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ROTARY BROOM CONSTRUCTION

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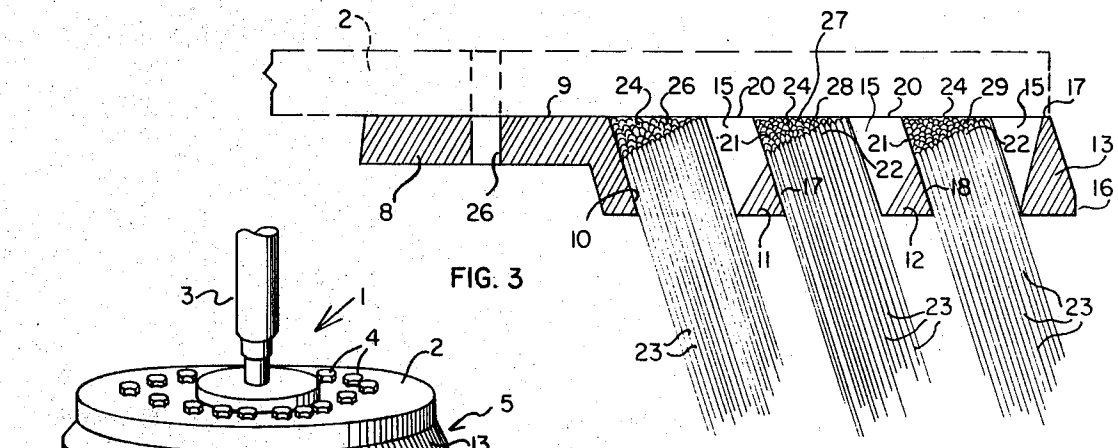


FIG. 3

FIG. 1

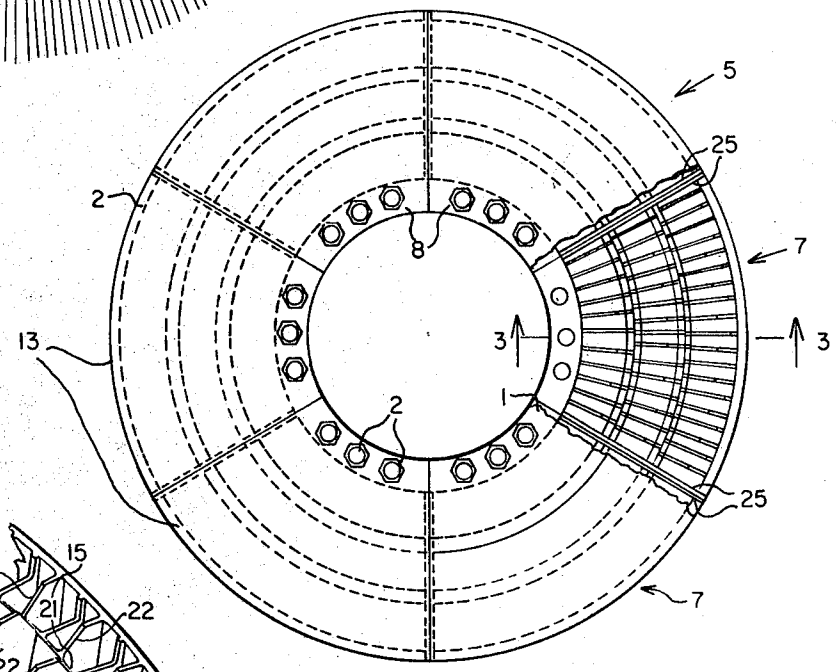


FIG. 2

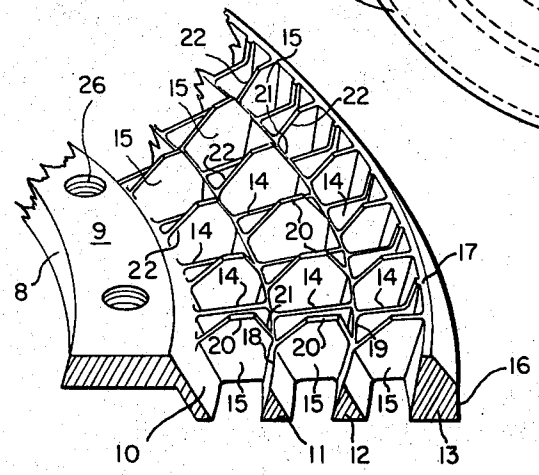


FIG. 4

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ROTARY BROOM CONSTRUCTION

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ABSTRACT OF THE DISCLOSURE

A rotary broom composed of a plurality of arcuate segments secured end to end to form an annulus having a radially inner body provided with a flat upper surface and surrounded by a plurality of concentric ribs. Extending from the body to the outermost rib is a plurality of radial connectors which are circumferentially staggered and spaced from one another. Between adjacent connectors is a bristle support which extends radially from the body to the outermost rib, the supports being staggered similarly to the connectors. Each bristle support has a radially outer upper surface which is coplanar with the upper surface of the body and a radially inner surface which is inclined downwardly and radially inwardly. U-shaped bristles are supported on the inclined surfaces of the bristle supports and extend downwardly and radially outwardly from the annulus. A disk overlies the annulus and prevents relative vertical movement of the annulus and the bristles.

This invention relates to a rotary broom construction of the kind especially adapted for use as a gutter broom for automotive street sweepers.

Street sweeper gutter brooms are subjected to extremely rough usage and bristle wear, and frequently require replacement of the bristles. In recognition of the desirability of substituting fresh bristles for worn ones, it has been proposed heretofore to provide bristle support devices in which one set of bristles can be exchanged for another. Due to the abuse to which the broom is subjected in use, however, it is of great importance that the bristles be incapable of inadvertent separation from their support. It has been customary in the past, therefore, to form a bristle support as an annulus, either of one piece construction or composed of a plurality of arcuate segments, and to provide the annulus with various kinds of bristle clamping devices which act between the annulus and the bristles to secure the latter in place. Although such bristle supports have made it possible to avoid discarding a bristle support member whenever the bristles need replacement they do have certain disadvantages. For example, the provision of individually adjustable clamp members requires the manufacture and assembly of multiple parts, thereby increasing the cost of the manufacture and the length of time required to effect the assembly of bristles with the support. In addition, the abuse to which such brooms inevitably is subjected frequently causes one or more of the relatively adjustable parts to loosen or become lost, causing damage to or loss of other parts of the sweeper assembly.

An object of this invention is to provide a rotary broom construction composed of a plurality of arcuate segments having bristle mounting means so constructed as to eliminate the necessity of providing clamp members for securing the bristles in place.

A further object of the invention is to provide a rotary broom construction composed of a plurality of arcuate segments which may be formed of strong material such as metal and yet which are relatively light in weight so at to be competitive in price with other kinds of bristle supports.

Another object of the invention is to provide a rotary broom construction which is so constructed as to facilitate the substitution of fresh bristles for worn ones.

Other objects and advantages of the invention will be pointed out specifically or will become apparent from the following description when it is considered in conjunction with the appended claims and the accompanying drawings, in which:

FIG. 1 is a fragmentary, perspective view of a rotary broom constructed in accordance with the invention;

FIG. 2 is a top plan view of the bristle supporting annulus, but with the bristles and mounting disk removed for clarity;

FIG. 3 is an enlarged, sectional view taken on the line 3—3 of FIG. 2 and illustrating the mounting disk in phantom lines; and

FIG. 4 is a fragmentary partly sectional perspective view of one of the arcuate segments forming part of the invention.

A rotary broom constructed in accordance with the invention is designated generally by the reference character **1** and comprises a mounting disk **2** secured to one end of a rotatable shaft **3** which is supported on and driven by a conventional street sweeper (not shown). Secured to the disk **2** by bolts **4** or the like is an annulus **5** on which is mounted a plurality of bristles **6** which project downwardly and radially outwardly from the annulus to form a generally conical broom.

The annulus **5** is composed of a plurality of identical arcuate segments **7** arranged end to end. Each segment includes a radially inner, arcuate body portion **8** having a flat upper surface **9** and a radially outer side or wall **10** which is inclined downwardly and radially outwardly. Radially outwardly of the body **8** is a plurality of concentric ribs **11**, **12** and **13** which are joined to one another and to the body **8** by radially extending connectors **14** which are spaced circumferentially from one another and stagged radially, as is best shown in FIGS. 2 and 4. Also joining the ribs **11**, **12** and **13** to one another and to the body **8** is a plurality of bristle supports **15** which alternate with the connectors **14**, and which are similarily staggered.

Each of the arcuate ribs **11**, **12** and **13** is substantially triangular in cross section, although the radially outer side of the outermost rib **13** may be truncated as at **16**, thereby reducing the overall diameter and weight of the annulus **5**. As is best shown in the FIG. 3, the upper edge **17** of the outer rib **13** is substantially coplanar with the surface **9** of the body **8**. The upper edges **18** and **19** of the ribs **11** and **12**, respectively, are located at a lower level than that of the surfaces **9** and **17**.

Each of the support members **15** has an upper, flat surface portion **20** which is at the same level as that of the surfaces **9** and **17**. The radially outer end of the surface **20** terminates in an outwardly and downwardly inclined surface **21** which forms a continuation of the outer sides of the ribs **11** and **12**, but the outer end of the surface **20** of the outermost member **15** extends to and is flush with the surface **17**. Each of the support members **15** has a rear surface portion **22** which is inclined downwardly and radially inwardly.

The bristles **6** are composed of substantially U-shaped wires having parallel legs **23** joined by a reversely turned web **24**. The web **24** spaces the legs **23** apart a distance sufficient to enable the legs to straddle any one of the support members **15**.

Each of the segments **7** has a thin end wall **25**, the upper edge of which is coplanar with the surface **9** and the upper edge **17** of the outer rib **13**. When the segments **7** are assembled in end to end relation, the end walls **25** of adjacent segments will abut each other. The bristles **20**, however, are mounted on the support members **15** only; they do not straddle the end walls **25**. Thus, the

end walls of adjacent segments are in face to face engagement.

When it is desired to assemble the bristles and segments to form the rotary broom, a plurality of bristles is suspended from each support member **15** and in such a manner that the webs **20** extend to, but not above, the plane of the surfaces **9**, **20** and **17**. The disk **2** then may be placed in overlying relation with the assembled segments **7** and be secured thereto by the bolts **4** which are threaded into correspondingly threaded openings **26** formed in the body **8** of each segment.

When the several parts of the apparatus are assembled, the bristles supported on the radially innermost supports **15** will fill a triangular space **26** defined by the surfaces **10** and **22** and by the lower surface of the disk **2**. The bristles **23** will be inclined downwardly and radially outwardly and will be maintained in such position by the surfaces **10** and **18**. The bristles supported by the outermost supports **15** will occupy a triangular space **28** defined by the surfaces **21** and **22** and by the lower surface of the disk **2**, and the bristles will be maintained in a downwardly and outwardly inclined position by the confronting surfaces of the ribs **11** and **12**. The outermost bristles will be inclined downwardly and radially outwardly and maintained in such position by the surface **18** of the rib **12** and the inner surface of the rib **13**. The lower edge of each rib **11**, **12** and **13** bears against the radially outer bristles of the adjacent ring of bristles so as to prevent their rotating in a counterclockwise direction, as viewed in FIG. 3.

When it becomes necessary to replace worn bristles, any one or more of the segments **7** may be removed from the disk **2** by removal of the appropriate bolts **4**, the bristles replaced, and the segment or segments returned to the disk.

The segments conveniently can be cast from lightweight metal, such as aluminum, magnesium, or alloys thereof, so as to be quite durable but light in weight.

The disclosed embodiment is representative of a presently preferred form of the invention, but is intended to be illustrative rather than definitive thereof. The invention is defined in the claims.

I claim:

1. A rotary broom construction comprising a body rotatable about an axis and having an upper surface; a plurality of radially spaced, arcuate ribs concentric with one another and with said body; a plurality of radial connectors securing said ribs to one another and to said body, said connectors being circumferentially spaced from one another; and radial bristle support means interposed between adjacent connectors and extending radially from said body to the outermost rib, each of said support means having an upper surface inclined downwardly from the level of the upper surface of said body, the connectors between adjacent ribs being staggered circumferentially.

2. The construction set forth in claim **1** wherein said surface of said support means is inclined downwardly and radially inwardly.

3. The construction set forth in claim **1** wherein said surface of said support means includes a radially outer portion substantially coplaner with said upper surface of said body and a radially inner portion which is inclined downwardly and radially inwardly.

4. The construction set forth in claim **1** wherein the said body has a radially outer edge inclined downwardly and radially outwardly from said upper surface and wherein said ribs are substantially triangular in cross-section, the radially outer sides of said ribs substantially paralleling said outer edge of said body.

5. The construction set forth in claim **1** wherein each rib between said body and the outermost rib terminates at its upper edge at a level lower than the level of said upper surface of said body.

6. The construction set forth in claim **1** wherein the upper edge of the outermost rib is substantially coplanar with the upper surface of said body.

7. A rotary broom construction comprising a body rotatable about an axis and having an upper surface; said body having a radially outer edge inclined downwardly and radially outwardly from said upper surface; a plurality of radially spaced, arcuate ribs concentric with one another and with said body, said ribs being substantially triangular in cross-section and the radially outer sides of said ribs substantially paralleling said outer edge of said body; a plurality of radial connectors securing said ribs to one another and to said body, said connectors being circumferentially spaced from one another; and radial bristle support means interposed between adjacent connectors and extending radially from said body to the outermost rib, each of said support means having an upper surface inclined downwardly from the level of the upper surface of said body.

8. The construction set forth in claim **1** wherein said support means between adjacent ribs are staggered circumferentially.

9. The construction set forth in claim **1** wherein said body is composed of a plurality of individual arcuate segments, and including means securing said segments in end to end relation to form an annulus.

10. The construction set forth in claim **9** wherein said securing means comprises a disk overlying said annulus and having a diameter corresponding substantially to that of said annulus.

11. The construction set forth in claim **10** including substantially U-shaped bristles having substantially parallel legs joined by a web, the web of each of said bristles extending athwart one of said support members beneath said disk and having its legs straddling said support member and projecting downwardly beyond said body.

References Cited

UNITED STATES PATENTS

2,853,729	9/1958	Link	15—180
2,917,767	12/1959	Lechene	15—180
3,074,094	1/1963	Lechene	15—180
3,332,100	7/1967	Mintley	15—180 XR

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