Aug. 25, 1936. C. E. DRUMHELLER 2,052,088

PLAIN KNITTED FABRIC CONTAINING RUBBER LIKE STRANDS

Filed Jan. 19, 1934 6 Sheets-Sheet 1

Fig. 1.

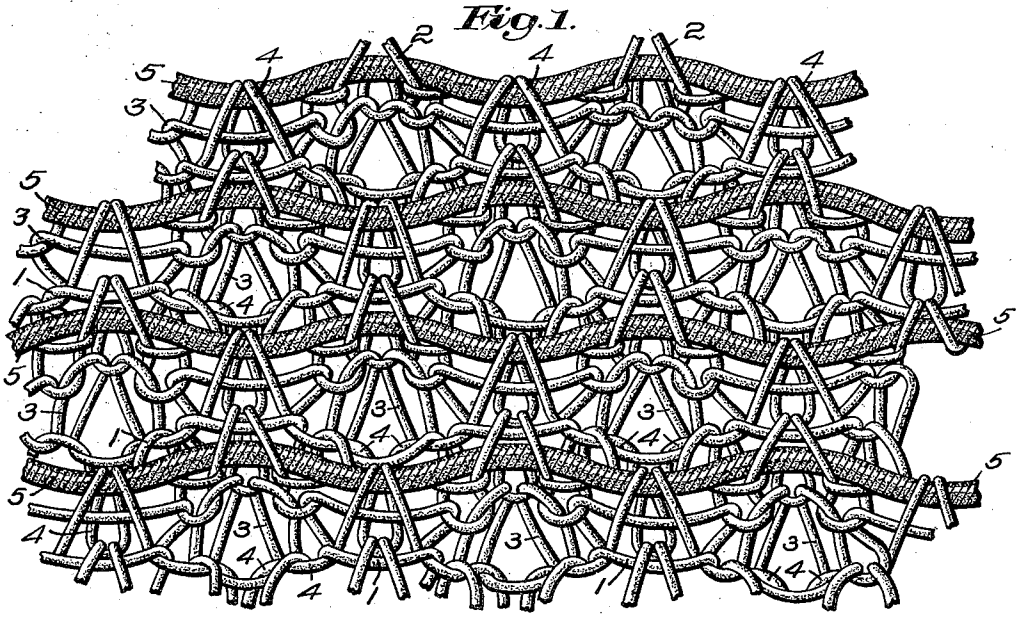
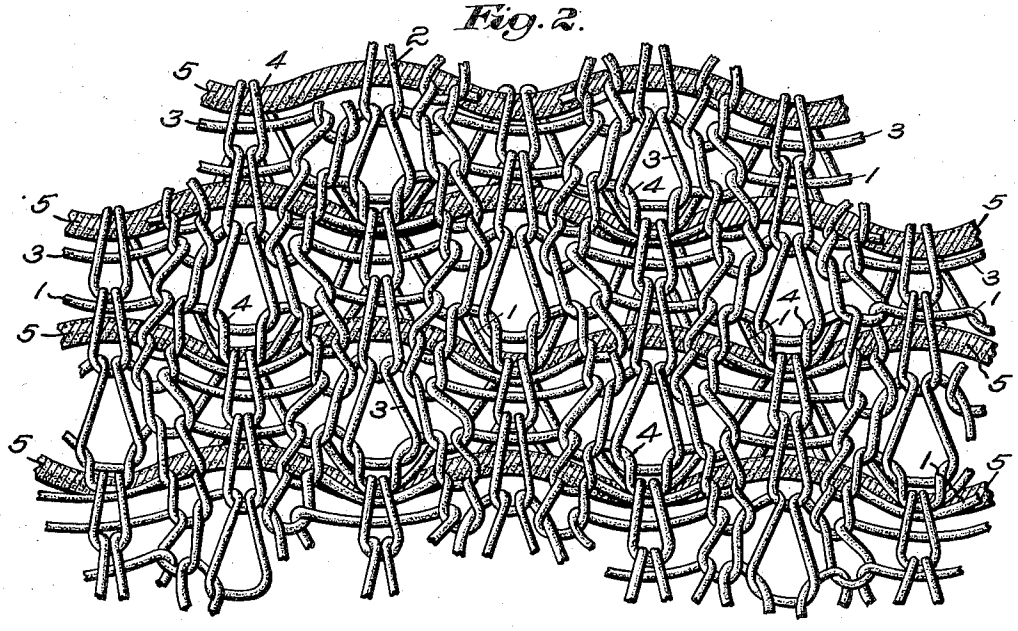


Fig. 2.



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PLAIN KNITTED FABRIC CONTAINING RUBBER LIKE STRANDS

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Fig. 3.

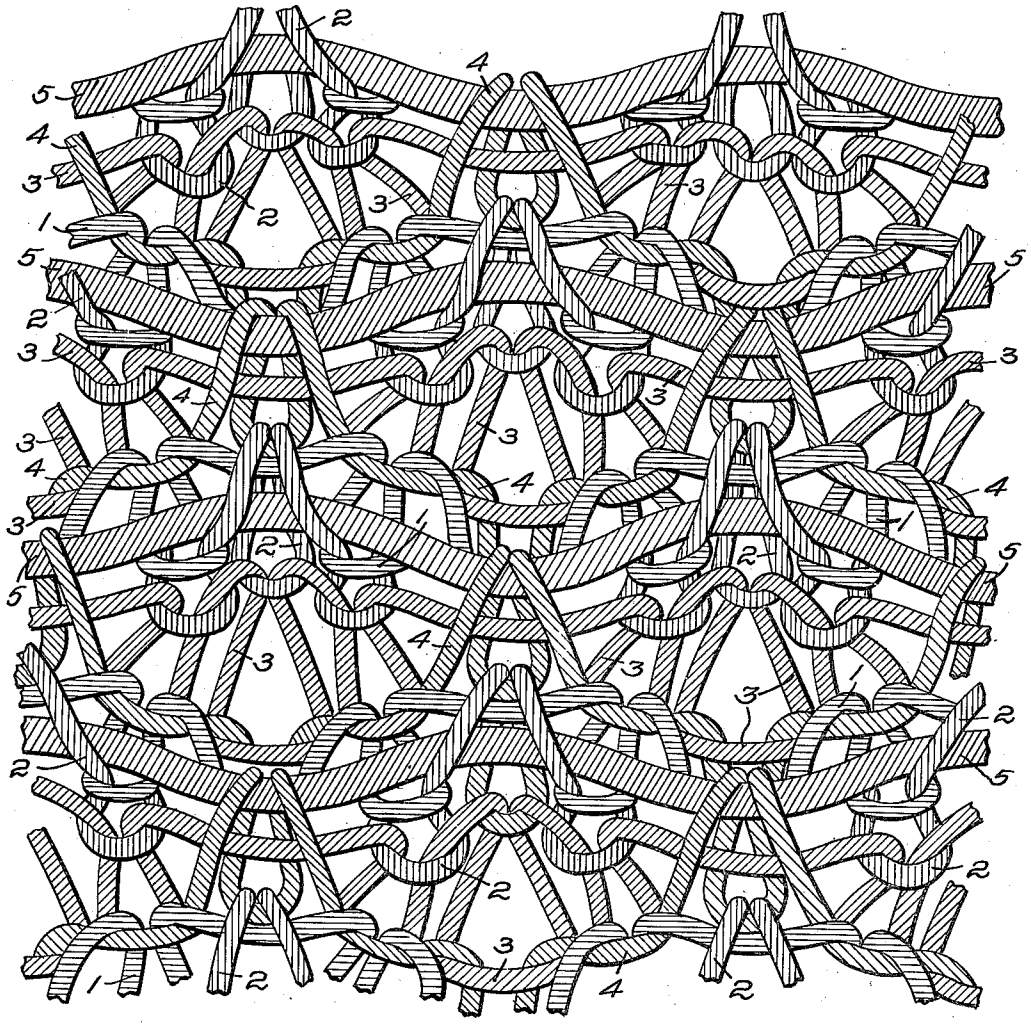
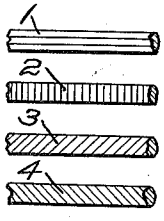


Fig. 3.a



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Fig. 4.

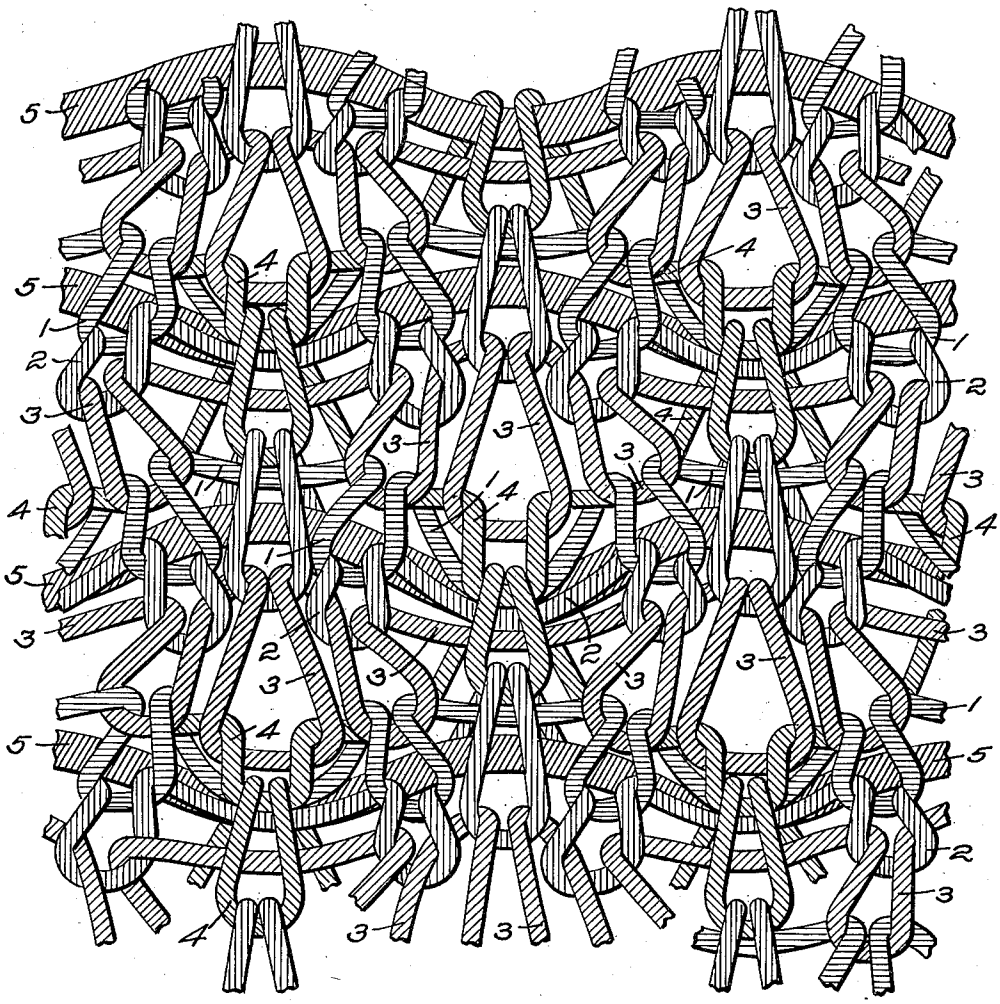
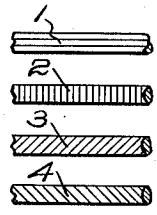


Fig. 4.a



YARN - 1ST. FEED.
YARN - 2ND. FEED.
YARN - 3RD. FEED.
YARN - 4TH. FEED.

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PLAIN KNITTED FABRIC CONTAINING RUBBER LIKE STRANDS

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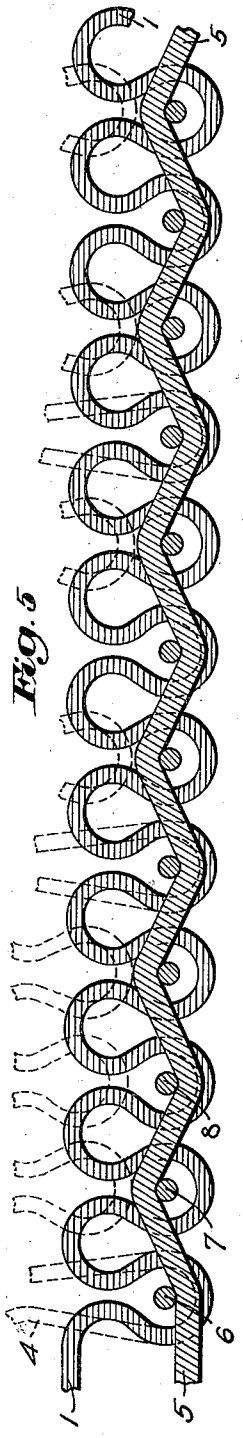


Fig. 5

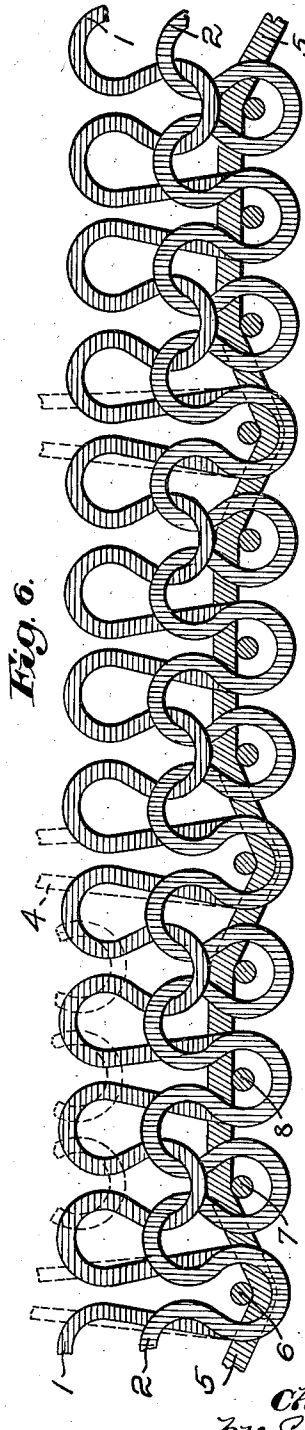


Fig. 6.

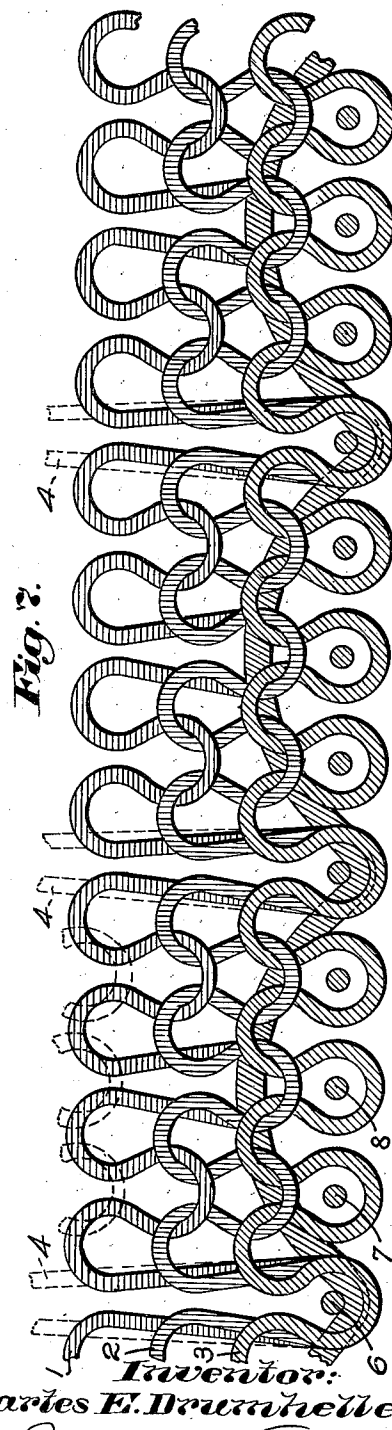


Fig. 7.

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PLAIN KNITTED FABRIC CONTAINING RUBBER LIKE STRANDS

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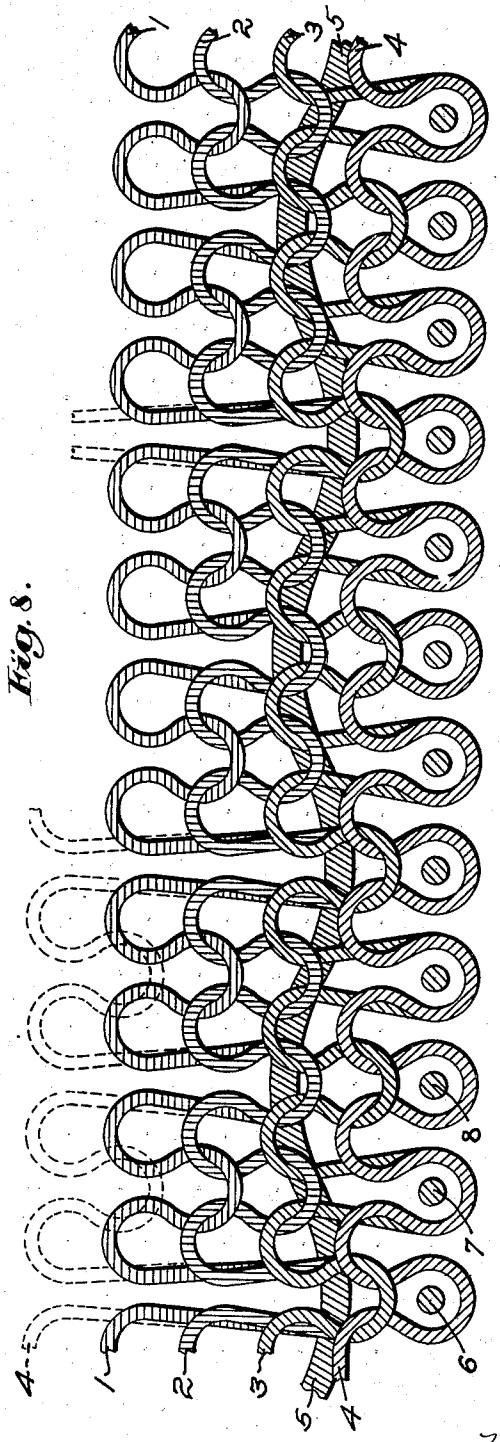


Fig. 8.

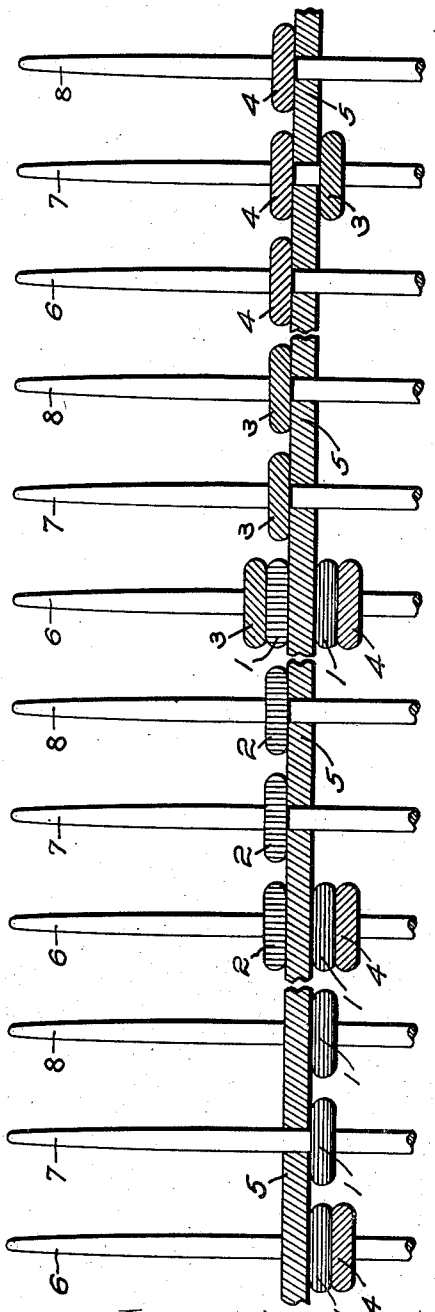


Fig. 9.

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PLAIN KNITTED FABRIC CONTAINING RUBBER LIKE STRANDS

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Fig. 10.

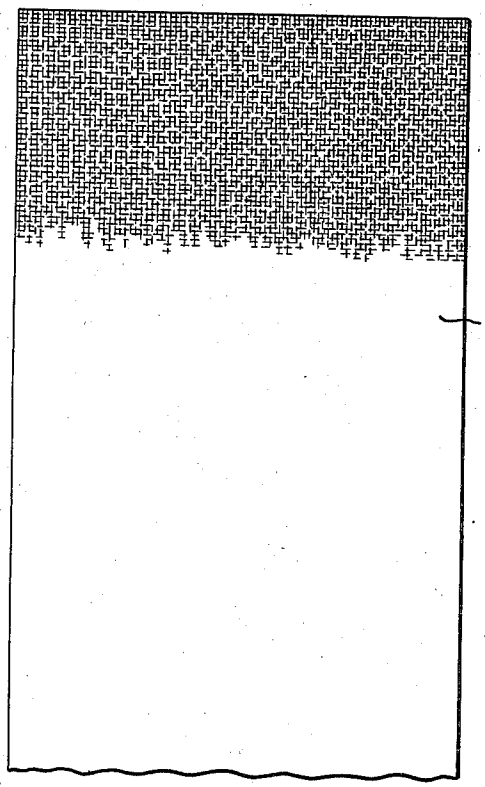


Fig. 11.

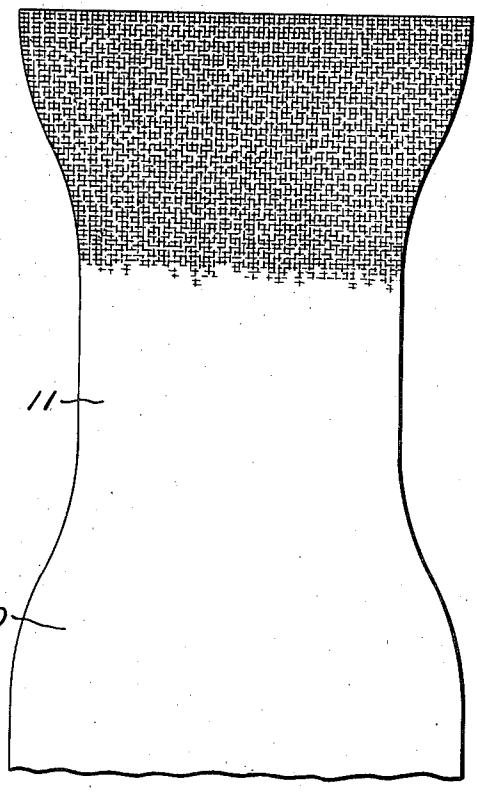
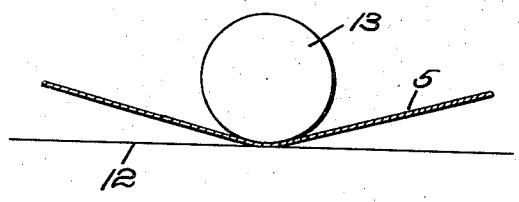


Fig. 12.



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Patented Aug. 25, 1936

2,052,088

UNITED STATES PATENT OFFICE

2,052,088

PLAIN KNITTED FABRIC CONTAINING RUBBER-LIKE STRANDS

Charles E. Drumheller, Springfield, Mass., assignor to The William Carter Company, Needham Heights, Mass., a corporation of Massachusetts

Application January 19, 1934, Serial No. 707,260

23 Claims. (Cl. 66—190)

This invention relates to highly expansible plain knitted fabrics containing rubber-like strands.

In order that the principle of the invention may be readily understood, I have in the accompanying drawings disclosed one embodiment only of the said fabric.

In said drawings,—

Fig. 1 is an outside or front plan view of a completed portion of the fabric much enlarged;

Fig. 2 is an inside or back view of the same fabric;

Figs. 3 and 4 are views corresponding to Figs. 1 and 2 but are enlarged thereover, and the yarn or thread at each of the four feeds and the rubber-like strand are all contrastingly designated or hatched;

Figs. 3*a* and 4*a* are charts indicating the contrasting hatching of the yarns or threads at the four feeds;

Figs. 5, 6, 7, 8 are somewhat diagrammatic representations of the yarns or threads and the rubber-like strand at the first, the second, the third and the fourth feeds respectively of the machine whereon my fabric is preferably knitted;

Fig. 9 is a series of four diagrams to show a group of three needles as they function at each feed of the machine, and the stitches accumulated thereon at said several feeds;

Fig. 10 is a side elevation of the fabric of my invention when knitted as a tube of uniform diameter, the structure of the fabric being conventionally shown;

Fig. 11 is a similar view of a fabric knitted in accordance with my invention, but of varying diameter according to the tension upon the rubber-like material; and

Fig. 12 is a detail indicating how the tension is applied to the strand of rubber-like material.

The fabric herein disclosed and claimed is preferably knitted by the mechanism and according to the process described and claimed in my copending application Ser. No. 707,259.

The fabric of my invention is a plain knit fabric as contrasted with a rib fabric, and by "plain fabric" I mean one knitted upon a single series or set of needles. The fabric is either a straight or a circular knit fabric, but is herein described as a circular knit fabric knitted upon a machine of sufficiently large diameter to have at least four feeds or, if desired, to have a multiple thereof. My invention, however, is not limited to a fabric knitted upon such plurality of feeds.

The fabric of my invention is one which is very highly expansible both lengthwise and transversely of the needle wales, and is one wherein a rubber-like strand is incorporated in such manner as to enhance very greatly such expansibility. It has heretofore been proposed to introduce a rubber-like strand into knitted fabrics but heretofore so far as I am aware, this has mainly been accomplished by laying a strip or strand of rubber or a strand of rubber-like material between the needles of the rib knitting machine in a wholly straight condition.

An important purpose of my invention is so to introduce a rubber-like strand as to render the fabric very highly expansible in both directions.

In addition I tension the said rubber-like strand at all times during its introduction into the fabric and in this way I control the shaping thereof. Assuming that the fabric is knitted in tubular form, the same may be of uniform diameter throughout or may be gradually tapering in one direction or the other or may be of varied shape, all as fully disclosed in my co-pending application Ser. No. 707,261.

In order to introduce the rubber strand in such a way as to render the fabric very highly expansible, I employ stitch variation at very closely recurring intervals, as hereinafter fully explained, and such stitch variation incidentally provides for a very attractive appearance of the fabric, desirably giving it the appearance of a multiplicity of small openings arranged in diamond or lozenge relation. My invention, however, is in no wise limited to any particular appearance of the fabric other than may be due to the employment of some suitable type of stitch variation. While my invention is not restricted to the introduction of any particular rubber-like strand, I have obtained the best results by employing a rubber-like strand and which consists of a core of unvulcanized material, such, for example, as rubber juice suitably coagulated in water and then wrapped with a very fine covering of silk or other suitable material, the composite strand being of very fine diameter. Coarser diameters may, however, be employed, this depending largely upon the cut of the machine.

In knitting the fabric, I provide a stitch variation and this is preferably of the character of tuck stitches at predetermined intervals, and so related that the rubber-like strand is positioned or incorporated in the stitches of the silk or other threads in a more or less corrugated,

slightly wavy or kinky condition. In knitting the fabric herein disclosed, the needles are alternately short and long butt needles respectively termed A needles and B needles, and I introduce a separate non-rubber thread at each of the feeds which for the purpose of the present description will be assumed to be four in number. In the claims I refer to the non-rubber threads as inelastic threads, for purpose of comparison with the rubber-like threads. I introduce the rubber-like strand at one only of said feeds (namely, feed No. I), and in order properly to introduce the said rubber-like strand, I divide the needles pertaining to said groups of A and B needles alternately throughout the machine, which will be assumed to be a circular spring beard needle machine of the general Wildman type. At the first feed the inner face of the drawing down cam is so recessed that said cam will not draw down A needles, but will permit them to remain substantially elevated, and thus affords space or room in which to introduce the rubber-like strand to the B needles.

Referring more particularly to the drawings and first to Figs. 1 to 4*a*, and first for clearness of description to Figs. 3 and 4 and the accompanying chart of Figs. 3*a* and 4*a*, the four threads of a non-rubber character introduced respectively to the four feeds of the machine are indicated respectively at 1, 2, 3, 4, and it will be observed that the hatching of these threads is differentiated merely for clearness of description. The rubber-like strand is indicated at **5**. The non-rubber threads or yarns may be of silk, cotton, rayon or other suitable material.

At the first feed where the non-rubber thread **1** and the rubber strand **5** are both introduced, every other needle remains elevated (that is to say, the A needles remain elevated and the B needles are drawn down in the customary manner). The said thread **1** is at the first feed engaged only by the beards of the B needles, being engaged thereby at about the usual point in the descent of the said B needles. The beard of each B needle as it is descending is closed before the point of the beard reaches the rubber-like strand **5**, which is at that time in the throats of the sinkers. The stitch of the thread **1** is cast off at feed No. II without the said rubber-like strand **5** being incorporated as yet into the knitted stitches.

At feed No. II all the needles (namely, both needles A and needles B) are drawn down together, and in addition I provide at feed No. II a pattern wheel having one deep notch immediately succeeded by one or more shallow notches so that those needles which are received at the deep notches are not pressed while those received at the shallow notches are pressed. In the particular fabric herein illustrated, at feed No. II there is provided on the presser wheel a deep notch immediately succeeded by three shallow notches, this structure being repeated throughout the circumference of the presser wheel. The result is therefore to form tuck stitches. In addition, it should be stated that each needle throughout the machine is provided with an individual presser and that alternately throughout the machine said pressers are of two types, as fully disclosed in my said co-pending application, so that the needles may be selectively pressed at the several feeds. As herein operated, alternate pressers are caused to function at the first feed, all pressers at the second and third feeds, and the intervening pressers at the fourth feed.

The fabric herein shown is knitted upon a machine in which the stitches formed at the first feed are cast off at the second feed, those formed at the second feed are cast off at the third, those formed at the third are cast off at the fourth, and those formed at the fourth are cast off at the first feed.

At the first feed, all the B needles take a loop of thread **1** into their beards, the rubber-like strand **5** not being received in the beards of the B needles, but lying at the back or shank side of the needles. Neither the thread **1** nor the rubber-like strand **5** is taken into the hooks of the A needles at the first feed, but both said thread and strand are measured as to the stitches to be formed at the needles by being kinked or bent thereabout.

At the second feed, both the A needles and the B needles are pressed off because all the needles are drawn down at the second feed, but at said second feed the first of every group of four needles is not pressed because in this embodiment or example of my invention, the first of every four needles is received in the deep notch of the presser wheel referred to. At feed No. III the same thing happens as at feed No. II, inasmuch as thereat I also provide a pattern wheel having a deep notch for the first needle of every group of four and a shallow notch for each of the next three. Therefore, at both the second and third feeds, all the needles are pressed excepting the first of each group of four. Referring to the four needles as *a*, *b*, *c*, *d*, needle *a* will take a stitch of the silk or non-rubber thread **1** and will take the rubber-like strand **5**. The next three needles *b*, *c*, *d* each takes a stitch of thread **1** and will cast off the stitches previously on said needles. The rubber-like strand **5**, however, is not taken by any of the needles at either said second feed or said third feed.

At feed No. IV both the A needles and the B needles take thread **4**, the threads **1**, **2**, **3** having been respectively taken at feeds Nos. I, II, III as already stated. At feed No. IV, however, the A needles press off and the B needles tuck. At feed No. IV there is no presser wheel provided, but all the A needles are pressed by their individual pressers. Therefore, the needles which at feed Nos. II and III did not press off their stitches, because of the employment of the pattern wheels referred to, now cast off their stitches at the said fourth feed.

The co-called diamond or lozenge effect that is clearly shown in Figs. 1, 2, 3, 4, is due to the employment of a certain number of needles, so as to provide for a slight progression incident to the use of such number of needles. For reference to the exact number of needles employed, but to which obviously applicant's invention is not restricted, reference is made to my co-pending application Ser. No. 707,259, wherein is disclosed the machine for making this fabric.

In Figs. 5, 6, 7 and 8, is diagrammatically indicated the positioning of the non-rubber threads **1**, **2**, **3**, **4**, and the rubber-like strand **5** with respect to each of said four feeds. The hatching employed in said diagrammatic figures is the same as that in Figs. 3 and 4. In Fig. 9, I have represented the same three needles **6**, **7**, **8** repeated four times.

Referring to Fig. 5, I have therein represented the thread **1** introduced at feed No. I and the

rubber-like strand 5, and have shown the relation thereof to all the needles. The structure in Figs. 6, 7 and 8 represents the further development of the fabric at the second, third and fourth feeds respectively. It will be observed that in Fig. 6, there is in process of formation a tuck stitch at every A needle. In Fig. 7 said tuck stitches are still being maintained at the A needles so far as the silk threads 1 and 2 taken at feed No. I and feed No. II respectively are concerned, and that for feed No. III a tuck stitch is also in process of formation at the first of every group of four needles beginning with the first A needle at the left of the needles. In Fig. 8 at feed No. IV all the said tuck stitches previously referred to have been cast off and at every B needle a tuck stitch is in process of formation which will be cast off at feed No. I.

In Fig. 9, wherein, as stated, the same three needles 6, 7, 8 are four times represented, the threads are shown on said needles that are received at the four feeds Nos. I, II, III, IV respectively.

Referring to Figs. 3 and 4, it will be noted that the silk or other non-rubber thread 1, 2, 3, 4, are differently hatched so that the threads introduced at each of the four feeds can be readily identified, and the rubber-like strand 5 is also contrastingly hatched. About fifteen courses are indicated in the Figs. 1, 2, 3, 4, this including the travel of the fabric four times past each of the said feeds, so that apparently the rubber-like strand 7 has been introduced four times. This is apparent only because it is evident that the rubber-like strand 5 as well as all the usual knitting threads 1, 2, 3, 4, lie in a spiral manner about the fabric.

It will be observed, viewing Figs. 1, 2, 3, 4, that the result of employing a stitch variation (here shown as a tuck stitch formation but to which my invention is not limited) is to effect the laying of the rubber-like strand 5 in a slightly sinuous path. This enhances the lateral expansibility of the fabric as the said strands 5 (meaning the different portions of the one strand 5) may be and are drawn straight in laterally stretching the fabric before expansion of the rubber material actually begins. The provision of the tuck stitch structure not only provides for the sinuous laying of the rubber-like strand 5 but enhances the lateral and the lengthwise expansibility of the knitted fabric as regards the non-rubber threads 1, 2, 3, 4. Thus the employment of a stitch variation in knitting the threads 1, 2, 3, 4 directly cooperates with the rubber-like strand 5 to render the fabric more highly expansible in both directions than heretofore. Moreover, the rubber-like strand 5 is more intimately incorporated into the actual structure of the fabric than heretofore. Notwithstanding that the fabric is a plain knit fabric, it is evident from a study of Figs. 1, 2, 3, 4, that the rubber-like strand 5 so lies in the fabric that at alternate needle wales the stitches of the non-rubber threads lie at opposite faces or sides of the said rubber-like strand 5. The fabric at both faces has a very distinctive appearance, there being a multiplicity of small interstices arranged in a diamond or lozenge effect. This is due to the fact that the tuck stitches are so cast off that the larger openings of the tuck stitches are spaced apart by four needle wales, and that in each revolution of the needle cylinder the pattern effect is incrementally advanced. Thus, viewing Figs. 1, 2, 3, 4 the two next adjacent occurrences of the rubber-like strand 5 provide a slight divergence of said two occurrences of said strand at the tuck stitch formation between them and a nearer approach of the said two occurrences of said strand at either side of said tuck stitch formation. This structure or appearance is repeated with respect to the third and fourth occurrences of said strand 5 and is reversed with respect to the second and third appearances of said strand 5 and so on throughout the fabric.

I have stated that during the introduction of the rubber-like strand 5, the tension thereof is controlled or varied so that the resulting fabric may be of uniform diameter or may be shaped. In Fig. 10, I have represented at 9 a piece of tubular material knitted in accordance with my invention and which is of uniform diameter throughout, inasmuch as the tension upon the said strand 5 is maintained constant throughout. In Fig. 11, I have represented at 10 another piece of tubular fabric knitted in accordance with my invention and which has a contracted portion 11 whose less diameter is due to the fact that the tension upon the strand 5 is increased during the knitting of the said contracted portion. Obviously, the fabric may be variously shaped by changing the tension from time to time as desired. In Fig. 12, I have indicated one manner in which the tension upon the rubber-like strand is controlled and varied as desired. Therein, I have indicated at 12 a positively rotated disk, and at 13 a roller which, by means such as disclosed in my co-pending application Ser. No. 707,259, is moved toward or from the axis of rotation of the said disk 12. The rubber-like strand 5 is introduced between the disk 12 and roller 13, and then is led to the needles under such tension as results from the position of the roller 13 with respect to the centre of rotation of the disk 12.

Having thus described one illustrative embodiment of my invention, it is to be understood that although specific terms are employed, they are used in a generic and descriptive sense and not for purposes of limitation, the scope of the invention being set forth in the following claims.

I claim:

1. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having stitch or loop variations in closely recurrent needle wales throughout the fabric and normally knit needle wale portions therebetween, and having one or more rubber-like strands positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric throughout by and because of loop portions of the said stitch variations, the normally knit loops lying at one side only of the said rubber-like strand or strands.

2. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having in relatively large areas thereof stitch variation wales and normal stitch wales in persistent recurrence, said fabric having one or more rubber-like strands positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric throughout said areas, by and because of loop portions of said stitch variations, the normally knit loops of said normal stitch

wales lying at one side only of the said rubber-like strand or strands.

3. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having in relatively large areas thereof tuck-stitch wales and normal stitch wales in persistent recurrence, said fabric having one or more rubber-like strands positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric throughout said areas by and because of loop portions of said tuck stitches, the normally knit loops of said normal stitch wales lying at one side only of said rubber-like strand or strands.

4. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having in relatively large areas thereof stitch variation wales and normal stitch wales in persistent recurrence, said fabric having one or more rubber-like strands positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric throughout said areas, by and because of loop portions of said stitch variations.

5. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having in relatively large areas thereof stitch variation wales and normal stitch wales in persistent recurrence, said fabric having one or more rubber-like strands positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric throughout said areas, by loop portions of said stitch variations, the said rubber-like strand or strands lying wholly at the front face of the normal stitch wales.

6. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having in relatively large areas thereof tuck-stitch wales and normal stitch wales, in persistent recurrence, said fabric having one or more rubber-like strands positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric throughout said areas, by and because of loop portions of said tuck stitches.

7. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having in relatively large areas thereof tuck-stitch wales and normal stitch wales, in persistent recurrence, said fabric having one or more rubber-like strands positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric throughout said areas, by and because of loop portions of said tuck stitches, the said rubber-like strand or strands lying wholly at the front face of the normal stitch wales.

8. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having stitch or loop variations in closely recurrent needle wales throughout the fabric and normally knit needle wale portions therebetween, and having one or more rubber-like strands positioned course-wise of the fabric and incorporated into the substance of the fabric in an undulatory condition throughout by and because of loop portions of the said stitch variations, said rubber-like strand or strands when the fabric is in non-distended condition lying in an undulatory condition throughout.

9. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having stitch or loop variations in closely recurrent needle wales throughout the fabric and normally knit needle wale portions therebetween, and having one or more rubber-like strands positioned course-wise of the fabric and incorporated into the substance of the fabric in an undulatory condition throughout by and because of loop portions of the said stitch variations, said rubber-like strand or strands when the fabric is in non-distended condition lying in an undulatory condition throughout, the undulations of the said strand or strands approaching more nearly each other between loop variations.

10. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having in relatively large areas thereof tuck-stitch wales and normal stitch wales, in persistent recurrence, said fabric having one or more rubber-like strands positioned course-wise of the fabric and incorporated into the substance of the fabric in an undulatory condition throughout said areas, by and because of loop portions of said tuck stitches, said rubber-like strand or strands when the fabric is in non-distended condition, lying in an undulatory condition throughout.

11. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having in relatively large areas thereof tuck-stitch wales and normal stitch wales, in persistent recurrence, said fabric having one or more rubber-like strands positioned course-wise of the fabric and incorporated into the substance of the fabric in an undulatory condition throughout said areas, by and because of loop portions of said tuck stitches, said rubber-like strand or strands when the fabric is in non-distended condition, lying in an undulatory condition throughout, the undulations of said strand or strands being most divergent where tuck stitch formations constitute interstices in the fabric.

12. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having stitch or loop variations in closely recurrent needle wales throughout the fabric and normally knit needle wale portions therebetween, and having one or more rubber-like strands positioned course-wise of the fabric and incorporated into the substance of the fabric in an undulatory condition throughout by and because of loop portions of the said stitch variations, the stitch variations in stitch-variation wales occurring in staggered relation in alternate stitch-variation wales.

13. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having in relatively large areas thereof tuck-stitch wales and normal stitch wales, in persistent recurrence, said fabric having one or more rubber-like strands positioned course-wise of the fabric and incorporated into the substance of the fabric in an undulatory condition throughout said areas, by and because of loop portions of said tuck stitches, the tuck stitches in tuck-stitch

wales occurring in staggered relation in alternate tuck-stitch wales.

14. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having stitch or loop variations in closely recurrent needle wales throughout the fabric and normally knit needle wale portions therebetween, and having one or more rubber-like strands positioned course-wise of the fabric and incorporated into the substance of the fabric in an undulatory condition throughout by and because of loop portions of the said stitch variations, said rubber-like strand or strands being under differentiated tension at different portions thereof, whereby said fabric is shaped.

15. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having in relatively large areas thereof tuck-stitch wales and normal stitch wales, in persistent recurrence, said fabric having one or more rubber-like strands positioned course-wise of the fabric and incorporated into the substance of the fabric in an undulatory condition throughout said areas, by and because of loop portions of said tuck stitches, said rubber-like strand or strands being under differentiated tension at different portions thereof, whereby said fabric is shaped.

16. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having stitch or loop variations in closely recurrent needle wales throughout the fabric and normally knit needle wale portions therebetween, and having one or more rubber-like strands positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric throughout by and because of loop portions of the said stitch variations, said expansibility being supplemented by the stitch variation.

17. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having in relatively large areas thereof tuck-stitch wales and normal stitch wales, in persistent recurrence, said fabric having one or more rubber-like strands positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric throughout said areas, by and because of loop portions of said tuck stitches, said expansibility being supplemented by the tuck stitches.

18. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having stitch or loop variations in closely recurrent needle wales throughout the fabric and normally knit needle wale portions therebetween, and having one or more rubber-like strands positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric throughout by and because of loop portions of the said stitch variations, the normally knit loops lying at one side only of the said rubber-like strand or strands, said fabric having a plurality of inelastic threads for each rubber-like strand.

19. A plain-knit fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having in relatively large areas thereof tuck-stitch wales and normal stitch wales in persistent recurrence, said fabric having one or more rubber-like strands positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric throughout said areas by and because of loop portions of said tuck stitches, the normally knit loops of said normal stitch wales lying at one side only of said rubber-like strand or strands, said fabric having a plurality of inelastic threads for each rubber-like strand.

20. A knitted fabric comprising a plurality of yarns arranged in one section to present loops in a plurality of rows and wales, and an elastic unlooped yarn in the rear of said section running substantially parallel to a row and lying behind all loops in said row of said section, certain of said yarns being looped in certain wales and unlooped in other wales, the unlooped portions of said certain yarns lying adjacent and in front of said elastic yarn partially to conceal said elastic yarn when viewed from the front of the fabric.

21. A knitted fabric having inelastic knitted threads, and being highly elastic or expansible in directions both transverse to and lengthwise of the wales, having stitch or loop variations in closely recurrent needle wales throughout the fabric and normally knit needle wale portions therebetween, and having one or more rubber-like strands positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric throughout by and because of loop portions of the said stitch variations, the normally knit loops lying at one side only of the said rubber-like strand or strands.

22. A knitted fabric composed of a plurality of inelastic knitted threads and one or more rubber-like strands, said fabric being highly elastic or expansible in directions both transverse and lengthwise of the wales, said fabric having stitch or loop variations in the closely recurrent needle wales throughout the fabric and normally knit needle wale portions therebetween, said rubber-like strands being positioned course-wise of the fabric and incorporated in an unknit undulatory condition into the substance of the fabric, undulations of said rubber-like strand or strands occurring at said stitch variations.

23. A knitted fabric composed of a plurality of inelastic knitted threads and one or more unknitted threads incorporated in a course-wise direction, said fabric having stitch or loop variations of said knitted threads in closely recurrent needle wales throughout the fabric and having normally knit needle wale portions therebetween, the said unknitted thread or threads being incorporated in an unknitted undulatory condition into the substance of the fabric, undulations of said unknitted thread or threads occurring at stitch variations of said knitted threads in said closely recurrent needle wales throughout the area of the fabric.

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