United States Patent

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Continuation of application Ser. No. 593,866, Nov. 14, 1966, now abandoned.

[54] **ANCHOR TAPES**
9 Claims, 2 Drawing Figs.

[52] **U.S. Cl.** **2/312,** 2/240, 128/535, 264/257
[51] **Int. Cl.** **A41f 9/02**
[50] **Field of Search** 2/240, 239, 224, 311, 312; 264/257; 128/519, 528, 535

[56] **References Cited**

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ABSTRACT: This application discloses a tape particularly adapted to be secured to extend beyond the free marginal edge of clothing and similar items to anchor them relative to the underlying surface. The tape comprises a strip of elastic fabric having stretch in at least one direction, and beads of elastomeric material physically bonded to the strip by depositing the material in fluid state upon the strip and drying and curing it in situ into a predetermined form.

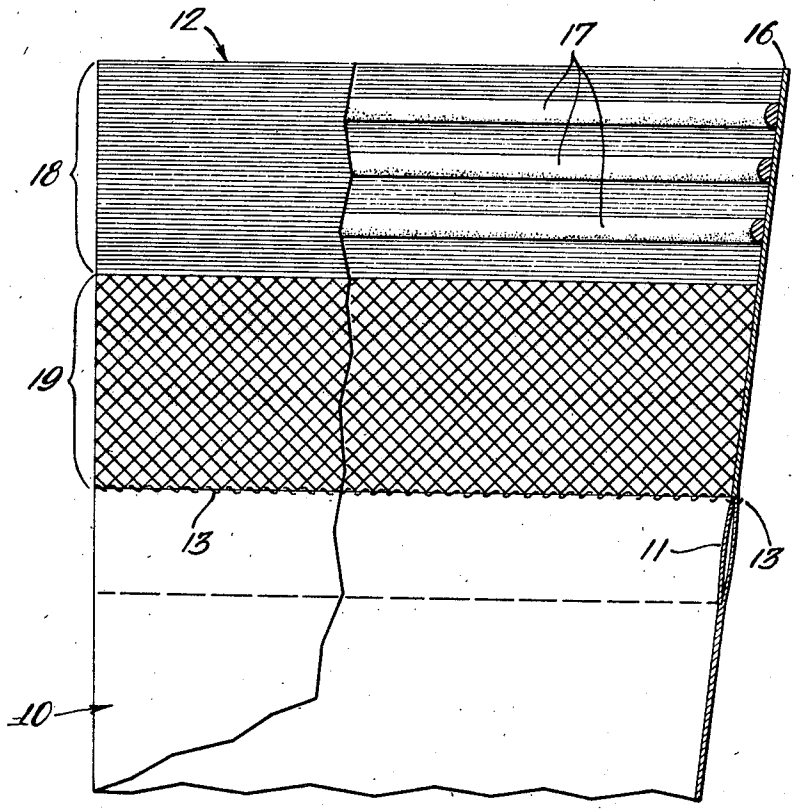


FIG. 1.

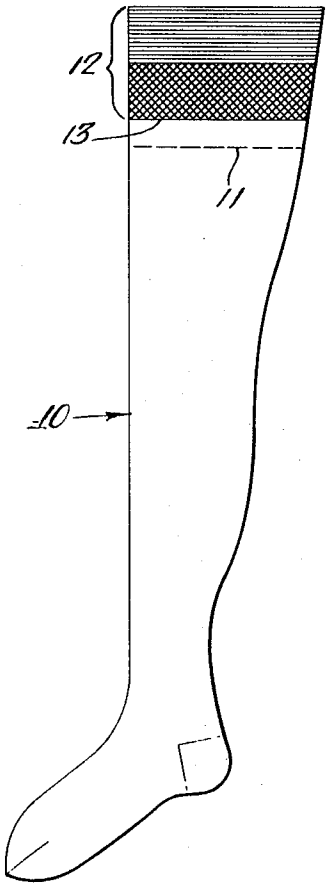
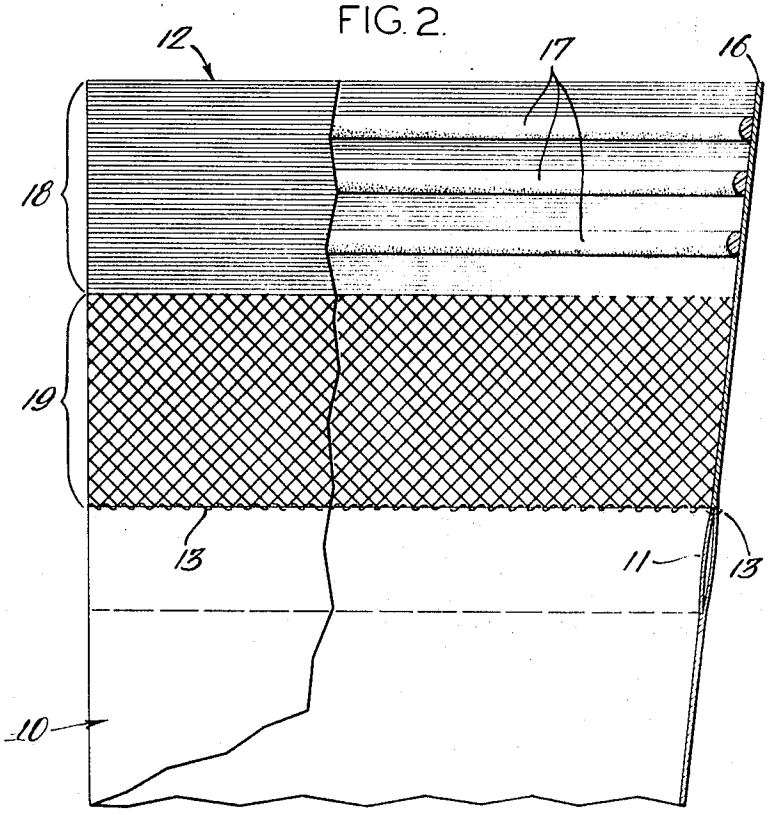


FIG. 2.



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ANCHOR TAPES

This application is a continuation of our copending application, Ser. No. 593,866, filed Nov. 14, 1966 and now abandoned.

The present invention relates to anchor tapes composed of an elastic fabric having gripping means thereon, and has particular application to anchor tapes adapted to be secured to clothing. The anchor tape of the invention is especially applicable for use as a garter top for stockings and the like.

Elastic bands have been used for many years to anchor clothing and similar items to the underlying surface by a simple constriction of the elastic strip. However, it has been found that such strips have a tendency to slip sideways on the surface, particularly when lateral forces are applied to the strip. In garter top stockings, the normal flexing of the leg exerts a downward pull on the garter and tends to allow the stocking to become loose upon the leg. Attempts have been made to overcome the slippage by incorporating gripping means in the elastic strip. One way of providing such gripping means has been to include bare rubber strands in the elastic strip which project out of the strip to engage the surface of the leg. Elastic strips have also been laminated with bands of rubber or similar material by adhesively securing the bands to the strip. Thin coatings of nonskid compositions have also been applied in localized areas of the strip. Such items have not been entirely successful in that they fail to produce sufficient gripping action to prevent slippage; they are uncomfortable when worn; or the gripping means tends to separate from the elastic strip upon repeated flexure of the elastic strip and/or repeated washing of the item.

The present invention provides an improved elastic tape comprising a strip of elastic fabric having one or more beads of elastomeric material along the length of the strip.

A primary object of the present invention is to provide an improved tape in which the elastomeric material is physically bonded to the strip and is provided with an elongation designed so as to retard separation of the material from the strip.

Another object of the present invention is to provide a novel tape in which the elastomeric material presents a smooth comfortable surface for engaging the body so as to provide a comfortable yet snug and secure engagement of the tape.

The present invention also provides a tape which has substantially improved resistance to lateral displacement when engaged upon the underlying surface.

Still another object of the present invention is to provide a tape capable of having the elastomeric material shaped into a predetermined form adapted to enhance the gripping function thereof and/or to improve the functional characteristics of the tape.

More specifically, the present invention provides a tape wherein the elastomeric material is deposited upon the fabric strip in a liquid or semiliquid form and is dried and cured in situ while the fabric is substantially relaxed so that the elastomeric material is substantially relaxed when the fabric strip is relaxed, and vice versa.

All of the objects of the invention are more fully set forth hereinafter with reference to the attached drawing wherein:

FIG. 1 is a view of a stocking embodying an anchor tape made in accordance with the present invention; and

FIG. 2 is an enlarged fragmentary view of the upper portion of the stocking showing the construction of the anchor tape embodied therein.

Referring now to the drawing, FIG. 1 illustrates an anchor tape of the present invention applied to a conventional stocking. As shown in FIG. 1, the stocking 10 having a turned welt 11 has secured thereto at the top of the welt an anchor tape 12, for example by stitching 13. As best shown in FIG. 2, the anchor tape comprises a base strip 16 having on the inside adjacent its upper end a series of beads of foamed elastomeric material 17. The strip, in the present instance, comprises an upper zone 18 of one-way stretch fabric which is capable of stretching in the longitudinal direction circumferentially of the stocking but is relatively inelastic in the transverse direction, and a lower zone 19 which is of two-way stretch fabric which is stretchable in both the transverse and the longitudinal directions. The zone 19 operates to reduce the transverse stress upon the upper zone 18 and thereby to reduce the tendency of the tape to slip down the leg when worn.

In accordance with the invention, the band 17 is secured to the upper zone 18 of the strip 16 by a physical bond to the surface of the strip without substantial penetration of the elastomeric material of the beads 17 into the body of the strip so as to permit the tape to "breathe" beneath the beads. The elastomeric material in the beads 17 is preferably a foamed material, in this instance a closed-cell foam which cures to form a substantially air-impermeable skin, for example a whipped neoprene latex composition. The strip 16 may be of various forms; in this case, it is a knitted structure utilizing fibrous-covered elastomeric core yarns.

It is desirable to insure that the elastomeric material 17 is in relaxed condition when the supporting strip 16 is relaxed so as to insure against puckering or wrinkling of either element when not subjected to stress. To this end, the elastomeric material is applied to the fabric strip in a liquid or semiliquid state and is dried and cured while the fabric is in substantially relaxed condition. In this way, the elastomer, when cured or stabilized, is in relaxed condition when the elastic strip is in relaxed condition, thereby avoiding the puckering or wrinkling of either component when not subjected to stress.

In order to be effective, the elastic material, when cured, set, or stabilized, must have stretch and recovery at least as great as the stretch and recovery as the strip so that the band 17 does not pass its elastic limit and fracture or crack when the fabric strip is extended to its elastic limit. The elastomer which composes the beads 17 must be dried and cured without degrading the elastic strip and should not dry or cure rapidly at room temperature in order to facilitate application of the elastomer to the strip. Therefore, the material preferably has drying and curing temperatures in the range between room temperature and the degradation temperature of the fabric in the strip.

In further explanation of the previous statements that the present invention provides a tape in which the elastomeric material may be shaped into a predetermined form and has improved resistance to lateral displacement relative to the underlying surface with which it may be engaged, the elastomeric material not only has sufficient density or body and firmness to substantially retain its initial predetermined self-sustaining form so that it does not collapse under gripping pressure, thus insuring effective interengagement with the underlying surface at all times, but also has sufficient surface friction which, in cooperation with the shaped form thereof, substantially eliminates relative slippage or sliding movement between the underlying surface and the elastomeric material while the latter is interengaged with such underlying surface.

In the form of tape shown in FIG. 2, the beads of elastomeric material 17 are deposited in fluid form upon the upper zone 18 of the strip 16, in the present instance by extruding, and its viscosity is controlled relative to the openness of the fabric construction to avoid penetration of the extruded material through the body of the fabric. In this way, the material is deposited on the surface of the fabric and forms a physical bond with the fibrous material at the surface of the fabric strip 16. In the present instance, the fabric is substantially relaxed while the material is extruded onto it so that when the material is subsequently dried and cured, it assumes a thickness corresponding to the thickness of the extrusion. If the fabric is stretched during application of the elastomeric material thereto, and the fabric is subsequently relaxed for drying and curing of the material, the relaxation of the fabric tends to build up the thickness of the elastomeric material thereon. The viscosity of the fluid material applied to the fabric must therefore be controlled in relationship to the openness of the fabric construction of the strip and its condition of tension when the emulsion is deposited thereon.

It is preferred to employ a foamed elastomeric material in the formation of the beads. The foamed material provides the desired density or body and firmness to retain its self-sustaining form and has sufficient surface friction. The foamed character of the material facilitates drying and curing or stabilizing without degradation of the surface thereof.

As the emulsion is dried upon the strip, it assumes a physical shape into which, upon curing, the elastomeric material returns when it is stretched and relaxed. In FIG. 2, the anchor tape comprises a fabric strip having three laterally spaced beads 17 of foamed elastomeric material deposited thereon in laterally spaced parallel relation as shown. This shape of band, which may be continuous or discontinuous, may be desired to provide the extensibility and gripping action desired for certain end uses of the anchor tape, but other forms may be desired for other end uses.

The self-sustaining predetermined form of the beads, in combination with the frictional characteristics of the elastomeric material in the laterally spaced beads 17 provides an interlock between the thigh and the band which presents a smooth, comfortable surface for engaging the body so as to provide a comfortable yet snug and secure engagement which resists lateral displacement or slippage by interlocking with the thigh, retaining the stocking at all times in proper position on the leg of the wearer.

In the present instance, the beads are relatively narrow so as to permit air passage between the beads and through the elastic fabric 16 upon which the elastomeric material is deposited enabling the tape to "breathe" over its entire area. It will be apparent that by the use of suitable molds and/or suitable extrusion beads, various shapes may be imparted to the elastomeric material applied to the elastic strip of the anchor tape.

As pointed out above, it is desirable to insure sufficient longitudinal stretch and recovery in the elastomeric band in excess of the stretch and recovery in the underlying elastic fabric strip. A typical elastic fabric may be warp knit on a 26 gage machine having a takeup to produce 76 stitches per inch when relaxed. The knitting yarns may be 100 denier nylon and the stitch connectors 30/2 ply bleached cotton with the elastic yarn being 64-cut heat-resistant compounded rubber which is rayon-covered on a conventional two-system covering machine. The fabric is preferably formed in indeterminate length and cut and sewn to form circlets of the desired diameter where desired, although it may be desired to fabricate the fabric as an integral circlet by tubular knitting either concurrently with the production of the clothing to which it is to be applied, or separately.

The elastomeric material of the band may be a whipped neoprene latex, for example of the following formulation:

	Dry	Actual
Neoprene Latex (59% duPont 601A)	100.00	185.20
Cell Lubricant (Mobilcer P)	3.00	3.00
Thickener (10% PVA solution)	2.00	20.00
Accelerator (Setsit 51 50% in H_2O)	2.00	4.00
Antioxidant (Agerite Spar Emulcon)	1.00	1.00
Curing Agent (ZnO_2 Dispersion 60%)	5.00	8.30
Ammonium Hydroxide to pH 10.5		2.0
Gelling Agent 1 (50% Dispersion of Na_2SiF_6)	0.50	1.00
Gelling Agent 2 (40% Dispersion of K_2SiF_6)	0.50	1.25
Foam Stabilizer (Aquarex ME and NS 15%)	.05	.33

The cell lubricant, thickener, accelerator, antioxidant and curing agent are added to the latex and then the latex is whipped to twice its original volume. The pH is raised to 10.5 by the addition of ammonia and then the gelling agents, premixed into the foam stabilizer, are added with rapid agitation.

The foam is applied to the fabric, dried for 10 minutes at 150°—190° and then cured for 10 minutes at 300° F. The material cures to a predetermined self-sustaining form which not only has sufficient density or body and firmness to substantially retain said form under gripping pressure, but also has sufficient surface friction which, in cooperation with the shaped form thereof, substantially eliminates relative slippage or sliding movement between the underlying surface and the elastomeric material while the latter is interengaged with such underlying surface.

Other base fabrics and elastomer compositions may be employed, depending upon the end uses to which the anchor tape is applied.

The invention has been described with particular relation to stockings but is apparent that it is equally applicable to other clothing including nether garments, body garments, body appliances, fitted bed clothing, slipcovers for furniture and the like, and other uses which require the application of a stretchable anchor tape.

While a particular embodiment of the present invention has been illustrated and described, changes and modifications may be made therein and thereto, as will be apparent to those skilled in the art.

We claim:

1. In a stretchable anchor tape comprising a strip of elastic fabric having substantial stretch and recovery in at least the longitudinal direction, said elastic fabric comprising elastomeric yarns having a core of stretchable elastomeric material and a covering of fibrous textile material upon said core, said strip being constructed with a zone of fabric extending throughout its length which is stretchable in the longitudinal direction and substantially inextensible in the transverse direction, and gripping means disposed along said strip, the improvement wherein said gripping means comprises at least one longitudinal air-impermeable bead of a foamed elastomeric material having stretch and recovery at least as great as the stretch and recovery of said strip, said material comprising a latex and a thickener formulated to produce no more than two parts of thickener per one hundred parts of dry latex, said formulation in the wet foamed state having a viscosity to avoid penetration through the body of the elastic fabric, and having both drying and curing temperatures in the range between room temperatures and the degradation temperature of said fabric, said bead being physically bonded to the fibrous material at one surface of said strip in said transversely inextensible zone by being dried and cured in situ upon said strip to provide an exposed smooth air-impermeable skin thereon, the fabric strip beneath and on either side of said being air-permeable to permit breathing of said tape, said bead being relaxed and unconstricted along its length when said strip is substantially relaxed.

2. A tape according to claim 1 wherein said tape is endless in the longitudinal direction to form a circlet adapted to encircle a portion of the body, said bead being coextensive with the circumference of said circlet.

3. A tape according to claim 1 wherein said gripping means comprises a series of laterally spaced longitudinal beads having exposed sections of air-permeable fabric therebetween.

4. A tape according to claim 2 wherein said bead of elastomeric material has a self-sustaining form projecting inwardly from the inside surface of said strip, and the strip of elastic fabric has substantial stretch in its longitudinal direction to effect firm engagement of said bead with the surface underlying said tape.

5. A tape according to claim 1 wherein said strip includes a second zone of fabric remote from said gripping means which is stretchable in both the transverse and the longitudinal directions to relieve transverse stress upon said gripping means.

6. A tape according to claim 1 wherein said foamed elastomeric material is a whipped neoprene latex.

7. A tape according to claim 1 wherein said strip is a warp-knitted fabric of covered rubber yarns, said rubber being a heat-resistant compound.

8. A method of fabricating a stretchable anchor tape comprising the steps of employing elastomeric yarns having a core of elastomeric material and a covering of fibrous textile material on said core to fabricate a strip of air-permeable elastic fabric having a predetermined stretch and recovery in at least one of the longitudinal and transverse directions, depositing in a fluid state a foamed elastomeric material in at least one bead extending longitudinally upon one surface of said strip, said material comprising a latex and a thickener in a

ratio to produce when dried and cured no greater than two parts of thickener to 100 parts of dry latex, and selecting the quantity of thickener to control the viscosity of the fluid material relative to the openness of the fabric construction of the strip and the tension condition of the strip to insure physical bonding of the elastomeric material to the fibrous material on one surface of the strip without substantially penetrating into the body of said strip to maintain air permeability of the fabric beneath and on either side of said bead, drying said material to dry said material into self-sustaining air impermeable form while the fabric strip is substantially relaxed, and thereafter curing said dried material to provide an exposed smooth air-impermeable skin thereon and an elongation and recovery therein at least as great as said predetermined stretch and recovery.

9. A method according to claim 8 wherein said depositing step consists of depositing a plurality of laterally spaced substantially longitudinal beads upon said one surface, and said controlling step correlates the viscosity of the material to the spacing between said beads to maintain the permeability of the fabric between said laterally spaced beads.