Bearings Encyclopedia Article

Bearings

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Bearings

In ancient times, bearings may have taken the form of roller (cylindrical) bearings in the wheel hubs of wagons or, more probably, of a conveyor-belt system of logs designed by the Egyptians to transport large sections of stone for the construction of their pyramids. The first ball-shaped bearings, made of bronze, were invented by the Romans to assist the movement of metal turntables on ship decks.

In none of these instances were the bearings likely to have moved freely and without skidding. This development came in 1543 when Italian sculptor Benvenuto Cellini (1500-1571) placed his statue of Jupiter atop a platform in which were housed four wooden bearings that permitted free lateral as well as rotational movement of the statue.

The key mechanical role of all bearings, as Cellini knew, is to serve as a contact and support for moving parts through the reduction of friction. Bearings became more prevalent in later centuries as greater attention was placed on axle design in all types of inventions. With the advent of fast-moving metal machine parts, which produce high levels of heat and friction, the importance of bearings became even more pronounced.

A host of manufacturing industries rely on bearings to enhance machine performance and prolong the stability of moving parts. The addition of a liquid film such as oil or grease to the surface of bearings further enhances machining capabilities. The most common bearings, of either the rolling or the ball type, are retained in a *cage*, which in turn is placed within two cylinders. Among the early inventors who obtained patents for ball bearings were French mechanic Jules Pierre Suriray and Welsh ironmaster Philip Vaughn.

Bushings are used to fill cylindrical holes, to preserve their dimensions and to provide a smooth surface for whatever object will fill the hole. In a larger sense bushings are removable metal linings, usually in the form of a bearing to carry a shaft. Generally a bushing is a small bearing in the form of a cylinder, made of soft metal.