

April 7, 1942.

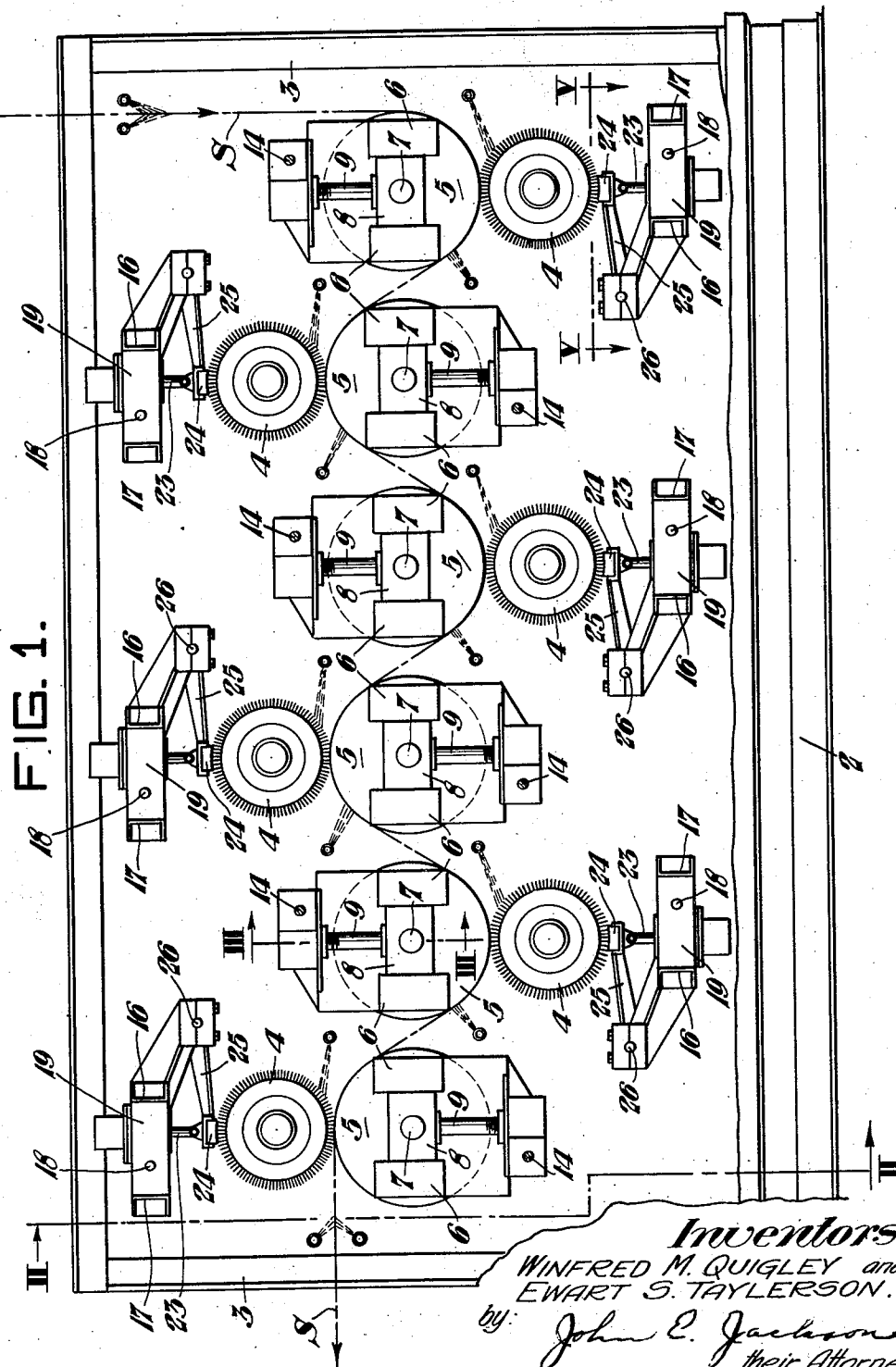
W. M. QUIGLEY ET AL

2,278,944

BRUSHING APPARATUS FOR METALLIC STRIP

Filed April 28, 1939

4 Sheets-Sheet 1



W. M. QUIGLEY ET AL

BRUSHING APPARATUS FOR METALLIC STRIP

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4 Sheets-Sheet 2

Inventors:
WINFRED M. QUIGLEY and
EWART S. TAYLERSON.
by: John C. Jackson
Their Attorney.

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4 Sheets-Sheet 3

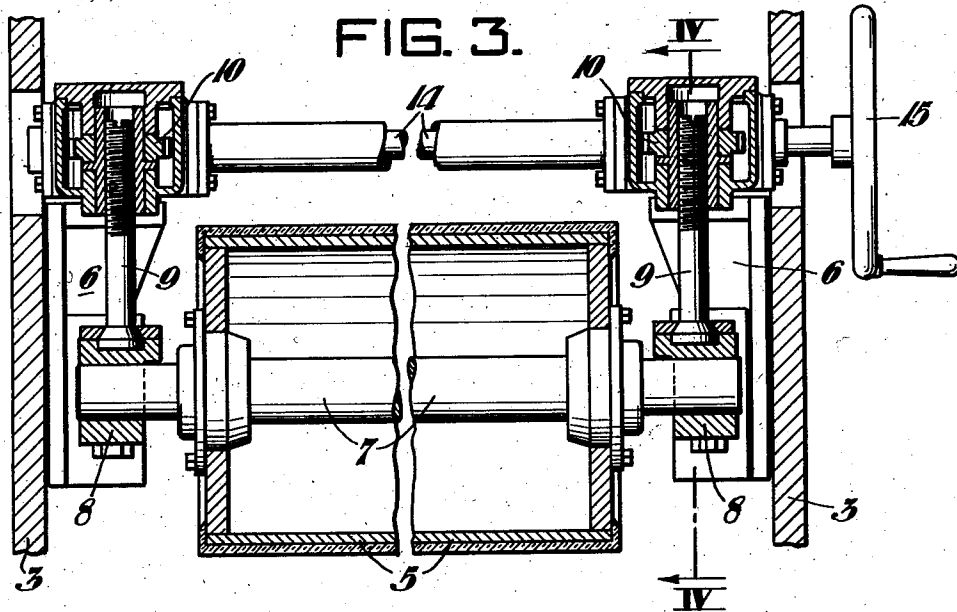
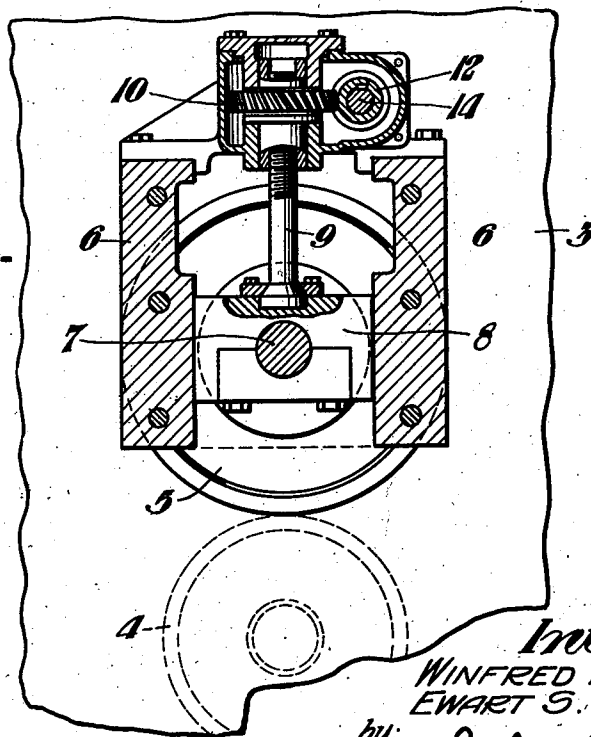


FIG. 4.



Inventors:
WINFRED M. QUIGLEY and
EWART S. TAYLORSON.
by: John E. Jackson
Their Attorney.

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FIG. 5.

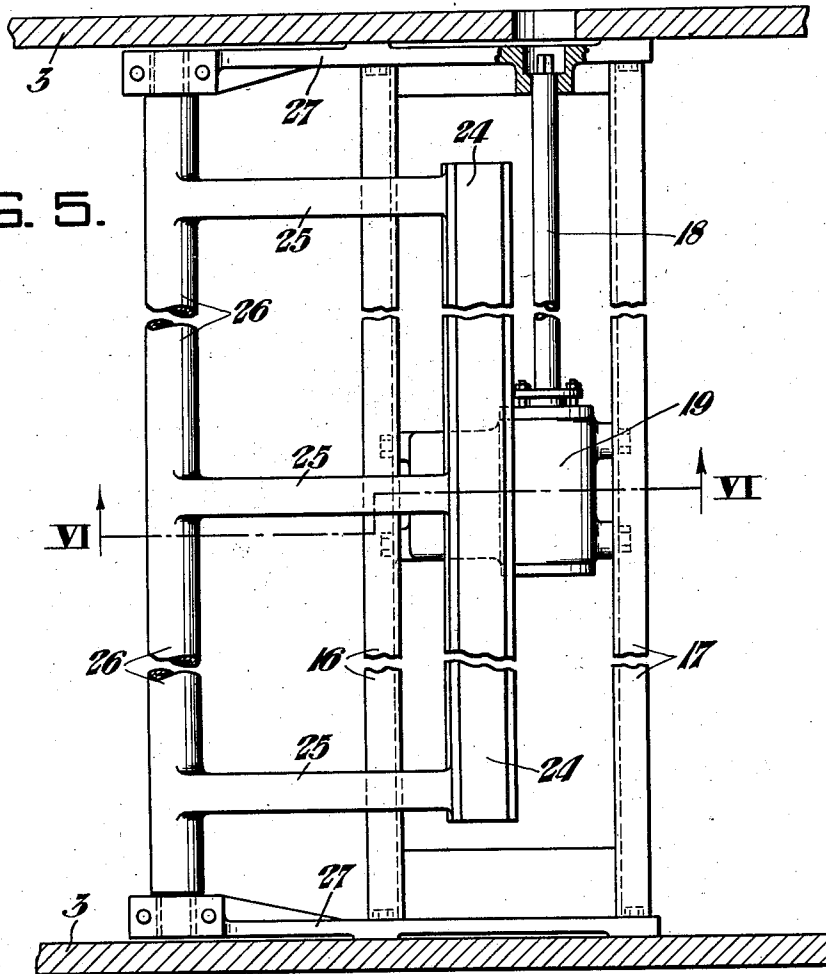
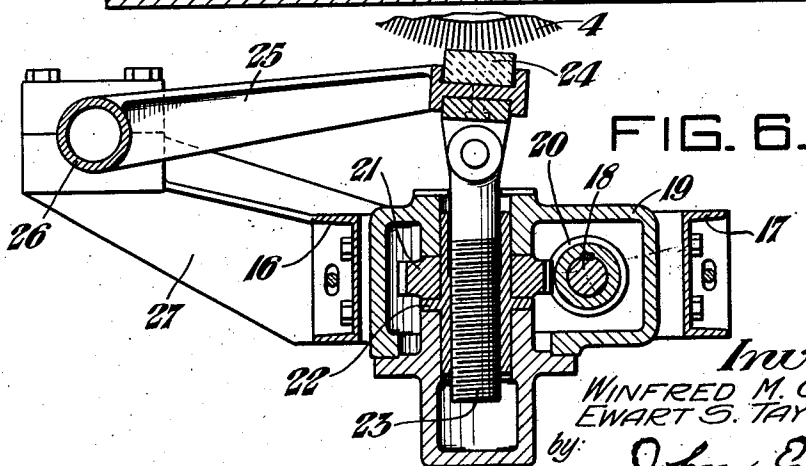


FIG. 6.

Inventors:
WINFRED M. QUIGLEY and
EWART S. TAYLORSON.

by: John E. Jackson
their Attorney.

UNITED STATES PATENT OFFICE

2,278,944

BRUSHING APPARATUS FOR METALLIC STRIP

Winfred M. Quigley and Ewart S. Taylerson,
Pittsburgh, Pa., assignors to Carnegie-Illinois
Steel Corporation, a corporation of New Jersey

Application April 28, 1939, Serial No. 270,699

1 Claim. (Cl. 15—77)

The present invention relates to a brushing apparatus for metallic strip.

An object of the present invention resides in uniformly brushing the surface of the metallic strip during its passage through the machine.

A further object of the present invention resides in supporting the metallic strip during its passage through the machine so that it will maintain a uniform contact with the brushing means and in such manner as to provide minimum slippage between the strip and the supporting means.

Another object of the present invention resides in providing a honing or grinding device for maintaining a constant uniform cylindrical surface to the brushing means.

A still further object resides in providing means for adjusting both the grinding device as well as the backing-up means with relation to the rotary brushes so as to maintain at all times direct contact of the brush unit with the metallic strip passing through the machine.

Other objects and advantages will become apparent at the description proceeds and reference is had to the accompanying drawings, in which:
Figure 1 is a side elevation of the present invention with the side wall of the housing removed;

Figure 2 is a sectional elevation on line II—II of Figure 1;

Figure 3 is a sectional elevation showing, in detail, the hold-down mechanism;

Figure 4 is a sectional elevation on line IV—IV of Figure 3;

Figure 5 is a plan view of the honing or grinding mechanism; and

Figure 6 is a sectional elevation on line VI—VI of Figure 5.

In the drawings, the numeral 2 represents a base for supporting spaced upright frame members 3 between which are positioned, in any conventional manner, the rotary brush units, an adjustable backing-up roll for each of said brush units, a brush grinding mechanism for each brush unit and sufficient spray nozzles or pipes to assist in rinsing the strip during its passage through the brushing machine and maintaining the brushes wet at all times.

In the drawings, there are shown positioned between the upright supporting members 3, six rotary brush units indicated generally at 4. These brush assembly units are so positioned and arranged throughout the brushing machine as to alternately brush each side of the strip material passing therethrough. Three of the brush

units operate upon one surface of the strip material and are in substantially the same horizontal plane, while the other three brush units operate upon the other surface of the strip material and are positioned in a plane parallel to the upper brush units. The brushes are staggered with respect to each other so that the opposite surfaces of the strip material are alternately subjected to a brushing action.

Positioned in a horizontal plane intermediate the upper and lower brush units are six backing-up rolls, one for each rotary brush unit. These backing-up rolls 5 are supported, in any conventional manner, between the side frames of the brushing machine and include vertically positioned tracks or guideways 6. These guideways 6 permit the respective backing-up rolls to be moved vertically with respect to their complementary brush units. By such a movement, the strip material can be forced against the rotary brushes to the extent that the desired degree of contact for uniform brushing of the strip material can be obtained. The adjustability of the backing-up rolls also permits the desired degree of contact to be maintained at all times. Such adjustment of the backing-up rolls is desirable since wear of the brushes results in a lessening of area of contact. The adjustment of the backing-up rolls permits the compensation of such wear on the brushes. Each backing-up roll 5 is supported upon a shaft 7, mounted in a pair of bearings 8 to each of which is secured an adjusting screw 9. A worm wheel 10 is keyed to an internally threaded collar on each adjusting screw and is in engagement with a worm 12, carried on a shaft 14, which shaft is rotated through movement of the hand wheel 15 and extends entirely across the space between the upright supporting members 3 of the frame. Upon rotation of the proper hand wheel 15, any backing-up roll 5 can be moved with respect to its complementary brush to obtain a micrometer adjustment of the roll with respect to said brush. This positions the strip into the required contact with that particular rotary brush so that there is provided a uniform brushing action of the strip material. Extending between the upright supporting members 3 at spaced points throughout the machine both at the top and bottom thereof, are transverse supporting frame members 16 and 17 for suitably supporting, in any conventional manner, the grinding or honing mechanism. In the present instance, this mechanism has been shown as including a shaft 18 extending from one of the frame members 3 into a housing 19

with a worm 20 keyed thereon so that a worm wheel 21 may mesh therewith. The worm wheel 21 is secured, in any conventional manner, upon an internally threaded collar 22 within which is adapted to move, upon rotation of the worm wheel 21, a threaded shaft 23 upon the end of which is pivotally supported a grinding or honing device 24 carried, in any conventional manner, by bracket arms 25. These bracket arms are rigidly connected to a shaft 26, the ends of which are pivotally supported by any conventional type bearing mechanism mounted on the bracket arms 27 carried by the channel members 16 and 17. When it is desired to true the surface of the rotary brush over its entire area, the grinding or honing device 24 is adjusted by rotating shaft 18, which in turn rotates worm 20 and worm wheel 21 so as to advance, as desired, the grinding or honing device 24 into contact with the cylindrical surface of the rotary brush assembly unit 4, thereby truing the cylindrical surface of the brush throughout its entire area in order to maintain the desired uniform brushing action upon the strip material passing through the machine.

It is to be expressly understood that any type of rotary brush may be used in the present apparatus. However, the specific construction of the rotary brush assembly with its driving mechanism for ready removal from the brush machine as a unit without affecting the movement or operation of the remaining brushes in the machine, has been specifically set forth and claimed in a copending application filed concurrently herewith by Howard G. Bargfeldt, Winfred M. Quigley and Ewart S. Taylerson, Serial No. 270,707.

In operation of the present invention, the continuous strip indicated at S, is shown as being fed into the machine from a previous processing device which, for example, may be an electroplating apparatus and passes down around the first backing-up roll 5 and into contact with the rotary brush 4 so that an initial brushing action may take place upon the surface of the strip material. The strip is then passed upwardly over the next adjacent backing-up roll and in contact with the upper rotary brush to provide a uniform brushing action upon the opposite surface of the strip material, after which it is directed downwardly over a third backing-up roll and into contact with a second lower rotary

brush. This directing of the strip in a tortuous path through the machine affords a means of firm contact with the backing-up rolls so as to minimize slippage of the material on the backing-up roll during the brushing operation. In addition to the brushing action, there are provided at predetermined positions, spray nozzles or pipes 26 for directing a spray of water upon each surface of the strip during its passage through the machine and also upon each rotary brush. By directing the spray of water upon the rotary brushes as well as upon the surfaces of the strip, the surfaces are not only kept free of any foreign matter which might mar their appearance, but the water dissipates the heat developed at the point of contact with the brushes and thereby produces a better appearing finished product.

During the operation of the apparatus, the honing devices are kept in constant contact with the surface of the rotary brushes so that uneven wear of the brushes is prevented and truly cylindrical brushing surfaces are maintained.

Under such a construction, there is provided an apparatus which uniformly brushes the strip on both sides and washes the same during its passage therethrough, which action brightens the surface of the strip material.

While we have shown and described a specific embodiment of the present invention, it will be seen that we do not wish to be limited exactly thereto, since various modifications may be made without departing from the scope of the invention, as defined by the following claim.

We claim:

Apparatus for brushing metallic strip during its longitudinal movement comprising, in combination, a roll adapted to contact the metallic strip and deflect it into an arcuate path, a power actuated rotary cylindrical brush disposed adjacent said roll for contact with the arcuately deflected portion of said metallic strip, the length of said power actuated rotary cylindrical brush being at least as great as the width of the metallic strip, and means continuously in contact with said power actuated rotary cylindrical brush for constantly abrading the brush to maintain a cylindrical brushing surface.

WINFRED M. QUIGLEY.
EWART S. TAYLERSON.