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BELTING FOR USE AS CONDENSER TAPES IN TEXTILE CARDING MACHINERY

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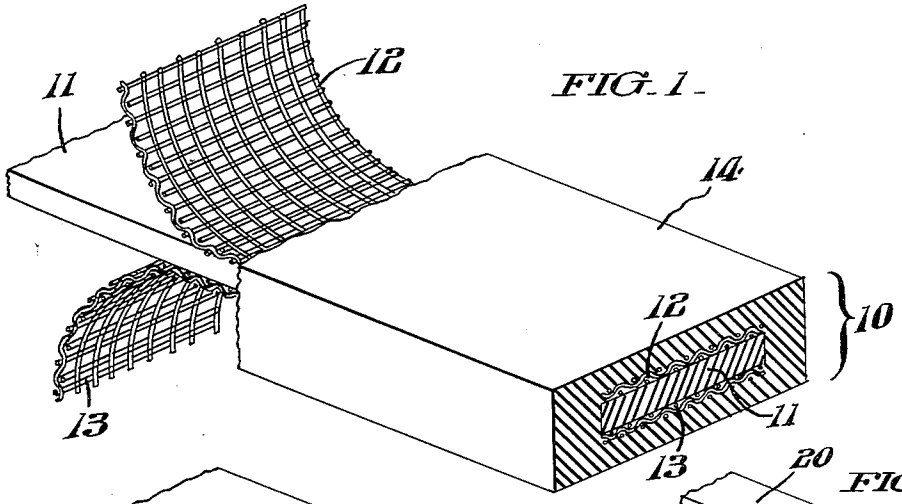


FIG. 1.

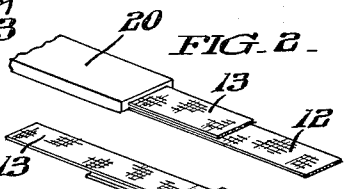


FIG. 2.

FIG. 3.

FIG. 4.

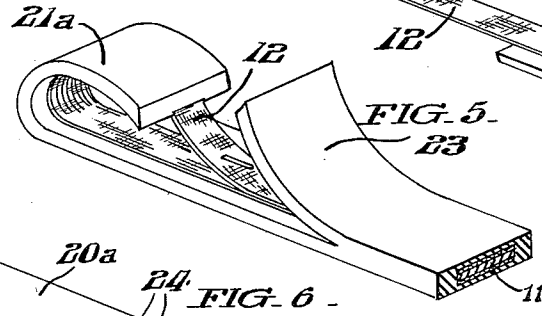
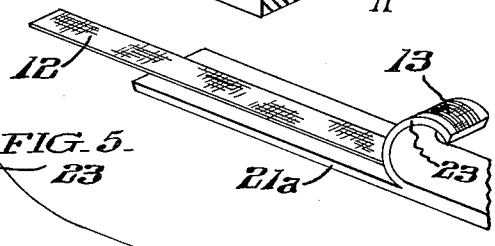


FIG. 5.



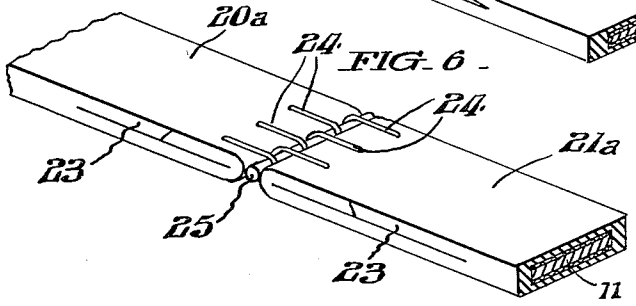


FIG. 6.

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BELTING FOR USE AS CONDENSER TAPES IN TEXTILE CARDING MACHINERY

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This invention relates to belting, and more particularly relates to continuous belting used as drive belts, conveyor belts, condenser tapes for textile carding machines and the like.

While this invention has wide applicability to belting of all types, it is particularly adaptable to condenser tapes for textile carding machinery. The purpose of condenser tapes in such machines is to divide the web of card stock into a predetermined number of individual ribbons, sometimes referred to as "slivers" or "ends," and deliver them to rub aprons where they are converted into "rope ends" or "roping." Such condenser tapes may comprise either a series of individual tapes or one single tape "threaded," in a manner well known in the art, on the machine.

In the past, condenser tapes have generally been made of either leather or rubber. In practice, use of leather tapes has not proven satisfactory since leather, being porous by nature, tends to absorb and retain dirt, oil and other foreign matter in the fibers. While rubber tapes are more impervious, they have not proven to be entirely satisfactory due to their inherent tendency to stretch, particularly when a "jam" develops, and also because of their inherent lack of body stiffness.

The chief aim of this invention is to provide a type of belting, particularly adaptable for use as condenser tape, which is impervious to foreign matter such as dirt, oil and the like carried by the stock fibers, which has a high resistance to wear and abrasion, which is flexible without being unduly stretchable and has sufficient body stiffness to resist "jamming" and break up the accumulations of stock which cause "jams."

The foregoing objective is realized in practice by the provision of belting having a core which is laminated with separate fabric strips along its periphery and entirely encased within a sheathing or body, both the core and the sheathing being formed of material having the characteristics of rubber.

Other objects and advantages of this invention will be readily apparent from the following description of a preferred embodiment thereof, reference being had to the accompanying drawings wherein:

FIG. 1 is a fragmentary sectional view in perspective of a condenser tape embodying this invention.

FIGS. 2 and 3 are fragmentary sectional views in perspective showing one method of joining the opposite ends of such condenser tape to form a continuous tape.

FIGS. 4, 5 and 6 are fragmentary sectional views in perspective showing an alternate form of joining the opposite ends of such condenser tape to form a continuous tape.

With reference first to FIG. 1 of the drawings, the numeral **10** designates a condenser tape for use in textile carding machines and the like having a core **11** of substantially rectangular cross section. Disposed along two opposite surfaces of core **11** in laminated relation thereto are separate fabric strips **12** and **13**. Fabric strips **12** and **13** preferably are of substantially the same width and length as the core surfaces to which they are laminated, and preferably are joined to core **11** by a cold press, such as friction calendering in any well known milling machine.

As shown, the core **11** with its laminated fabric strips **12** and **13** is entirely encased within a sheathing or body **14**. It is preferred that both core **11** and sheathing **14**

be formed of material having the physical characteristics of rubber. In practice, excellent results have been obtained where a synthetic rubber, such as neoprene, has been used for both the core and the sheathing. The fabric strips **12** and **13** preferably are woven of a synthetic thread or yarn, such as rayon, although a knitted fabric may readily be used, if desired. For a reason presently to be explained, it is preferred that the fabric be relatively loose in construction.

In making the tape or belting of this invention from neoprene, the core **11** is first extruded from plastic neoprene in elongated strips. While the core **11** is still in the uncured state, the separate fabric strips **12** and **13** are laminated thereon under cold pressure on the order of 200 pounds per square inch. As a result of this cold press operation, the threads of the fabric strips **12** and **13** actually penetrate the surface of the core, and thus are securely bonded thereto. Such bonding is enhanced when the fabric is of loose construction, since the threads will then penetrate the core more readily. After the lamination operation has taken place, the laminated core may be passed through a standard cross feed extrusion machine of any well known type containing a body of neoprene in a plastic condition. As the fabric laminated core passes through the machine, it is encased within a sheathing **14** of neoprene and extruded therefrom in the form shown in FIG. 1. Following extrusion, the tape is placed in a mold of a standard goose neck press and cured under heat and pressure. In practice, excellent results have been obtained when the tape is cured for a period of thirty minutes at 290° F. under pressure of 50 pounds per square inch. Following its removal from the mold, the tape is trimmed to the desired size and finished by sanding.

It is to be noted from FIG. 1 that the fabric strips **12** and **13** are disposed along those peripheral surfaces of the core which have the greatest cross sectional dimension. While it is not necessary that the entire periphery of core **11** be laminated with fabric, it is essential that the major portion thereof be fabric laminated. The essential feature of the invention contemplates separate fabric strips which overlie and underlie the core longitudinally of the tape or belt. Where a core of a different cross sectional configuration is utilized, as for example a cylindrical core, the fabric strips may be disposed so as to entirely surround the periphery thereof. While in the drawings only a single fabric strip is shown on each side of the core **11**, it is to be understood that plural separate strips may be utilized, if desired.

In practice, the belting or tape of this invention is made in elongated strips which, following sanding, are cut into segments of desired length and then formed into continuous belts or tapes by joining the cut ends in a suitable manner. In FIGS. 2 and 3 there is shown one preferred manner of joining the ends of a condenser tape segment to form a continuous tape. In these figures, **20** and **21** represent, respectively, the two ends of a tape segment. As may readily be seen, fabric strip **12** extends from tape end **20** a certain distance, preferably on the order of four inches, while fabric strip **13** extends therefrom slightly less than one-half of such distance, or approximately one and seven-eighths inches. On the other hand, fabric strip **13** extends from tape end **21** a distance (approximately 4") about twice that of fabric strip **12** (approximately 1⅞"). The fabric extensions are then overlapped in the manner shown in FIG. 3, with the longer fabric extensions in contiguous relationship, following which the overlapping fabric extensions are secured together by clips **22** or other suitable means, such as an adhesive. After the overlapping fabric extensions have been thus secured, they are encased or enveloped in a sheathing or body, indicated by the dot-dash lines in FIG. 3, composed

of the same material as the sheathing **14**. Where the sheathing **14** is composed of neoprene rubber, the lapped fabric extensions may be encased in uncured neoprene in sheet form which is then cured under heat and pressure. The juncture thus formed has an outside dimension equal to that of the sheathing **14**, and is finished by sanding.

In practice, the tape ends **20** and **21** are not formed initially with the fabric extensions. Rather, the core **11** and sheathing **14** are cut away at each of the tape ends leaving only the fabric extensions, following which one of the fabric extensions is trimmed to slightly less than half the length of the other.

In FIGS. 4, 5 and 6, is shown an alternate method of joining the ends of the tape segments to form a continuous tape. In this modification, each end **20***a* **21***a* of the tape is formed with an extension of fabric strip **12** and each end is split longitudinally in the medial plane of the belting for a given distance, preferably on the order of two to four inches, and the core material disposed between the fabric strips **12** and **13** is removed. Thereupon, one half of the top split portion of the tape ends **20***a*, **21***a* is removed, leaving a lip **23**. Next, the lower split portion of the tape is folded back upon itself with the fabric extension **12** secured under the lip **23** by suitable stapling, adhesive, or the like. The folded back portions shown in FIG. 5, for each of the tape ends **20***a* and **21***a* are then cemented to form a unitary structure as shown in FIG. 6, the ends of the folded back portions being butted together with the lips **23**. A plurality of belt hooks **24** are inserted in the ends of the unitary cemented tape segments in alternating fashion, thereby forming eyes through which a connecting rod **25** or other suitable material is passed in the well known manner shown in FIG. 6.

While a preferred embodiment of this invention in respect of condenser tapes has been described in detail herein, it will be obvious to anyone skilled in the art that this invention is widely applicable to the belting field in general, and that various modifications may be introduced in the applicability thereof without departing from the invention as hereinafter claimed.

Having thus described my invention, I claim:

1. As a new product of manufacture, belting, useful as condenser tape for carding machines, comprising a solid core strip of a material having the characteristics of rubber, single separate strips of woven textile fabric of substantially the same width as said core strip respectively overlying and underlying the core strip, and an enveloping sheathing of a material likewise having the characteristics of rubber the core strip, fabric strips and sheathing being bonded together into an integral structure by fusion of the core strip and the sheathing.

2. An endless belt formed from a length of belting characterized as in claim 1, wherein, at one end, the lower fabric strip is extended beyond the sheathing by a definite distance and the upper fabric strip is extended beyond the sheathing by substantially half said distance, wherein, at the other end, the upper and lower fabric strips are similarly extended but in reversed relation; wherein the projecting portions of the fabric strips at one end are inter-lapped with the projecting portions of the fabric strips at the other end of the sheathing; wherein the interlapped portion of said strips are secured together by staples; and wherein the overlapped extended portions of the tapes so secured are enveloped by fusing additionally applied sheathing material having the characteristics of rubber thereto.

3. An endless belt formed from a length of belting characterized as in claim 1, wherein the core strip is terminated short of opposite ends of the sheathing; wherein the portions of sheathing extending beyond opposite ends of the core strip are slit longitudinally in the medial plane of the belting and one slit portion of the sheathing is cut so as to be shorter than the other; wherein, in each instance, the longer slit portion of the sheathing is folded back upon itself and the end thereof is butt-joined to the end of the shorter slit portion; and wherein a connecting rod is passed through the eyes of groups of belt hooks alternately arranged and anchored respectively in the ends of the finished length of belting to complete the belt.

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