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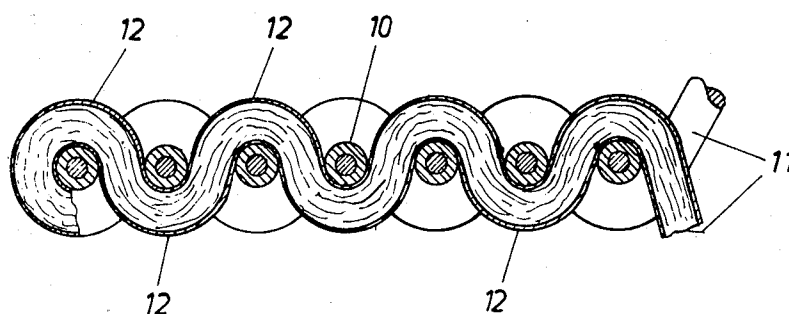
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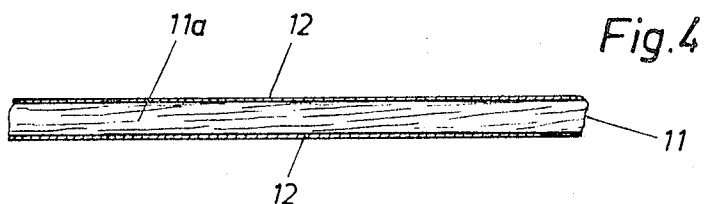
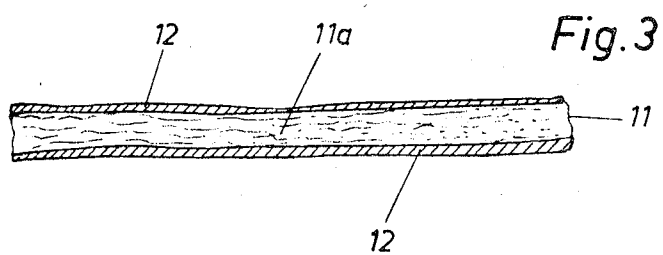
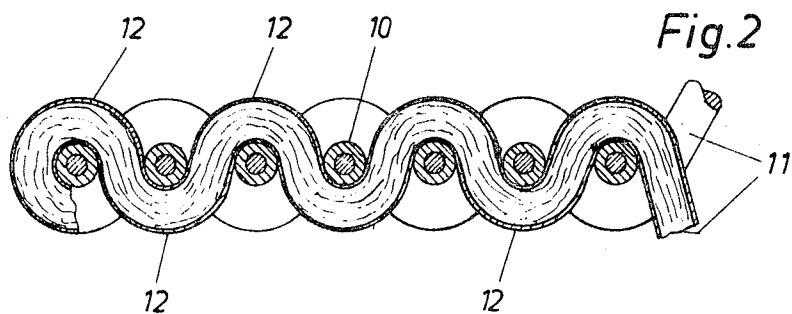
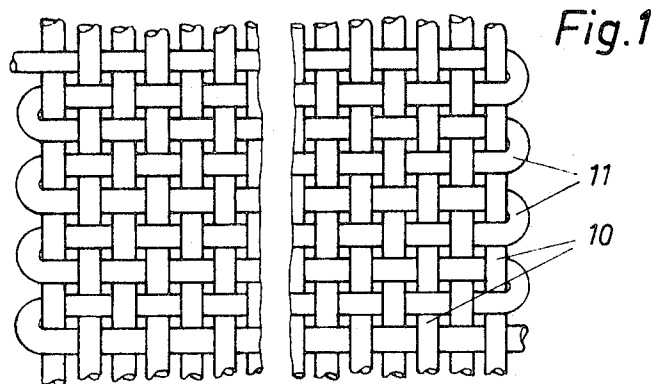
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[54] **ELASTIC WOVEN FABRIC**
1 Claim, 4 Drawing Figs.

[52] **U.S. Cl.**..... **161/77,**
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 [51] **Int. Cl.**..... **D03d 15/08,**
 D03d 17/00, F16a 1/04
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 173; 139/421, 422; 74/231, 232

ABSTRACT: An elastic-woven fabric is provided which is both longitudinally and laterally stretchable and comprises an elastically stretchable warp and a weft consisting of unprocessed cellulose threads, said elastic fabric being impregnated with a partly cured liquid latex and fully vulcanized after impregnation.





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ELASTIC WOVEN FABRIC

BACKGROUND OF THE INVENTION

This invention relates to a method of producing an elastic woven fabric of the type comprising extra wide band material, which is elastic in the lengthwise direction because it possesses a stretchable warp.

The weft in an elastic-woven band material of conventional kind consists of inelastic threads of jute or of a synthetic fiber material and the band cannot therefore be stretched in the crosswise direction.

SUMMARY OF THE INVENTION

It is the object of the present invention to provide a longitudinally elastic woven fabric, particularly an extra wide band material which also possesses some elasticity in the crosswise direction, i.e., in the direction of the weft.

To attain this object the present invention provides a method of producing an elastic woven fabric of the type including extra wide band material, which is both longitudinally and laterally stretchable, which comprises (a) weaving a fabric from an elastic warp with weft threads that crimp when they are moist; (b) impregnating the fabric with a partly cured latex and (c) fully vulcanizing the impregnated fabric at a maximum temperature of about 70° to 75° C.

This method has outstanding advantages. During their impregnation with the partly cured latex (trade name "Revul-tex"), the cellulose fiber threads absorb moisture from the latex and the individual fibers crimp. Consequently, after having undergone impregnation and vulcanization, the fabric is found to have shrunk somewhat in width (between 5 and 15 percent). However, since the crimp of the fibers is merely elastically fixed by the vulcanized latex, the weft now possesses a surprising degree of elasticity. When stretched, the crimped fibers of untreated cellulose will expand to their original length. However, as soon as the tension is relaxed they contract again to the shorter length of the crimped fibers since the crimp has been elastically fixed by the process of impregnation and vulcanization.

BRIEF DESCRIPTION OF THE DRAWING

A preferred embodiment of the invention will now be described by way of example and with reference to the accompanying drawing, in which:

FIG. 1 is a magnified top plan view of part of a woven fabric;

FIG. 2 is a fragmentary cross section through part of the warp and through one weft thread;

FIG. 3 is a magnified axial section of a weft thread showing the crimped cellulose fibers, and

FIG. 4 is an axial section of the same weft thread when under tension and the fibers are stretched.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. 1 and 2 show an elastic-woven fabric according to the invention which consists of warp threads 10 and weft threads 11. The warp threads 10 comprise cores of vulcanized rubber filaments provided with an external covering consisting of helically wound textile filaments. The weft threads 11 consist of unprocessed cellulose fibers 11a.

Although the nature of the above-described warp imparts a satisfactory degree of longitudinal stretchability to a woven

band or fabric web of such a kind, the fabric is completely inelastic in the widthwise direction because the cellulose threads cannot elastically stretch.

In order to provide the desired widthwise elasticity, the fabric consisting of warp threads 10 and weft threads 11 is conveyed through a bath of partly cured latex, the liquid being forced into the weave by rollers. Any surplus latex that may adhere to the fabric can be later squeezed off. The latex in the treated fabric is then fully vulcanized at a maximum temperature of about 70° to 75° C.

The described process of impregnation and vulcanization causes the fabric to shrink in width by an amount which varies between 5 and 15 percent, according to the thickness of the threads 11 used for the weft. This shrinkage is due to the unprocessed cellulose fibers assuming a crimp when they absorb moisture from the latex bath and the crimp being fixed by the subsequent vulcanization.

The degree of elastic transverse stretchability of a woven fabric web that has thus been impregnated with latex and then vulcanized is surprising. When subjected to tension the crimped fibers in the cellulose filaments can elongate to the full extent of their previous contraction due to the crimp.

FIG. 3 illustratively shows a weft thread 11 when not under tension, whereas FIG. 4 shows the same weft thread when longitudinally stretched.

The rubber 12 which bonds the fibers 11a of the weft thread 11 together pulls them back into the undular shape of the crimp as soon as the transverse tension is relaxed.

The present invention is particularly suitable for extra wide band material of between 40 and 80 or even 100 cms. in width. The method of production is simple and the elastic stretchability of the weft is permanent.

A particularly suitable weft consists of unprocessed cellulose fiber yarns. However, other yarns would also be suitable provided their fibers absorb moisture in a latex bath and crimp, permitting the vulcanized threads to stretch. A woven fabric of such a kind may be based on relatively coarse gauge warps and a relatively widely spaced weft (cf. FIG. 1).

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed is:

1. An elastic woven fabric of extra wide band material, comprising

- elastically stretchable warp threads comprising cores of vulcanized rubber filaments provided with an external covering of helically wound textile filaments,
- crimped weft threads consisting of untreated cellulose fibers having the characteristic of becoming crimped and shrinking in length in the presence of moisture, and
- a vulcanized latex impregnant elastically interconnecting the threads and elastically fixing the crimp in the weft threads,
- whereby said woven fabric is elastic in both the directions of the warp and weft, said latex causing the weft threads to return to the undular shape of the crimp after being subjected to tension.

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