

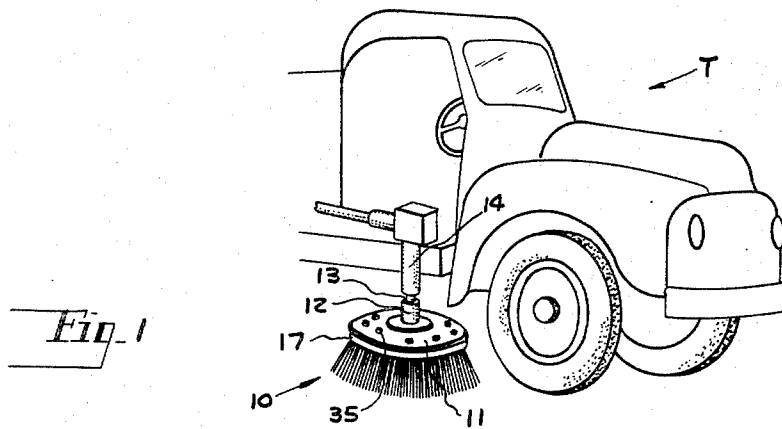
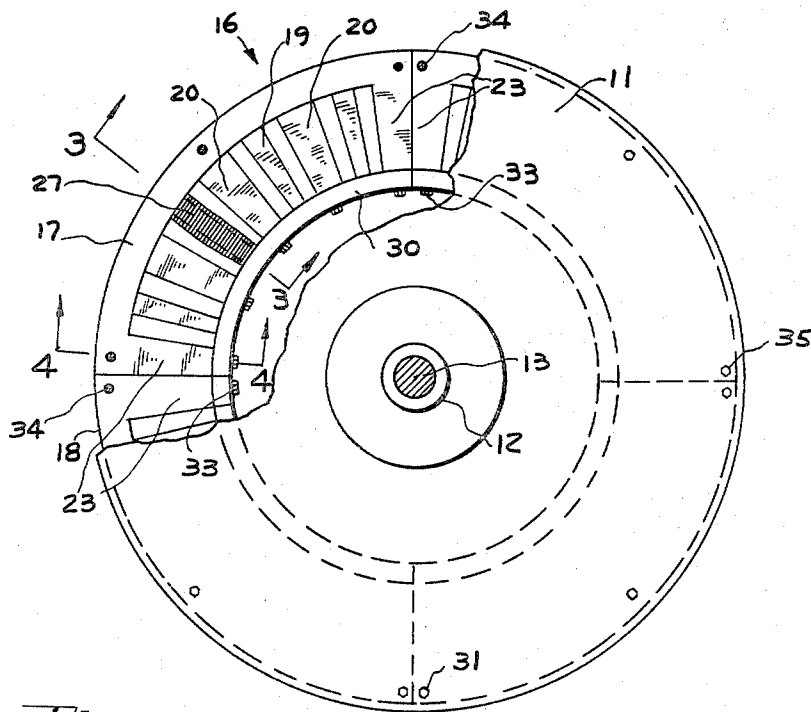
Dec. 22, 1959

L. L. LECHENE
STREET GUTTER BROOM

2,917,767

Filed Oct. 13, 1958

2 Sheets-Sheet 1



INVENTOR.
LEO L. LECHENE
BY *Louis Hayka*
ATTORNEY

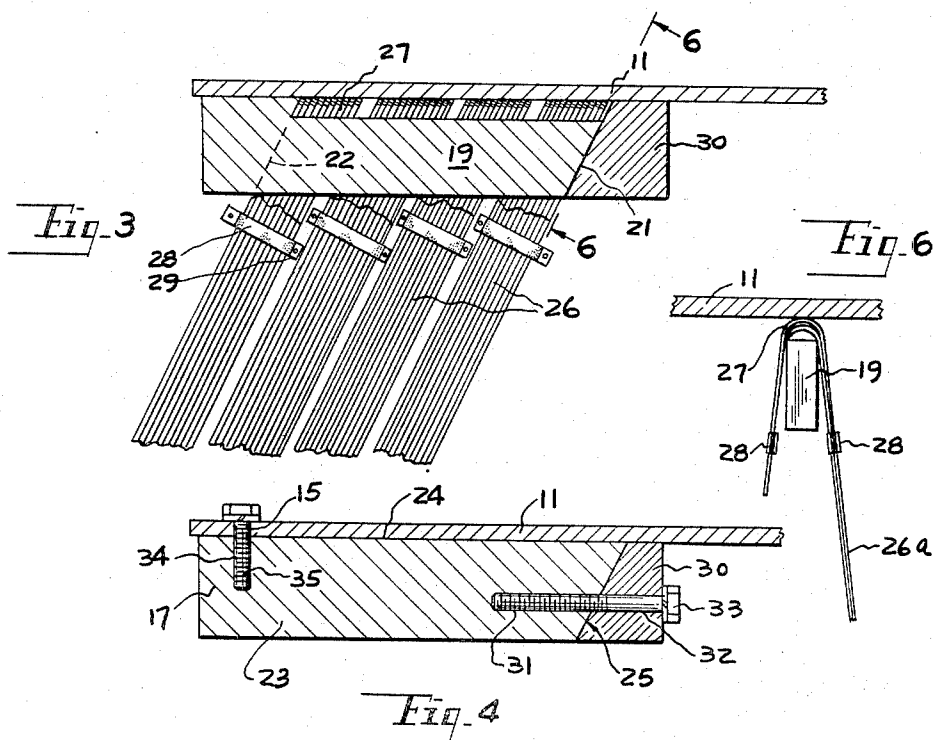
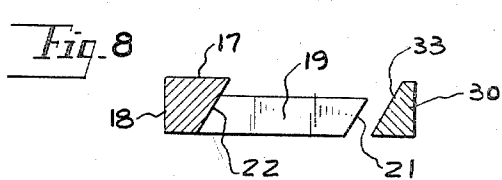
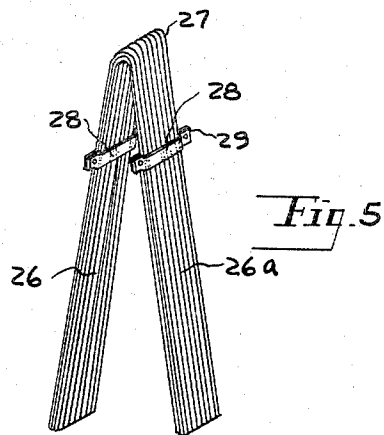
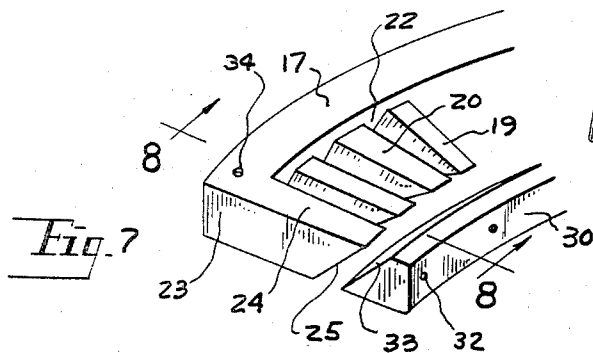
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L. L. LECHENE
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INVENTOR.
LEO L. LECHENE
BY *Louis Chayka*
ATTORNEY

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STREET GUTTER BROOM

Leo L. Lechene, Hazel Park, Mich.

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5 Claims. (Cl. 15—180)

The invention pertains to a rotary power-driven broom adapted to sweep street gutters. A broom of this type includes a horizontally-disposed circular head which may have the shape of a disk, a casing, or another suitable structure, and a plurality of bristles, preferably made of metal wire or of metal strips, which bristles extend downwardly and flare outwardly.

While in general brooms of this type are well known, the assembling of bristles and mounting them for use in the head portion of the broom is as a rule a slow and tedious process. The reason is that the bristles are stiff, that they have to be mounted in proper spacing from each other at a proper angle and in such a manner that they would not be easily displaced. Care also must be taken that in the operation the broad face of each strip should be the operative face thereof.

The invention which I shall now describe meets all the above requirements, rendering the assembling of the broom as a whole and the assembling of the bristles and mounting them in their proper positions easy, speedy, and efficient.

The structure of the broom is disclosed in the accompanying drawings in which:

Fig. 1 is a perspective view of the broom, the view including the front portion of a vehicle equipped with a mechanism for the operation of said broom;

Fig. 2 is an enlarged top plan view of the broom including a top plate which is partly broken off to disclose structural elements beneath said plate;

Fig. 3 is a sectional view on line 3—3 of Fig. 2;

Fig. 4 is a sectional view on line 4—4 of Fig. 2;

Fig. 5 is a perspective view of a bundle or sheaf of metal bristles forming a part of the broom;

Fig. 6 is a sectional view on line 6—6 of Fig. 3;

Fig. 7 is a perspective view of a part of a rack for suspension of the bristles of the broom, the view including a part of a bristle-retaining ring;

Fig. 8 is a sectional view on line 8—8 of Fig. 7.

Similar numerals refer to similar parts throughout the several views.

The broom, generally identified by numeral 10, includes a circular metal plate 11 which is to be disposed horizontally. Mounted upon the central portion of the plate is a cylindrical member 12 for connection to a vertical shaft 13 which in its upper portion is enclosed within a sleeve 14 and which is adapted to be rotated about its axis by power means within a truck T; said means are not shown in the drawings. The plate 11 is provided with a plurality of holes 15 (Fig. 4) along its rim for application of bolts to which I shall refer in the course of this specification.

Secured to the underside of the plate 11 is an annular rack, generally indicated by numeral 16. The rack is composed of a plurality of segments, the number of the segments being a matter of choice. The rack shown in the drawings consists of four such segments, each defining an arc covering 90 degrees. Each segment in-

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cludes a solid arcuate wall 17 defined in part by a vertical outer face 18 (Fig. 8). Projecting radially from said wall are a plurality of narrow fins 19 and a plurality of radial spacers 20, the relation therebetween being such that a free space in the form of a slot is left on each side of each respective fin. The spacers are similar to the fins, and, as shown in the drawings, differ from the fins only because they are wider than said fins. This, however, is no critical limitation, as the width of the spacers is more a matter of choice.

Each fin and each spacer are defined, in part, by two vertical sides and by an end face which slants downwardly away from the center of the annular rack as a whole. Such a face on a single fin is marked 21 in Fig. 8. The inner face 22 of the wall 17 is similarly sloped, the angle of the slope of said face 22 being approximately the same as that of the sloping face 21 of any of the fins.

At each end each segment includes a radial shoulder 23 (Fig. 7) which is analogous to a spacer except that its upper face is at the level of the top surface of the wall 17. This top surface of the wall is above the level of the tops of the fins 19 and the spacers 20. In this connection I wish to say that while the top portions of the fins are flat, they may be formed to a radius. At the end extending towards the center of the rack as a whole said shoulder 23 is defined by a face 25 (Fig. 7) which slants at the same angle as the faces 22 of the fins.

Each of the fins 19 serves as a means for support of one or more bundles of bristles. A single bundle is shown in Fig. 5. It consists of a plurality of thin, band-like strips made of spring-like steel or another metal of similar quality. Two or three strips of stock of this type, all of the same length, are first laid longitudinally on each other to form a unit of double or triple thickness, as the case may be, whereupon the unit is bent double in a hairpin turn to include a looped portion 27 and two legs 26 and 26a of the same length. Next, a number of these units are assembled side by side so that each leg of one unit is in the plane of the corresponding legs of all the other units. Thereupon, all the legs in the same plane in one unit are clamped by two cross strips 28 which at their respective ends are bolted or spotwelded to each other. This is done to keep the units in their proper alinement.

The bundles formed as above described are now placed, one by one, on the individual fins 19 so as to straddle them, the looped portions of the units or the bundle as a whole fitting over the upper surface of the respective fins, as shown in Figs. 2 and 6. The drawing in Fig. 3 shows four such bundles suspended from a single fin. Next, when the bundles of bristles have been placed upon the fins in each segment 16, an arcuate retaining member is secured to each of the respective segments against the inner end faces 21 of the fins 19 and the inner end faces 25 of end shoulders 23. For this purpose said shoulder 23 and said spacers 20 are provided with threaded radial bores 31 (Fig. 4), while the retaining member 30 for said segment is provided with holes 32 which are to be brought into register with said holes 31. Thereupon, bolts 33, thrust through the holes 32, may be threaded into the holes 31 to draw the retaining member 30 tight against said fins and said spacers.

In cross-section the retaining member 30 has the form of a trapezoid, as best shown in Fig. 7, the side of the retaining member which faces the fins having a slanting face 33 parallel to the slanting face 22 of the segment's wall 17.

After said retaining member 30 has been so secured to the respective segment, the whole segment is attached

to the underside of the plate 11. For this purpose each segment is provided with a number of vertical threaded holes 34 in its arcuate wall 17, which holes are to be aligned with the holes 15 in the plate 11. Thereupon, bolts 35 are threaded into the holes 34 in said segment through said holes 15 in the plate till the segment is drawn into a tight abutment with said plate 11. With all the segments in place, they form an annular rack in which the retaining members 30 form a complete concentric ring.

The plate 11 covering the rack from above is close enough to the upper surfaces of the respective fins to bear against the looped portions 27 of the respective bundles of the bristles to clamp them against said upper surfaces of the fins, and as the inner surface of the wall 17 of the rack slants downwardly and outwardly, and as the retaining ring 30 also slants in the same direction, the bundles of bristles are deflected outwardly from the center portion of the rack. This is shown in Fig. 3.

There is one important feature in the structure of the broom which still needs to be noted. This pertains to the operative angle of the individual bristles. As already stated, an individual bristle has the form of a flat, narrow band defined, in part, by two wide faces. During the operative use of the broom, because of the manner in which the bristles are mounted on the fins, it is these wide faces that are disposed crosswise to the direction of the rotary movement of the broom as a whole, thus assuring full efficiency of the operative capacity of the broom. This efficiency would be lost if the bristles were to move edgewise.

It will be understood that while in the above description I have referred to metal bristles, these may be substituted by bristles made of plastic material, by bristles of vegetable origin, or by bristles of any other suitable substance.

After having described my improvement, what I wish to claim is as follows:

1. A rotary gutter broom including an annular rack consisting of a circular wall and a plurality of radial fins extending from the wall towards the center of the space defined by said wall, a plurality of bristles, each being bent into a hairpin shape to include a looped portion and two legs extending therefrom, said bristles straddling a respective fin and extending downwardly out of the rack, a concentric retaining ring attached to the inner ends of the fins to hold the bristles against being displaced, and a concentric circular plate secured to the top of the rack and covering said rack, the plate bearing against the looped portions of the bristles, and a vertical shaft extending from the central portion of the plate, the shaft serving as a means to rotate the plate with the rack about the axis of said shaft.

2. A rotary gutter broom including an annular rack consisting of a vertical wall defining a circle and having an inner face slanting downwardly and outwardly from the center of said circle, a plurality of fins extending radially from said wall towards said center but terminating short thereof, the fins being laterally spaced from each other, a plurality of bristles suspended from said fins, each being bent into a hairpin shape to include a looped portion and two legs extending therefrom, said bristles straddling respective fins and extending downwardly out of the rack, a concentric retaining ring attached to the inner ends of the fins to hold the bristles against displacement, the ring being, in part, defined on the side on which it is connected to the fins by a face slanting parallel to the slanting face of the wall, a circular plate secured to the top of the rack in concentric relation thereto, the plate bearing against the looped portions of the fins, and a vertical shaft mounted upon the central portion of the plate, the shaft serving as a means to rotate the plate with the rack about the axis of said shaft.

3. A rotary gutter broom including an annular rack consisting of a vertical wall defining a circle and having an inner face slanting downwardly and outwardly from the center of said circle, a plurality of fins extending radially from said wall towards said center but terminating short thereof, the fins being laterally spaced from each other, a plurality of bundles of bristles suspended from the fins, each bundle consisting of a plurality of bristles bent into a hairpin shape to include a looped portion and two opposed legs, the bundles being adapted to straddle a respective fin, all the legs to one side of the fin being held in approximately the same plane by a clamp, while all the legs of a bundle to the other side of the fin are held in another plane by a similar clamp, said bristles extending downwardly out of the rack and slanting away from the center thereof, a concentric retaining ring attached to the inner ends of the fins to hold the bristles against displacement, the ring being, in part, defined on the side on which it is connected to the fins by a face slanting parallel to the slanting face of the wall, a circular plate secured to the top of the rack in concentric relation thereto, the plate bearing against the looped portions of the fins, and a vertical shaft mounted upon the central portion of the plate, the shaft serving as a means to rotate the plate with the rack about the axis of the shaft.

4. A rotary gutter broom including a horizontal rack consisting of a plurality of arcuate segments in an end-to-end relation to define a ring structure, each segment including an arcuate wall and a plurality of vertical fins radially extending therefrom, a plurality of bristles, each bent into a hairpin shape to include a looped portion and two opposed legs, said bristles straddling a respective fin and extending downwardly from said segment, an arcuate retaining member for each segment, the member being attached to the fins at their ends which are remote from the wall of said segment to hold the bristles against displacement, and a concentric circular plate attached to the top of the rack as a whole, the plate bearing from above against the looped portions of the bristles, and a vertical shaft mounted on the central portion of the plate, the shaft serving as a means to impart a rotary operative movement to the plate and the rack.

5. A rotary gutter broom including a horizontally-disposed annular rack consisting of a plurality of arcuate segments in end-to-end relation, each segment including a vertical arcuate wall and a plurality of fins radially extending from the wall towards the center portion of the rack as a whole, each fin being partly defined by two vertical side faces and a top surface disposed below the level of the top of the wall, a plurality of bristles, each bent into a hairpin shape to include a looped portion and two opposed legs, said bristles straddling a respective fin and extending downwardly from said segment, an arcuate retaining ring for each segment, the ring being attached to the fins at their ends which are remote from the wall of said segment to hold the bristles against displacement, and a concentric circular plate attached to the top of the rack as a whole, the plate bearing from above against the looped portions of the bristles, and a vertical shaft mounted on the central portion of the plate, the shaft serving as a means to impart a rotary operative movement to the plate and the rack.

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