March 24, 1970 F. D. SOLOMON 3,501,794

MECHANISM FOR SUPPORTING AND POSITIONING AN OVERHEAD BRUSH IN A CARWASH

Filed Feb. 27, 1968 2 Sheets-Sheet 1

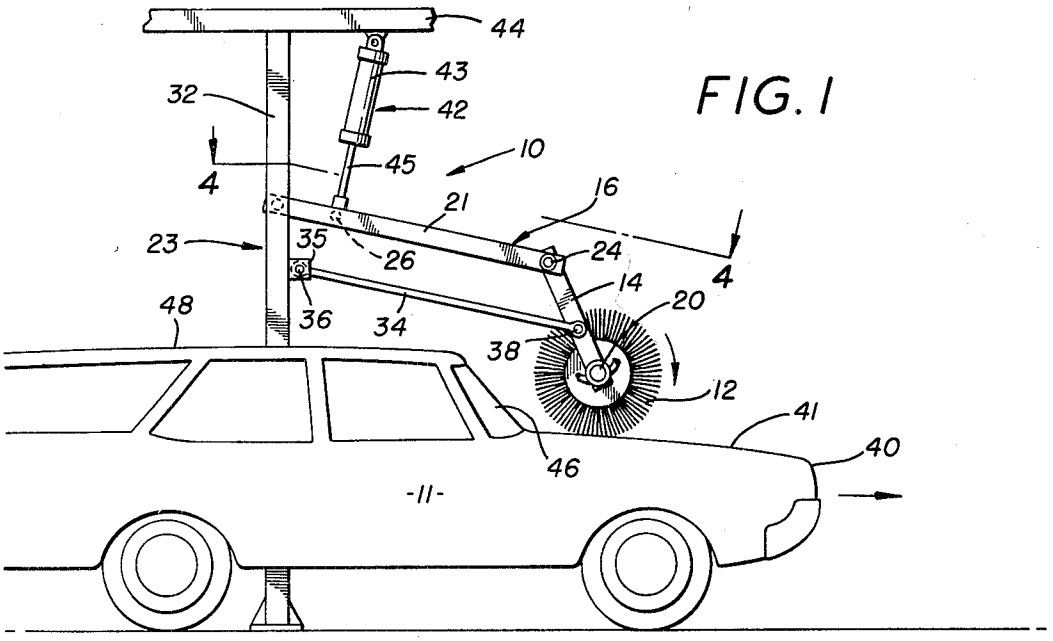

FIG. 1

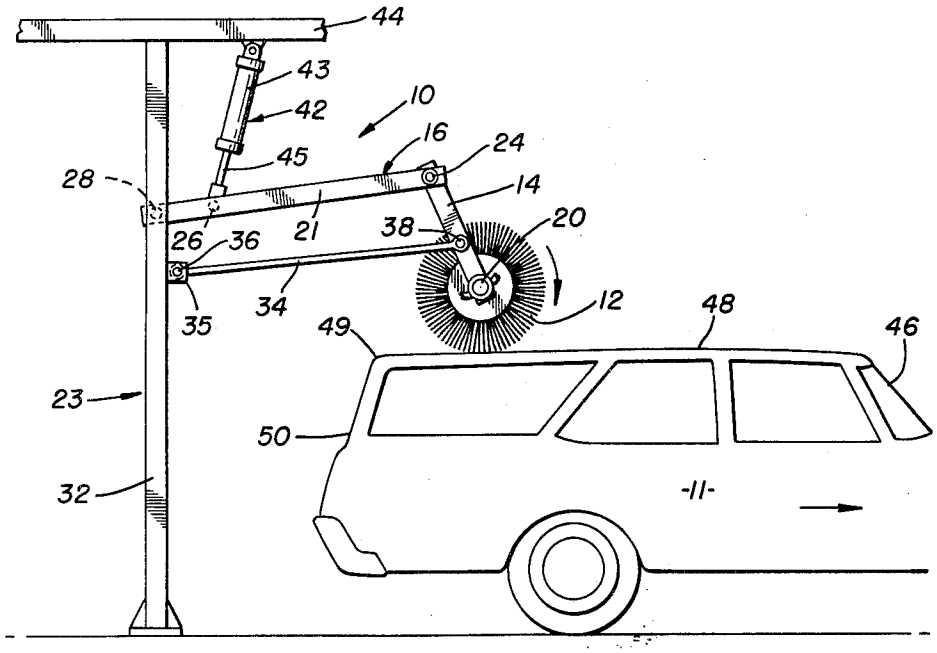

FIG. 2

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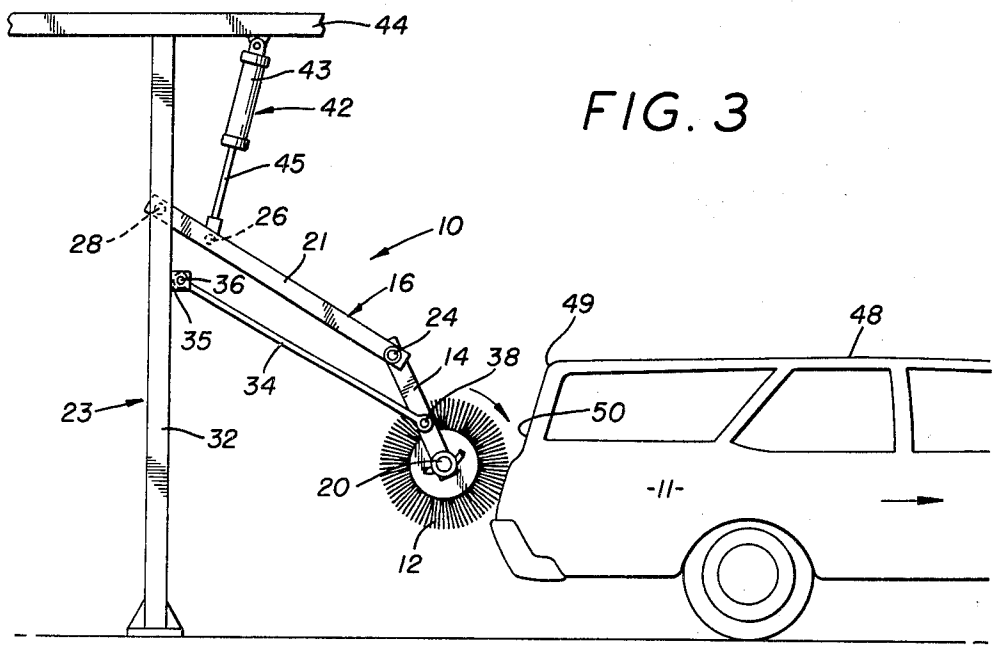

FIG. 3

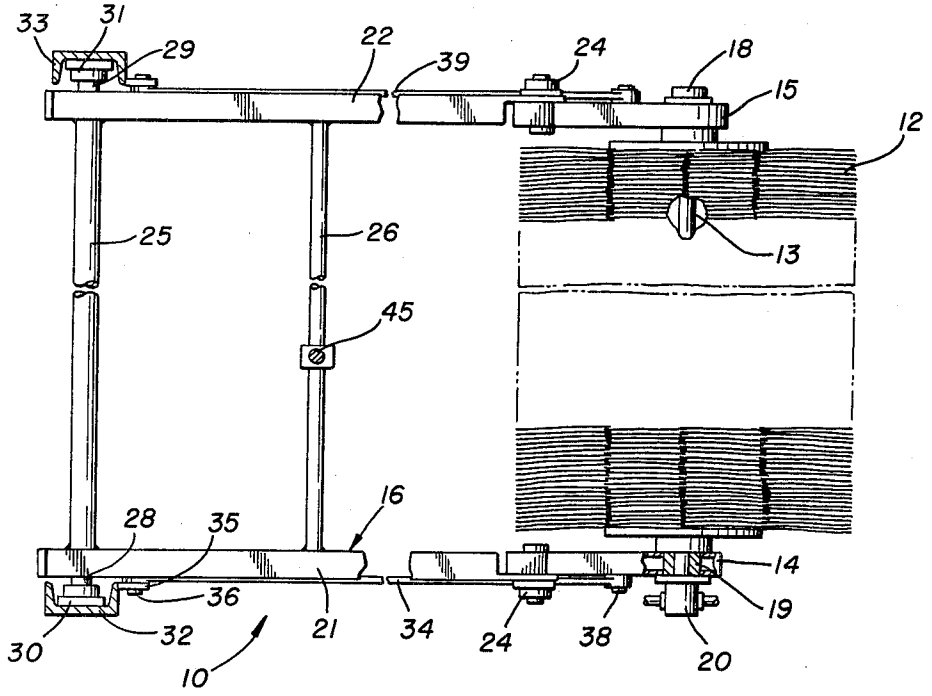

FIG. 4

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MECHANISM FOR SUPPORTING AND POSITIONING AN OVERHEAD BRUSH IN A CARWASH

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Int. Cl. B60s 3/06; A46b 13/02
U.S. Cl. 15—21 5 Claims

ABSTRACT OF THE DISCLOSURE

A mechanism for supporting and positioning the overhead brush in automatic carwashes. The overhead brush cleans the generally upwardly facing surfaces of the vehicle being washed. The subject mechanism rotatably supports the overhead brush on an articulated frame carried on a standchion. In the embodiment depicted the frame has a pair of upper, support links and a pair of lower, control links. The links in each said pair are pivotally secured to the stanchion and extend in generally parallel relation outwardly from the stanchion. Each pair is pivotally connected to an outer arm, the outer arms being laterally spaced to support the overhead brush rotatably therebetween.

Background of the invention

Automatic carwashing systems are generally of two types. In one type the automobile is parked in a stationary position and the washing mechanism traverses the extent of the auto, often making several passes to complete the job. In the second type system the washing mechanism is stationary and the automobile is propelled therethrough at a predetermined speed, the speed and spacing of successive autos being controlled by the utilization of the conveyor system. The present invention relates to a mechanism for supporting and positioning overhead washing brushes which may be used in either system. Although this mechanism shall only be described in conjunction with the second type system, adaptations of the present concept can also be employed by those skilled in the art in the first type system.

To clean the upwardly facing surfaces of a vehicle—i.e., the hood, the roof, rear window and trunk, most prior art automatic car washing systems employ a brush suspended laterally and above the car on counterbalanced swing arms.

Counterbalancing the swing arms relieves the downward force resulting from the weight of the brush and the arms so that the force with which the brush scrubs the car can be controlled by a biasing means. Most prior art installations utilize an air cylinder to apply a preselected, downwardly directed, biasing force to the brush. At best, the force applied by an overhead brush so biased tends to be somewhat erratic at those locations where the upwardly facing surfaces of the vehicle being washed abruptly changes directions.

Of even greater moment, however, is the fact that with the prior art swing arm type support the top brush will often completely fail to make contact with, and clean, the rear window.

The swing arms are preferably mounted to extend outwardly from their pivotal support in the same direction that the vehicle being washed moves with respect to the frame on which it is carrying the prior known construction. In this disposition the arcuate movement of the arms about their pivotal connection to the support frame permits accommodation of the forward movement of the vehicle with respect to the frame. Were the arms reversed, damaging pressure could easly be applied as the profile of the auto presented a forwardly facing, generally vertically inclined surface, such as the windshield, to be cleaned.

The orientation of the swing arms which provides this safety feature is, at the same time, the cause for failure to make proper contact with the rear window, particularly on those vehicles wherein the rear window is oriented at a rather steep pitch. This problem is easily visualized by reference to a station wagon wherein the rear window is inclined even more vertically than in most vehicles. As the vehicle moves forwardly with respect to the frame on which the swing arms are mounted, the brush swings downwardly and rearwardly—i.e., oppositely the direction in which the rear window is moving. As such, the brush leaves the roof and swings arcuately past, but not necessarily in contact with, the rear window.

Summary of the invention

It is therefore a primary object of the present invention to provide a mechanism which will support and position the overhead brush in a carwash so as to clean not only the upwardly directed surfaces of the hood, roof and top of the trunk, but also the rearwardly directed surface of a vertically oriented rear window.

It is a further object of the present invention to provide a mechanism, as above, by which the overhead brush can be supported so as not to apply damaging pressure to the windshield as the windshield moves forwardly and against the brush and yet be capable of scrubbing across the rear window even as the rear window moves forwardly and away from the brush.

These and other objects of the present invention, as well as the advantages thereof over existing prior art forms, will become apparent from the following detailed description of the attached drawings and are accomplished by means hereinafter described and claimed.

In general, a mechanism constructed according to the concept of the present invention for supporting and positioning the overhead brush in an automatic car wash utilizes an articulated support frame operatively mounted on a standchion. At least one support link is pivotally mounted on the standchion, and an arm is pivotally connected to the support arm outwardly of the pivotal connection of the support link to the standchion. The horizontally disposed, overhead brush is journaled on the outer arm. Generally paralleling the support link, and spaced therefrom, is a control link, also pivotally attached to both the standchion and the support arm.

One preferred embodiment of the present invention is shown by way of example in the accompanying drawings and is described in detail without attempting to show all of the various forms and modifications in which the invention might be embodied; the invention being measured by the appended claims and not by the details of the specification.

Description of the drawings

FIG. 1 is a side elevation of a supporting and positioning mechanism according to the present invention for an overhead brush, said brush depicted scrubbing the upwardly facing surface on the hood portion of a vehicle;

FIG. 2 is a side elevation similar to FIG. 1, but sequentially thereafter, depicting the brush scrubbing the upwardly facing surface on the roof portion of a vehicle;

FIG. 3 is a side elevation similar to FIGS. 1 and 2,

but sequentially thereafter, depicting the brush scrubbing down the substantially vertically disposed rear portion of a vehicle; and,

FIG. 4 is an enlarged top plan view, partly in section, of the support and positioning mechanism, taken substantially on line 4—4 of FIG. 1.

Description of the preferred embodiment

A typical embodiment of a mechanism constructed in accordance with the concept of the present invention for supporting and positioning an overhead brush in an automatic car wash is indicated generally by the numeral **10** on the attached drawings. FIGS. 1–3, inclusive, are sequential representations of this mechanism being used to support and position an overhead brush for cleaning the upwardly directed surfaces of a station wagon **11**. A station wagon is depicted herein because most station wagons have substantally vertically oriented rear portions with which the vast superiority of the present concept can be poignantly demonstrated. Although the station wagon **11** is depicted as moving with respect to the mechanism **10** in the direction of the arrows, and therefore symbolic of the second type washing system, one skilled in the art could well adapt the herein disclosed concept to the first type system.

Referring to FIG. 4, brush **12**, carried on a shaft **13**, is rotatably mounted between the outer arms **14** and **15** of an articulated support frame **16**. One end of shaft **13** is rotatably received in a blind journal **18** mounted on outer arm **15**. The other end of shaft **13** extends through a cylindrical journal **19** carried on outer arm **14** and is connected to a fluid motor **20** by which rotation of brush **12** is effected.

The outer arms **14** and **15** pivotally depend from support links **21** and **22**, respectively, that are, in turn, pivotally carried from a stanchion **23**. The articulating pivot between each outer arm and its respective support length may be accomplished by a pin connection such as **24**.

To stabilize the support links **21** and **22** cross braces **25** and **26** may be secured laterally therebetween. With the brace **25** located at the rotational axis about which the support links **21** and **22** swing, a pair of oppositely directed stub shafts **28** and **29** may extend outwardly therefrom to be received within a pair of blind journals **30** and **31** fixed to the vertical members **32** and **33** of the stanchion **23**, respectively.

A control link **34**, generally paralleling and extending beneath the support link **21**, is pivotally connected between the outer arm **14** and the vertical member **32** of stanchion **23**. Specifically, a tab **35** is secured to the vertical member **32** and a pin **36** joins one end of the control link **34** thereto. The other end of the control link **34** is pivotally connected to the outer arm **14** by a second pin **38**.

A control link **39**, generally paralleling and extending beneath the support link **22**, is similarly pivotally connected between the outer arm **15** and the vertical member **33** of stanchion **23**.

Referring to the sequential representations in FIGS. 1–3, inclusive, as the station wagon **11** moves forwardly, in the direction of the arrow, with respect to the stanchion **23** it initially comes into contact with brush **12** at the front **40** of the hood portion **41**. Preferably, the brush **12** is rotated, by the fluid motor **20**, in a direction (as shown by the appropriate arrow) such that the bristles thereof will move in a direction opposite to the relative movement of the surface being scrubbed thereby. Experience has revealed this rotational direction creates a better cleansing action.

As the car continues, the brush **12** remains in contact with the upwardly directed surfaces of the auto **11**. This contact may be assured by the application of controlled downward pressure to the articulated frame **16**. If the frame **16** were counterbalanced, a simple air cylinder, as taught by the prior art, could suffice; however, with the frame **16** cantilevered, as shown, the biasing means **42** is preferably a sensing and positioning control cylinder of the type fully disclosed in my copending U.S. application, Ser. No. 703,694, filed Feb. 7, 1968.

The improved biasing means **42** disclosed in my said application, Ser. No. 703,694, is also preferred because it obviates the erratic application of biasing pressure incident to the prior used air cylinders and assures a controlled, constant pressure of the brush **12** against the vehicle **11**. Cylinder **43** of such biasing means **42** is secured to a beam **44** in the stanchion **23**, and the piston rod **45** emanating therefrom may be fastened to the cross brace **26**.

As the car progresses forwardly with respect to the stanchion **23**, the brush **12** will scrub rearwardly along the hood (FIG. 1), up the windshield **46** and across the top **48** of the car to the position shown in FIG. 2.

Continued forward motion of the station wagon **11** with respect to the stanchion **23** brings the brush **12** to the rear edge **49** of vehicle **11**. Were the overhead brush **12** supported on the prior known rigid swing arms, the brush would move arcuately downwardly and away from the rear surface **50** of the wagon **11** and fail properly to scrub the rear surface **50**. However, with the brush **12** supported on the articulated frame **16**, as the brush moves past the rear edge **49** even though the outer end of the support links **21** and **22** will move arcuately downwardly and rearwardly, the control links **34** and **39** will compensate by forcing the outer arms **14** and **15** to swing forwardly and thus maintain the brush **12** in proper scrubbing contact with the rear surface **50** of vehicle **11**. As the vehicle continues to move forwardly the support links swing further downwardly and the control links continue to maintain the brush **12** in scrubbing contact with the vehicle **11**, as shown in FIG. 3. When the frame **16** reaches a predetermined stop (not shown) it will be in ready position to make contact with the next vehicle to be washed.

By the use of a biasing means **42** embodying the concept of the invention disclosed in my aforesaid application, Ser. No. 703,694, not only will the required force be exerted upon the frame **16** to move the brush **12** downwardly along the rear surface **50**, but the brush **12** will also apply a constant scrubbing pressure to the station wagon **11**. By using such a biasing means, the piston within cylinder **43** can itself determine the upper and lower stops.

It should now be apparent that a mechanism constructed in accordance with the present invention for supporting and positioning an overhead brush will thoroughly clean even the substantially vertically oriented rear surface of a vehicle and otherwise accomplish the objects of the invention.

What is claimed is:

1. A mechanism for supporting and positioning an overhead brush comprising, a stanchion, at least one support link pivotally mounted on said stanchion to swing along a primary arc, an outer arm depending from said support link said arm connected to said support link by an articulating pivot to permit said arm to swing along a secondary arc, the brush being mounted on said arm, and a control link pivotally connected between said stanchion and said outer arm beneath said support link, the pivotal connections of said support link and said control link with said stanchion being fixed with respect thereto.

2. A mechanism, as set forth in claim **1**, in which said control link is secured to said outer arm in spaced relation outwardly of the articulating pivot by which said outer arm is connected to said support link.

3. A mechanism, as set forth in claim **2**, in which the control link generally parallels the support link.

4. A mechanism, as set forth in claim **3**, in which there is a pair of laterally spaced support links, an outer arm depending from each said support link and the brush is mounted between the outer arms pivotally secured to said laterally spaced support links.

5. A mechanism for supporting and positioning an overhead brush comprising, a stanchion, support means having opposed, first and second ends, said first end mounted on said stanchion, said support means being swingable about said first end such that the second end swings at least downwardly and rearwardly, arm means mounted on said support means and movable with and with respect thereto, the brush being operatively carried on said arm means, and control means operatively connected to said arm means to move the brush forwardly in response to the downward and rearward movement of the second end of said support means.

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U.S. Cl. X.R.

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