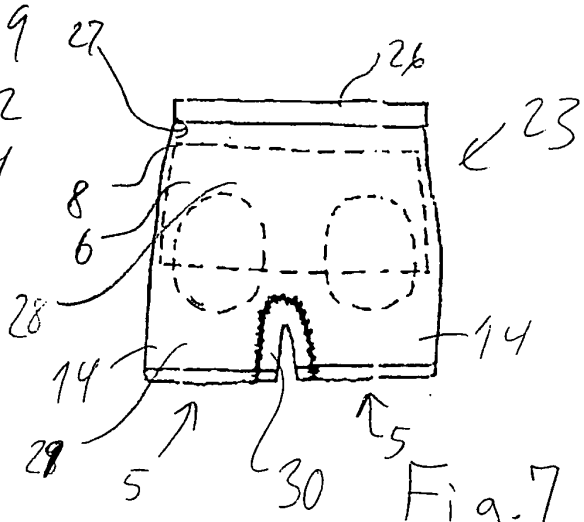


Fig. 7

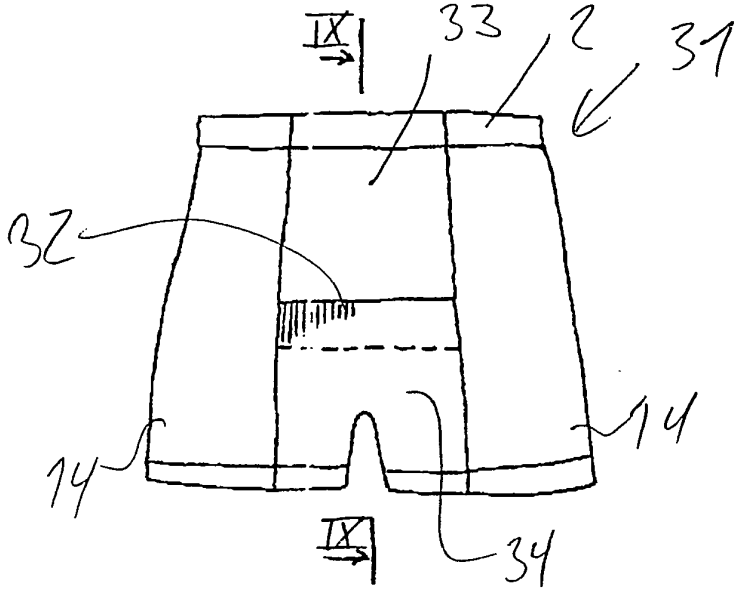


Fig. 8

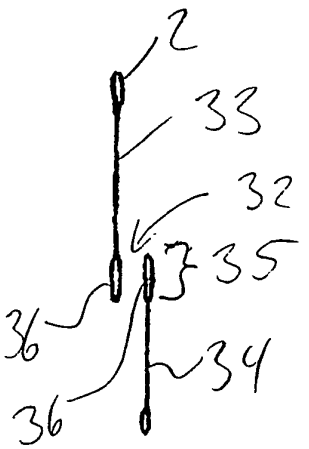


Fig. 9

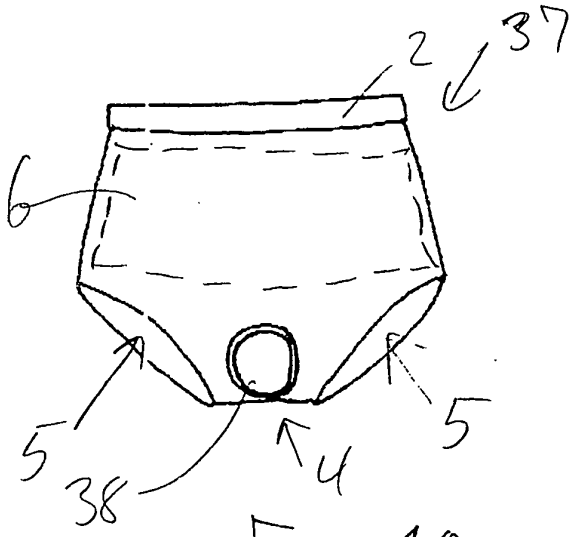


Fig. 10

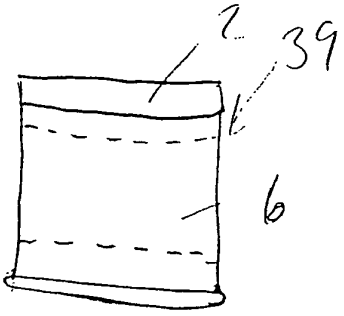


Fig. 11

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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