T. SLOPER.

ENDLESS BAND AND METHOD OF MANUFACTURING THE SAME.

APPLICATION FILED NOV. 18, 1915.

1,223,742.

Patented Apr. 24, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

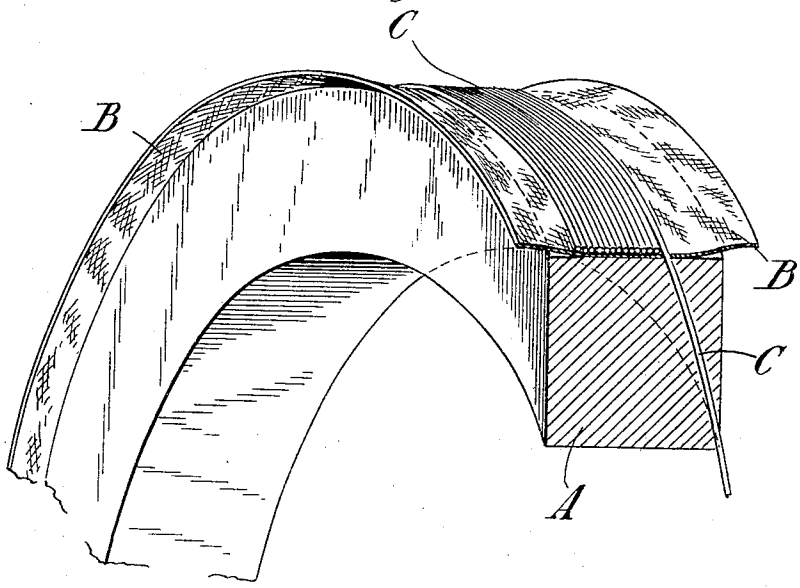
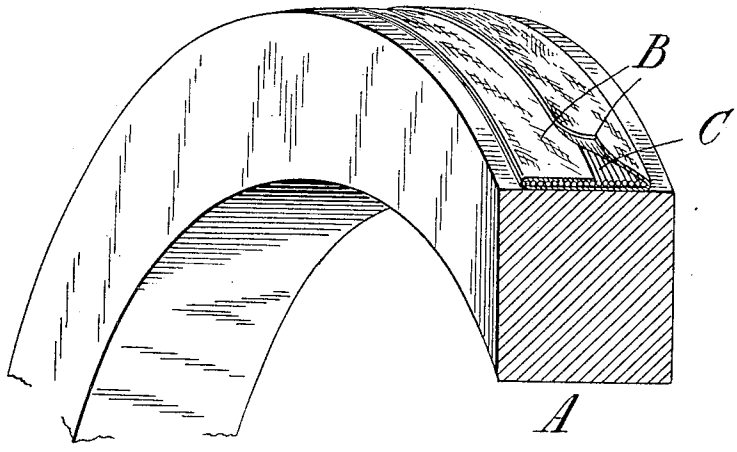


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

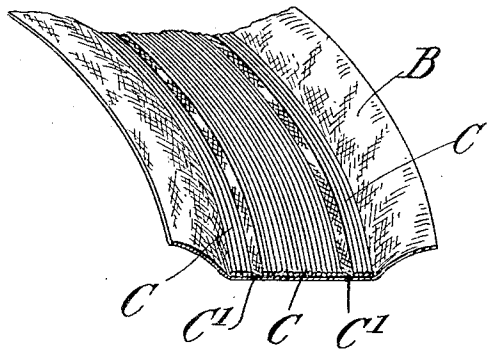


Fig. 4.

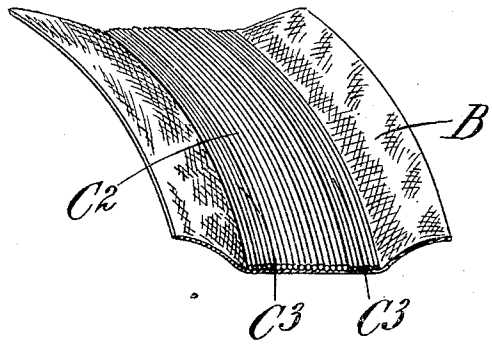


Fig. 5.

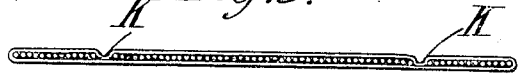
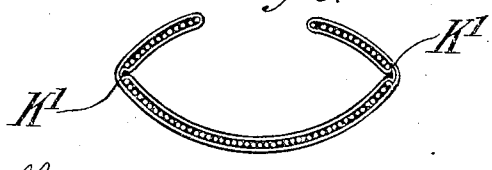


Fig. 6.



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UNITED STATES PATENT OFFICE.

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ENDLESS BAND AND METHOD OF MANUFACTURING THE SAME.

1,223,742. Specification of Letters Patent. Patented Apr. 24, 1917.

Application filed November 18, 1915. Serial No. 62,198.

To all whom it may concern:

Be it known that I, THOMAS SLOPER, a subject of the King of England, residing at Devizes, in Wiltshire, England, have invented certain new and useful Improvements in Endless Bands and Methods of Manufacturing the Same, of which the following is a specification.

This invention is for improvements in or relating to the manufacture of endless bands and has for its object to provide a method of manufacture of endless bands of a particularly light caliber, such as are suitable for use as "tapes" in cigarette manufacturing machines.

These "tapes" need to have considerable tensile strength, but must be thin and pliable, and the exterior must be free from all projections which could cause increased friction as they have to be pulled through dies at a considerable speed and any projections would soon result in the destruction of the band or "tape."

It has been proposed to build up driving-belts by winding cord helically across opposed rollers, the cord being stretched between them, and then when a band of sufficient width has been obtained in this manner, embedding the cords in rubber, with or without a covering of canvas being first placed around them, and then vulcanizing the whole together.

Further, it has been proposed to substitute for leather belts, a driving-belt built up by mounting an endless band of cloth, whose width is more than twice that of the band required, upon opposed pulleys, and then winding thereon a single helical layer of cords which are agglutinated together and to the cloth band with material other than rubber, such as gelatin, and finally folding the edges of the cloth band over the cords so that they overlap one another down the center of the band thus produced.

With neither of these processes can a band or "tape" be produced which is of sufficiently light weight and smooth surface for use in cigarette machines or other purposes where a band similar to that used in cigarette machines would be useful. It is found that in making such a light band, the threads which are to be laid upon the fabric base cannot be made to adhere properly if they are laid on this base when stretched between rollers, nor can the threads be made to adhere to one another satisfactorily if they are wound on opposed rollers without any canvas base; moreover, in this method of building up a band, placing the canvas cover around the threads afterward when the band is of such a light caliber, is difficult, and it is not desirable to bed them in rubber because this makes the band too heavy.

The method of making endless bands according to this invention consists in wrapping a strip of fine canvas around the periphery of a circular "former," winding a layer of threads in a spiral on the canvas, and applying a layer of fine canvas on the outer face of this layer of threads, for example by folding the free edges of the canvas strip which may be made wide enough for this purpose over the layer of threads, a thin coating of rubber being incorporated between the threads and those faces of the canvas which are toward the same.

The vulcanizing is preferably effected in a mold such as is described in the specification of my concurrent United States patent application No. 62,197, filed November 18, 1915, which matured Sept. 19, 1916 into Patent No. 1,198,875.

For such a band or tape it is preferred that the thickness of the canvas and threads should not exceed .01 of an inch and .04 of an inch respectively; the total thickness of the band if these extreme measurements were employed would thus be .06 of an inch.

For use in some types of cigarette-making machines, it has been found desirable to have a tape which shall be so constructed as to lend itself more readily to being folded at the edges as a whole or along a predetermined line or zone than in the general body of the tape. The folding referred to is required to take place longitudinally of the tape and for certain classes of work along two sides or lines on either side of the center line of the tape.

According to this part of the invention, the thickness of the longitudinal threads is reduced along the lines where folding is to occur, and this reduction may be infinite, the threads being entirely omitted at these parts so that only the canvas covering remains.

In the accompanying drawings:—

Figure 1 is a perspective view of part

of a "former" with a band in process of building thereon, the parts being shown in part section for the sake of clearness;

Fig. 2 is a perspective view of the same parts but showing the manufacture of the band carried farther;

Fig. 3 is a perspective view showing part of a band which is similar to the band shown in Figs. 1 and 2 but is so constructed as to crease readily longitudinally;

Fig. 4 is a perspective view of part of a band constructed according to another method whereby the edges are thinner and more flexible than the center;

Fig. 5 is a transverse section through a band made according to Fig. 3; and

Fig. 6 is a transverse section through the same band showing the curved form it takes when passing through the cigarette making machine.

The same letters indicate the same parts in all the figures.

The "former" A may be of metal and may be in the form of an endless ring. Around the periphery of this, a strip of fine canvas B is placed. This canvas is cut on the bias and is preferably not more than .01 of an inch in thickness, and if it is to be wrapped over the threads afterward laid thereon, it may be of more than twice the width of the required band. The canvas is coated with rubber on that side which faces away from the "former" prior to laying the threads thereon. The threads C are preferably rubbered, *i. e.* passed through rubber solution in their manufacture or prior to use, and are wound in the form of a close spiral and as a single layer on the central portion of the canvas strip; Fig. 1 shows this layer partially completed.

The layer of threads may then be coated with rubber solution and the edges of the canvas B wrapped over the outer face of the layer of threads, the said edges overlapping along the center of the layer, as shown in Fig. 2; this completes the building up of the band, and the whole is then vulcanized together.

It is found that by cutting the canvas B on the bias, the band is less easily distorted in use than is the case when the canvas is cut straight with its threads running parallel to and at right-angles to the threads C.

No rubber is applied to that side of the canvas which finally becomes the outside of the band, and that which is applied on the side next the threads is only a thin layer, as will be appreciated by the fact that the whole band when finished is not more than .06 of an inch in thickness and usually does not exceed .02 of an inch.

One of the functions of the tape of the cigarette machine is to carry and roll up the paper with which the cigarettes are made and it has been found desirable for some classes of work to so construct the tape that it lends itself more readily to being folded at the edges as a whole or along a predetermined line or zone than in the general body of the tape. The folding referred to is required to take place longitudinally of the tape and it is desirable that the folding shall take place along two lines or zones, one on either side of the center line of the tape.

Another feature of the present invention therefore consists in so constructing a tape of the kind described above, that it will offer less resistance to folding along its edges or along a line or zone extending longitudinally of the tape than it does in the general body of the tape. A method of obtaining the desired creasing or folding along a predetermined line is shown in Fig. 3 where gaps C^1 are left between the threads so that the sides of the tape will fold over readily along the lines of the two gaps. To form these gaps, threads are omitted. For example, the layer may be wound on first in its entirety, and those where the gaps are to be provided are removed.

Fig. 5 is a transverse section through a finished band made according to Fig. 3, the lines of creasing being indicated at K, and Fig. 6 shows the shape the band takes when passing through the cigarette making machine. Such a band is particularly useful for making cigarettes of the shape suggested by Fig. 6 and it will be seen that the band is made to bend at a sharp angle on each side at K^1 where the channels K are situated which bend would not be easily obtainable without the channels.

Another method is shown in Fig. 4 where the central threads C^2 are larger than the side threads C^3 so that the edges of the band are rendered less stiff than the central portion. Obviously the spaces C^1 could be filled with threads such as C^3 which threads would be smaller than the threads C^2 so that the band would still tend to fold along the lines C^1 though the resistance to such folding would be greater than would be the case with no threads along the parts C^1.

If the band is vulcanized after being built up, it will be appreciated that if this were done in an ordinary sectional mold, mold-lines or marks would be formed on the band at the points where the sections joined and these would cause the band to wear badly in passing through the dies. To avoid this, the mold described in my concurrent United States Patent No. 1,198,875 may be employed for vulcanizing the band. The material need not be incorporated with rubber, but may be held together by any adhesive material, rubber or rubber solution only being referred to as one convenient means for securing the parts of the band together and such a mold as is referred to in the concur-

rent United States patent application No. 1,198,875 may be used to press and dry it.

What I claim as my invention and desire to secure by Letters Patent is:—

1. The method of making endless bands of particularly smooth exterior and great flexibility suitable for folding the cigarette papers in cigarette machines consisting in wrapping a strip of canvas whose thickness does not exceed .01 of an inch around the periphery of a circular "former," winding a layer of threads whose thickness does not exceed .04 of an inch in a spiral on the canvas, and applying a layer of fine canvas on the outer face of this layer of threads, a thin coating of an adhesive being incorporated between the threads and those faces of the canvas which are toward the same, the thickness of all the materials used being such that the total thickness of the band when finished is not more than .06 of an inch.

2. The method of making endless bands consisting in wrapping a strip of fine canvas around the periphery of a circular "former," winding a layer of threads in a spiral on the canvas, and applying a layer of fine canvas on the outer face of this layer of threads by folding the free edges of the canvas strip, which may be made wide enough for this purpose, over the layer of threads, a thin coating of an adhesive being incorporated between the threads and those faces of the canvas which are toward the same.

3. The method of making endless bands consisting in wrapping a strip of fine canvas around the periphery of a circular "former," winding a layer of threads in a spiral on the canvas but reducing the thickness of the layer laid over predetermined longitudinally disposed zones along which it is desired the band shall be more flexible, and applying a layer of fine canvas on the outer face of this layer of threads, a thin coating of an adhesive being incorporated between the threads and those faces of the canvas which are toward the same, substantially as set forth.

4. The method of making endless bands consisting in wrapping a strip of fine canvas around the periphery of a circular "former," winding a layer of threads in a spiral on the canvas but reducing the thickness of the layer by omitting the threads at predetermined longitudinally disposed zones along which it is desired the band shall crease, and applying a layer of fine canvas on the outer face of this layer of threads, a thin coating of an adhesive being incorporated between the threads and those faces of the canvas which are toward the same, substantially as set forth.

5. An endless band of particularly smooth exterior and great flexibility suitable for folding the cigarette papers in cigarette machines, consisting in a strip of canvas whose thickness does not exceed .01 of an inch and whose ends are joined to make it into an endless band, a layer of threads thereon whose thickness does not exceed .04 of an inch such threads being laid in a spiral circumferentially around the endless canvas strip, and a layer of fine canvas on the threads, the whole being connected together by an adhesive incorporated between the threads and those faces of the canvas which are toward the same the thickness of all the materials used being such that the total thickness of the band when finished is not more than .06 of an inch.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS SLOPER.

Witnesses:
A. M. HAYWARD,
RONALD S. DOLLEYMORE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."