

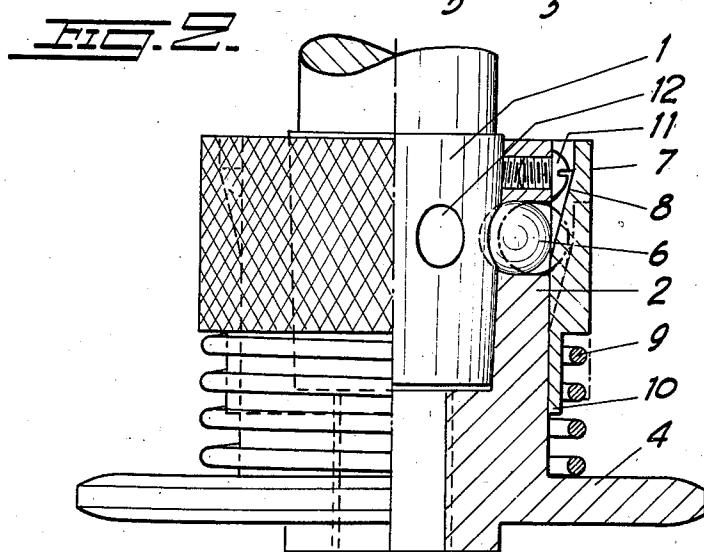
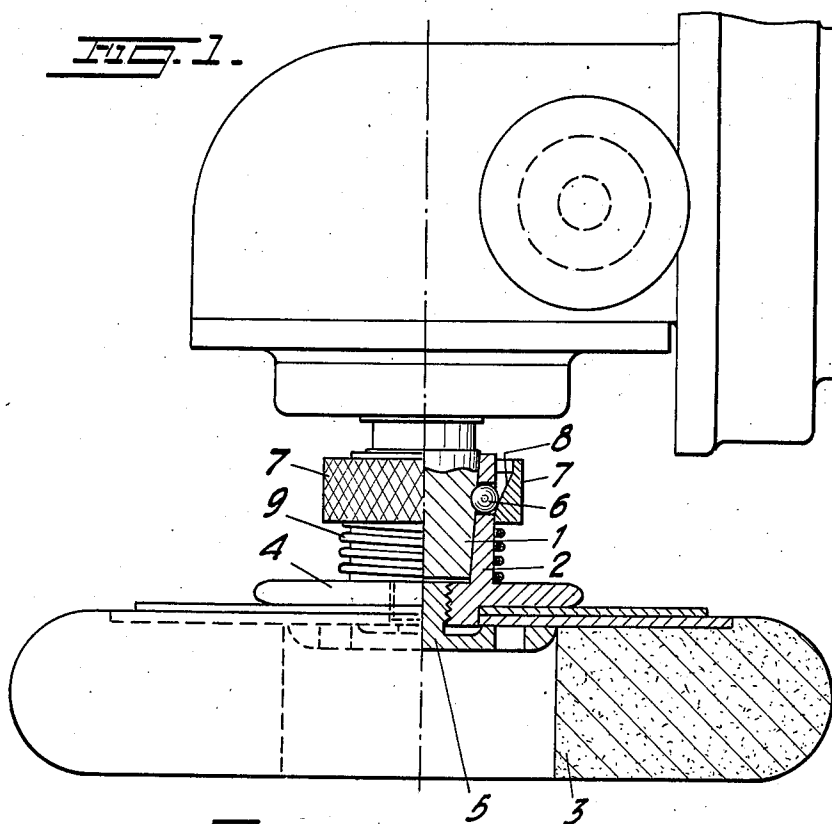
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TOOL HOLDER FOR MACHINE TOOLS

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TOOL HOLDER FOR MACHINE TOOLS

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2 Claims. (Cl. 287—53)

The present invention relates to a tool holder which permits a readily effected and reliable clamping of a tool on a shaft end and likewise a rapid release of the tool. The essential feature of the invention is that the holder comprises a socket or sleeve adapted to be pushed on the shaft end, said socket or sleeve carrying a set of balls adapted to engage recesses formed in the shaft and to remain in this engagement by the action of a ring slidably mounted on the socket or sleeve which is formed with a conical or similar inner surface which in the displacement of the ring in one direction forces the balls into said recesses and in the displacement of the ring in the other direction releases the balls from said engagement.

In the accompanying drawing two embodiments of the invention are shown. Fig. 1 is a side elevation, partly in section, of a tool holder according to one embodiment as used for clamping a grinding disc to a shaft end of a grinding machine. Fig. 2 is a side elevation, partly in section, of a tool holder according to the other embodiment.

It is to be noted that while the invention is illustrated as embodied in a grinding disc holder, it may also be used for many other purposes, without departing from its principle.

With reference to Fig. 1, the numeral 1 indicates a shaft end of the grinding machine. Pushed on the, preferably conical, shaft end is a socket 2 forming part of a holder for a grinding disc 3 clamped against a wheel-shaped portion 4 of the socket by means of a screw 5 engaging a threaded central bore in the bottom of the socket. The means shown in the drawing for clamping the tool to the holder do not form any essential parts of this invention, but may be varied according to the kind of the tool.

The socket 2 is formed with a circular set of holes extending through the side wall of the socket and each adapted to receive a ball 6 the diameter of which is larger than the radial thickness of the side wall of the socket. The balls may move in and out in their holes. The socket is surrounded by a slidable ring 7 having a conical inner surface 8 adapted to engage the balls in order to force them inwardly or allow them to roll outwardly, according to whether the ring is moved in one direction or the other. Inserted between the ring 7 and the wheel-shaped portion 4 of the socket is a helical spring 9, which tends to displace the ring outwardly. Preferably, the holes in the side wall of the socket may be contracted slightly at their inner

ends to permit the balls to project only to a predetermined extent into the bore of the socket. By this feature the balls are caused to act as stops to check the tendency of the spring to displace the ring outwardly.

The bore of the socket 2 is adapted to fit snugly on the conical surface of the shaft end 1. When the socket is placed on the shaft end and pushed inwardly thereon as far as possible, the balls 6 engage corresponding recesses formed in the conical surface of the shaft end and are retained in said engagement by the action of the spring loaded ring 7. This position is shown in Fig. 1. While the shaft is in rotation, the balls will, consequently, act as catch members causing the socket 2 and thus also the grinding disc to rotate with the shaft end.

The mounting of the tool holder may be readily effected. To this end the operator with his one hand pushes the ring 7 towards the wheel-shaped portion 4 against the action of the spring 9, while with his other hand he places the socket 2 on the shaft end and pushes it thereon as far as possible. Then, the operator need only turn the holder until the balls 6 come in register with the recesses of the shaft end 1 and release the ring 7, in order to lock the holder to the shaft end, the released ring being displaced outwardly by the spring, until it forces the balls into engagement with the recesses. The ring then automatically maintains the balls in this engagement.

The embodiment shown in Fig. 2 differs from that above described in that the ring 7 is provided with an inwardly extending projection 10 of an equal inner but smaller outer diameter than that of the ring 7. The shoulder thus formed between the ring 7 and its projection 10 affords an upper support for the spring 9 guided by the projection 10. The latter is such an axial length as to abut against the wheel-shaped portion 4, as the conical surface 8 of the ring releases the balls 6, the projection 10 at the same time limiting the compression of the spring 9.

A screw 11 provided at the upper edge of the socket 2 forms a stop for limiting the outward displacement of the ring 7. This embodiment is completely self-contained, in as much as its various parts can be dismantled only after a removal of the screw 11.

In both of the figures of the drawing the ring 7 is serrated to facilitate its operation. In Fig. 2 one of the recesses in the shaft is shown at 12, as seen in front view.

What I claim is:

1. A tool holder comprising in combination, a tapered shaft end having a ring of separate concave recesses in its tapered surface, a socket comprising a side wall having a conical inner surface to accommodate said tapered end and a disc-shaped bottom member to engage the tool, said side wall having a ring of through-extending holes, a ball in each of said holes, a ring slidably mounted on said side wall, said ring having a conical inner surface adapted upon a displacement of the ring in one direction to force the balls inwards, in order to cause them to engage the concave recesses in the tapered surface of the shaft end, a helical spring to effect said displacement of the ring, and a reduced extension of said ring for guiding and limiting the compression thereof and also limiting the retraction of the ring to release the balls.

2. A tool holder comprising in combination, a 20

tapered shaft end, having a ring of separate concave recesses in its tapered surface, a socket comprising a side wall having a conical inner surface to accommodate said tapered shaft end and a disc-shaped bottom member to engage the tool, said side wall having a ring of through-extending holes, a ball in each of said holes, a ring rotatably and slidably mounted on said side wall, said ring having a conical inner surface adapted upon a displacement of the ring in one direction to force the balls inwards, in order to cause them to engage the recesses in the tapered surface of the shaft end, a helical spring to effect said displacement of the ring, means on the side wall of said socket to limit said displacement, and a reduced extension of said ring for guiding said spring and limiting the compression thereof and also limiting the retraction of the ring to release the balls.

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