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TOOL CENTER

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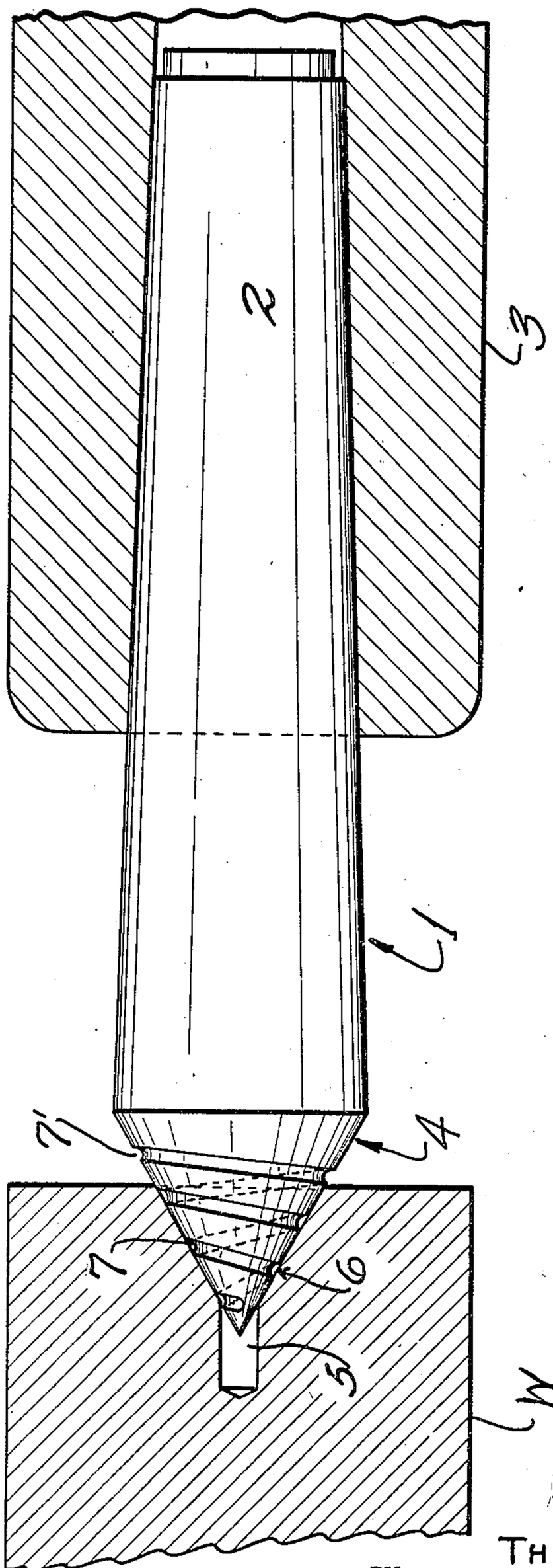

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TOOL CENTER

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5 Claims. (Cl. 82—33)

The invention relates to work-supporting centers such as are used on lathes, grinding machines, milling machines and similar metal working machines, and more particularly to stationary centers, and consists in the grooving of the work-engaging portion of the center as described and claimed herein and illustrated in the accompanying drawing.

Similar centers in general use do not facilitate the delivery of lubricant to the contacting surfaces of the center and the work supported thereby. Frequently the pressure between the center and the work tends to squeeze the lubricant away from the contacting surfaces and it is necessary for the workman to loosen the center to inject lubricant between the surfaces.

Unless fresh lubricant is applied at intervals or other provisions are made, the center will gall, burn, or twist off due to the heat caused by the lack of lubrication, the heat generated by cutting tools, the thrust load set up between centers by work expansion, and the heat from work turning at high speed, all tending to cause a rupture of the lubricant film.

It has been suggested that the center be provided with a storage cup or like recess, forming a lubricant reservoir, and a groove, extending longitudinally of the surface of the center 2, or a drilled opening extending from the point of the center back to the bottom of the reservoir. The projection of a cup from the side of the center is likely to interfere with the operator's hand or arm; the use of an open reservoir is likely to result in dirt and foreign matter mixing with the lubricant, and in either arrangement the reservoir should be kept upright to function; the provision of a groove extending longitudinally of the surface of the center is likely to produce a cutting edge; and a hole drilled through the center is likely to be blocked by dirt, chips or other matter.

The main object of the present invention is to simplify the provision of adequate lubrication for centers of this type at minimum expense and without inconveniencing the operator.

In the accompanying drawing illustrating a selected embodiment of the invention, the single figure is an elevation of a tool center mounted in a lathe tailstock and supporting one end of a piece of work, the tailstock and the work being sectioned to more clearly illustrate the invention.

The dead center 1 has a tapered shank 2 seated in the lathe tailstock 3 in the usual manner and frictionally held thereby against rotation. The forward end of the center includes a cone-like surface 4, a part of which may be inserted in a recess in the end of the work W to support the latter as it is rotated by the head stock in the usual manner. The work may be provided with the customary drilled hole 5 and counterbore 6, the inclination of the side of the counterbore corresponding to the inclination of cone surface 4.

Cone surface 4 is provided with a helical groove 7 leading in an anticlockwise direction, corresponding to a left hand thread, from the point of the cone rearwardly towards the base of the cone and extending a substantial distance beyond the adjacent end of the work, as indicated at 7'.

Obviously the friction between the work and the center as the work rotates in an anticlockwise direction (viewed from the left hand end of the drawing), as is customary, will tend to draw any lubricant deposited in the outer portion 7' of the groove towards the point of the center and inwardly of the recess in the work and, if there is a surplus, into the drilled hole 5. Hence it will be easy for the workman to maintain an adequate supply of lubricant throughout the contacting surfaces of the work and center cone by adding additional lubricant to the portion 7' of the helical groove at intervals, and this may be done readily without stopping the machine or withdrawing the center from the work and readjusting the tailstock. Since the groove extends circumferentially of the cone, there will be no cutting or abrading edges presented to the work, as would result from a groove extending longitudinally of the cone.

A tool center embodying the invention tends to lubricate the entire bearing surface of the work and center, to hold a supply of lubricant which will replenish that which has dissipated because of heat, to avoid dripping or crushing out of surplus lubricant, to eliminate frictional heat and thereby keep the expansion of work at a minimum, and to reduce the thrust load set up between the tailstock and the work and the tool head.

Having thus described the preferred embodiment of the invention, what is claimed as new is:

1. A machine tool center for a lathe or like tool comprising a stationary work-supporting conical part with a pointed end and provided with a helical groove in its work engaging surface and extending from the pointed end of the center towards the base of the cone and beyond the area normally contacted by the work.

2. A machine tool center as described in claim 1 in which the helical groove corresponds to a left hand screw thread whereby the rotation of the work supported by the center, in the usual direction relative to the center, tends to feed lubricant from the larger diameter portion of the cone part towards its point.

3. A machine tool center as described in claim 1 in which the direction of feed of the helix from the point of the conical part towards its base corresponds to the normal direction of rotation of the work to be mounted upon the center, whereby lubricant deposited in the portion of the groove nearest the base of the conical part will be drawn, by frictional contact with the work, along the groove towards the point of the conical part.

4. A machine tool center as described in claim 1 in which the outer end of the helical groove is so close to the point of the cone that it may open into the usual drilled hole in the end of the work applied to the center.

5. A center of the class described constructed and arranged to be fixedly mounted in a stationary machine tool tailstock with its axis disposed horizontally and having a conical part including a forward portion of relatively small diameter for engaging and supporting work and a rear portion of relatively large diameter for extending outwardly beyond the end of the work, the surface of said conical part having a helical groove leading from said rear portion substantially to the point of said forward portion and disposed so that normal rotation of the work over the helically grooved surface in a machining operation will draw lubricant applied to the groove in the larger diameter rear portion of said part towards the smaller diameter forward portion of said conical part inserted in the work.

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