

Feb. 17, 1953

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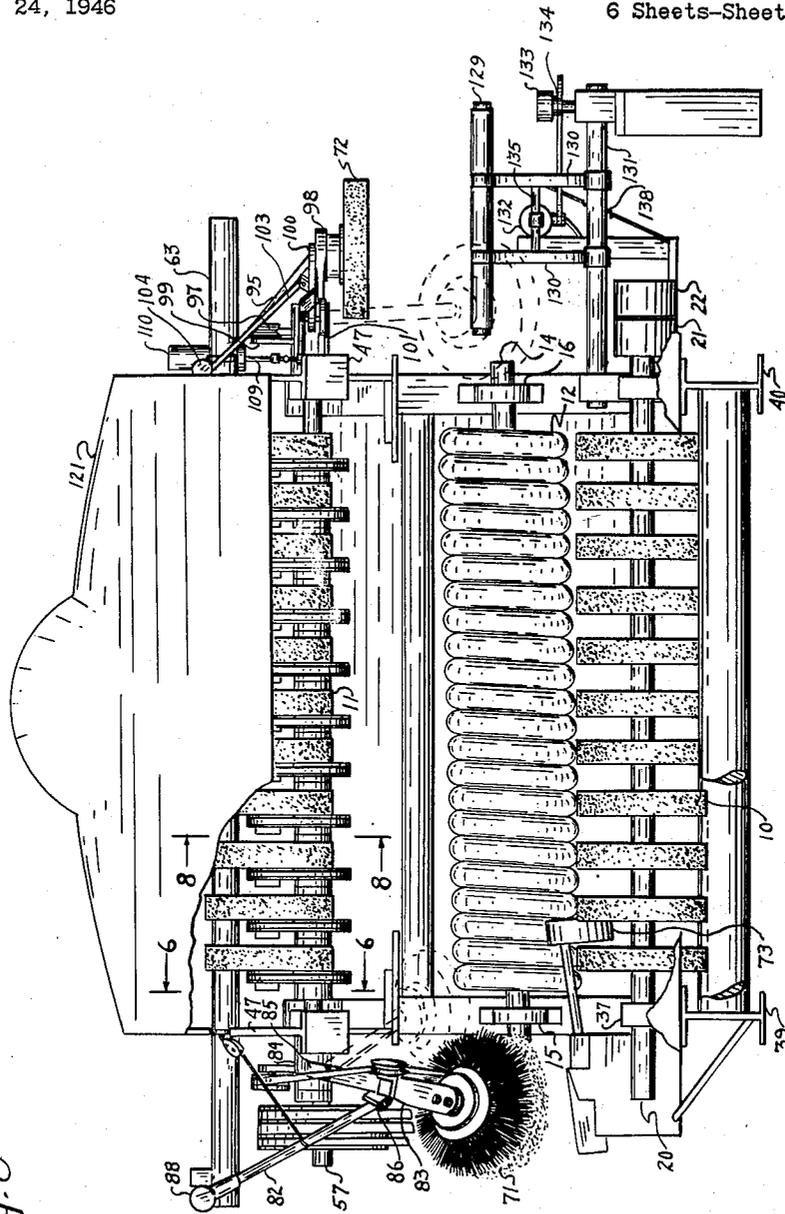
2,628,378

DRUM CLEANING MACHINE

Filed Aug. 24, 1946

6 Sheets-Sheet 2

Fig. 3



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6 Sheets-Sheet 3

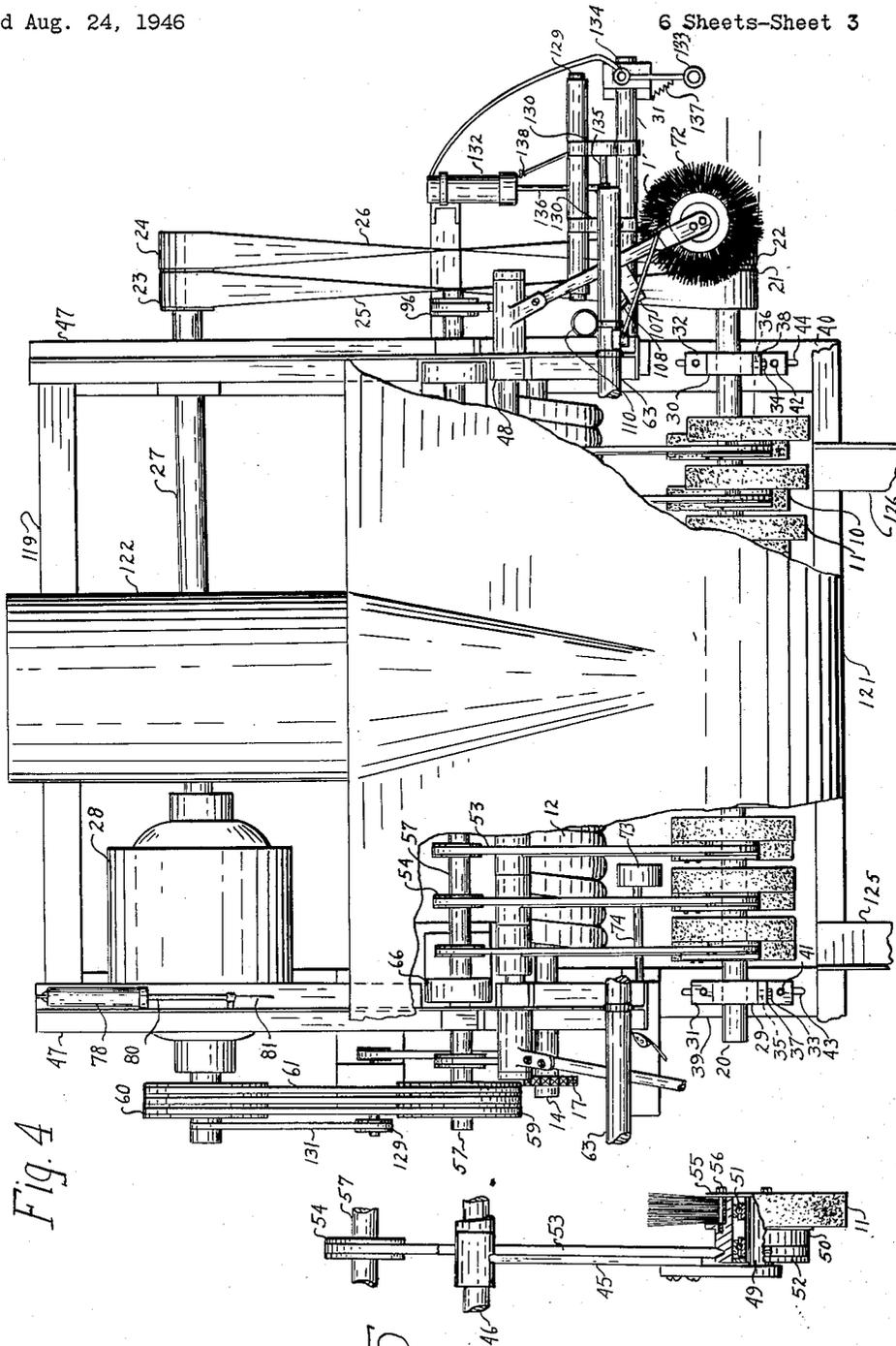


Fig. 4

Fig. 5

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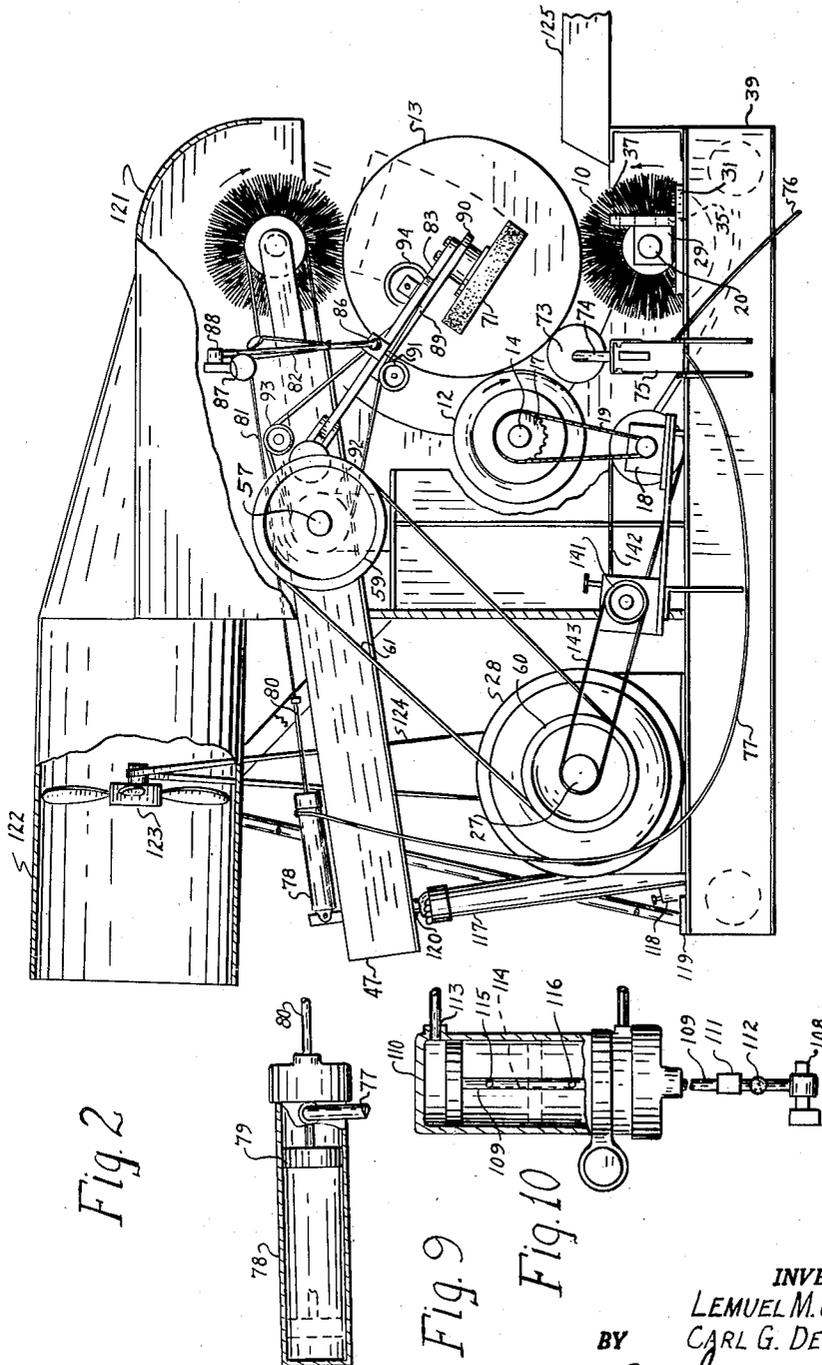


Fig. 2

Fig. 9

Fig. 10

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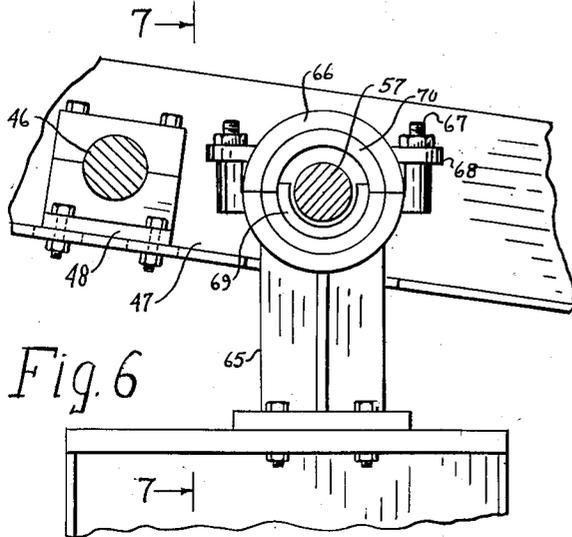


Fig. 6

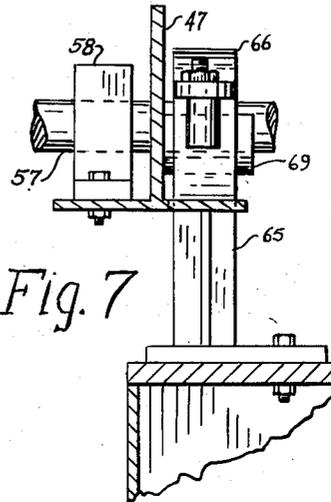


Fig. 7

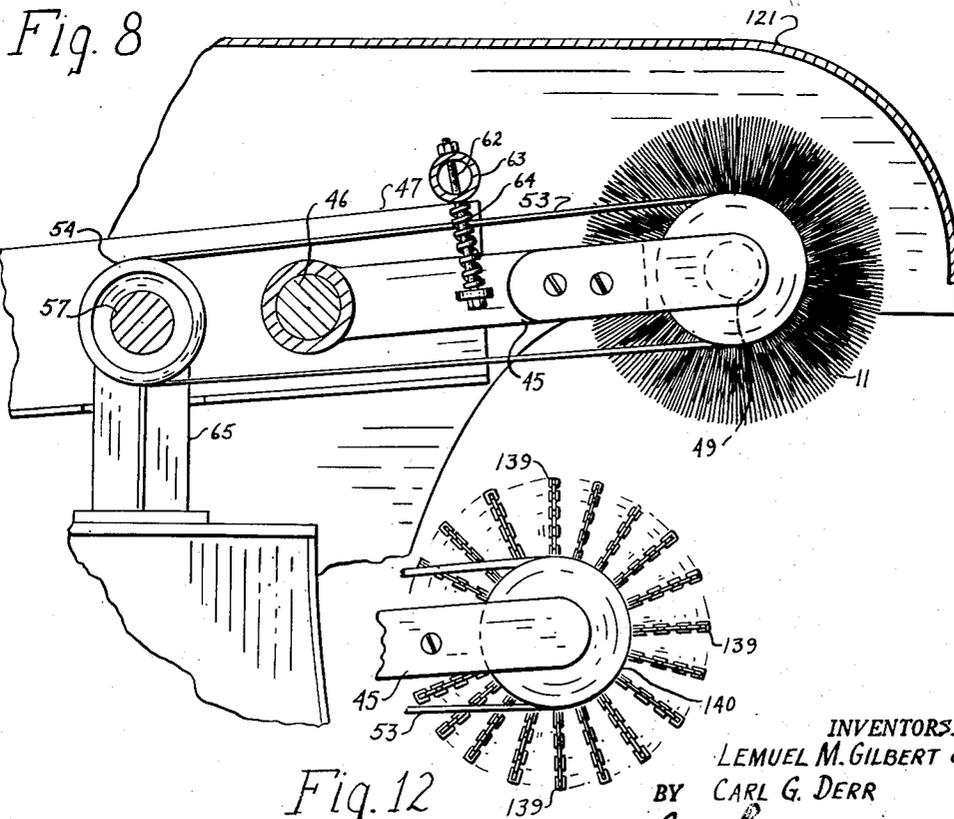


Fig. 12

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6 Sheets-Sheet 6

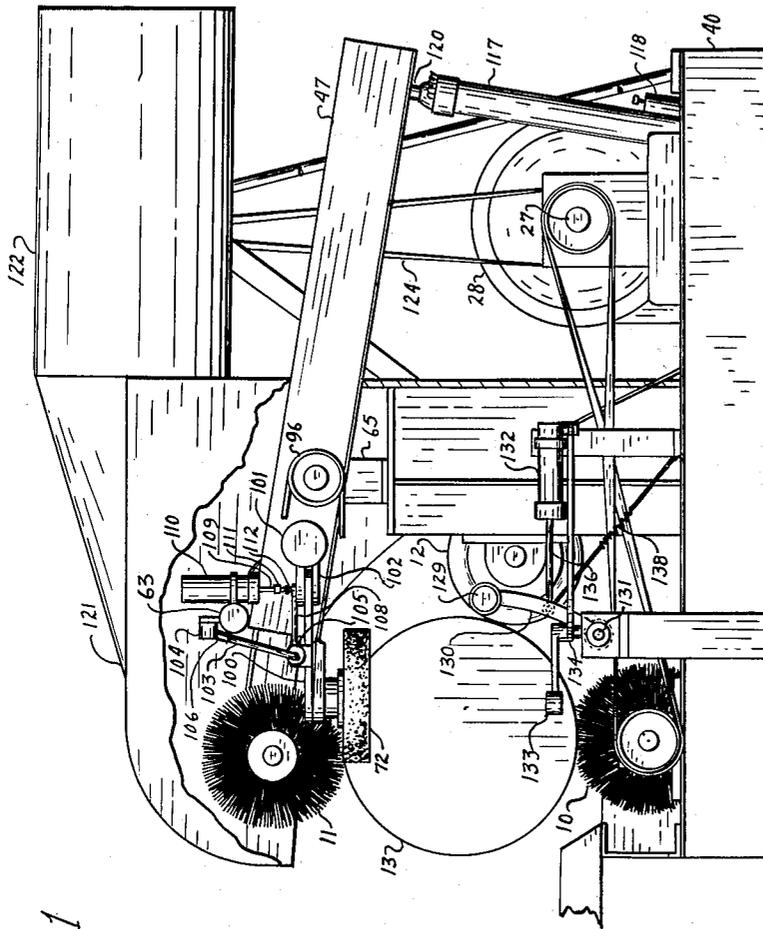


Fig. 11

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UNITED STATES PATENT OFFICE

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DRUM CLEANING MACHINE

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7 Claims. (Cl. 15—58)

1

This invention relates to surface cleaning machines, and in particular machines for cleaning the outer surfaces of the sides and ends or heads of drums commonly known as shipping drums, and includes cleaning drums, containers, and the like of various sizes, and also drums and the like used for various purposes.

Various machines and devices have been provided for cleaning both the inside and outside of drums of this type, and particularly closed drums or containers with heads in each end. These machines are normally manually operated in that the drums are fed into the machine by hand, and the time and thoroughness of cleaning depend upon the operator.

The cleaning machine of this invention contemplates the use of rotary brushes, and instrumentalities for holding and feeding the brushes and drums or containers in contacting relation.

Furthermore, the invention includes adjusting means in the feeding and cleaning elements wherein the said feeding and cleaning elements may be set to eject the drums after predetermined periods of time.

The invention also contemplates means for setting the ejecting means wherein the time the drums remain in contact with the cleaning elements may be set or adjusted so that the drums will remain in contact with the cleaning elements a sufficient length of time for thorough cleaning of the surfaces thereof.

In drum cleaning machines of this type, it has always been found difficult to automatically clean the ends of the drum. To accomplish this purpose, the machine of this invention contemplates substantially horizontally positioned brushes and means for automatically operating the brushes, as a drum enters the machine, wherein a brush moves in against the end of the drum, with the drum traveling against another brush, and the brushes automatically move across the surfaces of the ends to thoroughly clean, by brushing, the entire surface areas of the ends or heads of the drum.

In drum cleaning machines of this type, the brushes wear considerably so that the diameter thereof decreases in use, and for this reason the machine of this invention includes means for adjusting the positions of the brushes to compensate for decreasing sizes of the brushes and also for drums or containers of different sizes.

Whereas the brushes may be set for efficient cleaning of quantities of drums of the same size in the normal operation or use of the machine, it is required at times to use the machine for clean-

2

ing drums of various sizes, particularly as at present wherein the war has necessitated the use of various sizes of materials by manufacturers for making drums and therefore, it is necessary to set the machine for automatic adjustment wherein the cleaning elements will be automatically adjusted for cleaning drums of different sizes as they are fed to the machine.

Machines for cleaning rust, dust and dirt from drums of this type obviously create a cloud of dust and therefore it is necessary to, as far as possible, enclose the cleaning elements of the machine with a suitable housing and connect an exhaustor or suction fan to the housing to draw all dust, dirt, and the like from the cleaning elements.

Whereas various types of cleaning elements may be employed for contacting the surfaces of the drums, containers, or the like, the machine of this invention contemplates the use of rotating brushes with one set of brushes contacting the lower surface of the drum, another set of brushes, in staggered relation to the former set, positioned to contact the upper surface of the drum at a point substantially opposite to the point of contact of the former set, and additional brushes for contacting the ends or heads of the drum.

The cleaning machine of the type with which this invention is concerned also includes as a characteristic element a feed roller positioned to function as a bumper against which a drum fed into the machine comes to rest, and the feed roller is formed with a spiral surface of slightly resilient material such as rubber hose or tubing, and is also set at a slight angle wherein the rake or contacting angle in combination with the spiral surface causes the drum to creep or move lengthwise as it is rotated by the feed roller so that as it rotates, it will move comparatively slowly toward the discharge side of the machine, from which after cleaning, it is automatically ejected.

Due to the explosive hazard of fine suspended particles, such as the dust created in machines of this type, all adjusting elements and automatic devices are operated by mechanical instrumentalities instead of electrical and all parts are grounded to eliminate the danger of sparks from static electricity. The only electrically operated element of the machine is the motor by which the machine is operated and an explosion proof motor is used.

The purpose of this invention is to provide a machine for cleaning the entire outer surface of drums, containers, and the like wherein, with the machine operating, a drum is fed into the machine and the instrumentalities of the machine

3

automatically operate to thoroughly brush the outer side and end surfaces and after the brushing operation continues for a predetermined length of time the device is automatically ejected.

Owing to the abuse under which machines of this type are operated and also due to wear of the parts, it is necessary to mount the respective mechanical parts so that all parts may readily be removed, cleaned or repaired, or replaced.

In order to meet present day conditions prevailing in the use and demand for drums and containers for various purposes and particularly in view of the general shortage of these devices, it is necessary that the operating instrumentalities of the machine be effective for driving the respective parts at relatively high speeds.

The creation of these high speeds is responsible for sharp shocks, jars, and conditions in the machine which necessitate compensating strengthening of the materials and parts which insure against breakage, and extend the service life of the machine.

More in detail, the invention has in view the provision of a casing structure which serves to operatively mount various parts of the mechanisms included therein. The casing structure must be readily assembled and disassembled as occasion demands, and an important phase of the invention is the novel constructional features imparting these properties thereto. It is important that the casing structure be so designed that the machine may be readily manipulated and handled under conditions of practical usage.

Various other more detailed objects and advantages such as arise in connection with the building, design, and operation of a cleaning machine in accordance with the above noted objectives will in part become apparent, and in part be hereinafter stated, as the description of the invention proceeds.

The object of this invention is, therefore, to provide a substantially rugged machine, in which one drum, container, or the like, after another may be continuously fed into the machine, cleaned and ejected therefrom.

Another object is to provide means for receiving and ejecting cleaned drums and the like from the machine.

Another object of the invention is to provide a comparatively rugged cleaning machine for cylindrical devices, particularly with closed ends which is adapted for rough use such as removing excessive accumulations of rust, dirt, grease, corrosion, and the like from the complete outer surfaces of the devices.

Another object of the invention is to provide a cleaning device for drums and the like which includes elements that automatically operate to clean the ends of the drum at the same time the side surfaces thereof are being cleaned.

Another object is to provide devices for cleaning the ends or heads of drums as the side surfaces are being cleaned in which one of the end cleaning elements automatically moves out of the path of the drum as the drum is ejected after cleaning.

Another object of the invention is to provide a machine having rotating brushes for cleaning drums and the like, in which the brushes are mounted for adjustment to compensate for wear thereof.

Another object is to provide adjusting means in a machine for cleaning the surfaces of drums and the like wherein the cleaning elements may be set for drums of various sizes.

Another object is to provide, in a machine for

4

cleaning drums, containers and the like, automatic adjustments to compensate for drums of different sizes.

A further object of the invention is to provide in a cleaning machine for drums, containers and the like, having side and end cleaning elements, an air cylinder connected through suitable instrumentalities to the end cleaning elements wherein, by trip operation, the end cleaning element at the ejecting side of the machine, travels out of the path of the device being cleaned, providing a clear ejecting path.

With these and other objects in view the invention embodies a machine having a feeding track for drums, containers, and the like, through which drums may roll against the surface of a feed roller which functions as a bumper, and also as rotating and ejecting means. The machine is provided with upper and lower rotating brushes positioned to brush the surface of the drum as it rotates, end brushes with suitable operating instrumentalities, and exhausting means for drawing in and exhausting dust, dirt, and the like from the surfaces of the drums.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawings wherein:

Figure 1 is a view showing a drum in the machine with part of the housing broken away, showing the mounting of one of the end brushes.

Figure 2 is a view showing an end elevation of the machine with parts broken away.

Figure 3 shows a front elevation of the machine with parts broken away.

Figure 4 is a plan view of the machine with part of the cover broken away to show the relative positions of the brushes and operating parts.

Figure 5 is a detail showing the mounting of the upper brushes.

Figure 6 is a detail on line 6-6 of Figure 3, showing the mounting of the frame in which the upper brushes are supported.

Figure 7 is a detail on line 7-7 of Figure 6, showing the front view of the mounting of the frame of the upper brushes.

Figure 8 is a detail on line 8-8 of Figure 3, showing the supporting elements of the upper brushes.

Figure 9 is a view showing an air cylinder for operating the brush for cleaning one end of the drum.

Figure 10 is a detail showing a cylinder for operating the brush that cleans the end of a drum at the delivery side of the machine.

Figure 11 is an end elevation of the opposite end of the machine showing the ejecting cradle.

Figure 12 is a view showing an element for replacing a brush element of the upper brush wherein a plurality of outwardly extending chains are provided in place of the brush.

Referring now to the drawings wherein like reference characters denote corresponding parts, the drum cleaning machine of this invention is formed primarily with a lower brush 10, and an upper brush 11, each of which is formed of a plurality of individual brush elements, and a feed roller 12, which is positioned to be engaged by a drum 13 as it enters the machine. The roller 12, therefore, forms a bumper or stop to limit the inward movement of the drum, and holds the drums in the operating or cleaning position in relation to the brushes.

The outer surface of the feed roller 12 is formed in a spiral similar to the threads of a screw,

5

wherein with the roller rotating in a clockwise direction, and with the axis thereof slightly inclined, as shown in Figure 3, it will in combination with the rake of the brushes gradually feed a drum 13 out of the far end of the machine, as indicated by the dotted lines in Figure 1. The time of cleaning may be controlled by the pitch of the spirals on the surface of the feed roller 12 in combination with the rake or inclination of the axes of the feed roller and brushes. The ejection of the drum may also be controlled by changing the number of revolutions of the feed roller. The feed roller 12 is preferably formed with a slightly resilient surface, such as may be provided by round lengths of rubber or the like, or hose. In the design shown, the feed roller 12 is mounted on a shaft 14 which is supported in bearings 15 and 16, and at the end of the shaft is a sprocket 17 by which it is rotated from a speed reduction element 18 through a chain 19.

The lower brush 10, which consists of a plurality of separate brush elements, is mounted on a shaft 20 that is rotated by pulleys 21 and 22 at one end, from pulleys 23 and 24 by belts 25 and 26. The pulleys 23 and 24 are mounted on the end on a shaft 27 adapted to be rotated by a motor 28.

The shaft 20 of the brush 10 is mounted in bearings 29 and 30, which are supported for vertical adjustment in bearing stands 31 and 32 through bolts 33 and 34 in slots 35 and 36 in upright members 37 and 38 thereof. The bearing stands 31 and 32 are mounted on the horizontal elements 39 and 40 of the frame of the machine through bolts 41 and 42 which extend into slots 43 and 44. The position of the lower brush 10 may, therefore, be adjusted to compensate for wear of the brush elements and also for containers or drums of different sizes.

The upper brush 11 is also formed of a plurality of brush elements, each of which is independently rotated, and also independently mounted for upward and downward movement, controlled by spring tension, to compensate for unevenness on the surfaces of drums, containers, or the like that may be placed in the machine for cleaning.

Each of the brush elements 11 is mounted at the outer end of an arm 45, and the arms are pivotally mounted on a stationary shaft 46, as shown in Figures 4, 5, and 8. The ends of the shaft 46 are mounted in side frame members 47 through bearing blocks 48, in slotted holes, as shown in Figure 6. With the bearing blocks 48 held by the bolts in slotted openings in the side frame members, the ends of the shaft 46 may be adjusted to take up slack in the belts or to compensate for wear of the parts.

The brush elements 11 are mounted on pins 49 at the outer ends of the arms 45 through hubs 50 with ball-bearings 51 therein, and the hubs are provided with grooves 52 for belts 53, thereby forming pulleys that are rotated about the pins 49 from pulleys 54 through the belts 53. The brushes are held in recesses in the hubs 50 by plates 55 which are held in clamping relation to the hubs by bolts 56.

The pulleys 54 are rotatably mounted on a shaft 57, which is positioned in a plane extending through the axis of the stationary shaft 46 and the shaft 49, as shown in Figure 8. The shaft 57 is rotatably mounted in bearings 58 on the lower flanges of the T-shaped side members 47 of the frame, and at the outer end thereof is a pulley 59 that may be rotated directly from a pulley 60 on the shaft of the motor 28 through

6

belts 61, as shown, or that may be driven through a suitable speed reduction element to change the speed of rotation thereof, as may be desired. With this shaft rotating, each of the brush elements of the brush 11 will be rotated respectively through the belts 53, and as the elements of the brush 11 are pivotally mounted through the arms 45 on the shaft 46, they will be free for vertical movement to compensate for wear of the brushes, and also for unevenness of the surface of the drums or containers.

The arms 45 are pivotally mounted at their inner ends on the shaft 46 and the outer ends of the arms are suspended by bolts 62 from a bar 63. Springs 64 are provided on the bolts for holding the arms and brush elements in tension, as shown in Figure 8.

The feed roller 12 and the upper brush 11 are rotated in a clockwise direction; whereas the brush 10 is rotated in a counter-clockwise direction.

The side members 47 of the upper brush supporting frame are pivotally mounted on the axis of the brush driving shaft 57 through bearing stands 65 from the frame of the machine. The stands 65 are formed with split bearings, having removable caps 66 held by nuts on studs 67, which extend through ears 68. The bearings pivotally support cup-shaped or U-shaped bushings 69 extending from the side members 47, through which the shaft extends and from which the shaft may readily be removed by removing the caps 66. The bearing is also provided with a split bushing 70 for pivotally mounting the bushings 69 of the side members of the frame. The shafts 46 and 57 may be mounted in the machine, and also in the side members 47 of the brush frame in any suitable manner wherein the axis of the shafts are in alignment with the axis of the elements of the brush 11.

The machine is also provided with brushes 71 and 72 for cleaning the ends of drums, containers, and the like, and these brushes are automatically operated to brush the ends or the heads of the drums, and move across the upper portions of the heads which, with the drums rotating, moves the entire surfaces of the heads into cleaning positions, whereas the entire heads are cleaned by the brushes. After cleaning the ends of the drums, the brush at the discharge end of the machine moves upward out of the path of the drum so that the drum may be ejected longitudinally, or transversely.

As a drum enters the machine, it first contacts a small roller 73 which is suspended in the path of the drum by an arm 74 that extends outward from an air valve 75, shown in Figure 2, and as the drum actuates the roller, the arm 74 opens the valve whereby compressed air supplied from any suitable source through a tube 76 passes through a tube 77 to an air cylinder 78. When air is admitted to the cylinder through the connection at the upper end thereof, pressure is exerted on a piston 79, therein, and the piston is moved toward the opposite end drawing a rod 80 inward. A cord 81 attached to the end of the rod and also to a bracket 82 is drawn inward by the piston and this draws the bracket upward to raise the brush 71.

The brush 71, which cleans one end or head of a drum or container is hingedly mounted by an arm 83 on a hub 84 through a connection 85, and the travel of the arm is influenced by the bracket 82 to which the cord 81 is attached, as shown in Figures 1 and 2. One end of the bracket 82 is hingedly attached to the arm 83

at the point 86, and the other end 87 is pivotally mounted on the end of the bar 63 at the point 88. Through this series of universal joints or connections, the brush will first travel inward to engage the drum head and then travel upward across the upper half or portion of the head, and as the drum is rotating, the entire surface of the head is engaged by the brush, and therefore cleaned.

The brush 71 is rotated by a continuous belt 89 traveling over a pulley 90 on the brush, and around pulleys 91, 92, 93, and 94, as shown in Figures 1 and 2. The pulley 92 is mounted on and driven from the shaft 57 which is driven by the motor, as shown.

The upward movement of the brush 71 is controlled by air pressure, and when the brush is in the position of rest, as shown in Figure 1, the weight of the brush arm and pull of the belt will hold it, in the position shown. When a drum contacts the trip roller 73, the valve 75, through air pressure, operates the piston 79 to draw the brush 71 upward as described.

As the brushing and cleaning operations continue, the feed roller 12 moves the drum lengthwise so that the end thereof passes off of the roller 73, and as soon as this roller is released, it will return to the upper position and operate the valve 75 which will release or exhaust the air pressure in the cylinder, applying the pressure at the opposite end and returning the piston to the original position shown in Figure 9.

The trip roller 73 also operates a brush 72 at the opposite side of the machine through the valve 75, and this brush starts at the upper edge and travels downward across the upper half of the end or head of the drum.

The brush 72 is also rotated from the shaft 57 by a belt 95 which travels over pulleys 96, 97, and 98, as shown in Figures 3 and 4, the pulley 97 being mounted on the hub 101 by a bracket 99.

The brush 72, as shown in Figures 3 and 4, is mounted on an arm 100 which is hingedly attached to a hub 101 at the point 102, and this is also provided with a brace 103 connected through swivel or universal joints 104 and 105 to the end 106 of the bar 63, and to the arm 100 respectively.

The arm 100 is formed with an extension 107 and a diagonal brace 108 to which a connecting rod 109 from an air cylinder 110 is connected through universal joints 111 and 112.

The operation of the brush 72 is first downward, the air through the connection 113 from the valve 75 being admitted to the cylinder 110, equalizes the pressure as a drum engages the roller 73 wherein the brush drops downward by its own weight. As the drum moves toward the brush 72 it engages the brush and forces the brush outward, and the positions of the supporting instrumentalities cause the brush to travel upward as it is forced outward. The brush 72 therefore travels from the rim at the edge of the end or head of the drum to the center and back across the upper half of the head, and as the drum is rotating, the entire surface of the head will be contacted by the brush, and thereby cleaned.

The connecting rod 109 is provided with a passage 114 having spaced end openings 115 and 116 wherein with the piston adjacent the lower end of the cylinder air pressure from the connection at the lower end will pass through the connecting rod and escape therethrough; whereas when the opening 116 passes into the cylinder

the pressure forces the piston upward, and holds the piston upward until another drum engages the trip 73.

The outward travel of the drum moves the brush outward and upward until the air pressure picks up the travel of the piston and carries it upward until the brush 72 is above the upper surface of the drum wherein the cleaned drum may be ejected or delivered from the machine to an ejecting cradle.

It will be understood that the details of the mountings and operating instrumentalities of the brushes and other parts are not illustrated in the exact designs as used in the machine, and, therefore, these parts may be changed as desired. It will also be understood that adjustments may be made in the parts or instrumentalities to compensate for wear and also for drums or containers of different sizes, and in particular for drums of different diameters wherein the distance between the brushes 10 and 11 may be varied.

In Figure 2, an air control cylinder 117 and a pressure control valve 118, associated therewith, is provided for raising and lowering the side members 47 of the upper brush supporting frame, to raise or lower the brush 11. The position of the frame and brush may be adjusted manually through the valve 118, or the adjustment may be made automatically, through various known devices, as drums or containers of different sizes are fed or supplied to the machine.

The cylinder 117 is mounted on a base 119 of the machine, and the upper end or connecting rod 120 thereof is connected to the members 47 as shown.

The machine may be provided with a suitable housing 121, substantially enclosing the operating parts, and the housing may be provided with a suction or discharge duct 122 in which a fan 123, operated by a belt 124 from the motor shaft, may be positioned. Other means may be provided for withdrawing dust, dirt and the like from the cleaning brushes of the machine.

A platform is provided at the entrance of the machine having side members 125 and 126, and intermediate members 127 and 128, and the drums or containers to be cleaned may be placed on the platform and fed to the machine as desired.

The platform may be positioned to communicate with supply conveyors or chutes, so that the drums may be continuously fed or supplied to the machine if desired.

The delivery side of the machine may be provided with an ejection cradle formed with a kicker 129 at the upper ends of arms 130 pivotally mounted on a shaft 131 and operated by a cylinder 132. A knob 133 may be positioned in the path of the drums and as the knob is engaged by a drum it will be forced outward wherein it will open a valve 134 to admit air to the cylinder 132, which will in turn operate the kicker. The cylinder is attached to the arms 130 through a cross rod 135 to which the connecting rod 136 is attached. The kicker may be covered with resilient sleeves, as shown, and may be returned by springs 138 attached to the arms. A spring 137 may also be provided for returning the knob 133.

In the cleaning operation, the feed roller 12 frictionally engages the surface of the drum, which in combination with the upper brush, causes the drum to rotate, and the spiral surface in combination with the upward inclination or rake of the axis thereof and the outward slope

or rake of the axis of the upper brush 11 will cause the drums to travel lengthwise or across the machine until they reach the opposite or delivery side, as indicated by the dotted lines in Figure 1.

As the drums engage the knob 133 the kicker will be operated to eject the drums forward or transversely.

The drums may therefore pass directly out of the machine, or the cradle may be set to kick or eject the drums as may be desired.

Should the drums be coated or covered with excessive accumulations of rust, or should the rust prove obstinate to remove, some of the brush elements of the upper brush 11 may be replaced with chain elements wherein chains 139 are provided on hubs 140 similar to the hubs 50, whereas as the brush is rotated the chains, or the like, will strike the surface of the drum and facilitate the removal of rust or the like. It will be understood that other means may also be used in combination with the brush elements for removing substances from the surfaces of the drums.

The machine is illustrated as operated by the motor 28, however it may be operated by any suitable source of power. The motor shaft 27 rotates the upper brush 11 through the pulleys 59 and 60, and the belt 61, as shown, and the lower brush 10 through the pulleys and twisted belts 25 and 26, which reverse the direction of rotation thereof. The shaft 27 also rotates the feed roller 12 through the speed reduction element 18 and chain 19, and the reduction element may be driven from the shaft 27 by an additional speed reduction element 141 through the belts 142 and 143 as shown in Figure 2, to further reduce the speed, if desired.

While a preferred specific embodiment of the invention is hereinbefore set forth, it is to be clearly understood that the invention is not to be limited to the exact construction illustrated and described because various modifications of the details may be provided in putting the invention into practice within the purview of the appended claims.

What is claimed is:

1. In apparatus for cleaning the side and end surfaces of objects, the combination, which comprises, a rotary brush positioned to provide supporting means for an object being cleaned, an upper rotary brush positioned to brush the upper surface of the object, said upper brush comprising a plurality of individually mounted and individually rotated brush elements, a feed roller with a resilient spiral surface positioned to stop the object as it moves into the apparatus and also position the said object for cleaning by the brushes, means rotating said brushes and roller, and means cleaning the ends of said object.

2. In apparatus for cleaning the side and end surfaces of objects, the combination, which comprises, a rotary brush positioned to provide supporting means for an object being cleaned, an upper rotary brush positioned to brush the upper surface of the object, said upper brush comprising a plurality of individually mounted and individually rotated brush elements, a feed roller with a resilient spiral surface positioned to stop the object as it moves into the apparatus and also position the said object for cleaning by the brushes, means rotating said brushes and roller, rotating end brushes positioned substantially perpendicular to said former rotary brushes, and means moving said end brushes across portions of the ends of the object.

3. In an apparatus for cleaning drums and the like, the combination which comprises, an elongated cylindrical brush adapted to be rotated at one side of a drum in contact therewith and a second brush comprising a plurality of separate rotary disc-shaped brushes adapted to form a substantially elongated cylindrical brush in released position and adapted to be individually urged toward the drum being cleaned, and means adapted to rotate the drum against the action of said brushes, said means comprising a resilient cylindrical body having a spiral surface adapted to gradually move the drum along its axis.

4. In an apparatus for cleaning drums and the like, the combination which comprises, an elongated cylindrical brush adapted to be rotated at one side of a drum in contact therewith, and a second brush comprising a plurality of separate rotary disc-shaped brushes adapted to form a substantially elongated cylindrical brush in released position and adapted to be individually urged toward the drum being cleaned, and rotating disc-shaped brushes adapted to contact the ends of said drum and to move across the radius of said drum while rotating.

5. In an apparatus for cleaning drums and the like, in combination, a housing, a plurality of rotary brushes therein adapted to contact a drum, and a combined bumper and feed roller comprising an elongated cylindrical spiral device having a resilient surface adapted to rotate the drum in a direction opposite to the rotation of the cleaning brushes, and simultaneously adapted to move the drum gradually along its longitudinal axis.

6. In an apparatus for cleaning drums and the like, in combination, a housing, a plurality of rotary brushes therein adapted to contact a drum, and a combined bumper and feed roller comprising an elongated cylindrical spiral device having a resilient surface adapted to rotate the drum in a direction opposite to the rotation of the cleaning brushes, and simultaneously adapted to move the drum gradually along its longitudinal axis, feeding means adapted to feed a drum to one end of said feed roller, a cradle at the one end of said feed roller adapted to receive the drum after it has been cleaned, and a kicker operating in said cradle to remove the drum therefrom.

7. In an apparatus for cleaning drums and the like, the combination which comprises, an elongated cylindrical brush adapted to be rotated at one side of a drum, and a second brush comprising a plurality of separate rotary disc-shaped brushes adapted to form a substantially elongated cylindrical brush in released position and adapted to be individually urged toward the drum being cleaned, and rotary disc-shaped brushes adapted to contact the ends of said drum and to move across the radius of said drum while rotating, a combined feed roller and bumper comprising an elongated cylindrical device having a spiral resilient surface, said roller adapted to rotate the barrel against the rotation of said brushes and to move the drum along in the direction of its longitudinal axis, a feeding device adapted to feed the drum at one end of said feed roller, one of said end brushes adapted to move out of the way of said drum as it is ejected at the other end of said feed roller, a cradle at said other end of said feed roller adapted to receive the drum, a kicker adapted to remove the drum received by the cradle, and an automatic timing device adapted to control the operation of the

11

feed roller and brushes so as to present the drum to the brushes for a predetermined time.

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