PATENT SPECIFICATION (11) 1 583 687

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(21) Application No. 37241/77 (22) Filed 7 Sep. 1977
(23) Complete Specification Filed 30 May 1978
(44) Complete Specification Published 28 Jan. 1981
(51) INT. CL.[3] B23B 31/20
(52) Index at Acceptance
B3B 2A1 2G2 2K8 2L

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(19)

(54) IMPROVEMENTS RELATING TO MACHINE TOOL ADAPTOR ASSEMBLIES.

(71) We, HAWKER SIDDELEY AVIATION LIMITED, a British Company, of Richmond Road, Kingston upon Thames, KT2 5QS., do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:-

This invention relates to machine tool adaptor assemblies and in particular to adaptor assemblies for adapting the shanks of milling cutters to co-operate with standard collets. The milling cutters to which this invention is directed are those used primarily for numerically controlled (N.C) machining operations.

Individual cutters may, when necessary, be reground on a number of occasions within certain prescribed tolerances but once these tolerances have been exceeded, the cutters are no longer suitable for this purpose since their continuing use would require a new or modified N.C. programme to accommodate the significant change in cutter characteristics. Nevertheless, the cutters, though discarded for this purpose, still have a useful remaining life for manually controlled machining operations. However, for this use, their shank diameters and forms do not normally lend themselves to engage the standard chucks and collets which would be the case with conventional cutters. It is an object of the present invention to overcome this shortcoming.

According to the present invention, an adaptor assembly for mounting a shanked tool in a collet member includes, in combination, a cylindrical member arranged for fitting in the bore of the collet member, the cylindrical member having at one end a tang for driving engagement with a keyway in the collet member and a cylindrical bore extending from the other end for receiving the shank of the tool, and a key member extending through a radial aperture in the cylindrical member so as to drivingly engage the shank of the tool, the length of the key member being such that it is retained in driving engagement with the shank of the tool by direct engagement with the collet member.

According to a preferred feature of the invention the assembly includes resilient retention means for retaining the key member in position in the aperture.

A preferred embodiment of the invention will now be described with reference to the accompanying drawings, in which:-

Figure 1 shows a longitudinal section through the adapter assembly,

Figure 2 is an exploded plan view of the assembly whilst

Figure 3 is a longitudinal section through a collet chuck assembly illustrating the adapter assembly in use.

Referring now to figures 1 and 2 the adapter assembly comprises a cylindrical barrel member 1 having a concentric bore 2. The external diameter of the barrel member corresponds to the internal diameter of the collet chuck for which the shank is to be adapted, whilst the concentric bore 2 corresponds to the diameter of the cutter shank which is to be used. The barrel member 1 has a tang 3 for driving engagement with the collet chuck.

A radially disposed aperture 4 is formed in the barrel member 1 at approximately a mid-length position and a key 5 is inserted into and protrudes through this aperture. As shown in Figure 2 the external surface of the key 5 is part cylindrical so as to conform to the surface of the barrel member 1. The key 5 also has a chamfered portion 6 and a flat surface 7.

The key 5 is held in position in the aperture 4 by a circlip 8 accommodated within an annular groove 9 in the barrel and the key 5. This circlip spring loads the key 5

for insertion and withdrawal of the cutter shank.

In order to provide a degree of diametric resilience, a slot 10 is formed in the barrel member diametrically opposite the key 5 which extends longitudinally through the length of the barrel member 1 and radially into it terminating in alignment with the opposite wall of the barrel member.

Referring now to Figure 3, the shank 11 of the cutter tool is first fitted into the barrel member 1 so that a flat surface 12 on the shank is engaged by the corresponding flat face 7 on the key 5. The shank and the barrel member are then fitted into the collet 13 forming part of the collet chuck shown generally at 14 so that the tang 3 engages a corresponding slot in the collet.

From the foregoing it will be obvious that the key 5, by reason of its direct engagement with the bore of the collet member, is held in a position such that its flat face engages the flat surface on the cutter shank, thereby providing a driving connection between the cutter and the barrel member. The tang 3 will of course provide a driving connection with the collet 13.

WHAT WE CLAIM IS:-

1. An adaptor assembly for mounting a shanked tool in a collet member including, in combination, a cylindrical member arranged for fitting in the bore of the collet member, the cylindrical member having at one end a tang for driving engagement with a keyway in the collet member and a cylindrical bore extending from the other end for receiving the shank of the tool, and a key member extending through a radial aperture in the cylindrical member so as to drivingly engage the shank of the tool, the length of the key member being such that it is retained in driving engagement with the shank of the tool by direct engagement with the collet member.

2. An adaptor assembly according to Claim 1 including resilient retention means for retaining the key member in position in the aperture.

3. An adaptor assembly according to Claim 2 wherein an annular groove is formed around the external surface of the cylindrical member and the key member, and wherein the resilient retention means comprises a circlip which is accommodated within the groove.

4. An adaptor assembly according to any preceding claim wherein the cylindrical member is slotted longitudinally and radially to provide a degree of diametric resilience.

5. An adapter assembly substantially as herein described with reference to the accompanying drawings.

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Printed for Her Majesty's Stationery Office, by Croydon Printing Company Limited, Croydon, Surrey, 1980.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY,from which copies may be obtained.

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2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheet 1

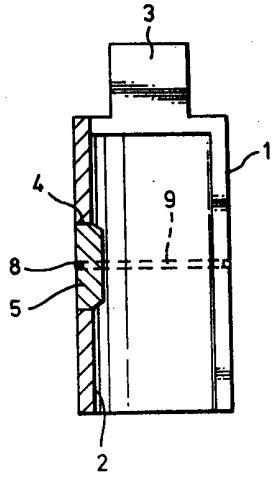

Fig.1.

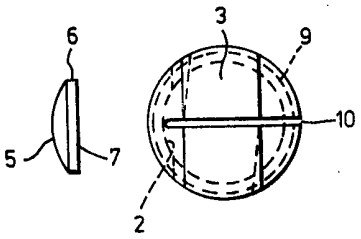

Fig.2.

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2 SHEETS *This drawing is a reproduction of the Original on a reduced scale*

Sheet 2

Fig. 3.