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APPARATUS FOR REMOVING PAINT FROM CYLINDERS AND CONTAINERS

Original Filed Nov. 17, 1924

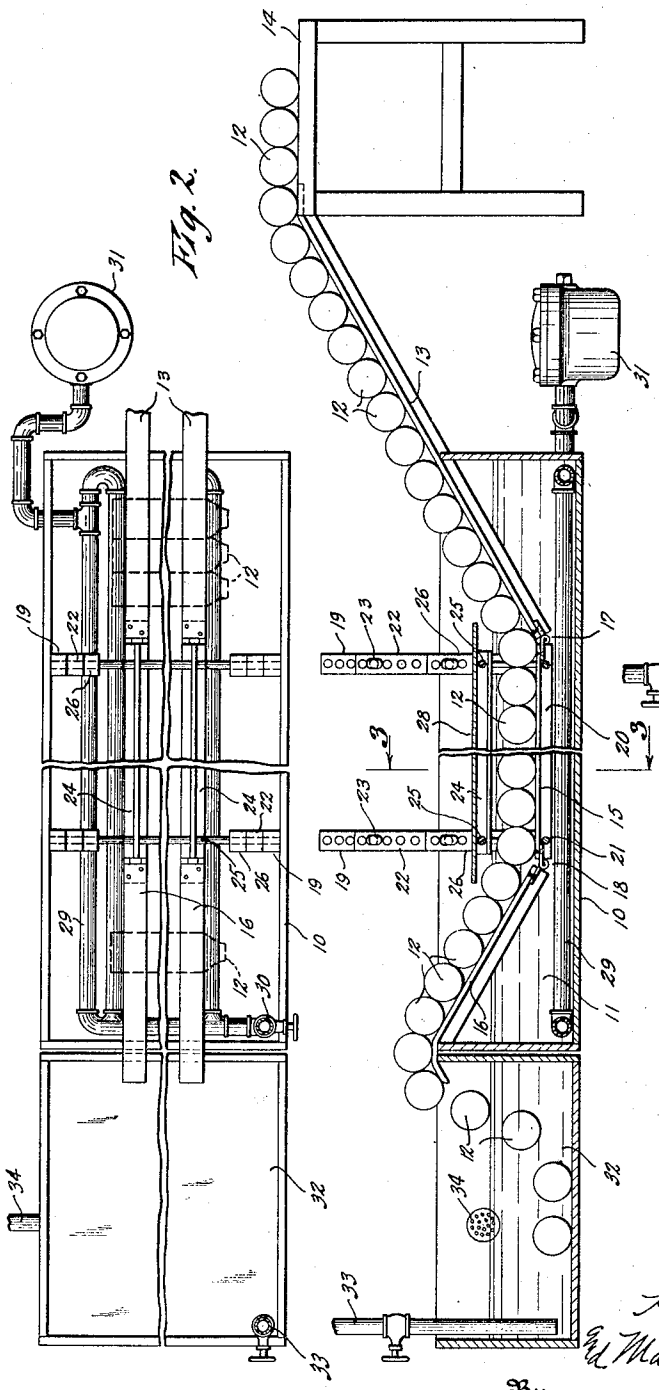


Fig. 2.

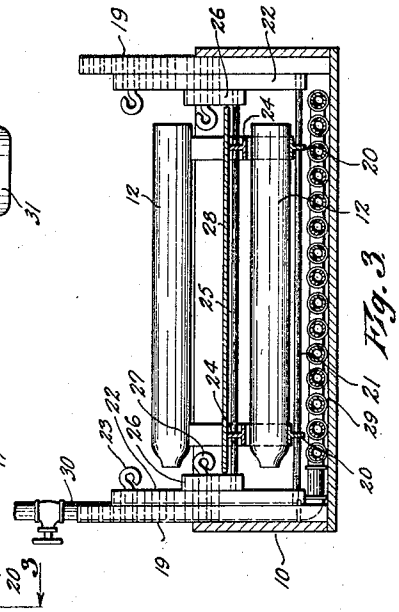


Fig. 3.

Fig. 1.

Inventors.
Harry W. Cole
& Malcolm W. McLaren
By Wooster & Davis
Attorneys.

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UNITED STATES PATENT OFFICE.

HARRY W. COLE, OF NEW ROCHELLE, AND MALCOLM W. McLAREN, OF JACKSON HEIGHTS, NEW YORK, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE LIQUID CARBONIC CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

APPARATUS FOR REMOVING PAINT FROM CYLINDERS AND CONTAINERS.

Original application filed November 17, 1924, Serial No. 750,359. Divided and this application filed August 21, 1925. Serial No. 51,538.

This invention relates to an apparatus for cleaning substantially cylindrical articles, and more particularly for removing paint or the like from such articles as cylindrical containers for compressed gases, although, of course, it is not confined to use for this specific purpose but may be used for cleaning other articles of similar type or shape. This application is a division of our application Serial No. 750,359, filed November 17, 1924.

It is an object of the invention to provide a device which will clean these articles, especially to remove paint from their outer surfaces, which will clean them much more rapidly and thoroughly than the methods now generally used and will, therefore, perform this operation at a much less cost.

It is also an object of the invention to so arrange the mechanism that the articles will pass through the cleaning solution under the action of gravity, which movement will also cause the surfaces of the adjacent cylinders to rub together to assist in the cleaning operation so that no mechanical feeding, rubbing or scraping device will be necessary, and therefore, the cost of operation will be reduced to a minimum.

With the foregoing and other objects in view, we have devised the construction illustrated in the accompanying drawing forming a part of this specification, simliar reference characters being employed throughout the various figures to indicate corresponding elements. In this drawing,

Fig. 1 is a longitudinal section through one form of device for carrying out our improved process.

Fig. 2 is a top plan view thereof with the cover, however, removed, and

Fig. 3 is a transverse section substantially on line 3—3 of Fig. 1.

Heretofore it has been a very difficult and expensive operation to remove paint from the outer surface of cylinders, such as the cylindrical metal containers used for transporting and storing compressed gases. Various methods were used, such as scraping off the paint with special knives, burning it off with torches, and in some more elaborate mechanical methods attempts have been made to simplify the process by inverting the cylinders one or more at a time in baths of heated alkali, but all of these methods were very slow and expensive, especially where a large number of cylinders were to be cleaned. With our improved apparatus the surfaces of the cylinders may be more thoroughly cleaned at a much less cost.

In carrying out our process we provide a tank 10 of any suitable size depending upon the sizes of the cylinders to be cleaned and the operation required which is adapted to hold a suitable solution 11, such as an alkali when the material to be removed from the cylinders is a coating of paint, and the cylinders indicated at 12 are passed through this solution at the proper speed to give the solution an opportunity to act, and at the same time the cylinders are kept in contact and are rotated so that their surfaces will rub together to scrape off the softened paint so that as they leave the tank they are thoroughly cleaned. We have provided a mechanism which employs the force of gravity to pass the cylinders through the solution, maintain them in contact and also cause relative rotary movement of the cylinders to give the rubbing effect desired.

This operation is secured by providing a downwardly inclined runway 13 extending into one end of the tank, preferably leading from a suitable platform 14 of the desired height. At the lower end of this runway is a longitudinally extending runway 15 below the surface of the solution, and an upwardly inclined runway 16 leads from the opposite end of this latter runway and out the opposite end of the tank. These various runways may be formed of any suitable construction, such as T-rails as shown, and the runway 13 is higher than the runway 16 so that as the cylinders 12 are rolled from the platform 14 onto the runway 13 the greater weight of the cylinders on this runway will cause them to roll down this runway into the solution, along the intermediate runway 15 in this solution and outwardly from the tank by rolling up the runway 16. It will be apparent that by continuously feeding cylinders to the top of the runway 13 there will be a continuous movement of the cylinders through the solution in the tank and out over the top of the runway 16. It will also be apparent that the weight of the cylinders on the two in-

clined runways will maintain the adjacent cylinders in contact and will cause a considerable pressure between them, so that the relative turning of the cylinders as they roll along the runways will cause their surfaces to rub together while under pressure, and will scrape off the paint or other coating which is softened by the alkaline solution. Furthermore, this coating will be more thoroughly and quickly removed because it is scraped off by this rubbing action as soon as it becomes sufficiently softened by the solution, allowing the solution to gain access to the harder coating underneath. In other words, the coating is removed as it is softened and the softening solution is not required to penetrate through a thick coating. Furthermore this movement of the cylinders causes a continuous agitation of the solution so that fresh solution is constantly brought into contact with the coating to be softened and removed, which still further facilitates the cleaning operation.

Means is provided whereby the speed at which the cylinders move through the solution may be controlled and varied at will. A convenient means of doing this is to hinge the opposite ends of the intermediate runway 15 to the lower ends of the inclined runways 13 and 16 as shown at 17 and 18 respectively, and to provide means whereby this intermediate runway may be raised or lowered to vary the inclinations of the inclined runways. For this purpose upright struts 19 may be provided on opposite sides of the tank and the rails 20 of the intermediate runway mounted on rods 21 extending between uprights 22. These uprights may be secured to the struts 19 by suitable pins 23 passing through the uprights and projecting into openings in the struts, of which there are a plurality at different heights. Thus by removing the pins either end of the runway may be raised or lowered and secured in the proper position by reinserting the pins. In this manner the inclination of the runways 13 and 16 may be varied and the speed at which the cylinders move through the solution regulated accordingly.

Guide means is provided above the cylinders on the intermediate runway to prevent their moving upwardly under the action of the pressure on opposite sides thereof and also the buoyant effect of the solution. This may be similar T-rails 24 extending horizontally above the cylinders and mounted on transverse bars 25 carried by upright members 26 which are adjustable up and down on the uprights 22 and held in adjusted positions by suitable pins 27. By this arrangement these upper guides may be moved to the proper distance above the lower rails 20 to accommodate any given size of cylinder, and when adjusted to any particular size of cylinder will move with the lower rails when they are adjusted to vary the inclinations of the inclined runways. A cover 28 may also be provided above the upper guides to more thoroughly enclose the solution and the mechanism.

Means is also provided for heating the alkali or other solution provided, such as a steam coil 29, supplied from any suitable source of supply by a pipe 30, and this coil is provided with any suitable form of trap 31 for condensation. A tank 32 is provided at the outlet end of the runway 16 and contains water or other suitable solution to remove the alkali from the cylinders as they pass out of the tank 10 over the top of the runway 16. The water from this tank may be kept fresh from a suitable source of supply through a pipe 33 and the level maintained by the drain 34.

It will be apparent from the foregoing description that the device is extremely simple in construction and requires no mechanically moving parts, so that the cost of operation is reduced to a minimum. Furthermore, that the weight of the cylinders maintains them in close contact while in the solution so that the rubbing effect caused by the rotation of the cylinders as they pass along the runways thoroughly removes the coating softened by the solution. Furthermore, the operation is continuous. The action is substantially automatic as all that is necessary is to roll the cylinders to the upper end of the inclined runway 13 from the platform, and the head or additional weight is sufficient to cause the movement of the cylinders into and through the tank and out the lower inclined runway 16. It has been found in practice that the scraping and rubbing of the cylinders together during this movement and the agitation of the solution also caused by this movement promotes in a most remarkable fashion the speed with which the cleaning may be effected. Whereas in the most efficient prior apparatus known to us the maximum capacity was sixty cylinders in ten hours in actual practice we can with our apparatus remove paint from eighty cylinders in four hours, but this capacity may be increased by increasing the size of the apparatus.

Having thus set forth the nature of our invention, what we claim is:

1. In a cleaning device for cylindrical articles, a tank for a cleaning solution, a downwardly inclined runway for the articles leading into said tank, an upwardly inclined runway for the articles leading out of the tank and of less height than the first runway so that the articles will run down the first runway under the action of gravity and force similar articles up the other runway, and means for varying the inclination of one of said runways to regulate the speed at which the articles pass through the tank.

2. In a cleaning device for cylindrical articles, a tank for a cleaning solution, a downwardly inclined runway for the articles leading into said tank, an upwardly inclined runway leading from the tank and of less height than the first runway, an intermediate runway in the tank between the first runways and hinged thereto, and means for raising and lowering the intermediate runway to vary the inclination of the first runways.

3. In a cleaning device for cylindrical articles, a tank for a cleaning solution, a downwardly inclined runway for the articles leading into the tank, an upwardly inclined runway out of the tank and of less height than the first runway so that the articles will pass through the tank on said runways under the action of gravity, an intermediate runway between said inclined runways, and top guides for the articles above the intermediate runway.

4. In a cleaning device for cylindrical articles, a tank for a cleaning solution, a downwardly inclined runway for the articles leading into the tank, an upwardly inclined runway leading out of the tank and of less height than the first runway, an intermediate runway between said inclined runways and connected thereto, a top guide for the articles above the intermediate runway, means for raising and lowering the intermediate runway to vary the inclination of the inclined runways, and means for raising and lowering the guide to vary its distance from the intermediate runway.

In testimony whereof we affix our signatures.

MALCOLM W. McLAREN.
HARRY W. COLE.