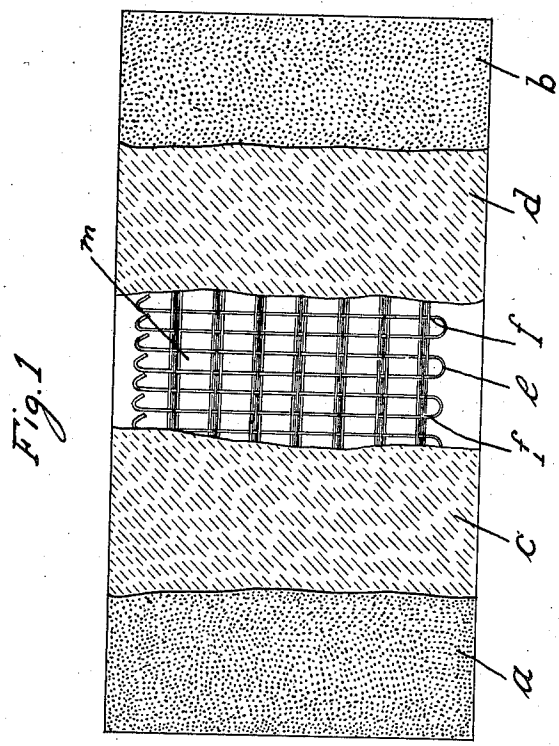
J. S. YOUNG.

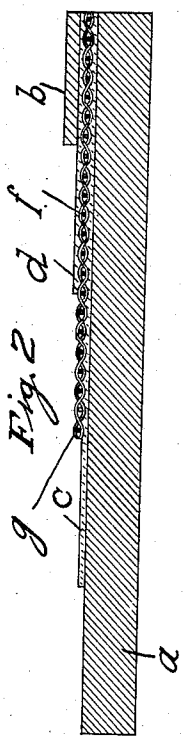
POWER TRANSMISSION BELTING.

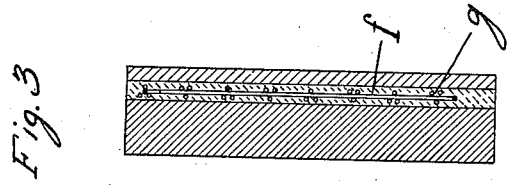
APPLICATION FILED NOV. 9, 1912.

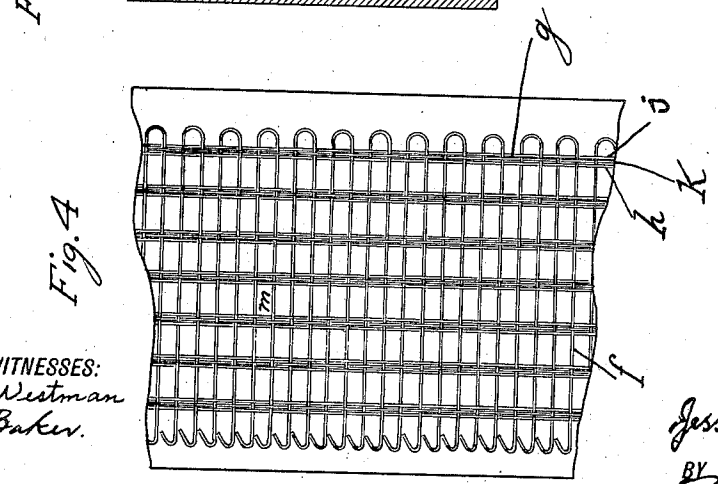
1,192,362.

Patented July 25, 1916.









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UNITED STATES PATENT OFFICE.

JESSE S. YOUNG, OF CHICAGO, ILLINOIS.

POWER-TRANSMISSION BELTING.

1,192,362. Specification of Letters Patent. Patented July 25, 1916.

Application filed November 9, 1912. Serial No. 730,504.

To all whom it may concern:

Be it known that I, JESSE S. YOUNG, a citizen of the United States, and a resident of Chicago, in the State of Illinois, have invented certain new and useful Improvements in Power-Transmission Belting, of which the following is a specification.

My invention relates in general to composite structures formed of fibrous material and more particularly to the belting commonly used for power transmission and has special reference to the provision of an improved form of belting which will not only have much less tendency to elongation in service, but will also possess much greater tensile strength per unit than other forms of belting of equivalent units known to me.

The principal objects of my present invention are the provision of an improved article of the character specified wherein I may advantageously employ a metallic reinforcement, to the end, first, that owing to the greater tensile strength of the metal the tensile strength of the belting may be increased without materially increasing the weight of the belting, and, second, that the tendency of the belting toward elongation in service, owing to the fibrous nature of the belting may be largely overcome; the provision of an improved article characterized as noted and containing a strengthening insert wherein all tendency of the insert to slip either longitudinally or laterally is overcome; the provision of belting having longitudinal inserts provided with means whereby not only is all tendency toward longitudinal movement of the insert prevented, but also a support for such inserts is provided thereby preventing any cutting thereof into the body of the belting; the provision of an improved form of multiplex belting characterized by the employment of a metallic reinforcement disposed between the plies of the belting and supported by the interlaced fibers thereof without cutting into such fibers, and to this end the provision of a belting so characterized wherein an elastic cement is used for joining the faces of the plies and thereby holding the reinforcement against displacement without danger of separation of the plies upon bending the belt; together with such other objects as may hereinafter appear.

I am aware that it has heretofore been proposed to use metal reinforcements in belting formed of fibrous material such as leather, one form of belting employing a flat ribbon which may be indented so as to form slight projections to the end that they may be embedded in the material sheets of belting the arrangement referred to proving however, inadequate for the present purposes since the indentations fail to hold the ribbons against either longitudinal or lateral displacement, and, moreover, the edges of the ribbons, owing to their lateral inflexibility, tend to cut the material of the belting, all of which features are the more pronounced when the device is used as a cross belt. Another form of such reinforcement contemplates the use of a number of single longitudinal wires with textile threads woven transversely through such wires and nominally serving to restrain them from lateral movement, such structure, however, proving inadequate in that the woof threads, owing to the cutting action thereupon of the metallic warp elements, interpose practically no resistance to the lateral movement of such warp elements, and furthermore furnish practically neither any support for such metallic elements nor any means for restraining their longitudinal movement. In fact, in view of my experience, I am convinced that instead of proving of advantage they are disadvantageous in this, that not only are they difficult to insert properly in place but that they also tend to separate the several belt plies and render the available amount of ply surface which may be cemented together of less extent than would be the case were they omitted, thus serving to weaken the belt.

In gaining the objects to which I have above referred and overcoming the objections and disadvantages suggested, I have provided the belting shown in the accompanying drawing, wherein—

Figure 1 is a plan view, partly in section, of a portion of a form of belting embodying my improvements; Figs. 2 and 3 are respectively a longitudinal elevational and a transverse sectional view of the device of Fig 1; and Fig. 4 is a detailed view of the reinforcing webbing.

Referring first to Fig. 1, it will be observed that while my present invention is applicable to belting of a number of different types, I have, as a matter of convenience,

here illustrated it as employed in connection with a form of two-ply belting wherein I utilize a relatively thick piece of hard oak tanned leather, *a*, forming its exterior, and a relatively thin piece of soft leather, *b*, the two plies respectively having applied thereto coats of cement, indicated at *c* and *d*, and I embed between the two plies of leather, after they have been covered with their respective coats of cement, my improved form of reinforcement *e*.

While the respective layers *a* and *b* of the belt may be of different forms of material as circumstances may require or render desirable, the cement employed by me is preferably elastic, being formed of the customary gelatin base and containing such other substance as may be convenient and render it tough and elastic, and remove the brittleness commonly present in most cements and generally found upon giving a multiplex belt a sharp bend when the tearing away of the plies owing to the powdering of the cement is noticeable, and readily from a crackling or crepitating sound which is audible at such times.

As may be observed upon inspection of Fig. 4 in the preferred form of reticulated structure, such as the metallic webbing employed by me, I utilize spaced woof wires *f* extending to points adjacent the edge of the belting, the warp wires being arranged in groups of strands *g*, (see Fig. 3), the several members *h*—*j* and *k* of each of the groups *g* being arranged to grip the woof wires *f* therebetween and maintain their spaced relation, the complete webbing, in preferred form, presenting a number of rectangular spaces, *m*, and the members *f* and *g* respectively serving for a material support whereby any cutting of either the layer *a* or the layer *b* is prevented. Preferably these spaces *m* should be sufficiently large not only to permit the free passage of the cement thereinto, but to permit the intimate contact of the belt layers *a* and *b* for the reason that I find in practice that when the structure as above described has been formed, and then subjected to pressure and dried, an intimate interlacing, and as it were, felting, of the fibers of the layers *a* and *b* takes place, the fibers, particularly those of the member *b*, gripping the web members *f* and *g* so firmly in position that neither longitudinal nor lateral movement thereof may take place.

By employing my improved form of reinforcement above pointed out, I find that I am not only able to utilize a fabric which may be both easily and inexpensively procured, but am also able practically to eliminate all elongation of the belting, to increase greatly its tensile strength, and thereby to add much to its length of life.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

1. An article of the character referred to comprising, in combination, a plurality of fibrous layers joined together and an unstretchable reticulated metallic reinforcement therebetween, said reinforcement having a greater number of filaments per square inch disposed transversely of the belting than are disposed longitudinally thereof, said first mentioned filaments being arranged to support said last mentioned filaments and restrain lateral movement thereof.

2. An article of the character referred to comprising, in combination, a plurality of fibrous layers cemented together and an unstretchable reticulated metallic reinforcement therebetween, said reinforcement having a greater number of filaments per square inch disposed transversely of the belting than are disposed longitudinally thereof, said first mentioned filaments being arranged to support said last mentioned filaments and restrain lateral movement thereof.

3. An article of the character referred to comprising, in combination, a plurality of fibrous layers and a reticulated metallic reinforcement interposed therebetween, one of said layers being of relatively thick and hard leather and another being of relatively thin and soft leather, and the several layers being joined together with elastic cement.

4. An article of the character referred to comprising, in combination, a relatively hard leather layer, a relatively soft leather layer, and a reticulated metallic reinforcement therebetween, the several layers being joined together.

5. An article of the character referred to comprising, in combination, a fibrous outer layer, a fibrous inner layer, and a reticulated metallic reinforcement therebetween having spaced transversely arranged woof members and longitudinally arranged warp members arranged in groups, the several layers being cemented together and the fibers of the inner layer felted into the cement and the reticulations of the reinforcement gripped by such fibers.

6. An article of the character referred to comprising, in combination, a plurality of fibrous layers joined together and a metallic webbing therebetween, said webbing having spaced transversely arranged woof members and the longitudinally arranged warp members being arranged in groups holding the woof members in predetermined relation whereby movement of the warp members relatively to the woof members is prevented and they are mutually supported and whereby cutting by either member into either of the said layers is prevented.

7. An article of the character referred to comprising, in combination, a plurality of layers joined together by cement and a

metallic webbing therebetween, one of said layers being of fibrous material, and said webbing having spaced transversely arranged woof members and the longitudinally arranged warp members being arranged in groups holding the woof members in predetermined relation and thereby forming reticulations, the several layers being cemented together and the fibers of the fibrous layer felted into the cement and the reticulations of the reinforcement gripped by such fibers.

8. An article of the character referred to comprising, in combination, a plurality of layers joined together by elastic cement and a metallic webbing therebetween, one of said layers being of fibrous material, and said webbing having spaced transversely arranged woof members and the longitudinally arranged warp members being arranged in groups holding the woof members in predetermined relation and thereby forming reticulations, the several layers being cemented together and the fibers of the fibrous layer felted into the cement and the reticulations of the reinforcement gripped by such fibers.

9. An article of the character referred to comprising in combination, a plurality of fibrous layers joined together and a reticulated metallic reinforcement having the longitudinally arranged warp members arranged in groups, the members of each group being in substantial contact with the adjacent members of the same group whereby stretching of the reinforcement is prevented.

10. An article of the character referred to comprising in combination, a plurality of fibrous layers joined together and reticulated metallic reinforcement consisting of substantially straight woof members and warp members arranged in groups, the members of each group of warp members being in substantial contact with the adjacent members.

11. An article of the character referred to comprising in combination, a layer of fibrous material, a reticulated metallic reinforcement connected thereto having substantially straight woof members and warp members arranged in groups, the members of each group of warp members being in substantial contact with the adjacent members of the same group.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

JESSE S. YOUNG.

Witnesses:
PAUL CARPENTER,
MARTHA WESTMAN.