

DESCRIPTION

The present invention concerns the sphere of accessories for numerically controlled machine tools, machining centres, flexible cells and workshops and relates to a boring head for producing precise holes having very strict geometric characteristics using an interchangeable range of boring tools.

Devices for adjusting the selected diameter are currently known but they inevitably exhibit a disequilibrium of mass which leads to an imbalance during the boring operation, this imbalance being more significant, the higher the speeds of rotation. Now modern machines and the new materials used generally allow high cutting speeds.

For this type of toolholder, precision is therefore very important during adjustment and it is also essential to prevent dispersion during the final locking.

To overcome this drawback, FR-A-2 561 555 proposes a balancing device for perforation having the form of two feeders connected to one another at their ends by flexible links and mounted on the perforating toolholder, these feeders being rotatable by means of a single covering and manoeuvring sleeve which can be locked in an adjusted position by a binding screw.

This device obviously allows the imbalance caused by the offset of the tool to be corrected but does not afford sufficient precision to eliminate the imbalance, particularly if the tool has to turn at very high speeds, the two feeders connected to one another by flexible links being difficult to adjust with sufficient precision. Furthermore, this device is also exposed to a problem of wear, in particular of the links joining the feeders, with the result that said links risk expanding and the precision of adjustment is thus affected.

Finally, in the aforementioned document, the positioning of the tool is permitted solely by a receiving bore provided in a radially displaceable and adjustable slider and it is locked merely by an adjusting screw with the result that dispersion during final locking is unavoidable.

CH-A-656 566 on which the preamble of Claim 1 is based also discloses a toolholder in two parts, the tail of which can be positioned in two different positions on a base parallel to the piston or to the bore with the result that said toolholder has a greater range of adjustment not limited solely to the displacement of the piston in its bore by means of the micrometric screw.

However, this device is subjected to significant vibrations, in particular when the tool is significantly offset and is consequently dependent on the speed of rotation of the spindle. The significant imbalance, once a certain speed is reached, can only be eliminated at a low speed of rotation of the spindle.

The object of the invention is to overcome these drawbacks.

In fact, it relates to a boring head consisting of a body equipped with a radial piston for receiving a boring tool gripped by means of a screw, said piston being adjustable in position by means of a micrometer screw, whereby the body is also provided with a slider producing the guidance and orientation for the piston, characterised in that the slider also produces an end-of-travel stop for the piston receiving the boring tool and in that the body is also provided with a balancing device with independent feeders, whereby the slider, which produces the guidance, co-operates with a transverse flat surface of the piston and is actuated on its face remote from that in contact with the piston by a screw for adjusting the operating play between the slider and the piston, said screw being locked in position by a pressure unit.

The invention will be understood better by means of the following description which relates to a preferred embodiment given as a non-limiting example and explained with reference to the accompanying schematic drawings.

Figure 1 is a lateral elevation, in section, of a boring head according to the invention.

Figure 2 is a view along F and partially in section along A-A in Figure 1.

Figure 3 is a view in section along B-B in Figure 1.

Figure 4 is a partial plan view showing the adjustment verniers for adjustment of the balance.

Figure 5 is a partial sectional view showing the installation of a boring tool equipped with a shoulder.

Figures 1 to 3 of the accompanying drawings show a boring head consisting of a body 1 equipped with a radial piston 2 for receiving a boring tool 3 which can be gripped by means of a screw 4, said piston 2 being adjustable in position by means of a micrometer screw 5, whereby the body 1 is also provided with a slider 6 producing the guidance, orientation and an end-of-travel stop for the piston 2 receiving the boring tool 3 and with a balancing device 7 with independent feeders 8 and 9.

When using a boring tool 3 equipped with a shoulder (Figure 5) which allows support on the piston 2, said tool 3 is gripped in said piston 2 by means of screw having a spherical end 11.

The slider 6 which provides the guidance, orientation and end-of-travel stop for the piston 2 cooperates with a transverse flat surface 2' of the piston 2 and is actuated on its face remote from that in contact with the piston by a screw 12

for adjusting the operating play between the slider 6 and the piston 2, said screw being locked in position by a pressure unit 13.

The slider 6 is also provided with a truncated cone-shaped perforation 14 intended to cooperate with a binding screw 15 to lock the piston 2 in position. Thus, after application of the slider 6 against the piston 2 by means of the adjusting screw 12 and locking in position thereof by the pressure unit 13, the slider 6 can be gripped against the piston 2 by means of the binding screw 5 and its position, like that of the tool 3 with which it is equipped, can be locked so as to prevent dispersion.

Finally, the adjusting screw 12 and the slider 6 are respectively provided with a central perforation 12' and 6', the perforation 6' of the slider 6 opening at the side turned toward the piston 2 in a spot face 6" which cooperates with a hole 16 in the piston 2 opening in the housing for receiving the tool 3. It is thus possible to cause the cutting fluid to flow through the centre of the boring head to the plate of the tool 3.

The balancing device 7 with independent feeders 8 and 9 also consists of rings 17 and 18 respectively connected to feeders 8 and 9 by means of screws 19 and 20 which simultaneously lock said rings 17, 18 and feeders 8, 9 in position, after adjustment, the feeders 8 and 9 preferably being in the form of annular quarters of rectangular cross section guided in a groove 24 in the body 1.

The position of the feeders 8 and 9 can therefore be adjusted individually by means of the corresponding rings 17 and 18 so the balance can be adjusted in the optimum manner.

The rings 17 and 18 are advantageously provided with graduations

21 and 22 intended to cooperate with a fixed mark 23 provided on the body 1.

The graduations 21 and 22 in cooperation with the mark 23 allow each ring 17 and 18 to be adjusted with its corresponding feeder 8 and 9 as a function of values pertaining to a boring tool and to its diametral position, these values being readable from tables provided for this purpose.

Owing to the invention it is possible to produce a boring head of which the tool can be adjusted particularly precisely and of which the imbalance caused by rotation of said tool in an eccentric position is compensated by a balancing device with independent feeders.

The invention is obviously not limited to the embodiment described and illustrated in the accompanying drawings.



CLAIMS

1. Boring head consisting of a body (1) equipped with a radial piston (2) for receiving a boring tool (3) gripped by means of a screw (4), said piston (2) being adjustable in position by means of a micrometer screw (5), whereby the body (1) is also provided with a slider (6) producing the guidance and the orientation for the piston (2), characterized in that the slider (6) produces also an end-of-travel stop for the piston (2) receiving the boring tool (3) and in that the body (1) is also provided with a balancing device (7) with independent feeders (8 and 9), whereby the slider (6), which produces the guidance, cooperates with a transverse flat surface (2') of the piston (2) and is actuated on its face remote from that in contact with the piston (2) by a screw (12) for adjusting the operating play between the slider (6) and the piston (2), said screw (12) being locked in position by a pressure unit (13).

2. Boring head according to claim 1, characterized in that the slider (6) is also provided with a truncated cone-shaped perforation (14) intended to cooperate with a binding screw (15) to lock the piston (2) in position.

3. Boring head according to claim 1, characterized in that the adjusting screw (12) and the slider (6) are respectively provided with a central perforation (12' and 6'), the perforation (6') of the slider (6) opening at the side turned toward the piston (2) in a spot face (6'') which cooperates with a hole (16) in the piston (2) opening in the housing for receiving the tool (3).

4. Boring head according to claim 1, characterized in that the balancing device (7) with independent feeders (8 and 9) also consists of rings (17 and 18) respectively connected to feeders (8 and 9) by means of screws (19 and 20) which simultaneously lock said rings (17, 18) and feeders (8, 9) in position, after adjustment, the feeders (8 and 9) preferably being in the form of annular quarters of rectangular cross section guided in a groove (24) in the body (1).



5. Boring head according to claim 4, characterized in that the rings (17 and 18) are advantageously provided with graduations (21 and 22) intended to cooperate with a fixed mark (23) provided on the body (1).