March 20, 1928. 1,662,995

E. H. ATWOOD ET AL.

BRUSHING MACHINE FOR CIRCULAR OBJECTS

Filed Sept. 2, 1927 3 Sheets-Sheet 1

Fig. 1

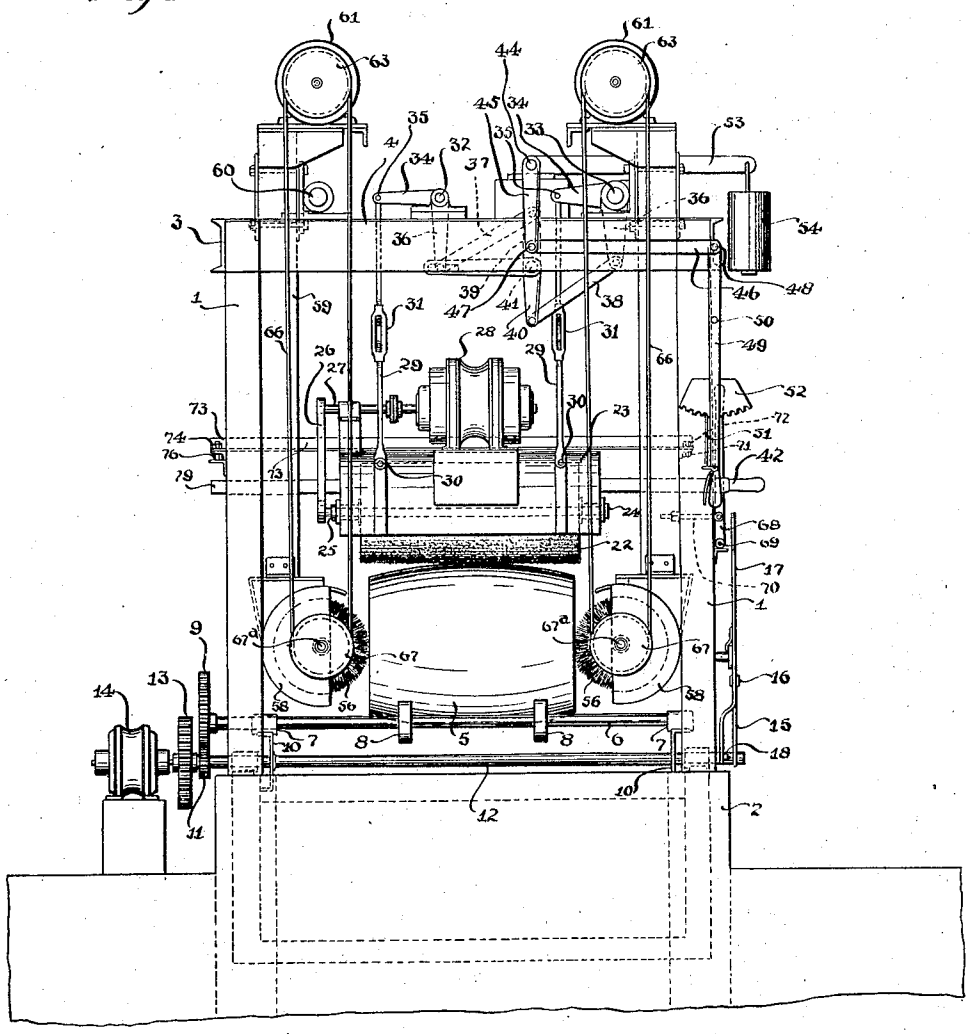
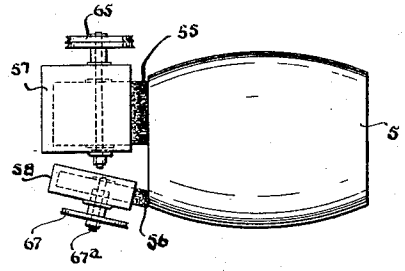


Fig. 2



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Fig. 4

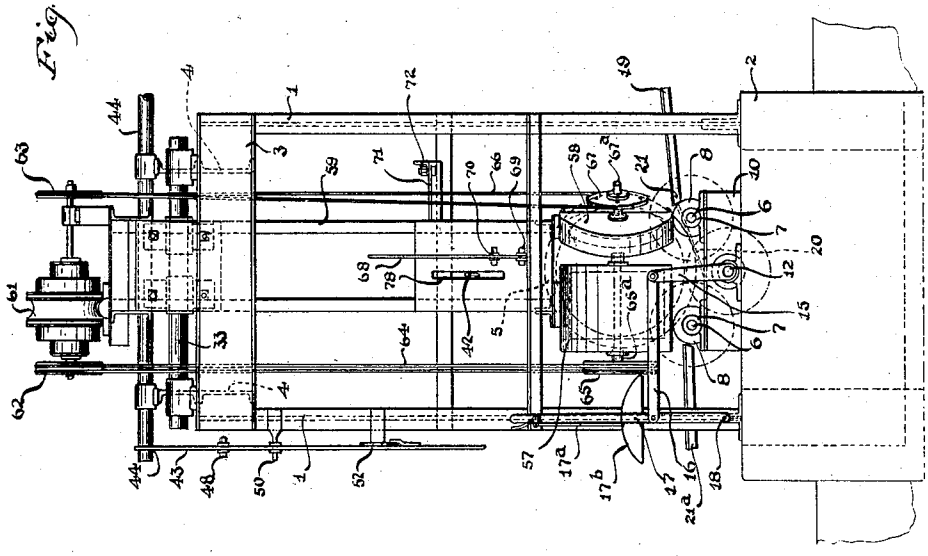
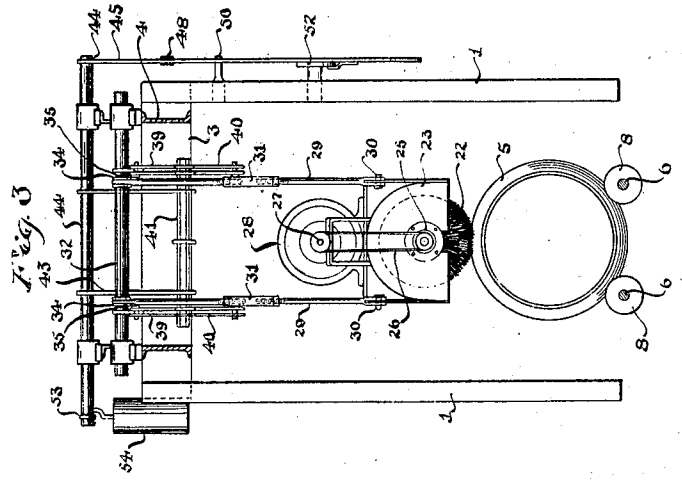


Fig. 3



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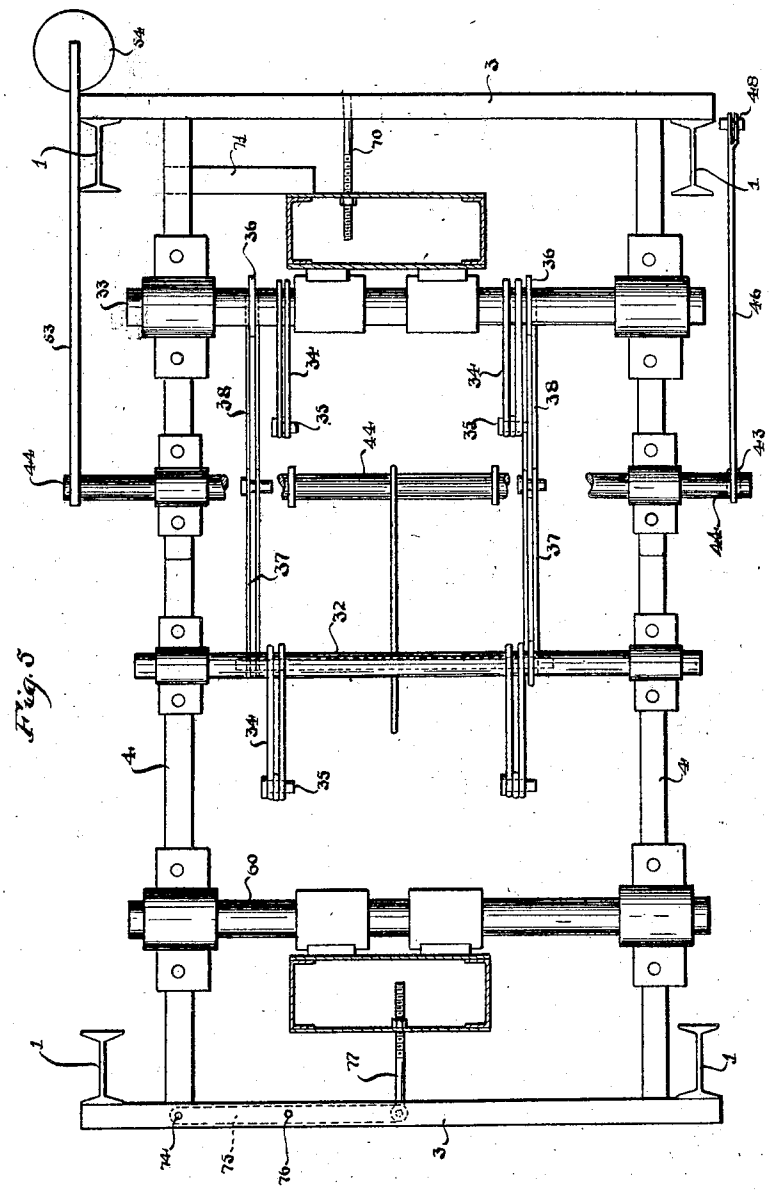


Fig. 5

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UNITED STATES PATENT OFFICE.

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BRUSHING MACHINE FOR CIRCULAR OBJECTS.

Application filed September 2, 1927. Serial No. 217,280.

The present invention relates to brushing machines for circular objects, such as bilged barrels and straight sided drums, and an object of the invention is to provide a brushing machine which will effectively brush the entire outside of a circular object, irrespective of the size and shape of the object within certain limits and without requiring any special adjustment of the machine for articles of different shapes and sizes so that the machine may work upon differently sized and shaped objects or bodies indiscriminately fed to it.

To these and other ends, the invention consists of certain parts and combinations of parts all of which will be hereinafter described: the novel features being pointed out in the appended claims.

In the drawings:

Fig. 1 is a side view of a brushing machine constructed in accordance with this invention;

Fig. 2 is a fragmentary view showing the end brushes operating on a barrel;

Fig. 3 is a fragmentary end view of the machine showing the mounting of the main brush;

Fig. 4 is a fragmentary end view of the machine showing the mounting of one of the end brushes; and

Fig. 5 is a fragmentary plan view.

The present invention contemplates the provision of a machine which will brush the side and ends of cylindrical or circular objects, such as straight sided drums and bilged barrels, irrespective of their sizes and shapes within certain limits.

In the illustrated embodiment of the invention, there is provided a main frame comprising, in this instance, four uprights 1 embedded at their lower ends in a cement base 2 and connected at their upper ends by two horizontal end pieces 3, the end pieces in turn being connected by two side pieces 4. At the lower part of the frame is arranged a work support which, in this instance, is constructed to impart to the body 5 a rotary motion and which preferably also may be tilted to one side to receive an object and to the opposite side to discharge an object. To this end, this work support may comprise two shafts 6 journalled at 7 on frame pieces 10 and each carrying a pair of spaced rollers 8, the shafts being spaced apart so that the object 5 to be cleaned rests on the two rollers of each shaft. On each of the shafts 6 may be arranged a gear 9, these two gears meshing with a gear 11 arranged to turn on a rock shaft 12 to which the frame pieces 10 supporting the shaft 6 are secured. Mounted to turn with the gear 11 is a large gear 13 which in turn is geared to the motor 14 so that, through the motor, the two shafts 6 may be rotated to effect the rotation of the circular object 5.

The shaft 12 is made to oscillate or rock in order that the work support may be swung in one direction to receive a circular object and in the opposite direction to discharge this object. This rocking of the work support may be effected through a lever 15 rigid with the rock shaft 12 and connected by a link 16 with an operating lever 17, pivoted at 18, to the frame of the machine and carrying a pawl 17^a for cooperating with a rack 17^b.

With the end in view of facilitating the discharge of the object from the support, a rigid intake skid or conveyor 19 has a lever 20 pivoted thereto at 21, said lever extending from the end of the skid over the adjacent shaft 6 between the two rollers thereon, so that, when the work support is moved to discharge the object onto the discharge skid or conveyor 21, the shaft 6 will engage the lever 20 and move the latter to discharge the object onto the discharge skid 21^a.

The cleaning of the circular wall of the object is, in this instance, effected by a rotary brush 22 of cylindrical formation. This brush may be partially enclosed in a housing 23 from which the lower edge of the brush projects and may be supported in the housing by a shaft 24, one end of which projects from the housing at 25 and carries a pulley with which a belt 26 engages. This belt also engages a pulley on a motor shaft 27 of a motor 28 which is supported on the housing 23 preferably at or near the center of the latter.

The supporting means for the brush permits the brush not only to adapt itself to objects of different diameters with certain limits, but also to adapt itself to circular objects of different shapes such as bilged barrels or straight sided drums. The support-

ing means, in this instance, embodies four links 29 each pivoted at 30 to the housing 23 of the brush. The links are preferably arranged in two pairs, each pair being connected to the housing on opposite sides of and substantially at an equal distance from the center of the housing 23. In this instance, these links have turnbuckles 31 in order that their lengths may be varied. Preferably also, each pair of links is suspended eccentrically from one of two rock shafts 32 or 33, the rock shafts having for this purpose each two arms 34 extending horizontally therefrom and pivotally connected at 35 to the links 29.

These rock shafts form part of an equalizing mechanism also comprising, preferably, arms 36 depending from the rock shafts 32 and 33 and connected by links 37 and 38 with two arms 39 and 40 extending in opposite directions from a rock shaft 41. It is apparent that with this arrangement, if either end of the brush 22 is elevated the other end of the brush will be depressed. This permits the cylindrical brush to be rocked over the surface of a bilged barrel or body 5. The manual control of the brush may be effected by extending an arm 42 laterally from the casing 23 and rigid therewith, this arm being moved manually to swing the brush 22 in an axial direction or being moved up and down or laterally to cause the brush to rock about an axis midway between its ends. The manner in which the brush is suspended through the links causes the two ends of the brush to counterbalance each other so that the movement of the brush through the handle 42 does not impose upon the operative any material effort.

With the end in view of adjusting the axis of rotation of the brush toward and from the axis of rotation of the circular object to accommodate quickly the machine to bodies of different diameters, a novel adjustment is provided comprising, in this instance, a swinging member 43 mounted to turn about an axis 44 on the frame of the machine and supporting the pivot 41 of the double arm member 39 and 40. On the shaft 44 of this member is an arm 45 to which a link 46 is pivoted at 47, said link also being pivoted at 48 to a lever 49 which is in turn pivoted at 50 to the frame of the machine and which carries a manually operatable pawl 51 adapted to cooperate with the rack or segment 52. Also supported by the shaft 44 is an arm 53 from which is suspended a counter-balance weight 54. The movement of the lever 49 in either direction from the position shown in Fig. 1 tends to shift the pivot 41, and in shifting said pivot turns the shafts 32 and 33 through the links 37 and 38, thus raising or lowering the housing 23 through the suspension rods 29, depending upon the direction in which the lever 49 is moved. The counterbalancing weight 54 tends to hold the housing 23 with the brush in any position to which it may be adjusted, and the rack 52 effectively locks it in this position.

The cleaning of the ends of the object may be effected preferably by four brushes, two operating on each end of the object. One of these brushes 55 is of cylindrical formation and cooperates with the major portion of one end of the object, its axis of rotation being at right angles to the axis of rotation of the object. The other of these brushes 56 covers a smaller area and is designed to cooperate with flanges or chimes on the ends of the object, its axis of rotation being at an oblique angle to the axis of rotation of the brush 55. The brushes 55 and 56 are mounted respectively in housings 57 and 58, both secured in fixed relation, in this instance, to a movable frame of which there are two, one at each end of the object. Each movable frame 59 may be mounted to swing about an axis extending transversely of the axis of rotation of the object and situated above the object. One of these frames is mounted to turn on a shaft 60, while the other is mounted to turn on the shaft 33, hereinbefore mentioned, the frames depending from said shafts and supporting the brush housings 57 and 58 at their lower ends. The driving of the two brushes on each frame 59 may be effected by a single motor 61 on each frame having at its opposite ends two pulleys 62 and 63. The pulley 62 connects by a belt 64 with a pulley 65 on the shaft 65^a of the rotary brush 55, whereas the pulley 63 connects by a belt 66 with a pulley 67 on a shaft 67^a of the brush 56.

With the end in view of effecting the movements of the two pairs of brushes simultaneously toward or from the opposite ends of the object 5, means is provided comprising preferably a lever 68 pivoted at 69 and connected by a link 70 to one of the swinging frames 59. This swinging frame 59 has a lateral arm 71 to which is pivoted at 72 a link 73. The latter in turn is pivoted at 74 to a lever 75 which is pivoted on the cross piece 3 at 76 and through an adjustable link 77 connects with the other swinging frame 59. Movement of the lever 68 in one direction simultaneously moves both pairs of brushes 55 and 56 toward the opposite ends of the body 5 and movement of said lever 68 in the opposite direction simultaneously moves both pairs of brushes 55 and 56 away from the opposite ends of the body 5.

The swinging frames 59 may also be employed as guides for confining the movement of the housing 23 carrying the brush 22 to a vertical direction and to this end each of the swinging members 59 is provided with a vertical slot 78. In one of these slots, the controlling lever 42 operates, while in the other

slot an arm 79 extending from the housing 23 in line with the controlling arm 42 is guided.

The operation of the invention will be understood from the foregoing, but it may be summarized as follows: An object such as a barrel 5 is rolled down the feeding skid or conveyor while the brushes 55 and 56 are separated and the brush 22 is in elevated position, the work support being swung toward the feeding skid 19 on its axis 12 so as to facilitate the entrance of the object onto the work support. The motors of the different mechanisms being started, the object 5 is rotated and the brushes under rotation are presented to the side and to the ends of the object, the different controlling levers being manipulated to effect this engagement. If the object has a bilge formation, then the brush 22 is through the controlling arm 42 oscillated or rocked to conform to the contour of the object and, if necessary, the brush may be moved axially through said controlling arm 42. After the brushing has been completed, the swinging work support is, through the lever 17, moved in the opposite direction, causing the ejector 20 to be engaged by the adjacent shaft 6 and to be tilted to push the body onto the discharge skid 21. It is apparent that with this invention, all portions of the outside surface of either bilged barrels or straight sided drums of any shape in regular commercial use will be effectively brushed. The machine can, without changing any brushes, be adapted immediately to the object fed thereto. It is particularly designed to clean the remaining soft paint and scale from barrels or drums used in the oil trade after such articles have been passed through a bath or other equipment for softening the paint, grease or dirt on the outside of the article. The machine effectively brushes the sides and both heads of the container, irrespective of whether the heads are recessed a considerable amount or whether the heads are barely recessed at all. The machine is adapted for quick adjustment so that the various types and sizes of containers may be fed indiscriminately thereto.

What we claim as our invention and desire to secure by Letters Patent is:

1. In a cleaning machine, the combination with a brushing mechanism, of a work support comprising an oscillatory shaft, two shafts supported in spaced relation by the oscillatory shaft to support and to rotate the work, gears on said two shafts, a pinion on the oscillatory shaft causing the two shafts to rotate in one direction, and means connected to the oscillatory shaft for turning the latter in one direction to receive the work between the two shafts and in the opposite direction to discharge the work from said shafts.

2. In a cleaning machine, the combination with a brushing mechanism, of a work support mounted to swing in one direction to receive the work and in the opposite direction to discharge the work, and an ejector arranged to engage the work on the work support as the latter is moved to discharge the work.

3. In a cleaning machine, the combination with a brushing mechanism, of a tiltable work support movable in one direction to receive the work and in the opposite direction to discharge the work, said work support embodying two spaced shafts geared together to rotate in the same direction and spaced rollers on the two shafts, and an ejector pivotally supported on the receiving side of the work support and projecting over one of the shafts between the spaced rollers so as to be engaged by said shaft as the work support is tilted to discharge the work in order to engage the work and assist in such discharge.

4. In a cleaning machine, the combination with means for rotating and supporting a circular body, of brushing means for one end of the body embodying two rotary brushes arranged to operate on the body end, one of said brushes having an axis of rotation at right angles to the axis of rotation of the body, and the other of said brushes having an axis of rotation at a slight angle to the axis of rotation of the first-named brush, the effective surface of the last-named brush being smaller than that of the first-named brush.

5. In a cleaning machine, the combination with means for rotating and supporting a circular object, of brushing means for one head of said object embodying a rotary brush for cooperating with the major portion of said head, and a smaller rotary brush for cooperating with the chime of the body, the latter brush being rotated about an axis at a slight angle to the axis of rotation of the first-mentioned brush.

6. In a cleaning machine, the combination with means for supporting and rotating a circular object, of a frame pivotally supported above said object, a rotary brush suspended by said frame to move toward and from the object, a motor mounted on said frame, and driving connection between the motor and the brush.

7. In a cleaning machine, the combination with means for supporting and rotating a circular object, of a rotary brush mounted to turn about an axis parallel with the axis of rotation of the object, and means for supporting said brush for swinging about an axis at right angles to the axis of rotation of said brush so that the brush may be made to conform to the bilge of a circular object.

8. In a cleaning machine, the combination with means for supporting and rotating a

circular object, of a rotary brush for cooperating with an object on said supporting means, two rock shafts, means for supporting the opposite ends of said brush from said rock shafts at points eccentric to the axes of turning of said rock shafts, and an equalizing connection between the two rock shafts.

9. In a cleaning machine, the combination with means for supporting a circular object, of a rotary brush for cooperating with an object on said supporting means, mounted to turn about an axis extending longitudinally of the axis of turning of the object, and equalizing mechanism for causing the brush to swing transversely of its axis of rotation.

10. In a cleaning machine, the combination with means for suporting a circular object, of a rotary brush for cooperating with an object on said supporting means, mounted to turn about an axis extending longitudinally of the axis of turning of the object, equalizing mechanism for causing the brush to swing transversely of its axis of rotation, and means for adjusting said equalizing mechanism to shift the axis of rotation of the brush toward or from the axis of rotation of the object.

11. In a cleaning machine, the combination with means for supporting and rotating a circular object, of a rotary brush for cooperating wtih an object on said supporting means, two rock shafts, means for supporting the oposite ends of said brush from said rock shafts at points eccentric to the axes of turning of said rock shafts, a double arm lever, and two links each connecting one of the arms of the lever with one of the rock shafts at points eccentric to the latter.

12. In a cleaning machine, the combination with means for supporting and rotating a circular object, of a rotary brush for cooperating with an object on said supporting means, two rock shafts, means for supporting the opposite ends of said brush from said rock shafts at points eccentric to the axes of turning of said rock shafts, a double arm lever and two links each connecting one of the arms of the levers with one of the rock shafts at points eccentric to the latter, and means for shifting the pivot of the double arm lever to move the brush toward or from the axis of rotation of the circular object.

13. In a cleaning machine, the combination with means for supporting a circular object, of a rotary brush for cooperating with an object on said supporting means, two rock shafts, means for supporting the opposite ends of said brush from said rock shafts at points eccentric to the axes of turning of said rock shafts, a double arm lever, two links each connecting one of the arms of the lever with one of the rock shafts, a swinging member by which the pivot of the double arm lever is carried, and means under the control of an operative for shifting said swinging member.

14. In a cleaning machine, the combination with means for supporting and rotating a circular object, of a rotary brush for cooperating with an object on said supporting means, an equalizing mechanism, and means for connecting said equalizing mechanism at opposite ends of the brush so that as one end of the brush is raised the other will be lowered and vice versa.

15. In a cleaning machine, the combination with means for supporting and rotating a circular object, of a rotary brush for cooperating with an object on said supporting means, said brush being mounted to swing about an axis extending longitudinally of the axis of rotation of the brush.

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