Benefits of Inching Drives

CMD Gears enables mills to operate under challenging conditions

Matthew Jaster, Senior Editor

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The mining industry relies heavily on efficient and reliable equipment to process large volumes of ore and mineral resources. One critical component in this ecosystem is the grinding mill, which plays a pivotal role in comminuting materials to prepare them for further processing. Grinding mills, particularly the large semi-autogenous (SAG) and ball mills, often operate under challenging conditions that demand precision, durability, and adaptability. A key technology enabling these mills to operate safely and efficiently is the hydraulic inching drive system.

"Hydraulic inching drives are auxiliary systems that provide precise, low-speed operation of large grinding mills during maintenance, inspection, and troubleshooting activities. They complement the primary mill drive systems, which are typically designed for normal operations," said Victor Manoury, sales engineer at FCMD North America, a company of Groupe CIF along with CMD Gears & Ferry Capitain.

Why Are Inching Drives Necessary?

Grinding mills in the mining industry are massive structures, with diameters that can exceed 40 feet and weights reaching hundreds of tons. Operating and maintaining these mills present unique maintenance challenges.

"Tasks such as replacing liners, repairing internal components, or inspecting the mill require precise positioning and rotation of the mill shell. For safety, inching drives allow controlled movement of the mill, minimizing the risk of accidental overspeed or uncontrolled rotation during maintenance," Manoury said. "During initial installation or post-maintenance alignment, inching drives enable precise positioning of components such as pinions and ring gears."

How Hydraulic Inching Drives Work

The hydraulic inching drive consists of several components working together to provide low-speed operation:

Hydraulic Motor: This motor converts hydraulic energy into mechanical motion, enabling the slow rotation of the mill.

Portable Hydraulic Power Unit (HPU): The portable power unit supplied pressurized hydraulic fluid to the motor, controlling its speed and torque.

Gearbox: The inching drive includes a high-reduction gearbox to achieve the necessary torque at low speeds.

Control System: An advanced control panel allows operators to regulate the speed, direction, and duration of mill rotation, either from the main cabinet of the HPU or from a remote control.

Brake System: Hydraulic inching drives incorporate robust braking systems to securely hold the mill in position when not in motion.

Engaging/Disengaging Mechanism: The system is equipped with engaging and disengaging systems, hydraulically controlled and operated, to transition from normal operation to inching mode.

Advantages of Hydraulic Inching Drives

There are several advantages to hydraulic inching drives including enhanced safety where operators have complete control over the mill's motion, minimizing risks during maintenance tasks. These hydraulic systems are also highly adaptable and can be customized to suit mills of different sizes and configurations.

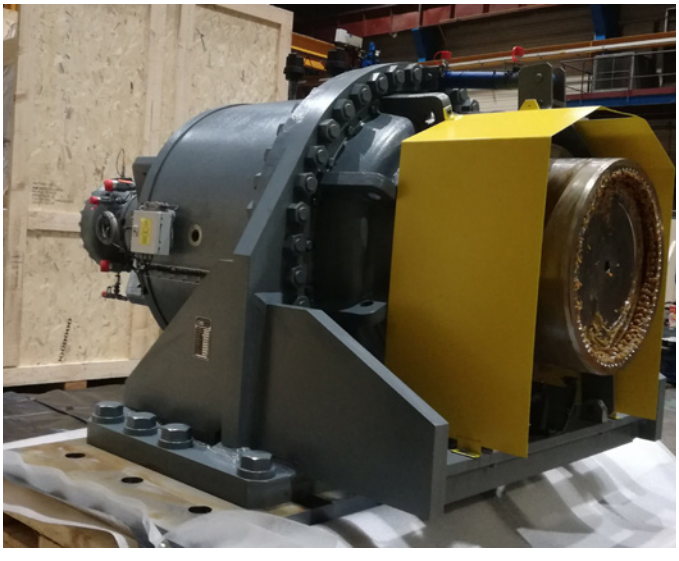
A frozen charge occurs when material solidifies inside the mill, causing an imbalance that can damage the equipment if restarted without proper management. The hydraulic inching drive helps detect frozen charges by rotating the mill slowly and monitoring the resistance or torque feedback during the process.

In addition, balance positioning is crucial for ensuring that the mill is in a safe and optimal position for maintenance or during startup. Hydraulic inching drives offer precise control over the mill's rotation, allowing operators to place the mill exactly where needed.

CMD Hydraulic Inching Drives are designed and manufactured for high torque and low-speed applications, CMD's inching drives are built for the most demanding operations worldwide.

"Our versatile inching drives can be moved across your plant, offering a plug-and-play solution for maintenance. This flexibility allows cost savings by reducing the need for multiple systems or spare parts. Complete Package CMD inching drives come equipped with all necessary accessories and can be combined with CMD torque-limiting couplings and brakes typically installed with variable frequency drives," Manoury said.

Complete drive systems—including ring gear, pinion, gearboxes, and couplings—are also available. CMD offers comprehensive support from design and manufacturing to installation, commissioning, and aftersales service.



CMD delivers inching drives for heavy-duty applications. The company offers over a century of experience combined with continuous innovation and a commitment to supporting heavy-duty operations with reliable, high-performance equipment.

"Our field engineering team provides inspections, monitoring, and technical assistance as needed. Operators can control the inching drive from a safe distance, enhancing safety during hazardous operations. Intelligent systems enable precise positioning and rotation, reducing the need for manual intervention. Sensors and monitoring tools provide real-time performance feedback, enabling proactive maintenance and minimizing downtime," he added.

Applications in Mining

Hydraulic inching drives are essential in the following scenarios within the mining industry:

1. **Liner Replacement:**
   Liners in grinding mills wear over time due to constant impact and abrasion. During liner replacement, inching drives provide precise rotation, allowing workers to position the mill shell for safe removal and installation.
2. **Inspection and Cleaning:**
   Regular inspection of the mill interior is critical for early detection of wear, cracks, or other issues. Inching drives allow slow and controlled mill rotation, making it easier for maintenance teams to conduct thorough inspections.
3. **Alignment and Commissioning:**
   During the commissioning phase, inching drives help align the mill components, such as the girth gear and pinions, ensuring smooth operation of the main drive system.

Experience and Knowhow

With over 150 years of accumulated knowledge and experience, CMD has been a trusted supplier for mining, cement, and other heavy-duty industries. "As part of our commitment to continuous innovation, CMD has developed a new generation of hydraulic inching drives equipped with state-of-the-art technology. Designed to handle the increasing power demands of the mining industry, CMD's hydraulic inching drives are built for the world's largest gear driven grinding mills, up to 22 MW," Manoury said.

CMD delivers the newest and largest inching drives for heavy-duty applications. The company offers continuous innovation and a commitment to supporting heavy-duty operations with reliable, high-performance equipment. CMD Gears hydraulic inching drives meet the demands of today's industries while preparing for tomorrow's challenges.

"CMD provides customized solutions to meet specific application needs, offering complete systems from the motor to the shell including gearboxes equipped with gear/grid couplings, pinion and ring gears up to 16 m , and components designed to meet the specific needs of the customers supply of hydraulic or electromechanics inching drives ," Manoury said.

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