H. E. FLACK & J. LECHICH.

WASHING APPARATUS.

APPLICATION FILED JAN. 15, 1913.

1,097,410.

Patented May 19, 1914.

2 SHEETS—SHEET 1.

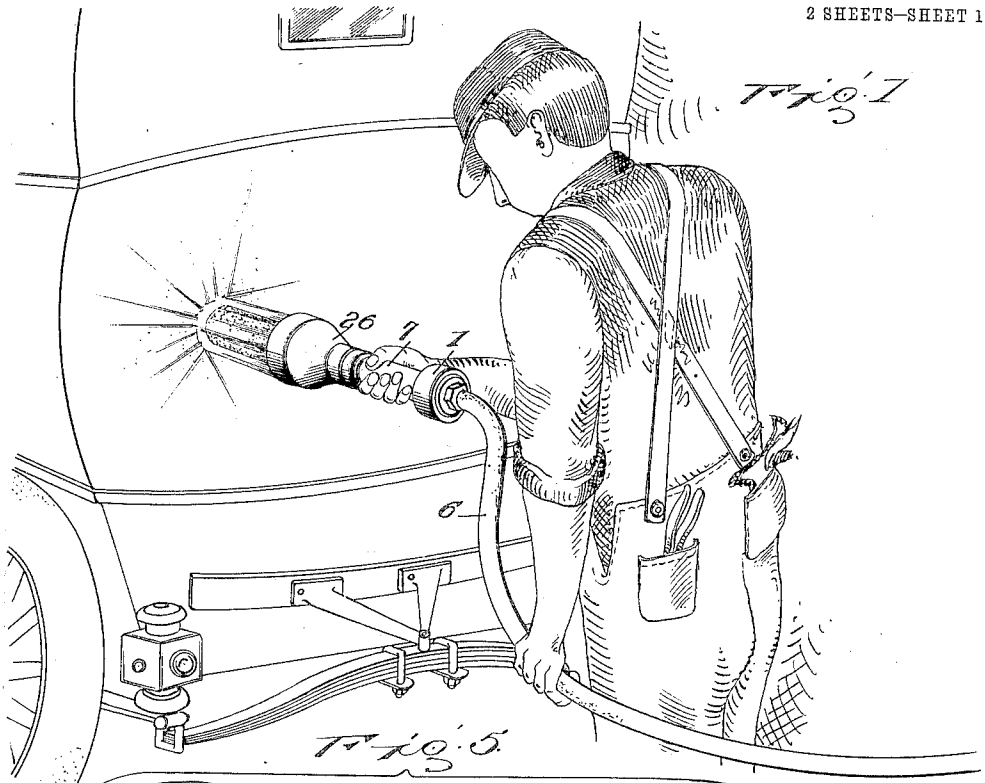


Fig. 5

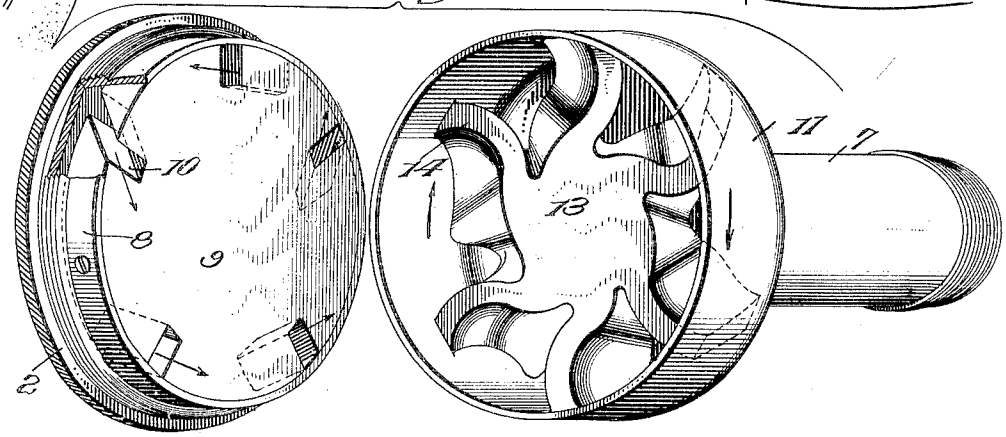
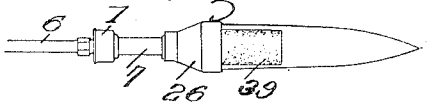


Fig. 6



Witnesses

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2 SHEETS—SHEET 2.

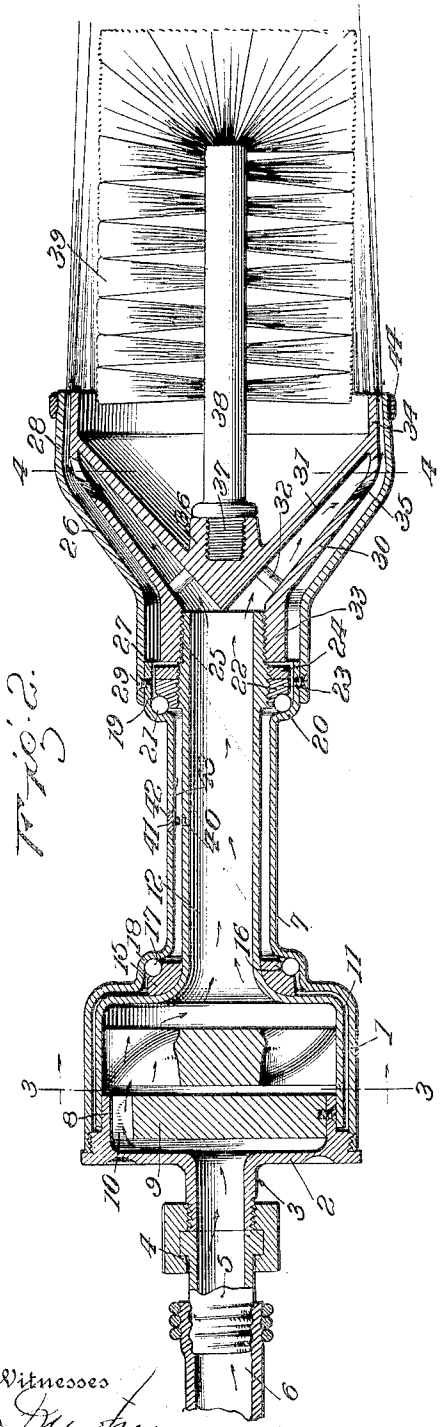


Fig. 2.

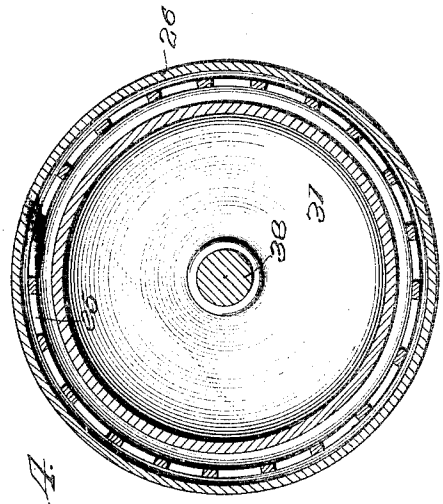


Fig. 4.

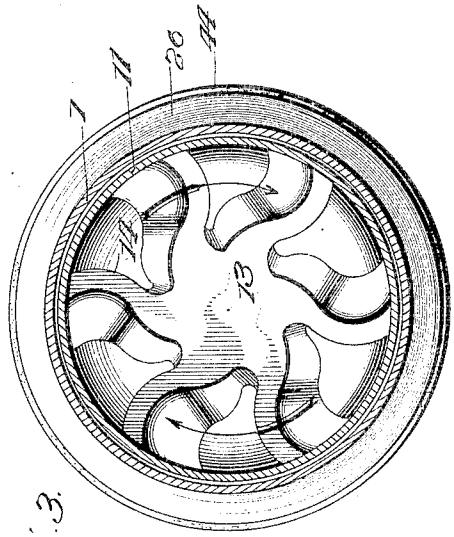


Fig. 3.

Witnesses

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WASHING APPARATUS.

1,097,410. Specification of Letters Patent. Patented May 19, 1914.

Application filed January 15, 1913. Serial No. 742,233.

To all whom it may concern:

Be it known that we, HENRY E. FLACK and JOHN LECHICH, citizens of the United States, residing at Potsdam, in the county of St. Lawrence and State of New York, have invented certain new and useful Improvements in Washing Apparatus, of which the following is a specification.

This invention relates to apparatus for use in washing automobiles, carriages, and the like, and has as its object to provide apparatus for this purpose which may be conveniently employed and which will apply water to the surface to be cleaned and will scrub the surface without the likelihood of dirty water being splashed over the one using the apparatus or over parts of the vehicle which it is not desirable to wet.

Another object of the invention is to provide, in apparatus for the purpose mentioned, including a rotary brush, means for rotating the brush actuated by the water supplied to the surface to be cleaned, the water being discharged in a film which surrounds the brush.

We are aware of the fact that it is old to provide, in washing apparatus, a rotary brush driven by water power and supplied with water which has passed through a motor for driving the brush. However, as far as we are aware, in all such constructions, the water is discharged directly onto the brush and the brush, in rotating will throw off the water in all directions due to centrifugal force. Such apparatus, however, is by no means adapted for use in washing automobiles and other vehicle bodies, for the water thrown off by the brush will, unless the brush is used with extreme care, be liable to wet parts of the vehicle body which it is not desired to wash, and will furthermore, wet surrounding objects and very probably the user of the apparatus. A sheet metal or similar guard partly surrounding the brush cannot be employed with success for the reason that it is liable to come in contact with the vehicle body and scrape or otherwise mar the finish thereof. Consequently, the present invention aims to provide in such apparatus, means for supplying water to the brush in such manner that the brush in its rotative movement will not be liable to throw off the water so as to wet surrounding objects or parts of the vehicle body other than those to the surface of which the brush is applied.

In accomplishing the above mentioned aim of the invention, we propose to discharge the water from the apparatus, after it has passed through the motor for actuating the brush, in a film which surrounds the brush and is spaced therefrom, the water being discharged with sufficient force to render the film strong enough to resist penetration by any water which may be discharged from the brush by centrifugal force.

A further aim of the invention is to provide means for imparting vortical movement to the water as it is discharged in a film in order that the film will close beyond the end of the brush.

For a full understanding of the invention reference is to be had to the following description and accompanying drawing, in which:—

Figure 1 is a perspective view illustrating the apparatus in use. Fig. 2 is a vertical longitudinal sectional view in detail through the apparatus. Fig. 3 is a vertical transverse sectional view on the line 3—3 of Fig. 2. Fig. 4 is a similar view on the line 4—4 of Fig. 2. Fig. 5 is a perspective view of the motor with certain of the parts disassembled. Fig. 6 is a diagrammatic view illustrating the manner in which the water is discharged to form a film surrounding the brush of the apparatus.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

Briefly stated, the apparatus consists of a water motor, the rotor of which is provided with a tubular shaft which carries for rotation a combined nozzle and brush support, the said shaft serving as a means for conveying water to the nozzle as it is exhausted from the motor.

The motor above mentioned includes a substantially cylindrical casing 1 into one end of which is threaded a head 2 having an intake pipe 3 extending therefrom. The pipe 3 is connected by a union 4 to a nipple 5 to which an ordinary hose 6 may be attached. At its other end, the casing 1 of the motor is provided with a tubular extension 7 which constitutes a hand-grip, as will be presently explained. The casing head 2 is provided with an annular flange 8 in which is removably fitted a disk 9 having obliquely extending ports 10 formed in its edges. The ports 10 are located at suitable

intervals, as clearly shown in Fig. 5 and all are inclined in the same direction. The rotor of the motor includes a cylindrical body 11 having a tubular shaft 12 extending from one end thereof. The shell 11 has fixed within it the rotor proper, which includes a hub 13 having vanes 14 extending therefrom to the wall of the shell 11. By referring to Figs. 3 and 5 of the drawing, it will be seen that the vanes 14 are substantially of ogee form and are disposed obliquely, thereby forming between them spiral passages. In assembling the rotor in the casing 1, the tubular shaft 12 is inserted into the tubular extension 7 of the motor casing 1 and the shell 11 of the wall is rotatably received within the said casing. The head 2 of the casing is then fitted into place and when properly assembled has its flange 8 fitting within the major end of the shell 11 and slightly spaced from the vanes 14. It will now be apparent that water supplied to the motor through the pipe 3 will issue through the ports 10 and strike the concave faces of the vanes 14 thereby imparting rotary movement to the rotor and its shaft 12. The exhaust water will flow through the said shaft 12, as will be apparent. In order that the rotor may rotate freely, a bearing ring 15 is fitted upon the shaft 12 at its juncture with the wall of the shell 11 and is provided with a ball-race 16 in which are arranged bearing balls 17. These balls are also received in a ball-race 18 which is formed by stamping out the tubular member 7 at its juncture with the motor casing 1.

As before stated, the pipe 12 is intended to supply water to a nozzle one member of which it supports and the construction and arrangement of the nozzle will now be described.

At its outer end the tubular extension 7 of the motor casing is increased in diameter, as indicated at 19 and provided with a ball-race 20 in which are arranged bearing balls 21. The shaft 12 is exteriorly threaded as at 22 near its outer end and fitted upon its said portion is a bearing cone 23 co-acting with the bearing balls 21. This cone is held in place by means of a lock-collar 24 also threaded upon the shaft. Beyond its threaded portion 22, the shaft is exteriorly threaded as at 25 to receive the rotatable member of the nozzle. The fixed member or casing of the nozzle is in the nature of a substantially frusto-conical body or shell 26 provided at its minor end with a cylindrical extension 27 and at its major end being tapered as at 28, for a purpose to be presently pointed out. The extension 27 is fitted upon the portion 19 of the tubular hand-grip 7 and is held in place thereon by means of screws 29. It will be observed that the outer end of the tubular shaft 12 is surrounded by the wall of the extension 27 and that this shaft does not project into the shell 26.

The rotatable member of the nozzle consists of a substantially frusto-conical body having an outer wall 30 and an inner wall 31, the said walls being spaced and being braced in their spaced relation by means of relatively small posts 32 which extend between the said walls. The inner wall 31 is conical and its minor end is co-incident with the axis of the shaft 12, as will be apparent from inspection of Fig. 2. The wall 30 at its minor end is provided with a substantially cylindrical extension 33 which is interiorly threaded and fitted onto the threaded portion 25 of the said shaft. At its major end the wall 30 is slightly tapered as at 34 and it will be observed that the said wall is spaced from the nozzle casing 26 and that the space between the portions 28 and 34 of the said casing and wall 30, respectively, is annular and relatively narrow so that the water discharged from the nozzle will issue in a film. As will be observed from inspection of Fig. 2, the wall 31 at its major end joins the wall 30 at the portion 34 thereof and the said wall 30 immediately inwardly of its portion 34 is formed with a number of ports 35 through which water may issue from the space between the walls 30 and 31. The conical wall 31 is formed in its concavity and at its minor end with a threaded socket 36 into which is removably fitted the threaded end 37 of a brush spindle 38. The brush carried by the spindle is indicated at 39 and may be of any well-known or preferred form. The brush 39 however, is of a diameter less than the diameter of the portion 34 of the wall 30 and while the one here shown is relatively short, it will be understood that a longer brush may be, and in fact will be, employed, where for example, it is desired to wash the spokes of the vehicle wheels, or to clean other portions of the vehicle which cannot be conveniently reached by the brush 39.

From the foregoing description of the invention it will be understood that in the use of the apparatus, water is supplied thereto through the hose 6, and acting upon the motor to actuate the same, is conveyed through the tubular shaft 12 to the space between the walls 30 and 31 of the rotatable member of the nozzle. The water will be discharged from the space through ports 35 and will finally issue from the annular space between the portions 28 and 34, in a thin film.

It will be apparent that inasmuch as the rotatable member of the nozzle is rapidly rotated by the shaft 12, vortical movement will be imparted to the water as it issues from the nozzle. Due to the vortical motion given the water the film will tend to close beyond the end of the brush, in a manner clearly shown in the diagrammatic view of

the drawings, and consequently the brush will be surrounded and completely inclosed by the film. It will be apparent at this point that the water issuing from the nozzle is not discharged directly upon the brush. Of course, the film thus formed is destroyed in part when the brush is disposed against the surface to be cleaned but it will be apparent that water thrown off by the brush will not be discharged with such force as to penetrate the intact portion of the film and consequently the user of the brush will not be inconvenienced by water being splashed upon him, nor will water be thrown onto portions of the vehicle which it is not desired to wet.

In order that the shaft 12 may be held against rotation while the rotatable member of the nozzle is being threaded onto the end thereof, the shaft is formed in its outer side with a socket 40 designed to receive a stud 41 upon a head 42 which is carried by a leaf-spring 43 secured within the tubular handle 7. The handle is formed with an opening receiving the said head 42, in the manner shown in Fig. 2, and it will be apparent that under normal conditions the head 12 will be so held by the spring that the stud will be out of engagement in the socket, the head being pressed inwardly when it is desired to apply or remove the said member of the nozzle.

In order to provide against injury to the finish of the vehicle body, should the nozzle of the apparatus come in contact therewith, a buffer band 44 of rubber, or like material is applied to the fixed member or casing of the nozzle adjacent to the discharge end thereof.

Having thus described the invention what is claimed as new is:—

1. In washing apparatus, a cleaning member, and a nozzle having a discharge surrounding the member and arranged to discharge water in a film surrounding but out of contact with the member.

2. In washing apparatus, a fluid motor having a hollow shaft arranged to convey the exhaust from the motor, a cleaning member supported by and rotatable with the shaft, and a nozzle supplied by the exhaust from the shaft and having a discharge surrounding the said cleaning member.

3. In washing apparatus, a fluid motor having a hollow shaft arranged to convey the exhaust from the motor, a nozzle supplied by the exhaust from the shaft and including a rotary member carried by the shaft, and a brush carried by the said shaft and rotated in advance of the discharge from the nozzle.

4. In washing apparatus, a fluid motor having a hollow shaft arranged to convey the exhaust from the motor, a nozzle supplied by the exhaust from the shaft and including a rotary member carried by the shaft, and a brush carried by the said shaft and rotated in advance of the discharge from the nozzle, the discharge from the nozzle being arranged to discharge water in a film surrounding the said cleaning member.

5. In washing apparatus, a fluid motor including a hollow rotatable element constituting the exhaust from the motor, a nozzle supplied with exhaust from the said member, the nozzle including a rotatable member operating to impart vortical motion to the fluid discharge therefrom, and a cleaning member driven from the motor and located in advance of the discharge from the nozzle.

6. In washing apparatus, a fluid motor including a hollow rotatable element constituting the exhaust from the motor, a nozzle supplied with exhaust from the said member, the nozzle including a rotatable member operating to impart vortical motion to the fluid discharged therefrom, and a cleaning member driven from the motor located in advance of the discharge from the nozzle, the said nozzle being arranged to discharge the fluid in a film surrounding but out of contact with the cleaning member.

7. In washing apparatus, a fluid motor having a hollow shaft constituting an exhaust, a nozzle supplied by the said shaft, the nozzle comprising a casing, and a member rotatable within the casing and carried by the said shaft and having discharge ports located inwardly of the nozzle from the nozzle, the nozzle being arranged to discharge water in a closed film, and a cleaning member carried by the rotatable member of the nozzle and arranged to be surrounded by the said film.

In testimony whereof we affix our signatures in presence of two witnesses.

HENRY E. FLACK.
JOHN LECHICH.

Witnesses:
ANN BARHELLER FLACK,
JOHN A. MAY.