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MEANS FOR GRINDING THE MANTLE SURFACES OF ROLLERS HAVING ARC SHAPED GENERATRICES

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Fig. 1

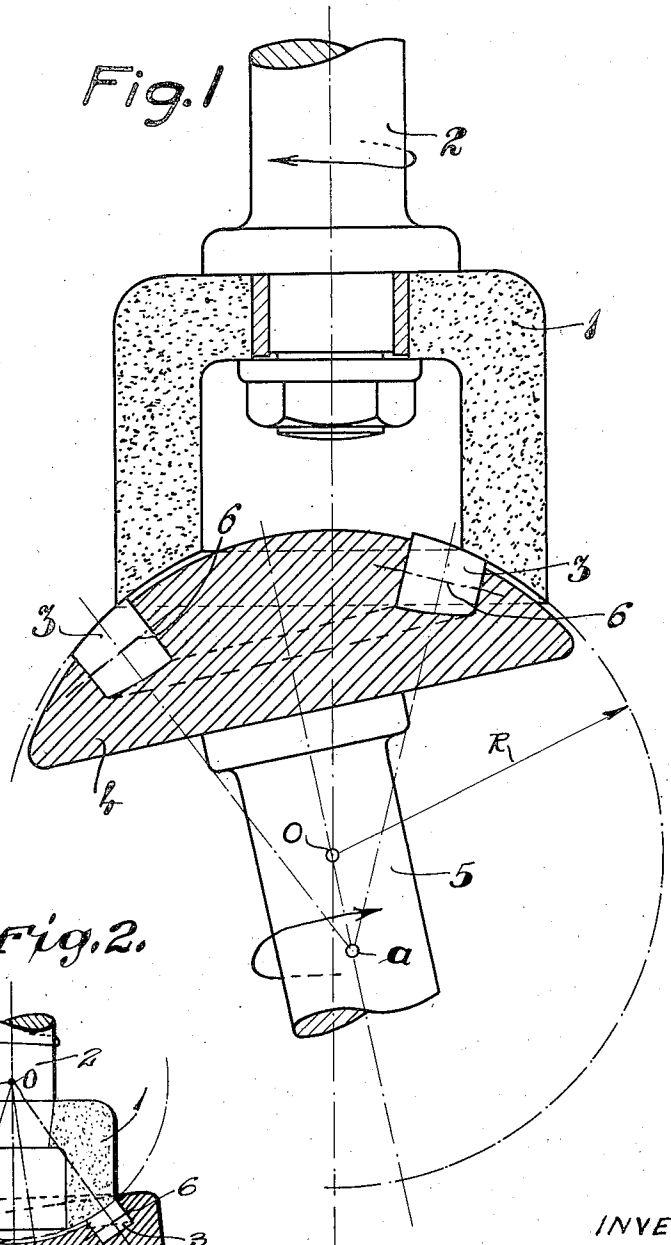
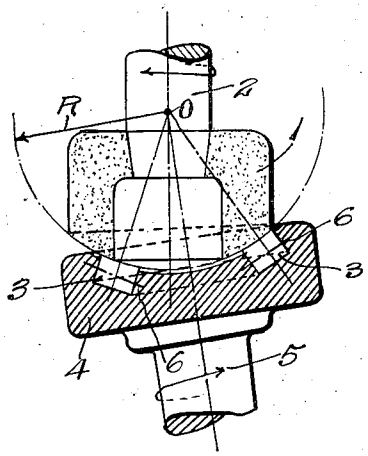


Fig. 2.



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MEANS FOR GRINDING THE MANTLE SURFACES OF ROLLERS HAVING ARC-SHAPED GENERATRICES.

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To all whom it may concern:

Be it known that I, VICTOR ABRAHAM SVENSSON, a subject of the King of Sweden, residing at the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improved Means for Grinding the Mantle Surfaces of Rollers Having Arc-Shaped Generatrices, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improved means for grinding the mantle surfaces of rollers having arc-shaped generatrix by means of a grinding disc rotatable in relation to the rollers.

The object of the invention is to secure an effective, quick, and exact grinding of such surfaces with the aid of simple means in such manner that the generatrix of the rollers will be an exact arc of a circle independent of whether the working surface of the grinding disc has a corresponding exact form or not.

The invention consists, chiefly, in this that the rollers during the grinding operation are brought to roll in such positions that the outermost generatrices of their mantle surfaces always are contained in a spherical surface, and that the grinding is performed by means of a grinding disc, the working surface of which is preferably formed in accordance with said spherical surface and the axis of rotation of which forms an angle with the axis of the roller race.

In the accompanying drawings Fig. 1 illustrates the grinding of the mantle surfaces of rollers having convex arc-shaped generatrix. Fig. 2 illustrates the grinding of concave mantle surfaces. Similar letters refer to corresponding parts in both embodiments.

Referring to Fig. 1 of the drawings, 1 is the grinding disc which is secured to a rotary shaft 2. The rollers 3 the convex mantle surfaces of which are to be ground, are mounted in a roller cage or retainer 4 said retainer or cage being secured to a rotary shaft 5 the axis of which forms an angle with the axis of the grinding disc. The axes of the shafts 2 and 5 intersect one another in a point 0 being the centre of the outermost generatrices of the rollers 3, the radius of curvature of said generatrices being R. The roller cage 4 is of such form and arrangement that the rollers during the grinding operation can rotate about their own axes 6 preferably by rolling on a circular race in the roller cage. The rollers 3 are furthermore so mounted in the roller cage or retainer that their transversal middle planes pass through one and the same point on the axis of rotation of the roller cage so that when several rollers are ground simultaneously all rollers will be uniformly ground. When the rollers, as shown in Fig. 1, are not symmetrical in respect of their transversal middle planes the point of intersection will be positioned at a distance from the centre 0, as for instance at *a*. If, on the contrary, the rollers are symmetrical in relation to their transversal middle planes, the retainer 4 is to be constructed in such manner that said middle planes pass through the centre 0.

During the grinding operation the grinding disc is rapidly rotated about its own axis while the roller cage and the rollers mounted therein rotate about the axis of the cage, preferably with a speed which is independent of and slower than that of the grinding disc. On account thereof each point of the outermost generatrices of the rollers will come in contact with different points of the working surface of the grinding disc, the result being that the said working surface maintains its spherical form in spite of its wear and that the generatrices of the rollers become exact circular arcs having their centre in 0.

Fig. 2 illustrates the grinding of rollers having concave mantle surfaces which are symmetrical in respect of their transversal middle planes. The working surface of the grinding disc 1 is here convex and positioned between the centre 0 and the rollers 3, whereas the grinding surface in Fig. 1 is concave and positioned outside of the rollers in relation to the centre 0. The axis of the grinding disc forms an angle with the axis of the roller cage 4 and the grinding operation is performed in the same manner as in Fig. 1, the roller cage being brought to rotate about the axis of the shaft 5 which intersects the axis of the shaft 2 in the point 0 forming the centre of the outermost gener-

atrices of the rollers 3 the radii of which are R, and at the same time the rollers rotate about their own axes 6 in the roller cage.

As the grinding disc is worn it is fed towards the point 0 by means of any well-known automatic feeding device in such manner that its working surface maintains a constant distance from said centre.

It is evident that the movements above described are not absolute but relative only. Accordingly, it would be possible to use a stationary grinding disc if the roller cage is rotated about its own axis as well as about the axis of the grinding disc.

What I claim is:

1. The combination, in a machine for grinding rollers whose periphery has an arc-shaped generatrix, of a rotating grinder having an annular sphericallly curved grinding surface and a fixed axis of rotation, and a work-holder rotating on an axis at an angle to the grinder axis and having an annular raceway shaped to receive the rollers and permit them to rotate individually about their geometrical axis while being ground.

2. The combination, in a machine for grinding rollers whose periphery has an arc-shaped generatrix, of an annular rotating grinder having a spherical grinding surface and a fixed axis of rotation, and a work-holder of corresponding contour rotating on an axis at an angle to the grinder axis and having in its peripheral face an annular raceway shaped to receive the rollers and permit them to rotate individually about their geometrical axis while being ground.

In testimony whereof I have signed my name.

VICTOR A. SVENSSON.