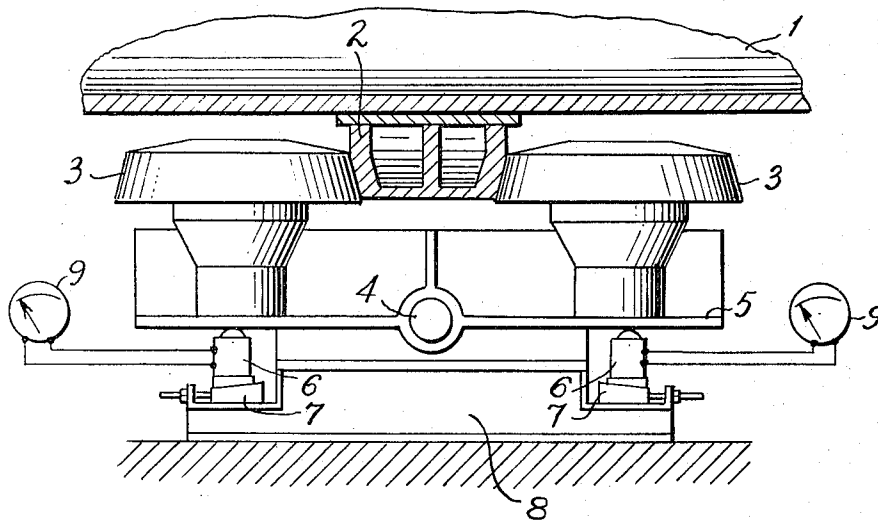


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JOURNALLING STRUCTURE FOR ROTATABLE PROCESSING
DRUMS SUCH AS ROTARY KILNS, TUBE MILLS
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JOURNALLING STRUCTURE FOR ROTATABLE PROCESSING DRUMS SUCH AS ROTARY KILNS, TUBE MILLS

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1 Claim. (Cl. 73—140)

My invention relates to a journalling structure for rotatable processing drums, such as rotary kilns, tube mills, dryer drums, beneficiating drums, and the like. In a more particular aspect, the invention relates to processing drums which have coaxial ring structures running upon or between pairs of pressure rollers, the drum axis being substantially horizontal or somewhat inclined to the horizontal direction, and the axes of the pressure rollers, straddling each runner ring, being substantially vertical.

In such journalling structures, there occurs a force upon the pressure rollers in a direction parallel to the drum axis, this force being dependent upon the setting of the pressure rollers or the inclination of the drum axis relative to the horizontal. This longitudinally directed force varies during operation, for example when the friction conditions between pressure rollers and the runner ring vary on account of insufficient lubrication causing the surface of parts rolling upon each other to run dry. Changes in mutual position between the pressure rollers and the processing drum, as may be caused by different settling of the foundation or by thermal expansion of the drum, or also by changes in driving conditions, may also result in a variation of the force exerted upon the pressure rollers. A timely discovery of such changes is important for maintaining a satisfactory operation of the processing drum so that irregularities in the processing results or damages to the equipment can be prevented by eliminating the causes of disturbance.

It is an object of my invention to provide a journalling structure for rotatable processing drums which readily affords recognizing such changes in force exerted upon the pressure rollers.

According to a feature of the invention, the pressure rollers are rotatably mounted on a teeter bar pivoted in its middle and having its free ends supported on respective force gauges. Each stress imposed upon the pressure rollers produces a force upon the appertaining force gauge which is thus subjected to elastic deformation without virtually permitting a discernible or appreciable movement of the pressure-roller bearings.

According to another feature of the invention, the force pulse thus imposed upon the force gauges is applied to an indicating or signalling device which may be mounted at a central control location, or is used for controlling a lubricating device for the pressure rollers. Preferably employed for such purposes are force gauges operating as electrical transducers, thus translating the force into a corresponding variation of an electrical voltage.

It is further preferable to make each force gauge adjustable in height in order to permit adjusting the pressure rollers when the processing drum is put in operation.

The invention will be further described with reference to an embodiment of journal structures according to the

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invention illustrated by way of example on the accompanying drawing, in which the single figure shows a longitudinal section through part of a processing drum in conjunction with two pressure rollers mounted on a common teeter bar.

Denoted by 1 in the figure is the lower portion of a processing drum, such as a tube mill, kiln or dryer, which rotates about a horizontal axis. Mounted on the drum is a runner ring 2 so as to rotate together with the drum. It will be understood that a number of such runner rings 2 may be distributed along the length of the drum. Two pressure rollers 3 are rotatably mounted on opposite sides of the ring 2 and have respective conical surfaces engageable with respective lateral faces of conical shape with which the ring 2 is provided. The pressure rollers 3 are rotatably mounted on a teeter bar structure 5 which is pivotally mounted on a horizontal shaft 4. The end portions of the teeter 5 abut against respective force gauges 6 which are mounted on the same supporting structure 8 as the shaft 4. Wedges 7 are inserted between the gauges 6 and the supporting structure and are provided with adjusting means to permit varying the height of the gauges. The gauges 6 are shown to consist of encapsulated electrical transducers which provide an output voltage in response to force acting upon the gauge. Such transducers are known and available in the trade. They may be of the electromagnetic or piezoelectric type, for example. Resistance strain gauges are likewise applicable. The output circuits of the force gauges 6 are connected to respective indicating instruments 9.

When, during operation of the processing drum according to the figure, the runner ring 2 is forced against one of the two pressure rollers 3, the appertaining force gauge 6 will respond and the measuring instruments then indicate respectively different loading conditions which are indicative of the force, or of the amount and direction of force unbalance.

To those skilled in the art it will be obvious upon a study of this disclosure, that my invention permits of various modifications with respect to details and hence may be given embodiments other than particularly illustrated and described herein, without departing from the essential features of my invention and within the scope of the claim annexed hereto.

I claim:

A journalling structure for a rotatable processing drum, comprising a ring member coaxially mounted on the drum to rotate together therewith, two rotatable pressure rollers spaced from each other and having substantially parallel axes, said ring member being straddled jointly by said two rollers and engageable therewith on opposite sides respectively of the ring member, a rigid support, a teeter bar pivoted in its middle to said support, said two rollers being mounted on the respective end portions of said teeter bar, and two force gauges mounted between said respective end portions and said support and responsive to thrust forces imposed by said ring upon said two rollers.

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