R. N. CHURCH.

CONCENTRATOR BELT.

APPLICATION FILED OCT. 8, 1913.

1,100,654.

Patented June 16, 1914.

Fig. 1.

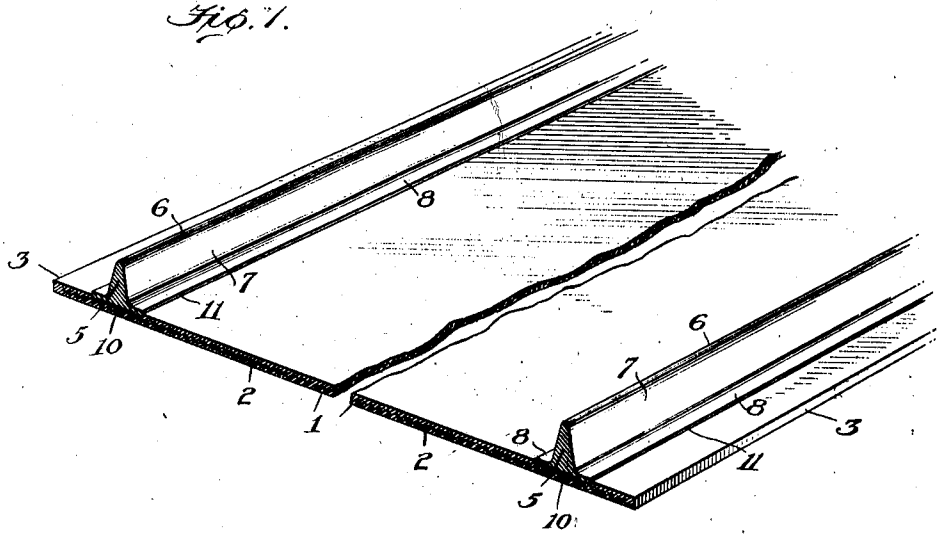


Fig. 2.

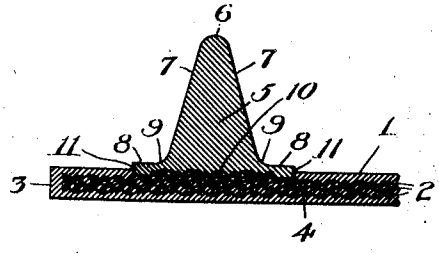
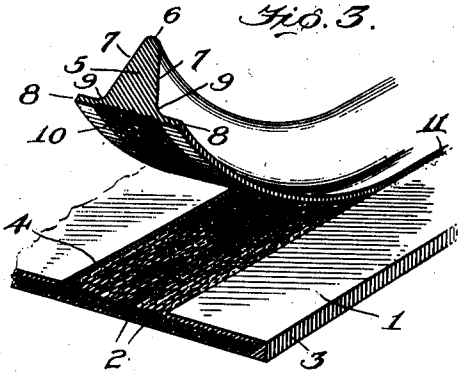


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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CONCENTRATOR-BELT.

1,100,654. Specification of Letters Patent. Patented June 16, 1914.

Application filed October 8, 1913. Serial No. 794,077.

To all whom it may concern:

Be it known that I, RICHARD N. CHURCH, a citizen of the United States, residing at Spokane, in the county of Spokane and State of Washington, have invented certain new and useful Improvements in Concentrator-Belts; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to belts, but more particularly to such as are provided with raised side flanges arranged and designed for use in connection with ore concentrators of the class known as wet concentrators.

As is well understood by persons skilled in the art, ore concentrating machines of the class mentioned employ an endless belt or apron, which is steadily driven over spaced rollers in a direction the reverse of that taken by the flow of water constantly being supplied to the surface between its upstanding marginal flanges. Pulverized ore is also delivered upon the surface of such belts or aprons where it is formed into "pulp" by mixing with the water. This pulp is confined between the side flanges aforesaid, and is constantly agitated, in the better class of concentrating machines, by a rapid vibratory movement imparted to the belt or apron laterally in addition to its continuous longitudinal movement. As a consequence of such treatment the heavy particles of ore containing the valuable constituents naturally gravitate to the surface of the concentrator belt and are carried away by it, while the lighter and worthless particles are carried off in the opposite direction by the flowing water. The upstanding flanges therefore, commonly formed upon opposite sides or edges of concentrator belts are for the purpose of confining the pulp during the movement of the belt both longitudinally and laterally. They are ordinarily molded with the body of the belt and form an integral part thereof, although there are instances where such flanges have been subsequently attached to the belt body, and others where they have been made detachable. All forms of concentrator belts however, are subject to the serious disadvantage of passing over end rollers of comparatively small diameter, which must of necessity place their upstanding side flanges, whether formed integral with the belt-body, subsequently applied thereto, or of detachable construction, under a serious radial flexing strain particularly at their extreme outer edges. For this reason the flanges of concentrator belts are generally recognized as their weak point, and various expedients have been resorted to in the hope of preventing them from checking, cracking and finally breaking down under the continued strain, because when this occurs the entire belt is, temporarily at least, rendered useless, thus entailing serious delays, and great expense when repairs are possible, and indeed a total loss of the entire expensive belt when repairs are not possible.

One object of my present invention is, therefore, to overcome these difficulties.

Another object is that of remedying them in an expeditious and economical manner without removal of the belt; and other objects and advantages will hereinafter become apparent to persons skilled in the art to which my invention relates.

The invention will be hereinafter particularly described and pointed out in the claims following.

In the accompanying drawings whereon corresponding numerals refer to like parts in the several views: Figure 1, represents a fragmentary view of a concentrator belt in perspective embodying my invention, this figure being broken away through its longitudinal center; Fig. 2, is also a fragmentary view showing a transverse section through one belt flange, and Fig. 3, is a sectional perspective view showing one belt flange partially removed.

Reference being had to the drawings and numerals thereon, 1 indicates the body of an endless concentrator belt, by preference made of laminated strips of rubber and reinforcing fabric such as duck 2, embedded in the rubber; and of suitable dimensions as to length, breadth and thickness. Adjacent to each side or edge 3 of body 1 are surface depressions or channels 4, 4, in parallel arrangement, extending through the surface of the belt-body to the outermost layer of fabric 2 as best shown by Fig. 3; and within these channels are located corresponding

belt-flanges 5, 5. The flanges 5 are made of pure rubber and are therefore stretchable and elastic. They are each continuous in form and are provided with a comparatively narrow elastic outermost apex or edge 6, from which they diverge inwardly toward body 1 as at 7. They also are provided with a relatively enlarged horizontal base 8 filleted as at 9, and reinforced upon its under surface by an exposed layer of fabric 10.

In the course of construction continuous flanges 5, formed substantially as above described, are introduced into their respective channels 4 of the belt-body 1 before vulcanization, and when so introduced, as will be seen by Fig. 2 of the drawings, the basal flanges 8 of each side flange 5 are only partially embedded, leaving a distinct offset 11 upon each side at the intersection of said base 8 and the belt-body 1 for purposes which will later appear. The belt-body 1 and flanges 5, 5, having been assembled substantially as stated, the entire structure is thereupon vulcanized in the ordinary and well understood manner. This being substantially the construction and arrangement of my improved belt its use and operation are that of ordinary concentrator belts, and therefore need not be herein particularly set forth. It should be noted, however, that in passing over the end rollers common to concentrator machines of the class hereinbefore mentioned, the flanges 5, owing to their high degree of elasticity, comparatively narrow flexible apex 6, and flat horizontal partially embedded base 8, are adapted to pass over and around the said belt rollers most advantageously. In the event of breakage or injury to said flanges 5, however, as the result of long continuous use, their repair is rendered a matter of small moment by the structural arrangement and relation of parts constituting the present invention. For obviously, should injury to either flange 5 occur the injured portion may be instantly removed by first severing same transversely with a knife blade upon opposite sides of the defective portion, and then cutting longitudinally through the surface of the belt-body 1 with the point of a knife, upon each edge of base 8 to a depth equaling that of channel 4. These longitudinal incisions consequently penetrate to the outermost layer of reinforcing fabric 2, as shown by Fig. 2, the knife blade being guided, and the operation materially facilitated, by offset 11 along which the longitudinal incisions are made. This accomplished the portion of flange 5 to be removed is folded back as shown by Fig. 3, and a new unbroken section substituted in place thereof. The operation of removal as aforesaid is facilitated by the fact that throughout the major portion of the width of flanges 5 the actual contact is formed between fabric 2 of the belt-body 1, and fabric 10 of the said flanges. This not only facilitates the removal of flange sections after they have been released by cutting as aforesaid, but insures quicker and better adhesion of the substituted sections when applied by the agency of rubber or other cement.

This being a description of my invention in its preferred form of embodiment it will be noted that I do not consider myself restricted to the precise arrangement and relation of parts herein shown and described, as these may be variously altered and modified without departing from the spirit of my invention as set forth by the following claims.

What I now claim therefor and desire to secure by Letters Patent is:—

1. An ore-concentrator belt having a channel in its upper surface, and an upstanding flange having one or more basal flanges partially embedded in said channel.

2. In an ore-concentrator belt, the combination with a belt body provided with marginal channels in its outer surface, and a flexible side flange having one or more basal flanges partially embedded in each of said channels.

3. In an ore-concentrator belt, the combination with a belt body having parallel channels provided in its outer surface, and parallel flexible side flanges having one or more basal flanges partially embedded in said channels.

4. In an ore-concentrator belt the combination with a belt body having a channel in its upper surface, of an upstanding side flange having a base partially embedded in said channel and projecting slightly above same.

5. In an ore-concentrator belt, the combination with a belt body having a marginal channel provided in its outer surface, of a flexible side flange having a fabric covered base partially embedded in said channel.

6. In an ore concentrator belt, the combination with a belt body of substantially uniform thickness except for marginal channels in its outer surface, of a fabric lining for the bottom of said channels, and flexible side flanges each having a fabric covered base partially embedded in its respective channel.

7. In an ore-concentrator belt, the combination with a belt body having marginal channels in its outer surface, of a fabric lining for the bottom of said channels, and flexible side flanges each having a fabric covered base partially embedded in its respective channel.

8. In an ore-concentrator belt, the combination with a belt body having marginal channels provided in its outer surface, a relatively porous fabric lining crossing the

bottom of said channels, and flexible side flanges each having a base partially embedded in its respective channel and an underlying strip of fabric directly contacting with the fabric lining aforesaid.

9. In an ore-concentrator belt, the combination with a belt body having marginal channels provided in its outer surface, and parallel flexible side flanges each having relatively enlarged lateral base extensions partially embedded in its respective channel.

In testimony whereof I affix my signature, in presence of two subscribing witnesses.

RICHARD N. CHURCH.

Witnesses:
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L. MCLAUGHLIN.