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SOCK CONSTRUCTION

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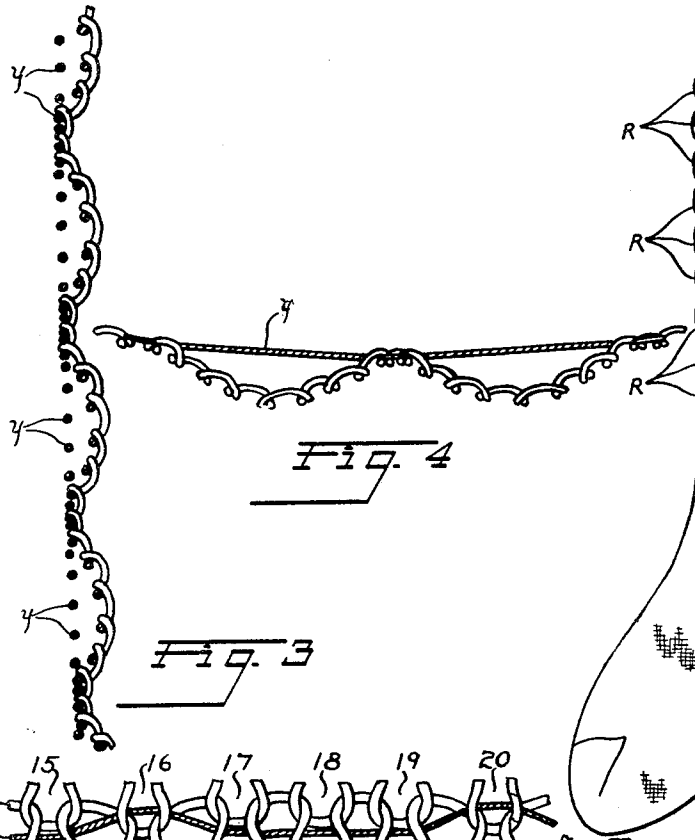


Fig. 4

Fig. 3

Fig. 1

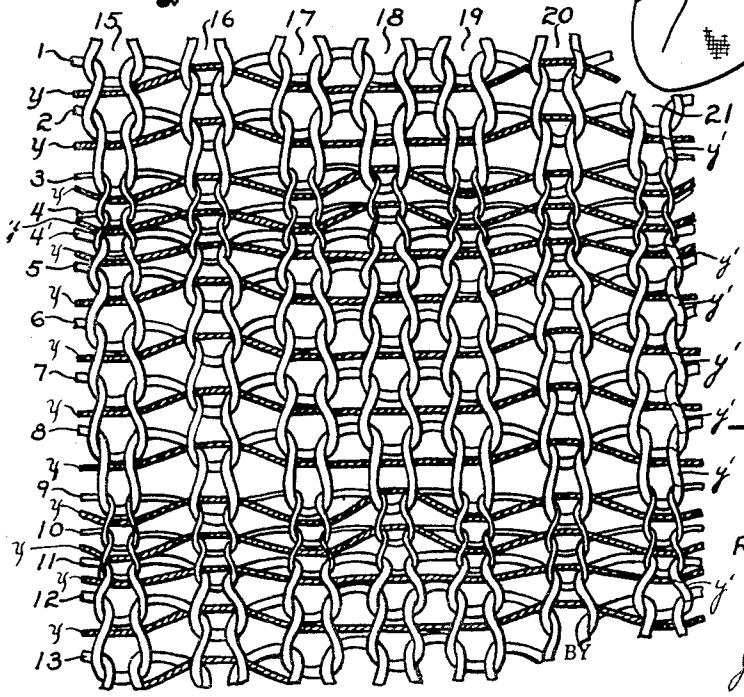


Fig. 2

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# SOCK CONSTRUCTION

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The present invention relates to a knitted fabric construction and more particularly to a plain knitted mock ribbed fabric construction having a new and ornamental design therein. The mock knitted fabric construction of the present invention is to be employed in the production of wearing apparel, and more particularly, in the manufacture of hosiery.

The production of mock ribbed knitted fabric, and particularly wearing apparel, has enjoyed considerable commercial acceptance for a great many years. For example, women and young girls have been wearing hosiery known as "bobby socks" which consist of a plain knitted foot portion and a mock rib knitted top or ankle portion which possesses a bulky ribbed appearance. The bulky ribbed ankle portion is generally designated as consisting of a mock rib construction, and is self-sustaining when encased around the leg of the wearer. This is made possible by elastic thread or yarn, such as, for example, rubber yarn, which has been incorporated into the ankle portion, in whole or in part, during its formation to provide the necessary elasticity thereto.

There are many types of such "bobby socks" in which various designs have been imparted to the ribbed ankle portion of such socks. This is achieved by varying the general knitting operation in one or more ways such that the rib appearance is changed to impart a design thereto. The present invention is directed to the production of a new and novel mock ribbed knitted fabric having a new and ornamental design therein, and particularly to a new and novel sock of the aforementioned type having a new and extremely attractive design appearance in the top or ankle portion thereof formed by a particular knitting operation.

It is therefore a principal object of the present invention to provide a new, novel, and improved mock ribbed knitted fabric construction.

A further object of the present invention is the provision of any plain knitted wearing apparel having a new and ornamental design therein.

A still further object of the present invention is the provision of a new and novel article of hosiery.

Another object of the present invention is to provide hosiery that possesses a new and ornamental design in the ankle or any other portion of the hose.

Yet another object of the present invention is the provision of a hosiery in which the top or ankle portion thereof is knitted in a new and novel manner.

A still further object of the present invention is the provision of a sock having a top or ankle portion in which the basic design is capable of being varied by the wearer to impart several designs thereto.

Other and additional objects will become manifest from the ensuing description taken in conjunction with the accompanying drawings.

Broadly stated, the present invention is a plain knitted mock rib fabric construction comprising at least a plurality of courses of multiple yarns, a plurality of courses of a lesser number of yarns, said multiple yarn courses and said courses of said lesser number of yarns being in alternate relationship. More specifically, the present invention is a self-supporting plain knitted article of hosiery comprising a foot portion and a self-sustaining mock ribbed ankle portion, said ankle portion having at least a plurality of courses of multiple yarns and a plurality



of courses of a lesser number of yarns, said multiple yarn courses and said courses of said lesser number of yarns being in alternate relationship, and elastic yarn layed in a plurality of courses and floated across at least some rib forming wales of said ankle portion.

To the accomplishment of the foregoing and related ends, the present invention consists of the means hereinafter fully described and particularly pointed out in the claims, the annexed drawings and the following description setting forth in detail certain means in the carrying out of the invention, such disclosed means illustrating, however, but one of the various ways in which the principal of the invention may be employed.

The present invention is illustrated by way of example in the accompanying drawings, in which:

FIGURE 1 is a side elevational view of one form of a sock construction made in accordance with the present invention illustrating the new and ornamental appearance possessed by the ankle portion of the sock.

FIG. 2 is an enlarged illustration of the fabric taken in section 2 of the sock shown in FIG. 1 illustrating the incorporation of the rubber in the ankle portion with a few wales and courses of fabric making up the fabric being included.

FIG. 3 is a sectional view taken on the line 3—3 of FIG. 1.

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 1.

Referring now to the drawings and with particular reference to FIG. 1, a completed sock, designated by reference letter S, is shown which illustrates a design of the ankle portion of an illustrative sock construction made in accordance with the present invention quite fully. The sock S consists of an ankle portion A and a foot portion F which is conventional in construction and is made by a plain knit operation. The ankle portion A includes a restricted make-up course B at the top free end thereof, with the remainder of the top or ankle portion being composed of a plurality of continuous horizontal bands of loosely knit, vertically extending mock rib portions R spaced vertically from one another by bands of tightly knit restricted plain portions P. The alternate relationship of the loosely knit mock ribbed bands R and the tightly knit plain bands P continues throughout the entire top or ankle portion A until it merges with the foot portion F. The illustrative construction of the ankle portion A results in a plurality of elongated mock ribbed bands separated from one another by narrow, restricted, plain bands which produce a layered or ruffled pattern in the ankle portion of the sock.

The mock rib portions R of the angle portion A may be of any mock ribbed knitting combination. In the illustrated top or ankle portion A, the rib portions R are shown in a 3 by 1 mock rib which is a conventional mock rib design. However, it is to be clearly understood that the rib stitch may be any conventional mock rib combination in use today, such as, for example, 2 by 1, etc. With regard to the vertical length of each band of rib portion R, this is determined by the number of courses knit for each rib portion. However, the number of courses knit for the rib portion will, preferably, always be greater than the number of courses knit for the plain restricted portion. However, it is to be understood that it is within the scope of the present invention to have the courses of the plain knit portion greater in number than the courses forming the rib portion.

As illustrated, each of the mock ribbed portions R consists of several courses of bulky loosely knit yarn, while each restricted plain knit portion P consists of two courses. However, it is to be clearly understood that this is illustrative in character only since the number of courses for each of the ribbed portions R and the plain

portions P may vary, as desired. For example, with a conventional Scott-Williams 60 needle knitting machine any numerical arrangement between the ribbed portions and the plain portions may be employed, such as, for example, 4 and 2, 6 and 2, 8 and 2, 8 and 4, etc.

The ribbed portions R, as hereinbefore indicated, are loosely knit and bulky in configuration. This is accomplished by using a loose stitch operation and a plurality of yarns in each of the rib courses. The courses of the plain knit restricted portioons P, however, are formed using a lesser number of yarn strands knit in a tight stitch. This produces the desired layered effect between the long bulky ribbed portions and the narrow restricted plain portions. The ankle portion A of the sock S achieves self-sustainability on the leg of the wearer by the use of elastic yarn layed in the ankle portion A of the sock. In the illustrative embodiment of the sock as hereinbefore indicated the rib design shown is a 3 by 1 rib. The elastic material, such as, for example, rubber yarn, is layed in the ankle portion in the form shown by being fed to every fourth needle. This construction results in the rubber being layed in every fourth wale and being floated across each three intervening wales, thus forming the bulky 3 by 1 mock rib. Of course, if another rib design is to be employed, the rubber yarn will be floated across the number of wales constituting the bulky rib portion and laid in the number of wales of the other segment of the rib portion.

Reference is now to be had to FIGS. 2, 3, and 4 wherein an enlarged fragmentary portion 2 of the sock shown in FIG. 1 is shown which illustrates the knitting operation to be employed. As illustrated, the fragmentary section of the sock comprises courses 1 through 13 and wales 15 through 21. As illustrated, courses 1 and 2 are knit in a loose stitch on a conventional circular knitting machine using a plurality of yarns. Courses 1 and 2, as well as courses 4'–8 and courses 11–13, are shown in wale 21 in FIG. 2 with a portion thereof in broken section, with Y' indicating the bottom yarn. This illustrates that courses 1–2, 4'–8, and 11–13 each consist of a plurality of yarns, thus making up multiple yarns for each course. For example, the body yarn is a 3/1 yarn with an additional 3/1 and 6/1 yarn added during the knitting of the courses 1 and 2. However, these size yarns are illustrative in character only since any size yarn may be employed. Moreover, any desired number of yarns may be employed so long as the number of yarns employed in the ribbed portion is greater in number than the number employed in plain knit restricted portion. These courses 1 and 2 constitute the two lower courses of the ribbed portion of the sock. During the knitting of courses 1 and 2, elastic yarn Y, such as, for example, rubber, is fed from an auxiliary feeding station to every fourth needle and floated behind the intervening needles, thereby resulting in the elastic yarn Y being layed in at wales 16 and 20 and being floated across intervening wales 17, 18, and 19.

After the completion of the knitting of the mock rib courses 1 and 2 and with the laying in of the elastic yarn Y therein, the plain knit restricted portion is to be knitted. To accomplish this, the auxiliary sinker cam for the formation of the loose or long stitch is retracted. At the same time, the two additional yarns used with the body yarn during the knitting of the rib courses 1 and 2 likewise are withdrawn. The plain courses 3 and 4 are then knit with tight or short stitches, using only the 3/1 yarn. During the knitting of the two courses 3 and 4, the elastic yarn is fed from an auxiliary station to alternate needles thereby insuring the formation of the desired restricted portion. The elastic yarn as shown is layed in every course of both the rib portion and the plain portion. While this is preferred in order to insure the desired elasticity and self-sustainability of the top or ankle portion, it is to be understood that the elastic yarn if desired may be layed in only alternate courses of the rib portion and plain portion. This arrangement of laying in the elastic yarn in only the alternate courses may be employed throughout the knitting of the entire top or angle portion.



At the completion of plain courses 3 and 4 which form the restricted portion P, the auxiliary sinker cam is again introduced to produce the desired loose stitch and the additional yarns are again added to the base yarn. The knitting sequence both with respect to the multiple yarns and the elastic yarn for courses 4', 5, 6, 7, and 8 is identical with that hereinbefore described with respect to courses 1 and 2. This operation produces the desired bulky rib courses of the 3 by 1 mock rib construction.

At the completion of course 8 the auxiliary cam enabling the formation of the loose stitches is again dropped out and the two additional yarns added for the bulky rib portion likewise are dropped out. Courses 9 and 10 are then knit with the single yarn in the manner hereinbefore indicated with respect to courses 3 and 4 to produce the desired restricted plain portion. At the completion of course 10 the loose stitch-forming cam again is placed in operative association with the sinker cam of the kniting machine and the additional yarns are introduced at the feeding station to complete the formation of courses 12 and 13, which constitute the first two courses of the next bulky rib portion. This operation is repeated in the same sequence as hereinbefore indicated until the formation of the ankle portion is complete. The foot portion of the sock is then knit in the conventional plain knit pattern until same is formed.

The yarn to be employed herein in the formation of the sock may be cotton, wool, nylon, Orlon, Dacron, Banlon, or any synthetic yarn. Similarly, the foregoing yarns may be blended with one another, such as, for example, wool and nylon, cotton and Banlon, etc. It is to be noted that the appearance will vary with respect to the yarns used. For example, employing cotton yarn the vertically spaced rib portions and the restricted portions therebetween will merge gradually with respect to one another forming the continuous ruffled pattern. However, using Banlon the restricted portion between the bulky rib portions will be more sharply defined, thereby giving a more clearly defined layer relationship between each of the rib portions of the sock.

The foregoing illustrative description has been had relative to hosiery of the type known as "bobby socks." However, it is to be clearly understood that the present invention may be employed with any type of knitted hosiery including ladies' hosiery, such as, for example, nylons, etc., men's hoisery, etc. Moreover, the present invention may be employed in hosiery tops of all kind and not necessarily in just the ankle portion. Furthermore, the design need not be employed throughout the ankle portion of the sock but may be used in only a portion thereof. Moreover, while the illustrative embodiment of the invention has been shown with respect to hosiery, it is to be clearly understood, as hereinbefore described, that the invention may be employed with any knitted fabric in which a design is desired. For example, the present invention may be used in the knitting of sweaters, bathing suits, skirts, jerseys, tights, undergarments, gloves, dresses, bathrobes, etc. Likewise, it may be used in the formation of other knitted articles of commerce such as, for example, bags, gun covers, etc.

While there have been described herein what are at present considered preferred embodiments of the invention, it will be obvious to those skilled in the art that modifications and changes may be made therein without departing from the essence of the invention. It is therefore to be understood that the exemplary embodiments are illustrative and not restrictive of the invention, the scope of which is defined in the appended claims, and that all modifications that come within the meaning and range of equivalency of the claims are intended to be included therein.

We claim:

1. A tubular plain knitted fabric comprising spaced mock rib portions separated by restricted portions, said mock rib portions each comprising a plurality of courses knit of a plurality of yarns and having elastic yarns inlaid therein, said elastic yarns being incorporated in spaced wales separated from each other by a plurality of wales across which said elastic yarn is floated, said restricted portions each comprising a lesser number of coures than said mock rib portions and being knit of a lesser number of yarns, and elastic yarns inlaid therein, said elastic yarns being incorporated in spaced wales which are separated from each other by a lesser number of wales than said first mentioned spaced wales and across which said elastic yarn floats.

2. A plain knitted article of hosiery including spaced mock rib portions separated by restricted portions, said mock rib portions each comprising a plurality of courses knit of a plurality of yarns and having elastic yarns inlaid therein, said elastic yarns being incorporated in spaced wales separated from each other by a plurality of wales across which said elastic yarn is floated, said restricted portions each comprising a lesser number of courses than said rock rib portions and being knit of a lesser number of yarns, and elastic yarns inlaid therein, said elastic yarns being incorporated in spaced wales which are separated from each other by a lesser number of wales than said first mentioned spaced wales and across which said elastic yarn floats.

3. A self-supporting plain knitted article of hosiery comprising a float portion and a self-sustaining ankle portion, said ankle portion comprising spaced mock rib portions separated by restricted portions, said mock rib portions each comprising a plurality of courses knit of a plurality of yarns and having elastic yarns inlaid therein, said elastic yarns being incorporated in spaced wales separated from each other by a plurality of wales across which said elastic yarn is floated, said restricted portions each comprising a lesser number of courses than said mock rib portions and being knit of a lesser number of yarns, and elastic yarns inlaid therein, said elastic yarns being incorporated in spaced wales which are separated from each other by a lesser number of wales than said first mentioned spaced wales and across which said elastic yarn floats.

4. A tubular plain knitted fabric comprising spaced mock rib portions separated by restricted portions, said mock rib portions each comprising a plurality of courses knit of a plurality of yarns and having elastic yarns inlaid therein, said elastic yarns being incorporated in every fourth wale and floated across the intervening wales, said restricted portions each comprising a lesser number of courses than said mock rib portions and being knit of a lesser number of yarns, and elastic yarns inlaid therein, said elastic yarns being incorporated in alternate wales and floated across the intervening wale.

5. A plain knitted article of hosiery including spaced mock rib portions separated by restricted portions, said mock rib portions each comprising a plurality of courses knit of a plurality of yarns and having elastic yarns inlaid therein, said elastic yarns being incorporated in every fourth wale and floated across the intervening wales, said restricted portions each comprising a lesser number of courses than said mock rib portions and being knit of a lesser number of yarns, and elastic yarns inlaid therein, said elastic yarns being incorporated in alternate wales and floated across the intervening wale.

6. A self-supporting plain knitted article of hosiery comprising a float portion and a self-sustaining ankle portion, said ankle portion comprising spaced mock rib portions separated by restricted portions, said mock rib portions each comprising a plurality of courses knit of a plurality of yarns and having elastic yarns inlaid therein, said elastic yarns being incorporated in every fourth wale and floated across the intervening wales, said restricted portions each comprising a lesser number of courses than said mock rib portions and being knit of a lesser number of yarns, and elastic yarns inlaid therein, said elastic yarns being incorporated in alternate wales and floated across the intervening wale.

7. A tubular plain knitted fabric comprising spaced mock rib portions separated by restricted portions, said mock rib portions each comprising a plurality of courses knit of a plurality of yarns and having elastic yarns inlaid therein, said elastic yarns being incorporated in spaced wales separated from each other by a plurality of wales across which said elastic yarn is floated, said restricted portions each being knit of a lesser number of yarns than said mock rib portions, and elastic yarns inlaid therein, said elastic yarns being incorporated in spaced wales which are separated from each other by a lesser number of wales than said first mentioned spaced wales and across which said elastic yarn floats.

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