

[54] HIGH SPEED OVERHEAD CAR WASH APPARATUS

[75] Inventors: David M. Haley, Glendale; Richard P. Bergantzel, Granada Hills, both of Calif.

[73] Assignee: Allen Electric and Equipment Company, Melville, Long Island, N.Y.

[22] Filed: Jan. 19, 1972

[21] Appl. No.: 218,997

[52] U.S. Cl. 15/21 D, 15/DIG. 2

[51] Int. Cl. B60s 3/06

[58] Field of Search 15/DIG. 2, 21 D, 15/21 E, 53, 97

[56] References Cited

UNITED STATES PATENTS

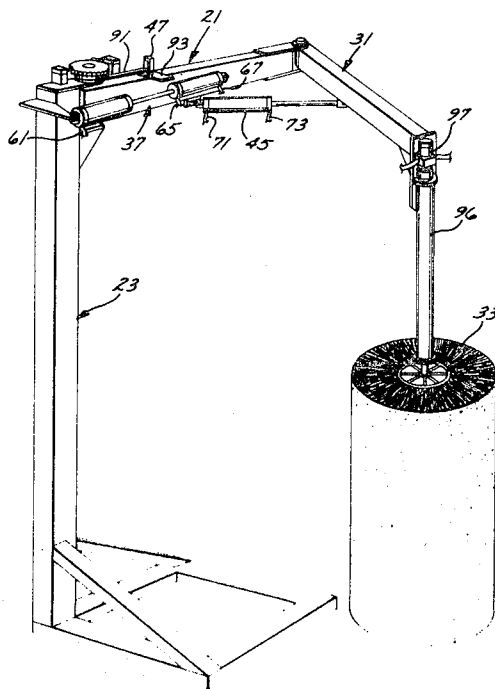
3,581,334 6/1971 Follis 15/21 D
3,624,851 12/1971 Barber 15/21 D

Primary Examiner—Edward L. Roberts
Attorney—Francis A. Utecht et al.

[57] ABSTRACT

High speed overhead car wash apparatus including an overhead primary arm supported on one end from a support structure disposed on one side of the path of a car to be washed and normally projecting transversely over such car path. A secondary arm is pivotally supported on one end from the free extremity of the primary arm and normally projects rearwardly along such car path and angles to such one side thereof. A rotary brush is suspended from the free end of the secondary arm and is normally disposed centrally in the car path. Drive means is provided for rotating the brush and control means is connected with the arms and is responsive to engagement of the brush by the front of the car to fold the secondary arm on the primary arm and move the brush to such one side of the car path and to then then move the primary arm rearwardly along such car path and is further responsive to such brush clearing the rear corner of the car to move such primary arm forwardly as the secondary arm unfolds to thereby carry such brush forwardly and inwardly across the rear of the car and to continue forward movement of the primary arm beyond its normal position to wash at least one half f the rear of such car.

8 Claims, 10 Drawing Figures



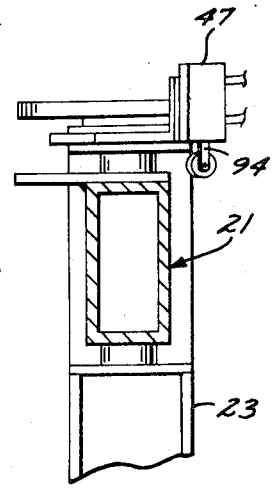
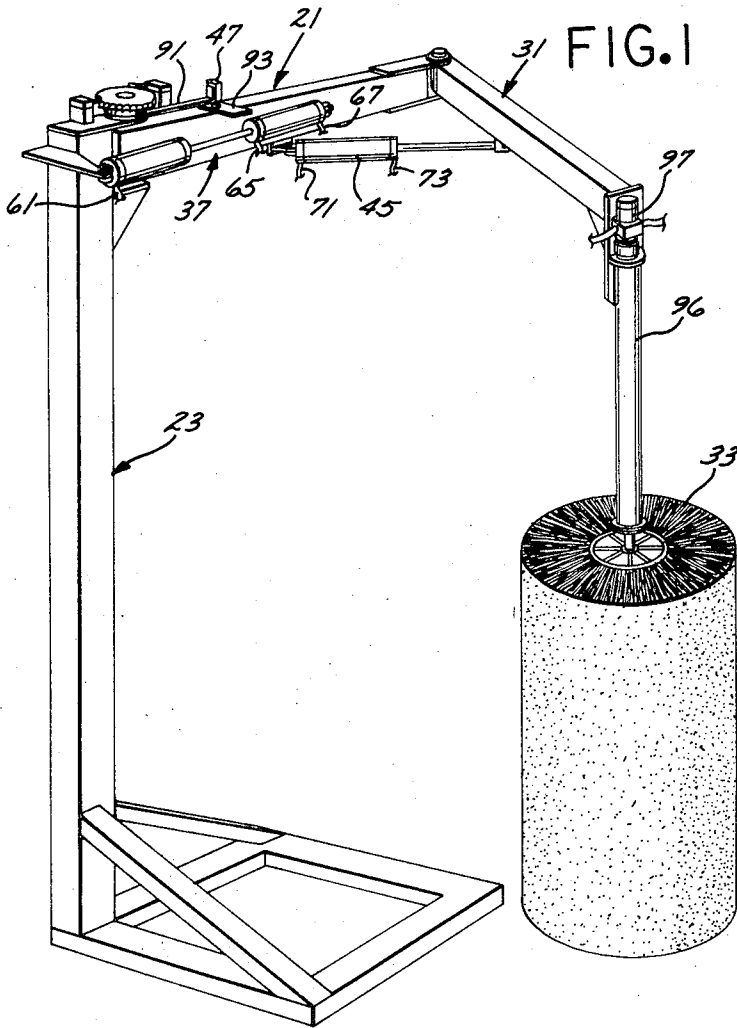


FIG. 3

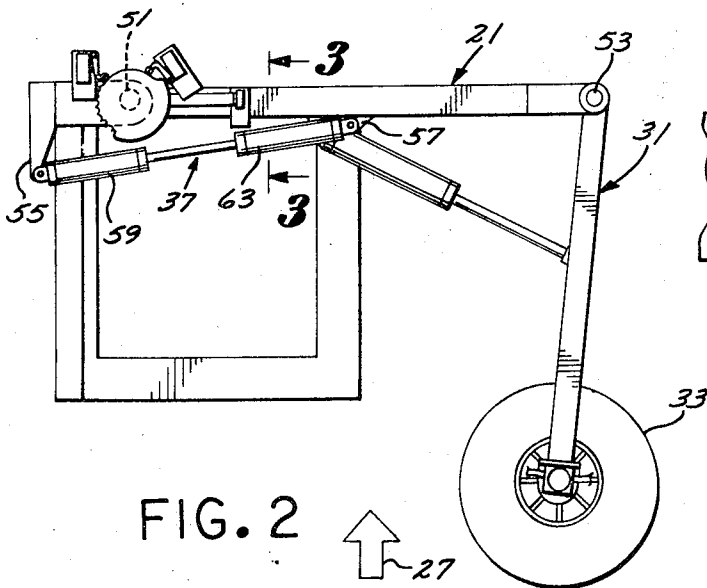


FIG. 2

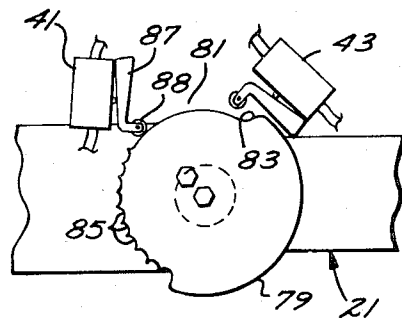


FIG. 4

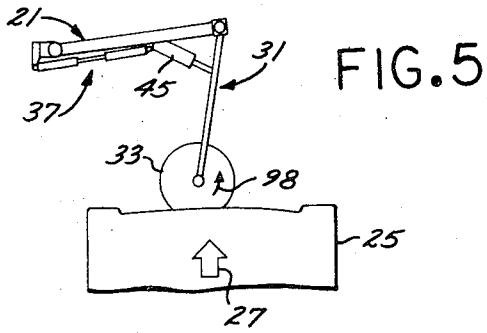


FIG. 5

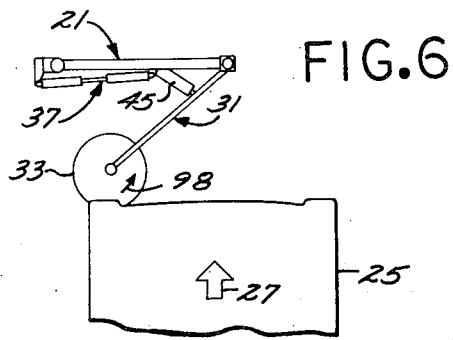


FIG. 6

FIG. 7

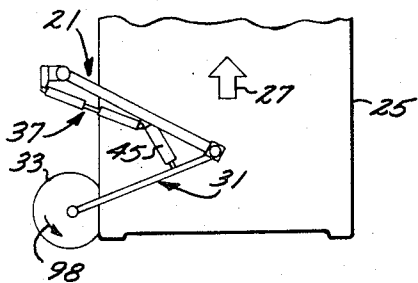


FIG. 8

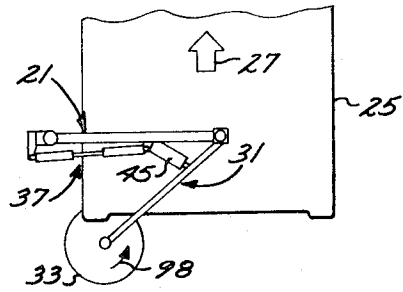


FIG. 9

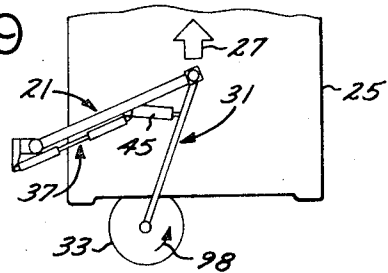
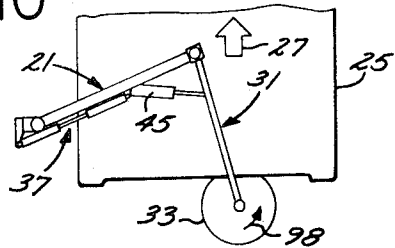


FIG. 10



HIGH SPEED OVERHEAD CAR WASH APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The car wash apparatus of present invention relates to a device for automatically washing the front side and rear of a car moving therepast.

2. Description of the Prior Art

Many efforts have been made to provide an inexpensive apparatus for washing cars at a relatively high rate of speed. One such device is shown in U.S. Pat. No. 3,581,334 and incorporates a primary arm which is pivotally supported at one side of the path of a car to be washed and normally projects transversely of such car path, and a secondary arm which is pivotally mounted on one end from the free extremity of such primary arm and normally projects forwardly along such path. Devices of this type suffer the shortcoming that the type of arm articulation provided severely limits the speed at which cars can be moved therepast for adequate washing thereof and that at relatively high rates of car speed the brush fails to maintain contact with the rear of the car for a sufficient period of time to provide for full washing thereof.

SUMMARY OF THE INVENTION

The high speed overhead car wash apparatus of present invention is characterized by a primary arm which normally projects transversely of the car path and pivotally mounts a rearwardly projecting secondary arm on the free extremity thereof for support of a brush from the free extremity of such secondary arm. Control means is responsive to engagement of the brush by the front of the car to fold the secondary arm on the primary arm to carry the brush across the front of the car and to then pivot the primary arm rearwardly along the side of the car and is further responsive to the brush clearing the rear corner of the car to move the primary arm forwardly as the secondary arm unfolds to carry the brush forwardly and inwardly across the rear of the forwardly moving car.

The objects and advantages of the present invention will become apparent from a consideration of the following detailed description when taken in conjunction with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a high speed overhead car wash apparatus embodying the present invention;

FIG. 2 is a top view of the high speed overhead car wash apparatus shown in FIG. 1;

FIG. 3 is a vertical sectional view, in enlarged scale, taken along the line 3—3 of FIG. 2 and showing a portion of a control device included in the apparatus shown in FIG. 1;

FIG. 4 is a detail view of the top of the control device shown in FIG. 3; and

FIGS. 5 - 10 are schematic views of the high speed overhead car wash apparatus shown in FIG. 1 during operation thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1 and 2, the high speed overhead car wash apparatus of present invention includes, generally, a primary arm 21 which is pivotally carried from a stand 23 and normally projects transversely of the path of a car 25 to be washed, such path being indicated by directional arrow 27. Carried pivotally from the free extremity of the primary arm 21 is a secondary arm, generally designated 31, which has a vertically extending rotary brush 33 carried from the free end thereof. A primary arm cylinder assembly, generally designated 37, is connected with the primary arm 21 and is controlled by means of switches 41 and 43 (FIG. 4) and a secondary arm cylinder 45 is connected between the primary and secondary arm and is controlled by a switch 47. Upon engagement of the brush 33 by the forwardly moving car 25, the primary arm 21 is moved slightly forward to activate the switch 47 to release pressure from the secondary arm cylinder 45 to initiate folding of such secondary arm on the primary arm 21 as shown in FIG. 6. When the front corner of the car 25 is cleared, the rotational friction of the brush 33 on the side of the car will draw the primary arm 21 rearwardly to release the switch 47 and again pressurize the cylinder 45. This urges the secondary arm 31 to its unfolded position as the primary arm 21 continues its rearward travel to the position shown in FIG. 7. When the brush 33 clears the rear corner of the car, the switch 41 will be actuated to urge the primary arm cylinder assembly 37 toward its fully extended position thereby urging the primary arm 21 forwardly as the secondary arm 31 unfolds to carry the brush forwardly and inwardly across the rear of the car as shown in FIG. 9. Forward movement of the primary arm 21 will continue until the primary arm 21 reaches its full forward position shown in FIG. 10. At such time the switch 43 will be actuated to release the pressure on one of the cylinders of the assembly 37 to retract the primary arm rearward to its normal position shown in FIG. 5.

In practice, two mirror image brush units similar to that shown in FIG. 1 are installed, one on each side of the car path 27 to cooperate in washing the front, both sides, and rear of the car 25.

Referring to FIG. 2, the primary arm 21 is carried from the support stand 23 by means of a vertically extending pivot pin 51 and the secondary arm 31 is carried from the free extremity of such primary arm by means of a pivot pin 53. Still referring to FIG. 2, carried from the outer extremity of the stand 23 is a rearwardly projecting lever arm 55 which has one end of the primary arm cylinder assembly 37 connected thereto. The opposite end of such assembly is connected with the intermediate portion of the primary arm 21 by means of a mounting bracket 57. The primary arm cylinder assembly 37 includes a first cylinder 59 which has its blind end selectively pressurized by means of a pressurizing conduit 61 (FIG. 1) and a second cylinder 63 which has the opposite ends thereof selectively pressurized by means of conduits 65 and 67. Still referring to FIG. 1, the opposite ends of the secondary cylinder 45 are selectively pressurized by means of pressurization conduits 71 and 73. In practice, air-over-oil reservoirs are included in the lines 61 and 71 for varying the rate of cylinder movement in a controlled manner throughout cylinder travel.

Mounted concentrically over the primary arm pivot pin 51 is a control cam 79 (FIG. 4) which has approximately 190° of its periphery cut away to form a recess 81 that defines a shoulder 83 at one end thereof for actuation of the control lever 84 of the switch 43 which controls pressure to the primary arm pressurization conduit 65 and 67. A portion of the recess 81 is formed with peripheral concave notches 85 which selectively engage a roller 88 on the end of an actuating arm 87 of the one-way switch 41 to actuate the switch 41 to pressurize the primary arm pressurization conduits 61 and 67.

Referring to FIGS. 1 and 3, the secondary arm control switch 47 is carried from the stand 23 by means of a radially projecting support arm 91 and control thereof is affected by a pad 93 mounted intermediately on the top side of the primary arm 21 for engagement with a control arm 94.

The brush 33 is carried from an axle shaft 96 which has a hydraulic motor 97 mounted on the top end thereof for rotating such brush in the direction of the directional arrow 98 (FIG. 5).

In operation, as the car 25 to be washed moves along the path 27, the front thereof will engage the brush 33 and push such brush forwardly thereby pushing the primary arm 21 forwardly until the switch actuation pad 93 engages the actuator arm 94 of the actuator switch 45. Thus, such switch is energized to exhaust air from the conduit 71 leading from the blind end of the secondary arm cylinder 45 thereby enabling such arm 31 to fold on the primary arm 21 under the influence of the air to the rod end of such cylinder, combined with the frictional force developed between the brush 33 and front of the car 25. As the secondary arm 31 continues folding on the primary arm 21, the brush 33 will clear the front corner of the car 25 as shown in FIG. 6 and commence rearward movement along the side of such car to carry the primary arm 21 rearwardly thereby moving the actuator pad 93 clear of the switch arm 94 to de-energize the switch 45. Again pressure is applied through the conduit 71 to the blind end of the secondary arm cylinder 45 to urge unfolding of the secondary arm 31 with respect to the primary arm 21. Rearward travel of the primary arm 21 rotates the control cam 79 clockwise as viewed in FIG. 4 to cause the roller 88 on the end of the actuator arm 87 of switch 41 to reciprocate the arm 87 as such roller follows the contour of the cutouts 85, but such reciprocation is ineffective to energize the one-way switch 41. However, when the brush 33 clears the rear corner of the car as shown in FIG. 7, the primary arm 21 will commence forward movement thereby rotating the cam 79 counterclockwise and causing the notch 85 in which the roller 88 is engaged to carry such roller for a limited distance therewith. This causes the arm 87 to rotate slightly clockwise thus energizing the switch 41 and switching the control valve (not shown) for the primary arm control cylinder assembly 37 to pressurize the blind end of the cylinders 59 and 63 to urge full extension of such cylinders. However, as forward travel of the car 25 continues, the brush 33 will be carried forwardly beyond its normal position shown in FIG. 5 to the position shown in FIG. 10. At this point the shoulder 83 (FIG. 4) of the cam 79 will engage the actuator arm 94 of the switch 43 to actuate such switch and shift the control valve (not shown) of the primary

arm control cylinder assembly 37 to exhaust pressure from the blind end of the cylinder 63 and pressurize the rod end thereof thus retracting the primary arm 21 rearwardly from the position shown in FIG. 10 back to the normal position shown in FIG. 5. The high speed overhead car wash apparatus of present invention is then ready for washing of the next automobile conveyed along the car path 27.

It is particularly important that the brush 33 is carried forwardly beyond the normal position shown in FIG. 5 while washing the rear of the car for such brush to pass the car center line thereby assuring full washing of the rear of the car. This feature overcomes the shortcoming of many prior art car washing systems wherein the brush travels only forwardly with the rear of the car to its normal position thereby resulting in a portion of the rear of the car being missed. The car wash apparatus of present invention has washed cars at a rate of 150 cars per hour without missing any portion of the rear ends thereof.

Various modifications and changes may be made with regard to the foregoing detailed description without departing from the spirit of the invention.

We claim:

1. High speed overhead car wash apparatus comprising:
 - support means disposed on one side of the path of a car to be washed;
 - an overhead primary arm pivotally supported on one end from said support means and normally projecting transversely of said path;
 - an overhead secondary arm pivotally supported on one end from the free extremity of said primary arm and normally projecting rearwardly along said path;
 - a rotary brush suspended from the free extremity of said secondary arm for rotation about a vertical axis;
 - drive means for rotating said rotary brush; and
 - control means connected with said arms and responsive to engagement of said brush by said car to fold said secondary arm on said primary arm to move said brush across the front of said forwardly moving car and to one side thereof and to then move said primary arm rearwardly of said path while moving said brush rearwardly along said one side and responsive to said brush clearing the rear corner of said car to then unfold said secondary arm relative said primary arm to carry said brush across the rear of said car.
2. High speed overhead car wash apparatus as set forth in claim 1 wherein:
 - said control means includes cylinder means connected with said arms.
3. High speed overhead car wash apparatus as set forth in claim 1 wherein:
 - said primary and secondary arms in their normal position are disposed at an acute angle to one another.
4. High speed overhead car wash apparatus as set forth in claim 1 wherein:
 - said control means includes cylinder means connected with said primary arm and switch means responsive to movement of said brush forwardly from its extreme rearward position to pressurize

5

said cylinder means in one direction to urge said primary arm toward its full forward position and responsive to said primary arm reaching its full forward position to, at least partially, pressurize said cylinder means in the direction opposite said one direction to urge said primary arm rearwardly to an intermediate normal position.

5. High speed overhead car wash apparatus as set forth in claim 1 wherein:

said control means includes means responsive to initial forward travel of said primary arm from its extreme rearward position to urge said primary arm forwardly.

6. High speed overhead car wash apparatus as set forth in claim 1 wherein:

said control means includes piston means connected between said arms and switch means responsive to initial forward movement of said primary arm from its normal position to vent said piston means to enable said secondary arm to fold on said primary arm and responsive to subsequent rearward move-

6

ment of said primary arm to pressurize said cylinder means to urge said secondary arm toward its unfolded position.

7. Overhead car wash apparatus as set forth in claim 4 wherein:

said control means includes means responsive to initial forward travel of said primary arm from its extreme rearward position to urge said primary arm forwardly.

8. Overhead car wash apparatus as set forth in claim 4 wherein:

said control means includes piston means connected between said arms and switch means responsive to initial forward movement of said primary arm from its normal position to vent said piston means to enable said secondary arm to fold on said primary arm and responsive to subsequent rearward movement of said primary arm to pressurize said cylinder means to urge said secondary arm toward its unfolded position.

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