W. H. SAYRE.

ROTARY WEAR RESISTING STRUCTURE.

APPLICATION FILED JAN. 13, 1919.

1,330,988.

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Fig. 1.

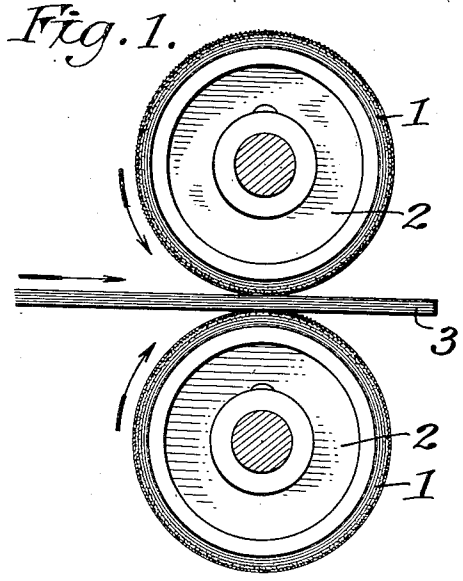


Fig. 2.

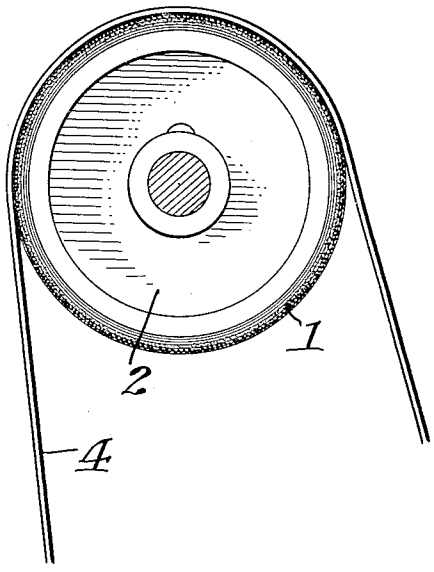


Fig. 3.

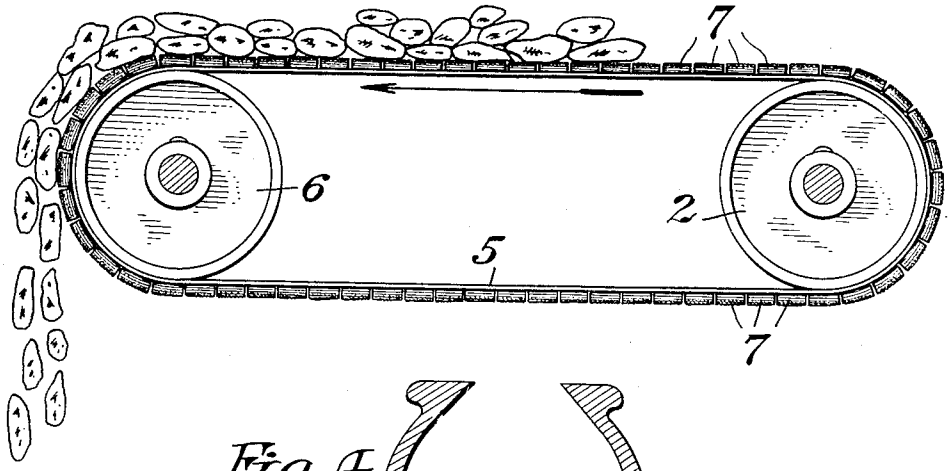
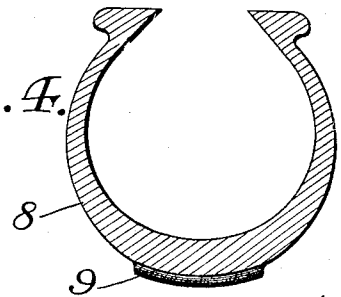


Fig. 4.



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UNITED STATES PATENT OFFICE.

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ROTARY WEAR-RESISTING STRUCTURE.

1,330,988. Specification of Letters Patent. Patented Feb. 17, 1920.

Application filed January 13, 1919. Serial No. 270,985.

To all whom it may concern:

Be it known that I, WILLIAM H. SAYRE, a citizen of the United States of America, residing at Glen Ridge, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Rotary Wear-Resisting Structures, of which the following is a specification.

My invention relates to the provision of wear resisting surfaces for rotary elements of mechanism such as pulleys, feed rolls, conveyer belts, traction wheels, etc., which surface shall have to a limited degree in addition to its wear resisting qualities, the features of resiliency and flexibility which are desirable in many cases. The best forms or embodiment of several typical phases of my invention are illustrated in the accompanying sheet of drawings in which,

Figure 1 is a side view of a pair of feed rolls equipped with my invention, the shafting or journals being shown in cross section.

Fig. 2 is a similar view of a pulley and belt, parts being broken away.

Fig. 3 is a similar view of a conveyer belt, and

Fig. 4 is a cross section of the casing of a pneumatic tire for vehicles having my invention applied as a tread.

Throughout the drawings like reference characters indicate like parts. In Fig. 1 is shown a pair of feed rolls. 2, is a roll or pulley in each case, which may be made of metal or wood or other material. 3, is a plate or bar being fed forward by the rolls 2, 2. In Fig. 2 is shown a belt 4, running over pulley 2. In both these figures of drawing 1, is a surfacing composition comprising a quantity of granulated or finely divided mineral of great hardness, such as alundum, set in and on a matrix which adheres to the face of the pulley or roll. Preferably this matrix includes vulcanized rubber, the fine or soft rubber and sulfur of which has been intimately mixed with alundum, and the whole trued up before or during vulcanization of the mass, which vulcanization is preferably performed *in situ*. As indicated in the drawings the larger proportion of the alundum is located at or near the outer surface of the layer 1, where its wear resisting qualities are needed, and the greater proportion of the rubber is localized at and near the inner surface where its adhesive qualities are needed for forming a secure union with the pulley or roll proper. This arrangement may be secured in several different ways. The method usually followed is to first lay in the mold a thin layer of pure rubber, then superpose on this one or more layers of rubber ground up and mixed with different percentages of alundum particles, and finally to place a layer of pure alundum particles on top. By pressure these layers are solidified into a homogeneous mass in which the percentage of alundum per unit of volume of the mass increases gradually from bottom to top. This mass is then vulcanized. Pulleys equipped with my invention would be especially useful in car lighting equipment where the electric generators are mounted under the car body and driven from the car axle by belts and pulleys.

In Fig. 3, the conveyer belt 5, running over pulleys 2 and 6, is provided on its working face with strips or panels 7, of the above described character. This division into separate strips or panels enables the belt to run around the pulleys without pulling the outer more brittle wearing surface apart as might happen otherwise if the facing of alundum and vulcanized rubber were continuous, on account of the greater length of the semi-circle through which the outer surface of any very thick belt so formed travels.

In Fig. 4, there is shown at 8, a cross section of the usual canvas and rubber shoe for an automobile tire to the outer surface of which has been vulcanized a layer 9, of the alundum and vulcanized rubber composition to serve as a tread therefor. Here, again, the layer 9, could be vulcanized *in situ*, or initially manufactured by vulcanization separately on a proper former, and then attached to the shoe by further vulcanization or by any other suitable method.

My invention could be similarly applied to elastic tires of other than the pneumatic type.

Having described my invention, I claim:

1. As a new article of manufacture a wear resisting machine element adapted for rotation comprising a supporting structure to the outer surface of which is attached a relatively thin layer of very hard granulated mineral set in a matrix of rubber vulcanized to the supporting structure, the greater proportion of the mineral particles being local-

ized at and near the outer surface and the greater proportion of the rubber being localized at and near the inner surface of the composite layer.

2. As a new article of manufacture a wear resisting machine element adapted for rotation comprising a supporting structure to the outer surface of which is attached a relatively thin layer of very hard granulated mineral set in a matrix of tough, resilient material capable of adhesion to the supporting structure, the said layer being separated into a plurality of comparatively narrow, closely adjacent panels by intervening narrow grooves parallel to the axis of rotation of the structure.

WILLIAM H. SAYRE.

Witnesses:
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ELEANOR C. SEAMAN.