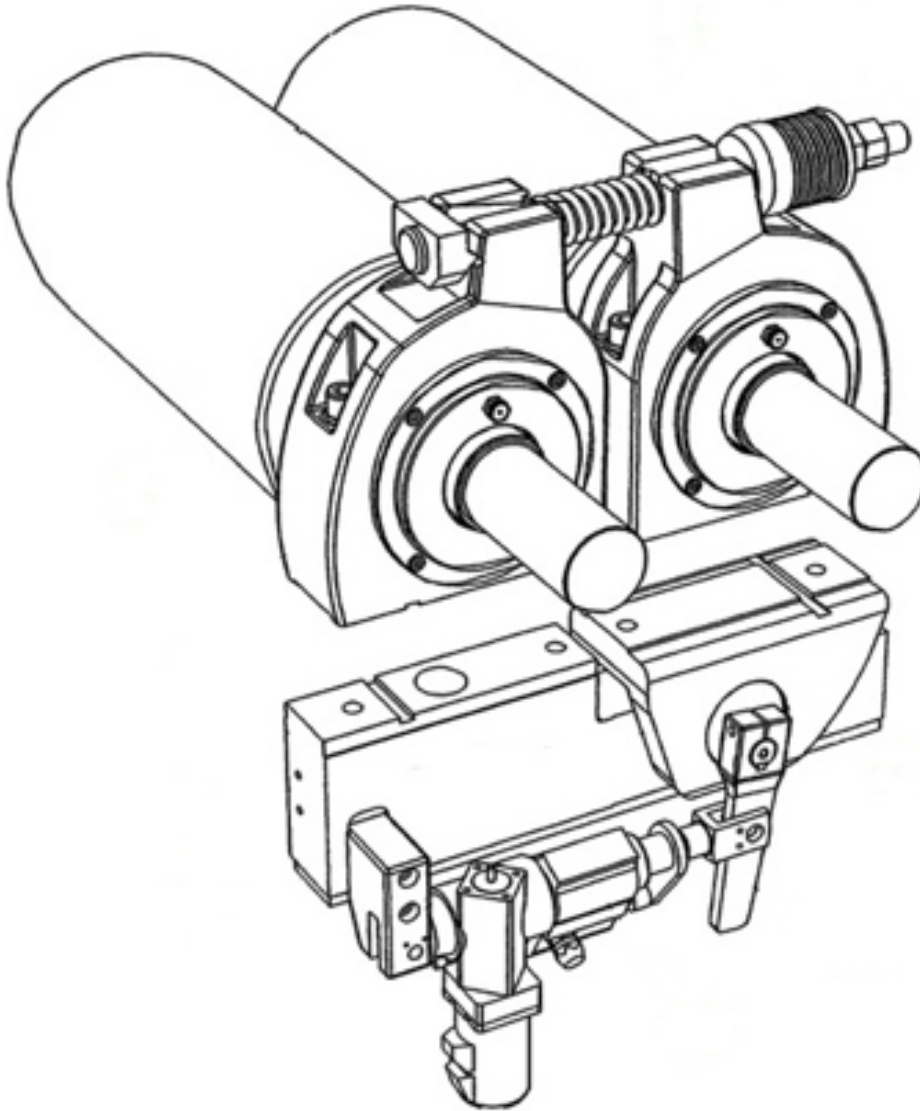


Roller mill stability and grinding roller system performance

by Gao Yangyang and Dr Wu Wenbin, Grain and Oil Machinery Research Institute, Henan University of Technology, China



The grinding roll system used within roller mills consists of grinding rolls, bearings, a bearing seat, inter-roll transmission mechanism and clutch rolling and distance adjustment mechanism.

In the actual work operations of the mill, the vibration amplitude of the roll produced by the defect of the roll grinding system and the impact of the load is called the stability of the roll grinding system. The grinding roll exerts a grinding effect on material, primarily through friction and extrusion.

The smooth operation of the grinding roll system is the key to ensure the grinding effect of the mill is carried out efficiently and properly. The poor stability of the grinding roll system will produce a periodic load/pressure on the grinding roll, increasing the friction force between the two rolls and the material, generating excessive friction heat and increasing energy consumption, resulting in wear and tear on the roll surface and reducing the grinding effect.

The service life of grinding rolls and the vibration of grinding rolls causes changes within rolling distance, seriously affecting the crushing effects of material, changing the roughness of grinding materials, increasing the temperature of grinding



materials and the instability of centrifugal grinding rolling distance will affect the pulverising rate of the grinder.

The low pulverising rate will aggravate the load of follow-up equipment, shorten the service life of equipment parts, reduce the output of the mill and make the pulverising rate too high. The quality of the grinding roll is reduced and the wear of the grinding roll is aggravated.

The main factors affecting the stability of the grinding roll system are the manufacturing accuracy of the grinding roll, bearing accuracy, feed uniformity, assembly accuracy and clutch rolling mechanism. Other factors can also be at play here.

The theoretical analysis and experimental results show that the working stability of the roller system directly affects the output and fineness of the mill as well as the temperature of the mill, energy consumption, the range of the processed materials, the shape and distribution of the particles and the life of the components. At the same time, it will increase the vibration and noise of the mill and deteriorate the workshop environment.

Therefore, improving the stability of mill roll system can not only improve the grinding effect of the mill, reduce the loss of nutrients caused by excessive temperature, but also prolong the service life of roller mills, reduce energy consumption and environmental pollution and save enterprise costs.

In the design and manufacture of the mill, the stability of the roller system should be fully considered to ensure the accuracy of the components and assembly, and the general inspection of the clutch function of the mill should be carried out when the mill stops or restarts.

The cleaning effect of the cleaning brush should be checked during the mill operation to prevent impact load damage caused by the powder holding roller. The residual flour dust build up in the grinding chamber should be removed regularly to keep the body clean and hygienic. In addition, lubricants should be checked regularly to clean or replace bearings in time.

The surface of grinding rolls and the temperature of bearings should be monitored in real time. The bearing cover should be opened for inspection when the temperature of bearings exceeds 70°C and the transmission skin of grinding rolls and feeding rolls should be checked regularly. The tension of the belt ensures the stability of the mill roll system and improves the performance of the mill.