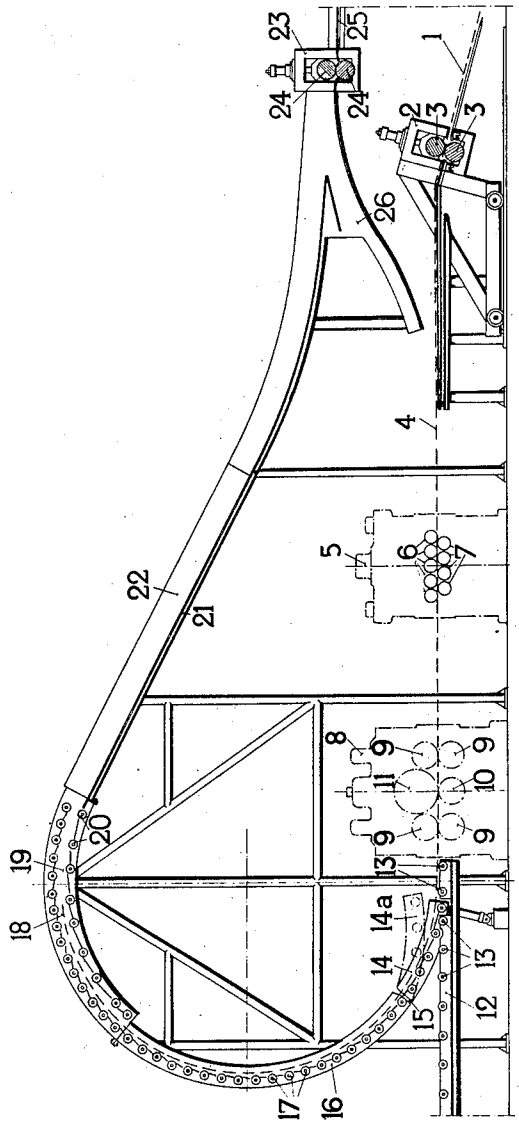
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APPARATUS FOR SURFACE TREATMENT OF ELONGATED, RELATIVELY WIDE METAL STRIPS

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# APPARATUS FOR SURFACE TREATMENT OF ELONGATED, RELATIVELY WIDE METAL STRIPS

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5 Claims. (Cl. 90—21)

The present invention relates to an arrangement for performing surface treatment of elongated, relatively wide strips or bands, etc., of ferrous or non-ferrous metals or alloys on one surface at a time.

In surface treatment, e. g. milling, finishing, inspection or the like of elongated, relatively wide strips or bands of metals, viz. ferrous or non-ferrous metals or alloys having a heavy weight it is often desirable to invert the strip in order that opposite surfaces thereof may be conveniently treated. In view of the fact that such elongated strips or bands are somewhat bulky and difficult to handle manually, which operation is both expensive and time consuming and furthermore involves the risk that strips or bands being treated will be damaged it is desired to perform the inverting operation with the least possible manual attention, which thus forms the primary object of the invention.

The invention also has a further object, viz., to render possible inverting of the strips or bands in such a manner as to successively present opposite surfaces of such strips to any desired machines for treatment of such surfaces.

The invention is mainly characterized therein that the strips or bands are placed substantially horizontally upon a bed, such as a roller conveyor or the like, and that the bands are caused to move through one or a plurality of surface treating machines, e. g. a milling or grinding machine, provided with working tools arranged to engage and treat one surface of the strips or bands, whereupon the bands are guided in an endwise direction upwardly and rearwardly in relation to the feed-in direction into the machine whereby the previous bottom side is turned upwardly whereupon the strips or bands may again be passed through the machine or machines to treat the opposite side thereof.

The invention will be more fully explained hereinafter with reference to an embodiment diagrammatically shown in the accompanying drawing and in connection therewith further characterizing features of the invention will be set forth.

The drawing illustrates a part-sectional view of an arrangement according to the invention.

The strips or bands to be treated may be stacked or piled at the entrance end I of the apparatus or may be supplied by a suitable conveyor to a feeding apparatus 2 of a suitable design, e. g. one having two cooperating feed rollers 3. Said feeding apparatus may suitably constitute an apparatus of the kind forming the subject of the Swedish Patent No. 150,124 (appln. No. 10285/52). Furthermore the drawing illustrates a strip designated by reference numeral 4 and it will be noted that the strip passes through a straightening machine generally designated by 5, which is provided with upper and lower straightening rollers 6 and 7. Subsequently the strip passes through a milling machine, or other desired treating apparatus, generally designated by 8, this machine being provided with a number of pairs of rollers 9, a milling cutter 10 and a backing roller 11. In this particular case the intention is mainly to treat the underside of the strip by means of the milling cutter 10 and thereafter to turn or invert the strip so that its upper surface will be disposed downwardly to be treated.



After passing through the milling machine the strip will be received upon a roll conveyor designated by 12 and having rolls 13, from which position it will be continuously bent upwardly through an arcuate roll conveyor switch 14, which is pivotally mounted at 15 for a purpose which will be later described. The switch 14 forms a part of a circular roll conveyor guide 16 of a suitable radius and provided with rollers 17, with which strips 4 engage for movement upwardly and rearwardly with relation to the original feeding movement of the strip. While in certain instances the strip will follow the entire path of the conveyor 16 without sagging adjacent the upper part thereof, where relatively thin strips are being treated it is necessary to provide a concentric guide designated by 19 and having conveyor rolls 20. If the end of the strip should drop downwardly it will engage the conveyor rolls of the guide 19 and move forwardly with negligible resistance.

In the embodiment shown as an example the arcuate guides 16, 19 terminate in a conveyor chute 21, provided on both sides with guiding flanges 22 to guide the strip in the desired path. This chute is not shown as provided with a roll conveyor but may obviously be equipped therewith, should it be desired.

The strip or band 4 is advanced through the chute 21 by means of a feeding apparatus 23 provided with two feed rollers 24 and subsequently deposited upon a partially illustrated bed 25. The strip is now inverted with the original upper surface downwardly disposed.

According to the invention the bed 25 may, if desired, be disposed in front of the feed-in end 1, but since frequently due to the desire to move the strip 4 through the milling machine etc. a plurality of times it is advantageous to have the bed 25 disposed on a higher level, as shown in the drawing for illustrative purposes.

Arranged at the end of the chute 21 is an inclined chute 26 through which the inverted strip may be fed by the apparatus 23 to pass downwardly and back through the treating apparatus as described above.

When the strip has passed through the described inverting and treating cycle a sufficient number of times it may either be fed back rearwardly through the feeding apparatus 2 or deposited upon the conveyor 12 for possible further handling or piling. This latter feeding is rendered possible in that the roller conveyor switch 14 may be moved into the upper position designated by 14*a* so that the same will be pivoted out of the path of the strip.

The fact that the guide is shown as constituting a part of a circle does not exclude the use of guides of other suitably curved form.

The invention is not limited to the embodiment shown and described but may be varied in several respects within the scope of the basic inventive idea.

Having now described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. Apparatus for successively treating opposite surfaces of an elongated strip of relatively flexible material, said apparatus comprising a first feeding means for said strip, a milling machine disposed in the path of movement of said strip and including a horizontally disposed milling cutter for engaging and machining the lower surface only of said strip, a conveyor for receiving said strip from said milling machine, an inverting apparatus for said strip comprising a vertically disposed, arcuate trackway having a plurality of rolls for engaging and guiding said strip through an arcuate path, a plurality of rolls disposed in spaced substantially parallel relation respec-

tively to said first rolls and providing a substantially closed channel to retain said strip in said arcuate path, a portion of said trackway at the entrance end being pivotally mounted whereby the same may be selectively disposed in the path of movement of said strip emerging from said milling machine to guide said strip into said trackway or moved out of the way to permit movement of said strip onto said first mentioned conveyor, a reversible feeding means, a chute leading from the discharge end of said arcuate trackway to said reversible feeding means and a guide channel between said reversible feeding means and the entrance end of said milling machine whereby strips inverted by said arcuate trackway may be withdrawn from said chute by said reversible feeding means and upon reversal of said reversible feeding means said strips may be fed through said channel to said milling machine for machining of the opposite surface of said strip.

2. Apparatus for successively treating opposite surfaces of an elongated strip of relatively flexible material, said apparatus comprising a first feeding means for said strip, a treating machine disposed in the path of movement of said strip and including horizontally disposed means for treating the lower surface only of said strip, a conveyor for receiving said strip from said treating machine, an inverting apparatus for said strip comprising a vertically disposed arcuate trackway having a plurality of rolls for engaging and guiding said strip through an arcuate path, a plurality of rolls disposed in spaced substantially parallel relation respectively to said first rolls and providing a substantially closed channel to retain said strip in said arcuate path, a portion of said trackway at the entrance end being pivotally mounted whereby the same may be selectively disposed in the path of movement of said strip emerging from said treating machine to guide said strip into said trackway or moved out of the way to permit movement of said strip onto said first mentioned conveyor, a reversible feeding means, a chute leading from the discharge end of said arcuate trackway to said reversible feeding means and a guide channel between said reversible feeding means and the entrance end of said treating machine whereby strips inverted by said arcuate trackway may be withdrawn from said chute by said reversible feeding means and upon reversal of said reversible feeding means said strips may be fed through said channel to said treating machine for treating the opposite surface of said strip.

3. Apparatus for successively treating opposite surfaces of an elongated strip of flexible material, said apparatus comprising a first feeding means for said strip, a treating machine disposed in the path of movement of said strip and including horizontally disposed means for treating the lower surface only of said strip, a conveyor for receiving said strip from said treating machine, an inverting apparatus for said strip comprising a vertically disposed arcuate trackway for engaging and guiding said strip through an arcuate path, a second trackway disposed in spaced substantially concentric relation to said first trackway and providing a substantially closed channel to retain said strip in said arcuate path, a portion of said



trackway at the entrance end being pivotally mounted whereby the same may be selectively disposed in the path of movement of said strip emerging from said treating machine to guide said strip into said trackway or moved out of the way to permit movement of said strip onto said first mentioned conveyor, a reversible feeding means, a chute leading from the discharge end of said arcuate trackway to said reversible feeding means and a guide channel between said reversible feeding means and the entrance end of said treating machine whereby strips inverted by said arcuate trackway may be withdrawn from said chute by said reversible feeding means and upon reversal of said reversible feeding means said strips may be fed through said channel to said treating machine for treating the opposite surface of said strip.

4. Apparatus for successively treating opposite surfaces of an elongated strip of relatively flexible material, said apparatus comprising a first feeding means for said strip, a treating machine disposed in the path of movement of said strip and including horizontally disposed means for treating the lower surface only of said strip, a conveyor for receiving said strip from said treating machine, an inverting apparatus for said strip comprising a vertically disposed arcuate trackway for engaging and guiding said strip through an arcuate path, a portion of said trackway at the entrance end being movable whereby the same may be selectively disposed in the path of movement of said strip emerging from said treating machine to guide said strip into said trackway or moved out of the way to permit movement of said strip onto said first mentioned conveyor and means for receiving inverted strips from said arcuate trackway and for feeding said strips to said treating machine for treating the opposite surface of said strip.

5. Apparatus for successively treating opposite surfaces of an elongated strip of relatively flexible material, said apparatus comprising a first feeding means for said strip, a treating machine disposed in the path of movement of said strip and including horizontally disposed means for treating the lower surface only of said strip, an inverting apparatus for said strip comprising a vertically disposed arcuate trackway for engaging and guiding said strip through an arcuate path and means for receiving inverted strips from said arcuate trackway and for selectively feeding said strips to said treating machine for treating the opposite surface of said strip or for discharging said strip from said apparatus.

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