Nov. 25, 1947. K. J. HALL 2,431,476

ALIGNING TOOLHOLDER

Filed March 4, 1946

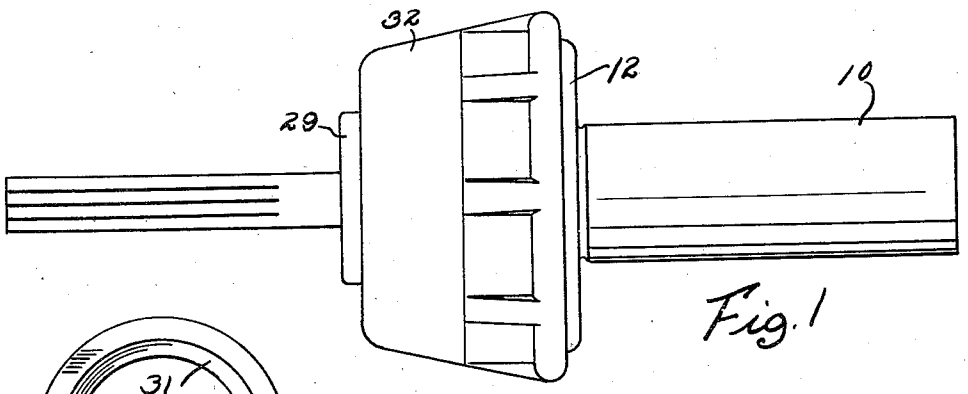


Fig. 1

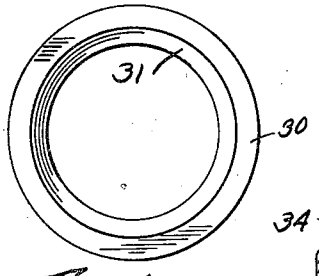


Fig. 4

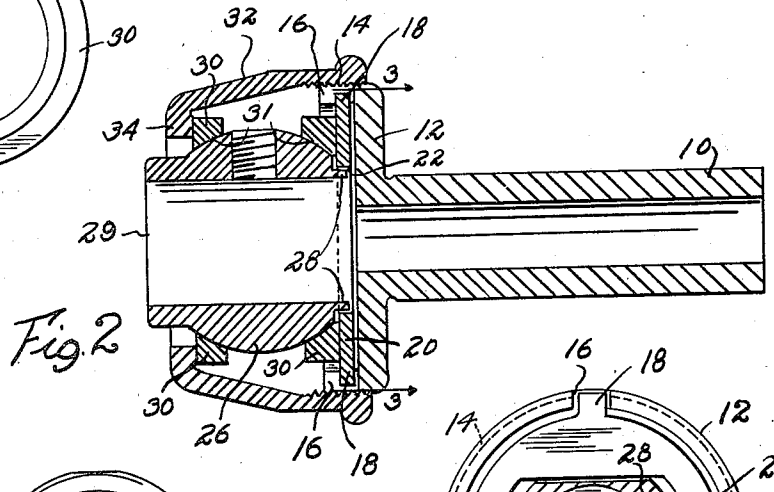


Fig. 2

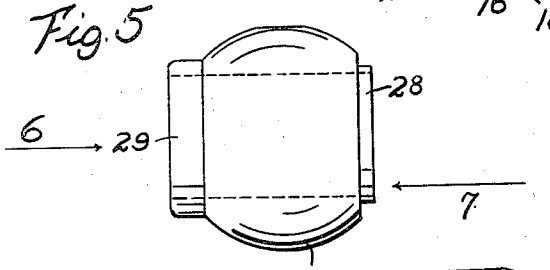


Fig. 5

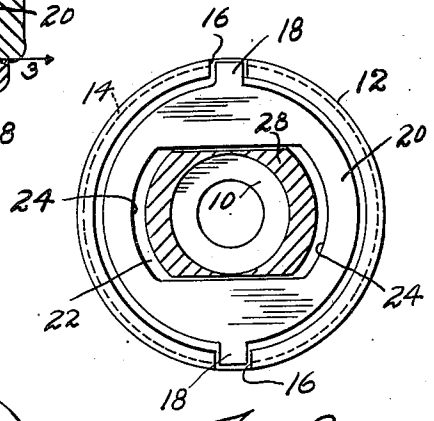


Fig. 3

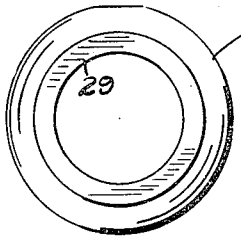


Fig. 6

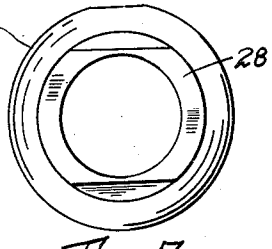


Fig. 7

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ALIGNING TOOLHOLDER

Kenneth J. Hall, Worcester, Mass.

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3 Claims. (Cl. 279—16)

1

This invention relates to an adjustable tool holder having means for rigidly holding a tool in universally adjusted position relative to a turret or stock for the purpose of compensating for wear thereof so as to provide an accurate alignment of the tool with the work axis even though the turret or stock is worn out of line.

Objects of the invention include the provision of a shank adapted to be held in a turret or stock and operatively and adjustably associated with a swiveling head held to the shank by a cap, the swiveling head being capable of universal adjustment when the cap is loose and rigidly clamped to the shank when the cap is tight, said swivel head being adapted to hold a tool or tool bushing.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a view in elevation;

Fig. 2 is a longitudinal section through the tool holder;

Fig. 3 is a section on line 3—3 of Fig. 2;

Fig. 4 is a view in elevation of a ring;

Fig. 5 is a view in elevation of the swiveling head;

Fig. 6 is an end view of the swiveling head looking in the direction of arrow 6 in Fig. 5; and

Fig. 7 is an end view of the swiveling head looking in the direction of arrow 7 in Fig. 5.

As shown in the drawings, this invention comprises a hollow shank 10 adapted to be held in a turret or stock either for rotation or for fixed operation. The shank is provided with a flange 12 exteriorly screw threaded at 14 and provided with a pair of diametrically opposed slots 16. Slots 16 receive a pair of tabs 18 extending radially from a driver plate 20 so that the latter is rotatively fixed to the shank. The driving plate is circular to fit into the flange 12 and is provided with an opening 22, said opening having straight edges at top and bottom, the side edges of the opening, however, being axially concentric as at 24.

A hollow swivel head 26 having the shape of a ball is provided with a reduced portion 28 at its rear end, and a projection 29 at the front end. The reduced portion 28 has a shape similar to that of opening 22 but smaller than said opening so that the swivel head may be adjusted sideways relative to the driving head. However, the distance between the straight edges of the opening in the driving plate is but a few thousandths of an inch greater than the distance between the corresponding straight edges of the reduced portion 28 of the swivel head so that the driving plate and the swivel head may be arranged in substantially fixed relation rotatively, the up and down adjustment of the swivel head being obtained by adjusting the driving plate in the flange 12. However, the arrangement is such that the swiveling head may be angularly adjusted slightly relative to the driving plate.

2

A pair of rings 30 having angular inside surfaces 31 are provided to contact the spherical surface of the swivel head. One ring 30 bears on the driving plate and the other ring is contacted by a cap 32 having interior screw threads meshing with threads 14 on flange 12. Cap 32 is provided with a flange 34 to contact the other ring 30 and it will be obvious that the swivel head 26 will be tightly clamped by the cap and the rings in any adjusted position thereof.

In the use of the device, the cap is loosened and the swivel head is located wherever desired for universal adjustment relative to shank 10. Then the cap is tightened to clamp the swivel head in adjusted position. Another way of using the device is to loosen the cap and run the tool into a hole to be finished and the tool in this case acts like a floating tool, but may be clamped in desired position as determined by the existing hole in which case an exact location of the tool relative to the work is obtained.

It will be seen from the above that the present invention provides a tool holder having a quick and easy clamping adjustment of a tool holding element in any direction radially of the axis of the tool holder and in any direction at a slight angle thereto for the purpose described.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. Tool holder comprising a shank, a driving plate radially adjustable and rotatively fixed relative thereto, a swivel head radially adjustable in a different direction relative to the driving plate and substantially fixed rotatively thereto, said head being capable of angular adjustment relative to the driving plate, a cap substantially enclosing the head, and means on the cap to clamp the head in adjusted position to the shank.

2. Tool holder of the class described comprising a flanged shank, exterior threads on the flanges, a cap having threads to mesh therewith, said cap having an inwardly directed flange spaced from the shank flange, a driving plate, radial tabs on the driving plate, said shank flange being provided with slots receiving the tabs for

guided adjustment of the driving plate diametrically relative to the shank, a hollow swivel head in the cap, interengaging means between the head and the driving plate, said means providing for diametrical adjustment of the head at 90° to the said adjustment of the driving plate, said interengaging means substantially rotatively fixing the head to the driving plate but providing for a slight relative angular adjustment thereof, said cap clamping the head to the driving plate and shank upon being turned up on the shank flange threads.

3. Tool holder comprising a flanged shank, a driving plate inside the flange, means on the plate and flange providing for diametrical adjustment of the plate relative to the flange in one direction, an opening in the plate, said opening having a pair of spaced parallel edges, a swivel head, a projection on the head received in the plate opening and having a pair of straight edges guiding the head for diametrical adjustment on the edges of the opening, said two adjustments being at angles to each other, said projection being sufficiently loose in the opening to provide for a slight angular adjustment of the head relative to the plate, and means clamping the head to the plate and the plate to the shank flange.

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The following references are of record in the file of this patent:

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