Dec. 17, 1963 A. B. RIORDAN 3,114,164

ROTARY FOUNTAIN BRUSH

Filed April 30, 1962 2 Sheets-Sheet 1

Fig. 1.

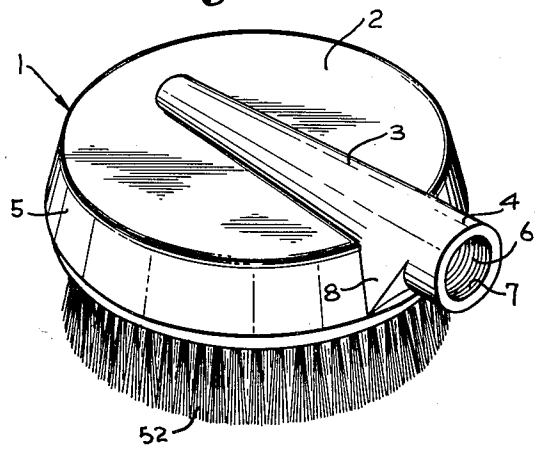


Fig. 2.

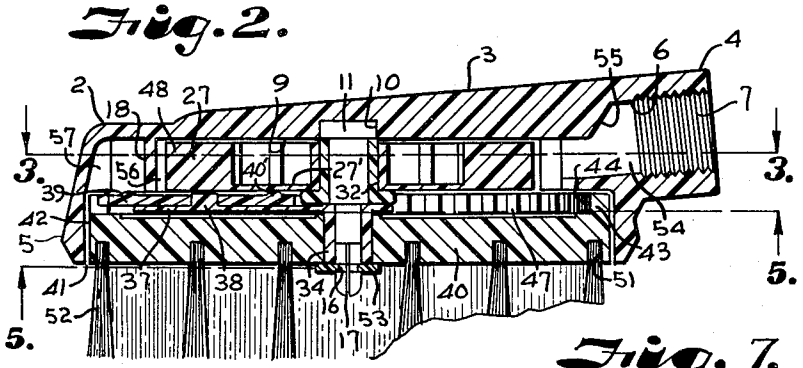


Fig. 6.

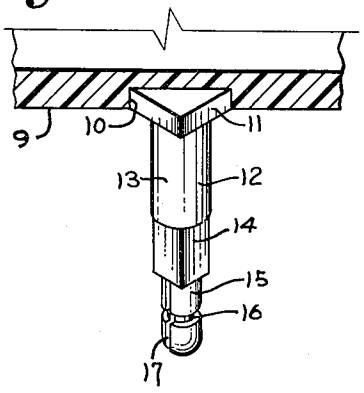
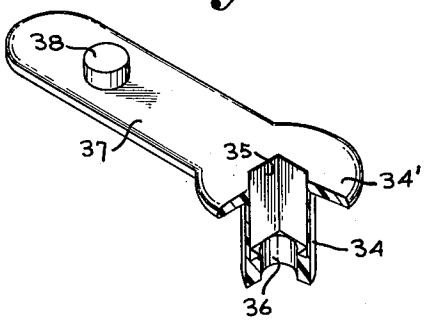


Fig. 7.



INVENTOR.
ARTHUR B. RIORDAN
BY
Fishburn & Gold
ATTORNEYS

Dec. 17, 1963 A. B. RIORDAN 3,114,164

ROTARY FOUNTAIN BRUSH

Filed April 30, 1962 2 Sheets-Sheet 2

Fig. 3.

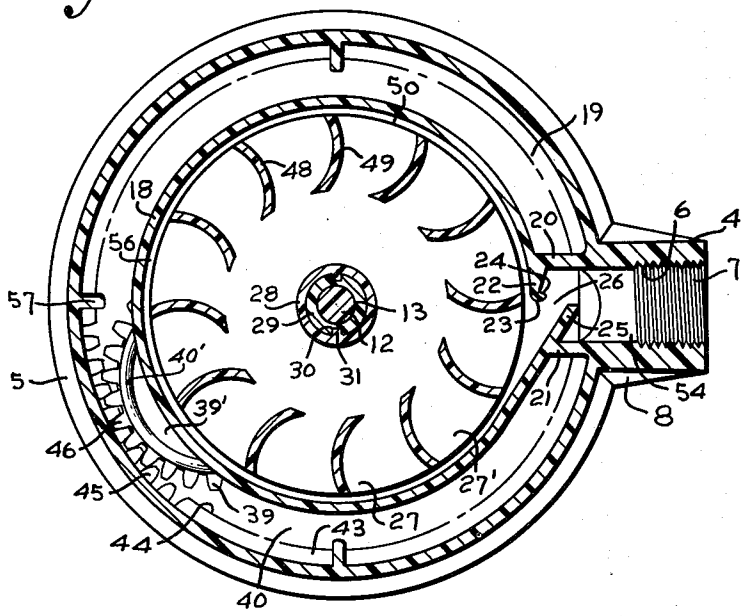


Fig. 4.

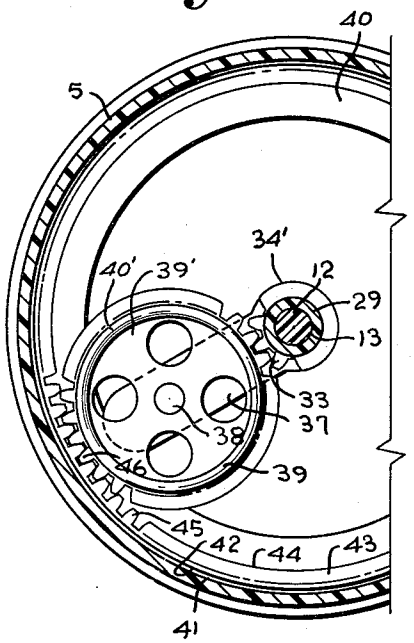
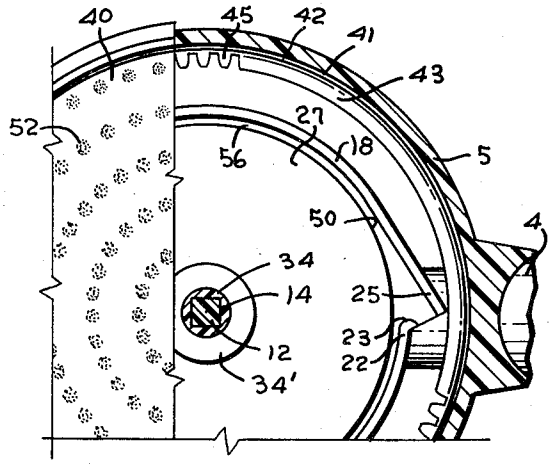


Fig. 5.



INVENTOR.
ARTHUR B. RIORDAN
BY
Fishburn & Gold
ATTORNEYS

United States Patent Office 3,114,164 Patented Dec. 17, 1963

3,114,164

ROTARY FOUNTAIN BRUSH

Arthur B. Riordan, Prairie Village, Kans., assignor to Auto Craft Products, Inc., Kansas City, Mo., a corporation of Kansas

Filed Apr. 30, 1962, Ser. No. 190,959
7 Claims. (Cl. 15—29)

This invention relates to a fountain brush and more particularly to a brush adapted for use in washing vehicles such as automobiles.

Still more particularly, this invention relates to a brush which is adaptable to be attached to a garden hose or the like for applying water to the head thereof for washing such vehicles.

The principal object of the present invention is to provide a fountain brush having novel means for rotating a bristle-carrying plate.

Other objects of the present invention are to provide a fountain brush head including a housing for the fountain brush having an inlet passage and connecting means for connection to a garden hose, to provide a skirt depending from the top of the head and having a stationary post or shaft in substantially the center thereof extending in the same general direction as said skirt; to provide an impeller having a plurality of curved baffles rotatable on said post by the force of the water entering the inlet of the head; to provide a gear on said shaft having teeth meshing with teeth on an idler gear carried by an arm extending from a sleeve mounted on said shaft; to provide a plate or rotating member provided with a plurality of bristle members embedded in sockets in said plate; to provide the rotating plate with a flange extending toward said impeller and the inside face of which is provided with teeth meshing with the teeth on the idler gear for rotating the plate; to provide means for locking the plate, arm member, and impeller on the shaft whereby when water enters through the water inlet, it will impinge against the blades on the impeller rotating the same in one direction, thus rotating the gear thereon and the idler gear in turn rotating the bristle-carrying plate in the other direction; to provide said head with a flange depending in the same direction as the skirt and spaced from said skirt having a throat or passageway connecting with the water inlet; to provide a space between the impeller and the depending skirt for the water to pass downwardly and impinge against the rotating plate member and then pass outwardly between the skirt of the head and the side edge of the rotating plate brush member and thereby wetting the bristles carried by said brush member and the vehicle to be washed; and to provide a device of this character simple and ecomonical to manufacture.

FIG. 1 is a perspective view showing my fountain head.

FIG. 2 is a enlarged cross-sectional view through the head.

FIG. 3 is an enlarged cross-sectional view taken on a line 3—3, FIG. 2.

FIG. 4 is a fragmentary detailed cross-sectional view particularly illustrating the gear arrangement.

FIG. 5 is a fragmentary detailed cross-sectional view taken on a line 5—5, FIG. 2.

FIG. 6 is a fragmentary, cross-sectional view of the shaft upon which the rotating parts are mounted.

FIG. 7 is a perspective view, with parts broken away to particularly illustrate the sleeve mounting on the shaft having an arm for mounting the idler gear.

Referring more in detail to the drawings:

1 designates broadly a head for a fountain brush embodying the features of the present invention having a top 2 provided with a longitudinal boss portion 3 terminating in a cylindrical portion 4 extending outwardly from the depending sides or skirt 5 of the head. The

circular member 4 provides a water inlet 6 and is provided with internal threads 7 for attachment to a garden hose or the like (not shown). Stiffening ribs 8 are provided on either side of the extension portion 4 of the inlet as illustrated in FIG. 3. It will be noted the sidewalls 5 of the head are tapered slightly outwardly forming a depending annular skirt.

The underneath side 9 of the top 2 is provided with a socket 10 here shown to be substantially square in cross-section and in which is mounted the head 11 by a cementitious material or the like of a shaft or post 12 having a cylindrical portion 13, a substantially square portion 14 and an offset cylindrical portion 15 provided with an annular groove 16 and being bifurcated as indicated at 17 for a purpose later discussed. The shaft 12 is mounted in the head so that it will be rigid therewith and not rotate.

Integrally secured with the underneath side 9 of the top 2 and spaced inwardly from the skirt 5 of the head is an annular flange 18 extending in substantially the same direction as the skirt. The cylindrical or neck member 4 of the head has walls extending inwardly into the compartment 19 of the head as indicated at 20 and 21 (FIG. 3), the wall 20 being slightly longer than the wall 21 and the end 22 of the flange 18 is secured to said wall and extends slightly past the same and is rounded and turned towards the inlet as indicated at 23 forming a shoulder 24. The other end of the flange 18 extends past the wall 21 as indicated at 25 forming a throat or passageway 26 for delivery of water therethrough as later shown.

An impeller 27 is provided for rotation on the shaft having a hub 28 formed integral therein and extending toward said head. A bearing sleeve 29 is mounted on the shaft 12 and is keyed to the impeller hub by notches 30 in the sleeve and ribs 31 on the hub 28. The impeller 27 includes a substantially thin plate or planar member 27' spaced from said head, and the sleeve 29 extends through the opening 32 therein and integrally formed with the sleeve bearing member is a gear 33.

The bearing sleeve 29 and gear 33 are substantially the length of the cylindrical portion 13 of the shaft and mounted on the substantially square portion 14 of the shaft is a sleeve member 34 having a substantially square inner surface 35 and a cylindrical portion 36. Formed integral with the sleeve member 34 is a head portion 34' having an arm 37 integral therewith and extending towards the depending skirt 5 of the head. Mounted on the top side of said arm is a short shaft 38, to receive and rotatably mount thereon an idler gear 39 meshing with the gear 33 as illustrated in FIG. 4.

Mounted for rotation on the outside cylindrical surface of the sleeve member 34 is a plate member 40 slightly less in diameter than the depending skirt portion 5 of the head leaving a space 41 between the outer periphery 42 of the plate and the inside wall of the skirt 5 as best illustrated in FIG. 2. The plate member 40 has a circular flange 43 extending outwardly from the body portion of the plate and toward said head, also as illustrated in FIG. 3, and formed on the inner face 44 of the flange 43 are teeth 45 meshing with the teeth 46 on the idler gear 39. The flange 43 on the plate member 40 forms a recess therein for housing the idler gear 39 and arm 37, and also forms a compartment 47 for the water to pass from the impeller.

The impeller has spaced blades or baffles 48 secured to the top side of the thin plate member having a plane surface 27' and curved slightly as indicated at 49 (FIG. 3) and extending inwardly from the outer periphery 50 thereof for rotating the impeller due to the force of water through the inlet 6.

The plate 40 is provided with a plurality of recesses 51 which may be in circumferential rows as indicated in

FIG. 5 or may be staggered, as preferred. Mounted within these recesses are bristles 52. A retaining ring 53 is placed over the bifurcated end 17 of the shaft and engages the notch 16 to retain the plate 40, sleeve member 34 and impeller 27 in place in the housing of the head.

When the fountain brush is attached to a garden hose or the like (not shown) by the threaded connection 7 water will enter through the water inlet portion 6 and pass through the cylindrical portion 54 thereof and will partially be deflected by the slanting wall 55 through the passageway 26 and engage the impeller blades 48 and rotate the same in a counter-clockwise direction, thus rotating the gear 33 and thereby rotating the idler gear 39. The upper side 39' of the gear 39 is provided with annular rib 40' which bears against the annular flange 18 and the face of the impeller plate 27' and acts as a spacer to align the teeth 46 of the gear 39 so that they will engage the teeth 45 of the bristle plate 40, thereby rotating said plate in a clockwise direction. The water will pass from the impeller blades through the space 56 between said thin plate 27' and the inner wall of the depending flange 18 and be forced against the bristle plate 40 and pass outwardly through the space 41 between said skirt and the rotating bristle-bearing plate 40 to impinge against the vehicle being washed and thereby wetting the bristles when water passes from the head. Water will also fill the compartment 47 in which the arm 37 and the idler gear 39 are housed.

Formed integrally with the inside wall of the skirt are spaced lugs or stop members 57 against which the upper edge of the flange 43 of the plate may engage to prevent tipping of the plate during operation. The walls of the neck of the inlet will also serve as a stop on that side of the head to prevent tipping.

It will be obvious from the foregoing that I have provided a fountain brush having an impeller mounted on a shaft rotating in one direction having a bristle-containing plate rotating in the opposite direction through a gear mechanism mounted on said shaft and wherein the water is impelled through the brush at the circumferential edge of the bristle-bearing plate. The ratio of rotation of the impeller to the bristle plate is approximately 6 to 1.

While I show the brush as made of synthetic resin, other materials may be utilized. A well-known synthetic gear material such as nylon may be used for the gears, arm and sleeves.

It is to be understood that while I have illustrated and described one form of my invention, it is not to be limited to the specific form or arrangement of parts herein described and shown except insofar as such limitations are included in the claims.

What I claim and desire to secure by Letters Patent is:

1. A fountain brush having a substantially circular head portion provided with a downwardly projecting skirt portion at its peripheral edge, a boss portion cooperating with the skirt portion providing a water inlet for engagement with a liquid supply means, and a shaft attached to the under surface of said head portion at substantially the center thereof, an annular flange attached to the underneath side of said head portion spaced from said skirt and extending in the same general direction of said skirt, the water inlet having walls connecting with the ends of said flange forming a passageway to said water inlet, comprising in combination with said head portion,

(*a*) a sleeve bearing on said shaft having a gear on the end spaced from said underneath side of the head,

(*b*) an impeller on said shaft having a hub surrounding said sleeve bearing,

(*c*) a plurality of spaced blades on said impeller extending toward the underside of said head portion, said blades being spaced from said depending annular flange,

(*d*) a non-rotatable sleeve bearing on said shaft below said gear on said first named sleeve bearing having a head portion engaging against said gear and an arm extending toward said skirt,

(*e*) a short shaft on said arm and extending upwardly therefrom,

(*f*) an idler gear on said short shaft having teeth engaging said first-named gear,

(*g*) a plate member rotatably mounted on said shaft having its peripheral edge spaced from said skirt forming a water passageway therebetween and having a flange portion extending toward said head, the inside face of the flange portion of said plate having teeth meshing with the teeth on said idler gear,

(*h*) and means on the end of said shaft for retaining said plate, sleeve member, sleeve bearing and impeller thereon, said plate member having provided on the under surface thereof a surface cleaning means, whereby water entering said inlet will contact the blades on said impeller to rotate the same in one direction thereby rotating said plate member through said gears in the opposite direction, the fluid passing from the impeller to said plate member and between the edge of the plate member as said skirt to the surface to be cleaned.

2. The combination of claim 1 wherein said blades are curved to form concave faces to face said water inlet.

3. The combination of claim 1 wherein the head has depending stop members engaging the plate member to prevent tipping thereof.

4. A fountain brush having a substantially circular head portion provided with a downwardly projecting skirt portion at its peripheral edge, a boss portion cooperating with the skirt portion providing a water inlet for engagement with a liquid supply means, and a shaft attached to the under surface of said head portion at substantially the center thereof, an annular flange attached to the underneath side of said head portion, spaced from said skirt, and extending in the same general direction of said skirt, the water inlet having walls connecting with the ends of said flange forming a passageway to said water inlet, comprising in combination with said head portion,

(*a*) a sleeve bearing on said shaft having a gear on the end spaced from said underneath side of the head,

(*b*) an impeller on said shaft having a hub surrounding said sleeve bearing and a plane surface surrounding said gear,

(*c*) a plurality of spaced blades on said plane surface of said impeller extending toward the underside of said head portion, said blades being spaced from said depending annular flange,

(*d*) a plate member rotatably mounted on said shaft, having its peripheral edge spaced from said skirt, and having a flange portion extending toward said head, the inside face of the flange portion of said having teeth,

(*e*) an idler gear carried by said shaft cooperating with the teeth on said plate for rotating the same,

(*e'*) means carried by said shaft for mounting said idler gear to mesh with said gear on the sleeve bearing and the teeth on said plate member,

(*f*) and means on the end of said shaft for retaining said plate, sleeve bearing and impeller thereon, said plate member having provided on the under surface thereof a surface cleaning means, whereby fluid entering said inlet will contact the blades on said impeller to rotate the same in one direction thereby rotating said plate member through said idler gear in the opposite direction, the fluid passing from the impeller to said plate member and between the edge of the plate member and said skirt to the surface to be cleaned.

5. The combination of claim 4 wherein said blades are curved to form concave faces to face said water inlet.

6. A fountain brush having a substantially circular head portion provided with a downwardly projecting skirt portion at its peripheral edge, a boss portion cooperating with the skirt portion providing a water inlet for engagement with a liquid supply means, and a shaft attached to the under surface of said head portion at substantially the center thereof, an annular flange attached to the underneath side of said head portion, spaced from said skirt, and extending in the same general direction of said skirt, the water inlet having walls connecting with the ends of said flange forming a passageway to said water inlet, comprising in combination with said head portion,

(*a*) a sleeve bearing on said shaft having a gear on the end spaced from said underneath side of the head,

(*b*) an impeller on said shaft having a hub surrounding said shaft and a plane surface spaced from said head,

(*b'*) a non-rotatable arm on said shaft adjacent said impeller and extending toward the skirt of said head,

(*c*) a plate member on said shaft adjacent said arm having its peripheral edge spaced from said skirt and having a flange portion extending toward said head,

(*d*) an idler gear carried by said arm cooperating with means on said plate member for rotating said plate member,

(*e*) and means on the end of said shaft for retaining said plate and impeller thereon, said plate member having provided on the under surface thereof a surface cleaning means, whereby fluid entering said inlet will contact said impeller to rotate the same in one direction thereby rotating said plate member through said idler gear in the opposite direction, the fluid passing from the impeller to said plate member and between the edge of the plate member and said skirt to the surface to be cleaned.

7. A fountain brush having a head portion provided with a downwardly projecting circular skirt portion, means on said head portion providing a water inlet for engagement with a liquid supply, and a shaft attached and

fixed to the under surface of said head portion at substantially the center of said skirt, said shaft having a circular portion adjacent said head, a non-circular portion and a reduced portion,

(*a*) a sleeve bearing having a gear rotatably mounted on said shaft,

(*b*) an impeller having a hub engaging said sleeve bearing and rotatable therewith and said impeller extending radially from said shaft, said sleeve bearing being substantially the length of said circular portion of said shaft,

(*c*) said impeller including a plurality of circumferentially spaced blades thereon,

(*d*) a sleeve on said non-circular portion of said shaft, said sleeve having an arm fixed with respect thereto and extending toward said skirt,

(*e*) a stud on said arm spaced from said shaft and extending parallel to said shaft,

(*f*) an idler gear on said stud having teeth engaging said first-named gear,

(*g*) a plate member rotatably mounted on the reduced portion of said shaft and having an annular flange portion extending toward said head, the inside face of the flange portion of said plate having teeth meshing with the teeth on said idler gear,

(*h*) means on said shaft for retaining said plate, sleeve and gear thereon,

(*i*) and surface cleaning means provided on the under surface of said plate member and extending away from said head, whereby water entering said inlet will contact the impeller to rotate the same in one direction and thereby rotate said plate member in the opposite direction through said idler gear.

References Cited in the file of this patent

UNITED STATES PATENTS

972,729	Strange	Oct. 11, 1910
1,606,821	Anderson	Nov. 16, 1926
2,678,457	Demo et al.	May 18, 1954
3,074,088	Williams	Jan. 22, 1963

FOREIGN PATENTS

197,038	Germany	Apr. 10, 1958