

Aug. 21, 1934.

H. ADELMANN

1,971,206

HAM BOILER WASHING MACHINE

Filed May 5, 1931

2 Sheets-Sheet 1

Fig. 1.

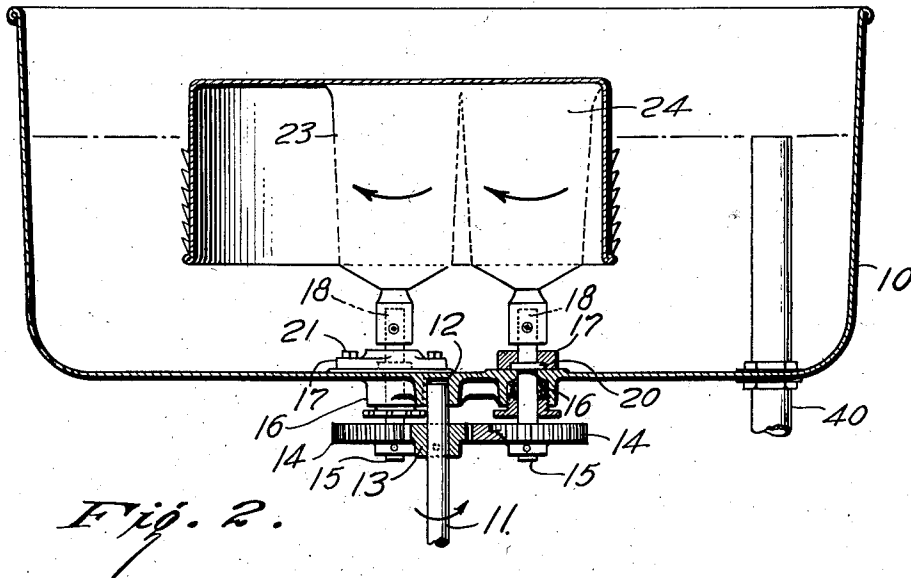
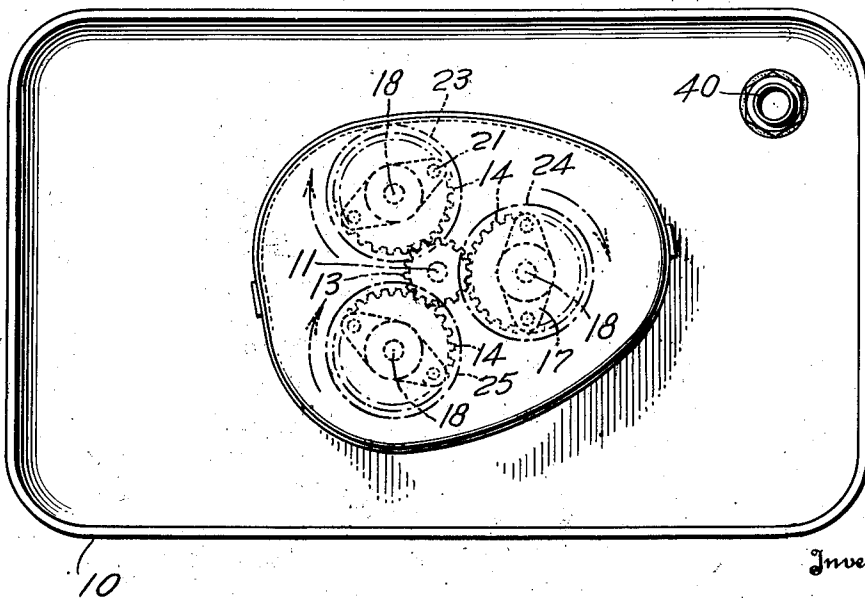


Fig. 2.



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Fig. 6.

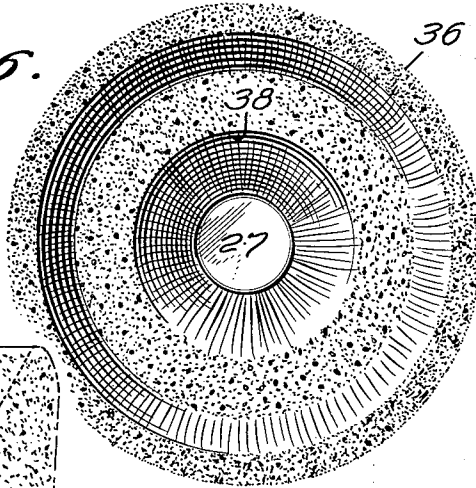


Fig. 5.

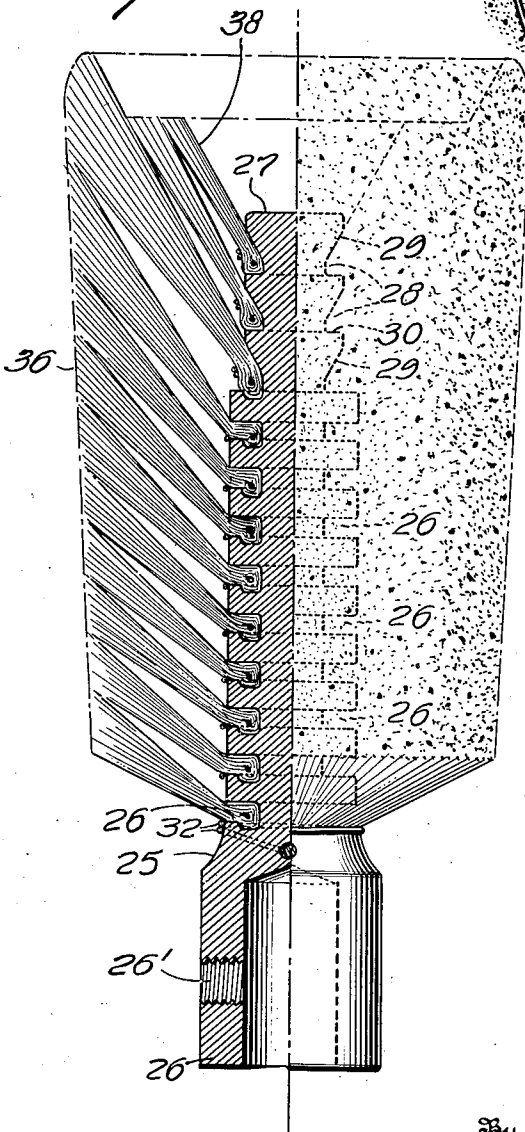


Fig. 3.

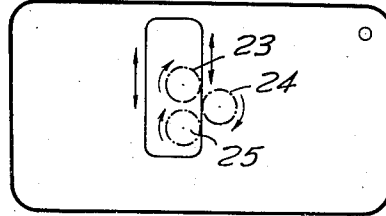
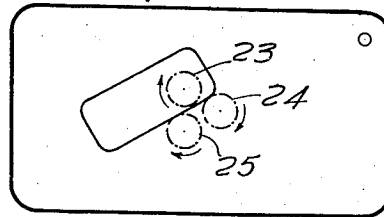


Fig. 4.



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UNITED STATES PATENT OFFICE

1,971,206

HAM BOILER WASHING MACHINE

Hans Adelmann, New Rochelle, N. Y., assignor
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a corporation of Delaware

Application May 5, 1931, Serial No. 535,110

7 Claims. (Cl. 15—56)

My present invention relates generally to scrubbing apparatus, and in one of its aspects relates to an apparatus for scrubbing ham boilers, and particularly irregularly shaped ones, and from another aspect relates to the employment of a brush so constructed and contoured as to enable the scrubbing action to effectively be applied to the corners of the containers.

The brush structure shown in Figures 5 and 6 and described herein is disclosed and claimed in my co-pending divisional application Serial Number 619,846, filed June 29, 1932.

One of the objects of my invention is the provision of an arrangement whereby ham boilers generally, and nonrectangularly shaped contoured ham boilers in particular, can be more effectively, and more quickly scrubbed and cleansed than has hitherto been possible.

Another object of my invention is the provision of an arrangement whereby narrowed areas, and particularly corners, can be more readily reached without requiring any unusual effort by the operator.

Another object of my invention is the provision of an apparatus, particularly adapted for the scrubbing and cleansing of open ham boilers of varied contours and shapes without requiring any adjustment of the parts.

Another object of my invention is the provision of an arrangement of a plurality of brushes so as to permit of the cleansing of the opposed walls of a ham boiler without calling for brushes of increased size or an undue shifting of the container.

Another object of my invention is the provision of an arrangement of brushes whereby ham boilers of varied sizes and varied contours can have either opposed inner walls or corresponding adjacent inner and outer walls simultaneously scrubbed.

In the embodiment herein disclosed, the brushes are shown as arranged in triangular formation with each brush at an apex of said triangle. As a result of this arrangement when any single brush is employed to penetrate a narrowed portion, the brush system will diverge outwardly therefrom. This arrangement, not only permits of ready access to corners and narrow areas, but also has the advantage of permitting the scrubbing of all the interior surfaces of the ham boiler by an angular jiggling or vibrating of the boiler and possesses the further advantage of permitting two of the brushes to contact with, for example, an inner surface of the ham boiler

and a third brush with the outer surface of the ham boiler.

Where I employ a plurality of brushes, positioned as set forth, I have found that simultaneous rotation of the brush each about its own axis, produces a sudden swirling movement of the water therebetween. This tends to shoot the water upwardly between the brushes so that it will forcibly strike the bottom of the container being washed.

One of the objects of my invention is the provision of an arrangement whereby in an arrangement of brushes as above set forth the objectionable results of the tendency of the water to be forced upwardly against the ham boiler bottom will be minimized and possibly wholly eliminated.

Another object of my invention is the provision of a brush head of a character in which the tendency of the bristles to spiral or compact is resisted and more particular an arrangement whereby any pressure brought against the head of the brush will tend to spread the bristles so as to force them into corners instead of compacting them.

For the attainment of these objects, and such other objects as may hereinafter appear or be pointed out, I have illustrated one embodiment of my invention in the drawings, wherein—

Figure 1 shows my washing apparatus in vertical section;

Figure 2 is a top plane view looking down on Figure 1;

Figures 3 and 4 are diagrammatic views of my apparatus used with other types of containers;

Figure 5 is a vertical cross section through my improved brush head; and

Figure 6 is a top elevational view thereof.

Before proceeding to describe my invention, I will premise that the washing basin 10 is mounted upon the stand (not shown) and within which the driving motor is contained, and 11 is a driving shaft extending upwardly from this stand, and driven by the motor and having its upper bearing in the bottom of the basin as shown at 12. Fixed to the driving shaft 11 is a gear 13 concentric of, and in mesh with the gears 14. As more clearly shown in Figure 2 of the drawings, these gears 14, which will hereinafter be referred to as the brush gears, are in external relation to the master gear 13, and are shown as arranged equidistantly so that the axes thereof form the apices of an isosceles triangle.

I have found that there are some advantages in employing a motor driven at 1800 R. P. M. and

that the brushes to be hereinafter referred to, are preferably driven at approximately 800 R. P. M. so that the gear ratio is of that reduction character.

5 The gears 14 are carried by the brush shafts 15 having their bearings in the stuffing boxes 16, affixed to the lower surface of the basin 10, and which then pass through the washers 17 to provide the spindles 15 with the portions 18 projecting upwardly into the basin 10 to receive the brushes 22, 23 and 24. The spindle shafts 15 are provided with the enlargements 20 received between the bottom of the basin 10 and the washers 17 and the washers are secured as by the bolts 21. 10 In this manner, the spindles 15 are held against vertical movement. This arrangement positions the spindle extensions 18 within the basin 10, and also in a triangular formation, the spindle extension forming the apices of a triangle which in the 20 illustrated embodiment is isosceles.

In Figure 5 of the drawings, I show the detailed structure of a brush head. Each brush head comprises a central core 25 made hollow at its lower end as shown at 26 and provided with a plurality of annular undercut grooves 26 generally horizontal and provided adjacent its head 27 with a plurality of grooves 28 defined by the inclined sides 29 and the substantially horizontal bottom 30.

30 I have found that for my apparatus, it is advisable to employ a bristle head which is made up partly of stainless steel and partly of a woody substance such as bassine, because in the first place, the stainless steel will have an abrading action and a woody fiber a species of sweeping action and, secondary, I have found that the resiliency of the bassine component will tend to keep the steel bristles from compacting or spiraling, and will tend to return them to their normal position. 35 In the illustrated embodiment, I have shown my brush head as made up of approximately three quarters stainless steel, and one quarter of bassine.

In the manufacture of the brush head of Figure 5, groups of bristles are doubled over and received at their bend in the grooves 26 as shown in this figure of the drawings. A steel wire 32 caught in the lower end of the core, is spiralled upwardly throughout to cause the groups of the 40 bristles to be held where they are bent and to have these bends forced into the grooves 26 and retained therein. The lower groups of bristles 36 which are received in the generally horizontal grooves will be directed generally in a horizontal plane with a slight upward incline as shown in the drawings. The groups of bristles, however, which are received in the grooves 28 are directed generally upwardly at a much greater incline than those of the groups therebelow, and are dimensioned so as to complete a contour which is more or less generally cylindrical and slightly in the form of a truncated cone.

In the top-most annular groove 29, is received the group of bristles to which the reference character 38 has been applied. These bristles are much shorter than those immediately therebelow. In fact, the bristle length which extends beyond the head 27 is not much greater than that which contacts with the wall 29, and these bristles therefore are relatively more rigid. This construction and arrangement of the bristles and particularly of the bristle group 38 tends to cause the top group of bristles adjacent thereto to spread outwardly in the event that any pressure is applied thereto.

75 The brushes of Figure 5 are each secured in

position by passing the hollow heads 26 thereof over the upwardly extending portions 18 of the brush shafts, and threading a bolt in the opening 26' in the brush head and locking it to the shaft.

In Figure 2 of the drawings, I show my apparatus employed for cleaning a ham boiler of the type shown in that figure. The ham boiler is presented inverted as shown in Figure 1, and will be held by the operator down on top of and 80 in contact with the brushes.

Upon viewing Figure 2 of the drawings, it will be observed that in the illustrated ham boiler which is 11 inches at its longest dimension, the ham boiler will extend beyond the brush areas 85 only for a slight distance, as for example, approximately two inches along its longer dimension, and at the most, one inch along its shortest dimension. With the motor in operation, the brushes will all rotate clockwise, as shown by 90 the arrows in Figures 1 and 2 of the drawings, and will cover the major portion of the area of the bottom of the ham boiler and for a thorough cleansing operation, all that is required is a slight jiggling of the ham boiler in a curved 100 path so as to bring the sides of the brushes in contact with all the areas of the inner side wall of the boiler and the top surface of the brushes in contact with the inner surface of the bottom of the ham boiler. Very little pressure, if any, 105 need be applied to the ham boiler in a downward direction, and such pressure as is applied will naturally be developed by the operator during the jiggling operation. Due to the construction of the brush head, and particularly, to the 110 manner in which the upper groups of bristles are arranged, the weight of the ham boiler plus any downward pressure that is applied thereto, will tend to spread the bristles at the top of the brush so that the bristles will reach every portion of the corners of the ham boiler as it has 115 been attempted to show in Figure 1 of the drawings. This manner of operation of the brushes will be enhanced by centrifugal force which will cause the upper portion of the brush to expand 120 and to reach the corners easily.

The employment of a plurality of brushes and particularly their triangular arrangement is extremely important, particularly in connection with a ham boiler having a substantially continuous curved inner surface, and upon careful study of the arrangement disclosed in the drawings, it will be observed that the slight jiggling operation given to the ham boiler, while the brushes are rotating will cause the bristles to 125 reach every portion of the boiler without requiring any undue pressures, and merely because of the construction of the individual brushes and their arrangement. For example, as the ham boiler of Figure 1 is forced to the extreme left 130 to bring the side wall of the brushes in contact with the inner side wall of the ham boiler, the outward spreading of the top as above referred to, plus the slightly conical shape of the sides of the brushes, will force the extreme upward bristles into the extreme upper corners of the ham boiler to completely cleanse these otherwise inaccessible corners. Cleansing the ham boiler presents a peculiar problem, because of their extreme depth, and because of the fact that in 135 their use, they become coated with grease burnt fat, brine and metal corrosion, and it is very important that every portion thereof be thoroughly cleansed and abraded.

One of the important features of the triangular 140

arrangement of the brushes is that each two adjacent brushes are in alignment, and the other brush is out of alignment. In fact, the system in effect presents three lines of brush surfaces, each at substantially 120° to the other two. This permits of a wide range of abrading and cleansing action of said brushes on ham boilers of various contours and dimensions. In Figure 2, I have shown this arrangement functioning with a ham boiler of the type therein disclosed. In Figure 3, I show these brushes functioning with a different type of ham boiler and in which two of the brushes, for example those numbered 23 and 25 are received inside the boiler and operate upon an inner wall and the other brush 24 is caused simultaneously to contact with the opposed outer wall, all shown in the drawings. It will be observed that the container, in this figure can be scrubbed inwardly and outwardly by a continuous shifting of the container wall between the brushes.

In Figure 4, I show an arrangement whereby the two brushes 24 and 25 contact with the outer wall, and the other brush 23 with the inner wall.

I have found that while three brushes are arranged triangularly as shown in Figure 2 of the drawings the simultaneous rotation of these brushes will cause the water therebetween to swirl upwardly, strike the bottom of the boiler be projected forcibly downwardly to strike the surface of the water, and cause a splash of the water in the basin 10. To overcome this, I have provided an overflow pipe 40 in one corner of the wash basin, and which is so positioned as to maintain the level of the surface at such a distance below the top of the brushes that this splashing tendency is wholly eliminated and, I have found that a point a little above midway of the height of the brushes serves effectively for this purpose.

In Figure 2 of the drawings, I have attempted to show the brushes as closely positioned, and due to the upwardly diverging character of each brush, the brushes will substantially contact toward their top as more clearly shown in Figure 1.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is—

1. In a ham boiler washing machine having a washing basin adapted to hold the washing fluid, three rotating brushes mounted at the same level within said basin and on vertical axes located at the apices of an equilateral triangle and spaced so that when the flat wall of an article to be washed is inserted between them, two of the brushes will be in operative contact with one of the sides of the wall and the third brush in operative contact with the opposite side of the wall, said brushes being in the form of inverted truncated cones with concave tops adapted to flatten as an effect of rotation and of pressure applied at their tops, whereby their top portions will spread laterally and penetrate into the remote corners and angles of an article to be treated, where such article has a flat bottom and upstanding walls and is applied to the brushes in an inverted position, and said basin being provided with a drain whereby the normal level of the washing fluid in the basin may be maintained at such a height in relation to the basin and to the tops of the brushes that splashing in the basin due to the effect of the washing fluid swirling upwardly between the brushes and striking the flat bottom of an article

of the aforesaid type, and being deflected downwardly thereby and forcibly projected against the main body of fluid, will be avoided.

2. For use with a ham boiler washing machine, having a washing basin adapted to hold the washing fluid, three rotating brushes mounted within said basin on vertical axes located at the apices of a triangle and symmetrically spaced so that when the flat wall of an article to be washed is inserted between them, two of the brushes will be in operative contact with one of the sides of the wall and the third brush in operative contact with the opposite side of the wall, said brushes being in the form of slightly tapered inverted truncated cones with concave tops adapted to flatten as an effect of rotation and of pressure applied at their tops, whereby the top portions will spread laterally and penetrate into the remote corners and angles of an article to be treated, and means for maintaining the level of the fluid below the tops of the brushes and above their middle portions.

3. In a ham boiler washing machine, a washing basin adapted to hold the washing fluid, three substantially cylindrical rotating brushes within said basin and mounted on vertical axes located at the apices of an equilateral triangle and spaced so that when the flat wall of an article to be washed is inserted between them, two of the brushes will be in operative contact with one of the sides of the wall and the third brush in operative contact with the opposite side of the wall, said brushes having concave tops adapted to flatten and spread as an effect of rotation and of pressure applied at their tops, whereby the top portions will spread laterally and penetrate into the remote corners and angles of an article to be treated, and said basin being provided with means whereby the level of the washing fluid may be automatically maintained at such a height in the basin that splashing in the basin due to the effect of the washing fluid swirling upwardly between the brushes and striking a horizontal surface of an article when said surface is in contact with the top of the brushes, and being deflected downwardly thereby and forcibly projected against the main body of fluid, will be avoided.

4. A ham boiler washing machine comprising a washing basin adapted to hold the washing fluid, three rotating brushes mounted within said basin on vertical axes located at the apices of a triangle and spaced so that when the flat wall of an article to be washed is inserted between them, two of the brushes will be in operative contact with one of the sides of the wall and the third brush in operative contact with the opposite side of the wall, said brushes being substantially cylindrical in form and having concave tops whereby the top portions of the brushes will penetrate into narrow areas and angled corners of an article to be washed, and said basin being provided with a drain whereby the level of the washing fluid may be maintained at such a height in the basin that splashing in the basin due to the effect of the water swirling upwardly between the brushes and striking the surfaces of an article to be washed, and being deflected downwardly thereby and forcibly projected against the main body of washing fluid, will be avoided.

5. In a ham boiler washing machine having a fluid containing basin, a system of three substantially cylindrical brushes rotating on laterally spaced vertical axes and relatively closely spaced from each other, but separated sufficiently so that their peripheries will be substantially tangent to a plane drawn between them so that one

- brush of the system is on one side of said plane and the remaining two on the other side, and so as to allow the insertion therebetween of the flat wall of an article to be treated so that all three brushes may simultaneously operate thereupon, said system of brushes being located in the fluid containing basin of the washing machine and means for automatically controlling the level of the fluid in said basin to avoid objectionable splashing due to a swirling motion imparted to the fluid as the result of the rotation of the brushes, and its reflection forcibly against the surface of said fluid.
6. In a ham boiler washing machine, a washing basin adapted to hold the washing fluid, three substantially cylindrical rotating brushes within said basin and mounted on vertical axes located at the apices of an equilateral triangle and spaced so that when the flat wall of an article to be washed is inserted between them, two of the brushes will be in operative contact with one of the sides of the wall and the third brush in operative contact with the opposite side of the wall, said brushes having concave tops adapted to flatten and spread as an effect of rotation and of pressure applied at their tops, whereby the top portions will spread laterally and penetrate into the remote corners and angles of an article to be treated.
- HANS ADELMANN.

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