

May 17, 1938.

J. J. CAUGHERTY

2,117,651

ROD CLEANING MACHINE

Filed Nov. 27, 1936

Fig. 1.

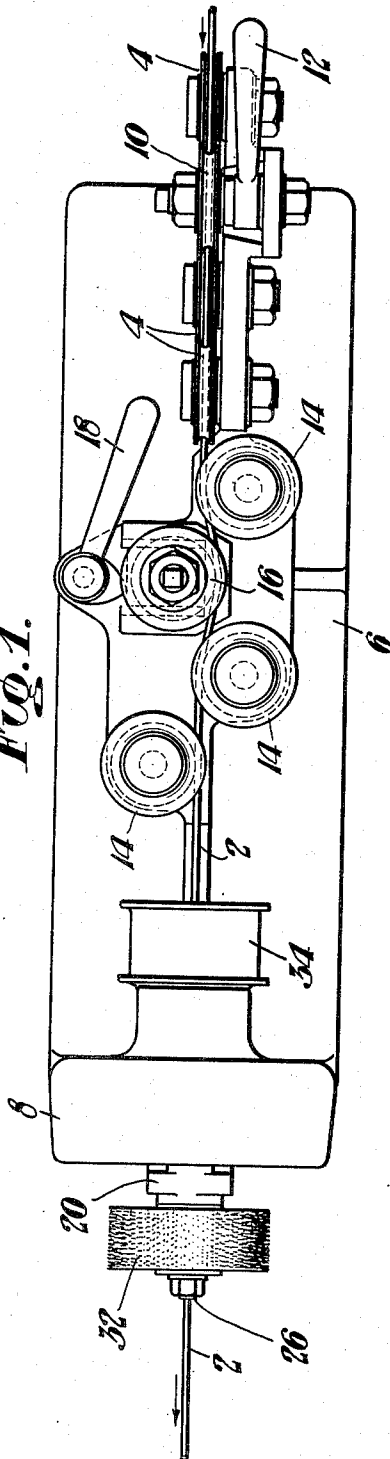
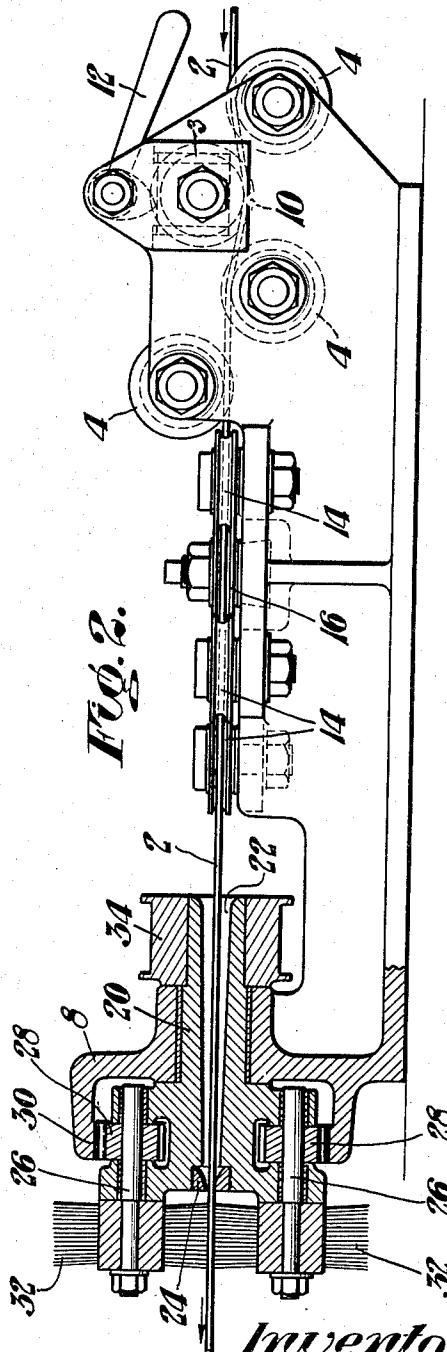


Fig. 2.



Inventor:
JOHN J. CAUGHERTY,
by: *Usina & Rauber*
his Attorneys.

UNITED STATES PATENT OFFICE

2,117,651

ROD CLEANING MACHINE

John J. Caugherty, Donora, Pa.

Application November 27, 1936, Serial No. 113,066

7 Claims. (Cl. 29—81)

This invention relates to cleaning machines and particularly refers to machines that mechanically remove scale and other surface impurities from metal rods or the like.

5 An object of this invention is to provide an inexpensive machine which rapidly and thoroughly removes the surface impurities from a continuously moving metal rod.

10 Another object of the above machine is to mechanically and efficiently remove the scale from a rod immediately preceding the drawing thereof without retarding the drawing operation.

The above and further objects will be apparent by reference to the following description and the accompanying drawing in which:

15 Figure 1 is a plan of one embodiment of my invention.

Figure 2 is an elevation, partly in section, of the apparatus shown in Figure 1.

20 Referring to the accompanying drawing, the numeral 2 indicates a rod, or other continuous metallic object, which is being drawn along a predetermined course by any suitable means (not shown). Means such as sheaves 4, over which the rod 2 can be drawn, are secured to a vertical web of a supporting structure or member 6. The sheaves 4 are all held in one plane which preferably is vertical, as shown. The sheaves 4 are positioned so that one point on each of their circumferences is tangent to the fixed path of the rod 2. Means, such as an adjustable sheave 10, is placed between the first two of the sheaves 4 which the rod 2 passes when being drawn along its fixed path, and is adjustable or movable in the plane of the sheaves 4 so as to bend the rod 2 in the direction of the plane in which the sheaves 4 are secured. The sheave 10 can be secured to the web of member 6 by any suitable means, such as a slidable block 3. The position of the sheave 10 is varied by a cam-lever 12 so that the amount of deflection of the rod 2 by the sheave 10 is readily controllable. The last two of the sheaves 4 cooperate to straighten the rod 2 after it has been bent by the sheave 10. The deflection of the rod 2 by the sheave 10, cooperating with two of the sheaves 4, functions to crack and loosen the scale and other surface impurities on the rod 2. However, the scale is loosened principally only on the surfaces of the rod 2 that are distorted when the rod 2 is bent in the above described manner.

55 In order to completely loosen the scale on the rod 2, the rod is preferably distorted in a direction that is substantially perpendicular to the first distortion. To secure this distortion, means

similar to the apparatus used to produce the first distortion are secured in a plane that is at right angles to the plane of the sheaves 4. These means include sheaves 14 similar to the sheaves 4, and a movable sheave 16 controlled by a cam lever 18 similar to the sheave 10 and the cam lever 12. The sheaves 14 are positively positioned in a horizontal plane, as shown in the drawing. Then, by the sheave 16 cooperating with the sheaves 14, the rod 2 is bent in a horizontal direction. By 10 distorting the rod 2 in two directions that are substantially at right angles to each other, all of the outer surface of the rod 2 has been slightly distorted and the scale or other impurities thereon has been cracked or loosened. The rod 2 is 15 again straightened when drawn by the last two of the sheaves 14.

Brushing means are provided to mechanically remove the loosened scale from the rod 2 and preferably are constructed and arranged in the following manner.

20 A mandrel 20, having an axial aperture 22 therethrough, is journaled in the supporting structure 8 and receives the rod 2 in the aperture 22. The rod 2 is positively positioned by a centering die 24 which normally is carried by the mandrel 20. Journaled in the mandrel 20 are shafts 26 which preferably are diametrically opposed. The shafts 26 are near the circumference of the mandrel 20 and mount pinion-gears 28 which project beyond the circumference of the mandrel 20. The pinion-gears 28 engage with an internal gear 30 that is fixedly associated with the supporting structure 8. Circular brushes 32, which preferably are made from wire, are secured on the shafts 26 and are adapted to bear upon the rod 2.

35 The mandrel 20 is rotated by any suitable means which, for example, includes a pulley 34 secured to the mandrel 20. The pulley 34 is driven by suitable external means (not shown). When the mandrel 20 rotates, the shafts 26 are made to rotate by the pinion-gears 28 which are engaged by the internal gear 30. The brushes 32 are then rotated in relation to the mandrel 20 and mechanically clean the rod 2 as they bear upon the surfaces thereof. As the scale and other surface impurities have been loosened by the above described bending action, they are readily removed by the brushes 32.

50 The rotational speed of the mandrel 20 and the brushes 32 is determined by the speed at which the rod 2 is drawn as the brushes 32 should contact the entire periphery of the rod 2 while the rod 2 is between the brushes 32.

While I have shown and described one specific form of my invention, it will be appreciated that various modifications thereof can be made without deviating from the scope of the invention as defined in the appended claims.

I claim:

1. A machine for cleaning wire or rod moving in a fixed path, comprising a plurality of stationary sheaves secured in a vertical plane, at least one sheave vertically movable in said plane and adapted to bend said rod in a vertical direction, a plurality of stationary sheaves secured in a horizontal plane, at least one sheave movable in said horizontal plane and adapted to bend said rod in a horizontal direction, means for controlling the positions of said movable sheaves, a member provided with an internal gear, a mandrel journaled on said member, said member having an axial aperture therethrough in alignment with the path of said wire or rod, a centering die carried by said mandrel, a plurality of diametrically opposed shafts journaled on said mandrel, pinion gears carried by said shafts and engaged with said internal gear, circular brushes secured to said shafts, said brushes being constructed and arranged to bear upon said wire or rod after it is drawn through said centering die, and means for rotating said mandrel.

2. A machine for cleaning wire or rod moving in a fixed path, comprising a plurality of stationary sheaves secured in a vertical plane, at least one sheave vertically movable in said plane at a point between two of said stationary sheaves and adapted to bend said wire or rod in a vertical direction, said stationary sheaves being constructed and arranged to straighten said wire or rod after it passes from said movable sheave, a plurality of stationary sheaves secured in a horizontal plane, a sheave movable in a horizontal plane at a point between two of said stationary sheaves, said last named sheave being constructed and arranged to bend said wire or rod in a horizontal direction, said second named stationary sheaves being adapted to thereafter straighten said wire or rod, cam means for controlling the positions of said movable sheaves, a supporting element provided with an internal gear, a mandrel journaled on said supporting element, said mandrel having an aperture therethrough in alignment with the path of said wire or rod, a centering die for said wire or rod, said centering die being carried by said mandrel, a plurality of diametrically opposed shafts journaled on said mandrel, pinion gears carried by said shafts and engaged with said internal gear, circular brushes secured to said shafts, said circular brushes being adapted to bear upon said wire or rod after it is drawn through said centering die, and means for rotating said mandrel.

3. A machine for cleaning wire or rod moving in a fixed path, comprising a plurality of stationary sheaves secured in a vertical plane, at least one sheave vertically movable in said plane at a point between two of said stationary sheaves and adapted to bend said wire or rod in a vertical direction, said stationary sheaves being constructed and arranged to straighten said wire or rod after it passes from said movable sheave, a plurality of stationary sheaves secured

in a horizontal plane, a sheave movable in a horizontal plane at a point between two of said stationary sheaves, said last named sheave being constructed and arranged to bend said wire or rod in a horizontal direction, said second named stationary sheaves being adapted to thereafter straighten said wire or rod, cam means for controlling the positions of said movable sheaves, a supporting element provided with a stationary internal gear, a mandrel journaled on said supporting element, said mandrel having an aperture therethrough in alignment with the path of said wire or rod, a pulley fixedly secured to said mandrel for driving the same, a centering die for said wire or rod, said centering die being carried by said mandrel, a plurality of diametrically opposed shafts journaled on said mandrel, pinion gears carried by said shafts and engaged with said internal gear, and circular brushes secured to said shafts, said circular brushes being adapted to bear upon said wire or rod after it is drawn through said centering die.

4. A machine for cleaning wire or rod moving continuously in a fixed path comprising means for bending the wire or rod in planes perpendicular to each other, means for straightening the wire or rod thereafter, a supporting bearing-member provided with an internal circular gear-rack, a mandrel journaled in said support, said mandrel having a tapered axially aligned aperture located therein through which the wire or rod is adapted to pass, means carried by said mandrel for automatically centering and guiding the wire or rod therethrough, a pair of diametrically opposed shafts journaled in said mandrel, a pinion-gear carried on one end of each of said shafts and a circular brush carried on their opposite ends, said pinion-gears adapted to cooperate with the internal gear-rack of the support to revolve the shafts and brushes when the mandrel is driven and means for driving said mandrel.

5. The combination defined in claim 4 wherein the means for centering and guiding the wire or rod is an annular removable centering-die positioned in the front end of the aperture of said mandrel.

6. The combination defined in claim 4, wherein the means for driving the mandrel is a belt-driven pulley mounted on one end thereof.

7. A machine for cleaning wire or rod stock moving continuously in a fixed path comprising means for bending the stock in a vertical plane, means for bending the stock in a horizontal plane, means for straightening the stock thereafter, a supporting member having a bearing portion and an annular internal rack-gear housing, a mandrel having a pair of diametrically opposed shafts journaled on one end thereof and a belt-driven pulley for driving said mandrel mounted on its opposite end and being journaled to said support therebetween, said mandrel having an axially aligned aperture therethrough carrying a centering-die therein, and each of said shafts having a circular wire brush on one end thereof and a pinion-gear on their opposite ends which is adapted to cooperate with the internal gear-rack to revolve the brushes about the stock when the mandrel is driven.

JOHN J. CAUGHERTY.