June 19, 1945. V. LOMBARDI 2,378,780

KNITTED FABRIC

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Fig. 1.

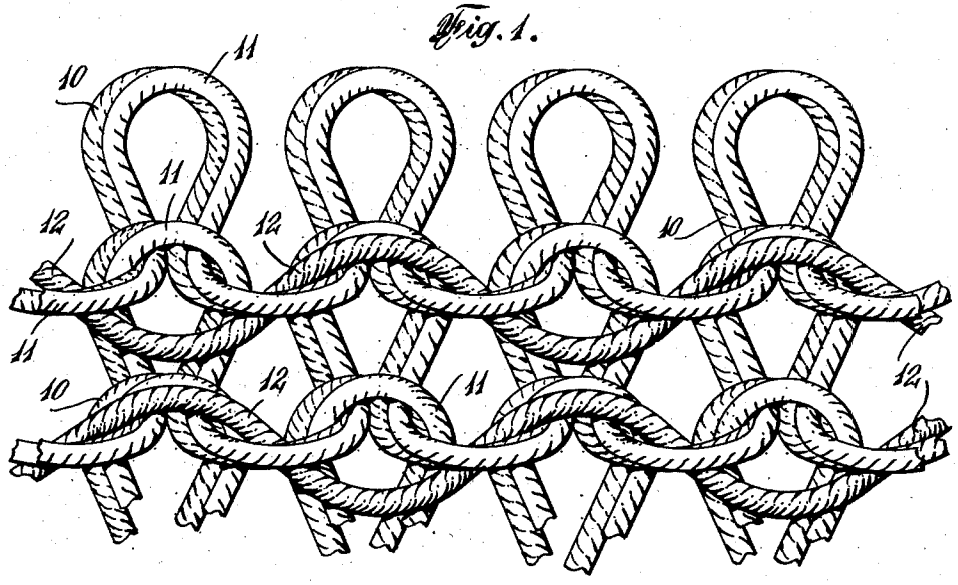

Fig. 2.

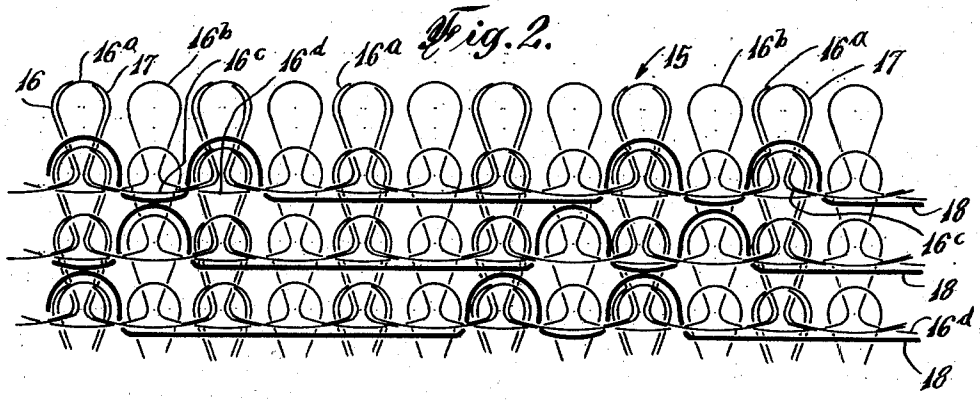

Fig. 3.

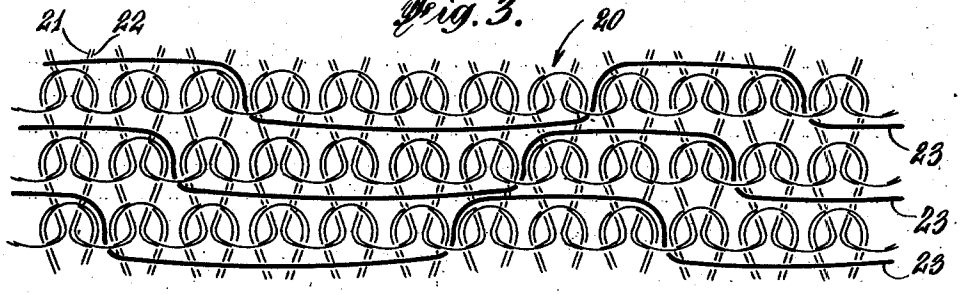

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Fig. 4.

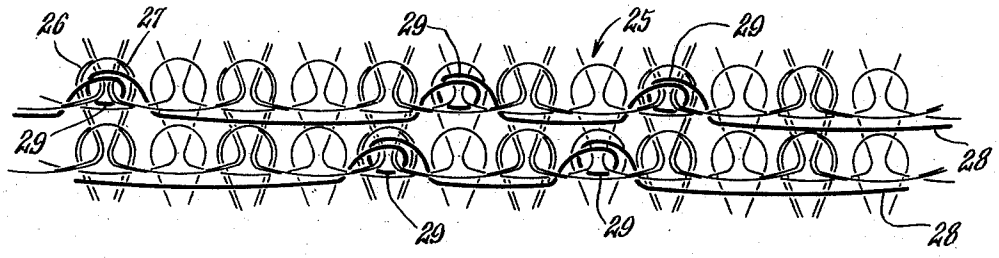


Fig. 5.

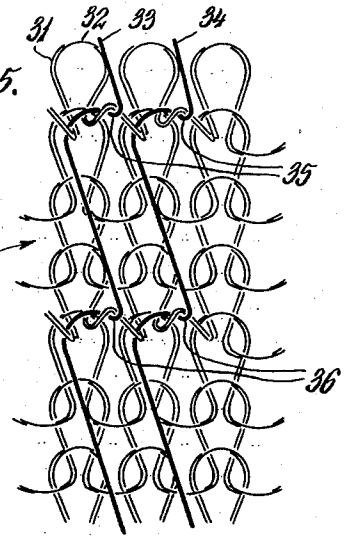
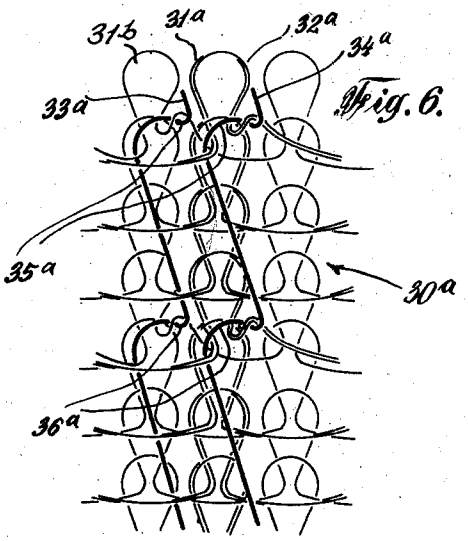


Fig. 6.



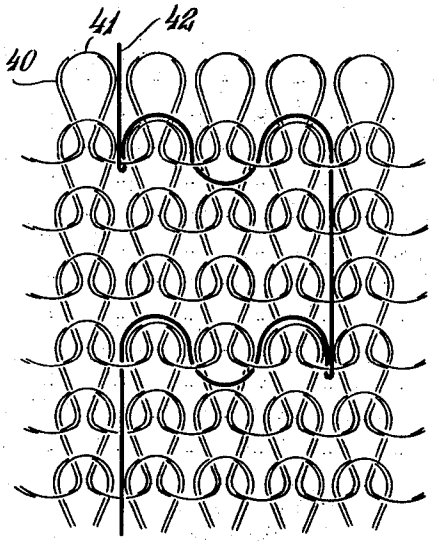


Fig. 7.

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Fig. 8.

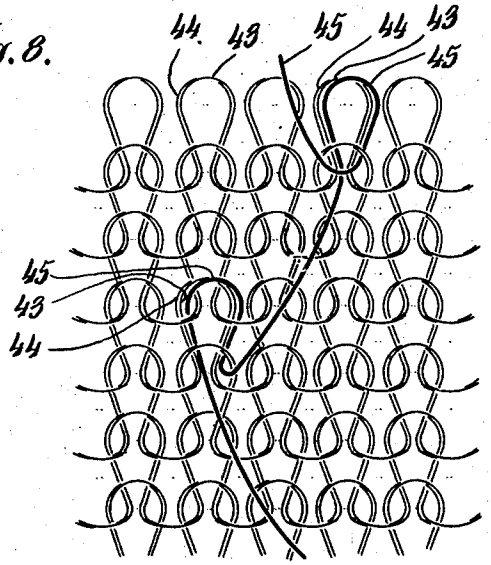

Fig. 9.

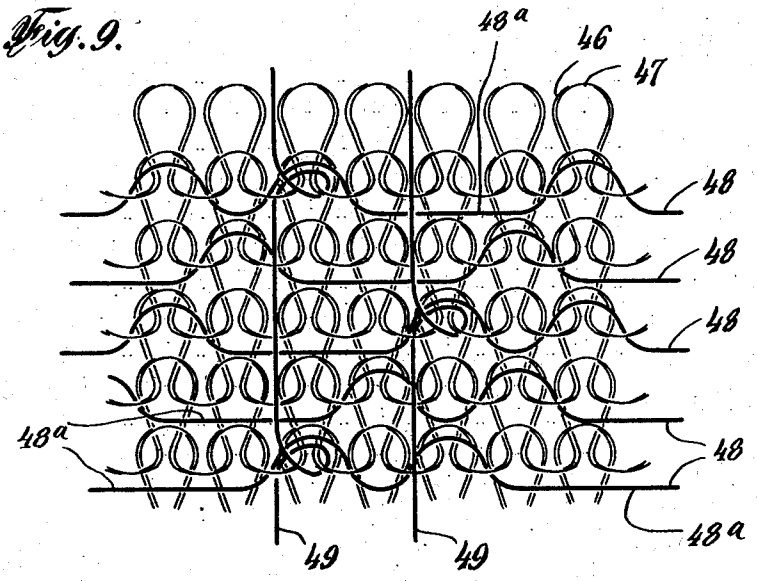

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Fig. 10.

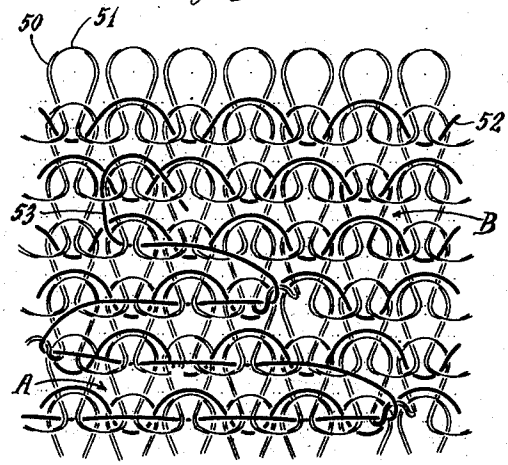

Fig. 11.

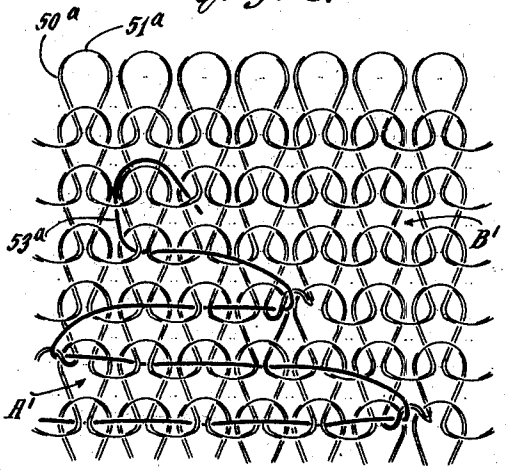

Fig. 13.

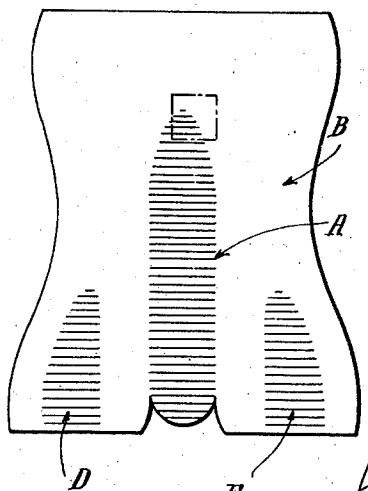

Fig. 14.

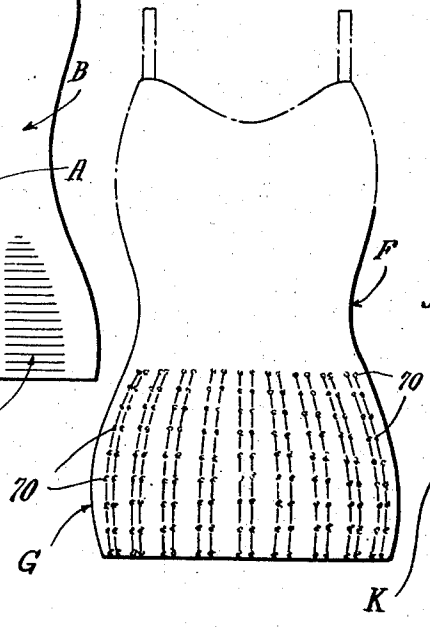

Fig. 15.

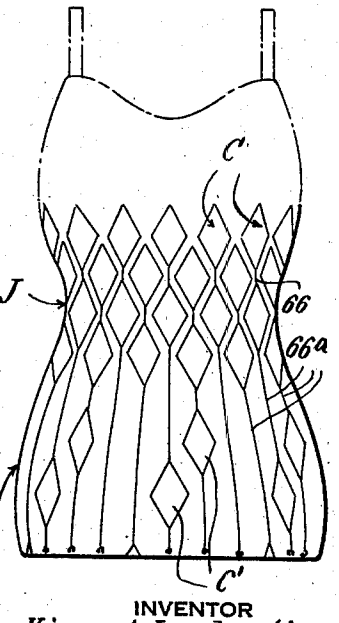

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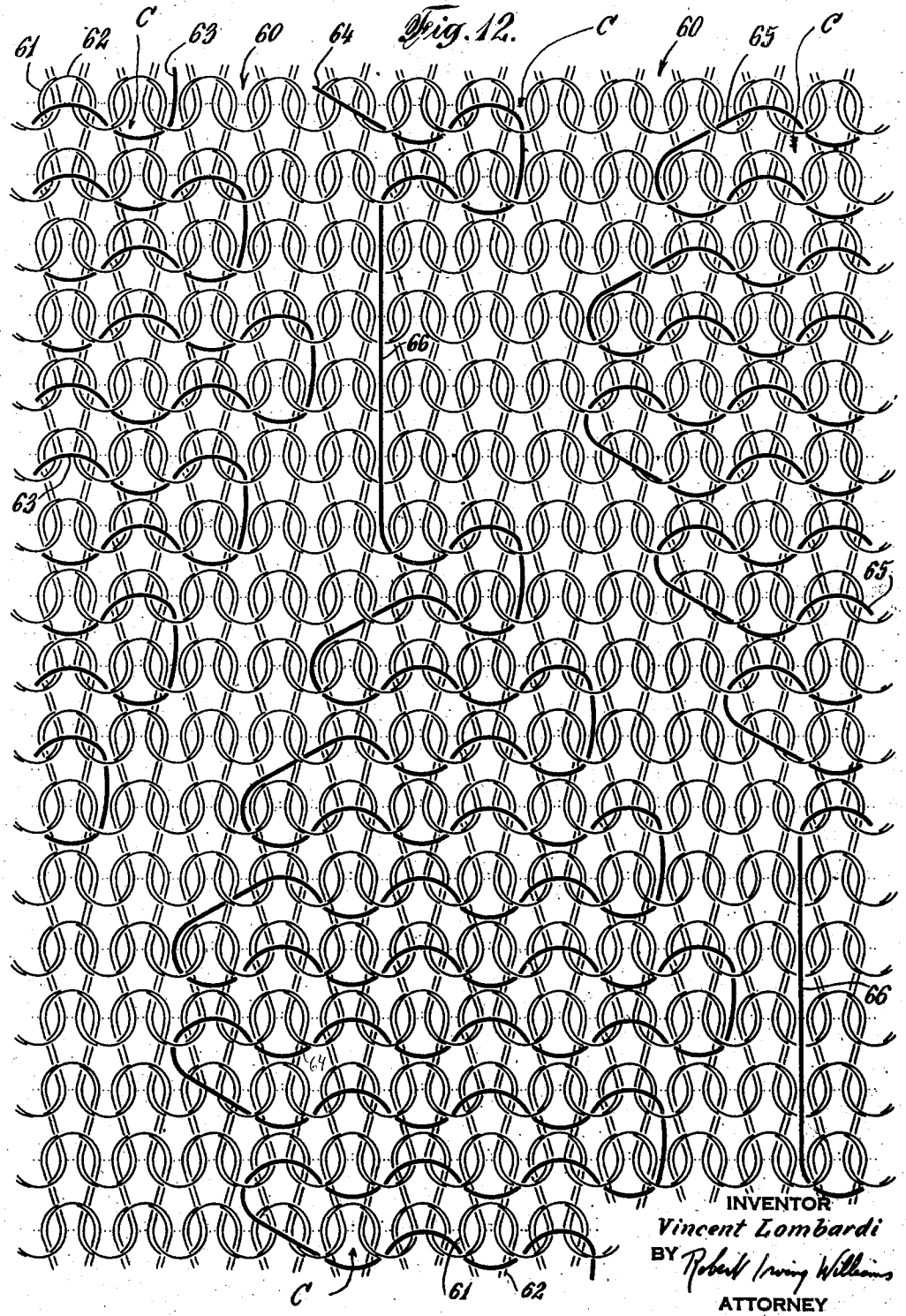
Fig. 12.



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Patented June 19, 1945 2,378,780

UNITED STATES PATENT OFFICE

2,378,780

KNITTED FABRIC

Vincent Lombardi, Montclair, N. J., assignor to Lombardi Knitting Machine Co., Inc., Brooklyn, N. Y., a corporation of New York

Application December 15, 1941, Serial No. 422,943

27 Claims. (Cl. 66—190)

This invention relates to knitted fabrics and particularly to knitted fabrics comprising yarns of special character such, for example, as elastic yarn.

The incorporation of elastic yarn in knitted fabric in such manner as to meet the exacting requirements for fabrics adapted for use in bathing suits, foundation garments, parts of dresses, and the like, has been a matter of considerable difficulty. Contact of elastic yarn with the body of the wearer and exposure thereof to the deteriorating effects of the sun's rays, as in bathing suits for example, are both undesirable, particularly when the elastic yarn employed is uncovered rubber yarn which because of economic desiderata is desirable for use in many instances instead of rubber yarn which is wound with a cotton covering. At the same time it is desirable that both the elastic and relatively non-elastic yarns employed be incorporated in the fabric in such manner that the fabric have a desired elasticity and stretchability in desired amounts and in desired directions; and that the use of an excess of yarn and undue heaviness of the fabric should be avoided. In addition, it is often important that design characteristics be imparted to such fabrics without, however, adversely affecting their other characteristics. Certain of these requirements apply both to the inclusion of elastic yarn in a variety of types of fabrics and to the inclusion of other types of special yarn, such for instance as metal yarn and flexible glass yarn, where it is desirable that the special yarn be spaced from the body of the wearer and/or from the surface of the fabric. In this connection it is to be understood that the term "yarn" is used herein in its broad sense to include all knittable materials.

Among other considerations involved in the construction of the elastic fabric are the factors that it is often desirable that a fabric have considerable stretchability up to a certain point but not beyond that point, and that control of elasticity is desirable in some fabrics or some portions of a fabric or garment to a greater extent in one direction than in another in some instances and to an equal extent in both directions in other instances. In connection with the obtaining of the latter the fact that a fabric including a rubber yarn which is knitted or plated throughout has a greater elasticity walewise than it does coursewise is a factor.

With the foregoing and other considerations in view the present invention contemplates in certain of its aspects the provision of a fabric wherein an elastic or other special yarn is plated at one side of a main yarn and wherein other yarn is provided at the opposite side of the fabric in at least certain portions of the fabric and is incorporated into the fabric in such manner as to control the elasticity or to provide attractive designs. The special yarn may be plated in every wale and in every row or in certain wales and/or certain rows, as, for example, in alternate or otherwise spaced wales of an accordion-stitch fabric. The special yarn should however, be present in the form of knitted loops in sufficient quantity in whatever portion of the fabric where it occurs so that it will constitute a second body yarn rather than a mere auxiliary yarn. If the special yarn is an elastic yarn it should be loosely enough incorporated so that it will not straighten out the loops to any substantial extent.

The "other" yarn, which is present at the side of the fabric opposite to the side at which the main yarn is present may desirably be included in such manner as to control the stretchability in one or more desired directions and/or to provide a design effect. Such results may be obtained by inlaying the "other" yarn, by having it extend coursewise and be wound around certain of the loops of the knitted yarn, by extending it more or less walewise and catching it into the fabric in the inlay manner in one or more points in a row or plating or otherwise knitting it in at certain spaced points, or by a combination of the foregoing, for example, and/or by controlling the points of inclusion of such yarn in the foregoing or other desired manners so that designs are formed on the side of the fabric where it appears.

In instances where the "other" yarn is incorporated in order to provide design effects at only spaced portions with the fabric, particularly striking or otherwise effective designs may be provided when the elastic yarn is in the form of colored rubber yarn. Similar effective design appearances may be obtained by such an arrangement when the special yarn is a relatively non-elastic yarn of distinctive color or character.

In certain further aspects the invention contemplates the formation of knitted garments and other knitted articles which include elastic yarn and wherein coursewise and/or walewise stretchability is definitely limited in certain portions thereof and/or where stretchability is limited to a greater extent and/or where elasticity is present to a greater extent in some portions than in others, and of knitted garments embodying in cer-

tain portions thereof fabric such as contemplated by the invention.

As main yarn there may be employed cotton, wool, rayon, silk, "Nylon," or any other suitable type of substantially non-elastic yarn, cotton being particularly desirable for use in many instances. As "other" yarn there may be employed yarn which is similar to or different from the main yarn, heavy worsted yarn being desirable in many instances, and cotton, silk, "Nylon," rayon and the like in certain others, and in instances where exterior decoration of an unusual type is desired, flexible glass or metal may, for example, be employed. Desirably, the main yarn may be of a relatively inexpensive type, and the "other" yarn of a relatively expensive type, since the former, being knitted into the loops either in all or a large part of the wales and rows, will commonly be required in greater quantity.

Since plating ordinarily requires that the plated yarns be of substantially similar size in order to be satisfactorily knitted together, the incorporation of the "other" yarn in the fabric in a different manner from the plated yarns enables the "other" yarn to be readily incorporated even though it is much thicker or otherwise different from the two yarns which form the body of the fabric.

The invention accordingly comprises an article of manufacture possessing the features, properties and relation of elements which will be exemplified in the articles hereinafter described and the scope of the application which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawings in which:

Figure 1 is an enlarged rear view of a section of one form of fabric embodying the invention;

Fig. 2 is a diagrammatic rear view of a section of a modified form;

Fig. 3 is a similar view of a section of a further modified form;

Fig. 4 is a similar view of a section of a still further modified form;

Figs. 5 thru 11 are similar views showing, respectively, still other modifications;

Fig. 12 is a similar view of a section of still another modified form;

Fig. 13 is a small scale front view of a foundation garment illustrating certain embodiments of the invention; and

Figs. 14 and 15 are front views of knitted bathing suits illustrating, respectively, certain other embodiments of the invention.

In Fig. 1 there is exemplified one form of fabric such as contemplated by the invention. Main yarn **10**, which may be cotton yarn, wool yarn, rayon yarn, or other type of substantially non-elastic yarn, knitted in the jersey fashion in plated relationship with rubber yarn **11**, with the rubber yarn plated in all the loops in the present instance. On the side of the fabric opposite the side on which the yarn **10** is disposed, yarn **12** is incorporated in the fabric in the inlay fashion. The yarn **12**, in the present instance, is present in every course but is staggered in successive courses as by having the yarn **12** which is fed at one course received by alternate needles, and by having the yarn **12** which is fed at the successive course received by the intermediate needles. The yarn **12** is desirably a substantially non-elastic yarn such as cotton, wool, rayon, etc., though it may be, and desirably is in many instances, formed of material different from yarn **10**. The yarn **12** may desirably be a relatively thick or fluffy yarn, for example worsted, so as to effectively stand out from the body of the fabric to provide a thick layer of protective or covering yarn beyond the rubber yarn on the side which is uncovered by the yarn **10**. In any case, this covering effect is improved by the staggering of the courses of inlay yarn. The yarn **12** is caught under each sinker loop in the present instance but may be caught under spaced sinker loops as hereinafter disclosed if desired.

The form of fabric illustrated in Fig. 2 is similar, except that the body of the fabric is differently constructed, and that the "other" yarn contains floats between portions wherein it is inlaid in the standard manner. The knitted body of the fabric **15** is composed of main yarn **16**, which may be cotton yarn, for example, and which is knitted in alternate wales in one course and intervening wales in a successive course as indicated at **16***a* and **16***b*, respectively, and is floated across the wales in which it is not knitted as indicated at **16***c* and **16***d*, respectively. In the courses containing the loops **16***a* and the floats **16***c* there is included with the main yarn **16** an elastic yarn **17** which may be "lastex" or uncovered rubber yarn as desired, this being plated with the yarn **16** and being disposed rearwardly of it in the fabric (in the front of the figure). In the courses containing the loops **16***b* and the floats **16***d* no elastic yarn is included. It will be appreciated in this connection that plated wales and unplated wales may either one be spaced more than a single wale apart either by introducing additional courses of one or the other type of yarn or yarn-group or by omitting certain of the floats and extending others of the floats as may be desired.

The "accordion" type of body yarn knitting exemplified in Fig. 2 tends to draw itself together coursewise, and when included in a garment tends to narrow this portion of the garment in a coursewise direction. In addition it provides extra thickness of main yarn at one side of the fabric, this being particularly desirable when the side of the fabric on which the main yarn is present is to be in contact with the person of a wearer.

In order to limit the coursewise stretchability of the body yarn, to provide a protective covering for the fabric on the side opposite to the side on which the yarn **16** appears, and to provide design effects, there is included "other" yarn **18**, which may be heavy worsted yarn, and which as exemplified appears in each row of main yarn loops, being inlaid in the standard manner throughout three wales and floated across five wales, the wales in question being shifted one wale to the left (as seen in the figure) in each successive row so as to provide a diagonal design effect. Not only is the obtaining of design effects facilitated by the presence of floats but these floats desirably, and as exemplified, are relatively tightly drawn so as to limit the coursewise stretchability of the fabric to a greater extent than a fabric wherein the "other" yarn is inlaid in the standard manner throughout, as in Fig. 1.

In Fig. 3 there is shown a fabric the body **20** of which is composed of relatively non-elastic yarn **21** and elastic yarn **22** each of which respectively may be similar in character and which in the present instance are shown as knitted similarly to the yarns **10** and **11** of Fig. 1. There

is included also "other" yarn 23 which is inlaid in such a manner that it extends under sinker loops spaced three and five wales apart, extending down in the present instance under a sinker loop three wales after it has passed up under one and extending up under a sinker loop five wales after it has passed down under a sinker loop, thus providing a fabric in which the coursewise stretchability may be limited without any substantial lateral movement of the inlaid yarn past the sinker loops under which is passes, the amount of coursewise stretchability being very exactly controlled nevertheless by the tightness of the inlaid yarn. The points at which the yarn 23 passes under the sinker loops are staggered one wale to the left (as seen in the figure) to provide a design effect in the present instance.

In Fig. 4 there is shown a fabric the body 25 of which is similar to that of the fabric shown in Fig. 2, being composed of relatively non-elastic yarn 26 and elastic yarn 27 which respectively may be similar in character and knitted similarly to the yarn 16 and the yarn 17 of Fig. 2. There is also included "other" yarn 28 which may be silk, "nylon," or worsted yarn, for example, and which in the present instance is included in the manner exemplified in my copending application Serial No. 421,260, filed December 2, 1941, by being twisted completely around certain of the loops of knitted yarn in the manner indicated at 29. This ties the yarn into the fabric in a manner which is particularly effective in preventing the same from being pulled out of the fabric or from becoming loose when the yarn is broken or the fabric is cut. The yarn 28 is floated between the points where it is wound around loops, the tightness of the yarn in the floats effectively determining the coursewise stretchability of the fabric. In the present instance, a design effect is secured by providing certain floats which are four wales in length and other floats which are two wales in length and by staggering the windings 29 one wale to the left (as seen from the rear view of the fabric shown) in successive courses. As exemplified, the yarn 28 passes under the sinker loops at each side of each of the points 29, thus assisting the effectiveness with which it is bound into the fabric.

In Figs. 5, 6, 7, and 8 the "other" yarn extends generally walewise of the fabric in a manner which may be utilized to limit the walewise stretchability of the fabric. In Fig. 5, there is shown a fabric, the body 30 of which is composed of relatively non-elastic yarn 31 and elastic yarn 32 each of which, respectively, may be similar in character and knitted similarly to the yarn 10 and to the yarn 11 of Fig. 1. There is also included "other" yarn which may be heavy worsted yarn, or which in certain instances may be cotton, wool or rayon, and may be similar to or different from the yarn 31, or may be yarn of a special type. Two extents 33 and 34 of this "other" yarn are incorporated. These extents run walewise of the fabric as will be seen, each being caught into the fabric in the present instance at walewise-spaced points as shown at 35 and 36 respectively, by extending across a needle loop and under the sinker loops at each side thereof, the points of catching, as exemplified at 35 and 36 respectively, being desirably spaced several loops from each other. The extents 33 and 34 are included in two adjacent ones of the three wales shown in the present instance, although as will be understood, they may be included in all the wales or in spaced wales. The yarns 33 and 34 serve to limit the walewise stretchability of an elastic fabric to cover the elastic or other special yarn to a greater or less extent, and to provide design effects.

The fabric of Fig. 6 is similar to the fabric of Fig. 5 except that the body fabric is differently formed, the formation being similar to that of Fig. 2. In this instance elastic main yarn 32*a* is plated with relatively non-elastic yarn 31*a* in alternate wales in alternate courses, both yarns being floated past the intervening wales, and the relatively non-elastic main yarn 31*b* is knitted by itself in the intervening wales and intervening courses, the elastic yarn being omitted in these courses in the present instance. The floated portions of the elastic yarn will tend to draw the fabric together in a coursewise direction in this instance, and the extra thickness of main yarn provides extra thickness between the elastic, metal or other special yarn and the surface of the fabric. Extents of "other" yarn 33*a* and 34*a* similar to the extents 33 and 34 and caught into the fabric in similar manner are provided.

In Fig. 7, a main yarn 40, which may be rayon yarn, and a special yarn 41, which may be "lastex" yarn, are plated in the manner exemplified in Fig. 1, and yarn 42 which extends generally walewise of the fabric is incorporated on the side of the fabric opposite the yarn 41 by being inlaid across a few wales in spaced courses. In the present instance, the yarn 42 is inlaid across the second, third and fourth wales from the left of the figure, extending vertically from each end of the inlaid portion; and is inlaid across the fourth, third and second wales from the left of the figure in the third course below, extending vertically downwardly from the left-hand end of the same. If desired, of course, the yarn may extend diagonally between the inlaid portions. It will run generally walewise of the fabric, either in the case shown or in that just mentioned, and will exert a limiting action upon the stretchability of the fabric though not so much so as in the case of the yarns 33 and 34 of Fig. 5 or 33*a* and 34*a* of Fig. 6.

In Fig. 8, there is shown a fabric, the body of which is similar to the body of fabric of Fig. 7—elastic or other special yarn 43 being plated with a relatively nonelastic main yarn 44. Other, walewise extending, yarn 45 is incorporated in a fabric by being plated at the rear of the fabric (the front of the figure) in spaced wales and courses. In the present instance, it extends diagonally back and forth between the places in which it is formed into knitted loops. It will be appreciated in this connection that a generally walewise extending yarn may run almost directly walewise, diagonally, or in a somewhat zigzag direction, regardless of the manner in which it is caught in.

In Fig. 9 there is exemplified a fabric which has on the rear thereof both coursewise extending and generally walewise extending supplemental yarn. The body of the fabric is composed of main yarn 46, which may be cotton yarn, and special yarn 47, which may be uncovered rubber yarn, the yarns 46 and 47 being plated, with the yarn 46 appearing at the front of the fabric (the rear of the figure). In each course there is incorporated in the inlay manner an extent of yarn 48 and in certain of the wales there is incorporated an extent of yarn 49. The yarn 48 is inlaid in the standard manner in three wales and then floated for three wales as shown at 48*a*, the floats being staggered one wale to the left (in the figure) at each succes-

sive course to provide a design effect, the general manner of incorporation being similar to that of the yarn 18 of Fig. 2. The extents 49 are incorporated in a manner similar to the extents 33 and 34 in Fig. 5 and the extents 33a and 34a in Fig. 6 (though somewhat more loosely in the present instance). In the present instance also, the points at which different extents 49 are caught into the fabric is varied to give additional design effects. The yarns 48 and 49 may be similar to or different from each other and similar to or different from the yarn 46, and may be cotton, rayon, heavy worsted, or other character as may be desired. As will be apparent, the yarn 49 may serve to limit the stretchability of the fabric in a walewise direction and the yarn 48 to limit its stretchability in a coursewise direction. The tightness with which each such yarn is introduced will control the point at which the stretchability of the fabric is limited in the respective direction.

In knitted garments and other knitted articles it is often desirable that the knitted articles be composed of fabric which in certain portions has a high degree of stretchability, but which in other portions the stretchability is greatly limited. A fabric which satisfies such needs to a high degree is illustrated in Fig. 10. This fabric comprises substantially non-elastic yarn 50, which may be cotton yarn, and elastic yarn 51 which may be either uncovered rubber yarn or "lastex" yarn, the yarns 50 and 51 being knitted together in plated relationship in the jersey fashion. Additional yarn 52, which may be cotton yarn, is inlaid in the standard manner in every row, being loosely incorporated so that the fabric may be stretched to a considerable extent in a coursewise direction without the yarn 52 imposing a limit on the stretchability. In a portion A of the fabric there is also included other yarn 53 which may be cotton yarn and which in the present instance is a wrap yarn and is tightly incorporated as by being fed under a high amount of tension, the yarn 53 being extended back and forth in portion A and caught into the fabric in the standard inlay fashion in that it is caught under all the sinker loops in the portion A. In the present instance the crests of the waves of the inlaid yarn 52 and the (slight) crests of the waves of the inlaid yarn 53 are in different wales.

There is thus provided a fabric comprising a portion A which is substantially non-stretchable in coursewise direction and has a definitely limited walewise stretchability, and a portion B of which the rest of the figure consists, which has a very marked coursewise and walewise stretchability.

In certain instances, and particularly when the elastic yarn 51 is composed of covered rubber yarn such as "lastex," yarn such as shown at 52 may be omitted. Such a fabric is shown in Fig. 11 and consists of cotton yarn 50a and "lastex" yarn 51a plated together similarly to the yarns 50 and 51 in Fig. 10, and cotton yarn 53a which is incorporated in a portion A' of the fabric in the same manner that the yarn 53 is incorporated in the portion A of Fig. 10. In the portion B' the stretchability will be unlimited except by the knitted loops themselves, no yarn such as 52 being present.

In Fig. 12 there is illustrated a form of fabric wherein the "other" yarn is so incorporated as to form closely spaced designs, these, in the present instance, being in the shape of diamonds. This not only illustrates one of the design possibilities of the invention, but also illustrates a design fabric wherein though not all of the body yarn is covered on its rear side, there is nevertheless sufficient covering to substantially space the body yarn from anything which might contact therewith, as well as to limit the stretchability of the fabric to a markedly greater extent, so far, at least, as coursewise stretchability is concerned, than would be the case if the "other" yarn were not present, or if the design portions were spaced further apart. It will be understood, however, that the invention in its broader aspects is not limited to the presence of "other" yarn in fully covering arrangements or closely spaced designs, but includes as well its presence in widely spaced designs and in other arrangements.

As shown, the body 60 of the fabric is formed of substantially non-elastic yarn 61 and elastic yarn 62 which are knitted in plated relationship in the same manner as the yarns 10 and 11, respectively, of the fabric shown in Fig. 1. At the rear of the fabric (the front of the figure) there is incorporated "other" yarn in design formation in inlay fashion, as by wrapping means, three wrap yarns 63, 64 and 65 being shown in that section of the fabric illustrated in Fig. 12. Each of these yarns is formed into diamond shaped designs as shown at C and extends vertically therebetween as illustrated at 66; the designs being staggered so that the diamonds formed by alternate yarns will have their widest portions in line with the extents 66 of the intermediate yarns. In the figure the right-hand portion of a diamond formed from the yarn 63 is at the upper left; the left-hand portion of a diamond formed from the yarn 65 is shown at the upper right, the bottom of a diamond formed by the yarn 64 is shown at the upper center and the top and central portions of another diamond formed by this yarn are shown at the middle and bottom center.

As illustrated, the "other" yarn, which may be worsted yarn of a single color, or a variety of colors blending or contrasting with the color of one or both of the body yarns, is shown as incorporated in a back-and-forth inlay fashion with the yarn passing under each sinker loop in each of its coursewise extents, as exemplified, although the crests or troughs of the waves thereof or both may, if desired, be lengthened so as to give a wider contour, one form of this being illustrated in Fig. 3. In the present instance, the placement of the crests of the waves of the inlay yarn is staggered in pairs, an extent running in one direction and another extent running in the other direction having crests in the same wales and the pairs of extents above and below having crests in other wales. The tightness with which the inlay yarn is fed will control the extent to which the coursewise stretchability is limited, and, to a certain degree, the extent to which the walewise stretchability is limited; and even though the inlay yarn is fed in an ordinary loose manner in the closely spaced designs, it will exert a limitation upon the coursewise stretchability and to some extent upon the walewise stretchability.

Certain of the fabrics exemplified, as will be appreciated, will be particularly desirable for use in certain instances, and others in other instances. Often it will be desirable to combine in a single garment or other knitted article two types of fabric embodying the present invention

and/or to combine one or more of them with other types of known or suitable fabrics. By doing this in a single knitting operation marked savings can be effected over procedures wherein two types of fabrics are sewn together or otherwise joined, but even in the latter instances great gains in the fitting of a garment and in the supporting properties of a knitted elastic article, such as a surgical bandage, a foundation garment, athletic support, etc., may be obtained.

In Fig. 13 there is illustrated a foundation garment wherein there is employed the two-type fabric exemplified in Fig. 10 utilized so as to provide portions wherein the extent of stretchability of the elastic plated body fabric is limited very greatly in one portion of the garment and limited much less in other portions of the garment. In the present instance, the garment includes the section of fabric shown in Fig. 10, this being set off by dot-and-dash lines. In Fig. 13, however, the full portion A is shown and the portion B is shown in much greater extent. The yarns of which the garment is composed will be the same as in case of Fig. 10, the body being composed of substantially non-elastic yarn such as **50** and elastic yarn, such as **51** plated as in the case of Fig. 10 with the yarn **50**, as well as "other" yarns as **52** and **53** incorporated as in the case of Fig. 10. The non-elastic main yarn such as **51** will be on the side of the fabric opposite the "other" yarns and ordinarily will be on the inside of the garment where it touches the body. In certain instances, the fabric may be reversed as with yarns **52** and **53** on the inside of the garment. In the present instance there are provided in addition to the portion A, portions D and E wherein yarn similar to the yarn **53** is similarly incorporated in a tightly drawn fashion so as to greatly limit the coursewise stretchability. In certain instances, and particularly when a yarn body such as **50** is on the inside of the garment, yarn such as **52** may be omitted and the garment composed of fabric such as shown in Fig. 11 consisting of main and elastic yarns knitted in plated relationship and of tightly inlaid yarn which is present only in that portion of the garment where stretchability is undesirable.

There is thus provided a foundation garment which is relatively non-stretchable in a coursewise direction in the portions A, D and E so that effective support of the body of the wearer will be provided at these portions and which throughout the remainder of the garment (the portion B) will have the desired high degree of stretchability and which may be formed as a substantially complete garment on a knitting machine in a single operation. To a certain extent in many instances and to a generally similar extent in most instances when the "other" yarn is tightly drawn, similar advantages may be secured when, instead of yarn such as the yarn **53** being employed at portions such as A, D and E for example, there is employed at these portions yarn caught into the fabric similarly to the yarns **18** of Fig. 2, **23** of Fig. 3 or **28** of Fig. 4.

Another example of a garment in which stretchability is controlled in a desirable manner in accordance with the invention is exemplified in Fig. 14 wherein there is illustrated a bathing suit the waist portion F of which is composed of fabric such as illustrated in Fig. 1 and the hip portion G of which is composed of fabric such as illustrated in Fig. 6; the portion F being composed of non-elastic (e. g. wool) and elastic (e. g. rubber) yarns knitted in plated relationship in the jersey fashion with other non-elastic yarn (e. g. wool) inlaid therein on the opposite side from the non-elastic plated yarn and preferably on the outside of the garment; and the portion G consisting of a body of "accordion" knitted non-elastic (wool) yarn, with elastic (rubber) yarn plated in every other wale, as exemplified in Fig. 6, and with vertical (e. g. wool) yarn such as the yarns **33***a* and **34***a* caught into the fabric at spaced points, also as exemplified in Fig. 6, these yarns being indicated at **70**. This bathing suit has free vertical stretchability but limited horizontal stretchability above the hip portion G at the waist, and free horizontal stretchability and limited vertical stretchability at the hips, and in addition has a greater tendency to pull together at the hips with nevertheless a sufficient elasticity so that it will spread outwardly to the relatively large extent necessary.

Another bathing suit embodying the invention is shown in Fig. 15. The body of the fabric is formed mainly or wholly of substantially non-elastic yarn—for example wool—and elastic yarn—for example "lastex"—knitted in plated relationship in the jersey fashion, with the wool yarn on the inside of the suit. In the waist portion J, the fabric is the same as that of Fig. 12 with wrap yarns composed of colored worsted inlaid to form closely spaced diamond-shaped designs C interconnected by short vertical extents **66**. The hip portion K is similar except that the designs C' though individually the same are much more widely spaced and are connected with the designs C and/or with each other by relatively long vertical extents **66***a*. There is thus provided a garment which in the waist portion has its vertical stretchability limited by the vertical extents **66**, and in the hip portions has its vertical stretchability still more limited by the longer vertical extents **66***a*; and which in the waist portion has its horizontal stretchability limited by the wrap yarns inlaid in the closely spaced designs, whereas in the hip portions the horizontal stretchability is limited much less due to the infrequency of the design portions.

Varied control of elasticity and/or stretchability in different parts of a garment or a fabric, such, for example, as indicated in Figs. 10, 11, 13, 14, and 15, may, as will be appreciated, be provided in accordance with the invention in a wide variety of types of garments and in various knitted articles including body-shaping, protective, and surgical bandages of various sorts.

It will be appreciated that while the "other" yarn is shown as incorporated in certain ways with body yarn knitted in certain manners, and as otherwise incorporated in connection with body yarn knitted in the other manners, these are merely illustrative, and "other" yarn may be incorporated in various of the ways shown with different ones of the types of body yarn shown, and, in addition, may be incorporated in these or other ways with these or modified types of body fabric within the spirit and scope of the invention. It will also be appreciated that while certain types of the fabrics shown have been exemplified in garments or other knitted articles as associated with each other, various other combinations of the types of fabric shown or suggested may be formed in accordance with the invention. In addition, certain portions of garments or other knitted articles may be formed of fabrics such as contemplated by the invention and other portion of the body yarn in various of the fabrics shown without the "other" yarn being

present, and fabrics such as contemplated by the invention may be united in a single knitting operation or otherwise with various known or suitable types of fabric.

Since certain changes may be made in the above article and different embodiments of the invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. Knitted fabric comprising knitted main yarn, special yarn of a significantly different character from the main yarn, and plated with at least certain of the loops of the main yarn and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric in a different manner from said special yarn.

2. Knitted fabric comprising knitted main yarn, special yarn of a significantly different character from the main yarn, and plated with at least certain of the loops of the main yarn, and other yarn present only in spaced design portions on the opposite side of the fabric from the main yarn and caught into the fabric in an unknitted manner.

3. Knitted fabric comprising knitted main yarn, special yarn of a significantly different character from the main yarn, and plated with at least certain of the loops of the main yarn, and other yarn present in closely spaced design portions on the opposite side of the fabric from the main yarn and caught into the fabric in a different manner from the special yarn.

4. Knitted fabric comprising knitted main yarn, special yarn of a significantly different character from the main yarn, and plated with at least certain of the loops of the main yarn, and other yarn covering the special yarn on the opposite side of the fabric from the main yarn and caught into the fabric in a generally unknitted manner.

5. Knitted fabric comprising knitted main yarn, elastic yarn plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric in a different manner from said elastic yarn.

6. Knitted fabric comprising knitted main yarn, uncovered rubber yarn plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric in a different manner from said rubber yarn.

7. Knitted fabric comprising knitted main yarn, special yarn of a significantly different character from the main yarn, and plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric at at least certain points in the inlay fashion, extending under sinker loops of both the main yarn and the special yarn.

8. Knitted fabric comprising knitted main yarn, special yarn plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric in the inlay fashion in varying ways in successive courses, the inlaid yarn passing under sinker loops of both the main yarn and the special yarn.

9. Knitted fabric comprising knitted main yarn, special yarn of a significantly different character from the main yarn, and plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric at at least certain points by being extended under certain spaced sinker loops of both the main yarn and the special yarn.

10. Knitted fabric comprising knitted main yarn, special yarn plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric at at least certain points by being wound around certain of the knitted loops of the fabric.

11. Knitted fabric comprising knitted main yarn, special yarn of a significantly different character from the main yarn, and plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric at walewise spaced single points and extending generally walewise of the fabric.

12. Knitted fabric comprising knitted main yarn, special yarn plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric in the inlay manner throughout a plurality of wales in portions of spaced courses and extending generally walewise between said courses.

13. Knitted fabric comprising knitted main yarn, special yarn of a significantly different character from the main yarn, and plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric by being plated in single loops in spaced courses, said other yarn extending generally walewise of the fabric.

14. Knitted fabric comprising knitted main yarn, special yarn plated with at least certain of the loops of the main yarn, other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric at certain points and extending generally coursewise of the fabric, and additional yarn also disposed on said opposite side of the fabric and being caught into the fabric at at least certain points, said additional yarn extending generally walewise of the fabric.

15. Knitted fabric comprising knitted main yarn, special yarn of a significally different character from the main yarn, and plated with only certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric in a different manner from said special yarn.

16. Knitted fabric comprising main yarn yarn knitted in different wales in different courses, spe-

cial yarn of a significantly different character from the main yarn, and plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric in a different manner from said special yarn.

17. Knitted fabric comprising main yarn knitted in different wales in different courses, special yarn of a significantly different character from the main yarn, and plated with the main yarn only in certain of said wales, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric in a generally unknitted manner.

18. Knitted fabric comprising knitted main yarn, elastic yarn plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric in a different manner from said elastic yarn and being tightly drawn.

19. Knitted fabric comprising knitted main yarn, elastic yarn plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric at at least certain points in the inlay fashion and being tightly drawn.

20. Knitted fabric comprising elastic portions including weft knitted elastic yarn, certain of said portions having free walewise stretchability, and other of said portions including relatively non-elastic yarn extending relatively directly generally walewise of the fabric to control its walewise stretchability, the last mentioned yarn being uncaught in the majority of courses of said other of said portions.

21. Knitted fabric comprising portions including weft knitted elastic yarn, certain of said portions including relatively non-elastic yarn extending relatively directly generally coursewise of the fabric to control its coursewise stretchability, and other of said portions including relatively non-elastic yarn extending relatively directly generally walewise of the fabric to control its walewise stretchability, the last mentioned yarn being uncaught in the majority of courses of said other of said portions.

22. A knitted garment including waist and hip portions each of which include knitted elastic yarn, the waist portion having free vertical stretchability, and the hip portion including relatively non-elastic yarn extending generally walewise of the fabric to control its walewise stretchability.

23. A knitted fabric comprising a portion wherein a relatively great coursewise stretchability is desirable and a portion wherein a relatively small coursewise stretchability is desirable, said portions comprising body yarn including loops of elastic yarn plated with loops of relatively non-elastic yarn, and the second mentioned portion including relatively non-elastic wrap yarn extending without knitting across plural wale sections in closely spaced designs in said second mentioned portion.

24. A knitted article comprising portions including knitted main yarn and elastic yarn plated with at least certain of the loops of the main yarn, one of said portions including tightly drawn substantially non-elastic yarn incorporated in the fabric in a substantially unknitted manner, said tightly drawn yarn being omitted from another of said portions.

25. A knitted article comprising portions including knitted main yarn and elastic yarn plated with at least certain of the loops of the main yarn, one of said portions including tightly drawn substantially non-elastic yarn incorporated in the fabric in a substantially unknitted manner, said tightly drawn yarn being omitted from another of said portions, loosely drawn substantially non-elastic yarn being incorporated in the fabric in a substantially unknitted manner in at least said other of said portions.

26. Knitted fabric comprising knitted main yarn, metal yarn plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric in a different manner from said metal yarn.

27. Knitted fabric comprising knitted main yarn, glass yarn plated with at least certain of the loops of the main yarn, and other yarn disposed on the opposite side of the fabric from the main yarn in at least certain portions of the fabric, said other yarn being caught into the fabric in a different manner from said glass yarn.

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