Belt 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 the spinning frames where they are converted into “rope ends” or “roving.” 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 cannot prove 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 proved 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 “jammimg” 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 thereon 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 machines.

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 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 of approximately 4½" about twice that of fabric strip 12 (approximately 1½""). 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 uncoated 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 20a, 21a 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 20a, 21a 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 20a and 21a 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. 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.