

PATENT SPECIFICATION

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(54) A MEASURING AND CHECKING DEVICE FOR ROLLER TRACKS COMPRISING JUXTAPOSED ROLLERS

(71) We, **MANNESMANN AKTIENGESELLSCHAFT**, a German Body Corporate, of Mannesmannufer 2, 4 Düsseldorf 1, Federal Republic of Germany, and **MASCHINENFABRIK GUSTAV WIEGARD**, a German Body Corporate, of Cörmannstr. 6, 5810 Witten, Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

The invention relates to a measuring and checking device for roller tracks comprising juxtaposed rollers and is particularly directed to such devices for use in continuous casting apparatus. Primary uses of the invention are in supporting frames, supporting tracks and extraction machines of extrusion installations. Devices of this type should enable the internal dimension of extrusion moulds, the nip spacing or pass of the rollers and the trueness thereof to be measured and the running of the rollers to be checked.

In order to carry out these measuring and checking operations, it was necessary hitherto, with correspondingly large installations with roller spacings larger than 250 mm, for a measuring engineer with an internal micrometer screw to climb into the roller frame. The measurement results which under these conditions can only be produced by taking considerable time did not exclude faulty measurements with the later consequence of production defects.

The principal aim of the present invention is to provide a measuring and checking arrangement of the type initially referred to, with which the required measurement data can be established in a reproducible manner with the respectively required accuracy, and also with curved installations without the direct involvement of any person. To this end, the invention provides a measuring and checking device for a roller track comprising two opposed spaced series of parallel rollers, which device comprises a holding frame 50 having a width which is adjustable to match

a given spacing between such series of rollers; and transporting means enabling the holding frame to be guided and transported to a respective point of measurement in the space between the opposed series, the holding frame having centering rollers mounted in pairs at opposite sides of the frame for engaging opposed rollers in the series of the track, at least one centering roller in each pair being arranged to be driven in either direction, and a measurement sensor arranged centrally between the rollers of each pair and extending therebetween perpendicular to the plane containing the centering roller axes for contacting a track roller engaged thereby, means being provided for transmitting signals from the sensors to an indicating or recording measurement value output, and the transporting means including two motor-driven endless belts which are arranged on one said side of the holding frame and which extend laterally of the frame for engagement with a plurality of rollers of one of the series of the roller track.

The main advantage of the invention is that the measuring and checking operations which can be carried out can be centrally controlled and evaluated and the arrangement is of particular value on those cases where installations having internal dimensions below 250 mm are to be checked.

One embodiment of the invention will now be described, by way of example, with reference to the accompanying diagrammatic drawings, in which:-

Figure 1 is a side elevation of a mould which is only indicated and of an arcuate roller track of an extrusion installation with an introduced measuring and checking arrangement;

Figure 2 is a plan view of the arrangement according to Figure 1; and

Figure 3 is a section on the line A-B of Figure 2.

According to Figure 1, the measuring arrangement is disposed in the guiding roller track of a curved extrusion installation 10.

The measuring arrangement comprises a holding frame 1, in the form of a lazy tong construction, which can be adjusted in width 100

by a device 5 and which may be guided by means of a chain 12 and a guiding and feeding mechanism formed of two driving and conveyor belts 4 up to the respective point 5 of measurement, the frame 1 having centering rollers 2 mounted thereon in pairs and on both sides and sensors or measuring rods 3 which are arranged centrally between these pairs of rollers 2 and extend perpendicularly to the roller axes, and which are connected by means of cables 11 or without use of any wiring to an indicating or recording measurement value output device (not shown). The conveyor belts 4 are arranged to one side of the centering rollers 2 of the supporting or holding frame 1 and they extend over the distance of at least three rollers 6 of the roller track which is to be checked. The device 5 may be hydraulically, pneumatically or electromechanically adjustable. Alternatively it might employ an adjustable internal wedge.

With introduction of the measuring arrangement into a curved installation 10, the conveyor belts 4 are located on the roller track with the larger radius of curvature. After the transition of the track into the horizontal, they are alone responsible for the transporting of the measuring arrangement. As regards the centering rollers 2 which bear on the rollers 6 of the guide track, at least one of each can be driven in reverse, so as to be able to check the rollers 6 for trueness and freedom of running.

With the use of the measuring arrangement according to the invention, the said arrangement is positioned through the installation to be checked, e.g. a curved installation, on the mould cover plate above the opening of the mould. Thereafter, the measuring part of the arrangement is lowered into the mould.

After pressing the centring rollers 2 against the walls of the mould, the measuring sensors 3 come into use. The measured values can now be read off on a digital indicator and/or can be retained by a recording unit. This measuring operation can be repeated at any desired positions on the wall of the mould.

After having measured the mould, the complete measuring arrangement is positioned centrally above the opening of the mould. Thereafter, the measuring arrangement is lowered as far as the first pair of rollers 6 and in fact to such an extent that the already extended measuring rods 3 of the arrangement indicate the position of the first pair of rollers 6. When this position is reached, the lowering of the measuring arrangement is stopped and the centring rollers 2 are moved up to the rollers 6 by means of the device 5 for adjustment of the width of the holding frame 1 in order accurately to establish the jaw width. After hav-

ing been applied to the rollers 6, these latter are mutually rotated with the aid of the driveable centring rollers 2 of the measuring arrangement, so that the trueness of each individual roller 6 can be established and retained from the changes in the measurement values.

At the same time, by measuring the load on the driving motors of the centring rollers 2, the freeness of running of the rollers 6 is checked.

After having established all measurement values, the measuring arrangement is lowered or moved forward to the next pair of rollers 6 of the guide track, where the measuring operations are repeated.

All the measuring operations can also be carried out off-centre, so as to establish the variations in jaw widths which are caused by mounting errors.

It is also possible to include a television camera in the measuring arrangement, which gives information by way of a monitor concerning the surface properties of the individual rollers 6.

The use of the measuring arrangement is independent of the casting, deflection and directional radius of the installation, i.e. it is also possible for it to be used with vertical installations and with roller mechanisms for flat rolled products. The measuring arrangement can also be used with quickly running roller tracks, which are open upwardly, in order here also to determine the trueness of the rollers.

WHAT WE CLAIM IS:-

1. A measuring and checking device for a roller track comprising two opposed spaced series of parallel rollers, which device comprises a holding frame having a width which is adjustable to match a given spacing between such series of rollers; and transporting means enabling the holding frame to be guided and transported to a respective point of measurement in the space between the opposed series, the holding frame having centering rollers mounted in pairs at opposite sides of the frame for engaging opposed rollers in the series of the track, at least one centering roller in each pair being arranged to be driven in either direction, and a measurement sensor arranged centrally between the rollers of each pair and extending therebetween perpendicularly to the plane containing the centering roller axes for contacting a track roller engaged thereby, means being provided for transmitting signals from the sensors to an indicating or recording measurement value output, and the transporting means including two motor-driven endless belts which are arranged on one said side of the holding frame and which extend laterally of the frame for engagement with a plurality of rollers of one of the series of the roller track.

2. A device according to Claim 1 wherein the holding frame takes the form of a lazy tong construction.

3. A device according to Claim 1 or 5 Claim 2 wherein the holding frame is adjustable in width by means of one of hydraulic, pneumatic or electromechanical means.

4. A device according to Claim 1 or 10 Claim 2 wherein the holding frame is adjustable in width by means of an adjust-

able internal wedge.

5. A measuring and checking device for roller tracks substantially as described herein with reference to and as illustrated by 15 the accompanying drawings.

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COMPLETE SPECIFICATION

3 SHEETS

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Sheet 1

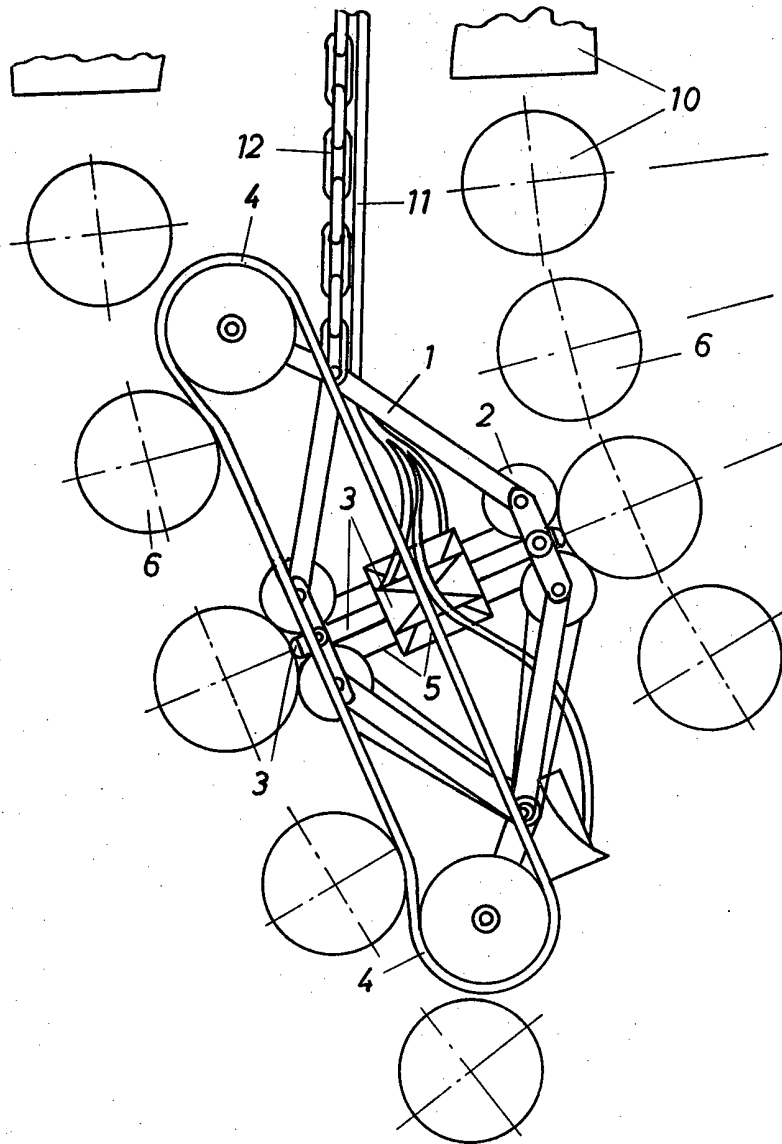


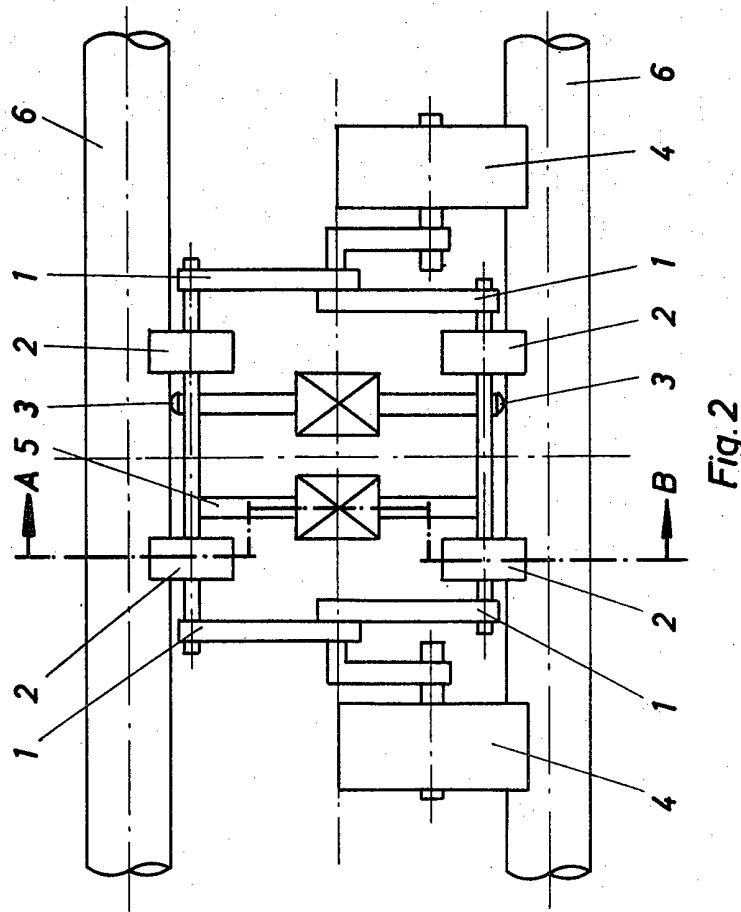
Fig.1

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COMPLETE SPECIFICATION

3 SHEETS

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Sheet 2



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Sheet 3

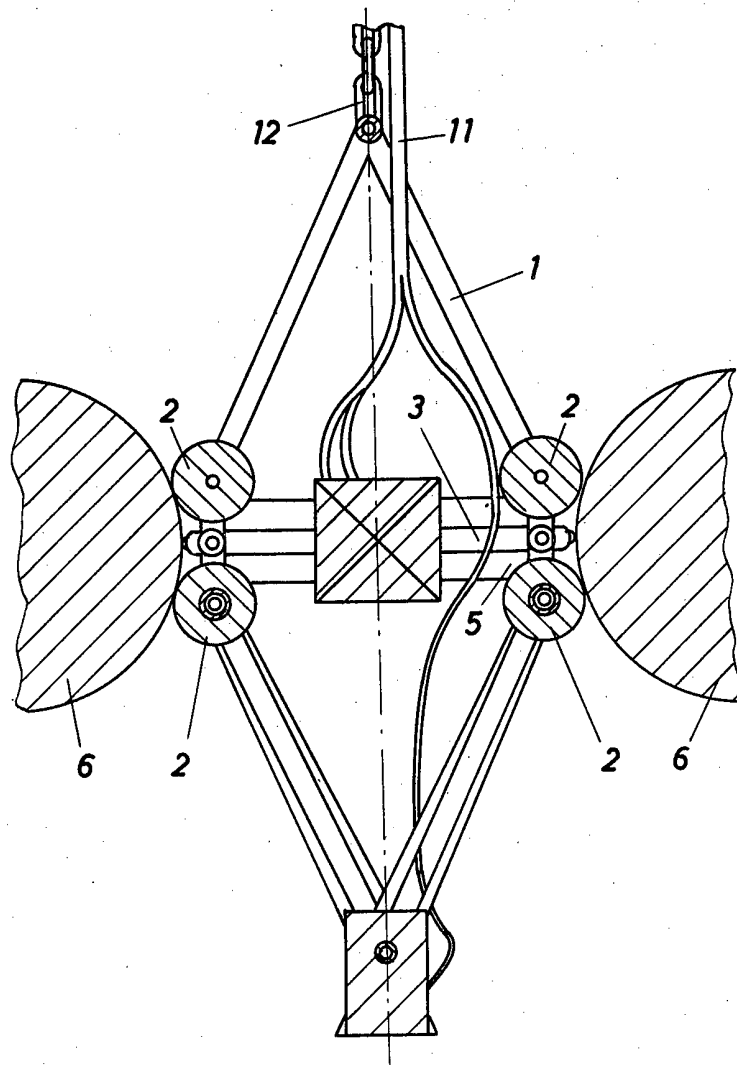


Fig.3