Claims

1.Clamping device for machine tools, comprising a chuck (1.1) and a drawbar (1.2) for clamping separate pallets (1.3), whereby the drawbar (1.2) possesses at least one projection (1.4) for entering a form-locking connection with a separate pallet (1.3) by a rotational motion of that drawbar (1.2),
whereby the chuck (1.1) has an inner guidance channel (4) in which the drawbar (1.2) is loosely positioned
characterized in that
the rotational motion of the drawbar (1.2) is guided and determined by means (2.7, 2.6, 2.4, 3) in the chuck (1.1) interacting with the drawbar (1.2, 2.13),
whereby the drawbar (1.2) is turnable journalled mounted in the inner guidance channel (4) but form-locking designed in respect to the inner guidance channel (4) and in respect of the chuck (1.1) to impede the drawbars extraction (1.2) out of the chuck, independent if the drawbar is in clamping or unclamped condition.

2.Clamping device for machine tools according to claim 1, characterized in that the drawbar is designed as a hollow sleeve (1.2, 4.6) or as a massive element (1.2), preferably the drawbar (1.2) is composed of one or more parts (2.1, 2.9).

3.Clamping device for machine tools according to claim 1 or 2, characterized in that the inner guidance channel (4) has an end contact surface (2.8) which faces a corresponding stop surface (4.4) on the drawbar (1.2) for form-locking and impeding therewith the drawbar's (1.2) extraction out of the chuck (1.1) against the pulling direction of the drawbar (1.2).

4.Clamping device for machine tools according to claim 3, characterized in that the end contact surface (2.8) is orthogonally aligned to the axis of the guidance channel (4),
whereby the drawbar (1.2) has a projection forming the drawbar's stop surface (4.4), preferably that projection is a ring shaped shoulder.

5.Clamping device for machine tools according to one of the preceding claims, characterized in that the drawbar (1.2) has at least one, preferably two, guiding grooves (2.13) at its cylindrical surface.

6.Clamping device for machine tools according to claim 5, characterized in that the guiding grooves (2.13) at the cylindrical surface of the drawbar (1.2) are S-shaped with two axially oriented and from each other displaced arranged straight groove portions (4.1, 4.3) and one intermediate angled groove portion (4.2), connecting both straight groove portions (4.1, 4.3).

7.Clamping device for machine tools according to the claim 5 or 6, characterized in that the guiding grooves (2.13) interact with corresponding guiding pins (2.5) contained in an inner, preferably annular formed, clamping piston (2.7) which is allocated within the chuck housing (2.3), whereby the inner clamping piston (2.7) is axially shiftable within the chuck housing (2.3) but without having the ability to conduct a rotational motion.

8.Clamping device for machine tools according to the claim 7, characterized in that the guiding pins (2.5), allocated and interacting with the guiding grooves (2.13) of the drawbar (1.2), cause the draw bar (1.2) to fulfill a guided and determined rotational motion around its own axis once the clamping piston (2.7) is moved in the axial direction of the chuck housing (2.3), preferably the guiding grooves (2.13) are dimensioned to allow a rotational movement of the draw bar (1.2) of 45 degrees.

9.Clamping device for machine tools according to claims 7 or 8, characterized in that the chuck housing (2.3) has a bottom cover (2.10), the drawbar (1.2) has a tapered lower end section (4.5) in contact with clamping elements (5.1), preferably balls or rollers, allocated between said tapered lower end section (4.5) of the drawbar (1.2) and a also tapered section of the inner clamping piston (2.7),
whereby the last part of the relative movement of the inner clamping piston (2.7) in direction of the bottom cover (2.10) causes the clamping elements (5.1), to pull and press the drawbar (1.2) in the clamping chuck (1.1).

10.Clamping device for machine tools according to claim 9, characterized in that the chuck housing (2.3) further contains springs (2.4), which are acting on the inner clamping piston (2.7) pressing the inner clamping piston (2.7) in direction of the bottom cover (2.10) and
whereby an expandable pressure chamber (3) is formed by the chuck housing (2.3), the bottom cover (2.10) and the shiftable the inner clamping piston (2.7),
whereby the pressure chamber (3) can expand if filled with compressed air by moving the shiftable the inner clamping piston (2.7) away from the bottom cover (2.10) against the force exerted by the springs (2.4).

11.Clamping device for machine tools according to claim 9, characterized in that the movement of the inner clamping piston (2.7) within the chuck housing (2.3) is guided by one or more guiding openings (2.12) located in the inner guidance channel (4) of the chuck ,
preferably said guiding openings (2.12) interact which a section (2.6) of the guiding pins (2.5) attached to the inner clamping piston (2.7) to allow a motion of the inner clamping piston (2.7) in axial direction only.

12.Clamping device for machine tools according to one of the preceding claims, characterized in that the chuck (1.1), preferably its bottom cover (2.10), is

designed with an through-going hole or opening (7.1).

Claims

1. Clamping device for machine tools, comprising a chuck (1.1) having on the chuck housing (2.3) face a coupling interface with xy- and z-reference elements (3.2, 3.3) with corresponding reference surfaces for the positioning of separate pallets (1.3) and
a drawbar (1.2) for clamping the separate pallets (1.3), whereby the drawbar (1.2) possesses at least one projection (1.4) for entering a form-locking connection with a separate pallet (1.3) by a rotational motion of that drawbar (1.2),
whereby the chuck (1.1) has an inner guidance channel (4) in which the drawbar (1.2) is loosely positioned
characterized in that
the rotational motion of the drawbar (1.2) is guided and determined by means (2.7, 2.6, 2.4, 3) in the chuck (1.1) interacting with the drawbar (1.2, 2.13),
whereby the drawbar (1.2) is turnable journalled mounted in the inner guidance channel (4) but form-locking designed in respect to the inner guidance channel (4) and in respect of the chuck (1.1) to impede the drawbars extraction (1.2) out of the chuck, independent if the drawbar is in clamping or unclamped condition.

2. Clamping device for machine tools according to claim 1, characterized in that the drawbar is designed as a hollow sleeve (1.2, 4.6) or as a massive element (1.2), preferably the drawbar (1.2) is composed of one or more parts (2.1, 2.9).

3. Clamping device for machine tools according to claim 1 or 2, characterized in that the inner guidance channel (4) has an end contact surface (2.8) which faces a corresponding stop surface (4.4) on the drawbar (1.2) for form-locking and impeding therewith the drawbar's (1.2) extraction out of

the chuck (1.1) against the pulling direction of the drawbar (1.2).

4. Clamping device for machine tools according to claim 3, characterized in that the end contact surface (2.8) is orthogonally aligned to the axis of the guidance channel (4),
whereby the drawbar (1.2) has a projection forming the drawbar's stop surface (4.4), preferably that projection is a ring shaped shoulder.

5. Clamping device for machine tools according to one of the preceding claims, characterized in that the drawbar (1.2) has at least one, preferably two, guiding grooves (2.13) at its cylindrical surface.

6. Clamping device for machine tools according to claim 5, characterized in that the guiding grooves (2.13) at the cylindrical surface of the drawbar (1.2) are S-shaped with two axially oriented and from each other displaced arranged straight groove portions (4.1, 4.3) and one intermediate angled groove portion (4.2), connecting both straight groove portions (4.1, 4.3).

7. Clamping device for machine tools according to the claim 5 or 6, characterized in that the guiding grooves (2.13) interact with corresponding guiding pins (2.5) contained in an inner, preferably annular formed, clamping piston (2.7) which is allocated within the chuck housing (2.3), whereby the inner clamping piston (2.7) is axially shiftable within the chuck housing (2.3) but without having the ability to conduct a rotational motion.

8. Clamping device for machine tools according to the claim 7, characterized in that the guiding pins (2.5), allocated and interacting with the guiding grooves (2.13) of the drawbar (1.2), cause the draw bar (1.2) to fulfill a guided and determined rotational motion around its own axis once the clamping piston (2.7) is moved in the axial direction of the chuck housing (2.3), preferably the guiding grooves (2.13) are dimensioned to allow a rotational movement of the draw bar (1.2) of 45 degrees.

9. Clamping device for machine tools according to claims 7 or 8, characterized in that the chuck housing (2.3) has a bottom cover (2.10), the drawbar (1.2) has a tapered lower end section (4.5) in contact with clamping elements (5.1), preferably balls or rollers, allocated between said tapered lower end section (4.5) of the drawbar (1.2) and a also tapered section of the inner clamping piston (2.7),
whereby the last part of the relative movement of the inner clamping piston (2.7) in direction of the bottom cover (2.10) causes the clamping elements (5.1), to pull and press the drawbar (1.2) in the clamping chuck (1.1).

10. Clamping device for machine tools according to claim 9, characterized in that the chuck housing (2.3) further contains springs (2.4), which are acting on the inner clamping piston (2.7) pressing the inner clamping piston (2.7) in direction of the bottom cover (2.10) and
whereby an expandable pressure chamber (3) is formed by the chuck housing (2.3), the bottom cover (2.10) and the shiftable the inner clamping piston (2.7),
whereby the pressure chamber (3) can expand if filled with compressed air by moving the shiftable the inner clamping piston (2.7) away from the bottom cover (2.10) against the force exerted by the springs (2.4).

11. Clamping device for machine tools according to claim 9, characterized in that the movement of the inner clamping piston (2.7) within the chuck housing (2.3) is guided by one or more guiding openings (2.12) located in the inner guidance channel (4) of the chuck ,
preferably said guiding openings (2.12) interact which a section (2.6) of the guiding pins (2.5) attached to the inner clamping piston (2.7) to allow a motion of the inner clamping piston (2.7) in axial direction only.

12. Clamping device for machine tools according to one of the preceding claims, characterized in that the chuck (1.1), preferably its bottom cover (2.10), is designed with an through-going hole or opening (7.1).