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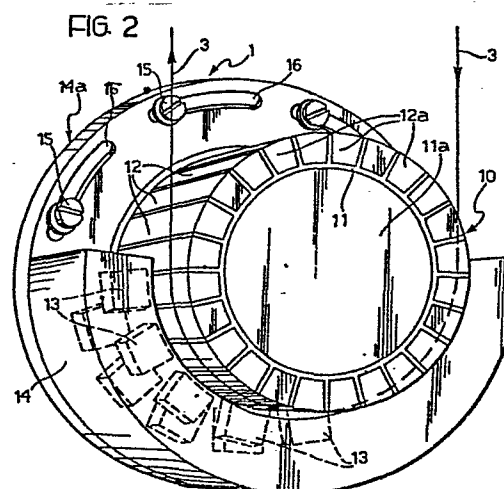
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Electric-power-supplying roller assembly for continuous wire annealing plants.

In a plant for the continuous annealing of steel wire, in which an electrical potential difference is applied to pairs of consecutive rollers (1) to heat the wire (3) by the Joule effect, each roller (1) has a sleeve constituted by electrically-conductive segments (12) which are insulated from each other and which are engaged by brushes (13) connected to a voltage source. The brushes (13) engage a portion of the sleeve of the roller (1) having an angular extent less than the arc of winding of the wire (3) on the roller (1), so as to avoid sparking as the wire (3) approaches and leaves the roller (1).



Electric-power-supplying roller assembly for continuous wire annealing plants

The present invention relates to an electric-power-supplying roller assembly for plants for the continuous annealing of wire, particularly steel wire, including a heating chamber located downstream of a drawing machine, and in which means are provided for applying an electrical potential difference between pairs of consecutive rollers for driving the wire, to cause a current to pass through the wire and anneal it by the Joule effect.

Each of the drive rollers for the wire is supported for free rotation and has an electrically-conductive sleeve to which voltage is applied by means of electrical sliding contacts, and the contact between each roller and the wire to be treated occurs along an arc of this sleeve.

In the zones in which the wire approaches and moves away from each roller, particularly the latter zones, extra currents arise which cause a spark. This spark is the cause of surface damage to the wire being worked, with a consequent reduction in its brightness and its market value.

The object of the present invention is to provide an electric-power-supplying roller assembly which can avoid the disadvantage mentioned above.

In order to achieve this object, the present invention provides an electric-power-supplying roller assembly for driving the wire in continuous wire annealing plants of the type specified above, the assembly

including a wire drive roller which is supported rotatably and has an electrically-conductive sleeve to which a voltage is applied by means of electrical contacts sliding on the sleeve and connected to a voltage source, the contact between the roller and the wire occurring over an arc of the sleeve, characterised in that the sleeve comprises a plurality of electrically-conductive segments which are insulated from each other, and in that the electrical sliding contacts engage an angular portion of the sleeve which is within the arc of winding of the wire and has an angular extent such that a voltage is not applied to the segments at the ends of the arc.

Further characteristics and advantages will become apparent from the detailed description of a preferred embodiment of the invention, illustrated by way of example in the appended drawings, in which:

Figure 1 shows a plant in which rollers according to the present invention are used, and

Figure 2 shows the roller assembly of the invention in perspective and in detail, while it is engaged by a wire which is to be thermally treated.

With reference to the drawings, the electrical-power-supplying roller formed in accordance with the present invention is generally indicated 1.

This roller is intended to be used in a plant 2 (Figure 1) for drawing and annealing a wire 3.

The plant 2 includes a device 4 for unwinding the wire

3, a wire-drawing machine 5, an annealing device 6, and a device 7 for rewinding the wire.

The annealing device 6 is constituted by a heating chamber 8 and a subsequent cooling chamber 9.

5 Two consecutive pairs of rollers 1 are provided in the heating chamber 8 and an electrical potential difference is applied to each pair of rollers so as to induce the passage of a current for annealing the wire 3 by the Joule effect.

10 As shown in Figure 2, each roller 1 has a sleeve 10 over an arc of which the wire 3 is wound.

This sleeve 10 has a structure similar to that of an electrical commutator of the type used in dynamo-electric machines, and includes a plurality of
15 conductive segments which are insulated from each other by an annular insulating part 11 surrounding a central metal part 11a of the roller 1.

The segments 12 form parts of bars 12a arranged parallel to the axis of the roller 1 and embedded in the
20 insulating part 11.

The central metal part 11a of the roller 1 is rotatably supported by a support structure, not illustrated in the drawing.

Sliding electrical contacts 13 engage the sleeve 10 of
25 the roller 1 and are constituted, for example, by graphite brushes slidable in an arcuate support structure 14 and subject to the action of springs, not

illustrated. The contacts 13 are connected in known manner to a common voltage source, not illustrated.

5 The contacts 13 engage an angular portion of the sleeve 10 which is within the arc of winding of the wire 3 on the sleeve 10, and has an angular extent slightly less than the extent of this arc.

10 The electrical contacts 13 include two circumferential series of contacts and the contacts of each series are staggered relative to those of the other series so as to cover the whole of the angular portion of the sleeve 10.

15 The arcuate support structure 14 for the contacts 13 is carried by a ring 14a fixed to the support structure (not illustrated) of the roller 1 by screws 15 which pass through circumferential slots 16 in the ring 14a. It is thus possible to adjust the angular position of all the contacts 13 relative to the arc of contact between the wire 3 and the sleeve 10 of the roller 1.

20 The structure described above allows the contacts 3 to apply a voltage only to those segments 12 which, at any moment, are in an angular portion of the roller 1 lying within the arc of winding of the wire 3 and having an extent less than the angular extent of this arc, whereby at the beginning of the arc of winding the wire 3 is in contact with a segment 12 to which no voltage is applied
25 and, likewise, at the end of the arc of winding the wire moves away from a segment 12 to which no voltage is applied; thus, the object of avoiding the disadvantage due to sparking as the wire approaches and leaves the winding roller is avoided.

CLAIMS

1. Electric-power-supplying roller assembly for plants
(2) for the continuous annealing of wire (3),
particularly steel wire, of the type including means for
applying an electrical potential difference between
5 pairs of consecutive rollers (1) for driving the wire
(3) to heat the wire (3) by the Joule effect, and in
which each of the rollers (1) for driving the wire (3)
is rotatably supported and has an
electrically-conductive sleeve (10) to which a voltage
10 is applied by means of contacts (13) sliding on the
sleeve (10) and connected to a voltage source,
characterised in that the sleeve (10) comprises a
plurality of electrically-conductive segments (12)
which are insulated from each other, and in that the
15 electrical sliding contacts (13) engage an angular
portion of the sleeve which is within the arc of
winding of the wire (3) and has an angular extent such
that a voltage is not applied to the segments (12) at
the ends of the arc of winding.
- 20 2. Assembly according to Claim 1, characterised in that
the electrical sliding contacts (13) engage an angular
portion of the sleeve of the roller (1) for driving the
wire, which is slightly smaller than the extent of the
arc of winding of the wire (3) on the roller (1).
- 25 3. Assembly according to Claim 1, characterised in that
the sliding contacts (13) are constituted by brushes
slidable radially in a support structure (14, 14a) which
surrounds the sleeve of the roller (1), and in that
means (15, 16) are provided for adjusting the angular
30 position of the support structure (14, 14a).

4. Assembly according to Claim 3, characterised in that the support structure includes an arcuate portion (14) in which the brushes (13) are slidable, and a disc (14) having arcuate slots (16) in which fixing screws (15) are engaged.
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FIG. 1

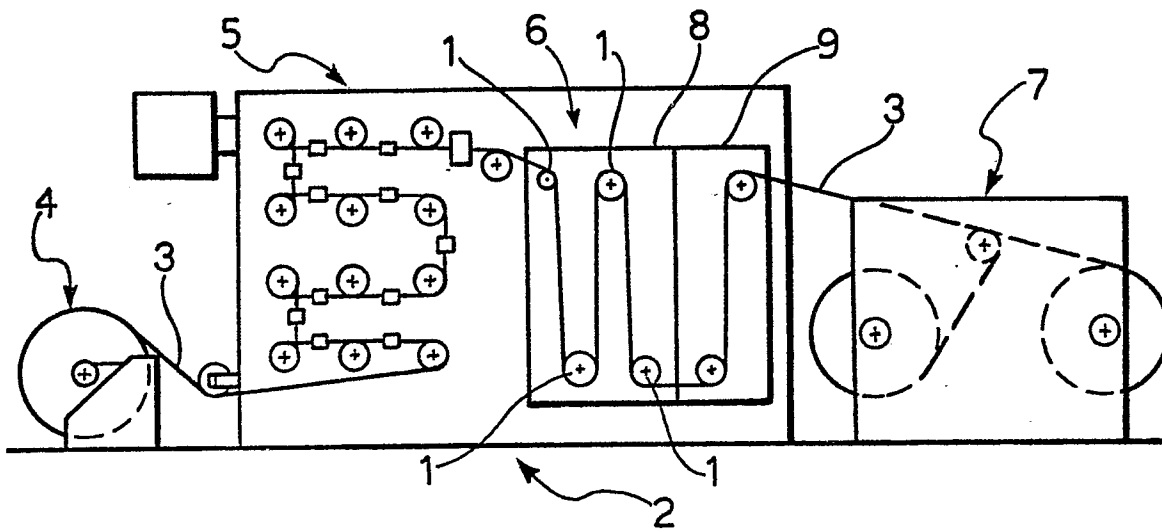


FIG. 2

