United States Patent

Wilkins

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[54] **SIDE BRUSH ASSEMBLY FOR CAR WASH APPARATUS**

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[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, 21 E, 53, 15/97

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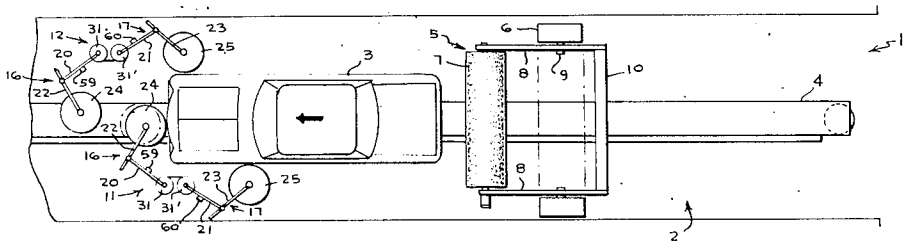
Primary Examiner—Edward L. Roberts

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[57] **ABSTRACT**

Automatic car wash apparatus having brush assemblies on each side of the path of a car moving through the car wash, wherein each side brush assembly includes a pair of brush units pivotally mounted upon fixed post support means, with the brush units extending in opposite directions either toward, or away from, one another and being yieldingly biased toward a predetermined, at rest, angular relationship with respect to one another. Each brush mounting unit has two arm components, pivotally interconnected, with the free end of one arm pivoted to the fixed post support means and the free end of the other arm carrying a brush. The arm components of each unit have a predetermined minimum angular relationship, and they are yieldingly biased to assume that angle.

11 Claims, 16 Drawing Figures



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SHEET 1 OF 6

FIG-1

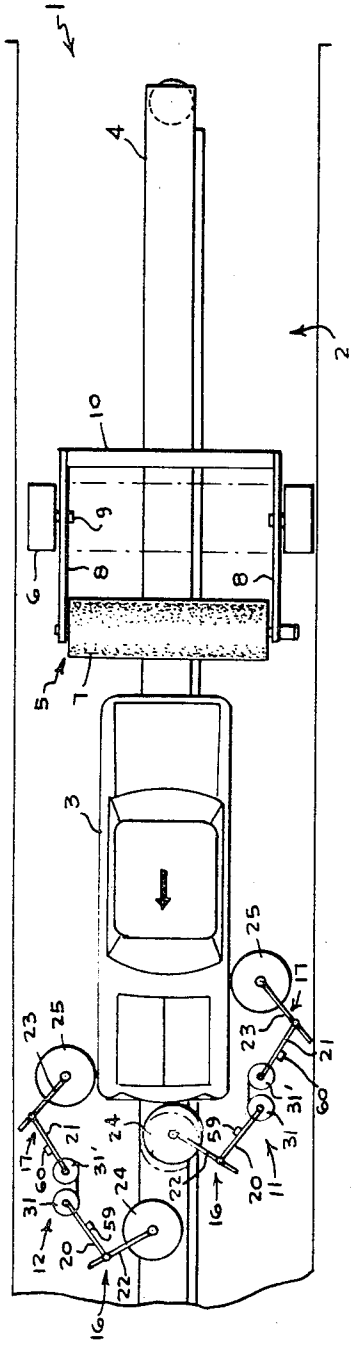


FIG-2-B

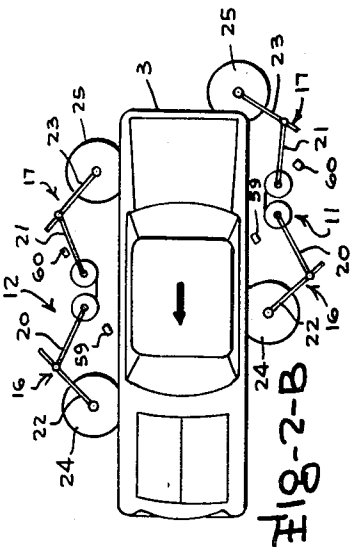


FIG-2-D

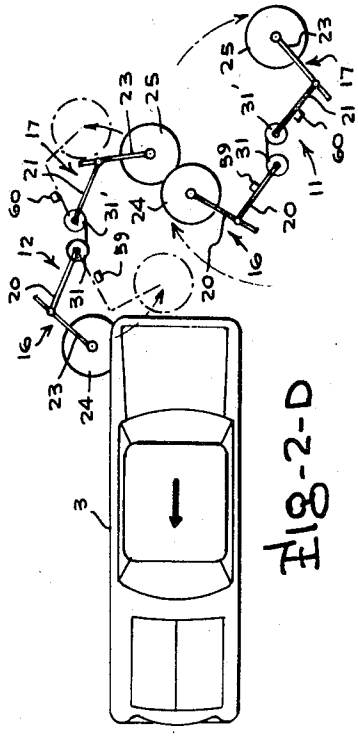


FIG-2-A

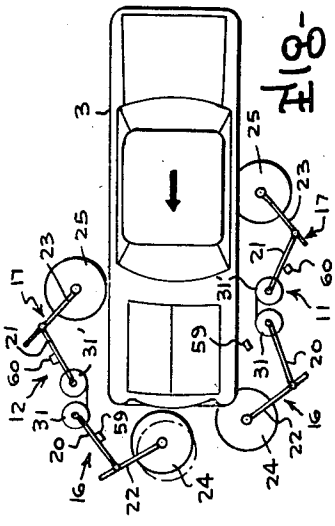
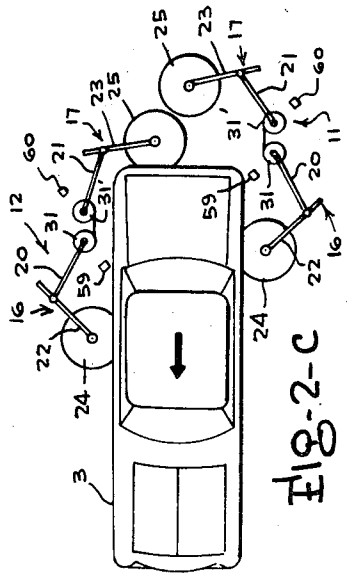


FIG-2-C



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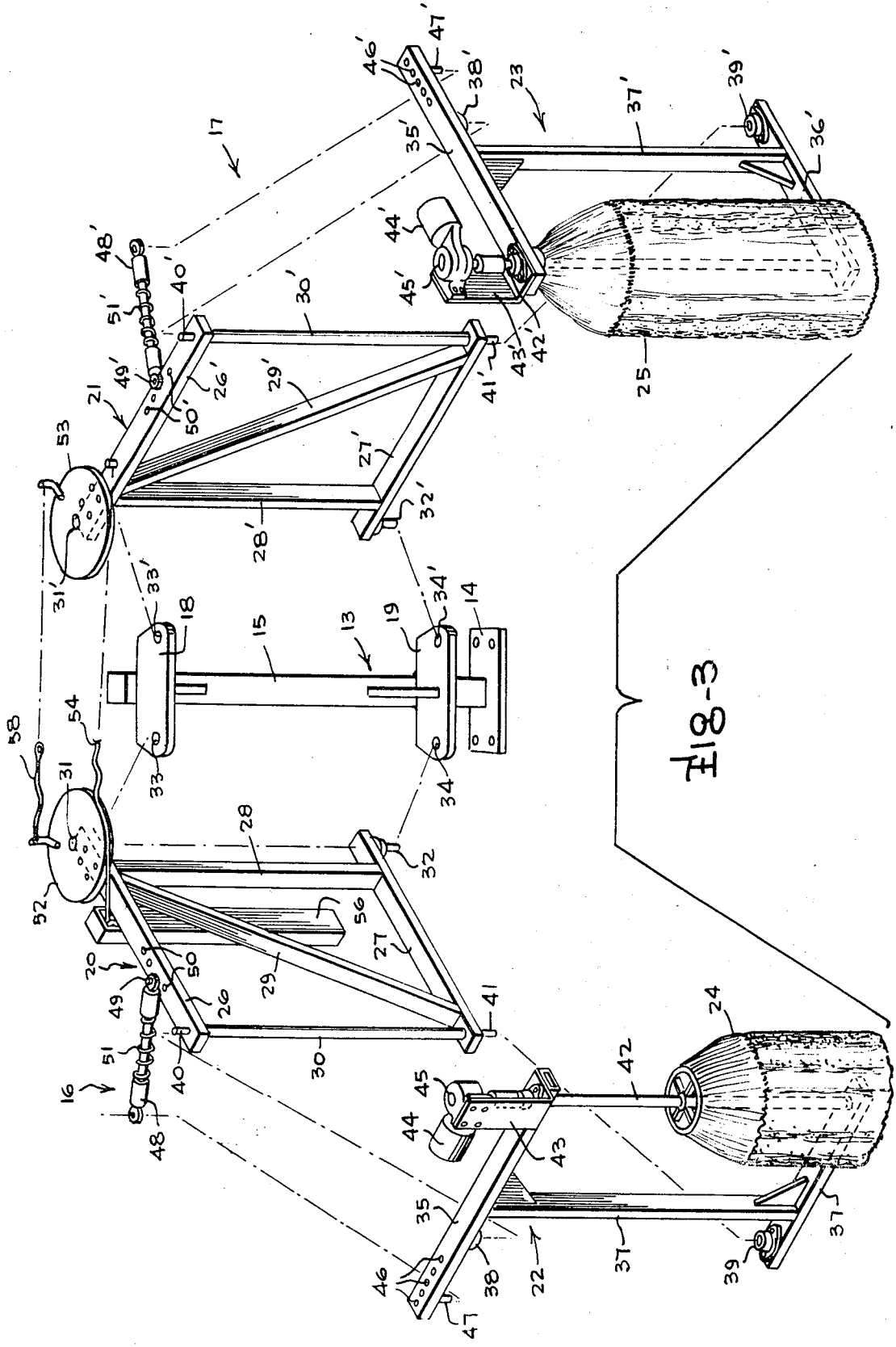


FIG-3

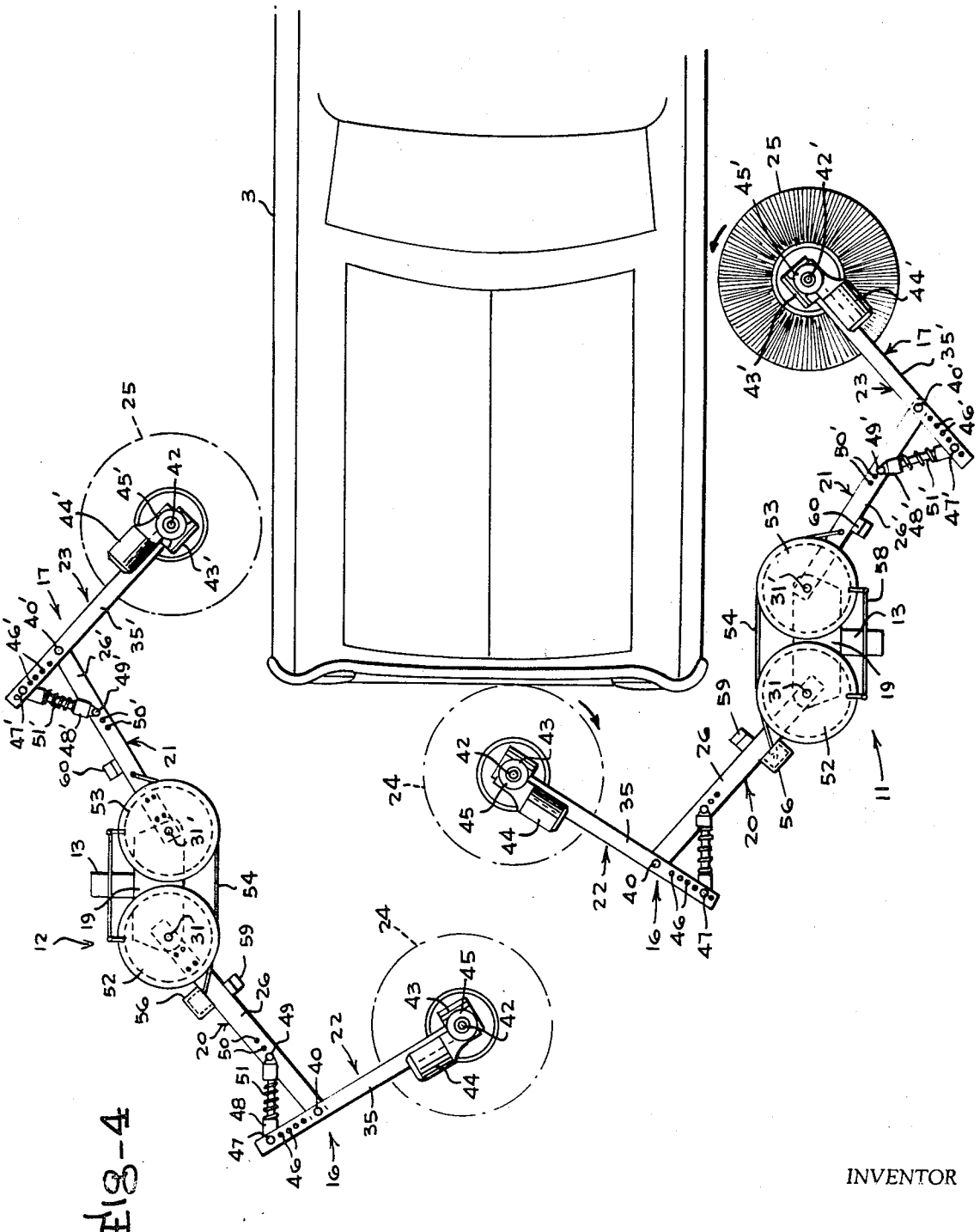


FIG-4

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Fig-5

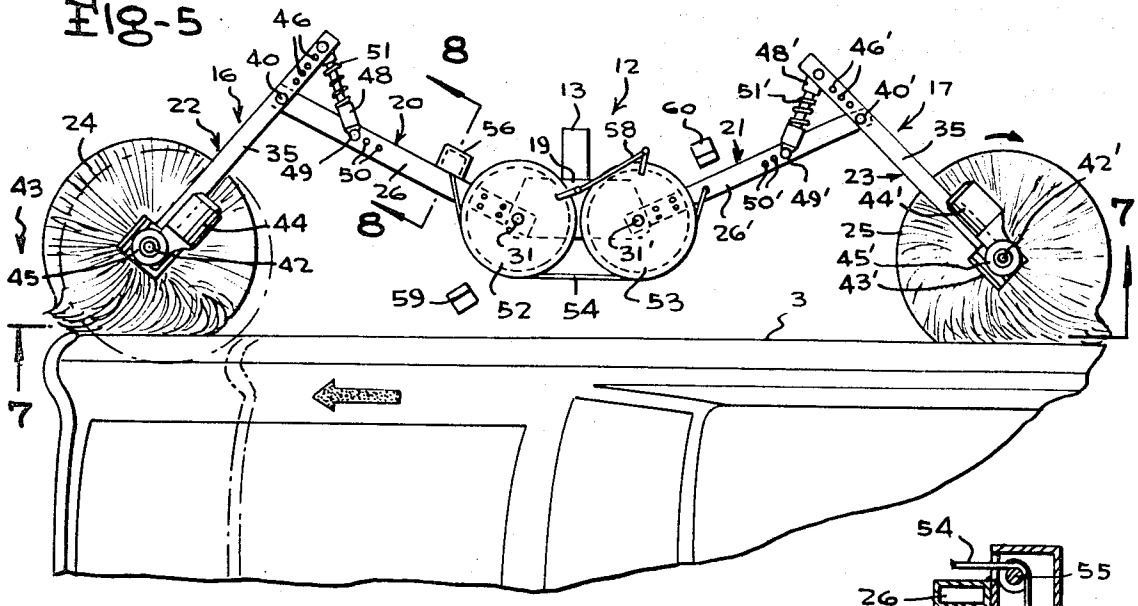


Fig-8

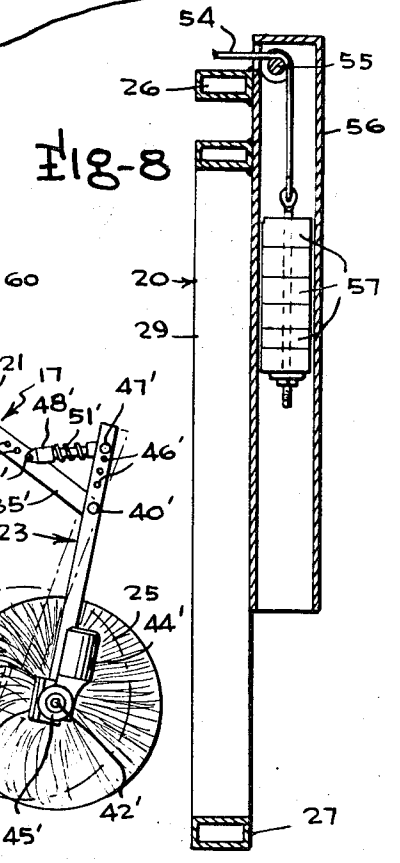
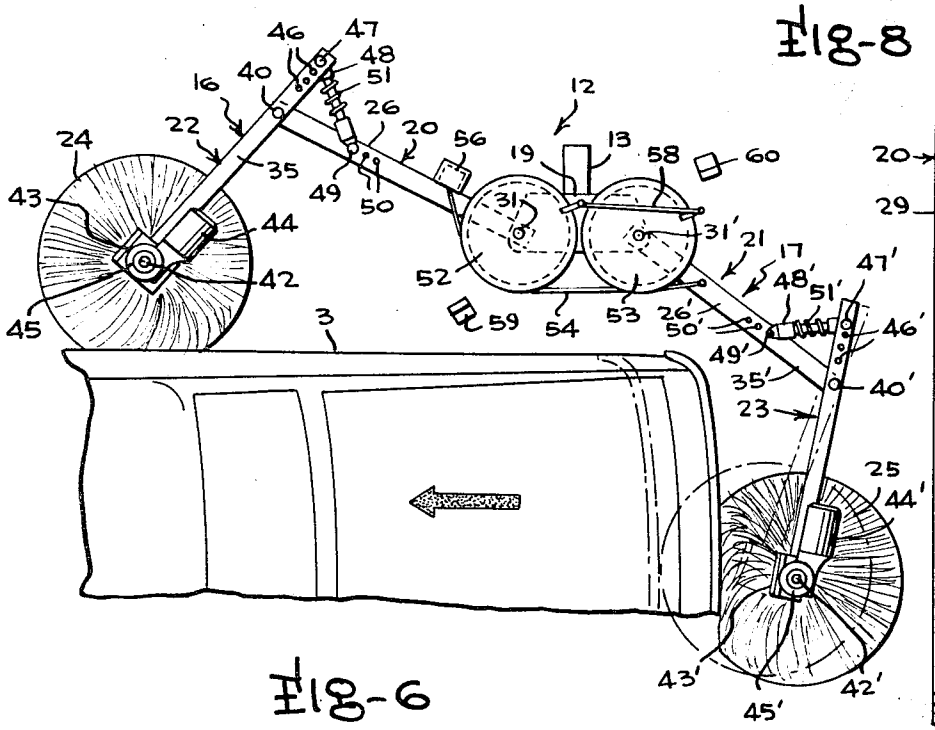


Fig-6



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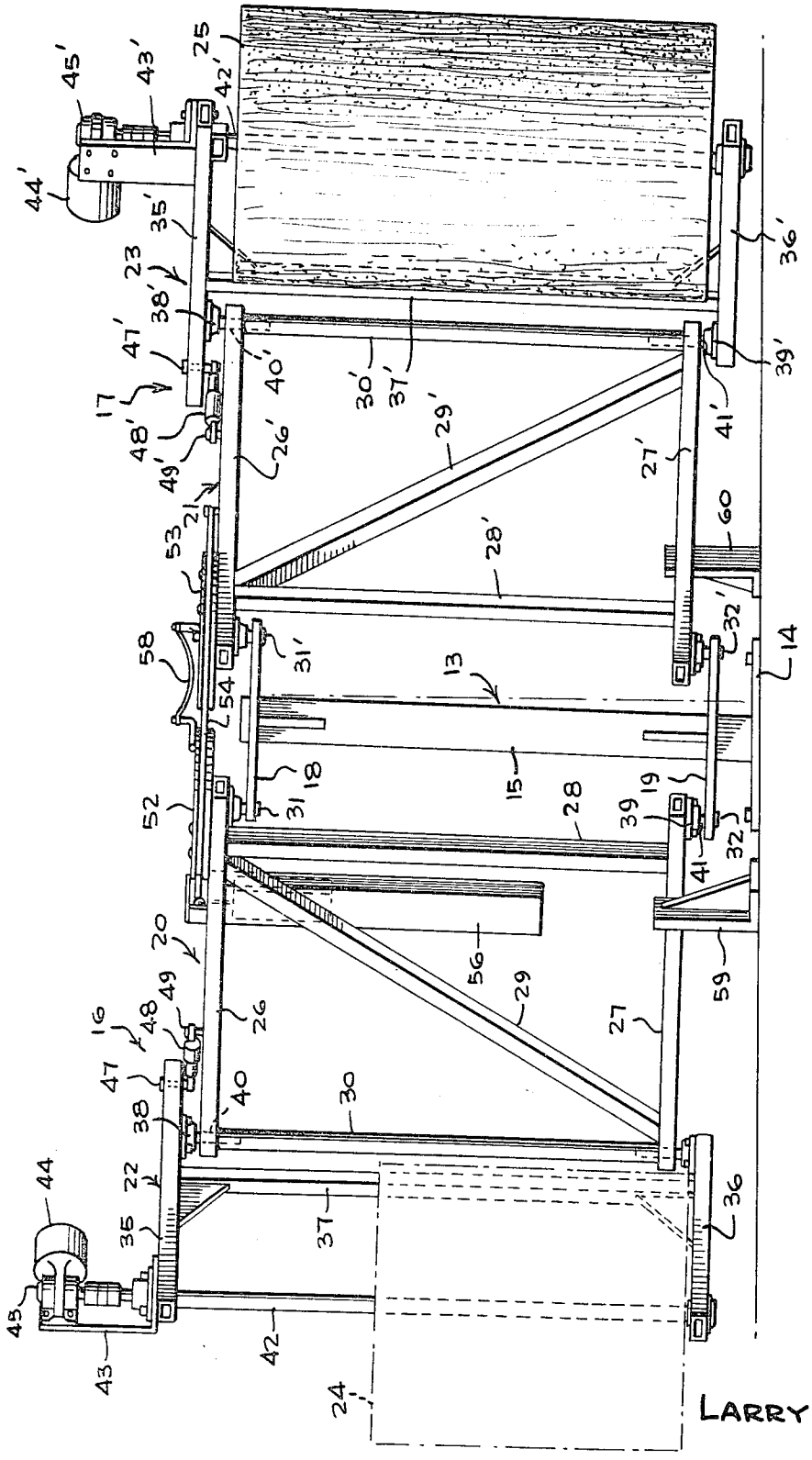


FIG-7

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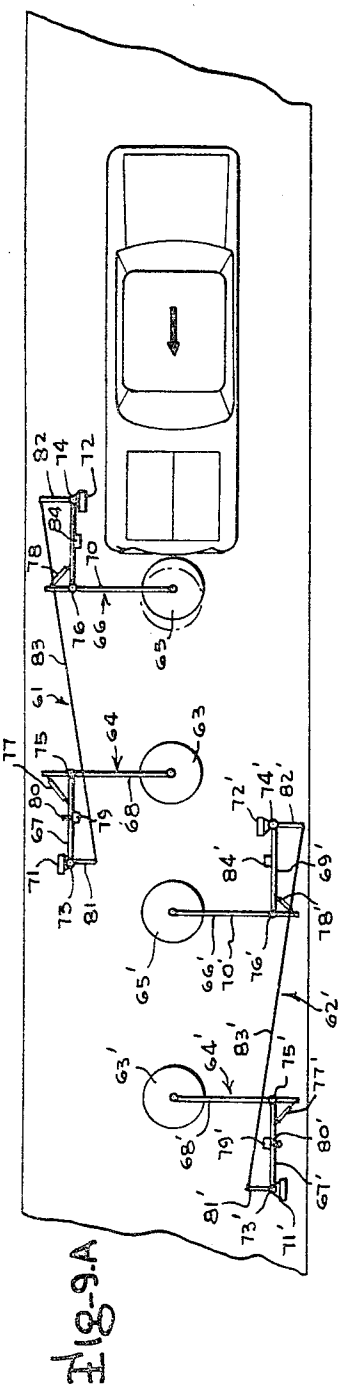


FIG-9-A

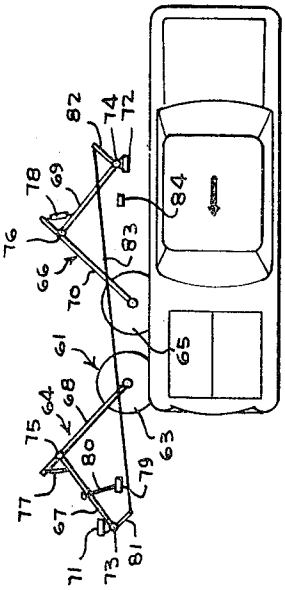


FIG-9-C

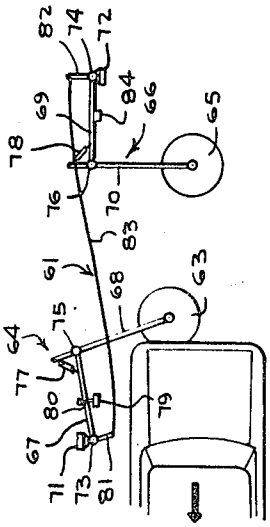


FIG-9-E

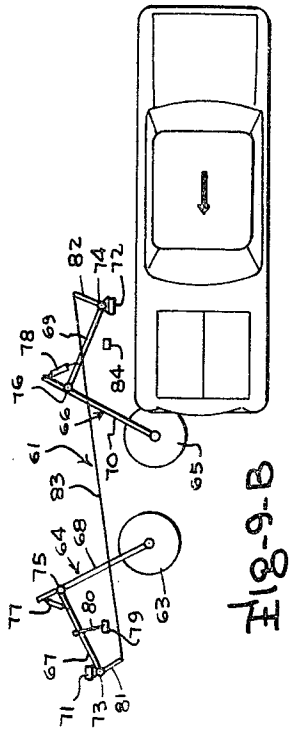


FIG-9-B

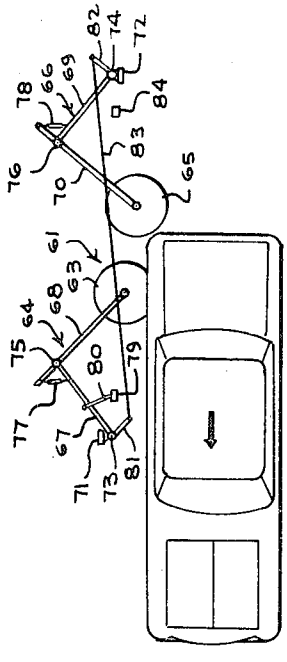


FIG-9-D

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SIDE BRUSH ASSEMBLY FOR CAR WASH APPARATUS

BACKGROUND OF THE INVENTION

This invention relates to automatic car washing apparatus, and particularly to that part of automobile washing apparatus that washes the front, sides, and rear of the car by following the car contour.

Conventional car washing equipment contains a track along which cars to be washed are drawn, usually by means of a chain. Jets spray water and a cleaning agent on the car, and the car then passes under a gravity operated brush, which is pivotally mounted over the track and follows the contour of the car hood, top and trunk. The car then passes between vertical brushes which clean its front, sides and back. Usually, the vertical brushes are pivoted on vertical axes and are yieldably biased toward the car path to cause the brushes to follow the car contour as the car is moved along the track.

It has been suggested that the arms mounting the side brushes be angular, somewhat in the shape of a dog leg, so as to allow further reach of the brushes around the car front. This has accomplished the purpose, but with some car models having reverse curvature across the front, there has been a tendency for the brushes to hang in the reentrant curved portions, or to override these portions without proper washing contact. If the brushes are small enough to enter the recessed areas, hanging occurs. If the brushes are sufficiently large to move freely around the car corners, they will not properly enter the recesses.

SUMMARY OF THE INVENTION

The general object of the present invention is to provide improved car washing apparatus which will insure complete brush contact with the car, without danger of the bushes hanging in recessed areas.

A more specific object of the invention is to provide a brush mounting which will have a dog leg shape, but which will be divided into two pivotally interconnected arms for free movement relative to the car.

A further object is the provision of an improved brush assembly, including a pair of brushes and mounting arms extending in opposed directions from mounting points, with the respective brushes and mounting arms being yieldably biased toward a predetermined at rest, angular relationship, while free to move in one direction to assume other angular relationships, with each brush mounting including two mounting arms yieldingly biased toward a minimum angular relationship, but free to assume greater angular relationships as required.

Another object is to provide an improved assembly wherein the entire assembly is biased to an initial operating position relative to the mounting points, and will move to that position when free, maintaining the mounting arms in their predetermined angular relationship.

Yet another object of the invention is to provide an improved car washing brush assembly as set out above, wherein the biasing means for urging the pairs of brush mounting arms to their predetermined angular relationship is a weight to insure constant biasing force regardless of the arm positions.

A still further object is to provide two such brush assemblies in slightly staggered relation relative to the car path, with the two assemblies being oppositely disposed to cause the brushes of one assembly to wash one-half of the car front, the adjacent side and the similar one-half of the back, while the other assembly washes the remainder of the vertical parts of the car.

Other objects of the invention will become apparent from the following description of practical embodiments thereof, when taken in conjunction with the drawings which accompany, and form part of, this specification.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a somewhat diagrammatic view of car wash apparatus including the improved side brush assemblies of the present invention:

FIGS. **2-A**, **2-B**, **2-C** and **2-D** are further diagrammatic views showing the brush assemblies in various positions as a car being washed is moved along the track;

FIG. **3** is an enlarged, exploded perspective view of one of the side brush assemblies forming the subject matter of the present invention;

FIG. **4** is a top plan view of the assemblies, in the positions shown in FIG. **1**, at the start of a washing cycle;

FIG. **5** is a top plan view of the structure at the position shown in FIG. **2-B**, when both brushes are in contact with a car side;

FIG. **6** is a similar view with the brushes in the position shown in FIG. **2-C**, with one brush at the center of the car back;

FIG. **7** is a side view of the assembly in the position shown in FIG. **5**, as viewed along the line **7—7** of FIG. **5**;

FIG. **8** is a vertical section taken on the line **8—8** of FIG. **5**, illustrating the brush arm biasing weight; and

FIGS. **9-A**, **9-B**, **9-C**, **9-D** and **9-E** illustrates diagrammatically a modified arrangement of the brush assembly in its various positions from at rest through full operation.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings in detail, and first to FIG. **1**, a car wash **1** is shown, which includes a passageway **2** through which a car **3** is drawn along a track **4**, usually by means of a chain, not shown. As the car is drawn along the track from the entrance end, which in FIG. **1** would be the right-hand of the passageway **2**, the car is sprayed from suitable jets, not shown, to wet the car and to apply a suitable cleaning agent. The car then passes under a top brush **5**, which is mounted in a suitable frame **6** so as to be freely movable in a vertical direction. The brush proper **7** is rotatably attached to supporting arms **8**, which, in turn, are pivotally attached at **9** to the frame **6**. The brush structure is suitably counterbalanced by a weight **10**, with the weight being so arranged that the brush **7** will move downward by gravity, but will not drop with any force. This structure is conventional. As the car is drawn beneath the brush, the rotating brush moves over the hood, up the windshield, across the top, down the back window, and across the trunk.

As the car is drawn further along the passageway, it contacts first the side brush assembly **11**, then the oppositely disposed side brush assembly **12**. These two side brush assemblies wash the front, sides and rear of the car. The car is then drawn by its propelling means along the track between suitable spray nozzles, not shown, to rinse the car, and then to exit end of the passageway for removal.

The side brush assemblies **11** and **12** are identical, except that one is positioned reversely with respect to the other, and the two assemblies are arranged in staggered relation along the track, to avoid interference between the brushes of the respective assemblies. It will only be necessary to describe one of the assemblies in detail.

Referring now particularly to FIGS. **3** through **8**, the side brush assembly is mounted upon a vertical post **13**. The post consists of a base **14**, which can be bolted, or otherwise secured, to the floor, and a vertical post member **15** which carries the brush mounting elements **16** and **17**. The post has an upper mounting bracket **18** and a lower mounting bracket **19** to which the brush mounting elements **16** and **17** are actually connected. Each of the brackets is of appreciable length, extending beyond the post on both sides, so as to permit spacing of the mounting element pivots on opposite sides of the post centerline.

Each of the brush mounting elements **16** and **17** is composed of a pair of mounting arms. The inner arms **20** and **21** are directly mounted on the post brackets, and the respective outer arms **22** and **23** are pivotally connected to the outer ends of the inner arms, and carry the washing brushes **24** and **25**.

Inner arm **20** is composed of upper and lower members **26** and **27**, held in spaced relation by a rear frame element **28** and a diagonal brace **29**. A rod **30** separates the upper and lower members at their outer ends. The rear frame element **28** is set inwardly from the ends of the upper and lower members, and the upper and lower members at their extreme rear ends carry downwardly projecting pivot pins **31** and **32**, for seating within the openings **33** and **34** of the respective mounting brackets **18** and **19** of the post. This construction mounts the inner arm **20** for free swinging movement on the post **15**.

Outer arm **22** also has horizontal upper and lower frame members **35** and **36**. In this case, the upper frame member **35** is considerably longer than the lower frame member **36**, and extends an appreciable distance beyond the vertical frame member **37** which holds the members **35** and **36** in spaced relation. Just to the rear of the vertical frame member **37**, the horizontal frame members **35** and **36** carry coaxial sockets **38** and **39**, on their respective opposed faces, to receive pivot pins **40** and **41** on the inner arm upper and lower members **26** and **27**, respectively. Pivot pins **40** and **41** are extensions of the rod **30** located between the upper and lower members of the arm. This arrangement mounts the outer arm **22** for free swinging movement relative to the inner arm **20**.

Brush **24** is rotatably mounted at the free end of arm **22**. The brush is mounted on shaft **42** journaled in the upper and lower frame members **35** and **36** of the outer arm. Frame member **35** carries a bracket **43** which provides a mounting for a brush drive motor **44**. The motor is connected to the shaft **42** through any convenient gear case **45**. It will be noted that brush **24** is relatively short, terminating about midway of the height of the outer arm **22**. This is done to provide a brush which will be capable of engaging the entire front surface of the car and the surface at the sides of the fenders along the hood. Brush **25** of the assembly **17** is a much longer brush, so that it will clean the entire side of the car from the bottom to the roof. By having the brushes of two lengths, the shorter one can clean the front and maneuver around its surface with ease, while the longer one can clean the complete side. The portion of the side below the belt of the car, which usually is the dirtiest portion of the car, will be washed by both brushes.

While it is necessary for the arms **20** and **22** to be freely movable relative to one another to obtain best results without hang-up of the brush in reentrant portions of the car front, it is essential that the two arms have a predetermined, at rest position relative to one another, and that when in this position the two arms will define an angle which is in the minimum angle to be permitted the arms during rest periods and during washing of the car. In order to limit the movement of the arms to the predetermined minimum angular relationship, and, at the same time, allow the arms free pivotal movement to increase this angle, the extended rear portion of the upper frame member **35** of the outer arm **22** is provided with a plurality of openings **46** to selectively receive a mounting pin **47**. One end of a shock absorber unit **48** is connected to the pin **47**, and has its opposite end connected to a pin **49** selectively positioned in one of a plurality of holes **50** in the upper member **26** of the inner arm **20**. The elements of the shock absorber are normally urged to their outer limits of movement by means of a coil spring **51**, which outer limit defines the limit of movement of the outer arm **22** toward the inner arm **20**, and thereby defines the minimum predetermined angular relationship of the two arms. Spring **51** yieldingly urges the arms to this position. However, if a force is exerted against brush **24**, the outer arm **22** is free to swing to increase the angle between the two arms and compress the shock absorbing unit **48**. Spring **51** will return the parts to their initial position when free to do so, but the shock absorber will slow the return movement so as to prevent undue strain and damage to the parts of the apparatus.

In order to save description, yet maintain individual numbering of the parts of the brush mounting element **17**, the parts of the arms **21** and **23** are given the same numbers primed as the corresponding parts of the respective arms **20** and **22**.

For the same reason that is is necessary to have a position of rest of the arms of the respective assemblies relative to one another, it is also necessary that the mounting elements **16** and **17** have an at rest position in which the respective elements assume a predetermined, and in the present form a minimum, angular relationship with respect to one another. This is accomplished by mounting a sheave **52** on the upper member **26** of the inner arm **20** coaxial with the pivot pin **31**, and mounting a similar sheave **53** on the upper member **26'** of the outer arm **21**, coaxial with the pivot pin **31'**. A cable **54** is wrapped partially around the sheave **53** and has its free end fixed to the sheave. The cable spans

the distance between the sheaves 52 and 53, partially encircles sheave 52, passes over a pulley 55 in a weight box 56 attached to the upper member 26 of the inner arm 20, and is connected to weights 57 hanging within the box 56. Weights 57 will tend to pull down the cable 54, causing the inner arms 20 and 21 to move toward one another. In order to limit the movement of the two arms toward one another to the predetermined minimum angle required, a flexible tether 58 is attached to similar points on the sheaves 52 and 53, on the opposite side of the sheaves from cable 54. With this arrangement, the sheaves can rotate under the influence of weights 57 only until the tether becomes fully extended. Forces operating upon the brushes tending to separate the assemblies can move the assemblies freely to increase the angular relationship between them. The weights 57 maintain a constant, uniform pull upon the assemblies, irrespective of their angular relationship, to draw them toward one another until tether 58 limits further movement.

It is also necessary that the entire brush assembly move, in effect, as a unit about the mounting post 13 to bring the entire assembly into a position of rest with its brushes arranged to that the car may move freely past the first brush of the assembly, with the second brush of the assembly prepositioned to contact the car at about its mid-front. Stops 59 and 60, located on the floor of the passageway, are positioned to be contacted by the inner arms 20 and 21 of the respective assemblies when these assemblies move in a counterclockwise direction. The two assemblies are caused to move in this direction, by mounting the post 13 so that its vertical member 15 is inclined, see FIG. 3, which inclines the mounting brackets 18 and 19, and similarly inclines the axes of the pivots mounting the assemblies 16 and 17. By inclining the post in the direction in which the assemblies are desired to swing, gravity automatically moves the assemblies into contact with the stops 59 and 60 when there is no restraining force upon the assemblies.

In the following description of the operation of the washing apparatus, it will be assumed that in FIGS. 1 through 2-D and 4, the side brush assembly 11 is the one to the left of the car as the car travels along its path, and is first contacted by the car front, and the side brush assembly 12 is the one which is staggered with respect to the assembly 11 to contact the car front after the assembly 1 has moved around to the side. Although the two assemblies are reversed, in the drawings and in the following description, the brush 24 of each will be the short brush, which first contacts the car at its mid-front, and the brushes 25 will be the long brushes which first contact the car along the sides.

At the beginning of operation, the mounting elements 16 and 17 of each of the brush assemblies 11 and 12 will be at their at rest positions. At this time, the arms 20 and 22 of the mounting elements 16 and 21 and 23 of the mounting elements 17 will be at their minimum angular relationship as limited by the shock absorbing units 48 and 48'. The weights 57 will have drawn the respective mounting elements 16 and 17 to their minimum angular relationship as limited by the tethers 58. At the same time, the respective units will have swung about their mountings on the post 13 by gravity, so that the arms 20 will be in contact with the stops 59 and the arms 21 will be in contact with the arms 60. This places the brushes 24 of the respective assemblies at approximately the centerline of the car path through the passageway 2, with the brushes in overlapping relation, as shown in FIGS. 1 and 4. At this time, the brushes 25 will be moved outwardly so that the car is free to move between them without contact.

As the car moves forward along the track 4, it will pass freely between the brushes 25, and move into contact with the brush 24 of the assembly 11. This contact will be at the center of the car front. As the car continues to move, it will push the brush 24 forwardly in the direction of car travel, causing the mounting element 16 to move about its pivots 31 and 32. This will tend to slacken the tether 58, but the weights 57 will operate to maintain the tether tight and swing the mounting element 17 in a direction to bring its brush 25 into contact with the car side. Continued progress of the car will cause the mounting element 16 to swing further about its pivot 31, but as the brush 25 is now in contact with the side of the car, it can move no further, and the brushes will begin to spread apart. At the same time, the direction of rotation of brush 25 will cause that brush to tend to walk down the side of the car, and cause a widening of the angle between the arms 21 and 23, compressing the spring 51' on the shock absorbing unit 48'. At this time, the car is pushing against the brush 24, and tending to swing the arm 22 about its pivot 40 with the arm 26, so that the angle between these two arms also is increasing. In the event that brush 24 should tend to hang in the reentrant recess in the car front adjacent the fender, the brush and its arm 22 can swing outward about the pivot 40 permitting the brush to move freely around the car corner. At this time the brushes 24 and 25 are spread quite far apart, and the tether 58 is loose. Both mounting elements have moved away from their stops, and the weights 57 and the springs 51 and 51' are tending to return the parts to their original position. This provides a biasing means to hold the brushes 24 and 25 into firm contact with the car surface at all times. The position of the assembly 11 as the brush 24 completes its traverse of the car front and is about to move onto the car side as shown in FIG. 2-A.

At about the time that the assembly 11 has reached the position shown in FIG. 2-A, brush 24 of the assembly 12 contacts the center of the car front. As this occurs, the brush 25 of the assembly 12 is moved into contact with the car side in precisely the same manner as was described for the assembly 11.

Ultimately, the two assemblies will have their brushes on the car sides, one being in advance of the other. During this time, the longer brushes 25 are cleaning the full side length of the car at the passenger compartment, and the small brushes 24 are giving a second cleaning to the lower portions of the car which are usually more dirty than the upper sections.

As brush 25 of the assembly 11 reaches the rear end of the car, it begins to move around the rear corner onto the back surface, as is shown in FIG. 2-B. As the brush begins to turn the corner, the spring 51' of the shock absorber tends to move the arm 23 inwardly, and the weights 57 tend to rotate the mounting element 17 about its pivot 31'. Actually, there will be little change in the angular relationship between the arms 21 and 23,

for the rotation of the brush will continue to create a walking effect and hold the arm 23 somewhat extended. As the tether 58 is slack, the weights will exert considerable force to maintain the brush 25 in contact with the car rear wall. The forces acting upon the mounting element will hold the brush tight against the rear wall as it moves from the side edge over to the center of the car. At this time, the brush will have moved to its limit, and the mounting element 17 will have moved about its pivot until the tether has again become taut. Thus, no further movement of the mounting element 17 relative to the mounting element 16 can take place so long as the brush 24 remains in contact with the car side. Thus, the mounting element 17 will maintain its minimum angular relationship with the mounting element 16, with the arms 21 and 23 at their minimum angular position until the brush 22 reaches the end of the car side and begins to move across the back. As the car is moving forward, there will be little real brushing contact between the brush 24 and the car rear, for the biasing action of the various forces will be tending to pull the brush away from the car back as the car is moving forward. As soon as there is no further contact between brush 24 and the car, the entire assembly 11 will swing about the pivotal connections with the post, to bring arm 20 into contact with stop 59 and arm 21 into contact with stop 60. At this time, the assembly 11 will be in precisely the same position that it occupied at the beginning of the operation.

As brush 25 of the assembly 11 leaves the car back, brush 25 of the assembly 12 has turned the corner and is moving inwardly toward the middle of the back. The action of the brushes and mounting elements of the assembly 12 will operate in precisely the manner described for the assembly 11 until the brush 24 of assembly 12 loses contact with the car and the assembly 12 returns by gravity to its starting position. At this time, both assemblies will be in their starting position ready for the arrival of another car.

Turning now to that form of the invention shown in FIGS. 9-A through 9-E, a somewhat modified form of the invention is shown. Here, the brush mounting arms extend oppositely from their mounting points toward one another, instead of away from one another as in the form just described. Due to the fact that the physical construction of the brush arms can be that of the first-described form, no detailed illustration of the structure has been made.

As in the first form, there will be two oppositely disposed brush assemblies 61 and 62, with one assembly being on each side of the car path through the wash apparatus, and the assemblies staggered along the path to place one ahead of the other. Each assembly consists of a brush 63, its mounting element 64, and a brush 65 and its mounting element 66. The mounting element 64 is composed of arms 67 and 68, and the mounting element 66 has arms 69 and 70.

The inner arms 67 and 69 are pivotally connected at their ends to mounting posts 71 and 72, similar to the mounting post 13 of the first form. However, each mounting element has its own post in this form, and the posts will be vertical, for there is no need for canting the post as other means are used to bring the brush assemblies to their at rest position. The pivotal connections to the posts are shown at 73 and 74.

The arms making up the brush mounting elements 64 and 66 are pivotally interconnected at 75 and 76, and are biased to predetermined minimum angular relation by means of shock absorber and spring assemblies 77 and 78, as in the first form, connected between extensions of the arms 68 and 70 and the arms 67 and 69. This permits the arms 68 and 70 to move about their pivots 75 and 76, to increase the angle between these arms and the arms 67 and 69, and to be returned to their at rest positions under the influence of the spring.

In this form of the invention only brush 63 and its mounting element 64 are biased toward an at rest position. Movement of brush 65 and its mounting element is governed by movement of brush 63, as will be described. The biasing means for the mounting element 64 consists of a weight vertically movable in a housing 79, the weight being connected by cable 80 to the arm 67 of the mounting element 64. In this form, the housing 79 is mounted on the wash structure floor, or other fixed structure not part of the movable brush assembly. Obviously, the weight tends to draw the arm 67 toward the weight housing, and this housing may form the at rest stop for the arm 67.

Arms 67 and 69 have extensions 81 and 82, respectively, projecting from the arms at substantially right angles adjacent the pivots 73 and 74. The extensions project in opposite directions from the arms 67 and 69, with extension 81 projecting from arm 67 in the same direction as arm 68 and extension 82 projecting from arm 69 in the opposite direction from arm 70. By connecting the outer ends of extensions 81 and 82 by a flexible tether 83, movement of brush 63 can be controlled in part by movement of brush 65 about the car contour, and movement of brush 65 can e controlled in part by movement of brush 63 under the influence of its biasing weight. The weight housing 70 can serve as a limit stop to determine the at rest position of brush 63 and its mounting means, and a stop 84 prevents the brush 65 and its mounting means from moving beyond a predetermined at rest position.

As with the previously described form, the same reference numerals with a prime added have been used to designate the parts of the brush assembly 62 as were used in connection with brush assembly 61.

In operation, the four brushes 63, 65, 63' and 65' will be in substantial alignment at or about the centerline of the car path of the wash apparatus, with the mounting elements of the several brushes being against their respective stops, and the arms of each unit at their minimum angular relationship, as determined by their respective shock absorber assemblies. As the brush assembly 61 is first contacted by the advancing car, and the action of the brush assembly 62 follows sequentially the action of the assembly 61, only the movement of the elements of the assembly 61 will be described in detail.

As the car approaches along the car path, the mid-center of the car front first contacts the brush 65. This causes the entire brush unit 66 to swing about its pivotal mounting 74 on post 72, and to continue this movement as the car moves, causing brush 65 to traverse the car front. Arm 70 may swing outwardly about its pivot 76, against the bias of the spring in the shock absorber assembly 78 depending upon the contour of the car front and the necessity of further move-

ment of the brush in the direction of car travel to clear the forward corner of the car. As the brush unit **66** moves in a clockwise direction about its pivot **74**, the extension **82** of mounting arm **69** also moves in a clockwise direction pulling tether **83** to the right, as viewed in the drawings, to swing arm extension **81** of brush unit **64** in a counterclockwise direction and cause counterclockwise movement of brush unit **64** about its pivot **73**. The resulting movement of brush **63** will equal the movement of brush **65**, so that by the time brush **65** has cleared the front corner of the car, brush **63** will have moved laterally of the car path to a position which is free of the car front but will bring the brush into contact with the car side as the car moves along the path. FIG. **9**-B shows the brush **65** about to clear the car front corner, and FIG. **9**-C shows both brushes in contact with the car side. The direction of brush rotation may be such that brush **65** is retarded slightly to expand the angle between arms **69** and **70**, against the shock absorber spring bias, and the brush tends to walk along the car side widening the angle between its arms **67** and **68**. At all times the weight in housing **79** tends to draw unit **64** back to its original position and holds the brush **63** in firm contact with the car side. Tether **83** serves to impose the same biasing pressure on the brush unit **86**.

When brush **65** moves off of the rear end of the car side (see FIG. **9**-D) it may move slightly inwardly to relieve the pull upon tether **83**, but there is not force to pull brush **63** inwardly along the back of the car, and the brush unit **64** simply floats in an inoperative position as brush **63** continues to advance along the car side. Of course, arms **69** and **70** immediately resume their minimum angular relationship under the influence of the shock absorber assembly **78**.

As brush **63** reaches the rear corner of the car, the biasing weight causes it to remain in contact with the car surface and move inwardly across the car back as the car continues its forward motion. The inward movement of brush **63** causes its mounting element to swing in a clockwise direction, and the extension **81** to move in a similar direction. This exerts a pull on tether **83** and initiates movement of the unit **66** toward its at rest position. This movement continues until such time as the brush **63** reaches the center of the car back, at which time, the two brush units have fully returned to their original positions with arm **67** in contact with the weight housing **79** and arm **69** in contact with stop **84**. During the final movement of brush **63** on the car back, the arms **67** and **68** will return to their original angular relationship, motivated by the shock absorber assembly **77**. Thus, the two brush units automatically to the positions they occupied at the outset, ready for the next car moving along the car path.

While the two brushes **63** and **65** are in washing contact with the car side, the car will move into contact with brush **65'** of the assembly **62** and a similar washing operation will be performed on the opposite side of the car by the brushes of this assembly.

In all operations, brush **65** washes one-half of the car front and the adjacent side. Brush **63** washes the same side of the car and the adjacent one-half of the car back. Brush **65'** washes the remaining one-half of the car front and the other side, while brush **63'** washes the second side of the car and the remaining portion of the car back. This is a slightly different washing sequence from that followed by the brushes of the first described form, although in each form, each brush traverses the car side and one-half of either the front or back.

By use of a side brush assembly wherein the brush carrying structure is pivotally mounted and includes two arms pivotally interconnected for yielding movement in a direction to increase an at rest predetermined minimum angular relationship, the brush has a freedom of movement not otherwise possible. The arrangement permits the brush support to yield if the brush meets an obstruction, so as to free itself and not damage the car being washed, and it insures a true following of the car's surface throughout the path of travel of the brush about the car.

While in the above practical embodiments of the invention have been disclosed, it is to be understood that the specific details of construction described and shown are merely by way of illustration, and the invention may take other forms within the scope of the appended claims.

I claim:

1. A side brush assembly for an automatic car wash apparatus of the type in which a car is moved along a car path of movement through a washing station, said side brush assembly comprising a fixed mounting means to one side of and adjacent the car path of movement, first and second brush mounting elements pivotally connected to the fixed mounting means to one side of and adjacent the car path of movement, each of said brush mounting elements including an inner arm and an outer arm, pivotal means connecting the outer end of the inner arm to the inner end of the outer arm, each inner arm being pivotally connected to the fixed mounting means at its end opposite the end pivotally connected to the outer arm at a location on one side of the car path of movement, a brush rotatably supported at the end of each outer arm opposite the pivotal connection of the outer arm to the inner arm, means for yieldingly biassing the inner arms toward a predetermined angular relationship and a predetermined at rest position with respect to each other, and means to yieldingly bias the outer arm and inner arm of each respective brush mounting element toward a predetermined minimum angular relationship with respect to each other.

2. Side brush assembly for automatic car wash apparatus as claimed in claim **1** wherein, the means to yieldingly bias the outer arm and inner arm of each mounting element with respect to each other includes extensible means interconnecting the outer arm and inner arm adjacent their pivotal interconnection, said extensible means having a limit of movement in one direction to define the predetermined minimum angular relationship between the inner and outer arms, and a yieldable force exerting element between the inner and outer arms positioned to yieldably urge the extensible means toward the said limit of movement.

3. Side brush assembly for automatic car wash apparatus as claimed in claim **2** wherein, the extensible means is a shock absorber, and the yieldable force exerting element is a spring.

4. Side brush assembly for automatic car wash apparatus as claimed in claim **3** wherein, the means to bias the inner arms toward a predetermined angular

relationship includes a weight and means interconnecting the weight and at least one inner arm.

5. Side brush assembly for automatic car wash apparatus as claimed in claim 4 wherein, there are fixed stops in the path of swinging movement of the inner arms to limit the extent of swinging movement and define the at rest position.

6. Side brush assembly for automatic car wash apparatus as claimed in claim 5 wherein, there are means carried by the outer arms on which the brushes are supported to drive the brushes.

7. Side brush assembly for automatic car wash apparatus as claimed in claim 3 wherein, the fixed mounting means is a mounting post and the means to yieldably bias the inner arms toward a predetermined angular relationship includes a weight and means interconnecting the weight and the inner arms so as to cause the inner arms to swing about their pivotal connections with the mounting post toward one another.

8. Side brush assembly for automatic car wash apparatus as claimed in claim 3 wherein, the fixed mounting means includes two posts spaced apart along the car wash apparatus, and the mounting elements extend from the posts toward one another.

9. Side brush assembly for automatic car wash apparatus as claimed in claim 8 wherein, the means to bias the mounting elements of the pair toward a predetermined angular relationship includes a weight mounted for free vertical movement, a cable connected to the weight and to one of the mounting elements to urge the mounting element toward the at rest position, and a flexible tether interconnecting the pair of mounting elements to cause similar movement of one mounting element upon movement of the other.

10. Side brush assembly for automatic car wash apparatus as claimed in claim 9 wherein, each mounting arm pivotally connected to a mounting post has an extension projecting from the arm adjacent the pivotal connection to the post with the extensions projecting from the respective arms in opposite directions, and the tether being connected to the extensions.

11. Side brush assembly for automatic car wash apparatus as claimed in claim 10 wherein, there are stops to limit the swinging movement of the mounting elements about their pivotal connections to the mounting posts to determine the at rest positions of the brushes.

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