

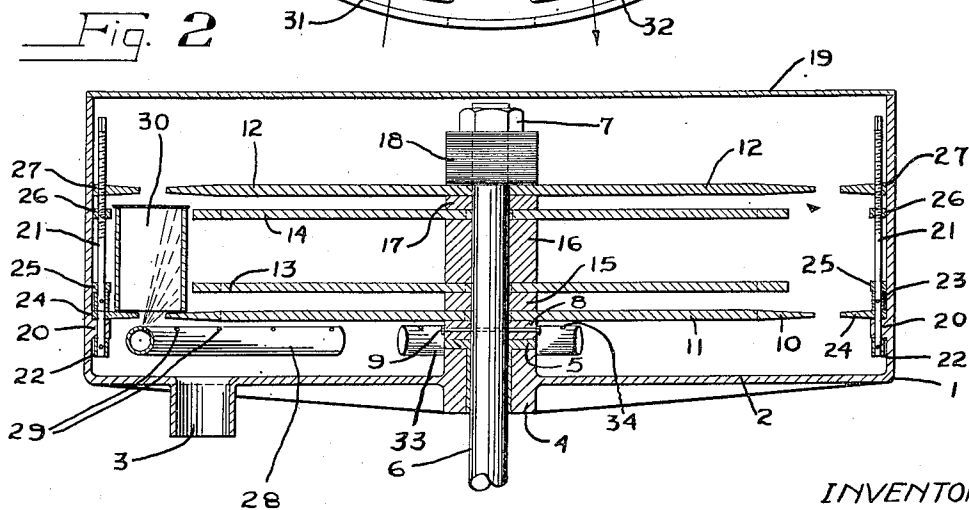
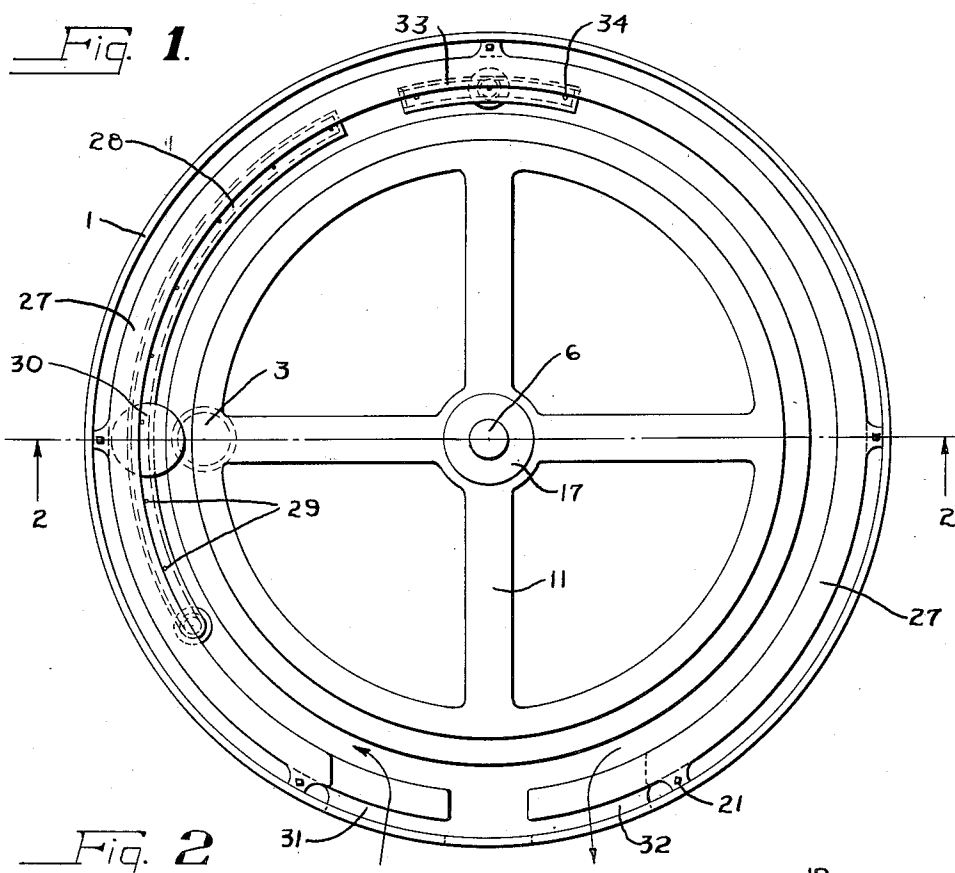
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CAN WASHER

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CAN WASHER

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This invention relates to machines for washing cans such as those used in the canning of food.

Cans in which foodstuffs of various natures are preserved are conveniently and economically manufactured, shipped and stored in large quantities so as to be ready for use in large scale canning operations when needed. The bottom is sealed to the cylindrical side wall but the top is left off until the can is filled, when the top is sealed in place. While they are being shipped or are in storage awaiting use, the empty cans collect dust and dirt in their interiors which must be removed just before they are used. Also, the cans frequently contain small quantities of soldering flux or minute particles of metal and solder from the soldering of the side and bottom which must of course be removed.

Can washers now in use do not, in general, effect as thorough a cleaning of the cans as is desirable. This is due to the construction of these washers being such that a thorough scouring of the interiors of the cans is not accomplished.

Also, in can washers as at present constructed, damage to the cans or to the washer sometimes occurs due to jamming up of the cans on the track beyond the washer. Stopping of the cans beyond the washer frequently is not detected quickly enough to stop the washer before it forces more cans forward and mashes them together, or before some damage is done to the washer itself.

An object of this invention is to provide a can washer which accomplishes automatically a thorough washing of the interiors of cans.

Another object of the invention is to provide a can washer which washes cans thoroughly but at the same time uses a minimum quantity of washing fluid.

Still another object of the invention is to provide a can washing apparatus which conveys cans through and beyond the washer and yet which can not cause damage to the cans or to the washer should there be a stoppage in the can line beyond the washer.

A further object of this invention is to provide a can washer, the parts of which are replaceable or adjustable so as to accommodate cans of varying sizes.

In the drawing,

Figure 1 is a plan view of the can washer with its top and the top disc removed; and

Figure 2 is a vertical sectional view on the line 2—2 of Figure 1, the top of the can washer and the top disc being shown in place.

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The can washer comprises a cylindrical shell or casing 1, which may be made of any suitable material, cast aluminum being one material which is satisfactory for the purpose. The shell has a bottom portion 2 which may be formed integrally with the shell or may be a separate part bolted or otherwise attached to the shell. In the bottom 2 is provided a drain pipe connection 3 through which water or other fluid used in washing the cans drains out of the shell. A bearing 4 is provided in the center of the bottom 2 and may have a bushing 5 for receiving a vertical shaft or axle 6 which is driven by a source of power not shown and which extends into the shell, being provided at its top end with screw threads for receiving a nut 7. A flange 8 is secured to the shaft or pinion 6, as by a bolt and nut 9 extending through the shaft. The flange supports the shaft on the top surface of the bushing 5.

A circular disc-shaped member 10 is connected at its center on the shaft. The member 10 preferably consists of a ring-shaped or annular peripheral portion supported on the shaft by a spider 11 and, as shown, the spider rests on the top surface of flange 8. The spaces between the spokes of the spider permit the water or other cleaning fluid to pass readily to drain 3. If desired, the member 10 may instead be a solid disc. Another disc-shaped member 12 is also connected at its center on the shaft and is spaced axially from member 10, in a manner presently to be described, a sufficient distance to accommodate the length of the cans being washed, with a small space to spare. The disc 12 is preferably a solid disc so as to deflect downwardly any water which may spurt upwardly, as between cans. Between the members 10 and 12, and likewise mounted on the shaft, are two spacer rings 13 and 14. These spacer rings, like the member 10, preferably comprise peripheral annuli or ring-shaped portions which are supported on the shaft by means of spiders.

Rings 13 and 14 are of smaller diameter than disc members 10 and 12, the diameter of the rings being selected so as to accommodate cans of a given size. The rings are spaced from each other and from the disc members by distance sleeves 15, 16 and 17, which are preferably of such lengths as to provide proper spacing of disc or ring members 10, 12, 13 and 14 for accommodating the smallest sized cans to be washed in the apparatus. A number of washers 18, which may be carried on the shaft between the disc 12 and nut 7 when not otherwise being used, are

provided for increasing the spacing between the discs and rings when larger sized cans are to be washed. When cans of larger diameter are to be washed, the spacer rings 13 and 14 are replaced by spacer rings of smaller diameter. The shell 1 is, during operation of the washer, closed by a lid or top 19, which is preferably water tight and is secured onto the shell by bolts or by other suitable means, not shown.

On the inner periphery of the shell 1 are provided a plurality of lugs 20 having vertical holes through them for the reception of cylindrical rods 21, whose upper portions are threaded and whose upper ends are formed into square cross sections for the reception of a key to rotate the rods. The rods are held in place through the lugs 20, as by means of sleeves 22 and 23, which may be secured to the rods by keys or cotter pins. An annular flange or rib 24 rests on the lugs 20 and is held in place by rods 21 passing through appropriate holes in the flange and by sleeves 23. On top of sleeve 23 rests a more narrow spacing rib or guide 25, which is also held in place by rods 21, which pass through holes in the rib. Another spacing rib or guide 26 has threaded holes for receiving the threaded portions of rods 21. A top flange 27 also has threaded holes for receiving rods 21. Lugs 20 are so located as to support flange 24 in the plane of disc member 10 and sleeve 23 supports spacing rib 25 in the plane of spacer ring 13. Spacing rib 26 and top flange 27 are placed on rods 21 in proper axial spacing so that when the rods are rotated a sufficient amount, rib 26 is in the plane of spacer ring 14 and flange 27 is in the plane of disc 12.

Disc members 10 and 12 are tapered, as shown, toward their outer peripheries and flanges 24 and 27 are tapered toward their inner peripheries for a purpose which will be explained later.

To adjust the axial distances of spacer ring 14 and disc 12 from the lower disc 10 and spacer ring 13 when it is desired to adjust these distances to accommodate longer cans in the apparatus nut 7, washers 18, disc 12, distance sleeve 17 and spacer ring 14 may be removed from the shaft and an appropriate number of washers 18 may be placed on the shaft at one or both ends of distance sleeve 16. When spacer rings 13 and 14 of appropriate diameter are in place and the distance between them has been suitably adjusted by insertion of the proper number of washers 18, the parts may be assembled and secured in place by tightening the nut 7, compressing the parts mounted on the shaft between the nut and the flange 3. As hereinbefore mentioned, rib 26 and the flange 27 are adjusted so as to be in the planes of spacer ring 14 and disc 12, respectively, by rotating the rods 21.

Close below the disc member 10 and flange 24 is an arcuate section of pipe 28, which is connected to a source of water or other suitable cleaning fluid under pressure. The pipe extends a portion of the way around the periphery of the member 10 and has in its upper surface a plurality of spaced holes 29, through which water under pressure spurts upwardly between disc 10 and flange 24. The holes are preferably drilled at a small angle to the vertical, as shown in the drawing, so that the water spurts up at such an angle, for a purpose to be explained later. It will be readily understood that, in place of the holes 29, spray nozzles of suitable size may be employed.

Cans 30 to be washed enter the apparatus from a track not shown, coming in at entrance 31,

passing around the inside periphery of the washer and being washed, and finally leaving the washer through exit 32 onto a delivery track, not shown.

The washer may be provided with an additional section of pipe 33, provided with spaced holes 34 in its upper surface which are similar to holes 29 in pipe 28. Pipe 33 is connected to a suitable source of steam or air under pressure and is positioned below the path of the cans following pipe 28. The purpose of the steam or air blast is to force droplets of water and any remaining particles of dirt from the cans.

In the operation of the apparatus of this invention, as the cans 30 come in the entrance 31, they are in inverted position so that their open ends are turned downwardly. The open end rests on one side on the tapered portion of flange 24 and on the other side on the tapered portion of disc member 10, which is rotated at a suitable speed by shaft 6. The can 30 is held in radial position on these members by spacer rings 13 and 14 on the inside and by spacer ribs 25 and 26 on the outside. As the member 10 rotates on the shaft, by frictional engagement with the edge of the can it causes the can to rotate. By having the surfaces of member 10 and flange 24 tapered, it has been found that the cans will be caused to rotate more reliably than if these surfaces were flat. This is true probably because only small, diametrically opposed parts of the can's edge contact the surfaces of member 10 and flange 24 and accordingly the twisting moment on the can is greater than it would be if the surfaces were flat, since it is exerted across the full diameter of the can. Also, since the can is supported only upon small, diametrically opposed parts of its edge, it has less frictional engagement with the supporting surfaces and therefore encounters less resistance to rotating. The can 30 is, in effect, rolled between the moving surface of member 10 and the fixed surface of flange 24.

It will be readily understood that should the row of cans on the delivery track beyond the exit 32 be stopped for any reason, no damage will result to the cans or to the washing machine since the cans in the machine will not move angularly forward as member 10 rotates but, instead, will remain stationary as the member 10 slides under them. They may, of course, still rotate but will not move angularly forward. In this manner, there is no possibility of the cans becoming mashed together when the row beyond the washer becomes stopped and, correspondingly, there is no manner in which the parts of the washer itself can become damaged.

When, in passing beyond the inlet 31, a can 33 reaches a position over the pipe 28, hot or cold water or other cleaning fluid being used spurts up through holes or nozzles 29 into the can. As previously stated, the holes or nozzles are preferably inclined at a slight angle to the vertical, such that the spout is directed toward the corner of the can where the bottom is joined to the side. In this way, the fluid covers the entire inner surface of the bottom and of the side wall as the can is rotated and the water drains down the side wall. Thus, all particles of dust, dirt, flux, metal and solder which have collected on any part of the interior surface are thoroughly removed and yet less fluid is required to effect the cleaning than in other washers where the spray is directed up centrally and where the can is no manner rotated to insure complete coverage of its interior surface by the cleaning fluid. Water draining from the can 30 falls to the bottom 2 of the casing

and passes out of the casing through drain pipe connection 3.

Should the pressure on the water be great enough to create a jet of sufficient force, the can 30 will be lifted upwardly off its seat on member 10 and flange 24 until its bottom is forced against the lower surfaces of disc 12 and flange 27. While the can 30 is in this elevated position, it still continues to rotate, being driven by frictional engagement of its bottom with the lower surfaces of rotating disc 12 and of stationary flange 27. As in the case of member 10 and flange 24, the peripheral surface of disc 12 is tapered outwardly and the surface of flange 27 is tapered inwardly so that rotation of the can is caused more effectively than it would be if these surfaces were horizontal and not tapered. Also, should there be a stoppage in movement of the cans on the track beyond the washer, neither the cans nor the washer will be damaged since the cans will not be moved angularly forwardly but will remain in place, disc 12 merely sliding across their bottoms as it rotates.

After passing over pipe 28, cans 30 next pass over pipe 33 and are subjected to jets of steam or air from holes 34 which blow from the cans any water remaining in them. The steam or air jets also serve to blast out of the cans any particles or dirt or other debris still remaining in them after the washing.

It is apparent that a can washer made in accordance with this invention accomplishes a thorough washing of cans and yet uses a minimum amount of water in doing so. Its manner of operation is such that stoppages of cans beyond the washer cannot cause the cans or the washer to become damaged. Furthermore, the washer can be readily adapted, by interchanging parts and by making adjustments, to handle cans of different sizes.

It will be appreciated that many modifications can be made of this device and that the specific construction illustrated and described is not the only one of which the invention is susceptible.

We claim:

1. Apparatus for conveying and rotating cylindrical objects comprising a vertical shaft, circular disc means mounted on the shaft for rotation therewith, a fixed annular flange mounted in the same plane as the disc means and concentrically therewith, said flange having an internal diameter slightly larger than the diameter of the disc means to combine with the disc means to form a surface supporting the cylindrical objects, said disc means tapering towards its outer edge and said flange means tapering towards its inner edge to support the cylindrical objects substantially on the ends of a diameter, ring means mounted on the shaft above the disc means, the distance of the ring means above the disc means being determined by and less than the height of the cylindrical objects, said ring means having a smaller diameter than the disc means and the outer edge of the ring means having a substantially uniform curvature, annular rib means fixed in a position above the flange and concentric therewith, the difference in the internal radius of the rib means and the radius of the ring means substantially equalling the diameter of the cylindrical object, and means to rotate the shaft.

2. An apparatus for conveying and rotating cylindrical objects comprising a vertical shaft, means for rotating the shaft, spaced parallel disc means mounted on said shaft, said disc

means being spaced a distance slightly greater than the length of the cylindrical objects, ring means of smaller diameter than the disc means mounted on said shaft between the discs for rotation therewith, fixed annular flanges mounted in the same plane as the disc means concentric therewith having an inner diameter larger than the diameter of the disc means, and fixed annular rib means mounted between the flange means and concentric therewith, the difference in the internal radius of the rib means and the radius of the ring means being substantially equal to the diameter of the cylindrical objects handled by the apparatus.

3. An apparatus for conveying and rotating cylindrical objects comprising a vertical shaft, means for rotating the shaft, spaced parallel disc means mounted on said shaft, said disc means being spaced a distance slightly greater than the length of the cylindrical objects, ring means of smaller diameter than the disc means mounted on said shaft between the discs for rotation therewith, fixed annular flanges mounted in the same plane as the disc means and concentric therewith having an inner diameter larger than the diameter of the disc means, said disc means tapering toward their outer edge and said flanges tapering toward their inner edges to support the cylindrical object substantially on the ends of a diameter.

4. An apparatus for washing containers comprising a vertical shaft, vertically spaced horizontal discs mounted thereon for rotation therewith, a flange mounted in a fixed position concentric with each of the discs and in the same plane therewith to combine with the disc to form a surface supporting the containers, said discs tapering towards their outer edges and said flanges tapering toward their inner edges, the internal diameter of the flange being slightly larger than the diameter of the disc to form an annular space therebetween, a circular ring mounted on the shaft between the discs for rotation therewith, said ring having a diameter less than the diameter of the discs, a rib mounted in a fixed position between the flanges and concentric therewith, the space between the discs being determined by the height of the containers being washed and the difference in the internal radius of the ribs and the radius of the rings being substantially equal to the diameter of the containers, a conduit under the annular space having openings therein for the discharge of cleaning fluid through the annular space into the containers, and driving means rotating the shaft.

5. An apparatus for washing containers comprising a vertical shaft, vertically spaced horizontal discs mounted thereon for rotation therewith, a flange mounted in a fixed position concentric with each of the discs and in the same plane therewith to combine with the disc to form a surface supporting the containers, said discs tapering towards their outer edges and said flanges tapering toward their inner edges, the internal diameter of the flange being slightly larger than the diameter of the disc to form an annular space therebetween, the space between the discs being determined by the height of the containers being washed, a conduit under the annular space having openings therein for the discharge of cleaning fluid through the annular space into the containers, and driving means rotating the shaft.

6. An apparatus for washing containers com-

prising a vertical shaft, vertically spaced horizontal discs mounted thereon for rotation therewith, a flange mounted in a fixed position concentric with each of the discs and in the same plane therewith to combine with the disc to form a surface supporting the containers, said discs tapering towards their outer edges and said flanges tapering toward their inner edges, the internal diameter of the flange being slightly larger than the diameter of the disc to form an annular space therebetween, a circular ring mounted on the shaft between the disc for rotation therewith, said ring having a diameter less than the diameter of the discs, a rib mounted in a fixed position between the flanges and concentric therewith, the space between the discs being determined by the height of the containers being washed and the difference in the internal radius of the ribs and the radius of the rings being substantially equal to the di-

ameter of the containers, a conduit under the annular space having openings therein for the discharge of cleaning fluid through the annular space, said openings being inclined to the vertical and directed against the inner wall of the container, and driving means rotating the shaft.

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