

Nov. 5, 1963

L. W. GARROU ETAL
SEAMLESS KNIT GARMENT HAVING INCREASED WIDTH
AND METHOD OF MAKING SAME
Filed Oct. 4, 1960

3,109,301

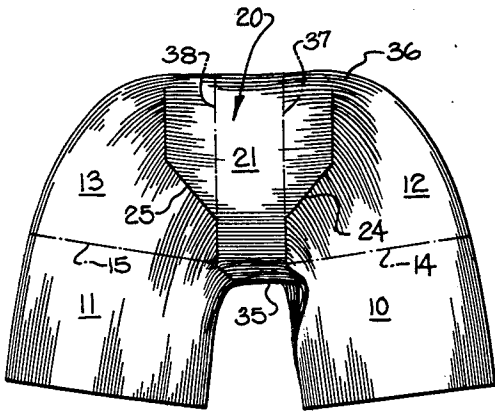


Fig-1

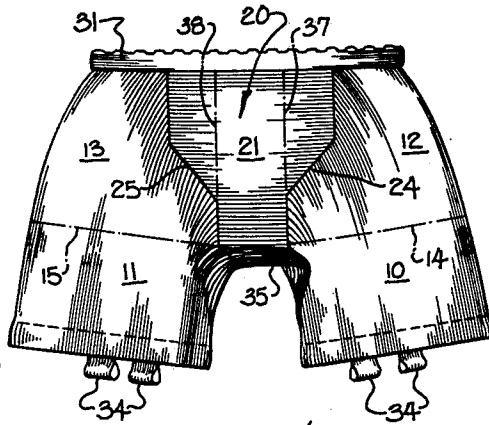


Fig-2

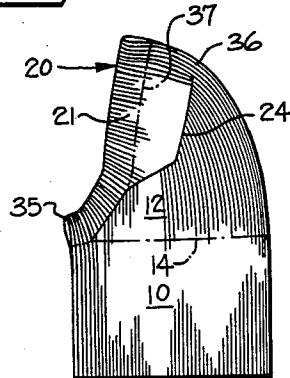


Fig-3

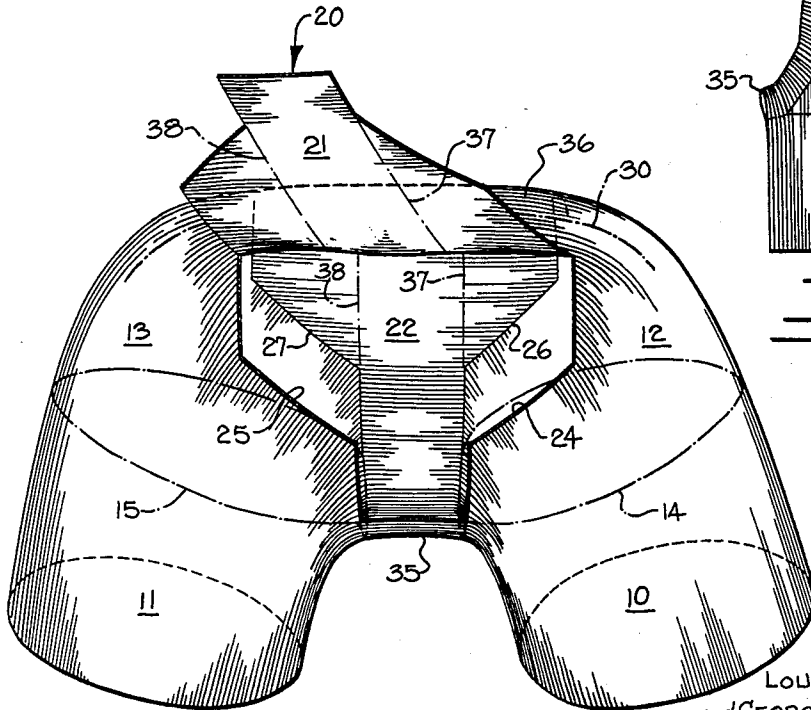


Fig-4

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SEAMLESS KNIT GARMENT HAVING INCREASED WIDTH AND METHOD OF MAKING SAME
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Filed Oct. 4, 1960, Ser. No. 60,456
11 Claims. (Cl. 66—177)

The present invention relates generally to seamless knit two-legged lower body garments, such as panties, panty girdles, bathing suits and tights, or the like, and to the method of making the same. More particularly, the present invention relates to garments of the above type in which the width of the garment may be varied substantially.

In our copending application, Serial No. 840,407, filed September 16, 1959, now Patent No. 2,962,884, of which the present application is a continuation-in-part, a seamless knit garment and method of knitting the same is disclosed which is similar in some respects to the garment shown in the present application. For example, the garments shown in both applications have seamless knit leg portions in which the knit wales extend longitudinally of the legs, the legs have integrally formed tapered extensions, and the garments have integrally formed fashioned front and rear body panels which connect the tapered extensions of the leg portions while the knit wales of the body panels extend perpendicular to the wales of the legs and extensions. However, in the garment disclosed in the above-noted copending application, the body panels extend downwardly in the front and rear of the garment only a portion of the way and the front and rear panels are knit throughout of reciprocatory partial courses while in the garment disclosed in the present application, the fashioned front and rear panels have portions which include complete courses that extend between the legs and through the crotch area. Because certain portions of the front and rear panels are formed of complete courses, the width of the garment can be varied by simply increasing or decreasing the number of complete courses knit during the formation of the front and rear panels and thereby vary the amount of material in the central portion of the garment and between the legs.

In the garment shown in our above-noted copending application, varying the fashioning of the leg extensions and the body panels may be employed to vary the size of the waist portion of the garment, however, the size of the garment in the hip portion depends upon the diameter of the knitting machine upon which the garment is knit.

With the foregoing in mind, it is a primary object of the present invention to provide a one-piece seamless two-legged garment and novel method of fashioning the same during knitting in which the width of the garment in the waist and hip portions does not depend upon the diameter of the knitting machine upon which the garment is being knit.

It is a more specific object of the present invention to provide a fashioned seamless two-legged lower body garment which may be fashioned during the knitting thereof to conform to a wide range of body sizes and shapes in a simple and economical manner.

It is another specific object of the present invention to provide a seamless knit two-legged garment having fashioned front and rear body panels which include a group of complete courses extending from the waist area and through the crotch whereby the width of the waist and hip portions of the garment may be changed by merely varying the number of complete courses knit in the body panels.

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Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

FIGURE 1 is a front elevation of a seamless garment blank which is knit in accordance with the present invention, illustrating the garment blank in substantially flattened condition after it is removed from the knitting machine and prior to finishing the same;

FIGURE 2 is a view similar to FIGURE 1, showing a finished garment which is made from the garment blank shown in FIGURE 1;

FIGURE 3 shows the panty blank of FIGURE 1 with one leg thereof folded over onto the other leg along a fold line extending vertically through the center of the blank shown in FIGURE 1;

FIGURE 4 is a perspective view of the garment shown in FIGURE 1 with the front panel cut along the gore or suture lines which connect the front panel to the upper tapered leg extensions, the front panel being raised to illustrate the appearance of the inside of the blank.

Referring to FIGURES 1, 3 and 4, it will be noted that the garment blank is knit in a shape suitable for forming a panty type article and the blank includes a pair of seamless tubular legs 10 and 11 having knit wales that extend substantially vertically or longitudinally of the legs 10 and 11 and knit courses that extend substantially horizontally or transversely thereof. The garments shown in the drawings are shaded with lines which extend in the direction of the knit wales in various portions of the garment. The legs 10 and 11 are provided with integrally knit fashioned extensions 12 and 13, respectively, which are knit integrally with and joined to the upper ends of the legs 10 and 11 and extend upwardly from the respective dash-dot lines indicated at 14 and 15. The inner edges of the extensions 12 and 13 as well as the upper portions of the legs 10 and 11 are connected to a fashioned body gusset broadly indicated at 20.

The body gusset 20 extends completely around the central portion of the blank to form front and rear panels 21 and 22 (FIGURE 4) which join each other at the top of the blank and between the legs 10 and 11. The upper inner edges of the extensions 12 and 13 are joined to opposite edges of the upper portions of the front and rear panels 21 and 22 of the body gusset 20 during the knitting operation in a manner to be later described, along respective front and rear suture or gore lines 24, 25 and 26, 27 (FIGURE 4). The body gusset 20 is knit in such a manner that the knit wales thereof extend in substantially a horizontal direction in FIGURES 1 and 4, as opposed to the substantially vertically extending wales of the legs 10 and 11 and extensions 12, 13.

After knitting of the garment blank is completed, the upper medial portion thereof is slit or cut along the dash-dot line indicated at 30 in FIGURE 4 to provide a waist opening. It will be noted that the slit extends walewise of the fabric to separate the upper ends of the front and rear panels 21 and 22 and opposite ends of the slit also extend into the upper portions of the extensions 12 and 13. The waist opening may then be finished to prevent raveling by sewing a stretchable band 31 or the like to the edges (FIGURE 2). The lower ends of the legs 10 and 11 may be finished by turning the same upon themselves and sewing along the edges to form turned hems. The garment may also be provided with suitable garter support straps 34 which are sewed to the hems at the lower ends of the legs 10 and 11.

The finished garment (FIGURE 2) thus is completely devoid of any seams with the body gusset 20 being joined to the leg extensions 12 and 13 and legs 10 and 11 and extending downwardly in the central portion of the front

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of the garment, between the legs 10 and 11 and upwardly in the central portion of the rear of the garment. During the knitting of the garment blank, the leg extensions 12 and 13 and the body gusset 20 are fashioned by narrowing and widening the fabric to form suture or gore lines, in a manner to be presently described.

Referring to FIGURE 4, it will be noted that when the blank is removed from the knitting machine, it defines a generally U-shaped tube having a crotch area 35 which extends between the legs 10 and 11 and forms the lower portion of the body gusset 20. The upper portion of the generally U-shaped tube defines a waist area indicated at 36 (FIGURE 1) which extends across the medial portion of the body gusset 20 and into the upper ends of the extensions 12 and 13.

As has been pointed out, the wales of the body gusset 20 run in substantially perpendicular relationship to the wales in the legs 10, 11 and extensions 12, 13, and by varying the length of stitches utilized in knitting different portions of the blank, the amount of stretchability of the different portions of the blank and the shape of the blank may be changed. Also, the body gusset 20 may be knit of a different yarn than that used to knit the legs 10, 11 and extensions 12, 13 so that the fabric of the body gusset 20 may have different characteristics than the fabric of the legs 10, 11 and extensions 12, 13. The panty type garment of the present invention will be described as being knit on a circular knitting machine which is capable of rotary and reciprocatory knitting although it is to be understood that the garment may also be knit on other types of machines capable of knitting a tubular fabric such as the Lamb type knitting machine in which a pair of angularly disposed needle beds are utilized.

When a circular knitting machine is used to knit the garment blanks shown in FIGURES 1, 3 and 4, the needle cylinder will be supplied with the proper number of needles necessary to produce the desired diameter of seamless tubular fabric in the leg. Knitting of the blank may be started at the bottom of either of the legs 10 or 11 and will be described starting at the lower edge of the leg 10. Through conventional pattern control means, the needle cylinder is rotated continuously in one direction with all of the needles in active or knitting position so that when the desired type of yarn is fed to the needles, the tubular seamless leg 10 is formed.

Rotary knitting is continued until the leg 10 is the desired length and in the present instance, rotary knitting continues until the dash-dot line 14 is reached. At this point, the machine switches into reciprocatory knitting and a group of the needles in the cylinder are moved to idle position with the remainder of the needles remaining in active position to start to knit the leg extension 12. The group of needles which are idled are positioned in the crotch area 35 of the garment and these needles will not again be active until the body gusset 20 is knit. During the knitting of the extension 12, partial courses are formed with each reciprocation of the needle cylinder and needles are successively removed from action during selected succeeding partial courses while retaining their stitch loop to produce a generally narrowed fabric.

It is preferred that the fabric of the extension 12 be narrowed very gradually by removing one needle from action during the knitting of each pair of succeeding partial courses, however, the fabric may be narrowed at a faster rate by removing one needle from action during the knitting of each partial course. The fabric of the extension 12 is gradually narrowed until only a relatively small predetermined number of needles remain active at the upper extremity of the tapered extension 12.

During the knitting of the first reciprocatory course of the body gusset 20, a group of needles adjacent each side of the previously active needles is brought back into action so that the first reciprocatory partial course of the body gusset 20 is knit on a much greater number of needles than the last partial course of the extension 12.

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The groups of needles activated form the vertical portions of the front and rear gore or suture lines 24 and 26 (FIGURES 1 and 4). Thus, the first reciprocatory partial course of the body gusset 20 extends across the top of the blank, down the front and rear of the garment blank and is connected to the inner edges of the upper portion of the extension 12, along the vertical portions of the respective gore lines 24 and 26. Following the knitting of the first partial courses, the following partial courses of the body gusset 20 are gradually widened and opposite ends of these partial courses are connected to the fabric of the extension 12 along the inclined portions of the front and rear suture lines 24 and 26.

After a predetermined number of partial courses are knit, at the dash-dot line 37, all of the remaining inactive needles in the cylinder are again activated and the machine switches into rotary knitting to again produce tubular seamless fabric and knit the centralmost portion of the body gusset 20. When all of the needles in the cylinder are again moved to active position, the group of needles which had been holding their stitch loops since the completion of the first seamless leg 10 are again activated to thereby join the leg 10 to one side of the body gusset 20 in the crotch area 35 of the blank. After the desired number of circular courses are knit in the body gusset 20, at the dash-dot line 38, a group of needles in the crotch area 35 are deactivated and the machine again switches into reciprocatory knitting.

Partial courses are again knit with each reciprocation of the needle cylinder as needles are successively removed from action during selected succeeding partial courses while retaining their stitch loops to produce a generally narrowed fabric in the area between the dash-dot line 38 and the vertical portions of the gore lines 25, 27. As the fabric is gradually narrowed, the inclined portions of the gore lines 25, 27 are produced until a predetermined number of partial courses are knit. The narrowing operation is continued until the last partial course of the body gusset 20 is formed and then a group of needles at each end of the active needles is deactivated before knitting the first partial course at the upper portion of the extension 13. The first partial course of the extension 13 is reciprocatorily knit on a small group of needles to form a short partial course extending over the top of the blank and terminating at opposite ends at the upper ends of the front and rear gore lines 25 and 27. As reciprocatory knitting of the extension 13 continues, additional needles are brought into action in succeeding partial courses to thereby gradually widen the fabric down to the dash-dot line 15.

When knitting of the lower portion of the leg extension 13 is completed, at the dash-dot line 15, all of the inactive needles in the cylinder are again activated and the machine switches into rotary knitting to again produce tubular seamless fabric and knit the tubular seamless leg 11. When all of the needles in the cylinder are again moved to active position, the group of needles which had been holding their stitch loops since the completion of the complete courses in the body gusset 20 are again activated to thereby join the first course of the leg 11 to the last of the complete courses in the body gusset 20 at the crotch area 35 of the blank. After knitting of the blank is completed, the upper end is slit along the dash-dot line 30 and the garment may be finished in the manner heretofore described.

It will be noted in FIGURES 2 and 4 that after the upper portion of the blank is slit along the dash-dot line 30 the fashioned body gusset 20 is U-shaped and extends from the front of the waist opening downwardly between the legs 10, 11 and then upwardly to the rear of the waist opening. Also, opposed ends of the U-shaped body gusset 20 are wider than the medial portion thereof.

It will be apparent that by changing the manner in which the body gusset and/or the leg extensions are widened and narrowed, the shape and size of the panty blank may

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be changed. For example, by changing the fashioning of the body gusset and the leg extension, the difference in width of the waist area, as compared to the width of the hip area of the garment, may be changed and also the overall width of the garment may be changed by varying the number of complete seamless courses knit in the body gusset 20.

It is to be understood that the seamless knit garment disclosed in the present application may be knit of any desired type of yarns to achieve the desired results in the garment. For example, the complete garment may be knit of either natural or synthetic, inelastic or non-stretchable yarn if stretchability of the garment is not desired. The complete garment may be knit of stretchable or elastic yarn if stretchability of the garment and support of the body of the wearer is desired. Various portions of the garment may be knit of stretchable yarn while other portions may be knit of non-stretchable yarn, and some portions of the garment may be knit by combining stretchable and non-stretchable yarns.

Although a particular panty type garment blank has been illustrated and described, it is to be understood that different shapes of garment blanks may be made by changing the fashioning of the fabric of the leg extensions and/or the body gusset without departing from the spirit of the invention.

In the drawings and specifications there has been set forth a preferred embodiment of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

We claim:

1. A seamless knit panty or the like comprising a pair of seamless tubular legs of substantially equal lengths, fashioned extensions knit integral with and extending upwardly from each of said tubular legs, and a fashioned body gusset knit integral with and interconnecting said seamless tubular legs and said fashioned extensions, said fashioned body gusset having a central portion extending between said seamless tubular legs and defining a crotch area.

2. A seamless knit panty or the like comprising a pair of seamless tubular legs of substantially equal lengths, fashioned extensions knit integral with and extending upwardly from each of said tubular legs, and fashioned front and rear gusset panels knit integral with the fashioned extensions of each leg, said fashioned front and rear gusset panels being integrally knit and extending between and interconnecting said seamless tubular legs and said fashioned extensions.

3. A seamless knit lower body garment comprising a pair of seamless tubular legs of substantially equal lengths, fashioned extensions knit integral with and extending upwardly from each of said tubular legs, and a fashioned body gusset panel knit integral with and extending between said seamless tubular legs and said fashioned extensions, said fashioned body gusset being U-shaped and connecting said seamless tubular legs and said fashioned extensions together in spaced apart relationship.

4. A garment according to claim 3 in which opposed end portions of said U-shaped body gusset are wider than the medial portion thereof.

5. A seamless blank for forming a knit panty or the like comprising a substantially U-shaped seamless knit tube including tubular leg portions of substantially equal lengths defining the openings of the U-shaped tube, a fashioned extension knit integral with each leg portion and connected thereto remote from the openings defined by the leg portions, each of said extensions having an inner edge, and a fashioned body gusset knit integral with and extending between and connecting said leg extensions and said tubular leg portions to define the central portion of the U-shaped tube.

6. A seamless blank for forming a knit panty or the

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like comprising a substantially U-shaped seamless knit tube including tubular leg portions of substantially equal lengths defining the openings of the U-shaped tube, a fashioned extension knit integral with each leg portion and connected thereto remote from the openings defined by the leg portions, each of said extensions having an inner edge, and a fashioned body gusset knit integral with said leg extensions and said tubular leg portions, said fashioned body gusset connecting said leg extensions and said tubular leg portions together in spaced apart relationship to define the central portion of the U-shaped tube.

7. A seamless blank for forming a knit panty or the like comprising a substantially U-shaped seamless knit tube including tubular leg portions of substantially equal lengths defining the openings of the U-shaped tube, said tubular leg portions having a plurality of complete courses, a fashioned extension knit integral with each leg portion and connected thereto remote from the openings defined by the leg portions, said fashioned extensions having a plurality of partial courses, and a fashioned body gusset knit integral with and connecting said leg extensions and said tubular leg portions to define the central portion of the U-shaped tube, said fashioned body gusset having a plurality of partial courses and a plurality of complete courses.

8. A method of making seamless panties or the like comprising the steps of knitting a plurality of complete courses to form a first tubular leg, knitting a plurality of partial courses to form a first leg extension knit integral with the first leg while fashioning to reduce the width of the partial courses of said extension, knitting a fashioned body gusset integral with the first leg and the first leg extension while fashioning to increase the width of the partial courses of the first portion of the body gusset, knitting a plurality of complete courses to form a central portion of the body gusset, then knitting a plurality of partial courses while fashioning to decrease the width of the partial courses to form a third portion of the body gusset, knitting a plurality of partial courses to form a second leg extension knit integral with the body gusset while fashioning to increase the width of the partial courses of the second leg extension, knitting a plurality of complete courses to form a second tubular leg integral with the second leg extension and joined to the body gusset, the first and second tubular legs being of substantially equal lengths, and then slitting the fabric transversely of the body gusset to form a waist opening.

9. A method of making seamless panty blanks or the like comprising the steps of knitting a first tubular leg while forming complete courses, knitting a plurality of partial courses to form a first leg extension knit integral with the first leg while fashioning to reduce the width of the partial courses of said extension, knitting a plurality of partial courses to form the first portion of a fashioned body gusset knit integral with a portion of the first leg extension while fashioning to increase the width of the partial courses of the first portion of the body gusset, knitting a plurality of complete courses integral with the partial courses of the first portion of the body gusset and integral with the first tubular leg to form the central portion of the body gusset, knitting a plurality of partial courses to form the third portion of the body gusset knit integral with the second portion of the body gusset while fashioning to decrease the width of the partial courses of the third portion of the body gusset, knitting a plurality of partial courses to form a second leg extension knit integral with the body gusset while fashioning to increase the width of the partial courses of the second leg extension, and then knitting a plurality of complete courses to form a second tubular leg integral with the second leg extension and joined to the body gusset, the first and second tubular legs being of substantially equal lengths.

10. A method of making seamless panties or the like

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comprising the steps of knitting a first tubular leg while forming complete courses, knitting a plurality of partial courses to form a first leg extension knit integral with the first leg while fashioning to reduce the width of the partial courses of said extension, knitting a plurality of partial courses to form the first portion of a fashioned body gusset knit integral with a portion of the first leg extension while fashioning to increase the width of the partial courses of the first portion of the body gusset, knitting a plurality of complete courses integral with the partial courses of the first portion of the body gusset and integral with the first tubular leg to form the central portion of the body gusset, knitting a plurality of partial courses to form the third portion of the body gusset knit integral with the second portion of the body gusset while fashioning to decrease the width of the partial courses of the third portion of the body gusset, knitting a plurality of partial courses to form a second leg extension knit integral with the body gusset while fashioning to increase the width of the partial courses of the second leg extension, and then knitting a plurality of complete courses to form a second tubular leg integral with the second leg extension and joined to the body gusset the first and second tubular legs being of substantially equal lengths, and then slitting the fabric transversely of the body gusset to form a waist opening.

11. A method of making seamless panty blanks or the like on a circular knitting machine having a predetermined number of circularly arranged needles comprising the steps of knitting a plurality of complete courses on all of the needles to form a first tubular leg, knitting a

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plurality of partial courses on only a portion of the needles while decreasing the number of needles knitting in the partial courses to form a first leg extension knit integral with the first leg, knitting a plurality of partial courses on only a portion of the needles while increasing the number of needles knitting in the partial courses to form the first portion of a fashioned body gusset, knitting a plurality of complete courses on all of the needles to form the central portion of the body gusset, knitting a plurality of partial courses on only a portion of the needles while decreasing the number of needles knitting in the partial courses to form the third portion of the body gusset, knitting a plurality of partial courses on only a portion of the needles while increasing the number of needles knitting in the partial courses to form a second leg extension knit integral with the body gusset, and then knitting a plurality of complete courses on all of the needles to form a second tubular leg knit integral with the second leg extension and joined to the central portion of the body gusset, the first and second tubular legs being of substantially equal lengths.

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