F. H. MALONEY.

PICKLING AND WASHING MACHINE.

APPLICATION FILED JULY 31, 1917.

1,251,073.

Patented Dec. 25, 1917.

2 SHEETS—SHEET 1.

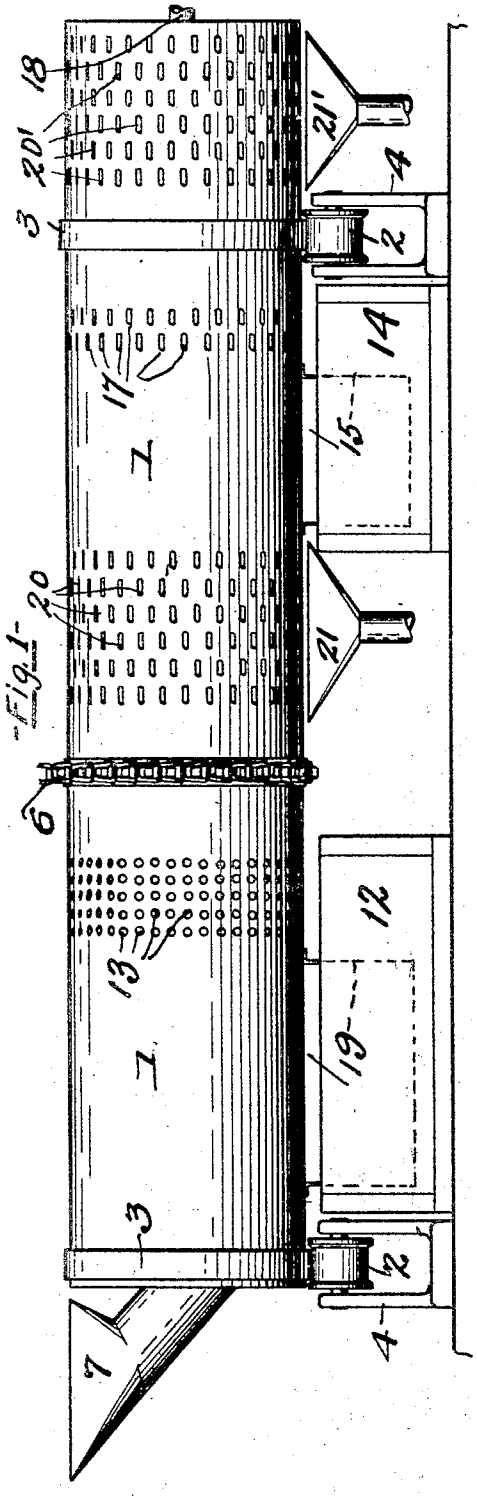


Fig. 1.

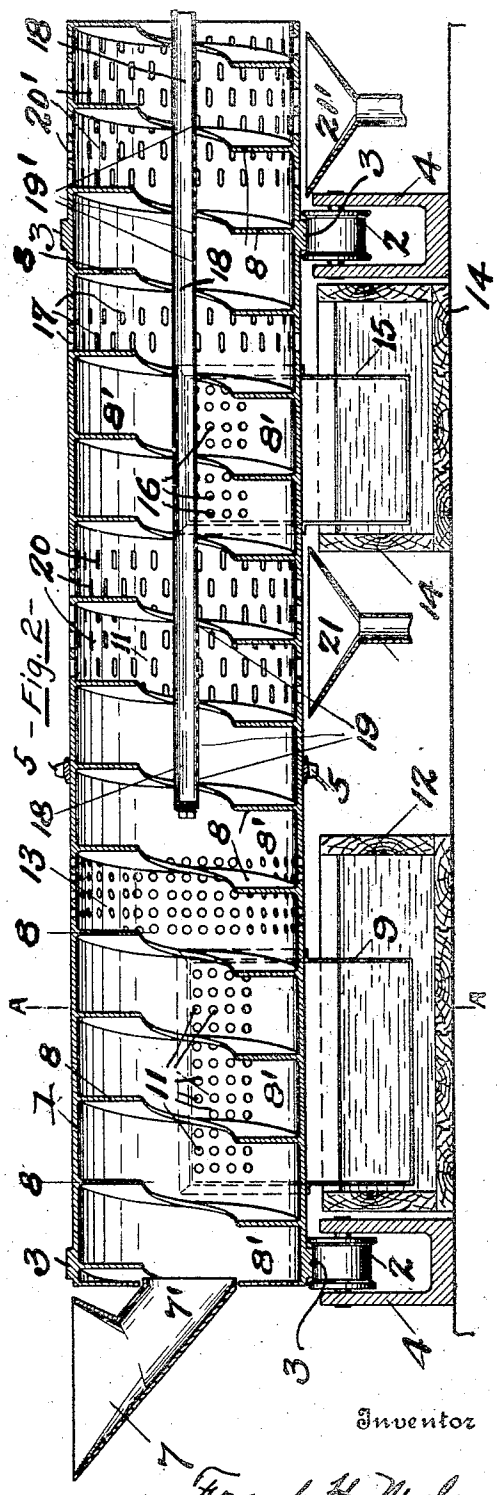


Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 5.

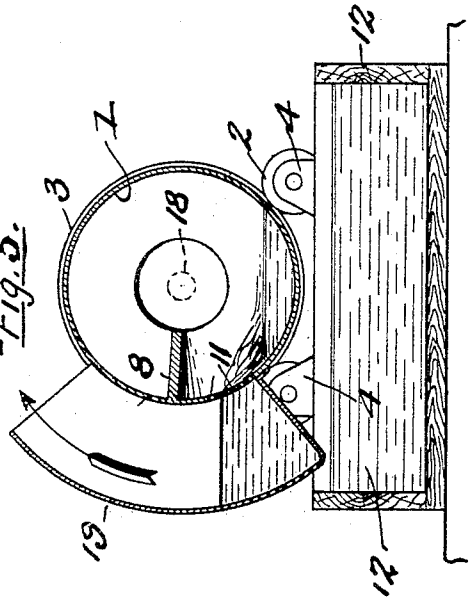


Fig. 3.

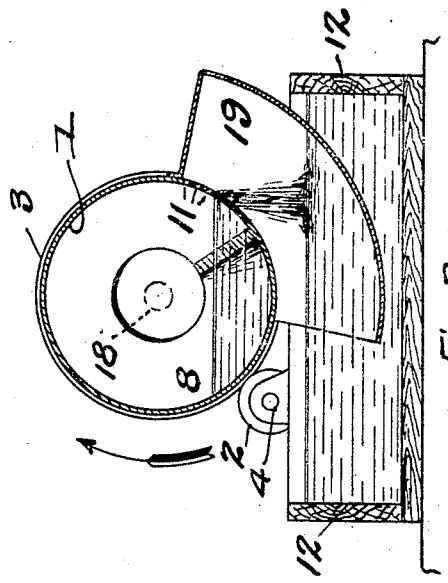


Fig. 4.

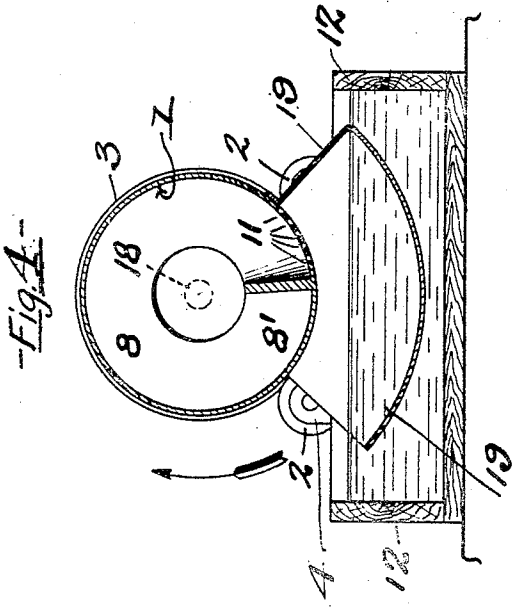
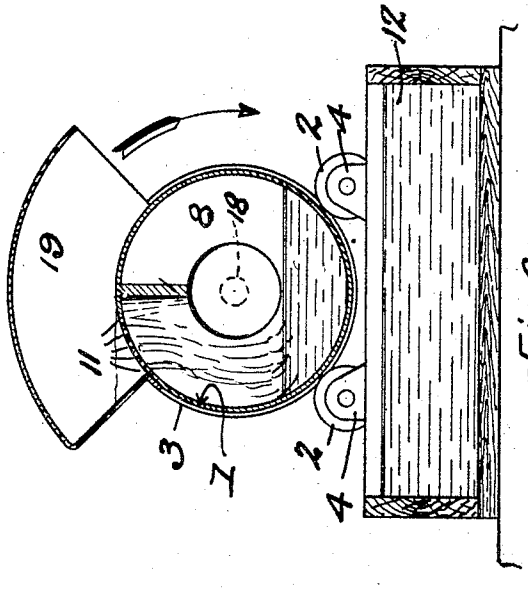


Fig. 6.



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UNITED STATES PATENT OFFICE.

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PICKLING AND WASHING MACHINE.

1,251,073. Specification of Letters Patent. Patented Dec. 25, 1917.

Application filed July 31, 1917. Serial No. 183,801.

To all whom it may concern:

Be it known that I, FRANK H. MALONEY, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Pickling and Washing Machines, of which the following is a specification.

The invention relates to improvements in machines for pickling, cleaning, and washing relatively small articles such as brass stampings, screw machine products, valve casings, and like articles which require treatment in order to relieve them of oxid and other foreign substances collected during the course of manufacture.

The object of the invention is to provide a continuously operating machine adapted to feed materials therethrough whereby to permit the materials to be subjected to a bath of a suitable solution, and to a washing bath so as to cleanse them of all foreign substances engendered during the course of manufacture, the construction and arrangement of the machine being such that the articles passing through the machine are first subjected to a bath of a cleaning solution, and then subjected to another bath and washed of the cleansing influence before being delivered through the discharge end of the machine. A further object of the invention is to provide an arrangement whereby to subject the articles passing through the machine to a tumbling or agitating movement, so as to insure an immersion and washing of the materials before being discharged at the delivery end of the machine.

The invention comprises a cylinder adapted to be continuously rotated and having an internal helical or spirally arranged web or blade extending throughout the length thereof providing a helical channel for feeding materials through the cylinder; in the arrangement of scoops carried by the cylinder and associated with tanks designed for containing acid or other cleansing solutions, said cylinder being provided with perforations whereby to permit the liquids collected by the scoops to flow into the cylinder upon the articles as they are fed therethrough. The invention further comprises means for washing the articles after passing through the cleansing influence, and in certain peculiar and novel features of construction and arrangement whereby waste of the solution is avoided, and still further in the novel and peculiar construction of the machine whereby the articles passing through the machine are immersed and rinsed before being delivered.

In the drawings, illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation of the machine. Fig. 2 is a longitudinal section of the machine. Fig. 3 is a transverse section drawn on the line A—A of Fig. 2, showing the scoop or dipper immersed in the cleaning influence holding tank, and Figs. 4, 5, and 6 illustrate the several positions of the scoop or dipper during the revolution of the cylinder.

1 designates a cylinder of substantially uniform diameter throughout its length supported by rollers 2 operating upon circumferentially arranged bands or tracks 3 carried by the cylinder. The said rollers 2 are journaled in brackets or frames 4, and are so disposed to hold the cylinder 1 in a substantially horizontal position. The cylinder 1 is designed to be rotated upon the rollers 2, and, for the purpose of illustration, I show the cylinder 1 provided with a band or rim of sprocket teeth 5 over which operates a drive sprocket chain 6 extending from a suitable source of power (not shown). It will be appreciated that while I have shown and specified a sprocket and chain mechanism for revolving the cylinder, that other mechanism may be employed for revolving the cylinder, and that the mechanism may be located in other positions than that shown in the drawings of the present application. While I have shown the cylinder 1 mounted upon rollers 2 supported in frames located at the inner and outer ends of the cylinder, it will be apparent that other supporting rollers may be employed according to the length of the cylinder.

Carried by suitable brackets (not shown), positioned adjacent to the inner end of the cylinder 1, is a hopper 7 having its discharge 7′ opening into the inner end of the cylinder 1. The cylinder is formed with an internal spirally arranged web or blade 8 extending

throughout the length thereof providing a spiral or helical groove or channel 8′ adapted for feeding the materials through the cylinder.

Located adjacent to and below the inner or forward end of the cylinder 1, is a tank 12, adapted for holding a solution of sulfuric acid or other cleansing solution. The cylinder 1 is provided with a scoop or dipper 9 open at one end and closed at its opposite end, and adapted to operate through said tank 12 during the revolution of the cylinder. The cylinder is provided between the end walls of the scoop or dipper with a plurality of perforations 11 designed to permit the feeding of the liquid into the cylinder and the escape of the liquid from the cylinder back into the tank 12 during the revolution of the cylinder, thereby flooding the channels 8′ and completely immersing the articles as they are fed through the machine. In order to avoid any waste of the cleansing influence, the cylinder 1 is provided with a plurality of circumferentially arranged perforations 13 located immediately forward of the scoop or dipper 9, which serve to drain the liquids fed into the channels 8′ forward of the scoop or dipper 9. Adjacent to the outer end of the cylinder 1 there is located a tank 14 adapted for containing a solution of soap and water or other suitable cleansing or washing solution, and operating in conjunction with this tank 14 is a scoop or dipper 15 carried by the cylinder 1, and which, like the scoop or dipper 9, is open at one end and closed at its opposite end, and is adapted to collect the solution contained in the tank 14 and spray and immerse the material as it is fed through the cylinder. The cylinder between the end walls of the scoop or dipper 15 is provided with perforations 16, whereby to permit the inflow and discharge of the liquid upon the material as it passes through the cylinder. Immediately forward of the scoop or dipper 15 the cylinder is provided with a plurality of circumferentially arranged perforations or slots 17 whereby to collect and drain back into the tank 14 the liquid that has been previously scooped up by the scoop or dipper 15. Arranged centrally within the outer end of the cylinder 1 is a pipe 18 having a plurality of perforations 19, said pipe being designed for supplying cleansing water to the materials to wash them of the first cleansing influence and subject them to an immersion of pure water, which is drained off through perforations 20 into a drain hopper 21 located below the cylinder and having a suitable drain pipe connected thereto for carrying off the water as it escapes through the perforations 20. Immediately adjacent to the outer end of the cylinder the latter is provided with perforations 20′, and the pipe 18 is provided with a plurality of perforations 19′, through which cleansing water is sprayed upon the materials before being delivered from the cylinder. A drain hopper 21′ is arranged below the perforations 20′ for carrying off the cleansing water as it escapes through the perforations 20′.

The operation of the machine is as follows:—

Taking, as an example, small brass pieces coming from an annealing furnace, and which are consequently coated with oxid, they are dumped or poured into the hopper 7, from which they flow into the groove or channel 8′ at the forward end of the machine, and through the rotation of the cylinder, it will be appreciated that the materials are fed therethrough in a manner similar to that of all screw conveyers. Now as the materials pass through the channels 8′ embodied within the length of the scoop or dipper 9, they will be sprayed and immersed in a suitable cleansing solution collected from the tank 12, and as the solution is fed into the channels 8′, immediately forward of the scoop or dipper 9, the solution will run back into the tank, through the perforations 13, and hence used over and over again. As the articles continue through the machine they are subjected to an immersion of fresh water supplied by the pipe 18, rinsed, and this rinsing water is drained through the perforations 20 formed in the cylinder 1. Then as the articles are passed through the cylinder they are subjected to a bath of the solution contained within the tank 14 in a similar manner as that described with respect to the scoop or dipper 9, after which the articles are subjected to a further washing, rinsing, and draining before being delivered out through the free end of the cylinder.

It will thus be seen that I provide a very simple and highly efficient apparatus for the purpose described, and it will be understood that while I have shown only two solution containing tanks and two scoops or dippers associated therewith, that a greater number may be employed should occasion require. I therefore do not limit myself to any specific number of scoops or dippers and tanks, or solutions or washes, as it will be obvious to anyone skilled in the art to which the invention relates that a greater or less number may be employed without departing from the spirit of the invention.

It will be particularly noted that the inlet and escape ports or perforations of the cylinder are arranged at intervals throughout the length thereof so that as the materials are fed through the helical channel they are subjected to an immersion, and that the solutions or water in which the materials are immersed are drained and fed back into the

several tanks, or into the drainage funnels as hereinbefore described.

It is to be noted that the scoop or dipper 9 forms a means for positively delivering fluid to the drum during a portion of each revolution thereof.

What I claim is:—

1. A machine of the character described, comprising a rotatable drum having an internally arranged helically disposed member for conveying work therethrough, means exteriorly arranged upon said drum for automatically supplying fluid to the work passing through said drum as the drum is rotated, said drum having a plurality of discharge openings to permit of the escape of the fluid at intervals during the passing of the work through the drum.

2. A machine of the character described, comprising a rotatable drum having an internally arranged helically disposed member, and means carried upon the periphery of the drum for positively delivering fluid to the drum during a portion of each revolution thereof.

3. In an apparatus of the character described, a drum having means at one end for receiving the work to be treated, means arranged within the drum for passing the work therethrough, and means carried by and connected to the periphery of the drum for positively delivering fluid to the work passing through the drum, said drum having a plurality of perforations to permit the escape of the fluid at intervals during the passage of the work through said drum.

4. A machine of the character described, comprising a rotatable drum provided with a helically arranged channel therein forming a plurality of separate work-carrying chambers, and means arranged externally upon the cylinder for positively delivering a cleansing solution to and discharging the same from said chambers to act upon the work in each a plurality of times while passing through the drum.

5. A machine of the kind described, comprising a rotatable cylinder having a spirally arranged web extending throughout the length thereof providing a spirally arranged channel, said cylinder having a plurality of perforations arranged throughout its length, in combination with a fluid holding tank, and a scoop or dipper arranged upon said cylinder and adapted to coöperate with said tank to positively deliver fluid to the cylinder during a portion of each revolution thereof, as and for the purpose specified.

6. A machine of the kind described, comprising a rotatable cylinder having a spirally arranged web or blade extending throughout the length thereof providing a spirally arranged channel adapted for feeding materials through the cylinder, said cylinder having a plurality of perforations arranged in its periphery, a scoop or dipper carried by said cylinder and embracing said perforations, a fluid holding tank through which said scoop or dipper is adapted to operate, and means for rotating said cylinder.

7. A machine of the kind described, comprising a rotatable cylinder having a spirally arranged channelway therein adapted for feeding materials through the cylinder, said cylinder having perforations, a scoop or dipper carried by the cylinder embracing the perforations thereof, a solution holding tank arranged below the cylinder through which the said scoop or dipper passes during the revolution of the cylinder, and means for revolving said cylinder.

8. A machine of the kind described, comprising a rotatable cylinder having a spirally arranged channel extending therethrough, means for rotating said cylinder, a hopper associated with the forward end of the cylinder and discharging into said channel, a tank arranged below said cylinder adapted for containing a suitable bath, and means carried by and arranged externally of said cylinder for collecting and delivering the solution of said bath upon the materials passing through said cylinder.

9. A machine of the kind described, comprising a rotatable cylinder having a spirally arranged channel extending therethrough, the said cylinder having a plurality of perforations opening into said channel, scoops or dippers carried by the said cylinder and embracing said perforations, tanks located below the said cylinder in the path of said scoops or dippers, as and for the purpose specified, and means for supplying rinsing water to the materials as they are fed through the cylinder.

10. A machine of the kind described, comprising a perforated cylinder having helical or spirally arranged feeding channels therein, a scoop or dipper carried by and arranged upon the periphery of said cylinder adapted for positively delivering a cleansing influence to materials passing through the cylinder, and a tank arranged below said cylinder through which the scoop or dipper operates, said cylinder having a plurality of perforations arranged forward of said scoop or dipper whereby to drain the said cleansing influence back into said tank.

11. An apparatus of the kind described, comprising a rotatable cylinder, a scoop or dipper arranged upon the periphery thereof to positively deliver fluid to the cylinder during a portion of each revolution thereof, said cylinder having a series of perforations adjacent to the inner or closed end of the scoop or dipper and a series of escape openings adjacent to the forward end of said scoop or dipper, a solution holding

tank arranged below said cylinder within the path of said scoop or dipper, said perforations forward of the scoop or dipper being so located as to drain the fluid sprayed upon the work passing through the cylinder back into said fluid holding tank, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 26 day of July, A. D. 1917.

FRANK H. MALONEY.

Witnesses:
MARY E. LYDDY,
MILDRED SEXTON.