

[54] **FORM FITTING LOWER BODY GARMENT AND METHOD OF MAKING SAME**

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[57] **ABSTRACT**

Garments, such as panty hose are provided with increased fullness of fabric, as for example in the rear or seat portion relative to the amount of fabric across the front so as to provide improved form fitting characteristics thereto and to reduce the tendency to pull the rear of the waistband downwardly when the wearer sits, bends and squats. The garment is formed of a pair of knitted tubular legs with a panty half knit integrally with each leg and extending upwardly therefrom. Each panty half is slit downwardly with at least a portion of the slit in each panty half extending across a plurality of wales. The corresponding slit edges are seamed together to form the panty of the garment and the offset portions of the slits form fullness fabric areas in an area of the panty for accommodating, for example, the buttocks of the wearer. Several different types of offset slits are disclosed to vary the amount and location of the fullness fabric areas in the rear or seat portion of the garment.

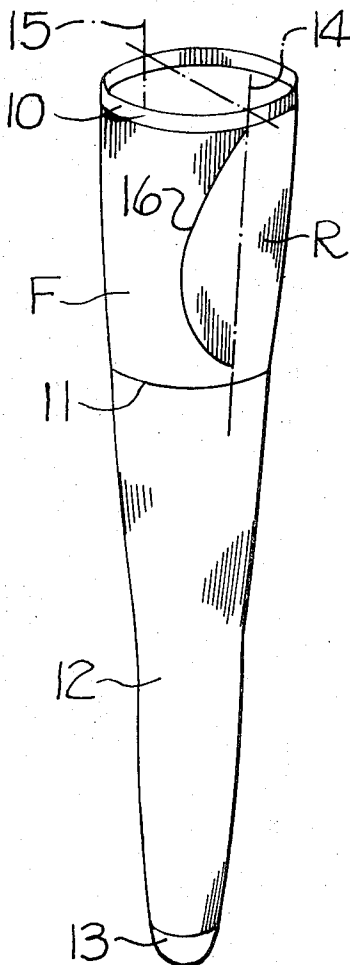
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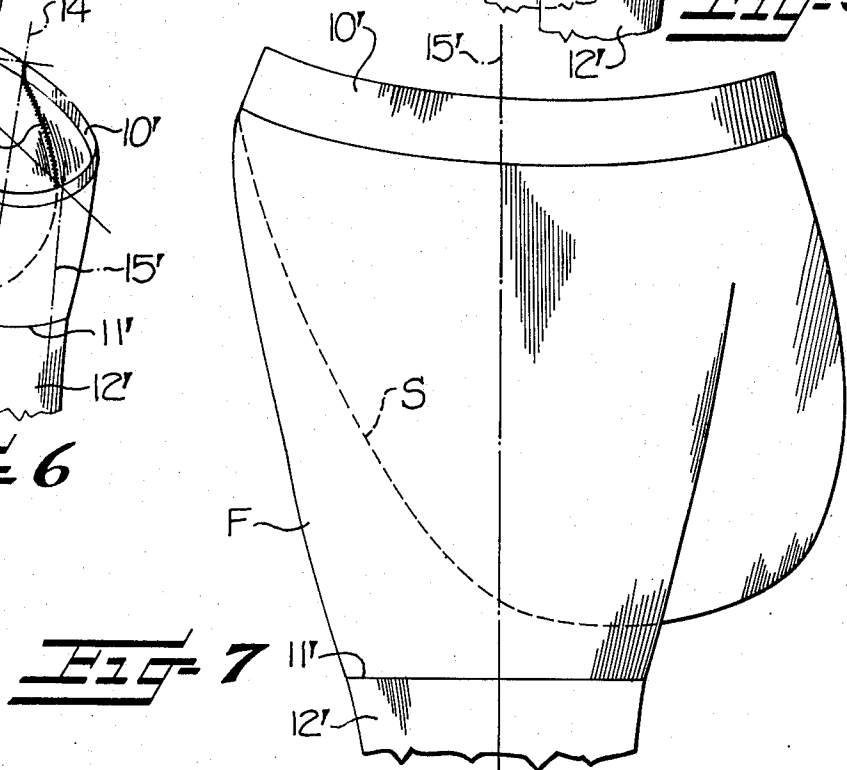
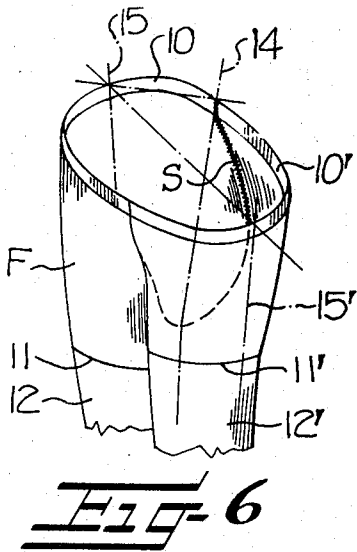
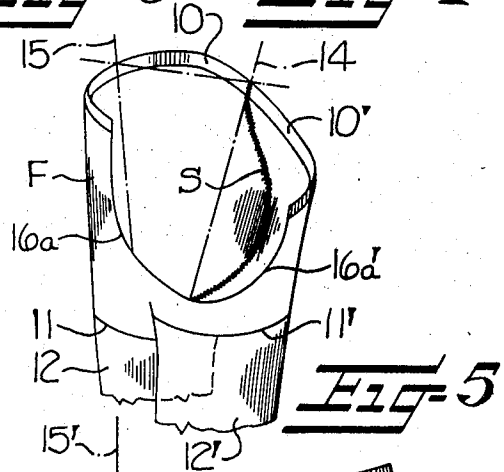
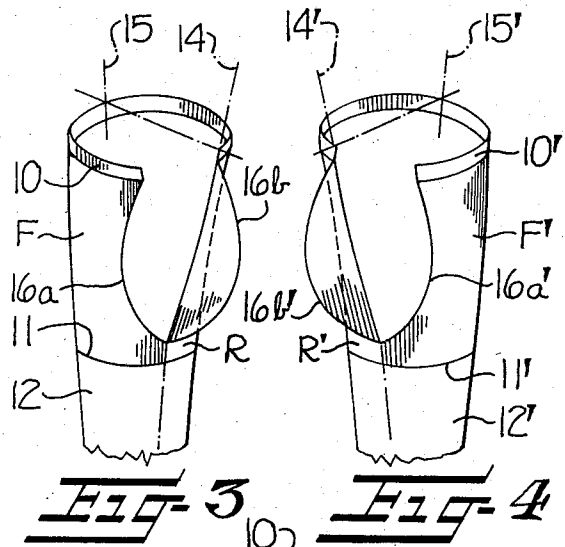
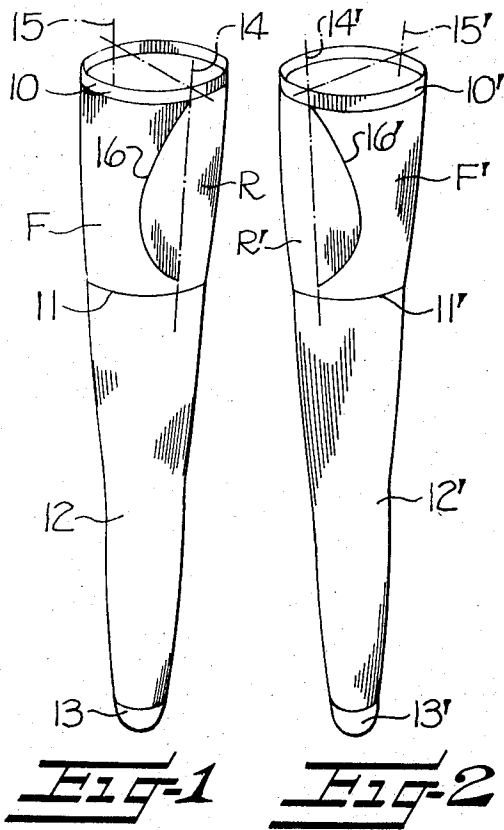
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20 Claims, 15 Drawing Figures





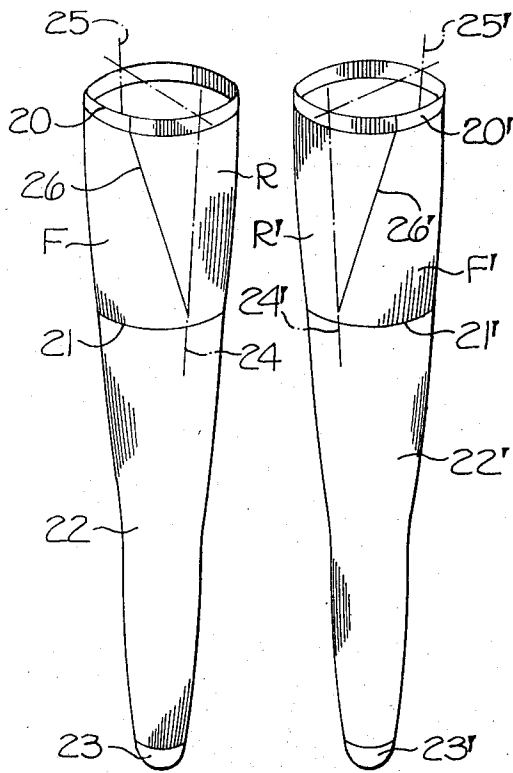


Fig-8 Fig-9

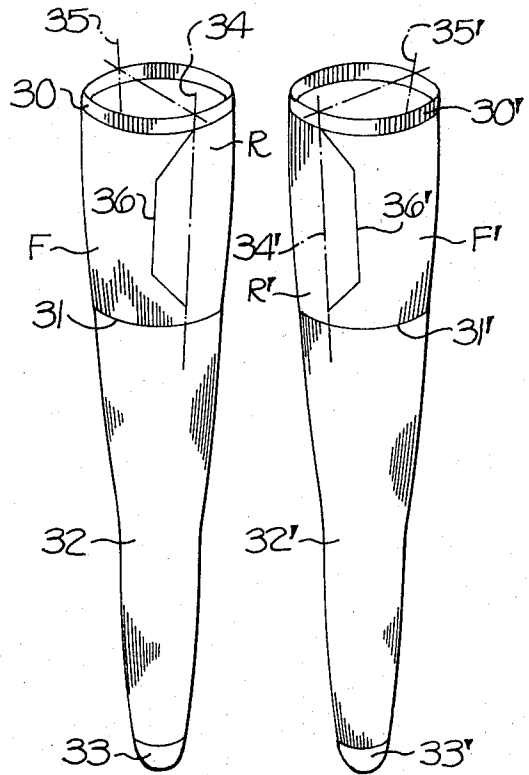


Fig-10 Fig-11

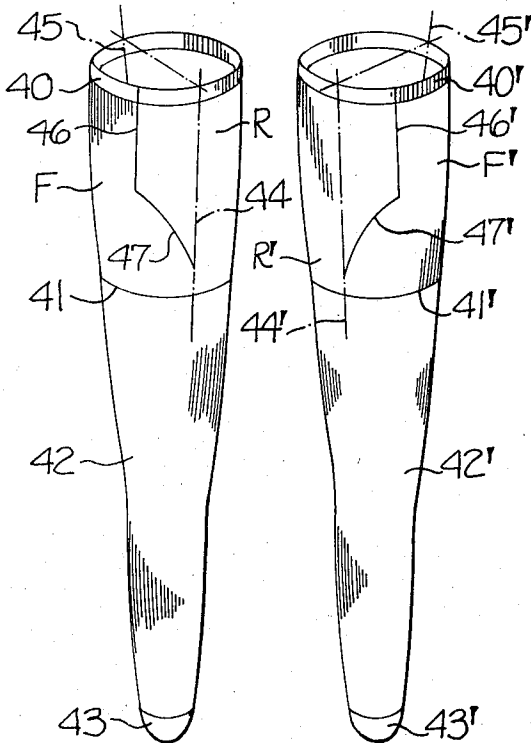


Fig-12 Fig-13

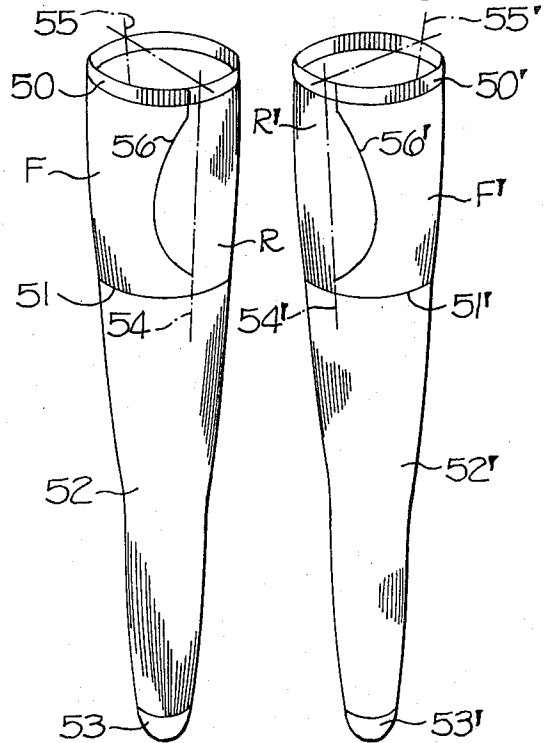


Fig-14 Fig-15

FORM FITTING LOWER BODY GARMENT AND METHOD OF MAKING SAME

This invention relates generally to lower body garments having long legs, such as panty hose, tights, leotards, and the like and to lower body garments having short legs, such as bathing suit trunks, panties, panty girdles and the like. More particularly, the present invention relates to improving the fitting quality and comfort of this type of garment by providing fullness fabric areas in a selected area of the panty portion to accommodate lower torsal protuberances of the wearer, such as the buttocks.

Heretofore, it has been the practice to produce panty hose by forming vertical slits extending substantially straight down an inside wale of a pair of elongate hosiery blanks. The corresponding edges of the slits of adjacent hosiery blanks are then seamed to form a seam which extends downwardly from the waist opening in the front and rear and passes through the crotch of the panty portion of the garment. The seaming together of the edges of the straight vertical slits produces a panty which is symmetrical, that is, the front and rear portions of the panty contain the same amount of fabric and the front and rear portions of the panty are shaped in an identical manner. Since most panty hose are knit of some type of stretchable yarn, the panty portion will stretch and conform to the configuration of the wearer. However, the distance across the buttocks of the wearer is usually greater than the distance across the front and this results in the rear portion of the panty being stretched to a greater extent than the front portion which tends to cause discomfort and to place extra strain on the connecting seam at the rear of the garment which can result in rupture of the seam. Also, when the wearer of this conventional type of symmetrical panty hose sits, bends or squats, additional stretching of the fabric in the seat of the garment takes place. This additional stretching places even greater strain on the connecting seam in the crotch and rear of the panty and tends to pull the rear portion of the waist opening down on the wearer so that when the wearer again assumes a standing position, it is necessary to pull up the rear of the panty to a comfortable position.

In an attempt to overcome some of these problems, it has been proposed that panty hose be knit with larger, looser or different type stitches in the portions of the hosiery blanks adapted to cover the buttocks of the wearer. However, this involves a change in the knitting machine and can change the appearance of the fabric. It has also been proposed that gussett panels of various sizes and shapes be sewn in various locations between the hosiery blanks, or knit in the blanks by fashioning, such as by knitting partial courses in selected areas. However, the addition of these gussett panels adds to the cost of producing the panty hose and often distracts from the appearance.

With the foregoing in mind, it is an object of the present invention to provide a lower body garment, such as panty hose, and a method of forming the same wherein the front and rear portions of the garment are of different fullness and are shaped to more nearly correspond to the natural shape of the body of the wearer and to accommodate lower torsal protuberances, such as the buttocks, with the amount of fabric in the rear of the panty being greater than the amount of fabric across the corresponding portion of the front of the panty.

This fullness fabric area in the rear or seat portion of the panty not only provides a better fit when the wearer is standing, but also provides an additional amount of fullness in the seat to permit the wearer to sit, bend and squat without bringing about any discomfort or binding effect, reduces the amount of strain on the connecting seam, and greatly reduces the downward pulling force on the rear portion of the waist of the garment.

The present invention will be described in connection with the formation of panty hose, however, it is to be understood that the present invention may be utilized in the manufacture of other types of garments having either short or long legs, with or without a closed toe and foot at the lower ends of the legs. Also, the panty hose of the present invention is described as being provided with more fabric in the rear portion of the panty for accommodating the buttocks of the wearer. However, it is to be understood that the fullness fabric area may be provided in the front of the garment, as for example, when it is to be worn by pregnant women.

The panty hose of this invention is formed of a pair of seamless tubular legs having a panty portion or panty half knit integrally with each of the legs and extending upwardly therefrom. The legs and panty halves are each knit with stitch loops forming courses extending circumferentially and wales extending longitudinally of the legs and panty halves and each leg and panty half includes an inside wale and an outside wale positioned 180° apart and defining corresponding front and rear portions therebetween. Each panty half is slit downwardly from the upper end with a portion of each of the slits in each panty half being offset relative to the inside wales and toward the front of each panty half. The corresponding edges of the slits in each panty half are connected to form a panty with the connection extending up the front and rear and through the crotch of the panty and forming a waist opening in the upper end of the panty. The forwardly offset slits in the panty halves provide a greater amount of fabric in the rear or seat of the panty than the amount of fabric which extends across the corresponding portion of the front of the panty to provide fullness fabric areas in the rear of the panty for accommodating the buttocks of the wearer in both the standing and sitting positions. Several different types of offset slits are disclosed in this application for providing more fabric in a selected area of the panty.

Other objects and advantages of the present invention will appear as the description proceeds when taken in connection with the accompanying drawings, in which

FIG. 1 is a perspective view of panty hose blank for the right leg and is provided with a slit extending downwardly from the upper end of the panty half and with the slit being curved forwardly into the front half of the blank and generally following the contour of the buttocks of a wearer;

FIG. 2 is a view similar to FIG. 1 but showing the panty hose blank for the left leg;

FIGS. 3 and 4 are fragmentary perspective views of the upper portions of the blanks shown in FIGS. 1 and 2 and with the corresponding edges of the slits in the two blanks being separated;

FIG. 5 is a perspective view of the blanks shown in FIGS. 3 and 4 and illustrating a seam line connecting the rear edges of the slits of each blank, the front edges

being spread apart to show the inside of the panty portion;

FIG. 6 is a perspective view of the upper portion of the panty hose with both the front and rear edges of the slits of each panty half being connected together by a seam extending from the front of the waist opening, through the crotch and up the rear of the panty to the waist opening;

FIG. 7 is a side elevational view of the upper portion of the panty hose, in flattened condition, and illustrating the manner in which the fullness fabric area in the rear or seat portion of the panty is provided to accommodate the buttocks of the wearer;

FIGS. 8 and 9 are views of panty hose blanks which correspond to FIGS. 1 and 2 but which are provided with different types of offset slits;

FIGS. 10 and 11 also correspond with FIGS. 1 and 2 and illustrate still other types of offset slits;

FIGS. 12 and 13 correspond with FIGS. 1 and 2 but illustrate yet other types of offset slits; and

FIGS. 14 and 15 correspond to FIGS. 1 and 2 but illustrate still further types of slits.

The seamless tubular panty hose blanks illustrated in each embodiment of the invention of the present application are preferably knit on a conventional hosiery knitting machine, such as one, having approximately 400 needles and each panty hose blank is preferably knit of some type of stretchable yarn and may be knit with plain or rib stitch loops or the blanks may be knit with patterned stitch loops forming a pattern of tucks, floats, or a combination of both, etc. Elastomeric or rubber yarns or the like may also be incorporated in the tubular panty hose blanks to provide support characteristics to either the legs or panty portions or both. The lower ends of the tubular blanks may be knit with or without reciprocated heel pockets and the lower toe end portions may either be provided with or without reciprocated toe pockets or the toes may be closed in the well-known manner on the knitting machine. Also, the lower ends of the blanks may be closed by a conventional toe closing operation.

Normally, a heavier denier yarn is used in knitting the upper panty halves of the tubular blanks and a lighter weight or sheer yarn is used for knitting the leg portions. However, it is to be understood that the same yarn could be used to knit the entire length of the panty hose blank, if desired. The panty hose blanks, including both the legs and panty halves, are knit with stitch loops forming courses which extend circumferentially and wales extending longitudinally of the legs and panty halves, as illustrated by the longitudinally extending shade lines on the tubular blanks.

The seamless tubular panty hose blank, as illustrated in FIG. 1 is preferably knit from the top to the bottom and may be provided with a turned welt 10 which has an elastomeric or rubber yarn incorporated therein for forming the waistband at the upper end of the panty. However, it is to be understood that the waist opening of the panty may be finished by applying a woven or knitted elastic tape thereto, as by a sewing operation.

The tubular blank is knitted with continuous rotation of the needle cylinder and while feeding a relatively heavy denier yarn to all of the needles to form a panty half down to the line 11 where the heavy denier yarn is normally exchanged for a lighter weight yarn and rotary knitting continues to knit the tubular leg portion

12. A heavier denier yarn is normally introduced again at the lower end to form the lower toe 13 of the blank. It is preferred that the size of stitch loops being formed by the knitting machine from the top to the bottom of the tubular blank be gradually reduced in a conventional manner so that the tubular blank tapers inwardly at its lower end to aid in fitting around the foot and ankle of the wearer.

The panty hose blank illustrated in FIG. 2 is knit in an identical manner to that described for the panty hose blank illustrated in FIG. 1 and the corresponding parts bear the same reference numerals with the prime notation added. Each leg and panty half includes an inside wale, designated by the dash-dot line 14, and an outside wale, designated by the dash-dot line 15, which is diametrically disposed relative to the inside wale 14. Thus, the outside wale 15 is positioned 180° from the inside wale 14 and these opposed inside and outside wales define corresponding front and rear portions F and R therebetween. In selecting the inside wale 14, care should be taken to locate the same in proper relationship to the foot to avoid twisting of the legs.

Each panty half includes a slit 16 extending downwardly from its upper end with at least the medial portion of the slits in each panty half being offset relative to the inside wales 14 and toward the front F of each panty half. In FIGS. 1 and 2, the medial portions of the slits 16, 16' curve forwardly from opposite ends and define curved lines generally corresponding to the contour of the buttocks of the wearer. Both the upper and lower ends of the slits 16, 16' terminate substantially coincident with the inside wales 14, 14' of each panty half.

In FIGS. 3 and 4, the front edges of the slits 16, 16' are designated at 16a and 16a' while the rear edges of the slits 16, 16' are designated at 16b and 16b'. Suitable means is provided for connecting corresponding front and rear edges of the slits 16, 16' in the panty halves to form a panty, as illustrated in FIG. 6, with the connecting means extending up the front and rear and through the crotch of the panty and forming a waist opening at the upper end of the panty. In FIGS. 5 and 6 this connecting means is illustrated as a sewn seam S which is preferably of the conventional over edge type. Although the corresponding edges of the slits in the two panty halves are illustrated as being directly connected together by the seam S, it is to be understood that a crotch patch or gusset may be interposed in between the edges of the slits, if desired and justified from an economic standpoint. Although the panty hose blanks are usually slit and then sewn together in separate operations, the blanks may be slit and sewn with a sewing machine in the same operation.

As illustrated in FIG. 5, the fullness fabric area which is cut from the front half F of the panty half is now positioned in the rear of the panty. Therefore, the amount of fabric extending around the medial portion of the rear of the panty and between the outside wales 15, 15' (FIG. 6) is greater than the amount of fabric extending across the front of the panty. Since these fullness fabric areas have been removed from the front halves F of the panty halves, a reduced amount of fabric extends around the corresponding portion of the front of the panty and between the outside wales 15 and 15' so as to provide more fabric in the rear or seat of the panty for accommodating the buttocks of the wearer in both the standing and sitting positions.

This fullness fabric area provides a "pocket," as is clearly illustrated in FIG. 7, and provides additional fabric for accommodating the buttocks of the wearer so that when sitting, bending or squatting the downward pulling force on the rear of the waist of the panty will be reduced and excess strain will not be placed on the seam extending up the rear of the panty. Because the fullness fabric area is present in the rear of the panty, the number of wales extending around the medial portion of the rear of the panty and between the outside wales 15, 15' is greater than the number of wales extending across the corresponding portion of the front of the panty.

Also, because the curved slits 16, 16' extend across a substantial number of wales adjacent the inside wales of each of the blanks, as best illustrated in FIGS. 1 and 2, the wales in the portion of the panty halves adjacent opposite sides of the crotch extend in opposite directions relative to the seam S with the wales in the lower front parts of adjacent panty halves converging toward the seam and the wales in the lower rear parts of adjacent panty halves diverging away from the seam. The wales adjacent opposite sides of the seam in the upper rear portion of the garment converge toward the seam while the wales in the upper front portion of the garment diverge away from the seam.

In each of the embodiments illustrated in FIGS. 8-15, at least the medial portions of the slits are offset relative to the inside wales and toward the front of each panty half. The parts of the panty hose blanks shown in the embodiments of FIGS. 8-15 bear the same reference numerals as corresponding parts of the panty hose blanks shown in FIGS. 1 and 2, except that they are increased by ten digits in each successive embodiment.

The slits 26, 26' in the panty hose blanks shown in FIGS. 8 and 9 terminate at their lower ends substantially coincident with the inside wales 24, 24' and terminate at their upper ends in the front portions of the panty hose and forwardly of the inside wales 24, 24'. The medial portions of the slits 26, 26' extend in straight outwardly diverging lines from their lower to upper ends.

The slits 36, 36' provided in the panty hose blanks illustrated in FIGS. 10 and 11 include medial portions which extend parallel to and forwardly of the inside wales 34, 34'. The upper and lower portions of the slits 36, 36' extend rearwardly in straight angular lines and terminate substantially coincident with the inside wales 34, 34'.

The upper portions of the slits 46, 46' in the panty hose blanks of FIGS. 12 and 13 extend parallel with and forwardly of the inside wales 44, 44'. The lower portions of the slits 46, 46' curve rearwardly, as indicated by the curved lines 47, 47', and terminate substantially coincident with the inside wales 44, 44'. If desired, the curved portions 47, 47' of the slits can be formed to extend straight across a course line to the inside wales 44, 44'.

The upper portions of the slits 56, 56' in the panty hose blanks of FIGS. 14 and 15 extend parallel with and forwardly of the inside wales 54, 54' and their lower end portions curve forwardly and then rearwardly and terminate substantially coincident with the inside wales 54, 54'. The lower portions of the slits 56, 56' are similar to the lower portions of the slits 16, 16', illustrated in FIGS. 1 and 2.

As illustrated, the lower ends of all the slits terminate substantially coincident with the inside wales and portions of each slit are positioned forwardly of the inside wales. It is important that the forwardly positioned portions be spaced a substantial distance from the inside wales so that a sufficient amount of fabric fullness is provided. For example, in a blank knit on a 400 needle machine the forward portions of the slits should be positioned forwardly approximately one-eighth of the total number of wales in each panty half. This amounts to approximately 50 wales when the blank contains 400 wales. This fabric fullness in the rear of the panty portion provides more wales across the rear than across the front. The number of wales across the rear exceeds the number of wales across the front by approximately 12.5 percent.

The panty hose, described as an embodiment of the lower body garment of the present invention, may be finished in any desired manner. For example, many panty hose are currently being sold in unboarded condition while some panty hose are placed on shaped boarding forms and subjected to heat to set the legs and panty portions in a smooth flat condition.

In each embodiment of the panty hose blanks illustrated, the slits extend across a plurality of wales adjacent the inside wales and portions of the slits are positioned forwardly of the inside wales so that fabric is removed from the front of the panty and transferred to the rear of the panty when the corresponding edges of the slits are sewn together to form the panty. In each instance, this provides fullness fabric areas in the rear of the panty and provides improved form fitting characteristics to the panty hose. While the fullness fabric area is normally required in the rear of the panty hose, there will be instances in which it will be desirable to have fullness fabric areas in the front of the panty hose. In these instances, corresponding offset portions of the slits will be positioned rearwardly of the inside wales so that fabric is removed from the rear of the panty and transferred to the front of the panty when the corresponding edges of the slits are sewn together to form the panty.

In the drawings and specification, there has been set forth several embodiments 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.

That which is claimed is:

1. A lower body garment, such as panty hose, characterized by increased fullness in a selected area of the panty portion to accommodate lower torsal protuberances of the wearer, said garment comprising
 - a. a pair of knitted tubular legs,
 - b. a panty composed of two halves, each panty half being knit integrally with each of said legs and extending upwardly therefrom, said legs and panty halves each being knit with stitch loops forming courses extending circumferentially and wales extending longitudinally of said legs and said panty halves,
 - c. each leg and panty half including an inside wale and an outside wale positioned 180° apart and defining corresponding front and rear portions therebetween,
 - d. each panty half having a slit extending downwardly from its upper end with at least a portion of the slit in each panty half extending across a plurality of

wales adjacent said inside wale to form fullness fabric areas between the respective slits and inside wales, and

- e. means connecting corresponding edges of the slits in said panty halves to form the panty with said connecting means extending from the waist opening in the panty in the front downwardly through the crotch and upwardly to the waist opening in the rear of said panty, said fullness fabric areas when connected by said connecting means providing increased fullness in that area of the panty to accommodate lower torsal protuberances of the wearer and thereby providing increased fitting quality and comfort.
2. A garment according to claim 1 wherein the portions of the slits extending across wales in each panty half extend toward the front of the panty halves to form the fullness fabric areas in the rear of the panty to accommodate the buttocks of a wearer.
3. A garment according to claim 1 wherein the portions of the slits extending across wales in each panty half extend toward the rear of the panty halves to form the fullness fabric areas in the front of the panty to accommodate a frontal lower torsal protuberance of a wearer.
4. A garment according to claim 2 wherein the lower ends of the slits terminate at points substantially coincident with said inside wales of each of said panty halves.
5. A garment according to claim 4 wherein the upper ends of the slits also terminate at points substantially coincident with said inside wales of each of said panty halves.
6. A garment according to claim 5 wherein the portions of the slits extending across wales curve forwardly from opposite ends and define curved lines generally corresponding to the contour of the buttocks.
7. A garment according to claim 5 wherein the medial portions of the slits extend in walewise directions and forwardly of said inside wales of said panty halves, and the upper and lower portions of the slits extend at angles from the medial portions of the slits to said inside wales.
8. A garment according to claim 4 wherein the upper ends of the slits terminate forwardly of said inside wales.
9. A garment according to claim 8 wherein the medial portions of the slits extend in a straight line positioned at an angle from the lower ends at said inside wales to the upper ends positioned forwardly of said inside wales.
10. A garment according to claim 2 wherein the upper ends of the slits terminate forwardly of said inside wales.
11. A garment according to claim 10 wherein the lower ends of the slits terminate at points substantially coincident with said inside wales.
12. A garment according to claim 11 wherein the upper portions of the slits extend in walewise directions and the lower portions of the slits curve inwardly from the lower ends of the lower portions of the slits and to said inside wales.
13. A garment according to claim 11 wherein the upper portions of the slits extend in walewise directions and the lower portions of the slits define curved lines generally corresponding to the contour of the buttocks.

14. A garment according to claim 2 wherein said fullness fabric areas comprise a number of wales equal to approximately one-eighth of the total number of wales in each panty half.

15. A garment according to claim 1 formed from highly stretchable knitted fabric.

16. A lower body garment, such as panty hose, having improved form fitting characteristics and comprising

- a. a pair of knitted tubular legs,
- b. a panty half knit integrally with each of said legs and extending upwardly therefrom, said legs and panty halves each being knit with stitch loops forming courses extending circumferentially and wales extending longitudinally of said legs and said panty halves,
- c. each leg and panty half including an inside wale and an outside wale positioned 180° apart and defining corresponding front and rear portions therebetween,
- d. each panty half having a slit extending downwardly from its upper end with at least the medial portion of said slit being offset relative to said inside wale and toward the front portion thereof,
- e. means connecting adjacent portions of said panty halves to form a panty, said connecting means extending up the front and rear and through the crotch of said panty and forming a waist opening at the upper end of said panty so that the number of wales extending around the medial portion of the rear of said panty and between said outside wales is greater than the number of wales extending across the corresponding portion of the front of said panty to provide a greater amount of fabric in the rear than the amount of fabric in the front of said panty of said garment.
17. A garment according to claim 16 wherein the number of wales extending around the rear of said panty exceeds the number of wales extending across the front of said panty by approximately twelve and one-half percent (12.5 percent).
18. A method of forming a lower body garment, such as panty hose, including a pair of legs and an integral panty and being characterized by increased fullness in a selected area of the panty portion to accommodate lower torsal protuberances of the wearer, said method comprising the steps of
 - a. knitting a pair of tubular elongate blanks with leg portions at the lower ends and panty portions at the upper ends and while forming stitch loops comprising courses extending circumferentially and wales extending longitudinally from one end of said tubular blanks to the other, each leg and panty portion including an inside wale and an outside wale positioned 180° apart and defining corresponding front and rear portions therebetween,
 - b. slitting the panty portions of each of said tubular blanks downwardly from the upper ends thereof while crossing a substantial number of the wales thereof, at least portions of said slits extending across a plurality of wales adjacent said inside wale to form fullness fabric areas between the respective slits and inside wales, and
 - c. interconnecting the corresponding edges of the slits in the blanks to form the panty with the connection extending from the waist opening in the panty in the front downwardly through the crotch

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and upwardly to the waist opening in the rear of the panty, the fullness fabric areas providing increased fullness in that area of the panty to accommodate lower torsal protuberances of the wearer and thereby providing increased fitting quality and comfort.

19. A method of forming a garment according to claim 18, wherein the portions of the slits extending across the wales in each blank are formed toward the

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front of the panty portions to form the fullness fabric areas in the rear of the panty to accommodate the buttocks of the wearer.

20. A method of forming a garment according to claim 19 wherein the slits in each blank are curved forwardly from opposite ends and define curved lines generally corresponding to the contour of the buttocks.

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