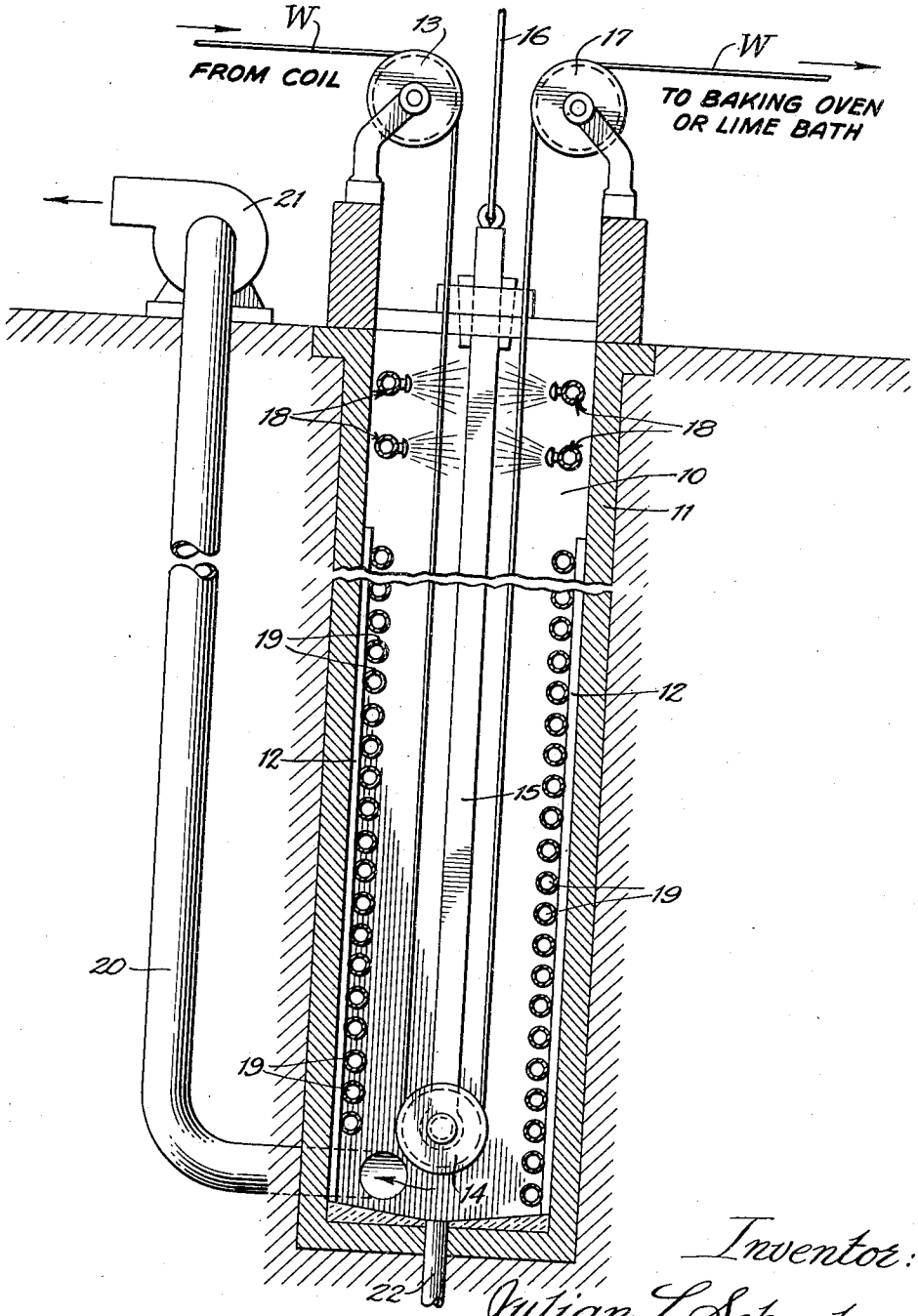
June 4, 1940.

J. L. SCHUELER

2,203,065

SULLING APPARATUS

Filed April 18, 1938



Inventor:
Julian L. Schueler,
By Banning & Banning
Attorneys.

Patented June 4, 1940

2,203,065

UNITED STATES PATENT OFFICE

2,203,065

SULLING APPARATUS

Julian L. Schueler, Kokomo, Ind., assignor to Continental Steel Corporation, Kokomo, Ind., a corporation of Indiana

Application April 18, 1938, Serial No. 202,717

5 Claims. (Cl. 266—3)

In preparing rods or wires for drawing, it is necessary to remove the scale (iron oxide) acquired in the process of hot rolling. This is usually done by an acid pickling bath which removes the scale and leaves the surface of the wire very clean. In this condition, however, it is hard to draw. In order to lubricate the wire to cause it to pass more easily through the die, it is often subjected to a process of sulling by which a coating of iron rust is formed on the freshly cleaned and washed surface of the wire. The thickness of this coating varies according to the desired use, and may range from a slightly greenish color to an extremely dark brown depending on the use to which the rod or wire is to be put. This rust covering acts as a lubricant carrier in the wire drawing process, and in many instances remains on the wire after drawing so as to form a sort of lubricant in cold heading or extrusion processes which may be later performed on the wire.

After the sulling operation, the wire is usually immediately dipped into a lime solution which is then thoroughly baked on. There are two types of lime coating generally used—a light lime and a heavy lime, depending upon what is going to be done with the wire after it is drawn from the rod.

It is a primary object of this invention to improve the apparatus for sulling rods or wires preparatory to drawing whereby the sulling operation can be accelerated and be more readily controlled.

This and other objects, as will hereinafter appear, are accomplished by my improved apparatus which is fully described in the following specification and shown in the accompanying drawing, in which is shown a vertical section through a sulling well embodying the present invention.

As illustrated, a sulling chamber, preferably in the form of a well 10, is provided with side walls 11 of any suitable material, as brick or concrete, and equipped, if desired, with an insulating lining 12.

The rod or wire W to be treated may come from a coil (not shown). It first passes over a sheave 13 suitably mounted above the well, then proceeds downwardly into the well and around and under a sheave 14 which is pivotally mounted on a frame 15 suspended in the well by means of a rope 16 suitably carried by a hoist or other means for raising and lowering the frame in the well. The wire then passes up and over a sheave 17 which is mounted similarly to the sheave 13, and then proceeds on to a liming bath or baking oven (not shown).

Spraying nozzles 18 which are located near the top of the well are adapted to spray either water or steam on the descending and ascending wires at this point. A series of coils 19 may be filled with steam to produce a higher temperature in the well or they may carry water or a cooled brine or the like to produce a lower temperature. By these means the temperature in the well may be varied through a considerable range and may be held at any predetermined point within this range to produce a desired result.

Circulation of the gases and vapors within the well is obtained by means of a pipe 20 which may, if desired, be connected to a motor-driven fan 21. This fan is adapted to deliver the vapors and gases to the atmosphere or it may return them to another part of the well. A drain 22 serves to carry off any excess moisture collecting in the bottom of the well.

It will be understood that the length of the well may be such as to accommodate a great many such wires traveling side by side, the direction of movement of each and the operating parts therefor being the same as already described. The well may be sufficiently deep to produce the desired amount of sull which will vary due to many factors such as the kind and size of the wire to be treated, the speed with which it is run through the apparatus, etc.

Rods and wires of different sizes, material, and composition may be treated concurrently in the same well while running at the same or different speeds. Under these conditions, there may be considerable differences in the length of travel required for different wires. This apparatus lends itself readily to variations of this kind which are accomplished by adjusting the length and time of the wire travel through the well by raising and lowering the various sheaves 14. Thus, the sull deposited upon the wire may vary from a slight greenish color to an extremely dark brown color.

While the width of the well may be quite narrow, it may have considerable length depending upon the number of strands of rod or wire to be treated. It will also have very considerable depth in order to provide means for giving the wire a long sulling operation. Thus, it will be seen that I have provided a very compact form of sulling well and that this long sulling operation is accomplished at the expense of a minimum amount of floor space.

It will be understood that the word "wire" as

used herein is intended to include both rods and wires of various gauges and forms.

I claim:

1. A sulling well comprising side walls, spaced sheaves near the top of the well, a frame between the sheaves and carrying at its lower end a third sheave whereby a strand of wire can be passed tightly over one of the upper sheaves under the third sheave and over the other upper sheave, and means for producing a sulling atmosphere in the well as a strand of iron or steel wire is run continuously therethrough.

2. A sulling well comprising side walls, spaced sheaves near the top of the well, a frame between the sheaves and having at its lower end a third sheave whereby a strand of wire can be passed tightly over one of the upper sheaves under the third sheave and over the other upper sheave, means for raising and lowering said frame and the third sheave to vary the length of wire in the well, and means for producing a sulling atmosphere in the well as a strand of wire is run continuously therethrough.

3. A sulling well comprising side walls, spaced sheaves near the top of the well, a frame between the sheaves and having at its lower end a third sheave whereby a strand of wire can be passed tightly over one of the upper sheaves under the third sheave and over the other upper sheave, means for producing a sulling atmosphere in the well, and means for producing circulation of the atmosphere in the well.

4. A sulling well comprising side walls, spaced sheaves near the top of the well, a frame between the sheaves and having at its lower end a third sheave whereby a strand of wire can be passed tightly over one of the upper sheaves under the third sheave and over the other upper sheave, means including said frame for raising and lowering the third sheave to vary the length of wire in the well, means in said well for spraying moisture on the wire in the well, and means for heating the atmosphere in the well.

5. A sulling well comprising side walls, spaced sheaves near the top of the well, a frame between the sheaves and having at its lower end a third sheave whereby a strand of wire can be passed tightly over one of the upper sheaves under the third sheave and over the other upper sheave, means for raising and lowering the third sheave to vary the length of wire in the well, means in the well for spraying moisture on the wire in the well, means for producing a desired thermal condition in the well, and means for draining excess water from the well.

JULIAN L. SCHUELER.