CLAIMS

1. A winding device (10) for winding and unwinding a flexible line (1) like a cable, hose or the like, including

a frame (11) which can be stationarily mounted;

a hollow-cylindrical winding drum (12) which is mounted to the frame rotatably about an axis of rotation (A), forms an internal space and has an outside (12A) on to and from which ~~a~~ the flexible line can be wound and unwound;

an inner rotary guide (18) for interruption-free guidance of ~~a~~ the flexible line (1) from a fixed point (F) which is fixed with respect to the frame to a rotary point (R) which is rotationally fixed to the winding drum (12) and is relatively rotatable about the axis of rotation with respect to the fixed point,

wherein the rotary guide between the fixed point and the rotary point predetermines a line path with two oppositely directed windings (18A, 18B) with a first winding direction about the axis of rotation (A), a direction-changing means (18C) which is rotatable about the axis of rotation and in which the line is changed over from the one winding (18A) into the other winding (18B) and a second winding direction in opposite relationship to the first winding direction;

wherein the inner rotary guide (18) is accommodated at least predominantly and preferably completely in the internal space (12B) of the winding drum (12);

characterised in that the winding drum (12) has a first opening (15A) at a first end, on the side of which the rotary point (R) of the inner rotary guide (18) is provided, which opening (15A) opens out at the first end in the axial direction with respect to the axis of rotation (A), and that provided at the opposite second end is a holding portion (19B) which is non-rotatably connected to the frame and which has a second opening (15B) which opens outwardly in a radial plane perpendicularly to the axis of rotation (A) so that a line (1) to be wound can be laid from the outside through the first opening

to the rotary point (R) in the inner rotary guide, in the inner rotary guide and from the fixed point (F) thereof through the second opening and vice-versa.

2. A winding device according to claim 1 characterised in that the inner rotary guide has a belt-like line guide device (18) for receiving ~~a~~ the flexible line and wherein the line guide device forms one or more first spiral layers (18A) in which ~~a~~ the received flexible line is wound about the axis of rotation in the first winding direction, one or more second spiral layers (18B) in which the received flexible line is wound in the opposite direction about the axis of rotation in the second winding direction, and a direction-changing arc (18C) which connects the two spiral layers and in which the received flexible line (1) is changed over.

3. A winding device according to claim 2 characterised in that the line guide device (18) is composed of individual members which preferably each have at the radial outside a continuous gap which can be expanded to insert ~~a~~ the flexible line into the respective member.

4. A winding device according to claim 1, claim 2 or claim 3 characterised in that the inner rotary guide (18) is connected to the holding portion (19B) to provide a guide unit, wherein the guide unit and the winding drum are releasable from each other, wherein the guide unit is preferably completely accommodated in the internal space in the winding drum.

5. A winding device according to one of claims 1 to 4 characterised in that the winding drum (12) is of a one-piece configuration, in particular in the form of a peripheral cylindrical casing; or

the winding drum is of a multi-part structure comprising a number of releasably connected individual parts, in particular a cylindrical casing comprising at least two casing portions which can be releasably connected; or

the winding drum (22C) has an insertion slot (24) for the insertion of ~~a~~ the flexible line, which slot starts from the first opening (15A) and extends continuously to the second end, in particular in the axial direction; or

the winding drum (12) is mounted to the frame (11) releasably at the first end of the drum by means of a coupling flange (19A).

6. A winding device according to one of claims 1 to 5, in particular according to claim 5, characterised in that provided on the frame (11) is a drive device (16) which in the assembled position is torque-transmittingly coupled to the first end of the winding drum (12), in particular releasably with the coupling flange (19A).

7. A winding device according to claim 6 characterised in that the drive device is in the form of a spring drive (16A) for automatically winding on, wherein preferably an automatic winding means (17) having a reverse-motion lock (17A) is associated with the spring drive.

8. A winding device according to one of claims 1 to 7 characterised in that the holding portion is designed in the manner of a support disc (19B) with a support region which at least region-wise is in the form of a circular ring and at which the second end of the winding drum (12) is slidingly or rollingly rotatably mounted, preferably with support rollers (19D), on which an inside of the winding drum (12) is rotatably mounted and/or the holding portion (19B) forms the fixed point (F) that is fixed with respect to the frame of the inner rotary guide.

9. A winding device according to one of the preceding claims wherein the frame (11) has two oppositely disposed holding plates (11A, 11B), between which the ends of the winding drum (12) are held; or the frame has precisely one holding plate at the first end of the winding drum, wherein the holding portion is fixed in opposite relationship to a holding shaft which is coaxial with the axis of rotation (A).

10. A winding device according to one of the preceding claims characterised in that there is provided a winding adjustment mechanism (14) with a guide head (14A) which is displaceable parallel to the axis of rotation for guiding a line during the winding-on operation, wherein the guide head is coupled to the rotary movement of the winding drum (12) by way of a transmission means, in particular a spindle drive (14B), so that the winding-on point of the line (1) on the winding drum is displaced in the axial direction during rotation of the winding drum.

11. A winding device according to one of the preceding claims characterised in that the winding drum has a cylindrical casing with a spiral profiling (13) at the outside for winding on the line (1) in guided fashion.

12. A winding device according to one of the preceding claims characterised in that the inner rotary guide, the winding drum and/or the holding portion at least predominantly comprise plastic parts.

13. A winding device according to one of the preceding claims characterised in that at the first end, in particular at the first opening, the winding drum (22A) has a holding tongue (23), on which there is provided a strain-relief means for the line (1).

14. A winding device according to one of the preceding claims including precisely one electrical control signal cable and/or power supply cable (1) which can be wound and unwound, that is guided interruption-free by the inner rotary guide (18) from the fixed point (F) to the rotary point (R).

15. Use of a winding device according to one of claims 1 to 14 for the stowage of ~~a~~ the flexible line and for winding ~~a~~ the flexible line on and off as required, in particular ~~a~~ the flexible line which is ready-made or which is already connected at least at one end and/or a line connected to a portable device, like for example in a factory or workshop.