G. RUSSELL.

COATING METAL SHEETS.

APPLICATION FILED AUG. 5, 1909.

1,035,242.

Patented Aug. 13, 1912.

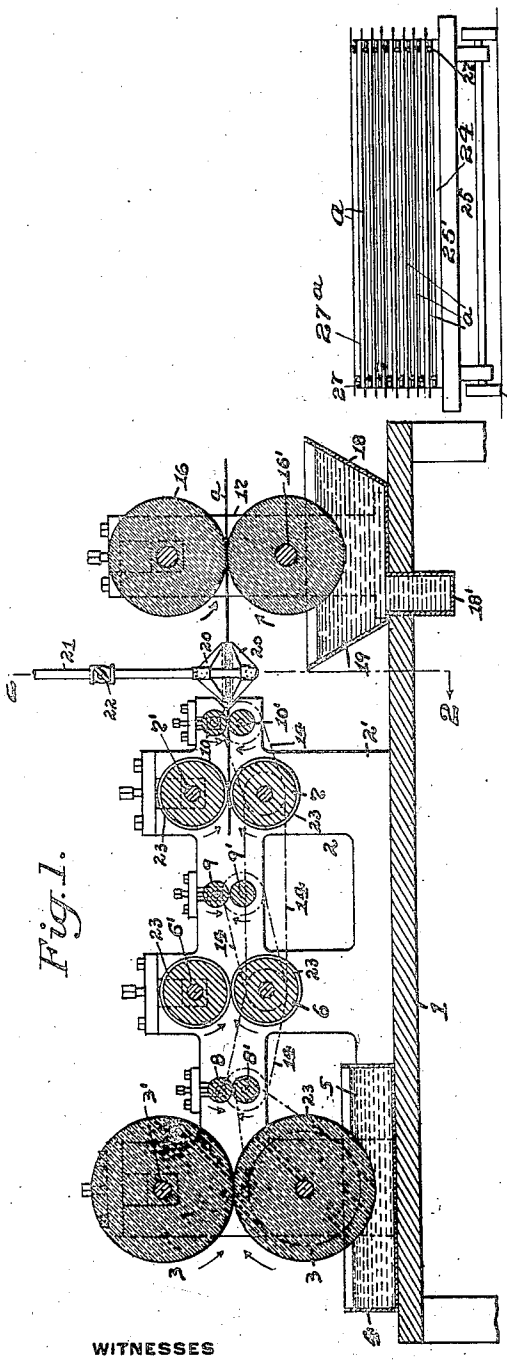

Fig. 1.

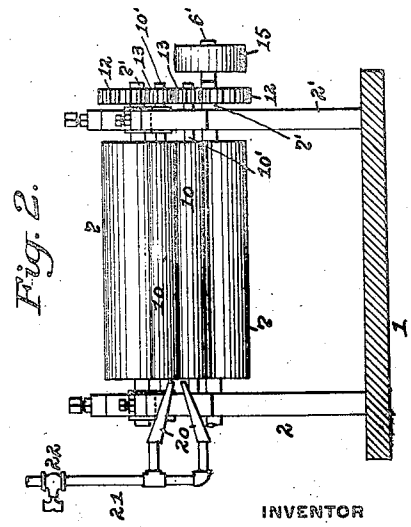

Fig. 2.

WITNESSES

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COATING METAL SHEETS.

1,035,242. Specification of Letters Patent. Patented Aug. 13, 1912.

Application filed August 5, 1909. Serial No. 511,464.

To all whom it may concern:

Be it known that I, GEORGE RUSSELL, a resident of McKeesport, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Coating Metal Sheets; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to coating metal sheets, and has special reference to thin metal sheets, such as tin, black iron or other sheets which are to be coated with enamel, lacquer or other like material.

The object of my invention is to provide a process of preparing metal sheets for coating, as well as a machine or apparatus in which the sheets as passed through the same are cleaned or prepared for the coating of the same, and if necessary thereafter kept completely cleaned or cleared after such preparation and before being coated, so that when such sheets are thus prepared they will present a clean, clear and highly polished and finished article when coated.

My invention consists, generally stated, in the novel process and arrangement, construction and combination of parts of the apparatus for carrying out such process, as hereinafter more specifically set forth and described, and particularly pointed out in the claims.

To enable others skilled in the art to which my invention appertains to practise my improved process and construct and use my improved machine for coating metal sheets, I will describe the same more fully, referring to the accompanying drawing, in which—

Figure 1 shows a longitudinal sectional view of the machine for coating metal sheets, and showing in full lines the means for handling and supporting the sheets after being coated. Fig. 2 is a vertical cross section on the line 2—2, Fig. 1, looking in the direction of the arrow.

Like symbols of reference herein indicate like parts in each of the figures of the drawing.

As illustrated in the drawings, 1 represents the bed of the machine, which has suitable racks or frames and then the plates are mounted on shafts 3′ journaled in said frame, and are in vertical line with each other. The lower roll 3 is adapted to travel within a receptacle or tank 4 on the bed 1, and such tank is adapted to contain a cleansing material 5, such as water, gasolene or other suitable cleansing compound or liquid. Intermediate of the ends of the frame 2 and within the same are the swabbing rolls 6, which are mounted on shafts 6′ journaled in said frame and are in vertical line with each other. At the rear end of the frame 2 and within the same are the two polishing rolls 7, which are mounted on shafts 7′ and are in vertical line with each other.

Between the rolls 3 and 6 are the two driving rollers 8 which are mounted on the shafts 8′ journaled in the frame 2, and are in vertical line with each other, and between the rolls 6 and 7 are the driving rollers 9, which are mounted on shafts 9′ journaled in said frame and are in vertical line with each other. Beyond the rolls 7 and at the rear end of the frame 2 are the driving rollers 10, which are mounted on shafts 10′ journaled in said frame, and are in vertical line with each other.

Each of the rolls 3, rolls 6, and rolls 7, are connected together by the two gear wheels 12, which are mounted on the respective shafts of said rolls, exteriorly of one side of the frame 2, and are adapted to mesh with each other, as shown in Fig. 2, and each of the driving rollers 8, 9 and 10 are connected to each other by the two pinions 13 mounted on the respective shafts of these rolls and exteriorly of one side of the frame 2, for meshing with each other, as shown in Fig. 2. The lower rolls 3, 6 and 7, and the lower driving rollers 8, 9 and 10 are operated by suitable connections 14, preferably of the sprocket wheel and chain type, as shown diagrammatically in dotted lines Fig. 1 and driven from the driving shaft 6′ of the lower swabbing roll 6. This shaft 6′ is provided with a pulley 15, such as is shown in Fig. 2, and connected to any suitable source of power in the usual manner, so that the rolls 3, 6 and 7, and rollers 8, 9 and 10, will be revolved in the direction of the arrows shown in Fig. 1, through the gears 12 on the shafts 3′, 6′, and 7′, pinions 13 on shafts 8′, 9′ and 10′, and the connections 14, and preferably said rolls 6 and 7 will be revolved at a faster speed than said

rollers 8, 9 and 10, while the roll 3 can be revolved at the same speed as said rolls 6 and 7, or at another speed, as desired.

Beyond the rear end of the frame 2 are the two coating rolls 16, which are mounted in a vertical line on the shafts 16′ and journaled in the housings or standards 17 extending vertically up from the bed 1. These rolls 16 are operated through suitable connection, (not shown), which are connected to, or operated by, any suitable source of power, and they will revolve in the same direction as the other rolls and rollers previously described, as indicated by the arrows in Fig. 1. Under the lower roll 16 is a receptacle or tank 18, which is adapted to contain any suitable coating material 19 for being fed to said lower roll, and this pan has a well 18′ at one end of the same to receive the gravimeter in testing the specific gravity of the enameling or other compound within the tank.

Between the driving rollers 10 and coating rolls 16 are the two flat nozzles 20, which are in vertical line with each other for being in position on each side of the sheet passing between the same, as hereinafter described, and are connected by a pipe 21 leading from any suitable air blast (not shown), while such blast is controlled by a valve 22 on the said pipe.

The rolls 6 and 7 are covered or faced with a suitable surfacing material, as at 23, while the rolls 3 and 16 are formed of a composition of glue and other materials, such as employed for printing rolls to form themselves soft and yielding, and such rolls 16 are of sufficient size or diameter to permit the entire surface of the sheet or plate to be coated at one revolution of the same. With one revolution of the lower roll 16 through the coating material 19 in the tank 18, the upper roll 16 will receive the said material from the lower roll over its entire face from said lower wall in such a like revolution through its contacting therewith, and thereby enable the coating of the entire sheet or plate when it is afterward passed between the same, as hereinafter described.

With the parts operating as indicated by the arrows in Fig. 1, the lower roll 3 in being revolved through the cleansing material 5 in the tank 4 will convey such material to the upper roll 3 in its revolution, and the sheet or plate *a* to be coated is passed between said rolls 3 where it is cleansed or washed on both sides, and then it is caught by the driving rollers 8. After it is caught by the driving rollers 8, the plate *a* is passed between and through the same and reaches the swabbing rolls 6 where it is dried on both sides in passing through and between the same. In passing through and between the swabbing rolls 6, the plate *a* is caught by the driving rollers 9 and passes between and through the same to the polishing rolls 7 where it is caught by said rolls, and it is polished on both its sides. When the plate *a* is being passed through and between the polishing rolls 7, it is caught by the driving rollers 10 and passes through and between the same to the coating rolls 16. After passing through the driving rollers 10 to the coating rolls 16, the plate *a* passes between the nozzles 20 where it receives an air blast on each side of the same through said nozzles from the supply pipe 21, so that all dirt, threads or any other material is blown off from said plate to clear the surfaces of the same of foreign particles before passing to said coating rolls.

The plate *a* in passing through the coating rolls 16 has a coating applied to each side of the same by said rolls through the lower roll 16 passing through the coating material 19 in the tank 18, and this coating material having been previously supplied from the said lower roll to the upper roll 16.

When each plate *a* has passed through the coating rolls 16, it is placed upon a rack or frame 24, and then each of such frames carrying plates are piled upon the bed 25′ of a truck 25, which is mounted upon wheels 26. When a sufficient number of these coated plates *a* are thus placed in the truck 25, it is moved to a drying oven or other suitable place, and such plates allowed to bake or dry in the usual manner.

It will thus be seen that my improved machine for coating metal sheets or plates will be cheap, simple and efficient in its construction and operation, and will enable the plates or sheets to be free from dirt, threads and other particles before being passed to the coating device, while the cleaning and polishing of such sheets or plates before being coated will form a bright and polished surface on the same, and thereby present an unusual highly colored and finished article when the same is coated. By reason of the sheets or plates receiving the air blast after leaving the polishing device any threads, dirt or other particles on or adhering thereto in or after passing through the rolls or rollers are removed before such sheets or plates enter the coating device and thereby enable the same to have perfectly clean and smoother surfaces thereon for the coating of the sheets or plates. The planishing or polishing is for the purpose of condensing or flattening down the surface of the sheet or plate to a smooth uniformity. This makes the surface of the sheet or plate dense in the sense of being non-porous and preserves the skin of the metal. It will also be seen that the machine will clean, polish and coat both sides of the sheets or plates at one operation and the parts of the device such as the driving roll-

ers, cleaning, drying and polishing rolls can be operated separately or together, or with the coating rolls or separated therefrom, as desired.

After the sheets or plates are coated they will be free from any moving or scratching of the same in handling on the device for supporting the same so that such coated surfaces thereon when baked or dried will present a smooth and perfect appearance to the eye and for marketing.

Various modifications and changes in my improved process and in the design and construction of the various parts of my improved machine for coating sheets may be resorted to without departing from the spirit of the invention or sacrificing any of its advantages.

What I claim as my invention and desire to secure by Letters Patent, is:—

1. In apparatus for coating metal sheets or plates, the combination of a coating device, mechanisms for cleaning, drying and polishing the sheets or plates before being coated, and an air blast pipe having flattened nozzles connected thereto for clearing the surfaces of the sheets or plates after polishing and before being coated.

2. In apparatus for coating metal sheets or plates, the combination of a pan for holding the coating material and two soft composition rolls, one roll within the material in the pan and the other roll above and contacting therewith at intervals for the coating of both surfaces of the sheets or plates in passing between the same.

3. The herein described process of coating metal sheets or plates, which consists in cleaning the sheet or plate, then planishing the sheet or plate while in a cold state, and then coating the same.

4. The herein described process of coating metal sheets or plates, consisting in cleaning, drying, then planishing the sheet or plate while in a cold state, and then coating the same.

5. The herein described process of coating metal sheets or plates, consisting in cleaning, drying, then planishing the sheet or plate while in a cold state, then clearing the same, and then coating the same.

In testimony whereof, I, the said GEORGE RUSSELL, have hereunto set my hand.

GEORGE RUSSELL.

Witnesses:
GERTRUDE KREMER,
J. N. COOKE.