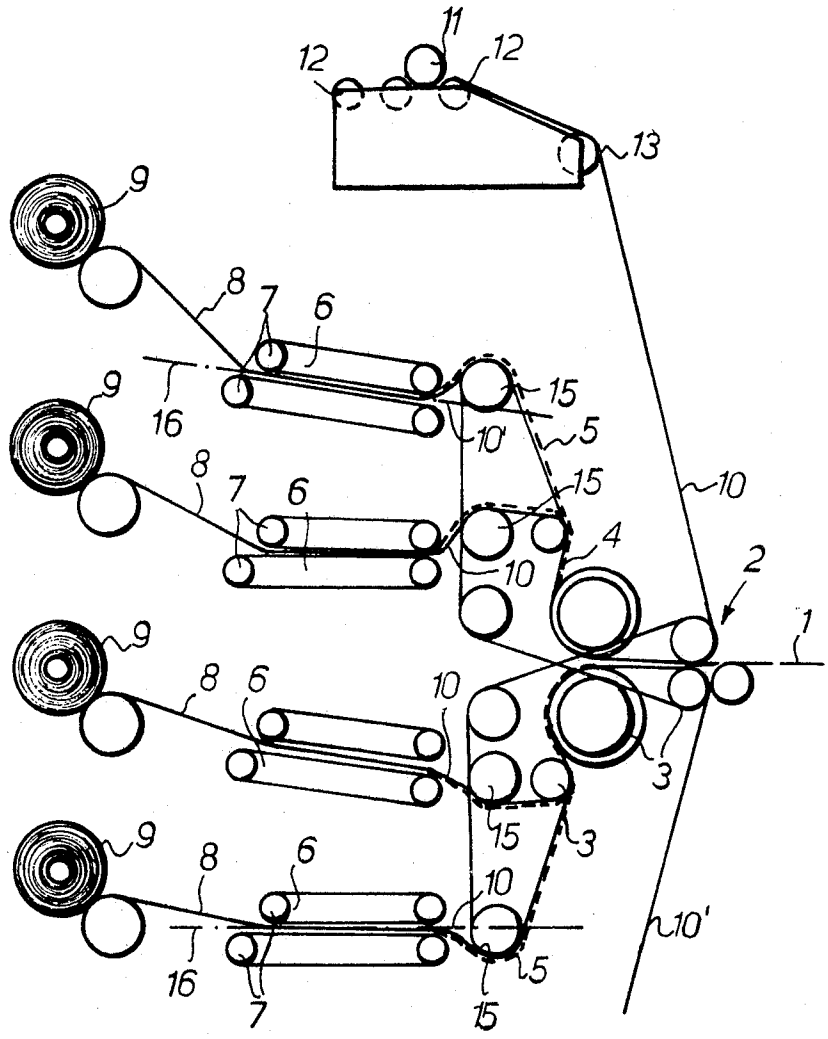
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METHOD OF MANUFACTURING CARDED YARN HAVING AN ELASTIC CORE

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FIG. 1



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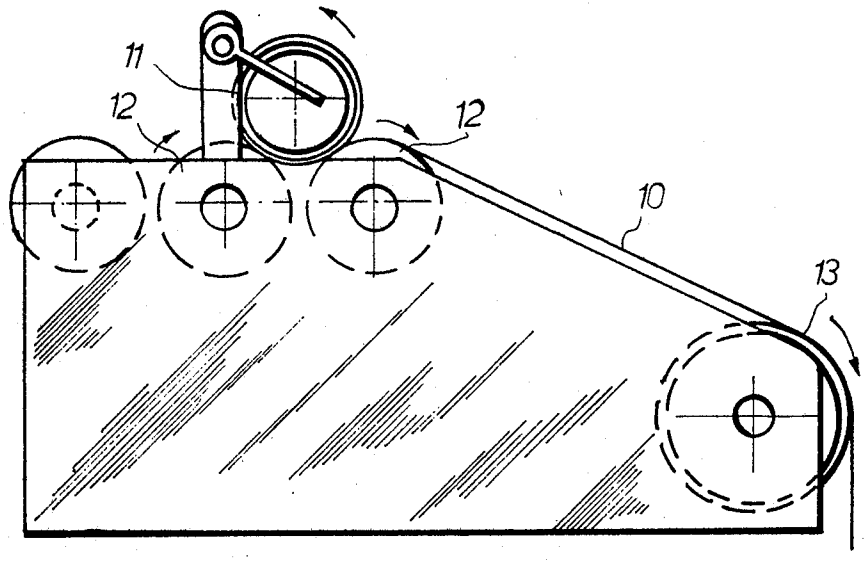
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FIG. 2



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METHOD OF MANUFACTURING CARDED YARN HAVING AN ELASTIC CORE

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ABSTRACT OF THE DISCLOSURE

The manufacture of carded yarn having an elastic core, in which the elastic core material is introduced together with the web strips into the condenser tape in a carding machine, wherein the roving is formed. The elastic core material is orientated along the center of the web strips and is stretched prior to entering the condenser tape. The web strips with the elastic core material disposed thereupon, between condenser and condenser tape, are conveyed in such a manner that the stretched elastic core has a pressure component in towards the web strips.

The present invention relates to a method of manufacturing carded yarn having an elastic core, with the yarn being manufactured in the conventional manner by means of a carding machine and spinning machine.

It has always been an aim to achieve a greater elasticity in a woven material than has been possible up to the present. The reason for this being the great strain and stretch such material is subjected to in the various fields of utilization, and in fact seams of ready-to-wear clothes often split open under this strain. An elastic, woven material is more adaptable and fits better when made into ready-to-wear clothes and similar goods.

It has not previously been possible to manufacture such material since elastic materials have never been sufficiently inexpensive. However, recent research within the artificial fibre industries has produced new synthetic fibres, the so-called elastomers, which have great elasticity. These elastomers can be extended to fine fibres in the same manner as other artificial fibres. Subsequent to the discovery of these elastomers, an intense experimentation has been carried out to find ways of utilizing them as cores in yarns so as to achieve an elastic, spun yarn which could be used in weaving the previously mentioned elastic materials.

The problem has been to dispose the elastic material in the center of the yarn so that it is covered on all sides by the textile fibres. This has been successful with worsted yarn where the so-called fibre slivers are spun together directly with the core material in a conventional spinning machine. It has proved that when the core material is subjected to a certain tension as it enters the spinning machine, the long fibres of the fibre slivers become twisted around the elastic core material.

The same method has also been tried with the carded yarn, but here one is faced with distinct problems. This is due to the fact that the roving used in the spinning of carded yarn consists of much shorter fibres than is the case with worsted. Nor are the fibres orientated in the same manner as in the worsted sliver. It has not been possible, therefore, to spin the elastic core material directly together with the roving in the spinning machine, as the short, unoriented fibres in the roving having no tendency to twist around the stretched core.

Attempts have been made to introduce the elastic core material into the actual carding machine while the roving is produced. Previously, an elastic core consisting of two or more elastic filaments has been used. This core material is disposed in a determined spaced relationship and

located approximately in the center of the web strips. During subsequent spinning, the threads in the divided core are twisted together in the same manner as with yarn having a plurality of threads. The fibres are thus pressed among the threads in the core material and retained thereby. The disadvantage of such a method is that the yarn has the appearance of a spiral brush with the fibres projecting on all sides, and the long fibres may become twisted in among the threads of the core, moreover, thus reducing the elasticity of the yarn.

A condition for spinning with an elastic core therefore must be that the core comprises a single thread only. It has, however, proved extremely difficult to place such a single thread into the center of a roving in such a way that the core is covered by textile fibres on all sides.

The object of the present invention is to facilitate the production of roving having an elastic core embedded in the center so that all sides are covered by fibre, for subsequent spinning to an elastic, carded yarn.

In order to describe the invention it is necessary to consider the manufacture of conventional, carded yarn. A thin fibre web is produced in a carding machine by means of a carding roll. This web is divided into relatively narrow strips by means of a condenser consisting of leathers disposed on either side of the web. These leathers are caused to intersect each other in such a way that the leathers located on the upper side of the web are guided downwardly and the leathers located on underside of the web are guided upwardly, so that the web located in between the leathers is cut. The web strips, which are of the same width as a condenser leather, are guided into a condenser tape where each strip is formed into a roving. From the condenser tape the roving is wound onto the roving reels which are then conveyed to the spinning machine. The roving, which consists of lightly compacted fibres, is then spun together in the spinning machine.

The object of the invention therefore, is a method of manufacturing the previously described carded yarn with an elastic core in which the elastic core material is guided together with the web strips into the condenser tape or the like in a carding machine, the roving is formed, and the elastic core material is located along the center of one or the other side of the web strips, with the core material being stretched, as is previously known. The invention is characterized in that the web strips with the elastic core material disposed thereupon are guided between the condenser and condenser tape in such a way that the stretched elastic core has a pressure component in towards the web strips. This is achieved in that the web strips and core are conveyed into the condenser tape in a manner known per se at an angle relative to a plane located between the leather hose in the condenser tape and in that the core lies closest to this plane, so that the stretched core will be pressed into the web strips against one of the hoses of the condenser tape.

The object here is to press the core thread in toward the center of the web strips while this latter enters between the hoses of the condenser tape. The web strips, which consist of short unorientated fibres, are very soft, and the stretched core compresses the material at the center so that the core becomes embedded in this area and the loose parts of the web strips located along the edges will, during treatment between the hoses of the condenser tape, be distributed around the core material and entirely enclose said core. This is achieved by introducing the web strips and the core material into the condenser tape at an angle relative to a plane located between the hoses of the condenser tape, and that the core material is constantly located closest to this plane. To achieve this, the core which is to enter the upper part of the condenser tape is conveyed on the underside of the

web while this enters the condenser, and the core material which is to enter the lower part of the condenser tape is conveyed on the upper side of the web while said web enters the condenser.

By means of this simple and inexpensive method, the previously mentioned disadvantages are overcome, and an elastic yarn is obtained having a very pleasing appearance.

The invention is further described in the following with reference to the drawing where:

FIG. 1 is a diagrammatic view showing the last part of a carding machine with condenser, condenser tape and roving reels, and wherein is constructed special means for feeding elastic core material.

FIG. 2 is a view in elevation showing a means for stretching the elastic core material.

On the drawing **1** indicates the web which arrives from the previous stage of the carding machine wherein the web is produced by the carding rolls etc. The condenser **2** consists of a series of rolls **3** which guide condenser leathers **4**. The web **1** is divided in the condenser **2**, as previously described, into relatively thin strips **5** which are introduced into a condenser tape **6** which consists of two belts disposed one above the other. Two such belts constitute together a so-called condenser tape hose and the two belts in each condenser tape hose reciprocate in axial direction of rolls **7**, and, at the same time, move at a uniform speed over the rolls in the radial direction thereof. The two belts in each condenser tape hose move in opposing directions in the axial direction and the web strips are thereby compacted or rolled into roving **8** which is then wound onto a roving reel **9**. The elastic core material which consists of very thin elastomer fibres **10**, **10'**, is introduced together with the web even prior to the condenser **2**. The elastomer fibres arrive from storage reels **11** and are fed at a determined speed by means of roll **12**. The elastomer fibres are subjected to tension by means of a stretch roll **13**, with the elastic core of the previous example being wound therearound.

One half of the elastic, stretched cores **10** are introduced to enter on the upper side of the web, prior to the web entering the condenser, and the second half **10'** of the cores are introduced with the under side of the web. The cores **10** accompany the web strips which are to enter the lower parts of the condenser tape and the cores **10'** enter the upper parts. On the upper parts of the condenser tape are located final rolls **15** for the web strips above a

plane **16** which is located between the hoses of the condenser tape. In this manner the web strips and the core enter at an angle to this plane **16** and in such a way that the core is located closest to the plane **16**. The same is the case on the lower parts of the condenser tape, except that here the rolls **15** are located on the underside of the plane **16**. Here also the core thread **10** is closest to this plane **16**.

Having described my invention, I claim:

1. Method of manufacturing carded yarn of the type having an elastic core in which an elastic core material is introduced with web strips into a condenser tape in a carding machine wherein a roving is formed and the elastic core material is orientated along the center of the web strips when such web strips enter the condenser tape and the core material is stretched prior to enter the condenser tape, the improvement comprising conveying the web strips with the elastic core material disposed thereupon between a condenser and the condenser tape in such a manner that the stretched elastic core has a pressure component in a direction towards the web strips.

2. Method according to claim **1**, including the steps of introducing the web strips and the core to the condenser tape at an angle relative to a plane located between the belts of the condenser tape, with the core being closest to such plane, so that the stretched core is pressed into the web strips against one of the belts of the condenser tape.

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U.S. Cl. X.R.

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