March 22, 1932. D. W. MARTIN ET AL 1,850,762

APPARATUS FOR TREATING METAL COATED PARTS

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Fig. 1.

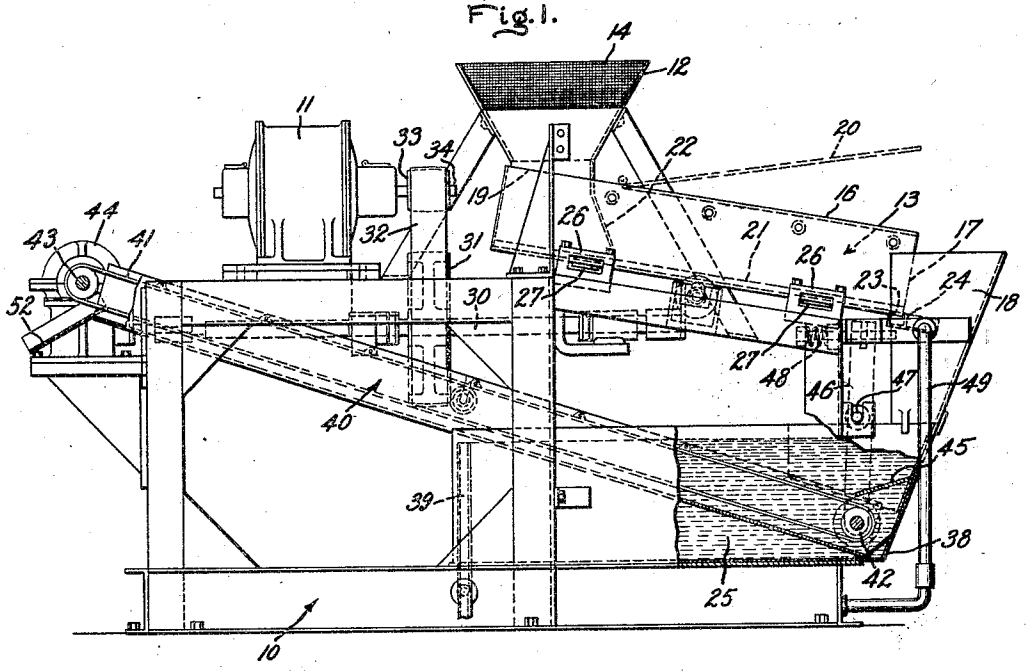
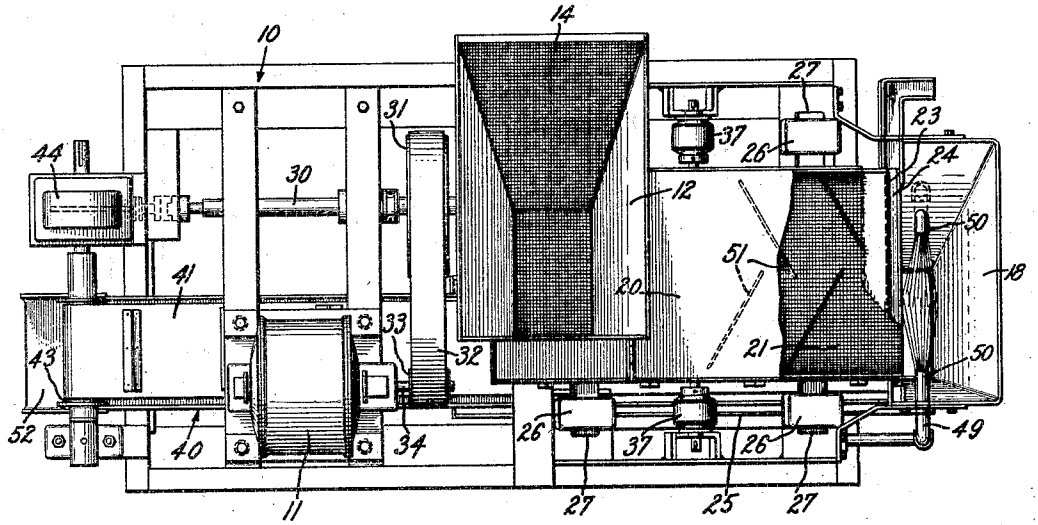


Fig. 2.



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Fig.3.

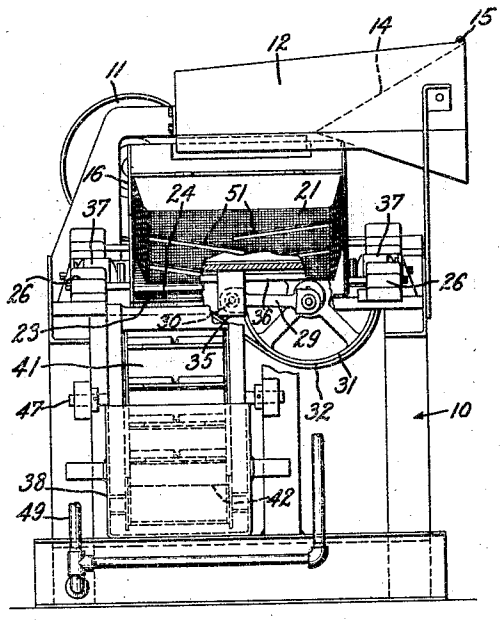


Fig.4.

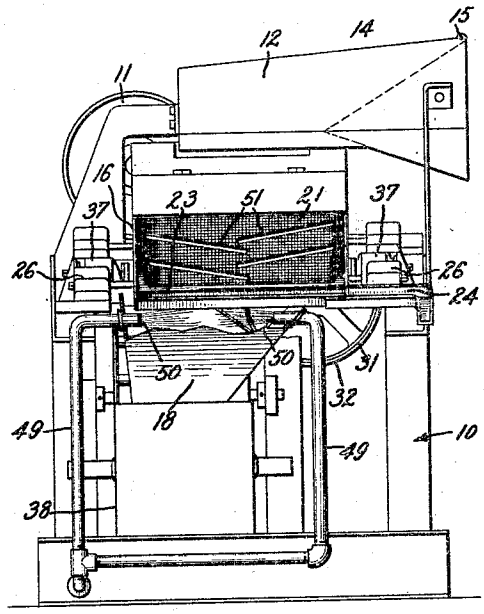
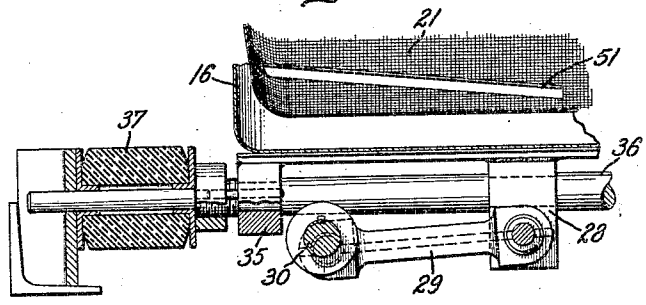


Fig.5.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR TREATING METAL COATED PARTS

Application filed March 29, 1930. Serial No. 440,118.

The present invention relates to an improved apparatus for treating metal coated parts. More specifically, this invention relates to an apparatus for treating metal coated articles so as to effectively remove from the surface thereof any excess hot metal which may be present on or adhering thereto.

A principal object of this invention is the provision of an apparatus which will efficiently and successfully remove all the excess coating metal from small metal coated castings which are provided with internal or external threads, and leave the threaded parts with a smooth, adherent, effective coating of protective metal.

Another object of the present invention is to provide an apparatus which will remove excess metal from coated parts in a minimum of time, and at the same time, leave none of the excess metal chilled and in contact with the threaded portions thereof.

Other and further objects of this invention will be more apparent as the description proceeds.

Machines heretofore employed to remove excess coated metal are generally more or less complicated in mechanical structure, and considerable difficulty has been experienced in providing a practical apparatus for successfully removing all the excess hot metal from coated metallic parts, especially threaded hardware such as nuts, bolts and the like. The present known machines often do not completely remove the excess metal and frequently leave the threaded portions non-uniformly coated so that in many cases they cannot be used without retapping. This means added labor and time, and hence increased cost. In addition, after retapping or rethreading, the threaded parts often must again be coated.

In accordance with the present invention, a comparatively simple, rugged and compact machine has been devised, which machine or apparatus will effectively and speedily remove all excess metal from small coated metal parts leaving a uniform coating of protective metal. If the parts are threaded, all excess metal is removed from the threaded portions, leaving them smooth and uniform and unimpaired for use.

The invention will be better understood by referring to the following detailed description in connection with the accompanying drawings which form a part of the present application. In said drawings,

Fig. 1 represents a side elevational view, partly in section and partly broken away, of the apparatus constructed in accordance with the present invention;

Fig. 2 is a plan view of the apparatus shown in Fig. 1 certain parts being broken away;

Fig. 3 is a front elevational view of the apparatus shown in Fig. 1, certain parts thereof being broken away for the sake of clearness;

Fig. 4 is also a front elevational view of the apparatus shown in Fig. 1 with certain parts broken away to disclose the sprays or nozzles;

Fig. 5 is a fragmentary view, partly in elevation and partly in section, showing in detail the reciprocating mechanism for the shaking screen mechanism.

Referring more particularly to Fig. 1, it will be seen that the machine is provided with a steel frame-work designated generally at 10. A motor 11 is used to drive all the moving parts of the apparatus. The apparatus proper comprises a receiving hopper 12 suitably fastened to the framework 10 and delivering into the top upper portion of an inclined vibrating or shaking screen mechanism designated generally at 13. The hopper 12 contains an inclined screen 14 which is removably fixed to an upper portion thereof by means of pin 15. This screen 14 is for the purpose of receiving the coated parts as they are delivered to the hopper and is from time to time taken out and the excess metal from the coated parts which deposits thereon removed. Such excess metal may be conveniently removed from the screen by burning it off.

The shaking screen mechanism 13 may be constructed of any suitable material such as sheet steel and comprises a substantially enclosed receptacle or box 16 provided with an opening 17 at one end thereof connecting

with or delivering into another hopper 18. The screen mechanism also has an opening 19 connecting with the hopper 12. A cover or lid 20 is hinged at the upper part of the box 16. This cover is normally in closed position when the machine is operating but may be opened to permit the interior thereof to be inspected, or for the purpose of removing or cleaning the screen 21 within the box 16. A gate or valve 22 is hinged within the box 14 adjacent the opening leading from the hopper 12, for the purpose of controlling the flow of the coated metallic parts from the hopper 12 onto the vibrating screen.

Within the box 16 is suitably fixed, as by welding, the screen proper 21, which is spaced from the bottom of the box 16 so as to permit the excess metal removed from the coated parts to fall to the bottom. The extreme lower end of the bottom of the receptacle or box 16 is cut away for a distance as shown clearly in Fig. 2 of the drawings, at 23, to permit the excess metal which drops through the screen to flow into a gutter 24 fixed to the box 16 and which carries the metal away to one side of the machine as clearly shown in Figs. 2 and 4, and prevents it from flowing into the cooling bath 25.

The box 16 is mounted for reciprocatory movement in bearings 26 which are in turn suitably fixed to the adjacent portions of the framework 10. The bearings 26 have associated therewith slide bars 27 fixed to the under side of the box 16, which bars 27 are adapted to be reciprocated in the said bearings by mechanism hereinafter described.

The reciprocating mechanism is shown more in detail in Fig. 5 of the drawings. A lug 28 is fixed at one end thereof to the under side of the box 16. To the free end of said lug is suitably connected one end of a connecting rod 29, the other end of which is eccentrically connected to the shaft 30. The shaft 30 is suitably mounted in bearings on the framework 10 and carries thereon a pulley 31 connected by means of belt 32 to the motor pulley 33 which is in turn fastened to and adapted to be driven by the motor shaft 34. The box 16 carries guide lugs 35 which slide on a fixed shaft 36. Suitable buffers 37 made of a material such for example as rubber or a coil spring are provided to absorb the shocks of vibration of the screening mechanism.

Mounted on the bottom portion of the framework 10 and directly beneath the screen mechanism is a cooling bath 25 comprising a suitable container 38 filled with a suitable cooling fluid, such as water, and connecting at one end thereof with the lower end of the hopper 18. The level of the cooling fluid is kept almost at the top of the container 38 and is controlled by the overflow pipe 39. A belt conveyor designated generally at 40 is mounted on the framework 10 and is inclined and travels through the cooling bath 25 for a substantial portion of its length. The conveyor comprises an endless belt 41 trained around lower and upper rollers 42 and 43 respectively, and driven through the medium of the shaft 30 to which the upper roller 43 is suitably connected by a speed reducing mechanism enclosed in the housing designated at 44. A deflecting element 45 is suitably mounted within the container 38 to deflect the metal parts falling through the hopper 18 onto the conveyor 40. The lower roller 42 is suitably journalled at one end thereof in the lower end of a belt tightener 46. This belt tightener is suitably fulcrumed on the framework at an intermediate point in its length, as at 47, the end opposite to that at which the roller 42 is journalled being suitably provided with adjustable means 48 to permit the belt tightener to be adjusted when necessary.

Pipes 49 containing a suitable cooling fluid, such as water, are provided, and terminate in nozzles or sprays 50 within the hopper 18 at points substantially in line with the level of the bottom of the box adjacent the opening 17. The purpose of the nozzles or sprays 50 will be more particularly set forth in the description of the operation of the apparatus.

The operation of the apparatus is as follows:

The metallic articles or parts such as metallic castings, nuts, bolts and the like, having first been coated with a protective metal, for example, by dipping in a molten metal such a zinc, are delivered to the hopper 12. They fall by gravity through this hopper onto the screen 21 within the box 16 which is rapidly vibrated by means of the reciprocating mechanism described above. The box 16 is closed so as to prevent cold drafts from coming in contact with hot coated parts, which cold drafts would cause the excess hot metal to solidify in spots and render the coated articles and especially the threaded portions thereof, unfit for use. The motor 11 imparts the necessary power to the mechanism which reciprocates the screening mechanism and drives the conveyor. The screening mechanism is vibrated very rapidly and the coated parts are caused to be acted upon on every portion of their surfaces and in a minimum of time, the screen 21 being provided with baffles 51 suitably spaced along the surface thereof to make sure that the coated parts will be thoroughly acted upon and the excess metal effectively removed. This excess metal drops through the screen 21 onto the bottom of the box 16 and is carried away through the gutter 24 therein. Passing from the box 16 the coated parts fall through the hopper 18 onto the conveyor 40 within the cooling bath 25. As the coated parts leave the screen 21 and fall into the hopper 18 they receive a spray of

cooling fluid from the nozzles 50. This has been found to be desirable and effective to prevent the coated parts, which are still relatively hot, from picking up any of the excess metal which may have escaped the gutter 24 and have fallen into the hopper 18 and have adhered to the walls thereof. It is important that no such excess metal come in contact with the coated parts since the latter will, while still relatively hot, pick up such metal which will adhere to them, and when the parts fall into the cooling bath 25 the excess metal so picked up will solidify on the parts and render them unfit for use, especially if the excess metal should adhere to threaded portions of the coated parts. By spraying the cooling liquid on the parts at this point they are partially cooled and thus sufficiently chilled so that even if they should subsequently come in contact with any excess metal which has escaped the gutter 24 and found its way to the walls of the hopper 18, such excess metal will not adhere thereto.

The conveyor carries the coated parts which fall thereon through the cooling fluid, where they are cooled and washed, and then up and out of the bath and onto a platform 52 whence they fall into a receptacle (not shown), placed thereunder, or from which platform they can be removed in any desired manner.

An apparatus constructed as shown and described will operate successfully in removing excess zinc from previously galvanized threaded hardware such as nuts, bolts and the like. The arrangement is compact and rugged and such that the coated parts are caused to be acted upon in a minimum of time and in a manner insuring the complete removal of all excess metal and the prevention of any cooling or chilling of the excess metal around threaded portions. With the present apparatus the removal of excess metal from coated parts may be effected continuously and with practically no rejects.

It is obvious that many changes may be made in the apparatus shown which will fall within the spirit and scope of the present invention.

What we claim as new and desire to secure by Letters Patent of the United States, is:

An apparatus for removing excess hot metal from previously galvanized threaded hardware comprising a substantially enclosed, inclined, vibrating screening mechanism provided with baffle plates, said screening mechanism being adapted to receive at the upper end thereof said coated hardware, means for rapidly vibrating said screening mechanism whereby said hardware is caused to come in contact with said baffle plates and to be acted upon the surfaces thereof and to have all excess metal removed therefrom, means including a hopper for delivering the so treated hardware directly to a conveyor within a cooling bath, means for moving said conveyor carrying said hardware through said cooling bath, and spray means located within said hopper adjacent to the screening mechanism and substantially in line with the level at which the coated articles leave the said mechanism, said spray means being adapted to spray a cooling liquid on the coated articles as they leave the screening mechanism and before they fall into the cooling bath.

In witness whereof, we have hereunto set our hands this 27th day of March, 1930.

DAVID W. MARTIN.
JOHN J. WHALIN.