CLAIMS

1. A line routing apparatus (10) for guiding a plurality of lines like cables, hoses or the like, for hanging applications like for example supplying a vertically travelling top drive (3) of a drilling rig (1) or the like, including:

- a flexible carrying strand (11) which has tensile strength and which extends over the length of the line routing apparatus, and

- a number of guide bodies (14, 34) arranged in succession in the longitudinal direction of the carrying strand,

- wherein adjacent guide bodies (14) can be spatially deflected relative to each other and each guide body has a central part (15A) having a central axis (A) extending coaxially relative to the carrying strand (11) and an outer part (15B) having at least one peripheral element (17), wherein the peripheral element (17) outwardly delimits a receiving region (L) open in the axial direction for the lines and is held to the central part (15A),

- wherein in each guide body (14, 34) the outer part (15B) is openable, and

- wherein at least some guide bodies (14, 34) at their central part (15A) have a respective fixing device (18) for fixing the central part (15A) to the carrying strand (11),

characterised in that

- the central part (15A) has two axially projecting mutually opposite joint regions (26A, 26B), wherein the joint regions are of conjugate configuration, wherein the one joint region (26A) can be releasably introduced in the axial direction into the other conjugate joint region (26B) of an adjacent guide body, and wherein the joint connection of successive guide bodies (14) is axially releasable and loose in the axial direction;

or

- provided as the fixing device (18) is a screw clamping device with clamping screw , the guide bodies (34) are fixed to the carrying strand (11) in axially mutually spaced force-locking relationship by means of their fixing

device and the central part (15A) has no conjugate mutually opposite joint regions.

2. A line routing apparatus (10) for guiding a plurality of lines like cables, hoses or the like, for hanging applications like for example supplying a vertically travelling top drive (3) of a drilling rig (1) or the like, including:

- a flexible carrying strand (11) which has tensile strength and which extends over the length of the line routing apparatus, and

- a number of guide bodies (14) arranged in succession in the longitudinal direction of the carrying strand,

- wherein adjacent guide bodies (14) can be spatially deflected relative to each other and each guide body has a central part (15A) having a central axis (A) extending coaxially relative to the carrying strand (11) and an outer part (15B) having at least one peripheral element (17), wherein the peripheral element (17) outwardly delimits a receiving region (L) open in the axial direction for the lines and is held to the central part (15A),

wherein in each guide body (14, 34) the outer part (15B) is openable, and

- wherein at least some guide bodies (14, 34) at their central part (15A) have a respective fixing device (18) for fixing the central part (15A) to the carrying strand (11),

characterised in that

the carrying strand (11) is in the form of a link chain and the guide bodies (14) are fixed to the carrying strand in axially mutually spaced relationship, wherein two respective successive central parts are spatially deflectably connected by one or more chain links of the carrying strand (11).

3. A line routing apparatus according to claim 1 or claim 2 characterised in that the at least one peripheral element (17) is connected releasably, moveably and/or pivotably to the central part (15A).

4. A line routing apparatus according to claim 1, claim 2 or claim 3 characterised in that at least some and in particular all guide bodies (14) at their at least one peripheral element on the outside have an elastic buffer (19) for shock absorption.

5. A line routing apparatus according to claim 1 characterised in that the fixing device is a clamping and/or locking device (18) which to fix the central part (15A) to the carrying strand (11) fixes the central part in force-locking relationship with an inside surface of the through opening to the carrying strand (11).

6. A line routing apparatus according to claim 5 characterised in that as the fixing device there is

- a clamping device (18) in the form of a joint clamping shell having a hinge-like joint (24) which connects two shell-shaped regions (21A, 21B) which can be braced against the carrying strand, or
- a quick release clamp, latching clamp or the like, which at least partially reduces the free diameter of the through opening.

7. A line routing apparatus according to claim 2 characterised in that each central part (65A) forms a chain link, wherein two successive central parts are respectively spatially deflectably connected by at least one intermediate member (62).

8. A line routing apparatus according to claim 1 characterised in that the carrying strand (71) has carrying bodies (72) which are mounted stationarily in the longitudinal direction of the carrying strand and to which

the central parts (75A) are fixed in positively locking relationship by means of the respective fixing device (77).

9. A line routing apparatus according to one of claims 1 to 8 characterised in that the outer part of each guide body has two peripheral elements (17) which are respectively connected to the central part pivotably by way of a rotary joint (23) in order to insert lines into the receiving region or remove them from same, wherein the peripheral elements (17) are preferably in the shape of a half ring and/or are in the form of identical parts.

10. A line routing apparatus according to claim 4 characterised in that the elastic buffer (19) is made from an elastomer and/or the buffer is of a ring-shaped or toroidal configuration, wherein the buffer preferably surrounds the peripheral element or elements (17) over the full periphery.

11. A line routing apparatus according to claim 10 characterised in that all guide bodies (14) have a buffer (19) and each buffer projects axially with respect to the peripheral element or elements (17) or is axially flush therewith so that the buffers of adjacent guide bodies limit the maximum angle of the spatial deflection of said guide bodies (14) relative to each other as abutments.

12. A line routing apparatus according to one of claims 1 to 11 characterised in that the carrying strand has a first end (11A) and a second end (11B), wherein each end has a connecting device (80) for releasably fixing (84) the line routing apparatus.

13. A line routing apparatus according to claim 12 characterised in that each connecting device (80) has at least two oppositely disposed holding arms (85A, 85B) fixed to the connecting device for tensile strain relief of lines.

14. A line routing apparatus according to claim 1 characterised in that the joint regions form a ball joint-like joint connection (27A, 27B) for spatial deflection of adjacent guide bodies.

15. A line routing apparatus according to claim 1 characterised in that the central part (15A) has an axial through opening (16) which forms the central axis (A) and through which the carrying strand (11) extends and the through opening (16) has mutually opposite mouth regions (36) which enlarge radially outwardly.

16. A line routing apparatus according to claim 5 characterised in that the central part (15A) of each guide body (14) includes two one-piece carrying arms (20A, 20B) which respectively have an inner clamping shell (21A, 21B) and a radial bar (22A, 22B), wherein the clamping shells can be connected to form therebetween the through opening (16) for the carrying strand (11) and the bars (22A, 22B) have an outer end region to which the outer part (15B), in particular both peripheral elements, is or are connected (23).

17. A line routing apparatus according to claim 5 characterised in that the central part (15A) at the inside at the through opening (16) has a clamping tooth arrangement (28) extending transversely relative to the central axis (A) for axial securing to the carrying strand (11) and/or the carrying strand is in the form of a carrying cable (11) of plastic and/or is of a length of at least 5 m, in particular at least 10 m.

18. A line routing apparatus according to one of the preceding claims characterised in that it has a first substantially vertically downwardly hanging length portion (12A) having a first end (12C) connected to a consumer (M) to be supplied, a second substantially vertically downwardly hanging length portion (12B) having a second end (12D), and a loop (13)

connecting the two downwardly hanging length portions and the carrying strand (11) is extended beyond both ends (12C, 12D).

19. A guide body for a line routing apparatus according to claim 1 including a central part (15A) having an axial through opening (16) which forms a central axis (A) and through which a carrying strand (11) can be passed, and an outer part (15B) having at least one peripheral element (17), wherein the peripheral element outwardly delimits a receiving region (L) open in the axial direction for the lines and is held to the central part (15A), wherein provided on the central part (15A) is a fixing device (18) for stationarily fixing the central part (15A) to a carrying strand (11), characterised in that

- the central part (15A) as the fixing device has a clamping and/or locking device (18) to fix the central part in force-locking relationship with an inside surface of a through opening to a carrying strand in the form of a carrying cable, and

- the central part (15A) has two axially projecting mutually opposite joint regions (26A, 26B), wherein the joint regions are of conjugate configuration so that the one joint region (26A) can be releasably introduced in the axial direction into the other conjugate joint region (26B) of an adjacent guide body, or

- the central part (15A) has no conjugate mutually opposite joint regions, wherein the fixing device (18) is a screw clamping device with clamping screw.

20. A guide body according to claim 19 characterised in that on the outside the peripheral element (17) has an elastic buffer (19) for damping radial shocks.

21. A guide body according to claim 19 characterised by the characterising features according to one of claims 3 to 6 or 8 to 18.

22. A drilling rig (1) having a rotary power head (3) or top drive including a line routing apparatus (10) according to one of claims 1 to 18 for supplying the top drive.

23. Use of a line routing apparatus (11) according to one of claims 1 to 18 as a service loop in an onshore or offshore drilling rig (1), in a deep drilling installation or the like, comprising two substantially vertically downwardly hanging length portions (12A, 12B) connected by a loop (13).