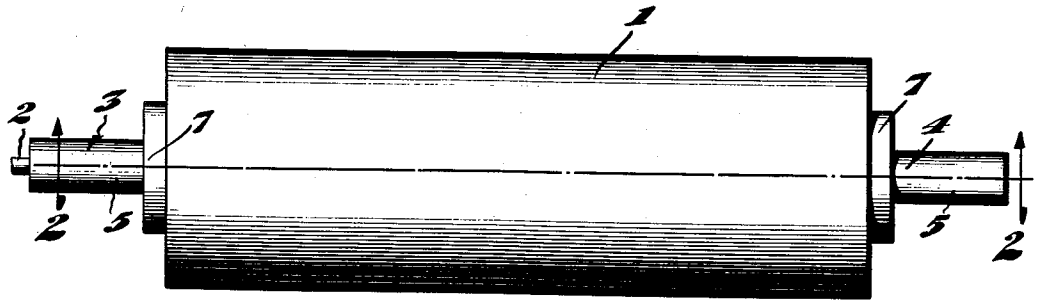
Dec. 24, 1929. C. P. BRASINGTON 1,740,940

MILL ROLLER

Filed April 28, 1928

Fig. 1



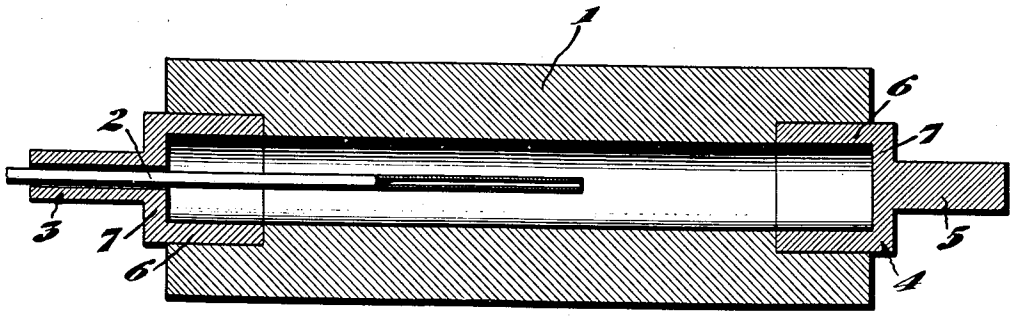


Fig. 2

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UNITED STATES PATENT OFFICE

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MILL ROLLER

Application filed April 28, 1928. Serial No. 273,728.

This invention relates to rollers adapted for use upon mills wherein the action of the rollers generates heat, for instance, in a pigment grinding mill. It is conventional and expedient to use chilled iron rollers in an environment of the nature above specified because of many desirable characteristics of such rollers, and it has also been the practice to cool these rollers by introducing a stream of cooling medium such as water into a bore within each roller.

One difficulty encountered previously to this invention has been that the rollers tended to bind upon the ends and to be relatively spaced too far in the center. While this is a drawback in practically all environments, it is particularly undesirable in a pigment grinding mill, where it is requisite to have a very evenly and uniformly ground pigment.

My investigation antecedent to this invention has disclosed that one reason for this uneven grinding has been the relative thermal expansion of the ends of the rollers compared to the thermal expansion of the middles of the rollers. This variable thermal expansion has been due, in the past, to the presence of the trunnions or bearing extensions by which the rollers were journalled in the ends of the bores used for cooling the rollers, the presence of these trunnions providing increased metal thickness adjacent to the ends of the rollers so that less radiation of heat took place, and also to the fact that there was more metal to cool at the ends of the rollers.

The object of this invention is to provide a chilled iron roller suitable for service in the specified environment, said roller characterized by uniform thermal expansion over its length and radiating surfaces appropriate to maintain this uniform thermal expansion.

Further objects and advantages will be more fully set forth in a description of the accompanying drawings, forming a part of this specification, in which:

Figure 1 is a side elevation of the improved roller.

Figure 2 is a sectional view taken on line 2—2, Figure 1.

The roller of this invention comprises a chilled iron cylinder 1 centrally bored to admit a cooling medium, such as water, which is introduced through a pipe 2 extending into this internal bore from one end of the roller. The ends of the cylindrical bore are of greater diameter than the central portion of the bore, and into these enlarged ends are forced trunnion members 3, 4, each of which is provided with an outer portion or bearing extension 5 of small diameter adapted to be journaled in bearings in the mill frame, and an inner annular end or cylindrical portion 6 adapted to fit into the enlarged bores at the ends of the roller. The metal thickness of this inner annular end portion is so related to the enlargement of the bore in the ends of the roller that a passageway or internal bore of uniform diameter is provided over the entire length of the roller, and has an extent commensurate with the grinding or working surface of the roller.

The action of the stream of cooling medium is, therefore, relatively uniform over the entire roller so that the thermal expansion is relatively the same and the grinding or working of the rollers is more uniform axially of the rollers.

Moreover, the inner side of the shoulder 7 of the trunnion, said shoulder between the small diameter and the large diameter, forms a heat radiating surface which tends to dissipate any undue amounts of heat which might be generated in the bearings, and tends to check the flow of said heat into the roller, which might contribute to its expansion. In short, the heat radiating surface at the end of the roller is constituted with area sufficient to maintain the end of the roller at substantially the same temperature as the center.

In practice the inner trunnion ends are made approximately four one-thousandths of an inch larger than the enlarged roller bore, and are forced in under high pressure, such as twenty tons, for a trunnion of six inches diameter.

As disclosed, one trunnion 3 is hollow to permit the pipe 2 to pass therethrough, and the other trunnion is provided with a solid

outer end to confine the cooling liquid in respect to that end.

Thus, I provide a chilled iron roller for a mill of the class described adapted to give more uniform working action upon the medium fed into the mill.

Having described my invention, I claim:

1. A roller for a mill of the class described, comprising, a cylindrical roller provided at its ends with enlarged bores, and trunnions disposed in said enlarged bores, said trunnions having a metal thickness providing, together with the roller bore, a passageway adapted to receive a cooling medium, said passageway of relatively uniform diameter over an extent commensurate with the working surface of the roller.

2. A roller of the class described, comprising, a cylinder, the internal bore of said cylinder of uniform diameter throughout the entire length of the roller, and trunnions extending from each end of said roller, said trunnions of lesser diameter than the internal bore of the cylinder.

3. A roller of the class described, comprising, a cylinder, the internal bore of said cylinder being formed straight and of the exact length of the cylinder, and bearing extensions disposed at each end of said roller, said extensions of lesser external diameter than the internal bore of the cylinder.

4. A roller of the class described, comprising, a cylinder, the internal bore of said cylinder of uniform diameter throughout the entire length of the roller, bearing portions extending from each end of said roller, said bearing portions of lesser external diameter than the internal bore of the cylinder, and means for introducing a cooling medium into the internal bore of the cylinder.

5. A roller of the class described, comprising, a hollow chilled steel cylinder provided at its ends with enlarged bores, two dimension trunnion members, the larger ends of which are disposed in said enlarged bores, said ends having a metal thickness equal to the enlargement of said end bores of the cylinder to provide a passageway adapted to receive a cooling medium, said passageway of relatively uniform diameter over an extent commensurate with the working surface of the roller, the shoulder between the larger and smaller trunnion diameters being disposed on the outside of the roller, and means for introducing a cooling medium into said roller.

In witness whereof, I hereunto subscribe my name.

CHARLES P. BRASINGTON.