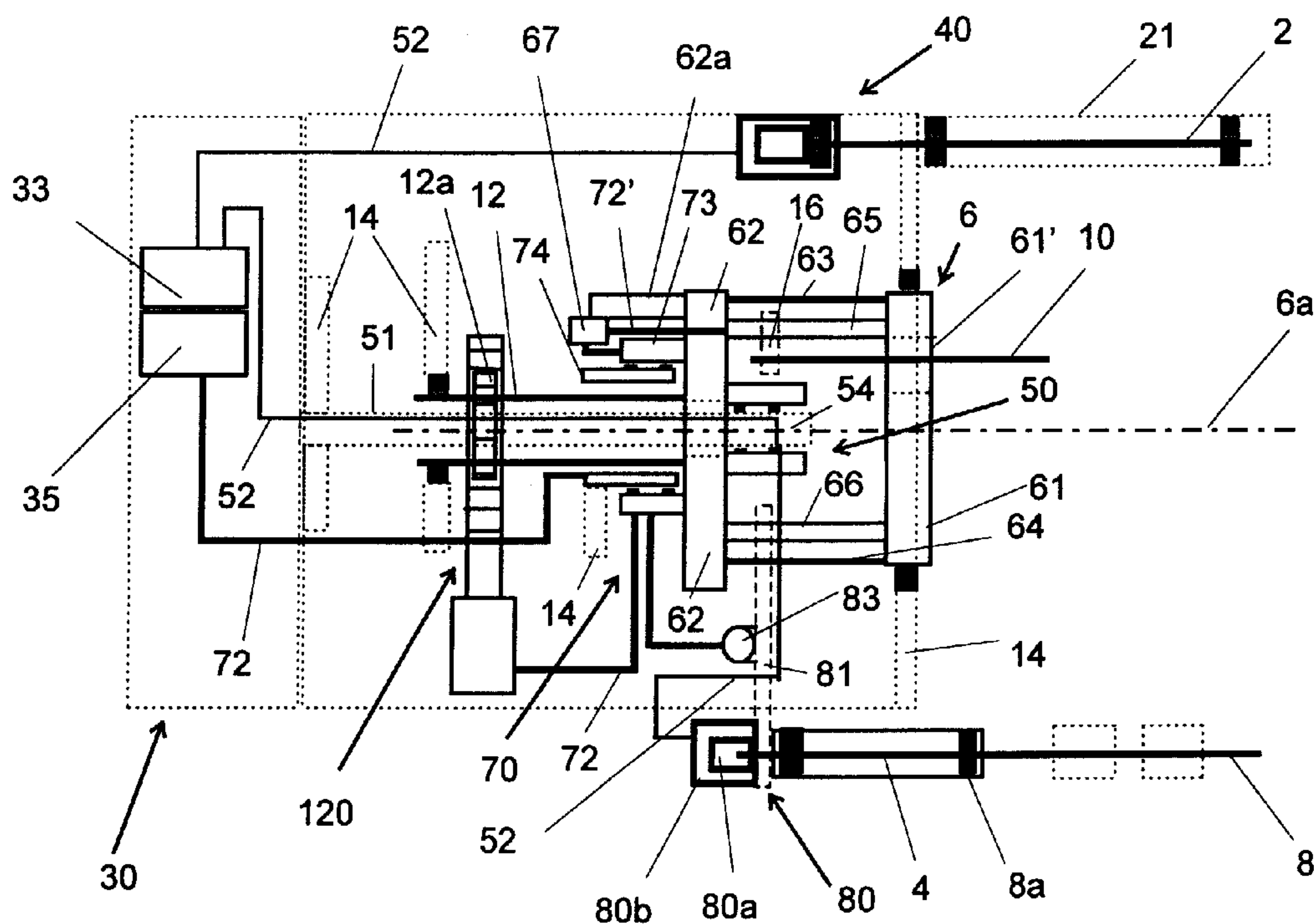




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(54) **DISPOSITIF DE BOBINAGE DE FILS SANS FIN**
(54) **WINDING DEVICE FOR ENDLESS YARNS**



(57) In a winding device for endless yarn with a least one turning centre (6a) for at least one chuck (8, 10), which is being connected with driving devices (80, 83, 67), to these driving devices at least one electrical and one mechanical, in particular a pneumatic control unit (33, 35) is being arranged, which through lines (52, 72) via several rotation transmitters (50, 70), being arranged within the turning centre, are in operational connection with the driving devices. Each rotation transmitter consists of a rotor (53, 73) and a stator (54, 74) which are arranged coaxially in relation to each other and to the turret. Preferably an electric rotation transmitter is being arranged within the turning axis or the turning centre of the turret 6, while a pneumatic rotation transmitter is being arranged in particular for pneumatic lines outside the circumference of a shaft (12) of the turret.

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Summary

In a winding device for endless yarn with a least one turning centre (6a) for at least one chuck (8, 10), which is being connected with driving devices (80, 83, 67), to these driving devices at least one electrical and one mechanical, in particular a pneumatic control unit (33, 35) is being arranged, which through lines (52, 72) via several rotation transmitters (50, 70), being arranged within the turning centre, are in operational connection with the driving devices. Each rotation transmitter consists of a rotor (53, 73) and a stator (54, 74) which are arranged coaxially in relation to each other and to the turret. Preferably an electric rotation transmitter is being arranged within the turning axis or the turning centre of the turret 6, while a pneumatic rotation transmitter is being arranged in particular for pneumatic lines outside the circumference of a shaft (12) of the turret.

Fig. 1

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Winding device for endless yarns

The invention relates to a winding device according to the preamble of the independent claim. A similar invention is disclosed with the European patents 98811175.3 and EP 98811174.6, whose content is to be considered as part of the present disclosure.

Besides an increase in performance with the development of winding devices, the emphasis lays in a cost and space saving design. From the European patent 0 073 930 a winding automat is known with several drives that can be operated independently of each other, whereat the chucks (bobbin holding schuckdle) are arranged individually on a tacho roller which are movably towards and away from it. Each single drive is provided with lines, for instance to control electric motors or pneumatic operating elements which are being connected with one or several control units.

It is the object of the present invention to provide a winding device which is of a most possible compact design whereat a fewest possible number of freely movable lines lead from the control units to the single driving devices.

The task is being solved with a device according to the characteristics of the independent claim. The depending claims relate to preferred further embodiments.

The winding device for endless yarns according to the invention with at least one turning centre for at least one chuck, which is being connected with driving devices is characterised in that to these drives at least one electrical and one mechanical or pneumatic control unit is being arranged, which, through lines, via several rotation transmitters, being arranged within the turning centres, are in operational connection with the driving devices, whereat each rotation transmitter comprises a rotor and a stator each.

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A turret carrying several chucks is being rotatably supported in a frame and which turret is connected with a first driving device, which driving device is being connected via a rotation transmitter and lines to an electrical and/or mechanical control unit. The term „mechanical“ in particular is to be understood as „pneumatic“.

A chuck comprises an electric driving device in particular, which is connected through a rotation transmitter and lines with an electrical control unit in particular.

The lines can be led to one of the rotation transmitters on a turret, along the turning centre.

The lines are routed within a tube being arranged coaxially with the turning centre, which tube is being attached on a frame.

The stationary part or the stator of a rotation transmitter is being fastened within the turret on a tube, coaxially with said turret.

The lines of the control unit are thus being led within a shaft of the turret to a rotation transmitter.

A stator is being arranged around the shaft and fastened to a part of the frame.

The turret is furnished with a rotary disk which is supported rotatably within the frame, which rotary disk is being connected with a yoke via support rods.

The rotors are being fastened on a yoke of the turret.

Between the rotary disk and the yoke axes extend, axial-parallel to the turning centre, whereat these axes within the turret are being supported rotatably as well as longitudinally shiftable.

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At least one axis can be shifted in longitudinal direction by means of an actuator, which is being fastened on the yoke of the turret.

On the turret swinging arms are being fastened which support chucks, whereat the swinging arms are in particular being connected, preferably fixedly, with the axes.

The chucks are being driven by shafts, which are being supported rotatably in a support tube on a swinging arm and which are being provided with driving devices.

One driving device consists of an electric motor, whereat the rotor is directly plugged onto the shaft and the casing is being flanged onto the swinging arm or the support tube.

One rotation transmitter is being arranged within the turret, where it in particular is being partly attached to a yoke of the turret, and a second rotation transmitter is being fastened outside the turret.

In the following the invention is being described in more detail according to a schematic illustration of a winding automat shown in a cross sectional view through the turning centre of a turret on which chucks are mounted.

The turret 6 comprises a rotary disk 61 and a turret yoke 62, which can be rotated around a turning centre 6a and which are being connected via rods 63, 64 which run parallel to the turning centre 6a. Furthermore there are axis 65 and 66 between the rotary disk 61 and the turret yoke 62, said axes are being shiftable in longitudinal direction and rotatable with the turret 6. In the upper part of the figure an actuator 67 for the axis 65 is being shown, which performs the longitudinal shifting of the axis 65. Thereby a swinging arm 16 is being shifted in the longitudinal direction of the turning centre 6a, said swinging arm carrying a first chuck for yarn bobbins. A further swinging arm 81 is fastened onto an axis 66, which swinging arm 81 holds a support tube 8a, in which a second chuck 8 is being supported rotatably. The yarn bobbins

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are shown in a dotted line on the second chuck 8. The second chuck 8 is being driven via a shaft 4 by the driving device 80, which comprises a rotor 80a and a stator, a casing 80b respectively, whereat the rotor is mounted directly onto the left end side of the shaft 4. As driving device for the chucks 8 or 10 preferably an asynchronous motor is being applied. The bearings, in particular the roller bearings, are shown as shaded squares in the figure. The bearing for instance serves to support a tacho roller 2 in a support 21 on a frame 14, further the left end of the tacho roller 2 in a second driving device 40, which is also fixedly supported in the frame. The turret 6 is being connected with a hollow shaft 12 on the left side of the turret yoke 62, said hollow shaft is also being supported by a roller bearing on its left end side in the frame 14. A further driving device 120 in the form of a toothed rack with a pneumatic cylinder, which meshes with a gear wheel 12a on the shaft 12, turns the turret 6 by half a revolution each in order to bring a further chuck 8 or 10 near the tacho roller or friction roller during an exchange of bobbins. In order to pivot the second chuck 8 on the axis 66, a motor 83, preferably in the form of a pneumatically operated cylinder is being fastened to the second swinging arm 81.

The driving device 80, the actuator 67, the positioning motor 83 etc. together with the turret 6 are being rotated around the turning centre 6a during the operation of the winding device, whereat the lines 72' or 52' are mounted fixedly onto the turret 6. On the other hand the lines 72 and 52 have to be led from the control unit 33, 35 to the turret, whereat the latter lines are fixedly fastened in the frame 14. Between the lines 52, 72 and 52', 72' respectively, the rotation transmitters 50, 70 are being positioned, whereat lines 52 from an electric control unit 33 are led to the turret 6, which lines are continued as electric lines 52', while mechanical and pneumatic lines 72 respectively are continued from a mechanical or pneumatic control unit 35 on the turret 6 as pneumatic lines 72'. The pneumatic control unit 35 and the pneumatic lines 72 respectively, are being supplied with pressurised air from a not further shown source of pressurised air. At the transition points between the lines 52, 72 and 52' 72' respectively, there is each an electric rotation transmitter 50 and a pneumatic rotation transmitter 70 respectively, each of which comprises a rotor 53, 73 and a

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stator 54, 74 respectively. The rotor 53 is being fastened within the turret 6 on the right side of the turret yoke 62, which by means of a projecting part 62a carries the pneumatic actuator 67. Said actuator is being provided with and position dampers so that impacts occurring on the chuck 10 during shifting of the first chuck parallel to the rotation centre 6a can be absorbed. Between the frame 14 and the turret 6 a tube 51 is being arranged concentrically with the turning centre 6a and the turret, within said tube electric lines lead to the stator 54 of the electric rotation transmitter 50. By means of sliding contacts driving power and signals can be transmitted via the rotor 53 and a line 52 to the driving device 80. The main control unit 30 which comprises the electric control unit 33 and the pneumatic control unit 35 is preferably arranged in a housing on the left side of the frame 14.

The rotor 73 of the pneumatic rotation transmitter 70 is flanged onto the outer left side of the turret yoke 62, said transmitter communicates with stator 74, which again is mounted fixedly on the frame 14 and which encompasses the shaft 12 of the turret.

With the concentric arrangement of the electric and pneumatic rotation transmitters 50 and 70, on and within the turret 6 a space saving design results. All lines, except within the transition zone between the main control unit 30 and the frame 14, if these are movable towards one another, can be laid fixedly onto the respective movable or immovable parts such as the turret 6 or the frame 14. This results in a clearly laid out arrangement of all driving elements on a smallest possible space.

Electronic, mechanical (pneumatic) rotation transmitters as described in the disclosure of US 42 13 573 or DE 24 59 990A1 and 2524415 can be applied within the scope of the present invention described.

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Claims

1. Winding device for endless yarns with at least one turning centre (6a) for at least one chuck (8, 10) which is being connected with driving devices (80, 83, 67), **characterised in that** to these driving devices at least one electrical and one mechanical or pneumatic control unit (33, 35) is being arranged, which, through lines (52, 72) via several rotation transmitters (50, 70), being arranged within the turning centres (6a), are in operational connection with these driving devices, whereat each rotation transmitter comprises a rotor (53, 73) and a stator (54, 74) each.
2. Device according to claim 1, **characterised in that** a turret (6) carrying several chucks is being rotatably supported in a frame (14), and which turret is connected with a first driving device (120), which driving device is being connected via a rotation transmitter (70) and lines (72) to an electrical and/or mechanical control unit (33,35).
3. Device according to claim 1 or 2, **characterised in that** a chuck (8) is furnished in particular with an electric driving device (80), which is connected through a rotation transmitter (50) and lines (52,52') with a electrical control unit (33) in particular.
4. Device according to one of the preceding claims, **characterised in that** lines (52 and 72) are being led to a rotation transmitter on a turret (6) along the turning centre (6a).
5. Device according to claim 4, **characterised in that** lines (52, 72) are routed within a tube (51) being arranged coaxially with the turning centre (6a), which tube is being fastened on a frame (14).

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6. Device according to claim 5, **characterised in that** the stationary part or stator (54) of a rotation transmitter (50, 70) is being fastened within the turret (6) on a tube (51), coaxially with said turret.
7. Device according to claim 6, **characterised in that** lines (52) are being led from a control unit (33) within a shaft (12) of the turret (6) to a rotation transmitter (50).
8. Device according to claim 7, **characterised in that** that a stator (74) is being arranged around the shaft (12) and fastened to a part of the frame (14).
9. Device according to one of the preceding claims, **characterised in that** the turret (6) is furnished with a rotary disk (61) which is supported rotatably within the frame (14), which rotary disk is being connected with a yoke (62) via rods (63).
10. Device according to claim 9, **characterised in that** the rotors (53, 73) are being fastened on a yoke (62) of the turret (6).
11. Device according to claim 10, **characterised in that** axes (65,66) extend between the rotary disk (61) and the yoke (62), axial-parallel to the turning centre (6a), whereat these axes within the turret (6) are being supported rotatably as well as longitudinally shiftable.
12. Device according to claim 11, **characterised in that** at least one axis (65) can be shifted in longitudinal direction by means of an actuator (67) which is being fastened on the yoke (62) of the turret (6).
13. Device according to claim 12, **characterised in that** on the turret (6) swinging arms (16,81) are being fastened which support the tensions schuckdles (8,

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10), whereat the swinging arms (16,81) are in particular being connected, preferably fixedly, with the axes (65,66).

14. Device according to claim 13, **characterised in that** the chucks (8,10) are being driven by shafts (4), which are being supported rotatably in a support tube (8a) on a swinging arm (81, 16) and which are being provided with driving devices (80).
15. Device according to one of the preceding claims, **characterised in that** a driving device (80) is an electric motor, whereat the rotor (80a) is plugged directly onto the shaft (4) and the casing (80b) is being flanged onto the swinging arm (81) or the support tube (8a).
16. Device according to one of the preceding claims, **characterised in that** one rotation transmitter (50) is being arranged within the turret (6), where it in particular is being partly attached to a yoke (62) of the turret (6), and that a second rotation transmitter (70) is being fastened outside the turret.
17. Device according to one of the preceding claims, **characterised in that** for the tacho roller (2) an electric motor is being arranged within the driving device (40), whereat the rotor of the electric motor is mounted directly on the shaft which is being connected with the tacho roller (2) and which is being supported in the frame (14) and whereat the casing of the driving device (40) is being attached directly to the frame (14).
18. Device according to claim 17, **characterised in that** the rotor is being supported by an additional bearing within the casing or within the frame.

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