Feb. 13, 1940. E. F. GAINES 2,190,560

STOCKING

Filed April 3, 1939 7 Sheets-Sheet 1

Fig. 1

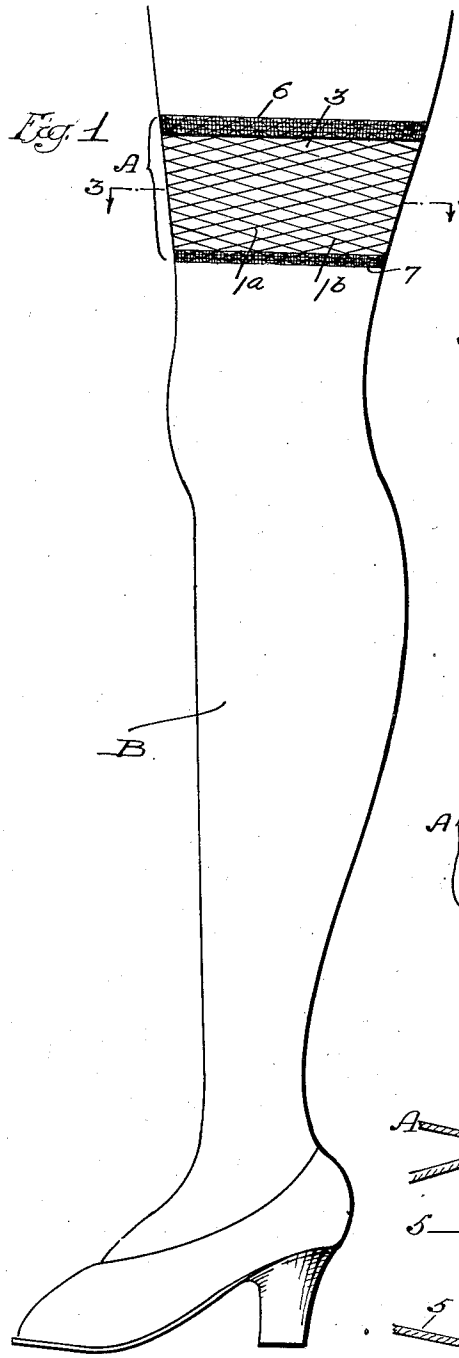


Fig. 2

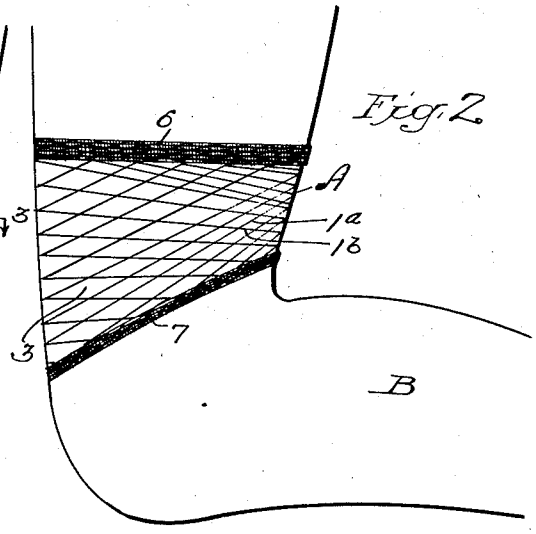
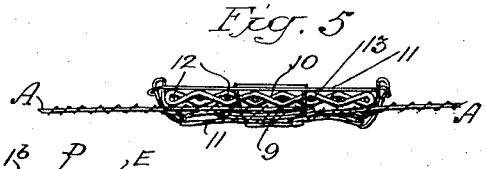


Fig. 5



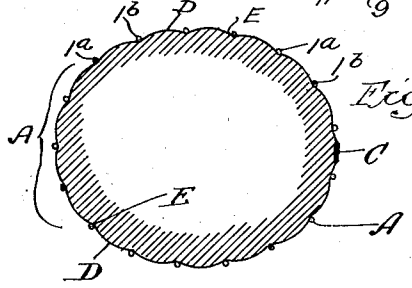
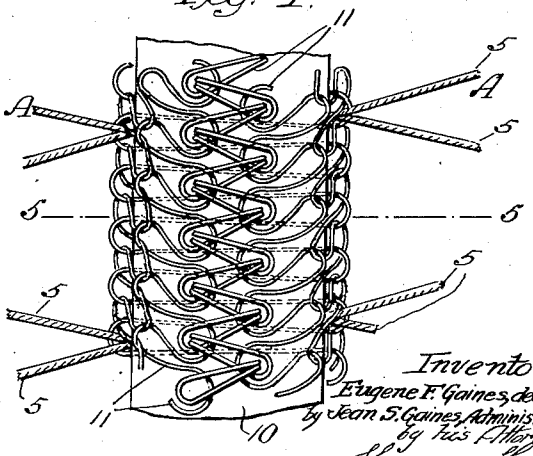


Fig. 3.

Fig. 4.



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Filed April 3, 1939 7 Sheets-Sheet 2

Fig. 6.

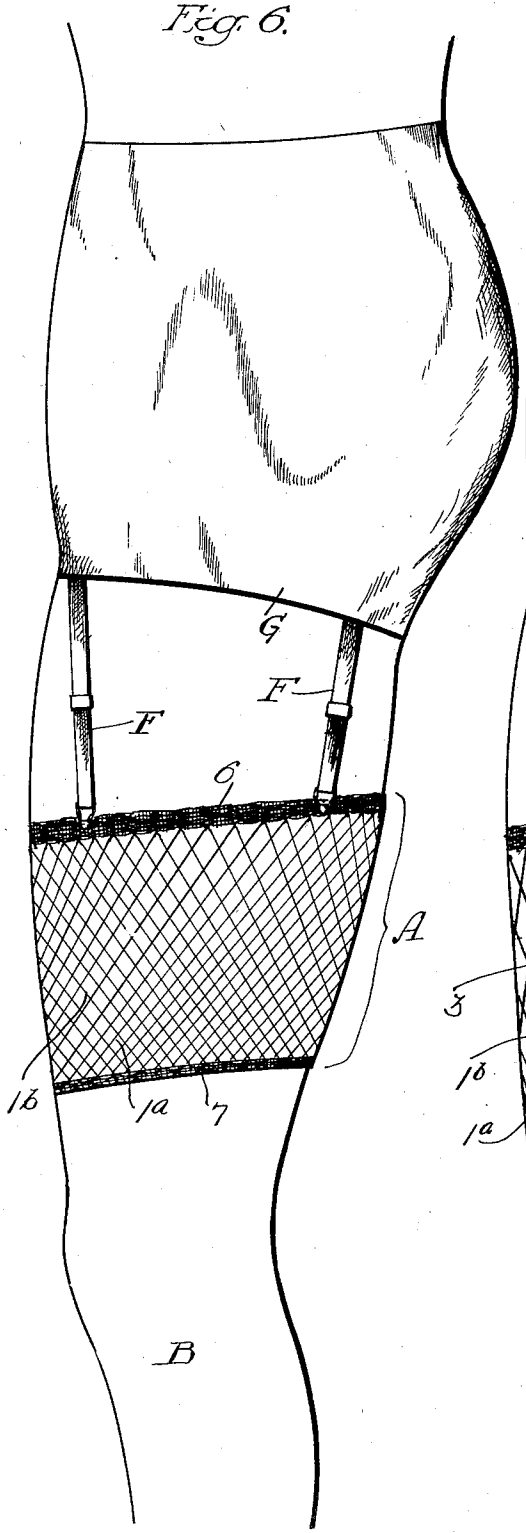
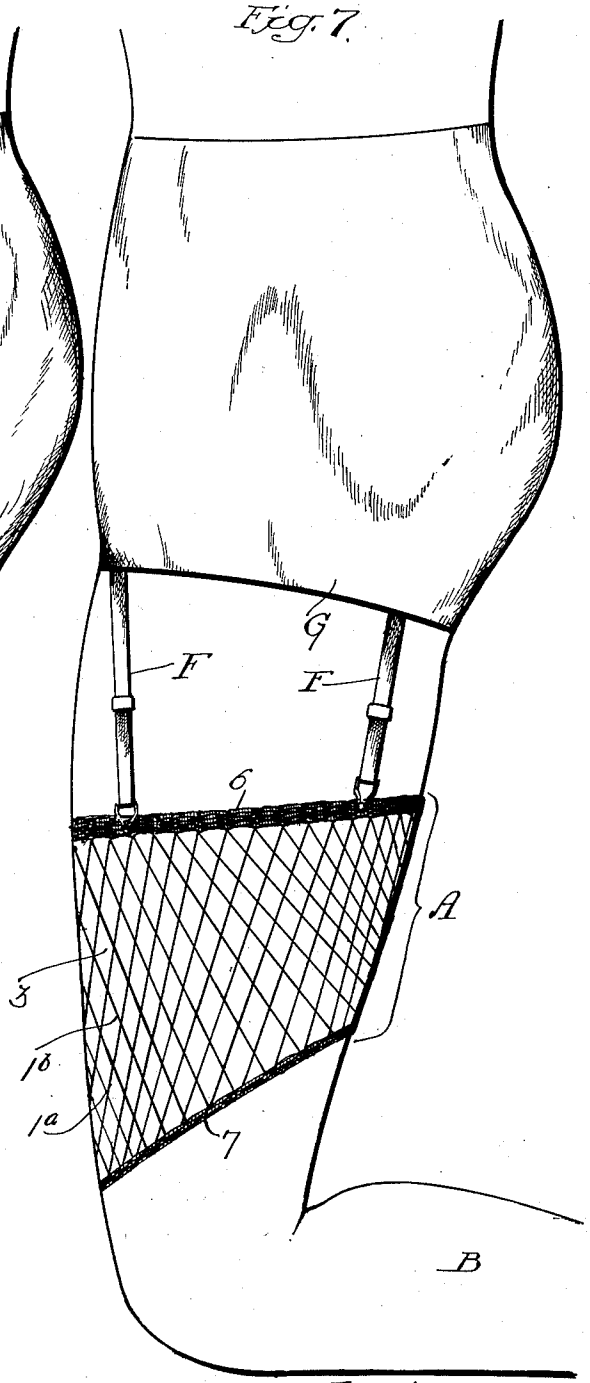


Fig. 7.



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Feb. 13, 1940. E. F. GAINES 2,190,560

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Filed April 3, 1939 7 Sheets-Sheet 3

Fig. 8.

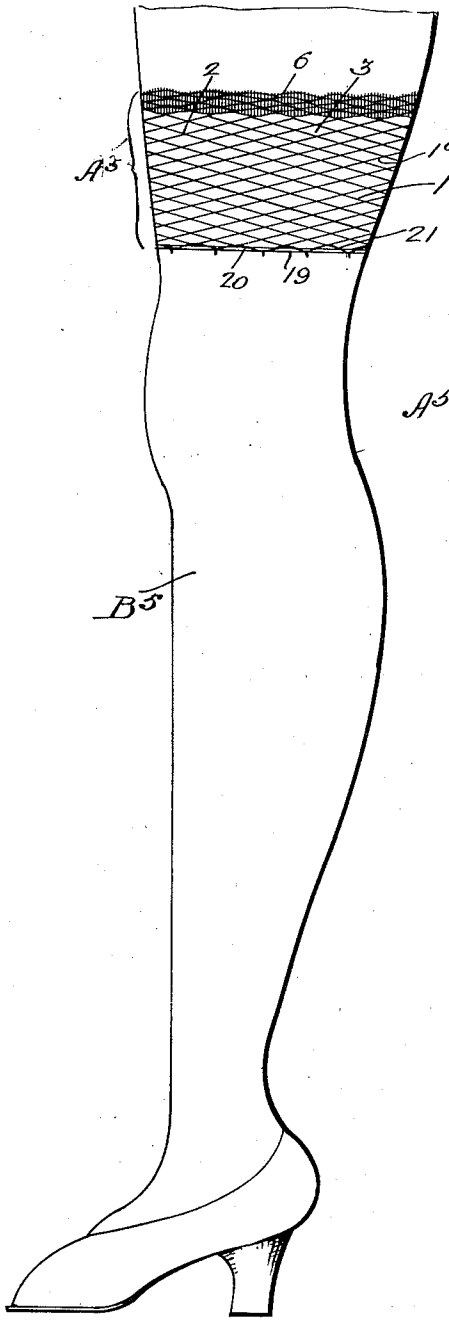
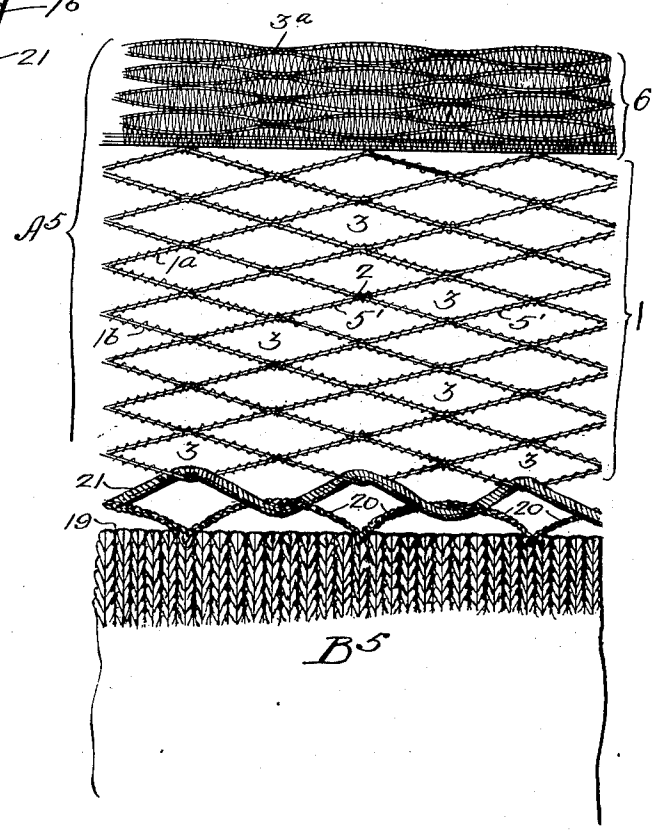


Fig. 9.



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Filed April 3, 1939 7 Sheets-Sheet 4

Fig. 10.

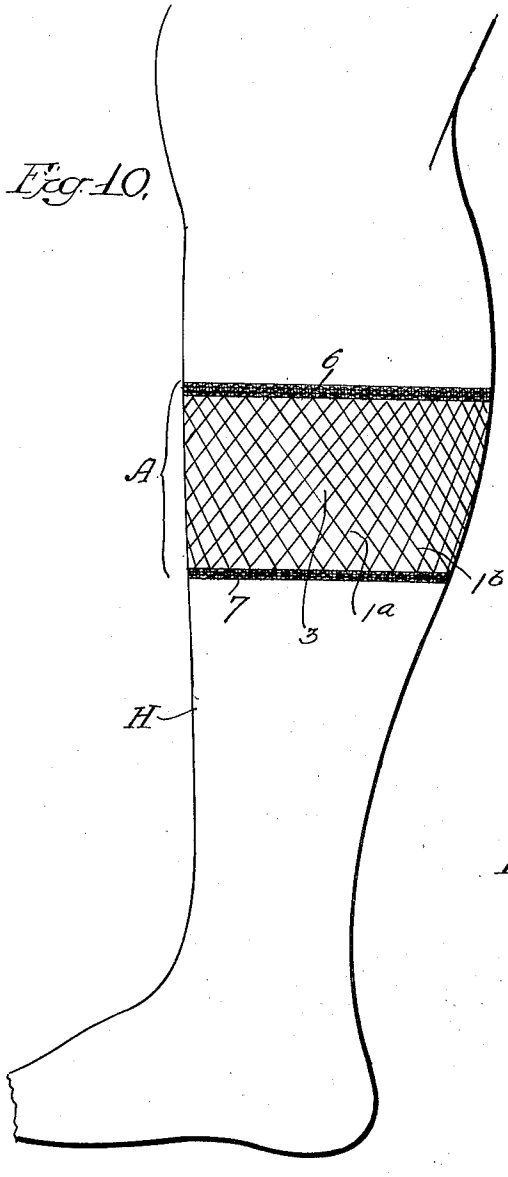


Fig. 12.

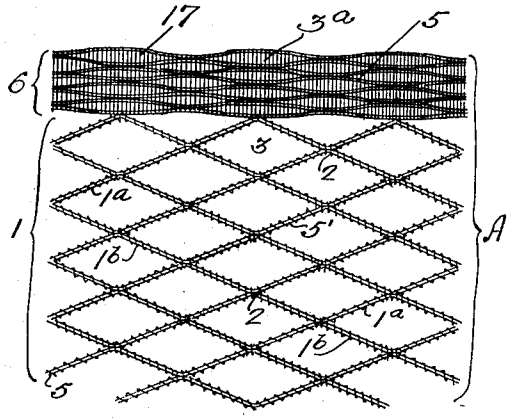
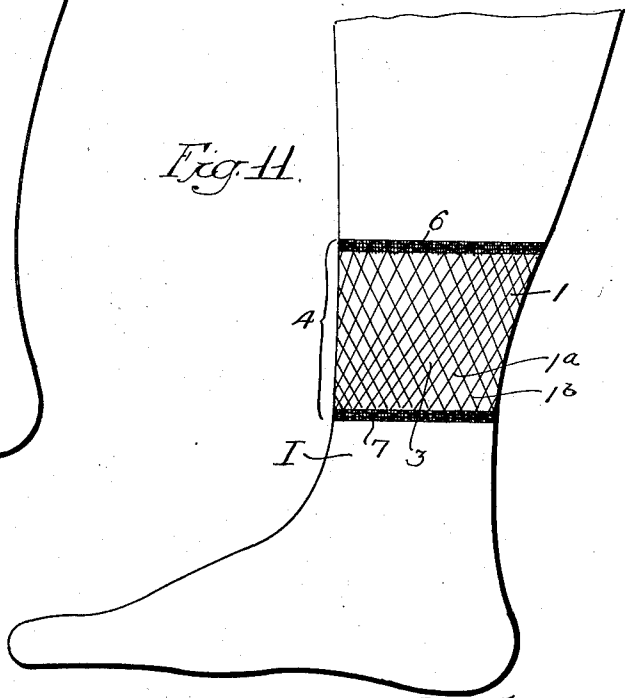


Fig. 11.



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Filed April 3, 1939 7 Sheets-Sheet 5

Fig. 13.

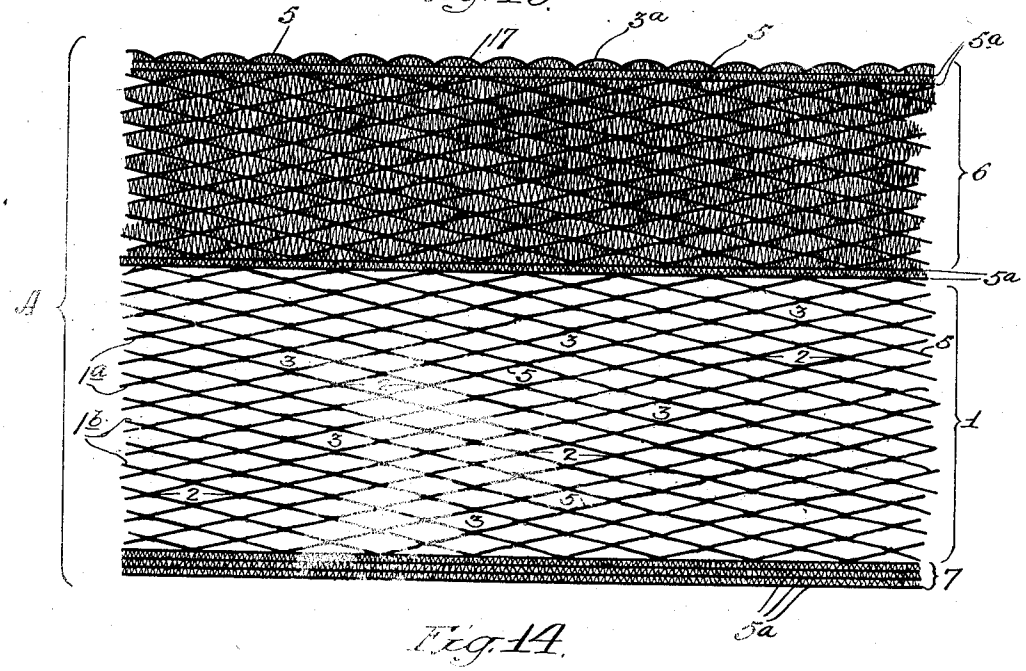
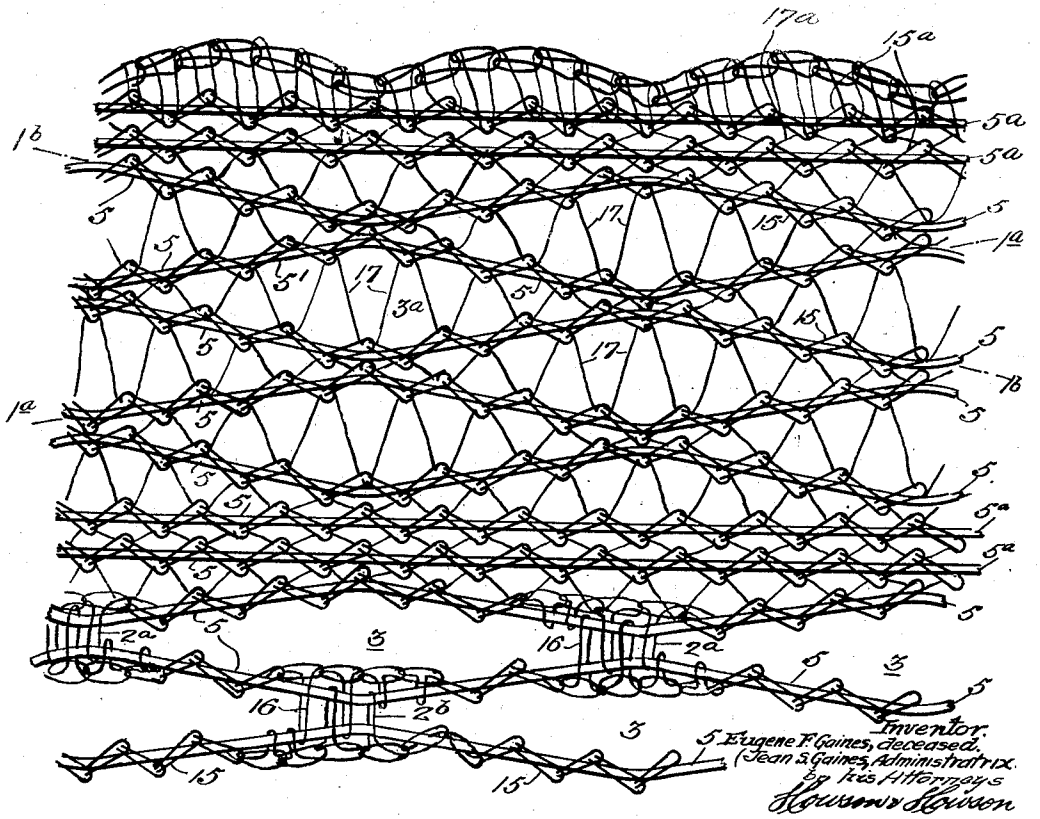


Fig. 14.



Feb. 13, 1940. E. F. GAINES 2,190,560

STOCKING

Filed April 3, 1939 7 Sheets-Sheet 6

Fig. 16.

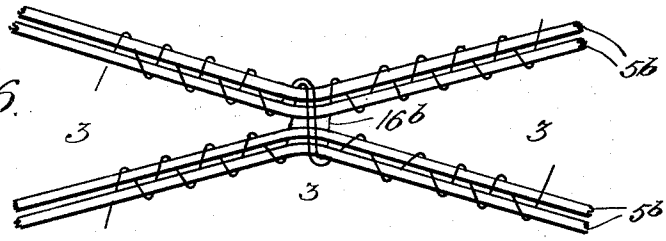


Fig. 17.

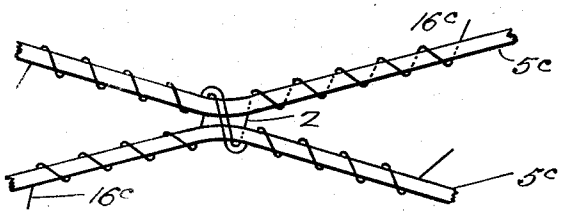
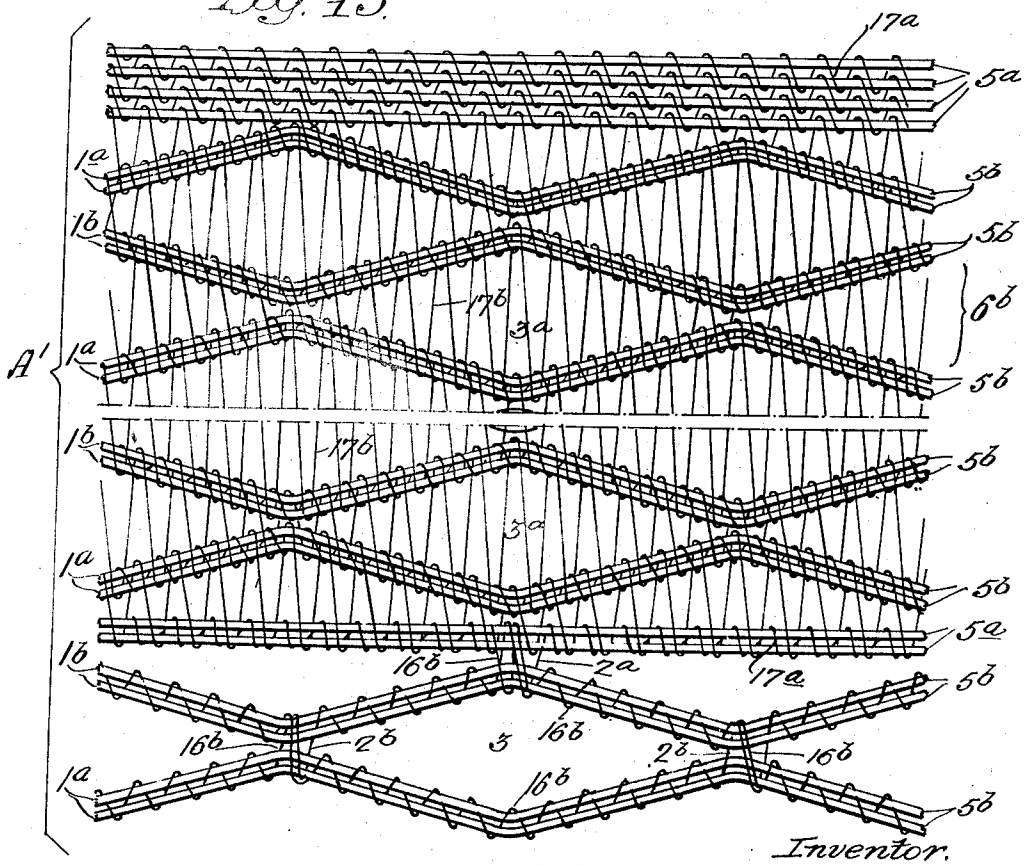


Fig. 15.



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Feb. 13, 1940. E. F. GAINES 2,190,560

STOCKING

Filed April 3, 1939 7 Sheets-Sheet 7

Fig. 18.

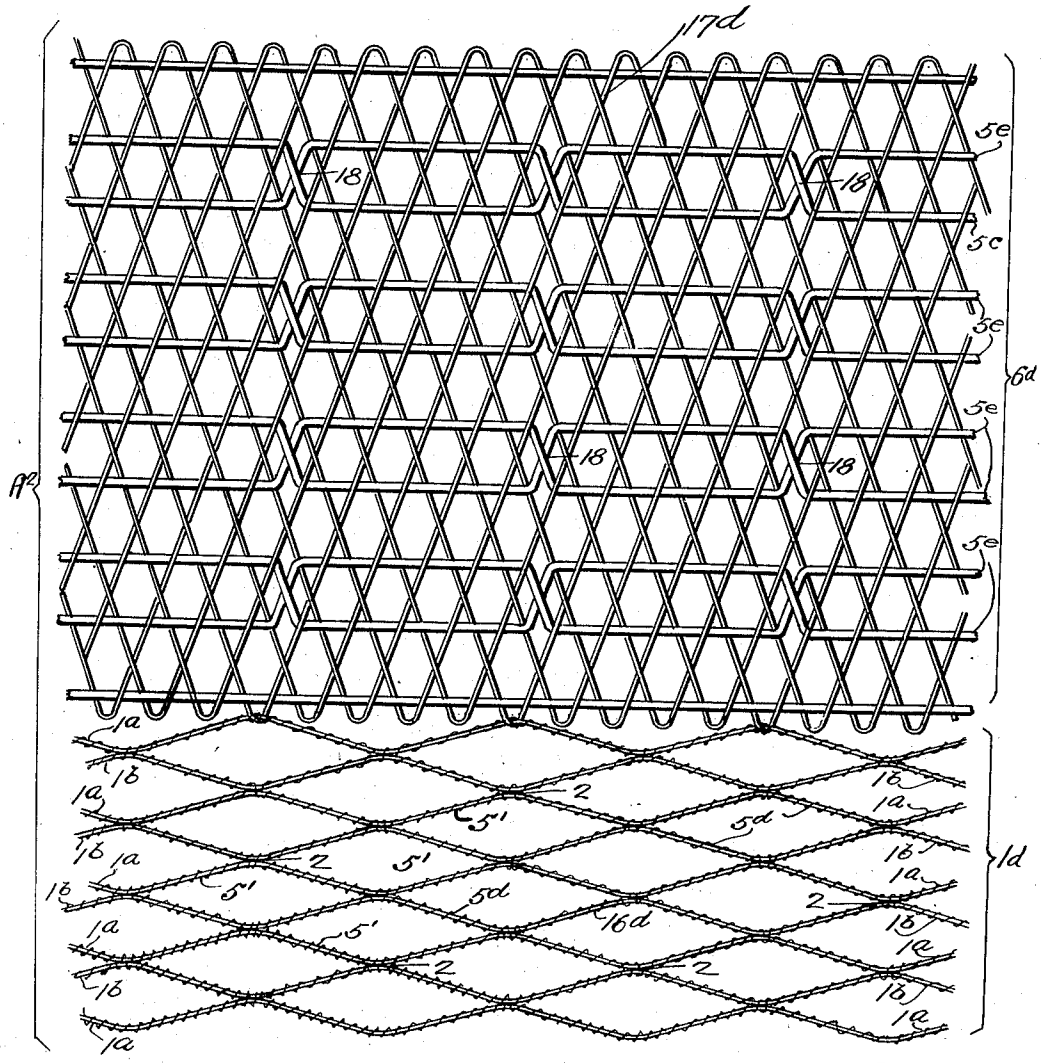


Fig. 19.

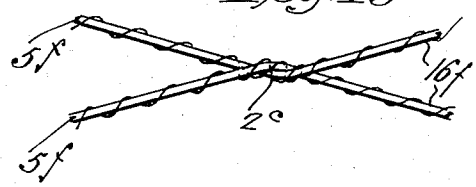
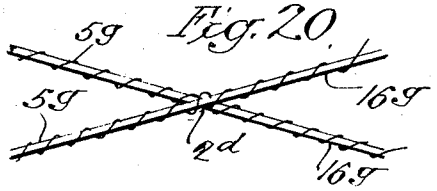


Fig. 20.



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Patented Feb. 13, 1940 2,190,560

UNITED STATES PATENT OFFICE

2,190,560

STOCKING

Eugene F. Gaines, deceased, late of Bala, Pa., by Jean S. Gaines, administratrix, Bala, Pa.

Application April 3, 1939, Serial No. 265,852

19 Claims. (Cl. 66—172)

This invention primarily relates to a specific form of elastic fabric having an extremely high degree of universal elasticity, i. e., a fabric capable of stretching to a considerable extent in all directions simultaneously.

The primary object of the invention is to provide a fabric suitable for use as hosiery tops on ladies' full length stockings, men's normal or extra length half hose, and shorter lengths of men's, women's and children's hosiery, including anklets.

More particularly, the fabric of the present invention, by which the super-universal elesticity is obtained, is of the openwork type. In its preferred form, the main body of the fabric may be termed a netted fabric in that it presents an open mesh construction resulting from a general diagonally intersecting arrangement of the main structural elements of the fabric.

One principal object of the present invention is to provide the high degree of universal elasticity in the tops of ladies' hose, above the knee:

First: to permit the top of the stocking to stretch sufficiently in a direction circumferentially of the leg to allow the stocking top to fit legs of a wide range of diameters with substantially the same degree of snugness, i. e., to be equally comfortable and close fitting on large and small legs alike, without creating any unusual consciousness of the presence of the stockings on the leg.

Second: to permit the stocking top to stretch longitudinally of the leg when the knee is bent, to relieve the knitted stitches of the regular knitted fabric of stocking proper from the usual strains and consequent formation of "runners" attending the bending of the knee, particularly when the stocking is held up by hosiery supporters attached to a girdle, corset, etc.

Third: to permit the stocking top to stretch freely in diagonal directions at the same time as the fabric stretches longitudinally of the leg and circumferentially of the leg, the latter occurring as a result of the leg directly above the knee expanding as the knee bends; wherein said knee-bending, in stretching the fabric longitudinally of the leg at the same time as the fabric is stretched circumferentially of the leg, coincidently produces diagonal strains in the fabric of the stocking top.

Fourth: to retrieve stocking fabric drawn down over the knee, as a result of the bending of the knee, as the leg is again straightened, to prevent the formation of wrinkles in the stocking on the leg below the knee; and to prevent the formation of "baggy" knees resulting from permanently stretching the knitted fabric of that portion of the body of the stocking which encases the knee.

Fifth: to provide a top for women's hose which will make the hosiery self-supporting and still possess all of the foregoing characteristics.

Sixth: to prevent the stocking from twisting, during wear, in such a manner as to dislodge the back seam of a full fashioned ladies' stocking from its correct position straight up the back of the leg.

The "fifth" and "sixth" characteristics are directly contingent on the open mesh construction, in that the oppositely arranged diagonally disposed elements of the fabric structure, which provide the open mesh, by reason of their containing rubber, and by reason of the fact that they extend spirally around the leg under conditions of use, tend to contract constantly and, in so doing, press into the flesh of the wearers leg along opposed spiral lines. This pressure, even though it be so slight as to present no unusual consciousness of presence, causes the flesh to puff outwardly into and protrude through the mesh openings, thereby burrowing the diagonal structural elements of the top fabric in the flesh. This causes the top to resist movement relative to the skin, whereby longitudinal and circumferential displacement of the top is eliminated.

When the knee is bent, and the leg above the knee expands as a result of such knee-bending, the skin stretches longitudinally and circumferentially simultaneously and, by reason of the free universal stretchability of the top fabric and by reason of the diagonal structural elements of the top fabric being embedded in the skin, the top fabric stretches universally with the skin. Therefore, when the leg is again straightened and the skin again assumes its normal position, the top fabric concurrently therewith assumes its normal position. Thus, there is no relative movement between the skin and the stocking top. This in turn prevents wrinkling of the stocking and twisting of the stocking on the leg. Therefore, a stocking top constructed according to the present invention makes any stocking to which it is attached self supporting.

For women who attach the tops of their stockings to the lower edges of their girdles or corsets, through the medium of elastic suspenders, to keep the girdle or corset from working upwardly over the hips, the stocking top of the present invention is provided with a garter grip band along its upper edge. This grip band is formed

by the otherwise open meshes being filled in with fabric of such a character that it places no material restriction on the stretch of the fabric circumferentially of the leg. It does, however, place restriction on the fabric, solely within the width of the band, in a direction longitudinally of the stocking, to provide a firm grip for the garter fastener.

If desired, the stocking top and the stocking proper may be constructed in such a manner as to be readily detachable one from the other, to permit the detachable tops being interchangeably employed with a plurality of different stocking bodies, it being understood that the stocking body in each instance would be provided with means adapted to cooperate with one edge of the detachable top to facilitate attaching and detaching of the one with respect to the other.

In utilizing the hosiery top of the present invention on men's or children's socks or anklets, or in fact, in ladies' stockings terminating below the knee, all of the characteristics above referred to are present and effective. However, as the stocking top under these circumstances is disposed between the ankle and the knee the top is not subjected to the same strains as the ladies' full length hosiery receive in the bending of the knee. However, the diagonal relationship of the main body elements produces the same gripping effect as noted above and makes the top self-supporting.

In order to accentuate the self-supporting characteristic, the top is preferably, though not necessarily, provided with a relatively narrow band along its edge opposite to that to which the body of the stocking is attached and which is of substantially the same character as the garter grip band above noted. This relatively narrow band, when the top is pulled up into the proper normal position and the fabric of the top is thereby stretched circumferentially and longitudinally of the leg, acts as an anchorage for the upper edge of the top and keeps this upper edge of the top from moving downwardly under the tension of the rubber strands embodied in the diagonal structural elements of the top, until such time as these structural elements impress themselves in the skin of the leg and produce the self-supporting conditions of the structure. This anchorage band, however, is not absolutely essential to the functioning of the stocking top, as experience has proven that where no anchorage or garter grip band has been provided the open meshes of the fabric immediately adjacent the upper free edge of the top, under conditions of use, will tend to close up to some extent longitudinally of the leg and in effect provide an anchorage of the type described. With the top edge anchored, the normal downward pull of the stocking tends to cause the diagonal elements to grip the leg more firmly.

In order to facilitate attachment of the hosiery top of the present invention to the upper edge of the body of the hose with which the top is used, the second edge of the top is provided with a relatively narrow band of substantially the same construction as the garter grip or anchorage bands above noted, to provide a more or less solid fabric along the lower marginal edge of the hosiery top to which the knitted fabric of the hose proper may be looped or stitched to this marginal edge of the hosiery top. In some instances, if desired, this lower marginal edge band of the hosiery top fabric may be "topped" onto the needles of the knitting machine prior to the knitting of the leg of the stocking, whereby the leg of the stocking will be knit directly to the lower marginal edge of the hosiery top, thereby eliminating the necessity for looping or sewing the two together.

Experience has proven that a fabric of the type forming the subject matter of the present invention may be produced on any one of a number of different machines, including what is generally known as "Levers" lace machines, normally employed for making lace curtains and similar lace fabrics, on "warp" knitting machines of different types, and on various types of "braiding" machines, and in fact on any machine which is capable of laying main structural elastic elements in diagonal intersecting relation to each other and tying these structural elements together at the intersecting points.

The construction of the fabric forming the subject of the present invention and the application of the fabric to the different types of hosiery above noted will be fully disclosed hereinafter, reference being had to the accompanying drawings of which:

Fig. 1 diagrammatically illustrates the stocking top of the present invention applied to a ladies' full length stocking and shows the complete unit under conditions of use with the leg in a normal straight standing position;

Fig. 2 is similar to Fig. 1 but shows the circumstances encountered during the bending of the knee;

Fig. 3 diagrammatically illustrates the working condition of the hosiery top as viewed on the line 3—3, Fig. 1;

Fig. 4 is an enlarged diagrammatic view of the back seam, when the fabric is made in continuous strip form and cut into lengths corresponding to the circumferential measurement of the leg;

Fig. 5 is a transverse section taken on the line 5—5, Fig. 4;

Fig. 6 is a view similar to Fig. 1, showing the conditions when the hosiery top is attached to the lower edge of a girdle, corset, etc. by connecting suspenders;

Fig. 7 is a view similar to Fig. 6 showing the conditions when the knee is bent as in Fig. 2;

Fig. 8 is a view similar to Fig. 1, illustrating the interchangeable top.

Fig. 9 is a fragmentary enlarged view showing in detail the manner of detachably connecting the elastic top to the upper edge of the knitted stocking body;

Fig. 10 is a view similar to Fig. 1, showing the top as applied to a man's half hose;

Fig. 11 illustrates the top as applied to an anklet form of hosiery, such for example, as a sport or play sock for men, women or children;

Fig. 12 is a fragmentary enlarged view diagrammatically illustrating a portion of the main body of the top fabric and the relatively narrow anchorage band on the upper edge thereof;

Fig. 13 is an enlarged diagrammatic view of the top fabric showing the broader garter grip structure on the upper marginal edge of the top;

Fig. 14 diagrammatically illustrates the fabric as constructed on a warp knitting machine;

Fig. 15 diagrammatically illustrates the construction of the fabric as made on a lace machine;

Fig. 16 and Fig. 17 illustrate diagrammatically the details concerning the tying of the structural elements of the open mesh fabric at the intersecting points of Fig. 15;

Fig. 18 diagrammatically illustrates the fabric as made on a braiding or similar machine;

Figs. 19 and 20 illustrate different ways of connecting the main structural elements of the top fabric of Fig. 18 at the intersections thereof.

As shown in Fig. 13 for example, the main portion 1 of the top fabric A consists of a series of laterally spaced parallel diagonally extending structural elements 1*a* and a corresponding series of structural elements 1*b* extending diagonally in the opposite direction to the series 1*a*. The structural elements 1*a* and 1*b* are tied together at the intersecting points 2, in any suitable manner to prevent excessive relative movement between the intersecting structural elements at the tie points, but at the same time placing no restriction on the elasticity of the structural elements at the tie points. The intersecting relationship of the structural elements 1*a* and 1*b*, tied together at the points 2, provides the open work mesh fabric having the free open spaces 3 therein.

The above noted construction provides the super-universal elasticity in the fabric previously referred to. By allowing the two sets of diagonal structural elements to stretch freely the fabric as a whole is permitted to stretch in all directions simultaneously, it being borne in mind that the structural elements 1*a* and 1*b* each contain at least one rubber strand. Preferably the rubber strand in each instance is spirally wound with a fibrous yarn in the manner commonly employed in what is known as "covered rubber." The present invention is not restricted to the use of any particular kind of covered rubber, as any extruded or cut rubber strand provided with the well known spiral covering may be employed. For ladies' hosiery particularly, a fine gauge rubber strand with a fine gauge fibrous spiral wrapping is preferred. However, heavier gauges in both the rubber and in the fibrous thread spirally wound about the rubber to form the completed elastic yarn may be employed when desired, depending upon the type of hosiery to which the top is attached.

In the enlarged views of the various forms of the fabric the elastic yarn is indicated at 5 and for the purpose of illustration and to avoid confusion in the drawings the detailed structure of each elastic yarn 5 is eliminated but, it is to be borne in mind that in each instance the yarn indicated at 5 contains a rubber core element with the spiral wrapping of fibrous thread around the rubber core. However, the invention is not restricted to the use of covered rubber as bare rubber strands under certain circumstances may be employed and a partial covering at least may be provided by knitting or wrapping an additional thread around the bare elastic yarn during the incorporation of such bare elastic yarn in the fabric forming the hosiery top.

As shown in Fig. 13 the main body portion 1 of the top fabric is provided along one of its longitudinal edges with a band of more or less solid fabric 6. The solid band 6, like the main body portion 1, contains elastic structural elements formed of elastic yarns 5 arranged in opposite diagonally extending relation to each other and the otherwise open meshes 3 are filled in with fibrous threads to produce more or less solid fabric 3*a* in the diamond shaped areas between the intersections of the elastic yarns 5. The threads forming the solid fabric areas 3*a* function to tie the elastic yarns 5, 5 together and extend in a general direction transversely of the strip constituting the top fabric. These space filling threads place a predetermined restriction on the stretch of the fabric transversely of the strip without materially affecting the stretch of the fabric longitudinally of the strip. Thus, a suitable garter band or a suitable anchorage band, depending upon the width of the section 6 of the fabric, is provided.

In a like manner a relatively narrow band 7 is provided along the opposite edge of the main body portion 1 of the strip, for the purpose, as noted above, of attaching the top fabric A to the top edge of the knitted fabric of the stocking proper.

As shown in Fig. 13, the band 7 may be composed of two or more parallel longitudinally extending elastic yarns 5*a* arranged in relatively close laterally spaced relation to each other and tied together by suitable cross threads in much the same manner as the elastic yarns 5 are tied together in the solid fabric areas 3*a* of the upper band 6.

As noted above, the fabric A is preferably produced in strip form and subsequently cut into lengths substantially corresponding to the circumferential measurement of the upper edge of the stocking to which the top is to be attached. The cut ends of each strip section are brought into abutting or overlapping relation to each other as shown, for example, at 9 in Fig. 5. Preferably a narrow longitudinally elastic tape 10 is superimposed on the overlapping ends 9 of the fabric section A and the whole stitched together by any one of a number of well known "flat-lock" seaming machines which employ a plurality of binding threads such as those indicated at 11, which pass through and around the assembled fabrics and interlock with each other in such a manner that a strong seam is provided which will prevent separation of the cut ends of the fabric laterally of the seam but which will provide a high degree of elasticity longitudinally of the seam.

"Flat-lock" seams are well known in the knitting arts but normally such seams are usually made between two edges of a knitted fabric which is of a close construction as compared with the open mesh fabric of the top constituting the subject of the present invention. Due to the open work construction of the present top the elastic tape 10 is provided at and included in the seam to function as a foundation for anchoring the opposite cut ends of the open mesh fabric by passing the binding threads through the open mesh fabric and through the elastic tape and interlocking the binding threads with each other between and beyond the marginal edges of the tape.

The elastic tape 10 may be of any desired construction including longitudinally extending rubber strands 12 bound together in any suitable manner by tie threads 13 which, while restricting the tape against laterally stretch produce substantially no restriction to the tape longitudinally. In this manner a highly efficient back seam is provided in the present instance.

As noted above, the fabric of the top A may be produced on a number of different types of machines. As shown in Fig. 14, the fabric is produced on what is known as a warp knitting machine. In this instance a plurality of elastic yarns 5 are hung in the machine and a stitch chain or wale is knit about each elastic yarn in a manner well known in the art for knitting stitch chains about ordinary warp threads. In the present instance these stitch chains are

formed of a fibrous thread and the successive stitches 15 cross the elastic yarns 5 first in one direction and then in the opposite direction, with parts of the threads of which the stitches 15 are composed passing around the backs of the elastic yarns 5, causing the individual stitch chains to follow respectively the individual elastic yarns 5. At predetermined intervals, alternate elastic yarns 5 are moved laterally in one direction and connected to the intermediate elastic yarns 5, as indicated at 2a, for example, in Fig. 14. The threads 16 which form the chain stitches 15 following the two adjacent elastic yarns 5, 5 being manipulated at these points to embrace both elastic strands to tie the two together. The knitting of the fabric then progresses and the alternate elastic yarns 5 are subsequently moved in the opposite direction toward the oppositely disposed intermediate elastic yarns and the threads 16 which form the stitch chains following the two adjacently disposed elastic yarns are knit about both elastic yarns to tie the same together, as indicated, for example, at 2b in Fig. 14.

The knitting of the fabric progresses in the above manner throughout the length of the strip and results in each elastic yarn following a zigzag path or course longitudinally of the fabric, with the oppositely pointing sharp angular bends of each pair of adjacent zig-zagging elastic yarns placed and bound together. This arrangement, in effect, as a whole, produces the oppositely extending diagonal structural elements 1a and 1b.

As the knitting of the main portion 1 of the fabric A progresses the knitting of the bands 6 and 7 progresses in a like manner. However, in the band 6 weft threads 17 are incorporated in the fabric and tie the stitches 15 following the respective elastic yarns 5 together, in the manner indicated in Fig. 14, thereby filling the otherwise normally open areas 3 with a more or less solid fabric 3a.

Adjacent the opposite marginal edges of the band 6, and in the band 7 at the opposite marginal edge of the main body portion 1 of the fabric A, a pair of elastic yarns 5a, 5a are shown as extending in straight lines throughout the length of the fabric. These elastic yarns 5a, 5a are provided with stitch chains composed of stitches 15a and the stitches embracing or being entwined about the adjacent straight elastic yarns 5a are tied together with weft threads 17a, in much the same manner as the weft threads 17 tie together the stitch chains following the zigzag elastic yarns 5 within the band 6.

From the above it will be clear that the diagonal structural elements 1a and 1b, while having the effect of integrally continuous elements extending in opposite diagonal directions, are in fact formed of short straight lengths 5' of the zigzagging elastic yarns 5 tied together at the sharp angular points where these yarns bend and touch one with the other. This construction does produce the effect of integrally continuous structural elements running in straight diagonal lines across the fabric, to produce the open mesh thereof.

The fabric A1 shown in Fig. 15, which as noted above is produced on what is commonly known as a Levers lace machine, embodies the same characteristics of construction as found in Fig. 14, in that the diagonal structural elements 1a and 1b are composed of elastic yarns 5b arranged in pairs concurrently zigzagging throughout the length of the fabric, in the same manner as the single elastic yarns 5 of Fig. 14, said pairs or units of elastic yarns 5b being tied together throughout their lengths by wrap threads 16b, said wrap threads at the intersections 2a and 2b of the diagonal elements 1a and 1b, where two pairs of the zigzagging elastic yarns 5b bend sharply and lie in laterally abutting relation to each other, passing around the two pairs of elastic yarns and tying the same together to produce the continuity of the diagonal structural elements 1a and 1b respectively.

It will be understood that in the drawings the elastic yarns at the intersection of the diagonal elements 1a and 1b are shown as being separated, merely for the purpose of illustration, to illustrate how the tie is made, whereas in the actual fabric the elastic yarns are drawn in close contacting relation to each other at the intersections or tie points and in so doing cause the short straight portions 5' of the yarns 5, between the sharp bends thereof, to assume substantially straight line alignment throughout, by which the effective continuity of the diagonal structural elements 1a and 1b is produced.

The fabric shown in Fig. 15, like that shown in Fig. 14, includes a solid fabric band 6b for garter grip or anchoring purposes, wherein the diamond shaped areas 3a are filled in with substantially solid fabric produced by cross threads 17b extending back and forth from one pair of zigzagging elastic yarns 5b to the next pair thereof. Also, like the fabric of Fig. 14, the fabric of Fig. 15 includes groups of straight longitudinally extending elastic yarns 5a tied together by cross threads 17a.

Fig. 16 illustrates in detail the manner of tying the pairs of elastic yarns 5b together in the main body portion of the fabric, to provide the open areas 3 of the open mesh structure.

Fig. 17 illustrates the use of single elastic yarns 5c in place of the pairs shown in Fig. 15, with single fibrous threads 16c spirally wound about the elastic yarns 5c throughout their length and about pairs of elastic yarns 5c where the sharp angular bends of adjacent zigzagging yarns come into abutting relation to each other.

Fig. 18 illustrates a fabric A2 which may be constructed on a braiding machine or an equivalent therefor. In this instance, the main body portion 1d of the fabric is composed of elastic yarns 5d arranged in the same zigzagging manner of the corresponding elastic yarns in the fabrics of Figs. 14 and 15, each of the zigzagging elastic yarns 5d having a fibrous yarn 16d wrapped spirally around it, throughout its length, and about adjacent pairs thereof at the intersecting points where the sharp angle bends of the zigzagging elastic yarns come into abutting relation to each other, thereby tying the adjacent zigzagging elastic yarns together in such a manner that the straight portions 5' assume longitudinal alignment and produce the continuity of the diagonally extending structural elements 1a and 1b.

In the fabric of Fig. 18, as in the fabrics of Figs. 14 and 15, an anchorage or garter grip band 6d is provided and includes pairs of elastic yarns 5e which extend through the band 6d in a general longitudinal direction and held in place by transversely extending tie threads 17d interbraided with each other and with the elastic yarns 5e in a manner to produce the substantially solid band 6d. In the present instance the pairs of elastic yarns 5e are twisted about each other at predetermined intervals throughout the length

of the strip of fabric A2, such as at the points 18, merely for esthetic effects rather than for any physical function.

In Fig. 19, single elastic yarns 5f are shown as being interbraided or twisted about each other where the sharp bends of adjacent zigzagging elastic yarns come together to produce the intersections 2c. While with this construction no tie threads would be necessary at the intersections 2c, it is preferred that each of the elastic yarns 5f be provided with a spirally extending fibrous thread 16f throughout its length and which at the intersections 2c embrace both of the elastic yarns and prevent relative slipping therebetween, at the intersections.

Fig. 20 shows continuously straight elastic yarns 5g crossing each other at the intersections 2d with fibrous tie threads 16g spirally wound about the respective elastic yarns 5g throughout their length and embracing both of the elastic yarns 5g, 5g at the intersections 2d to prevent relative slippage therebetween. When this construction is used in the fabric there would be actual physical continuity in each of the diagonally extending structural elements 1a and 1b. However, while it is possible to produce a fabric such as that shown in Fig. 13 with actual continuous structural elements 1a and 1b composed of the elastic yarns 5g—5g, on a special type of machine, such as a special braiding machine, it is preferred to use the zigzagging form of elastic yarn, as such fabric can be made on a conventional Levers lace machine, a conventional warp knitting machine, or a conventional braiding machine, by merely setting up the design or pattern mechanism of such machines to produce the fabric with this zigzagging construction.

The effectiveness of the diagonal structural elements composed of the straight portions of the succeeding zigzagging elastic yarns tied together at the sharp bends in the manner above noted is as great in such a structure as though these diagonal structural elements were formed of continuous elastic strands tied together at the crossings or intersections thereof in the manner shown in Fig. 20.

As shown in Fig. 1 the fabric A of Fig. 13 is applied to the upper end of a ladies' stocking B, as by looping or stitching the band 7 of the fabric A to the upper end of the knitted stocking leg B. As the stocking so provided is drawn onto the leg, the fabric A is extended longitudinally of the leg, by pulling upwardly on the upper band 6 until the stocking B and the top A thereof are smoothly positioned on the leg with the back seam C, Fig. 3, in correct position at the back of the leg. The oppositely extending diagonal structural elements 1a and 1b have then assumed their correct relationship to allow portions of the skin of the wearer to puff outwardly through the open areas 3 of the fabric A, as indicated at D in Fig. 3, the structural elements 1a and 1b pressing lightly into the skin, as shown in E in said figure. The longitudinal and circumferential stretching of the fabric A, during the positioning of the stocking on the leg, sets up sufficient tension in the structural elements 1a and 1b to cause these elements to press into the skin in the manner noted. With the stocking top set in this normal position subsequent bending of the knee, as shown in Fig. 2, causes an expansion of the leg above the knee with a consequential circumferential stretching of the skin. At the same time the stretching of the skin longitudinally of the leg, at the front of the leg, occurs with the diagonals of the top fabric more or less imbedded in the skin, so, with the top fabric being capable of universal stretching, the top fabric stretches with the skin in whatever direction the skin stretches, thus, there is no displacement of the diagonals from the furrows formed in the skin. Consequently, when the leg is normally straightened and the skin returns to its normal position the top fabric A also returns to its normal position and in so doing retrieves the knitted fabric of the stocking which has been drawn down over the knee as the knee was bent. Thus, the stocking is retained in position and wrinkling thereof is prevented when the leg is straightened after the knee has been bent.

In a like manner the furrowing of the diagonals in the skin prevents relative circumferential movement between the top fabric A and the skin and thus the back seam of the stocking is prevented from twisting out of position.

As shown in Figs. 6 and 7, when the band 6 at the upper edge of the top fabric A is connected to the lower edge of a girdle or corset G, for example, by suspenders F, the fabric A is stretched longitudinally on the leg to a greater extent than in Fig. 1 where the fabric A alone supports the stocking B on the leg. However, due to the construction of the top fabric A this increased extension of the fabric A does not alter the effectiveness of the fabric when the leg is bent in the manner indicated in Fig. 7, and the only change that takes place is that the open areas 3 are elongated to a greater extent longitudinally of the leg when the suspenders are used, as in Fig. 6, than in a case where the fabric A solely supports the stocking, as in Fig. 1.

As shown in Fig. 10 the fabric A is attached to the upper end of a man's half hose H, and embraces the calf of the leg on the lower converging portion thereof, and due to the above noted characteristics of the fabric of the top A, including the furrowing of the diagonals in the skin, the sock is held neatly in position by the universal elasticity of the top fabric conforming snugly to the tapering portion of the leg.

In Fig. 11 the top is shown as being applied to an anklet I and the characteristics of the structure as noted above become effective in the same manner.

Fig. 12 merely shows the reduction in the width of the anchorage band 6 over the garter grip band of Fig. 13, this narrower anchoring band is preferably used on the socks or anklets where no garter is to be employed. However, the wider band of Fig. 13 may be used on the socks for garter gripping purposes if such should be desirable. It is preferable to place the broader band on the ladies' hose at all times, in the event that the purchaser may desire to wear the stockings with or without suspender supporters.

Figs. 8 and 9 show the open mesh top A5 as being interchangeably detachably connected to the top edge of the knitted leg portion B5 of the stocking, wherein the upper edge 19 of the knitted leg is provided with a series of loops 20, formed in the present instance as a row of chain stitches connected at spaced intervals to the knitted leg. An elastic yarn 21 is threaded alternately through the loops 20 and through the lowermost row of open areas 3 of the top fabric A5. After threading completely around the stocking the opposite ends of the lace 21 are tied together or threaded reversely through the loops and open areas until the entire length of the lace is confined in place. If desired one or both ends of the elastic lace 21 may be tipped in the manner of an ordinary shoe

lace to facilitate the threading of the lace through the loops and spaces.

What is claimed is:

1. A universally stretchable open mesh elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions, means forming part of said structural elements for tying said elements together at said intersections, and a band of relatively solid longitudinally stretchable fabric extending along one longitudinal edge of and formed integral with said open mesh fabric.

2. A universally stretchable open mesh elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions, means forming part of said structural elements for tying said elements together at said intersections, a band of relatively solid longitudinally stretchable fabric extending along one longitudinal edge of and formed integral with said open mesh fabric, and a relatively narrow band of similar longitudinally stretchable relatively solid fabric extending along and formed integral with the second longitudinal edge of said open mesh fabric.

3. A universally stretchable open mesh fabric formed of a plurality of elastic yarns running in laterally adjacent zigzagging courses longitudinally of the fabric with oppositely pointing sharp angular bends of adjacent zigzagging elastic yarns in opposite abutting relation to each other, a fibrous thread entwined with each zigzagging elastic yarn throughout the length of the zigzagging yarn and embracing the adjacent elastic yarns at said sharp angular bends to tie said bends together and form the open mesh of the fabric, and a band of relatively solid longitudinally stretchable fabric extending along and formed integral with one longitudinal edge of said open mesh fabric.

4. A universally stretchable open mesh fabric formed of a plurality of elastic yarns running in laterally adjacent zigzagging courses longitudinally of the fabric with oppositely pointing sharp angular bends of adjacent zigzagging elastic yarns in opposite abutting relation to each other, a fibrous thread entwined with each zigzagging elastic yarn throughout the length of the zigzagging yarn and embracing the adjacent elastic yarns at said sharp angular bends to tie said bends together and form the open mesh of the fabric, a band of relatively solid longitudinally stretchable fabric extending along and formed integral with one longitudinal edge of said open mesh fabric, and a relatively narrow band of similar relatively solid longitudinally stretchable fabric along the opposite longitudinal edge of said open mesh fabric.

5. A stocking comprising a knitted leg portion and an elastic top composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions and connected together at said intersections.

6. A lady's full length stocking comprising a knitted leg portion and an elastic band adapted to embrace the wearer's leg above the knee with said band composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions spirally around the wearers leg and connected together at said intersections.

7. A lady's full length stocking comprising a knitted leg portion and an elastic top adapted to embrace the wearers leg above the knee with said top composed of a band of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions spirally around the wearers leg and connected together at said intersections, and a band of relatively solid longitudinally stretchable fabric extending along and formed integral with the upper longitudinal edge of said open mesh fabric extending circumferentially of the wearers leg.

8. A lady's full length stocking comprising a knitted leg portion and an elastic top adapted to embrace the wearers leg above the knee with said top composed of a band of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions spirally around the wearers leg and connected together at said intersections, a band of relatively solid longitudinally stretchable fabric extending along and formed integral with the upper longitudinal edge of said open mesh fabric extending circumferentially of the wearers leg, and a relatively narrow band of similar relatively solid longitudinally stretchable fabric along and formed integral with the lower longitudinal edge of said open mesh fabric extending circumferentially of the wearers leg and to which said leg portion of said stocking is attached.

9. A stocking comprising a knitted leg portion and an interchangeable detachable elastic top composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respertively arranged on intersecting lines extending in opposite diagonal directions and connected together at said intersections.

10. A stocking comprising a knitted leg portion and an interchangeable detachable elastic top composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions and connected together at said intersections, a band of relatively solid longitudinally stretchable fabric along and formed integral with one longitudinal edge of said open mesh fabric, and means for detachably connecting the opposite longitudinal edge of said open mesh fabric with the knitted fabric of said leg portion.

11. A half hose stocking comprising a knitted leg portion and an elastic top adapted to embrace the wearer's leg below the knee, with said top composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions spirally of the wearer's leg and connected together at said intersections.

12. A half hose stocking comprising a knitted leg portion and an elastic top adapted to embrace the wearer's leg below the knee, with said top composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in op-

posite diagonal directions spirally of the wearer's leg and connected together at said intersections and a band of relatively solid longitudinally stretchable fabric along and formed integrally with the upper edge of said open mesh fabric.

13. A half hose stocking comprising a knitted leg portion and an elastic top adapted to embrace the wearer's leg below the knee, with said top composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions spirally of the wearer's leg and connected together at said intersections, a band of relatively solid longitudinally stretchable fabric along and formed integrally with each of the opposite longitudinal edges of said open mesh fabric, and means for securing the knitted leg portion of said stocking to the solid fabric along the lower edge of said open mesh top fabric.

14. A short anklet stocking comprising a knitted ankle and foot portion and an elastic top adapted to embrace the angle of the wearer with said top composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions and connected together at said intersections.

15. A short anklet stocking comprising a knitted ankle and foot portion and an elastic top adapted to embrace the ankle of the wearer with said top composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions and connected together at said intersections, and a band of relatively solid longitudinally stretchable fabric along and formed integrally with the upper edge of said open mesh fabric.

16. A short anklet stocking comprising a knitted ankle and foot portion and an elastic top adapted to embrace the ankle of the wearer with said top composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions and connected together at said intersections, a band of relatively solid longitudinally stretchable fabric along and formed integrally with each of the opposite longitudinal edges of said open mesh fabric, and means for securing the knitted leg portion of said stocking to the solid fabric along the lower edge of said open mesh top fabric.

17. A stocking comprising a knitted leg portion and an elastic top composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions and connected together at said intersections, and an elastic seam joining transversely extending cut edges of said top and comprising a longitudinally stretchable tape overlying said cut edges, and flat-lock stitching binding said cut edges and said tape together.

18 A stocking comprising a knitted leg portion and an elastic top composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions and connected together at said intersections, a band of relatively solid longitudinally stretchable fabric extending along and formed integral with the upper longitudinal edge of said open mesh fabric extending circumferentially of the wearer's leg, an elastic seam joining transversely extending cut edges of said top and comprising a longitudinally stretchable tape overlying said cut edges, and flat-lock stitching binding said cut edges and said tape together.

19. A stocking comprising a knitted leg portion and an elastic top composed of universally stretchable elastic fabric comprising two series of laterally spaced composit elastic structural elements respectively arranged on intersecting lines extending in opposite diagonal directions and connected together at said intersections, a band of relatively solid longitudinally stretchable fabric extending along and formed integral with the upper longitudinal edge of said open mesh fabric extending circumferentially of the wearer's leg, a relatively narrow band of similar relatively solid longitudinally stretchable fabric along and formed integral with the lower longitudinal edge of said open mesh fabric extending circumferentially of the wearer's leg and to which said leg portion of said stocking is attached, an elastic seam joining transversely extending cut edges of said top and comprising a longitudinally stretchable tape overlying said cut edges, and flat-lock stitching binding said cut edges and said tape together.

JEAN S. GAINES.

Administratrix of the Estate of Eugene F. Gaines, Deceased.