A. SUNDH.

MACHINE FOR TREATING METAL STRIPS.

APPLICATION FILED FEB. 17, 1920.

1,436,464.

Patented Nov. 21, 1922.

4 SHEETS—SHEET 1.

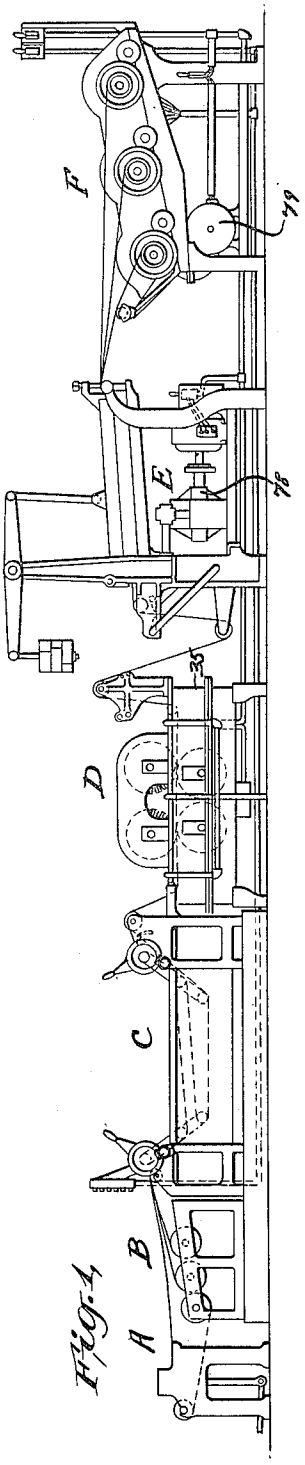


Fig. 1

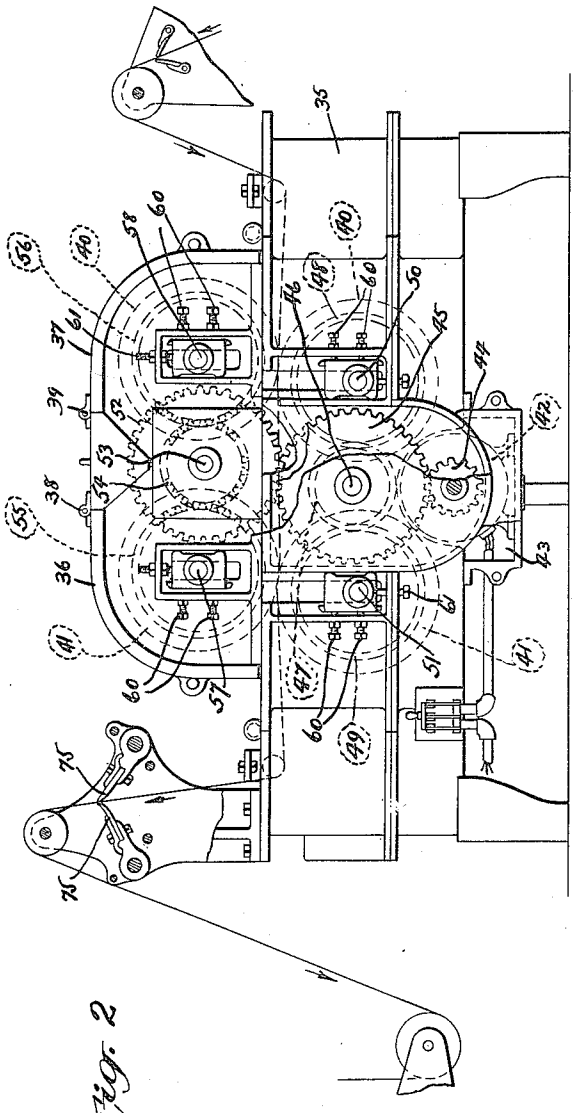


Fig. 2

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4 SHEETS—SHEET 2.

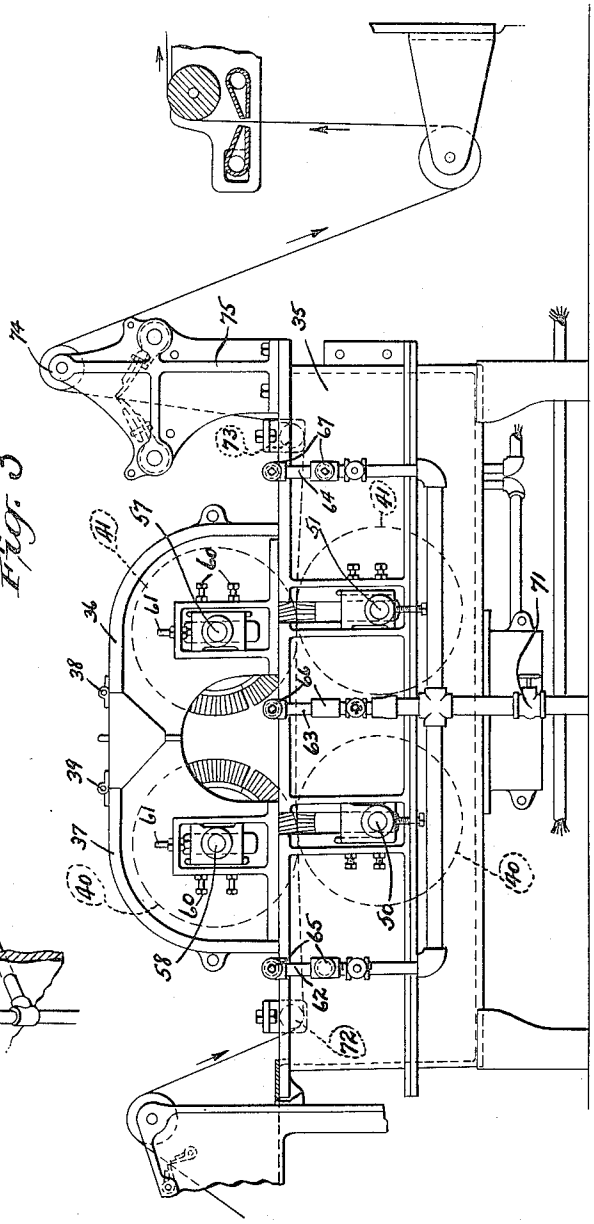


Fig. 3

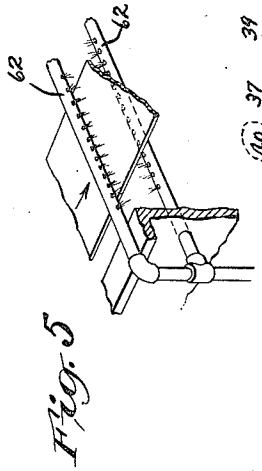


Fig. 5

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4 SHEETS—SHEET 3.

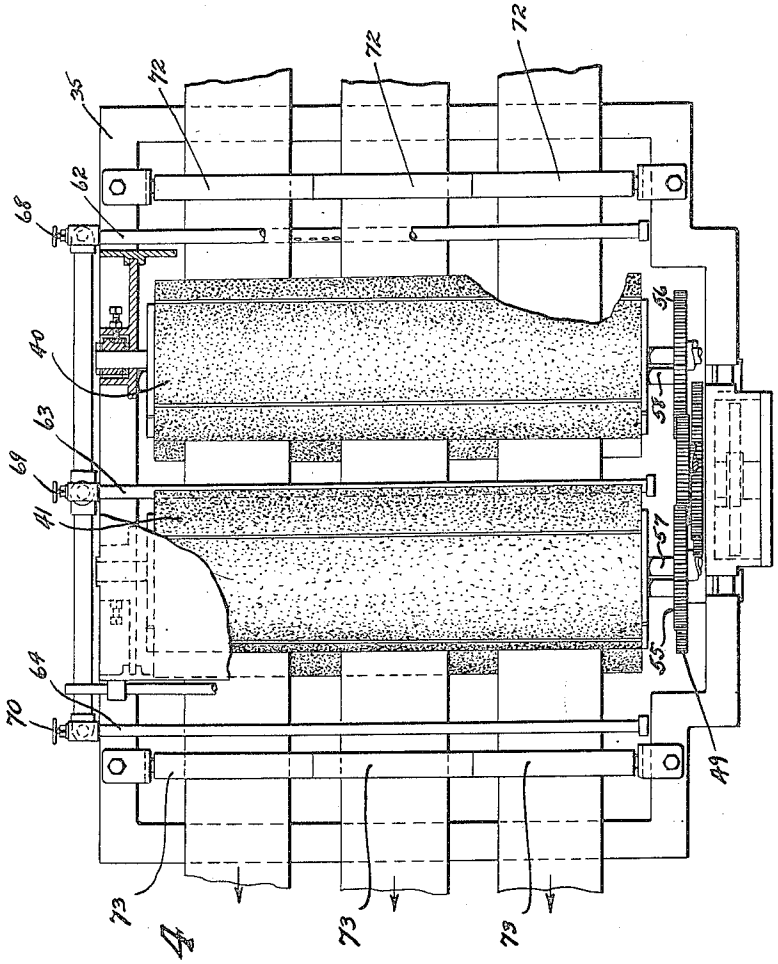


Fig. 4

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4 SHEETS—SHEET 4.

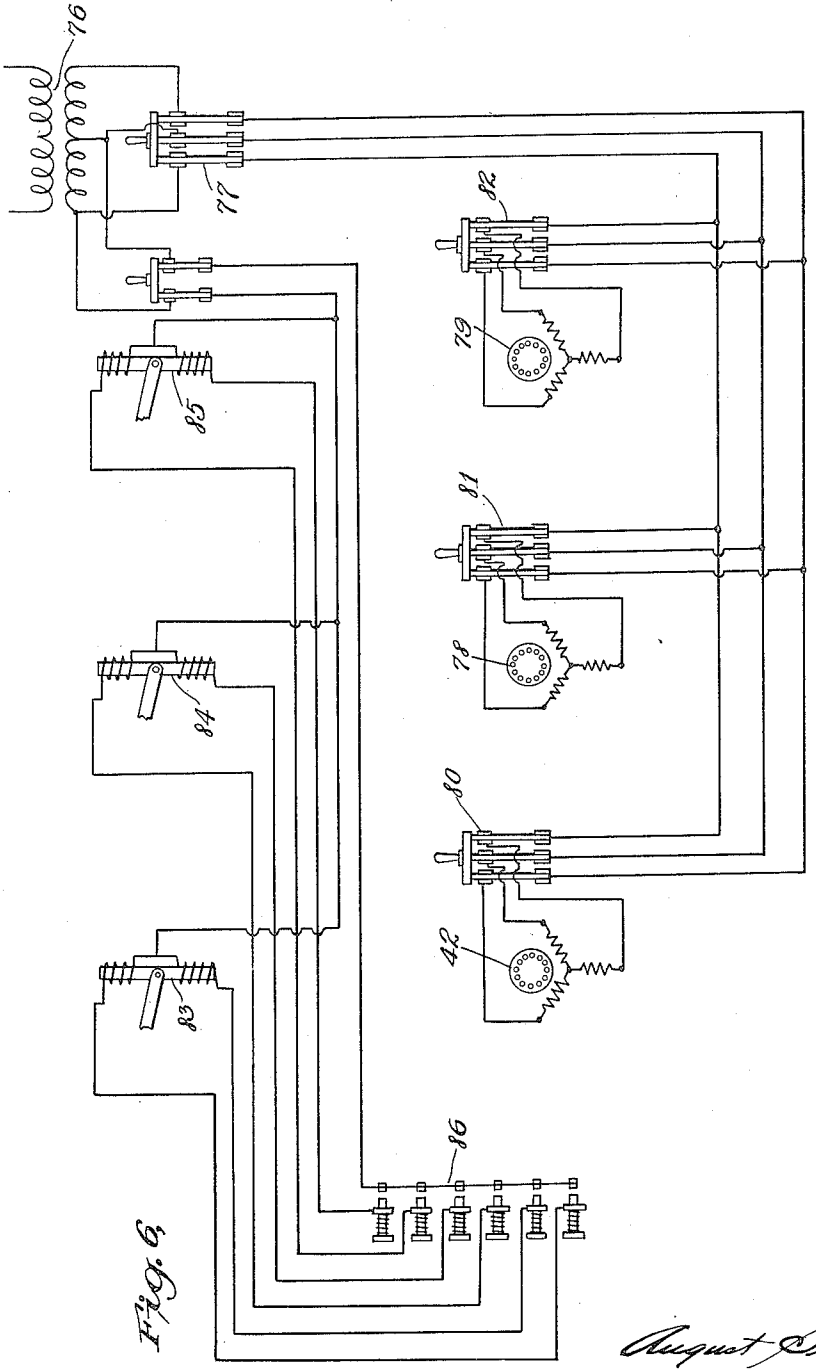


Fig. 9.

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By his Attorneys

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Patented Nov. 21, 1922. 1,436,464

UNITED STATES PATENT OFFICE.

AUGUST SUNDH, OF HASTINGS-UPON-HUDSON, NEW YORK, ASSIGNOR TO SUNDH ENGINEERING AND MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MACHINE FOR TREATING METAL STRIPS.

Original application filed December 20, 1917, Serial No. 208,070. Divided and this application filed February 17, 1920. Serial No. 359,379.

To all whom it may concern:

Be it known that I, AUGUST SUNDH, a citizen of the United States, and a resident of Hastings-upon-Hudson, county of Westchester, State of New York, have invented certain new and useful Improvements in Machines for Treating Metal Strips, of which the following is a specification.

This invention relates to an improvement in machines for treating metal strips, wherein the strips after the rolling or other process by which they are manufactured, are pickled, washed, dried and finally wound up.

Inasmuch as the present application is a division of my co-pending application Serial No. 208,070, filed December 20, 1917, reference may be had to such application for a detailed description of the machine as a whole, the present application being directed more particularly to what has been termed the washing and scrubbing unit.

In order, however, that the objects sought to be attained by the apparatus of this application may be clearly brought out and understood, I have here illustrated more or less diagrammatically the complete machine and illustrated in detail the washing and scrubbing unit.

In general, the machine as a whole comprises, as noted above, a unit wherein strips taken from a source of supply are drawn through a bath of acid or similar material for removing or at least loosening the scale and dirt with which the strip is covered. The strip or strips, as the case may be, are next drawn through a washing and scrubbing unit which is the particular apparatus to which this application is directed. After being thoroughly scrubbed and washed the strip is passed through a drying and straightening unit where the strip is thoroughly dried and straightened, the strip then passing to a winding or coiling unit where it is coiled up in a thoroughly cleaned condition.

In a machine of this character I am enabled to treat a plurality of strips simultaneously being limited so far as number of strips being treated is concerned merely by the space available for installation of the machine. In this way the capacity of the machine is very much greater than in machines as now constructed for similar purposes. The washing and scrubbing unit being driven independently of the drives for the other units of the machine, shutting down of any of the other units, one of the winding units for example, has no effect upon the washing and scrubbing unit—obviously a great advantage over present practice where shutting down of one unit of the machine necessitates closing down of the entire machine.

In the accompanying drawings,—

Fig. 1 illustrates more or less diagrammatically an elevation of a machine for treating metal strips which machine embodies my washing and scrubbing unit;

Fig. 2 is an elevation of the washing and scrubbing unit taken from the far side of the machine of Fig. 1;

Fig. 3 is an enlarged elevation of the washing and scrubbing unit as viewed in Fig. 1;

Fig. 4 is a plan view of the washing and scrubbing unit;

Fig. 5 is an enlarged perspective of one of the water-supplying means forming a part of the washing and scrubbing unit; and

Fig. 6 is a wiring diagram.

Referring to the drawings in detail, A designates a splicing unit where the end of a strip passing through the machine of Fig. 1 is spliced to the next strip which is to pass through the machine, which strip is taken from a supply unit designated B. It will be noticed from Fig. 1 that three (3) strips are being treated simultaneously. C designates a pickling unit through which the strips are passed and where the dirt and scale on the strips are removed or loosened. D designates the washing and scrubbing unit to be described in detail presently, where the scale and dirt are removed and the strips thoroughly scrubbed and washed. E designates the straightening and drying unit through which the strips are next drawn and where they are freed of all moisture, slightly warmed or heated, and thoroughly straightened. F designates the winding unit comprising in this instance three (3) winding blocks or cylinders, electrically driven, the winding of the strips on these blocks drawing the strips through the machine.

The washing and scrubbing unit com-

prises a box or tank having a cover comprising sections 36 and 37 hinged at 38 and 39, respectively. Within this box or compartment are two (2) pairs of brushes 40 and 41, between which the strips are drawn by the winding unit F, these brushes engaging each side of the strips to remove all the dirt and scale therefrom. The brushes 40 are preferably of coarser material than the brushes 41, the latter acting more or less as a polishing or finishing medium.

The brushes are rotated in a direction opposed to the direction of the travel of the strips, and are driven by an electric motor 42 confined in a separate fluid-tight compartment 43 beneath the unit. A gear 44 mounted on the armature shaft of the motor meshes with a gear 45 mounted on a shaft 46 on which is mounted a small gear 47 meshing with a pair of gears 48 and 49 carried on the supporting shafts 50 and 51 for the lower brush of each pair. Rotation is imparted to the upper pair of brushes through a gear 52 meshing with the gear 45, the former carrying on its supporting shaft 53 a gear 54 meshing with gears 55 and 56 carried on the supporting shafts 57 and 58 of the upper brushes of the unit.

I have found in practice that the brush drums to which the bristles of the brushes are secured, may be made in sections slightly spaced apart to permit of swelling of the wood of the drums, due to the action of the water on the same in the washing process.

As will be noted from an inspection of Fig. 2, the brushes have been mounted in adjustable bearings, whereby by loosening the bolts 60 and 61, the brushes and their bearings may be moved vertically to take up wear of the brushes without, however, throwing the gear train described out of mesh.

To provide water for washing the strips sprinkler pipes 62, 63 and 64 are supplied, these pipes being connected to any convenient source of water supply and each constituting a pair of pipes, one on each side of a strip as plainly indicated in Fig. 5. The pipes 62 and 64 are in front of and beyond the brushes, respectively, so as to apply water to the strips before and after the same pass through the brushes. The pipes 63 pass between the two sets of brushes.

Plugs 65, 66 and 67 are provided to enable the pipes to be readily cleaned when desired. Valves 68, 69 and 70 control the flow of water through the pipes individually, while 71 designates a single valve for controlling the flow of water to all of the sprinkler pipes.

The strips drawn through the washing and scrubbing unit by the winding unit F are guided by rollers 72 and 73 so as to be drawn through the unit horizontally, the face and underside of each strip being subjected to the action of the water imposed upon the same from the sprinkler pipes, the face and underside of each strip as the same pass between the brushes being subjected to a scrubbing action due to rotation of the brushes.

After passing the rollers 73 of which there are as many as there are strips being treated, as will be seen from Fig. 4, the strips are caused to pass over rollers 74, these rollers being mounted on a suitable bracket 75 on the box or tank 35, and in such a position relatively thereto as to cause the strips to travel vertically.

Before reaching the rollers 74, the strips are drawn between pivoted wipers 75, movement of which wipers is limited by suitable stops, which bear on each face of the strips to remove the water therefrom, a great deal of the water of course flowing from the strips by gravity due to their vertical motion.

Referring now to Fig. 6, it will be seen that the motive power for the various units may be taken from a suitable source designated 76, current from said source being controlled by a single switch designated 77. The motor for the washing unit, as already noted, is designated 42, that for the drying unit 78 and that for the winding or coiling unit whereby the strips are caused to pass through the entire machine, including the washing and scrubbing unit, 79. The circuit of the motor 42 is controlled by an independent switch 80, the circuit for motor 78 by an independent switch 81, and the circuit for the motor 79 by an independent switch 82.

As there is but one motor, to wit: the motor 79, for the winding unit, and this unit comprises in the present instance three (3) blocks or cylinders, it becomes necessary to provide some sort of clutch arrangement whereby each block may be run or stopped, as the case may be, independently of the others. To this end I provide the double wound electro-magnets designated 83, 84 and 85, controlled by a bank of push buttons 86 whereby any block or cylinder may be controlled from either end of the machine, independently of the others. This has been set out in my co-pending application already herein referred to, so a detailed description here is unnecessary. However, it will be apparent from what has been here set out, that the strips may be drawn through the washing and scrubbing unit by the winding unit and any strip or strips stopped or started at any time without affecting the washing and scrubbing unit. It will be obvious also that opening the circuit of any motor of the machine as a whole will not affect the motor circuits of any of the other units and therefore the other units will continue to function.

It is to be understood that changes may be made in the apparatus herein described and illustrated within the purview of this invention.

What is claimed as new is:

1. In apparatus of the class described, the combination of sets of rotatable brushes, one set being of coarser material than the other, means for rotating said brushes, means operable independently of the means last mentioned for simultaneously drawing several strips between said brushes and against the direction of rotation of the brushes, the brushes being arranged so that the coarser brushes are engaged by the strips before the finer brushes.

2. In apparatus of the class described, the combination of a tank, a plurality of pairs of brushes in said tank, motor-driven means for drawing a plurality of strips simultaneously between said brushes, an independent gear connected to each brush a motor operable independently of the said motor-driven means, and gearing between said motor and the said independent gears for establishing a driving connection between the brushes and motor, said gearing being arranged so that the brushes may be adjusted with respect to each other without disrupting the gearing.

3. In apparatus of the class described, the combination of a tank, sets of rotatable brushes therein, means for drawing a strip between said brushes while the same are being rotated, means for projecting a washing fluid upon the strip before the same reaches the brushes, while passing between the brushes and after leaving the brushes, means for guiding the strip vertically above said tank after passing between the brushes, and wipers for engaging the strip while so travelling.

This specification signed this 13th day of February, 1920.

AUGUST SUNDH.