CLAIMS

1. An apparatus (1) for laying an elongated element (5) into a duct, comprising:

a driving unit with a two-belt conveyer (10, 20) for driving the elongated element into the duct, forming an inlet part (71) into which the cable is inserted in the driving unit and an outlet part (72) from which the elongated element is sent out of the driving unit, and

a fiber protecting unit for the elongated element,

wherein the fiber protecting unit comprises at least a non-parallel belt setting system (10, 20), for setting the two-belt conveyer (10, 20) in a non-parallel fashion during driving of the elongated element into the duct.

2. The apparatus (1) according to claim 1, comprising a precise clamping force setting means for setting a clamping force exerted by the two-belt conveyer (10, 20) onto the cable so as to allow slippage between the elongated element and two-belt conveyer (10, 20) during the driving of the elongated element into the duct and before an actual buckling force exceeds a predetermined buckling force.

3. The apparatus (1) according to claim 1, comprising stepped belts having a stepped contact surface with the elongated element, when seen in a transverse direction of the elongated element.

4. The apparatus (1) according to claim 1, wherein the two-belt conveyer (10, 20) comprises:

an upper belt conveyer (10) including a first drive roller (15), a first idler roller (16) and a first flexible belt (11),

a lower belt conveyer (20) including a second drive roller (25), a second idler roller (26) and a second flexible belt (21),

wherein a lower surface of the first flexible belt (11) and an upper surface of the second flexible belt (21) extend in non-parallel to form a gap therebetween that gradually narrows towards the outlet part (72), and wherein a clamping force (F1) is configured to be imparted to the elongated element at a position between the first and second drive rollers (15, 25).

5. The apparatus (1) according to claim 4, wherein:

- the first and the second idler roller (16, 26) and
- the first and second drive rollers (15, 25),

are respectively disposed in a manner that both the first and second flexible belts (11, 12) apply a contact pressure to the elongated element which is greater at the outlet part (72) side than at the inlet part (71) side.

6. The apparatus (1) according to claim 1, wherein the two-belt conveyer (10, 20) comprises:

an upper belt conveyer (10) including a first drive roller (15), a first idler roller (16) and a first flexible belt (11),

a lower belt conveyer (20) including a second drive roller (25), a second idler roller (26) and a second flexible belt (21),

wherein the upper belt conveyer (10) is configured to change an angle of a lower surface of the first flexible belt (11) whereas the lower belt conveyer (20) is configured to change an angle of an upper surface of the second flexible belt (21) in accordance with a diameter of the elongated element (5a, 5b).

7. The apparatus (1) according to claim 6, further comprising elastic elements (51, 52) for adjusting clamping force (F1, F2).

8. The apparatus (1) according to claim 3, wherein the two-belt conveyer (10, 20) comprises:

an upper belt conveyer (10) including a first drive roller (15), a first idler roller (16) and a first flexible belt (11), the first flexible belt (11) being formed as a stepped belt, and

a lower belt conveyer (20) including a second drive roller (25), a second idler roller (26) and a second flexible belt (21), the second flexible belt (21) being formed as a stepped belt,

wherein the first flexible belt (11), in a sectional view, comprises:

- at least a first and a second and preferably a third horizontal surface (111a, 111b, 111c) and

- at least a first and preferably a second vertical surface (111s, 111t),

wherein the second flexible belt (21), in a sectional view, comprises:

- at least a first and a second and preferably a third horizontal surface (211a, 211b, 211c) and

- at least a first and preferably a second vertical surface (211s, 211t),

and wherein the flexible belts (11, 21) are configured to laterally guide the elongated element between the second horizontal surfaces (111b, 211b) and between the second vertical surfaces (111t, 211t).

9. The apparatus (1) according to claim 8, wherein the first and second flexible belts extend in non-parallel along a conveying direction of the elongated element.

10. The apparatus (1) according to claims 8 or 9, wherein, when an elongated element is driven by the apparatus:

- a gap is present between the first horizontal surface (111a) of first flexible belt (11) and third horizontal surface (211c) of second flexible belt (12),

and/or

- a gap is present between the third horizontal surface (111c) of first flexible belt (11) and first horizontal surface (211a) of second flexible belt (12).

11. The apparatus (1) according to any one of claims 4 or 6 or 8, wherein a distance between the first and second drive rollers (15, 25) is changeable to adjust a clamping force (F1).

12. The apparatus (1) according to any one of claims 1 to 10, further comprising an infeed guide (7) near the outlet part (72).