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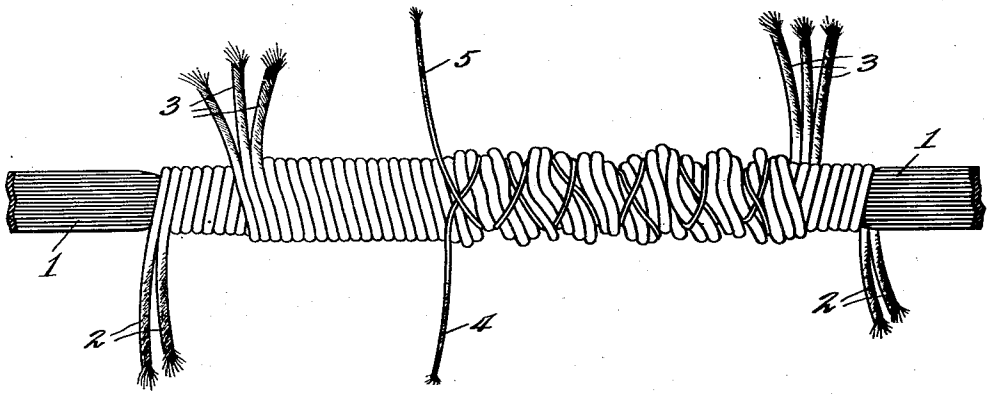

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COVERED ELASTIC THREAD

Application filed February 5, 1931. Serial No. 513,492.

This invention relates to a covered elastic thread adapted to enter the construction of knitted, woven and braided fabrics such as are used in corsets, garters, supporters and a variety of other articles.

One object of the invention is to construct a covered elastic thread having a corrugated or roughened outer surface which causes it to be gripped securely by the sewing machine stitches and held tenaciously in the knitted, woven or braided fabric, thereby greatly retarding its slippage through the fabric or the sewing machine stitches.

Another object of the invention is to provide an elastic covered rubber thread having a plurality of covers so constructed and arranged that, when the rubber core is severed by the sewing machine needle, the several covers cooperate to form an encasement which decidedly limits the separation of the severed ends and encloses them in such a manner as to make the rupture hardly perceptible.

Another object of the invention is to provide an elastic covered rubber thread having a plurality of covers so constructed and arranged that the breaking points of all the covers are reached at approximately the same time but well within the elastic limit of the rubber core.

Still another object of the invention is to provide an elastic thread having a core composed of one or more rubber strands, and a plurality of superimposed spirally wound textile covers applied in such a manner that, while the rubber core may be securely encased and held either at a relatively low tension or extended to its normal stretch, the extension of the covers may be limited to the desired degree.

In the manufacture of corsets and other garments it is customary to sew sections of elastic fabrics together or to other sections of non-elastic fabrics. When the elastic fabric is made of ordinary covered rubber thread, having the usual smooth outer surface, the sewing machine needle often enters the spaces between adjacent threads, or sometimes merely pierces the edges of the threads. Consequently, when the elastic fabric is stretched, many of the covered rubber threads slip between the sewing machine stitches, and then through the fabric, causing objectionable imperfections and impairing the utility and value of the garment. The sewing machine needle may also glance off the smooth or hard surface of the thread, causing the needle to break with consequent loss in production. Sometimes the needle severs the rubber core, and when this happens the edges of the core pull apart in spite of the covering threads, leaving an unsightly gap.

Elastic rubber thread is used for the purpose mentioned above because of its qualities of extension and contraction. It is covered to give added strength, prevent deterioration, and to control or regulate the stretch and contraction. The requirements of elastic fabrics are decidedly in favor of short stretch having a quick contraction to its original length after being stretched, and possession of the greatest strength with a minimum bulk. Some attempts have been made to regulate or limit the stretch of the rubber by laying an inextensible cotton stay thread alongside the rubber, or by twisting threads around the rubber in a long pitched or open spiral. In these instances, however, as the stay thread or the long pitched spiral coverings constitute only about 20% of the aggregate tensile strength of the total covering, they are readily broken and of doubtful further value.

Our improved elastic thread consists of a rubber core composed of one or more rubber strands having a plurality of cover threads which are wrapped around in superimposed spirals, one entirely outside the other. The innermost cover is preferably wound around the rubber core with a short pitched spiral. The second cover is wound over the first cover in the opposite direction, also with a short pitched spiral. One or more outer covers are then applied in open or long pitched spirals so as to compress the first two covers and cause the second cover to bulge out between the open outer spirals, giving the finished thread a very rough or corrugated gripping surface.

The roughened gripping surface of these elastic threads enables the sewing machine

needle to pierce the body of the threads, preventing the needle from breaking and preventing the threads from slipping through the fabric. Even if an occasional stitch fails to pierce the body of the thread, the rough gripping surface will cling to the surrounding portions of the fabric and prevent slipping. The several cover threads likewise cooperate to form an encasement which grips the rubber core firmly so that, even if the core is ruptured by the sewing machine needle, the several ends will only separate to a limited extent. In the preferred form of the invention the cover threads are so arranged and applied that their breaking points are reached at approximately the same time but well within the elastic limit of the rubber core.

Our improved elastic thread renders possible the economical production of thread having the desirable characteristics of the more expensive braided elastic thread, being decidedly more difficult to unravel than previous wrapped threads of this type, and retaining to a far greater degree the original encasement formed by the covers to effectually conceal and control the rubber core even when it is severed.

The invention will be described in connection with the accompanying drawing which shows one embodiment of our elastic thread on a greatly enlarged scale, with the covers partly unwrapped.

The elastic thread consists of one or more elastic rubber core threads or strands 1 on which are wound a plurality of superimposed spirally wound textile cover threads 2, 3, 4 and 5.

The innermost cover 2, consisting of one or preferably two ends of suitable textile fibres, is wound upon the rubber core in the usual manner, preferably with a short pitched close spiral so that it completely encloses the rubber core when in the normal contracted condition shown in the drawing.

The second cover 3 is similar to the first cover, but is preferably composed of three ends of textile fibres wound in the opposite direction over the first cover, also in a short pitched close spiral. The covers 2 and 3 together substantially cover and conceal the rubber core even when it is stretched to the limit of its elasticity.

The third cover 4 is preferably composed of one end of hard twisted cotton which is wound tightly over the inner covers in a long pitched open spiral running in the opposite direction to the cover 3. The fourth cover 5 is preferably composed of one end of hard twisted yarn which is wound in an opposite direction to the cover 4, also in a long pitched open spiral. When a fifth cover is applied the process is similar to the third and fourth covers.

The covers 2 and 3 serve to protect and strengthen the rubber core and also cooperate in controlling the stretch thereof. Covers 4 and 5 with their long pitched open spirals cooperate in compressing the first two covers, causing the cover 3 to protrude or bulge out between the open spirals, raising countless small bumps or corrugations all around the outer surface of the thread.

With the arrangement described above, all the threads forming the encasement about the rubber core will tighten and reach the breaking point at substantially the same time, well within the elastic limit of the rubber core, limiting the stretch of the rubber, and insuring that the breaking points of the core and all the covers are reached at approximately the same point.

It will be understood that we do not limit ourselves to any particular number of strands in the core or covers, or to the preferred arrangement of spirals which we have shown here for purposes of illustration, as it will be obvious that various changes may be made without departing from the scope and spirit of the invention as defined in the appended claims.

The invention claimed is:

1. A covered elastic thread comprising an elastic rubber core having a plurality of spirally wound superimposed covers applied thereon, one entirely outside the other, the outermost cover having a greater pitch than the inner cover and compressing same to form an extensible encasement gripping the rubber core and limiting the stretch thereof.

2. A covered elastic thread comprising an elastic rubber core having two superimposed covers wound thereon in oppositely directed short pitched close spirals, one entirely outside the other, and another cover wound upon the first two covers in a longer pitched open spiral compressing the first two covers to form an extensible encasement gripping the rubber core and limiting the stretch thereof.

3. A covered elastic thread comprising an elastic rubber core, an inner cover wound around the core in a short pitched spiral, and an outer cover wound around the inner cover in a long pitched spiral compressing the inner cover and causing it to bulge out between the convolutions of the outer cover.

4. A covered elastic thread comprising an elastic rubber core, an inner cover wound around the core in a short pitched spiral, and a pair of outer covers wound around the inner cover in oppositely directed long pitched spirals compressing the inner cover and causing it to bulge out between the convolutions of the outer covers.

5. A covered elastic thread comprising an elastic rubber core having at least two superimposed inner covers wound thereon in oppositely directed short pitched spirals completely covering the core, and at least two outer covers wound around the inner covers

in oppositely directed long pitched open spirals compressing the inner covers and causing them to bulge out between the convolutions of the outer covers to give the thread a rough outer surface.

6. A covered elastic thread comprising an elastic rubber core having an inner cover wound around it in such a short pitched close spiral as to substantially cover the core even when stretched, a second cover wound around the first cover in an oppositely directed short pitched close spiral, and a pair of outer covers wound upon the first two covers in oppositely directed long pitched open spirals compressing the first two covers and causing the second cover to bulge out between the convolutions of the outer covers, all of said covers being adapted to tighten so as to break at substantially the same point well within the elastic limit of the rubber core.

7. A covered elastic thread comprising an elastic rubber core, an inner cover composed of a plurality of ends of fibrous material wound around the core in a short pitched close spiral completely enclosing the core when in normal contracted condition, a second cover composed of a plurality of ends of fibrous material wound around the first cover in an oppositely directed short pitched close spiral cooperating with the first cover to substantially conceal the core even when stretched to the limit of its elasticity, and a pair of outer covers composed of hard twisted fibrous material wound upon the first two covers in oppositely directed long pitched open spirals compressing the first two covers and causing the second cover to bulge out between the convolutions of the outer covers, all of said covers being adapted to tighten and reach the breaking point at substantially the same time well within the elastic limit of the rubber core.

Signed at Stoughton, in the county of Norfolk and State of Massachusetts this 30 day of January A. D. 1931.

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