Aug. 28, 1923. 1,466,087

G. CHRISTENSON

COMPOSITE PISTON PACKING RING AND METHOD OF MAKING SAME

Filed Jan. 11, 1921

Fig. 1.

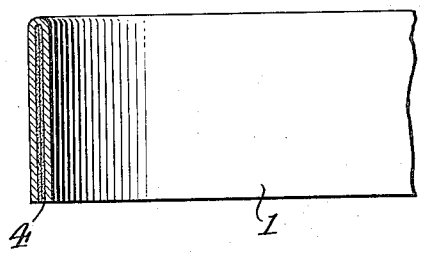


Fig. 2.

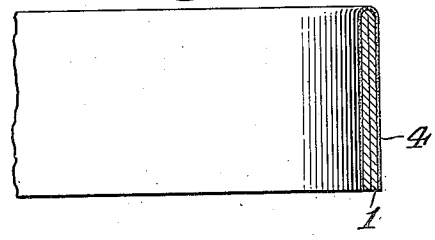


Fig. 3.

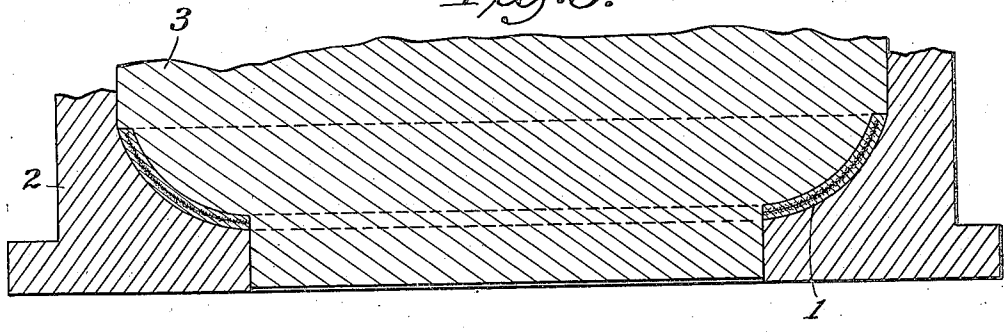


Fig. 4.

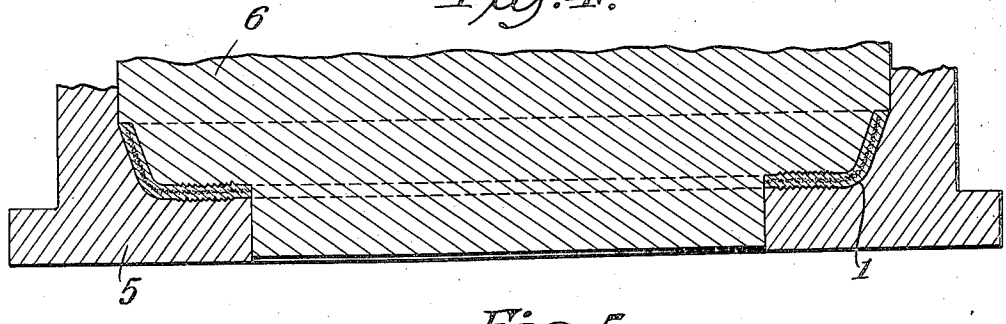
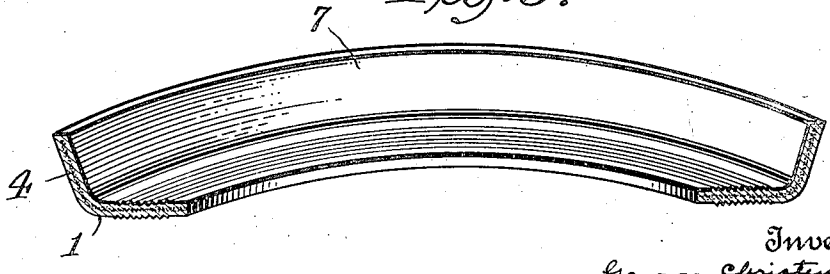


Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE CHRISTENSON, OF NORTH PLAINFIELD, NEW JERSEY, ASSIGNOR TO JOHNS-MANVILLE INCORPORATED, A CORPORATION OF NEW YORK.

COMPOSITE PISTON-PACKING RING AND METHOD OF MAKING SAME.

Application filed January 11, 1921. Serial No. 436,445.

To all whom it may concern:

Be it known that I, GEORGE CHRISTENSON, a citizen of the United States of America, residing at North Plainfield, county of Somerset, and State of New Jersey, have invented certain new and useful Improvements in Composite Piston-Packing Rings and Methods of Making Same, of which the following is a specification.

My invention relates to the formation of composite rings which are suitable for use as cup-shaped packing for pistons where great toughness and durability is required, as in the case of packing for pistons in air-brake cylinders.

According to my invention these rings are formed of a body of plastic vulcanizable material spread upon a sheet of textile fabric and the composite body so formed folded upon itself, shaped into a ring and molded and vulcanized under pressure, with the result that the textile fabric is distributed more of less through the body of the vulcanized material forming the major portion of the ring, said textile fabric serving as a strengthening skeleton therefor.

One embodiment of my invention and of the apparatus and materials for making the same, is illustrated in the accompanying sheet of drawings, in which

Fig. 1 is a cross section of one form of blank from which the completed ring may be made, part being broken away;

Fig. 2 is a similar view of a modified form of blank;

Fig. 3 is a cross section of a mold for changing the shape of the blank, parts being broken away;

Fig. 4 is a similar view of a vulcanizing mold; and

Fig. 5 is a perspective view of a segment of the completed ring.

Throughout the drawings like reference characters indicate like parts.

1 is a layer of plastic vulcanizable material, such as that set forth in my U. S. Patent No. 1332320, issued March 2nd, 1920, which is spread upon any suitable textile fabric 4. Preferably the textile fabric should be a fairly coarse, strong asbestos cloth. The composite structure so formed having been cut into strips of the proper size is folded one or more times upon itself and the abutting ends of the folded strip fastened together to form a ring of proper diameter. These strips may be folded so as to bring the fabric 4 on the inside, if only a double fold is employed, as shown in Fig. 1, or may be folded so as to bring the fabric on the outside of the ring, as shown in Fig. 2.

The ring so formed is then shaped or molded into the desired form for cup-packing or other purpose for which it is designed, and vulcanized under pressure in this shape.

Preferably in forming piston packing I first compress the blank between the curved mold 2 and cooperating former 3, as shown in Fig. 3, and then transfer the cup-shaped ring so formed to the vulcanizing die 5, in which it is compressed, and given its final form by the corresponding cooperating former 6, as shown in Fig. 4. After subjection to the proper degree of heat to vulcanize the plastic material, the ring may be removed, producing the completed packing ring 7 shown in Fig. 5.

In the completed packing ring the textile fabric is imbedded and more or less disseminated by the action of the plastic material which has been forced between the threads of the fabric by the great pressure of the molds, and the textile fabric thereby becomes a supporting skeleton for the completed ring, which adds greatly to its toughness and tensile strength and its resistance to wear.

This fabric arranged as a skeleton in the ring is indicated at 4 in Figs. 3, 4 and 5, the arrangement being that which would be produced by operating on the form of blank shown in Fig. 1. Of course if the blank shown in Fig. 2 were employed, the two sections of the skeleton fabric would be somewhat more separated and located nearer the external surfaces of the completed packing ring.

Of course more than two folds of the original fabric might be employed in making the rings, if desired, and other means of molding or shaping the same might be employed.

I claim:

1. The method of forming a composite ring suitable for use as a cup-shaped piston packing or the like, which comprises the following steps: first, applying to a sheet of woven fabric a layer of plastic material capable of being vulcanized of a greater thickness than that of the fabric; second, folding the composite fabric so formed upon

itself and arranging such folded fabric in an annular form; third, molding said ring into the desired shape and vulcanizing the plastic material, whereby the textile material becomes imbedded in the vulcanized mass and forms a skeleton support therefor in a relatively thick completed ring.

2. A product of the herein described process, being a composite ring suitable for use as a cup-shaped piston-packing or the like, composed of a relatively thick mass of vulcanized material having a folded sheet of relatively thin textile fabric imbedded therein.

GEORGE CHRISTENSON.

Witnesses:
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WM. N. ALLMAN.

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