

(No Model.)

G. GATES.
CONCENTRATING BELT.

No. 495,795.

Patented Apr. 18, 1893.

Fig. 1.

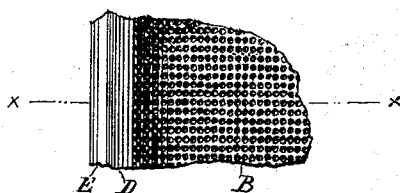


Fig. 3.

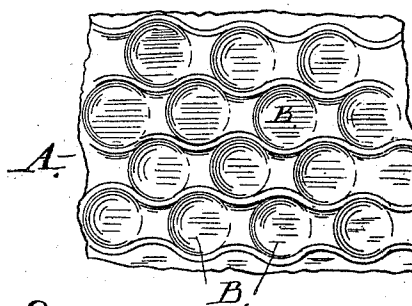
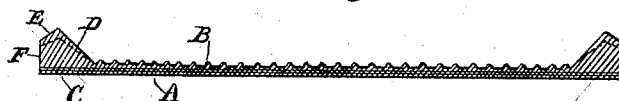


Fig. 2.



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UNITED STATES PATENT OFFICE.

GEORGE GATES, OF JACKSON, CALIFORNIA.

CONCENTRATING-BELT.

SPECIFICATION forming part of Letters Patent No. 495,795, dated April 18, 1893.

Application filed January 19, 1892. Serial No. 418,593. (No model.)

To all whom it may concern:

Be it known that I, GEORGE GATES, a citizen of the United States, residing at Jackson, Amador county, State of California, have invented an Improvement in Concentrating-Belts; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improved concentrating belt which is especially applicable for the concentration and saving of fine sulphurets, and heavy valuable metals from pulverized ores.

It consists in certain details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a view showing a portion of the surface of my improved belt. Fig. 2 is a transverse section. Fig. 3 is a detail showing on an enlarged scale a portion of the belt with its pitted surface.

The object of concentrating belts is to provide a surface over which the pulp is allowed to flow, and upon which the heavier and more valuable portions will settle and be detained during this flow. The belt is usually mounted upon rollers at a slight inclination and is caused to travel up the incline toward the source of supply, so that the arrested particles are carried over the roller at the upper end and are then washed off from the lower side of the belt, thus making the operation continuous.

The belt is usually agitated in various ways to give it a shaking motion for the purpose of adding to its effectiveness, these features being common to all concentrating belts. These belts are made of various materials; canvas and rough burlaps have been largely used, also rubber belts with various forms of corrugation and pockets into which the concentrates are intended to settle and be retained. The objection to canvas is that the constant action of the water soon renders it slippery and slimy, and causes it to swell so that the surface does not hold the concentrates and much is lost, in addition to which the material soon becomes destroyed, and must be replaced.

In the various forms of rubber belts, the

pockets or corrugations are made so deep that with the comparatively small quantity of sulphurets contained in any given stream of pulp, there will not be enough of the sulphurets to fill these corrugations, and consequently a considerable quantity of valueless sand will be retained and the separation of the sulphurets and sand will not be as perfect as is desirable.

In my invention I employ a rubber belt A which is formed with a closely pitted upper surface B over which the material will pass. Upon an enlarged scale this surface is substantially like what is shown in Fig. 3 where the pitted portions *a* are practically in series and have connecting necks *b*, and flanges *c* which are produced by reason of the alternate arrangement of the pits and the depressed or pitted condition of the surface of the belt. This arrangement produces practically a series of fine channels through which the pulp passes.

The belt which is made of rubber and cloth put together in the usual manner of manufacturing belts, is prepared, and while the rubber is in its plastic condition I take any surface which will produce a desired closely pitted surface upon the belt, which may be sand paper or any other suitable or desirable material. This surface is laid upon the upper surface of the rubber and the two are then passed between rollers so that the applied surface will be pressed into and indented upon the rubber; the belt is then vulcanized or treated in the usual manner, and the surface is completed.

In order to prevent the material from discharging over the edges of the belt during its travel from the upper to the lower end, it is customary to apply raised flanges upon each side of the belt. These are made triangular and in various other forms, and it will be manifest that when the belt passes around the rollers at the upper and lower end, the upper edges of these flanges being at a greater distance from the center of the roller than the surface of the belt, will be stretched and distorted while passing around the rollers. The common defect is that these flanges are turned outwardly as they pass around the rollers, and the constant stretching and restoring to

the proper position when a straight surface is reached, cracks and breaks the edges and ruins the flanges.

In my belt I have shown an improved form of flange which in cross section presents an irregular four-sided polygon, the base C of which rests upon the edge of the belt, an inclined side D extends upwardly from the inner edge forming an acute angle at this point, a short incline E extends down upon the outer side from the apex, while the outer edge F of the flange stands at right angles with the belt, as plainly shown in the section Fig. 2. By reason of this construction it will be seen that on passing around the pulleys, the apex or thinner portion of the belt, between the two inclined surfaces, which is subjected to the greatest tension, will not only stretch freely without much lessening the height, or changing the form of the flange, but will act, as it were, as a compressing band for the thickened portion of the flange beneath, and aid to lessen the strain upon the same. Experience has also shown that this form of flange will not crack or break with long and continued use.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An improved concentrator belt formed of rubber having its upper surface pitted to form elevations and depressions arranged in series to form independent channels for the material, substantially as herein described.

2. A concentrator belt having flanges along its sides whose upper surfaces are formed of two inclined planes connected to form an apex or thin portion which will freely stretch when the belt passes around its end pulleys, without materially lessening the height or changing the form of the flanges, and will act as a compressing band for the thicker underlying body portion of the flange, and lessen the strain upon the same, substantially as herein described.

In witness whereof I have hereunto set my hand.

GEORGE GATES.

Witnesses:

S. H. NOURSE,
J. A. BAYLESS.