Oct. 29, 1968 A. E. DRUMM 3,407,425

SPACER FOR USE IN ROTARY BRUSH ASSEMBLY

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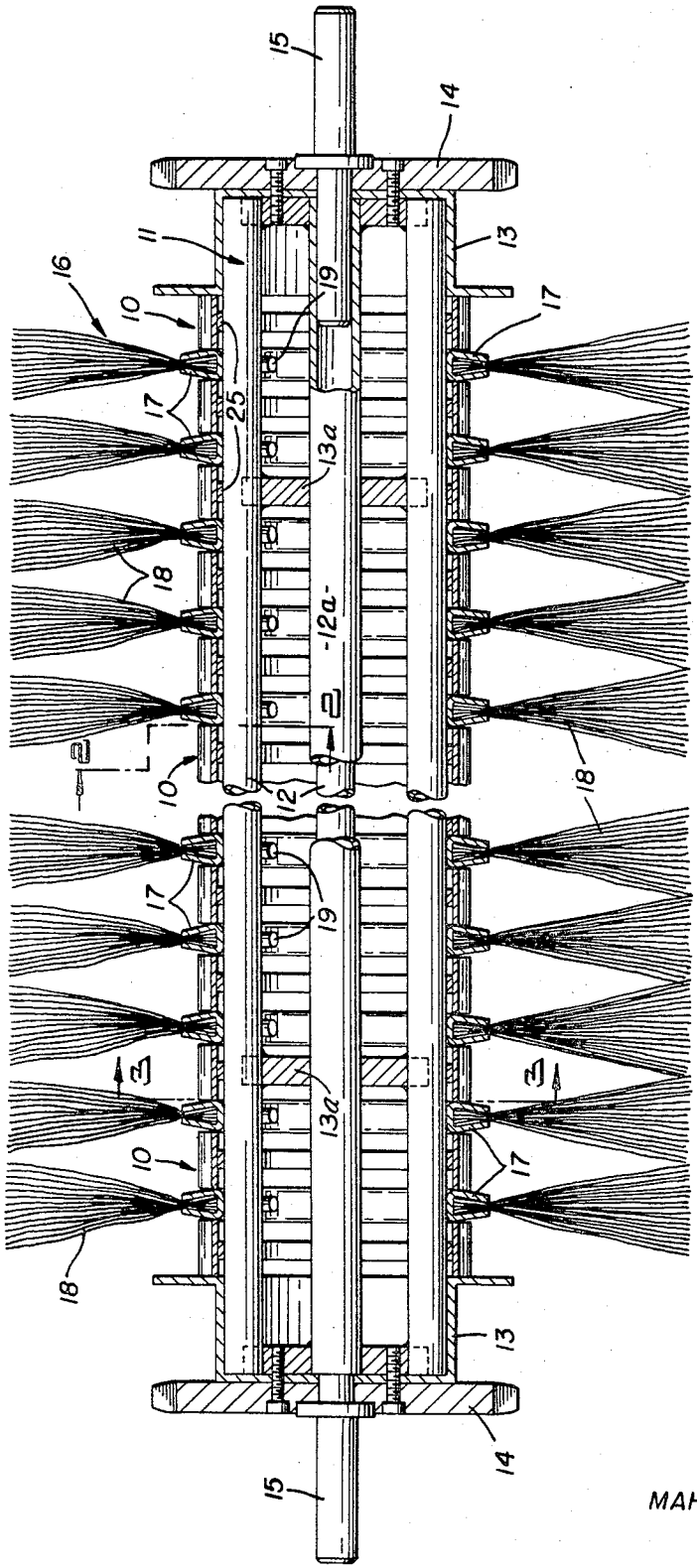


Fig. 1

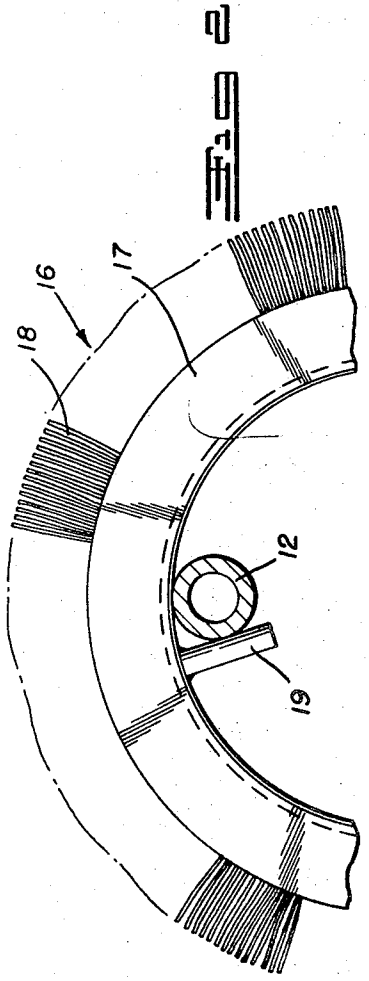


Fig. 2

INVENTOR.
ARTHUR E. DRUMM

BY
MAHONEY, MILLER & RAMBO
BY Wm. V. Miller
ATTORNEYS

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Fig 3

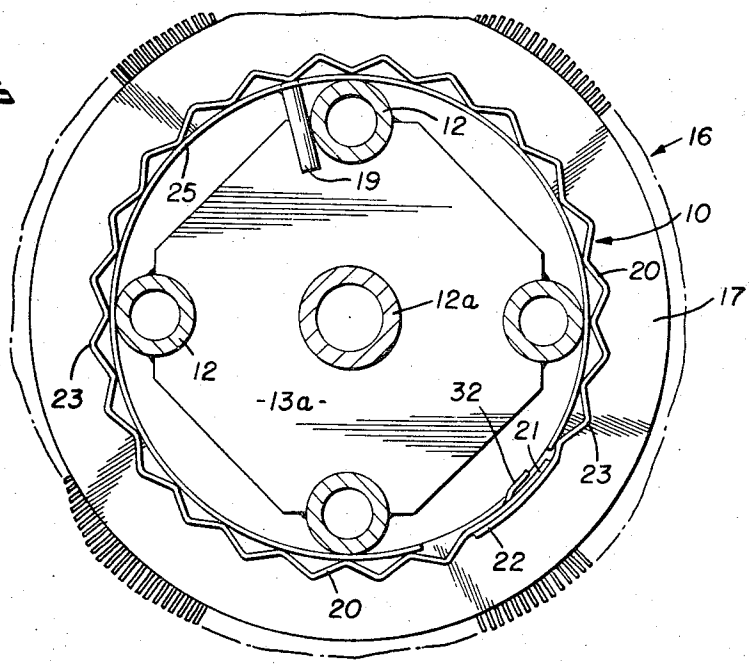
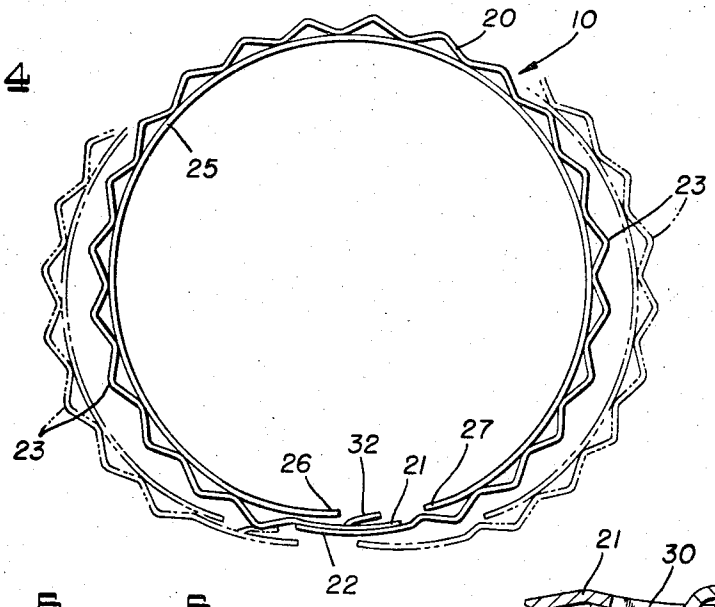


Fig 4



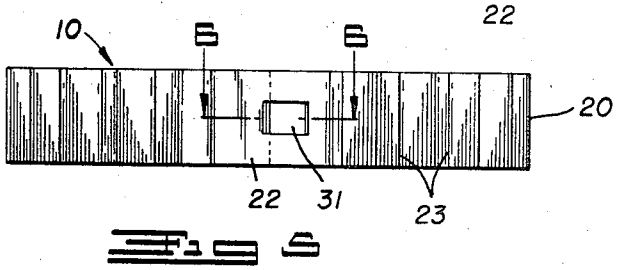


Fig 5

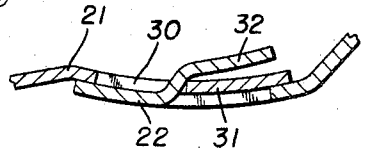


Fig 6

INVENTOR.
ARTHUR E. DRUMM

BY
MAHONEY, MILLER & RAMBO
BY Wm. V. Miller
ATTORNEYS

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SPACER FOR USE IN ROTARY BRUSH ASSEMBLY

Arthur E. Drumm, Rte. 1, Marysville, Ohio 43040

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ABSTRACT OF THE DISCLOSURE

A spacer for use in a rotary brush assembly of the heavy duty type generally used for sweeping streets and pavements or similar heavy duty sweeping. The spacers are disposed between the annular hubs or rings of sweeper brush sections on an axial support, such as a core or shaft carrying said sections, and maintains said sections in axially spaced relationship thereon. Each of the spacers is in the form of a split ring of suitable material which is corrugated transversely to give it transverse or axial compressive strength and radial thickness or depth so that it can function properly as a spacer between axially adjacent brush units.

In the accompanying drawings, I have illustrated the spacer of this invention and the incorporation of a plurality of such spacers in a rotary brush assembly and in these drawings:

FIGURE 1 is an axial sectional view through a brush assembly showing the spacers of this invention assembled on the core with the brush units.

FIGURE 2 is an enlarged transverse sectional view taken along line 2—2 of FIGURE 1 and showing the stop for a brush unit.

FIGURE 3 is an enlarged transverse sectional view taken along line 3—3 of FIGURE 1 showing a spacer associated with a brush unit.

FIGURE 4 is an edge elevational view of the split-ring type spacer of my invention indicating its expanded or disconnected condition by broken lines and its connected or operative condition by full lines.

FIGURE 5 is a plan or face elevational view of the spacer of FIGURE 4 showing it connected.

FIGURE 6 is an enlarged sectional view taken on line 6—6 of FIGURE 5 showing the interlocking connection at the ends of the split-ring type spacer.

With reference to the drawings, the spacer of this invention is indicated generally by the numeral **10**. A number of these spacers may be incorporated in rotary brush assemblies of various types and are shown in such an assembly in FIGURE 1, this assembly being shown only as an example. This general type of brush assembly usually includes a core, indicated generally by the numeral **11**, and consisting of a plurality of longitudinal supports, shown as pipes **12**, which are angularly spaced in a circular pattern and are held in that pattern normally by having their ends suitably disposed in removable cylindrical caps or housings **13**. These housings may suitably carry the driving gears **14** for rotating the brush assembly. A central pipe or bearing sleeve **12***a* may be provided for rotatably receiving the inner ends of the opposed removable spindles **15** and this pipe is removably connected to the caps **13** and associated gears **14**. Additional supports and spacers **13***a* may be welded to the members **12** and **12***a* axially intermediate their lengths. The brush units are indicated generally at **16** and may be of any suitable type but will include a central ring or hub **17** suitably carrying the radially extending bristles **18**. The rings **17** are adapted to slip onto the core **11** at one of its ends when the cap **13** and its associated gear **14** are removed. The spacers **10**, as indicated, are adapted to be disposed on the core for properly

spacing the brush units **16** thereon. The ring **17** of each brush unit is provided with a radially inwardly extending stop pin **19** which will cooperate with an associated pipe member **12** to limit rotation of the brush unit on the core.

The details of the brush assembly are not critical to the present invention which deals with the spacer **10** except that the assembly will include an axial support, such as a shaft or core, for receiving brush units axially positioned thereon, the brush units including a central ring, collar or hub, adapted to surround the core, and with which the split spacer collars or rings of this invention can engage to maintain the brush units in predetermined axially spaced relationship on the core.

The detailed structure of the spacer **10** is illustrated in FIGURES 3–6, and as indicated, this spacer is in the form of a split ring having suitable means for connecting its ends together. The split ring is formed from a band of suitable material which is indicated as being of resiliently flexible metal but may be of any other suitable material such as flexible plastic, paperboard, fiberboard, or other fibrous material, as long as it can be formed in accordance with this invention and have sufficient compressive strength transversely of itself or in an axial direction when in the brush assembly. The resiliently flexible band **20** is of substantial width, depending upon the axial spacing desired for the brush units, and is formed into normally substantially circular shape with the adjacent ends **21** and **22**. To give the band substantial radial thickness or depth and transverse or axial compressive strength, the band is provided with a series of transverse corrugations **23**, formed throughout its extent, which are of substantial depth to give a corresponding depth or thickness to the band.

To provide a continuous bearing surface inside the band **20**, it is provided with a bearing strip **25**, which may be narrower than the band, and which is suitably secured to the interior thereof as by welding. This band has the ends **26** and **27** which are disposed closely adjacent each other when the band is in circular form and adjacent the respective ends **21** and **22** of the main band **20**.

The ends **21** and **22** of the band **20** are secured together in a suitable manner, either permanently when the band is formed but preferably so that the ends can be readily connected or disconnected. I prefer to employ an interfitting or releasable interlocking connection of the type shown best in FIGURES 3–6. This connection comprises a tab-receiving opening **30** formed in the end **21** which will be innermost with the end **22** overlapping it. This end **22** is provided with a locking tab **31** which may be formed in a stamping operation to cut the tab from the band and bend it inwardly and reversely relative to the end **22** of the band. To lock the ends, the tab **32** is slipped through the opening **30** and is pulled rearwardly over the extremity **31** at the adjacent edge of the opening **30**. It will be noted that the tab **32** is angular to provide a wedging locking action on the extremity **31** of the end **21**. Reverse relative movement of the interlocking ends **21** and **22** will result in disconnection of such ends.

The spacers **10** may be positioned on the core **11** between the rings **17** of the various brush units **16** and between each end brush unit ring and the associated cap flange **13***a* to properly axially space these members. The split ring spacers with ends interlocked may be slipped over the ends of the core **11** in the initial assembly or may be removed or replaced at any time by disconnecting the ends **21** and **22**. The inner bands **25** will bridge the spaces between the angularly spaced pipe supports **12**. The transverse corrugations in the bands will provide substantial radial thickness or depth and the ends of these corrugations or ribs will engage the associated side

surfaces of the adjacent rings **17**. The corrugations will not only provide effective thickness for the spacer bands but will also provide resistance to radial compressive forces. The spacer bands can be made relatively inexpensive and, therefore, can be discarded and replaced if necessary. Shipping of the spacers is facilitated since they can be shipped as flat bands under sufficient pressure to maintain them flat and overcome the tendency to assume ring form if they are of resilient material and are initially formed with a substantially circular outline.

Various other advantages will be readily apparent.

Having thus described this invention, what is claimed is:

1. A spacer for use in a rotary brush assembly between brush members to be spaced along an axial support comprising a band arranged in circular formation to extend around the support, said band being corrugated transversely at angularly spaced intervals to provide thickness for the band and to resist axial compression so that it will effectively space said members, said band including a strip mounted on and extending around the interior of said band to bridge said corrugations and provide a smooth bearing surface.

2. A spacer according to claim **1** in which the band is split to provide opposed ends adjacent each other, and means for connecting said ends.

3. A spacer according to claim **2** in which said connecting means includes interfitting locking portions on said ends.

4. A spacer according to claim **1** in which said band is split and has adjacent cooperating ends, means for connecting said ends, said strip also having adjacent ends disposed adjacent the ends of said band.

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PETER FELDMAN, *Primary Examiner.*