Claims

1. Support device (20) for supporting a tube (T) on a tube working machine (10), particularly a laser tube cutting machine, the device (20) comprising
a pivoting arm (22) arranged to be rotatably supported at an end thereof by a base (12) of the machine (10) for rotation about a first axis of rotation (y1) oriented transversely to the direction of the longitudinal axis (x) of the tube (T) as the tube (T) is being fed by a tube-carrying carriage (14) of the machine (10) to a working head (16) of the machine (10),
a cylindrical roller (24) mounted at the opposite end of the pivoting arm (22) with its axis oriented parallel to the first axis of rotation (y1),
a first driving system (28,36,38) for controlling the angular position of the pivoting arm (22) about the first axis of rotation (y1), **characterized in that** the device further comprises a variable-profile support member (26) rotatably mounted at the free end of the pivoting arm (22) for rotation about a second axis of rotation (y2) parallel to the first axis of rotation (y1), wherein the support member (26) has a cavity (40) for receiving the tube (T) whose cross-sectional profile has a variable size depending on the angular position of the support member (26) about the second axis of rotation (y2), and wherein the support member (26) is movable, by rotation about the second axis of rotation (y2), between a working position, in which the support member (26) receives the tube (T) in the cavity (40), and a non-working position, in which the support member (26) is placed underneath the cylindrical roller (24), thereby allowing the tube (T) to be supported on the cylindrical roller (24), and a second driving system (42, 44, 46, 48, 50) for controlling the angular position of the support member (26) about the second axis of rotation (y2).

2. Support device according to claim 1, wherein the cavity (40) of the support member (26) has a cross-sectional profile whose size progressively increases in a given direction of rotation of the support member (26) about the second axis of rotation (y2).

3. Support device according to claim 1 or claim 2, wherein the cavity (40) of the support member (26) has a cross-sectional profile shaped as an arc of circumference.

4. Support device according to any of the preceding claims, wherein the cylindrical roller (24) is arranged with its axis coinciding with the second axis of rotation (y2).

5. Support device according to any of the preceding claims, wherein said first driving system (28, 36, 38) comprises a linear actuator (28) arranged to be hinged at an end thereof to the base (12) of the machine (10) and at the opposite end to the pivoting arm (22), whereby an extension and retraction movement of the linear actuator (28) results in a rotational movement of the pivoting arm (22) about the first axis of rotation (y1).

6. Support device according to claim 5, wherein the linear actuator (28) comprises first and second pneumatic cylinders (30, 30’), each of which has a body (32, 32’) and a rod (34, 34’), wherein the bodies (32, 32’) of the first and second pneumatic cylinders (30, 30’) are attached to each other with the respective rods (34, 34’) facing towards opposite sides, and wherein the rod (34) of the first pneumatic cylinder (30) is arranged to be hinged to the base (12) of the machine (10) while the rod (34’) of the second pneumatic cylinder (30’) is arranged to be hinged to the pivoting arm (22).

7. Support device according to any of the preceding claims, wherein said first driving system (28, 36, 38) comprises a cam mechanism (36, 38) having a cam-shaped control member (36) arranged to be moved along a given direction of movement and a follower (38) which is supported by the pivoting arm (22) and is arranged to cooperate with a control surface (36a) of the cam-shaped control member (36), whereby a movement of the cam-shaped control member (36) along said direction of movement brings about a rotational movement of the pivoting arm (22) about the first axis of rotation (y1).

8. Support device according to any of the preceding claims, wherein said second driving system (42, 44, 46, 48, 50) comprises a pinion (48), a rack (50) arranged to control the rotation of the pinion (48) and a motion transmission mechanism (42, 44, 46) for transmitting the rotational movement of the pinion (48) to the support member (26).

9. Tube working machine (10), particularly for the laser cutting of tubes (T), comprising a base (12), a working head (16), a tube-carrying carriage (14) arranged to feed the tube (T) to be worked to the working head (16), and a plurality of support devices (20) according to any of the preceding claims, wherein the pivoting arm (22) of each support device (20) is rotatably supported at an end thereof by the base (12) for rotation about a first axis of rotation (y1) oriented transversely to the direction of the longitudinal axis (x) of the tube (T) as the tube (T) is being fed by the tube-carrying carriage (14) to the working head (16).

10. Machine according to claim 9, comprising a first actuation unit (52, 54, 56) for
10. simultaneously actuating the first driving systems (36, 38) of some support devices (20) of the machine (10) and a second actuation unit (60, 62) for simultaneously actuating the second driving systems (42, 44, 46, 48, 50) of some support devices (20) of the machine (10).