(No Model.)

R. F. M. CHASE.

BELTING FOR MACHINERY.

No. 306,131. Patented Oct. 7, 1884.

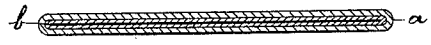


Fig. 1.

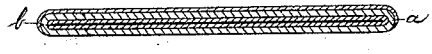


Fig. 2.

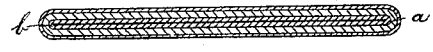


Fig. 3.

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UNITED STATES PATENT OFFICE.

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BELTING FOR MACHINERY.

SPECIFICATION forming part of Letters Patent No. 306,131, dated October 7, 1884.

Application filed April 14, 1884. (No model.)

To all whom it may concern:

Be it known that I, RICHARD F. M. CHASE, of New York, in the State of New York, have invented certain new and useful Improvements in Belting for Machinery, of which the following is a specification.

My invention has for its object the production of a belt, band, or rope of cotton or other suitable material, with a vulcanized compound of india-rubber or other suitable substance, and is made in the following manner:

I take a knit tube, either knit of cotton or other suitable fibrous material. This tube may be made in any well-known way. I prefer, however, to use the knit tubular fabric made on the machine described in Letters Patent to George Merrill, dated July 8, 1873, numbered 140,635. I place inside this tube, by any of the well-known methods of accomplishing it, india-rubber compound, for the purpose of causing the sides of the tube to adhere when pressed together. The tube is then to be pressed together, so as to make it flat, by passing it between rolls, or by any other suitable method, so that a flat belt will be produced, consisting of two layers of fibrous material, with warps running lengthwise, and a layer of india-rubber in the center. This belt may be coated on the outside with india-rubber.

I have shown in the drawings, in Figure 1, a section of belt made without coating the outside; in Fig. 2, one made with an outside coating of vulcanized india-rubber, and in Fig. 3 one with both sides coated with vulcanized india-rubber.

a is the knit fabric, and *b* is the india-rubber applied thereto, as above explained.

I am aware that an india-rubber and cotton belt has long been in use, made of a broad belt of woven fabric coated with india-rubber, the edges of which are folded toward each other, so as to meet in the center, or laid in plies the width of the belt. Various objections, however, exist to the use of this belt, especially from the fact that the seam or place of junction of the two edges is a source of weakness, and that there is more or less stretch in a woven fabric. In my belt there is no seam, and, the fabric being comparatively inelastic, it cannot stretch, by reason of the warp running lengthwise, and, differently from woven goods, the warp is perfectly straight; also, from its peculiar construction it has a uniform strain, thus giving a greater tensile strength than is possible by any other method of knitting, weaving, or braiding, and, further, it can be produced more rapidly and inexpensively. It has a still greater advantage, in that from the elasticity of the knitting-stitch there is no possibility of the outside threads cracking or breaking while running over the pulley, which is the case with all other woven belting fabric now made. This is very obvious from the fact that when the belt is stretched tightly over the pulley the strain is entirely on the outside threads. This, I am aware, is obviated in some cotton belts by stitching, and if the stitching-thread be of sufficient strength to overcome that difficulty it leaves an uneven surface, and has not the grip or frictional property of the belt herein described as my invention. Still further, all cotton belts not coated are limited in their use, and cannot be used where the damp atmosphere will affect them, and are entirely useless for outdoor purposes on account of the shrinkage being so great as in many cases to pull down shafting. This is entirely obviated in my belt by having a rubber compound or other suitable substance so rolled, forced, or pressed into the interstices of the fabric that there is no possibility of any shrinkage; also, I am aware that in English Letters Patent to Robert Wm. Waithmaun, dated December 16, 1853, numbered 2,936, to Jules Le Blanc, dated July 8, 1868, numbered 2,167, and to Charles Isidore Toussaint, dated November 19, 1873, numbered 3,753, there is described a tube having india-rubber in the center and pressed into the form of a flat belt, although I believe such belts have never been used, and I believe them to be impracticable, even if they should be made multiple, for the reasons given above, and which are applicable to all woven belts.

My invention differs from those in the employment of a knit tube made of cotton or other suitable fibrous material, and in the employment of vulcanized rubber with which to unite the sides of the tube.

The impracticable character of such belts as those described in the English Letters Pat-

ent to which I have referred results from the fact of cotton not being employed in the manufacture of the tube, together with a vulcanized compound; also, that all woven fabrics, if made of sufficient strength and thickness, will gave way on the outside, as above explained, and that in woven fabrics the warps are not straight, as is the case with the knit fabrics above described, thus permitting the fabric to stretch.

I have described a belt made of cotton, although it is obvious that a belt of other materials may be made and be useful; but experiment has shown that cotton is the best material for my use, and that some materials—as linen, for example—would be unfit for my purpose from the fact that the heat necessary to be used in the process of vulcanizing or applying the rubber would rot the fibers of the linen and make it comparatively worthless.

I prefer to prepare my warps so twisted that it is not necessary, after the manufacture of the belt, to take out the stretch, thus avoiding the cracking and breaking of many of the binding-threads, which is more or less the case in all other ways of manufacturing. It is readily seen that this would allow a far greater elasticity and freedom to the knitting, making it absolutely impossible, whatever the stretch may be, to break the outside cover, or even to strain it. The durability of the belt is therefore very much increased.

In some cases I find it an advantage to cover my warps with rubber or other vulcanized substance before or at the time of manufacturing the web, more particularly when I do not use a partly or fully covered outside covering, as by that means I have the rubber or other compound more thoroughly distributed into and through the fabric.

In making very heavy belts or bands, or in case where I wish to give additional strength, I place in the tube an extra woven or knitted material; and to give greater strength to the end of the belt for lacing or splicing, I place a wire-cloth, and where a belt or band is required to be absolutely inelastic I insert wire warps, suitably covered and suitably distributed into and through the fabric, either in forming the web, when first made, by leaving out the cotton warps and having the wire in their places, or by placing them in the additional band.

What I claim, and desire to secure by Letters Patent, is—

1. Belting for machinery made of a circular seamless knit tube or tubes, lined with a vulcanized-rubber compound or other vulcanized substance pressed or rolled together in the form of a flat belt or band, substantially as described, and for the purpose specified.

2. Belting for machinery made of a circular seamless knit tube or tubes, with a woven center, lined with a vulcanized-rubber compound or other vulcanized substance pressed or rolled together in the form of a flat belt or band, substantially as and for the purpose above described.

3. A belt or band composed of any suitable fiber knitted in circular form, having loops formed by a continuous thread, and having additional woven threads, in combination with rubber or other vulcanized substance pressed or rolled together in the form of a flat belt covered either on one side or forming a complete cover, or without covering, substantially as described.

4. A circular knitted fabric, in combination with a vulcanized-rubber compound or other vulcanized substance distributed into and through it, and cementing the fabric together in the form of a flat belt, substantially as set forth.

5. A belt, band, or rope made of a circular fabric having therein specially-prepared warps coated with rubber or other similar substance, as above described, and for the purpose specified.

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