Abstract of the Disclosure

The specification discloses improvements in the method of making panty hose garments wherein two stockings are separately knitted, slitted adjacent their upper portions and sewn together in a manner highly stylized panty portion of a denser contrasting visual appearance than the hose or leg portions is formed in the stockings during the knitting thereof by adding and deleting one or more yarns within selected courses contained within a juncture area between the panty portion and each leg portion, each juncture area extending over a multiplicity of courses contained in part in the panty portion and in part in the associated leg portion.

This invention relates to ladies' knit garments and more particularly to a combination stocking and panty garment, commonly referred to as panty hose, and to improvements in the method of making the same.

The commercial panty hose garments heretofore produced have been generally of two types; the first being panty hose wherein the entire garment is substantially of uniform density giving the same overall visual appearance throughout; and the second being a panty hose wherein there is a contrast in appearance between the panty portion and the leg portions of the garment by reason of differences in density. The present invention is concerned with improvements in panty hose of the second type.

With respect to panty hose of this type, heretofore a contrasting appearance between the panty portion and leg portions of the garment has been obtained by knitting a conventional welt or after-welt in the upper portion of the stockings used to make the garment. In the subsequent assembly of the garment, slits are cut in the welt portions and the slits are sewed together usually with a separate crotch piece therebetween at least adjacent the crotch area.

The welt knitted into the stockings, being denser than the remaining lower portions of the stockings, thus serve to delineate the panty portion from the leg portions in the finally formed garment. The area of delineation, which presents the contrast in appearance, with garments of this type is generally in a number of courses equal to the number of feeds in the machines utilized to knit the stockings. For all practical purposes the line of demarcation when the garment is worn is contained generally within a horizontal plane. With panty hose constructed in this fashion, the contrasting appearance of the panty portion is inherently limited in design, as, for example, to a simple horizontal line of demarcation. Conventionally, the denser panty portion in a garment of this type includes a panty body which extends downwardly a short distance onto the leg of the wearer, the contrast in density presenting an appearance similar to that provided by the wets of conventional ladies hose.

Where it is desired to provide a panty hose garment with a panty portion of a different design, as, for example, a panty portion cut high at the sides in a style similar to a bikini panty, the practice heretofore has been to separately knit the panty structure, cut conventionally knitted hose sections to match the panty structure, and then to sew the panty structure to the hose sections. In this way, the line of demarcation between the panty structure and the hose sections could be made to extend over a substantially greater number of courses in the hose sections than the number of feeds of the machines with configurations which can be varied by the cutting operation. A garment of this type, while presenting a desirable appearance, as compared with the first mentioned garment, has the disadvantage of a greater cost of manufacture.

This greater cost results from the necessity to separately knit the panty portion, to cut the hose portions and to sew the same together as distinguished from the simpler and more economical slit and seam assembly procedures.

As object of the present invention is to provide a panty hose construction which obtains the advantages of low cost and high styling of both types of conventional garments mentioned above, while eliminating the disadvantages of each.

The present invention is directed to a procedure for obtaining a contrasting appearance between the panty portion and the leg portions of a panty hose garment over a juncture area of a substantially greater number of courses than the number of feeds of the machine without the necessity of separately forming a panty portion, cutting the hose portions and sewing the same together. This result is obtained by adding and deleting one or more yarns within selected courses in the juncture area during the knitting of the stockings used to make the panty hose.

With this procedure the panty hose may be finally assembled by the more economical slitting and seaming procedures heretofore utilized.

Accordingly, it is an object of the present invention to provide a panty hose garment formed of two stockings slit and sewed together in which a denser highly styled panty portion is delineated from less dense leg portions by adding and deleting one or more yarns within selected courses of the stockings utilized to make the panty hose throughout a juncture area extending over a multiplicity of courses.

Another object of the present invention is the provision of an improved procedure for making panty hose garments of the type described in which one or more yarns are added and deleted within selected courses of stockings during the knitting thereof, which stockings are subsequently slit and sewed together to form panty hose having a highly stylized panty design of contrasting appearance to the leg portions of the garment.

These and other objects of the present invention will become more apparent during the course of the following detailed description and appended claims.

The invention can best be understood with reference to the accompanying drawings wherein illustrative embodiments are shown.

In the drawings:

FIGURE 1 is a front elevational view of a panty hose garment embodying the principles of the present invention;

FIGURE 2 is a side elevational view of the garment shown in FIGURE 1;

FIGURE 3 is an exploded view illustrating the component part of the garment prior to assembly;

FIGURE 4 is a view similar to FIGURE 3 showing the garment in partially assembled condition;

FIGURE 5 is an enlarged photographic view of a portion of the garment within the circle shown in FIGURE 3, illustrating the contrasting visual appearance and density of the panty portion with respect to the adjacent portion of the garment and one embodiment of a highly stylized design of the line of demarcation therebetween; and
FIGURE 6 is a view similar to FIGURE 4 illustrating another embodiment of a highly stylized design of the line of demarcation between the panty portion and a leg portion of the garment.

Referring now more particularly to the drawings, there is shown in FIGURES 1 and 2 a panty hose garment, generally indicated at 10, embodying the principles of the present invention. The garment 10 is made up essentially of four pieces or parts including a pair of stockings 12 and 14, a crotch piece or part 16, and an elastic waistband part 18. The present invention is more particularly concerned with the procedures for making the stocking parts 12 and 14 and the construction of the finally assembled garment resulting from these procedures. In general, the manner in which the stocking parts, once knitted in accordance with the principles of the present invention, are subsequently processed and assembled with the crotch piece and waistband, is of a conventional nature.

In accordance with the principles of the present invention, each stocking part 12 and 14 is knitted separately, preferably on a conventional circular knitting machine, as, for example, a Mark IV knitting machine, which is a 4-feed, 400 needle machine with suction drawdown. Each stocking part 12 and 14 is knitted with a foot portion 20 which is adapted to cover a foot of the wearer. Each foot portion is knitted in conventional fashion, that is, the toe of the foot portion may be closed in any conventional manner, such as sewing or looping, and the heel of the foot portion may be knitted as a reciprocated heel or a non-reciprocated heel. The mesh used in the heel and toe areas of the foot portion 20 may be of any conventional construction as can be the remaining areas. Likewise, any conventional yarn or yarns may be utilized in knitting the foot portion 20, including monofilament or multifilament yarns of any desired denier and material.

Each stocking part 12 and 14 is knitted to include a leg portion 22 which extends continuously upwardly from the foot portion 20 and which functions to cover the leg of the wearer. Here again, each leg portion is knitted utilizing any conventional mesh and any conventional yarn or yarns including monofilament or multifilament yarns of any desired denier and material. Finally, each stocking part 12 and 14 is knitted to include an upper portion 24 which extends continuously upwardly from the leg portion 22 to a length sufficient to extend approximately to the waist area of the wearer.

In the preferred embodiment shown, the upper portion 24 of each stocking part 12 and 14 includes a juncture area extending over a multiplicity of courses, as, for example, approximately 764 courses in the preferred embodiment shown. The knitting of each upper portion 24 in the juncture area is an essential feature of the present invention. In the juncture area one or more yarns are knitted into and cut out of selected courses thereof so as to form in the juncture area a design by virtue of differences in density and fill, which, when the stocking parts are assembled into a completed garment, define a line of demarcation, indicated by the numeral 26, between a denser panty portion of the garment, indicated generally by the numeral 28, and the less dense associated leg portions 22 of the garment.

In the particular embodiment shown in FIGURES 1–5, the line of demarcation 26 defines a panty portion 28 which is high cut at the sides simulating the cut of a bikini panty. Also, as shown, the highest point of each line of demarcation is somewhat below the upper extremity of the crotch portion 24, but it will be understood that the line of demarcation could extend to the upper extremity and that any desirable design may be provided to define the panty portion in accordance with the principles of the present invention. For example, in the embodiment shown, a line of demarcation could be formed in courses extending about the juncture area, as, for example, to define a low cut waist line of demarcation. The manner in which the upper portion of each stocking part 12 and 14 is knitted and particularly the juncture area thereof will now be described in relation to the particular embodiment disclosed in FIGURES 1–5.

As previously mentioned, the preferred embodiment on which the stocking parts are knitted is a 4-feed 400 needle circular knitting machine. Preferably with the use of this machine, the knitting precedes from the end of the upper portion 24 to the end of the foot portion 16, although the reverse direction may be utilized. The upper portion 24 of each stocking part is initially knitted with a jersey stitch mesh utilizing as yarn in the 4-feeds respectively, (1) a one end 20 denier Z torque monofilament nylon and a one end 2/30 super loft yarn (2) a one end 20 denier S torque monofilament nylon, (3) a one end 20 denier Z torque monofilament nylon and a one end 2/30 super loft, and (4) a one end 20 denier S torque monofilament nylon. When the juncture area of the upper portion 24 is reached in the operation of the machine, the one end 2/30 super loft yarn is knitted in and cut out of alternate courses throughout the juncture area. Preferably, this adding and deleting of yarns is selected courses is accomplished by utilizing the adjustments and mechanisms in the Mark IV machine which are utilized in knitting a reinforced heel. It will be understood that while a single yarn is added and deleted to alternate courses in particular embodiment of FIGURES 1–5, it is within the contemplation of the present invention to add and delete one or more than one yarn in all of the courses within the juncture area or within any selected number of courses less than all, either in a regular sequence, as with alternating courses, or in a random sequence. The selected courses may have yarn added and deleted, however, must be sufficient to present a contrasting appearance to the panty portion 28 and to delineate the line of demarcation 26.

It will also be understood that while it is preferred to delete the added yarn by cutting out the yarn as the stocking part is knitted, it is within the contemplation of the present invention to float the portions of the added yarns to be deleted and to subsequently cut out the floated portions. It is, of course, preferable to delete the yarns by cutting during the knitting process since this is more economical than to utilize a subsequent cutting action after the stocking part has been knitted. Alternatively, it may be desirable to effect deletion by cutting during knitting in some courses while utilizing subsequent cutting in other courses. The desirability of performing either or both of these cutting operations for a given stocking will be dictated somewhat by the intricacy of the design of the line of demarcation 26.

Each line of demarcation 26, as shown in FIGURES 1–5, is of a stepped design which extends upwardly and outwardly from the crotch area in both front and back to define a highly stylized panty portion 28 which is high cut at the sides. This configuration is formed in the juncture area after first knitting a narrow conventional well, as indicated at 30, and a predetermined number of courses down, to the juncture area utilizing an added yarn in alternate courses as previously described. The stepped design is begun by deleting a portion of the added yarn (i.e., the one end 2/30 super loft yarn) at a position intermediate the front and back. Thus, during the knitting of the first 16 courses of the juncture area (four revolutions of the machine) 16 less needles are utilized adjacent the hip area (i.e., intermediate the front and back) thus knitting with the first 16 courses and adding yarns in eight courses extending throughout all but 16 waives, the additional yarns being deleted, as by cutting, in the aforesaid 16 waives of the alternate eight courses. In the next 16 courses, eight less needles of each side of the initial 16 needles are utilized in conjunction with the added yarns so that there is included within the next 16 courses added yarns in eight courses extending over...
all but 32 wales symmetrical to the 16 deleted wales of the first 16 courses, the added yarns being deleted, as by cutting, from the aforesaid 52 wales of the second 16 courses. This procedure is repeated by inserting the knitting of the added yarn in the selected courses by eight wales on each side until the additional yarn is no longer included in any of the wales. When the added yarn is deleted within all of the wales, the lowermost point of the line of demarcation is defined. In the particular embodiment shown, the parts of all of the courses within the juncture area contained within the pane portion are knitted with a standard jersey stitch while the remaining parts are knitted with a tuck stitch mesh as is the remainder of the associated leg portion 22.

While it is, of course, desirable that the parts of the courses within the juncture area outside of the panty portion be of the same mesh as the leg portions 22, the panty portion may be of the same or different mesh. It will also be understood that while it is greatly preferred to knit the stocking parts 12 and 14 with a seamless construction on a circular knitting machine by reason of cost and style considerations, the principles of the present invention can be applied to the knitting of seamless stocking parts of full fashion knitting machines.

The design of the line of demarcation 26 in the embodiment shown in FIGURE 5 is broken into fairly well defined steps. In FIGURE 6, there is shown an alternative embodiment presenting a line of demarcation 32 more nearly simulating a smooth line characterized by a greater number of smaller steps than shown in FIGURE 5. The FIGURE 6 embodiment is knitted in a manner similar to the FIGURE 5 embodiment except that each step is defined by eight courses and three wales rather than 16 courses and eight wales.

After two stocking parts 12 and 14 have been knitted in the manner set forth above, the stocking parts are sized by the horizontal stretch method utilizing a Jones machine. Next, the toe areas of both stocking parts are closed by any conventional means, such as sewing a tailored toe.

It will be understood that where the heel area of the stocking part is of non-reciprocated construction, the stocking parts 12 and 14 can be made on the same circular knitting machine utilizing the same settings. Under these circumstances, after the stocking parts have been knitted and further processed in the manner described above, each is longitudinally slit, as indicated at 34, within the upper portion 24 thereof at a position intermediate the front and rear thereof in alignment with the position of the lowermost extent of the panty portion and the extent substantially down to the lowermost extent of the panty portion. The slitting of the stocking parts is accomplished in any conventional fashion, as, for example, by utilizing conventional equipment such as an Eastman Chickadee machine. Also, in accordance with conventional practice, a tuck mark (not shown) is preferably formed during the knitting of the stocking parts to accurately locate the lower termination of the slits.

It will be noted that in subsequently assembling the garments, the slits 34 are opened and secured together in a relationship generally facing one another. Thus, in the completed garment 10, the stocking part 12 is reversed front to back with respect to the stocking part 14. By utilizing a non-reciprocated heel, the shape of which is subsequently formed under heat and pressure, no orientation problem is encountered in the reversal of the stocking parts during assembly. It will be understood, however, that where a reciprocated heel construction is utilized, it is necessary to separately knit right and left-hand stocking parts 12 and 14 in order to provide proper orientation of the heel construction in the finished garment.

In securing together the slits 32 of the two stocking parts, it is preferable to utilize the crotch part 16 previously described, although, it is within the contemplation of the present invention to sew the slits 32 directly together by a common seam.

Preferably the crotch part 16 is knitted on a full-fashion knitting machine utilizing the same mesh and yarn as the panty portion 22, however, being in the shape generally of a man's tie, although, it will be understood that other shapes may be utilized, as, for example, a conventional diamond shape or the like. Alternatively, the crotch part 16 may be cut from a tube knitted on a circular knitting machine with the same mesh and yarns as the present portion 28. After the knitting of the tube has been completed, it is heat pressed and then cut to the desired configuration. A fashioned crotch part is preferable because the edge of the subsequently formed seam is selvedged during assembly and because there is no wasted yarn as is the case when the crotch part is cut from a seamless tube.

With the embodiment shown in FIGURES 1-5, after both stocking parts 12 and 14 have been slit, as indicated at 34, they then go to a seam sewer who sews one complete side of the crotch part 16, as by a seam 36, to an extent of the slit 32 adjacent the crotch area and rearwardly of the one of the stocking parts, for example, as shown in FIGURE 4. The front extent of both slits 32 of both stocking parts are then sewn together, as by common seam 38, as shown in FIGURE 4. Finally, the other side of the crotch part 16 is sewn to the slit 32 of the stocking part 12, as by a seam 40, to within about 4" of the top edge.

The garment thus assembled is then sent to the blind stitch machine operator who attaches the elastic waistband 18 to the narrow welts 30 of the stocking parts 12 and 14. The waistband 18 is of any conventional construction, a preferred embodiment being 54" woven elastic, type 6 nylon, United Elastic Company Style No. 3-4307-WRS/8. After the waistband 18 has been attached, the garment is then returned to the closure operator, using a Merrow machine, who sews the last 4" of the crotch part 16 to the slit 32 of the stocking part 12, closing the two ends of the waistband part 18 in the same operation.

The completely assembled panty hose garment is then steamed in a Lydon box at 190° F. at atmospheric pressure for 30 minutes and then dyed. After the dying operation the garment is then bearded in a Turbo Boarding machine where the garment is treated at 235° F. for 30 seconds at maximum steam. A 2½ minute drying cycle is allowed to ensure that the garment is dried sufficiently before stripping. It will be understood that other conventional processes may be utilized, as, for example, conventional prebonding procedures.

It will thus be seen that the objects of this invention have been fully and effectively accomplished. It will be realized, however, that the foregoing specific embodiment has been shown and described only for the purpose of illustrating the principles of this invention and is subject to extensive change without departure from such principles.

What is claimed is:
1. A panty hose garment comprising a pair of knitted stocking parts each having a foot portion for covering a foot of a wearer, a leg portion for covering a leg of the wearer, and an upper portion, said upper portions being longitudinally slit intermediate the front and rear thereof, means for securing the upper portions of said stocking parts together along the slits thereof with each of the latter opened and facing toward the other to provide an assembly for covering the remainder of the wearer up to approximately the waist, said assembly including a panty portion of a density greater than the density of said leg portions so as to provide a contrasting visual effect between the panty portion and said leg portions, the contrasting visual effect between said panty portion and each of said leg portions being defined within a junc-
structure area comprising a multiplicity of knitted courses each of which is contained in part within said panty portion, each of said juncture areas having additional yarn means knitting with selected courses thereof within the parts thereof contained within said panty portion, said additional yarn means being cut out of the remaining parts of said selected courses so as to define a line of demarcation of contrasting density and predetermined highly stylized design between said panty portion and the associated leg portions.

2. A panty hose garment as defined in claim 1 wherein said selected courses comprise alternate courses within said juncture areas.

3. A panty hose garment as defined in claim 1 wherein the line of demarcation of each juncture area is of stepped design extending generally upwardly and outwardly from the crotch area in both the front and back so as to define a panty portion presenting high cut sides.

4. A panty hose garment as defined in claim 1 wherein said securing means comprises a separately knitted crotch piece disposed between predetermined extent of said slits at least adjacent the crotch area, a seam securing said crotch piece to the predetermined extent of each slit and a common seam securing the remaining extent of said slits directly together.

5. A panty hose garment as defined in claim 1 wherein each of said stocking parts is of seamless knit construction.

6. A panty hose garment as defined in claim 1 wherein the parts of the courses within said juncture areas outside of said panty portion are of a knitted mesh the same as the knitted mesh of said leg portions but different from the knitted mesh of the parts of said courses within said panty portion.

7. In a method of making a panty hose garment in which a pair of stocking parts are separately knitted so as to form a foot portion for covering a foot of a wearer, a leg portion for covering a leg of a wearer and an upper portion, each stocking part being longitudinally slit in its upper portion intermediate the front and rear thereof and the slit stockings are secured together along the slits with each of the latter opened and facing toward the other to provide an assembly for covering the remainder of the wearer up to approximately the waist, the improvement which comprises the step of knitting and cutting out additional yarn means with selected courses during the knitting of a multiplicity of courses within the upper portion of each stocking part to thereby form a juncture area within the upper portion of each stocking part presenting a contrasting visual effect due to change in density along a line of demarcation of predetermined design, the line of demarcation serving to define the lower extremities of a highly stylized panty portion of contrasting visual effect in the assembled garment.

8. A method as defined in claim 7 wherein said additional yarn means is cut out during the knitting of said selected courses.

9. A method as defined in claim 7 wherein a single additional yarn is knitted and cut out in said selected courses.

10. A method as defined in claim 7 wherein said selected courses are alternate courses.

11. A method as defined in claim 7 wherein said stocking parts are knitted on a circular knitting machine.

12. A method as defined in claim 7 wherein each of a pair of stocking parts is knitted in a similar manner with a non-reciprocated heel in the foot portion thereof, the stocking parts being oppositely oriented with respect to the front and back in the assembled garment, but with the non-reciprocated heels of both in proper orientation in the back of the foot portions.

13. A method as defined in claim 7 wherein a predetermined extent of said slits are secured together by seaming a separately knitted crotch piece therebetweem at least adjacent the crotch area of the garment and the remaining extent of the slits are secured together by seaming them directly together.

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