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(54) **CIRCULAR PLATE FOR WEED/GARBAGE SWEEPER DISH BRUSHES**

(57) The invention concerns a special circular plate (2) and is executed to weld the flat sweeping elements (4) and the steel cable plugs (5) with a robot in one procedure through inventive sets of slit openings in the.

L-form (6) and partly circular form (7). Furthermore, the raised contour (3) is upwardly deformed in a circular form (8) for said cable plugs (5). All can be manufactured in a very economical way.

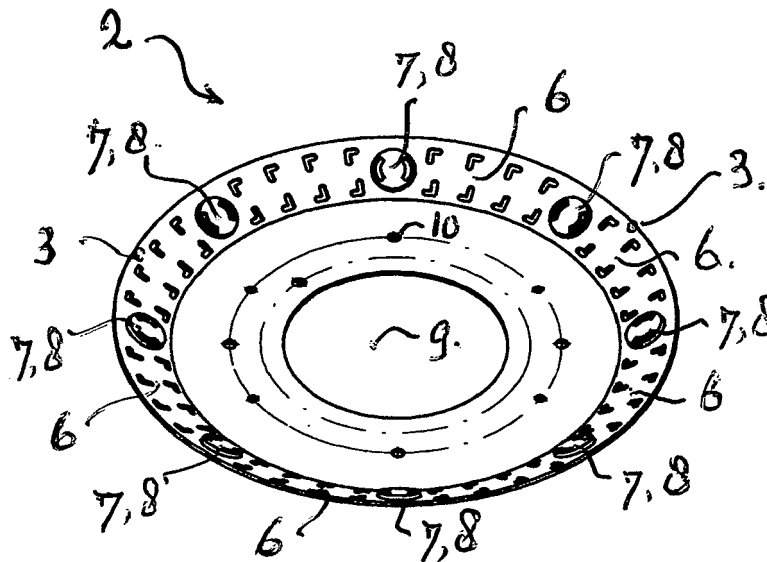


FIG. 2

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Description

[0001] The present invention concerns dish brushes, which are normally mounted under an upstanding axle of a street sweeper machine. Mostly weed and garbage/dirt has to be removed from paved surfaces such as streets and other pavements without and with joints. Most dish brushes are executed to remove dirt and garbage. Dish brushes are also developed for removing weed between the pavement. In our European Patent Application number EP 3560378 a special Dish Brush for Sweeper Machines is described and disclosed. This known patent application is a first step in partly fabricating the dish brush with robot welding technology and for practical use has still disadvantages in production costs, mechanical strength/properties and mechanical life time.

OBJECT OF THE INVENTION

[0002] Because of mentioned disadvantages and drawbacks of the circular plate, the dish brush is further developed in an inventive way. So, an optimal dish brush is obtained in a mechanical and economical way. In the same rotating procedure, an optimal dish brush is obtained in a technical and economical way for weeding and sweeping activities. For a detailed description, see the annexed claims.

SUMMARY OF THE INVENTION.

[0003] The circular plate for a combined weed and sweep dish brush according to the invention is characterized in that said flat sweeping elements and said steel cable plugs are fastened with welds from the upper side through a set of small slit openings in a radial equidistant sense at said raised contour edge of the adapted circular plate with thickness d and diameter D , wherein said slit openings for said flat sweeping elements have a set of two L-formed openings and said slit openings for said steel cable plugs have a set of two partly circular slit openings, wherein said slit openings have a width w .

[0004] The advantage is, that a fully robot welded dish brush with excellent mechanical strength is obtained at minimal costs and minimal production time. The excellent mechanical strength of the welds is obtained by the configuration of the shape of said slit openings.

[0005] Then the circular plate according to the invention is further developed characterized in that the circular connecting area of the steel cable plugs under the contour edge of the circular plate are upwardly mechanically deformed.

[0006] The advantage is a further mechanical strengthening of the steel cable plugs by upwardly deforming the contact area of the top of the steel cable plug.

[0007] Subsequently the circular plate according to the invention is further developed characterized in that said slit width w for welding activities is between 3 mm and 7 mm, preferably 5 mm.

[0008] The advantage is an optimal slit width w for a robotic welding procedure as happened to be in practice.

[0009] Then the circular plate according to the invention is further developed characterized in that said angle α (α) is between 20 degrees and 40 degrees, preferably 30 degrees.

[0010] The advantage is a dish brush with an optimal angle to the paved surfaces.

[0011] Then the circular plate according to the invention is further developed characterized in that said plate thickness d is between 2 mm and 6 mm, preferably 3 mm and diameter D is between 300 and 800 mm, preferably 400 mm, 450 mm, 500 mm and 640 mm, wherein said centre angle β (β) is between 5 degrees and 15 degrees, preferably 9 degrees.

[0012] The advantage is to construct the dish brush in different dimensions to fit sweeping machines and execute special jobs.

BRIEF DESCRIPTION OF THE DRAWING

[0013] The embodiment of the invention is described now by way of example with reference to the accompanying drawing with figures, in which:

figure 1 shows a top view of the spread-out circular plate according to the invention;

figure 2 shows an oblique view from the bottom of the circular plate with the raised contour;

figure 3 shows a pure bottom view of the circular plate of figure 2;

figure 4 shows a cross section over the line A-A of figure 3;

figure 5 shows a detailed and enlarged cross section of part X of figure 4, within the upwardly deformed circular connection area;

figure 6 shows an oblique view of a constructed dish brush according to the invention; and

figure 7 shows a top view of the dish brush of figure 6.

DETAILED DESCRIPTION

[0014] Figure 1 shows a top view of the spread-out circular plate 1 according to the invention, which is deformed to a circular plate 2 with a raised contour 3 (see figure 2). Under said raised contour 3 the flat circular elements 4 and the steel cable plugs 5 are fixed by means of robotic welding through the set of L-formed slit openings 6 and the set of partly circular slit openings 7. See figures 6 and 7.

[0015] Figure 2 shows the upwardly deformed circular connecting area 8 for placing said steel cable plugs 5, which are welded through partly circular slit openings 7, also see figure 5. There is a central bore hole 9 in said circular plate 1, 2 which through suction removes the weed and garbage from the paved surface. The angle α (α) is usually around 30 degrees, but can be adapted to specific applications. To mount the circular plate 2

to an upstanding tube (not shown) there are no bore holes 10 provided to screw the total executed combined weed and sweep dish brush 11. See figures 6 and 7.

[0016] Figure 3 shows a pure bottom view of the circular plate of figure 2. The same parts have the same numbers.

[0017] Figure 4 shows a cross section of the line A-A in figure 3. Shown is the angle alpha (α) of the raised contour 3.

[0018] Figure 5 shows an enlarged cross section X of figure 4. The detail shows the mechanical upwardly deformed circular connecting area 8 for said steel cable plugs 5 (not shown).

[0019] Figure 6 shows an oblique view of a fully constructed dish brush according to the invention. The same parts have the same numbers.

[0020] Figure 7 shows a top view in an enlarged scale of the dish brush of figure 6.

[0021] However, it is obvious that modifications and/or additions to the afore mentioned circular plate can be made to form the dish brush but these shall remain within the field and scope of the invention.

4. Circular plate as in claim 1, **wherein** said slit width w for welding activities is between 3 mm and 7 mm, preferably 5 mm.

5. Circular plate as in claim 1, **wherein** said angle alpha (α) is between 20 degrees and 40 degrees, preferably 30 degrees.

6. Circular plate as in claim 1, **wherein** said centre angle beta (β) is between 5 degrees and 15 degrees, preferably 9 degrees.

7. Circular plate as in claim 1, **wherein** said welds w are executed with a welding robot.

Claims

1. Circular plate to construct a circular dish brush for street sweepers for removing weed and dirt/garbage from paved surfaces/streets, wherein under a raised contour at an angle alpha (α) of said plate at radial constant distances with a centre angle beta (β) flat sweeping elements and between them some cable plugs are fixed, wherein the complete circular dish brush is mounted with an upstanding tube structure with a flange under a conventionally driven street sweeper, **characterized in that** said flat sweeping elements (4) and said steel cable plugs (5) are fastened with welds from the upper side through a set of small slit openings (6, 7) in a radial equidistant sense at said raised contour edge (3) of the adapted circular plate (2) with thickness d and diameter D, wherein said slit openings (6, 7) for said flat sweeping elements (4) have a set of two L-formed openings (6) and said slit openings for said steel cable plugs (5) have a set of two partly circular slit openings (7), wherein said slit openings (6, 7) have a width w.
2. Circular plate as in claim 1, **wherein** the circular connecting area (8) of the steel cable plugs (5) under the contour edge (3) of the circular plate (2) are upwardly mechanically deformed.
3. Circular plate as in claim 1, 2, **wherein** said plate thickness d is between 2 mm and 6 mm, preferably 3 mm and diameter D is between 300 mm and 800 mm, preferably 400 mm, 450 mm, 500 mm and 640 mm.

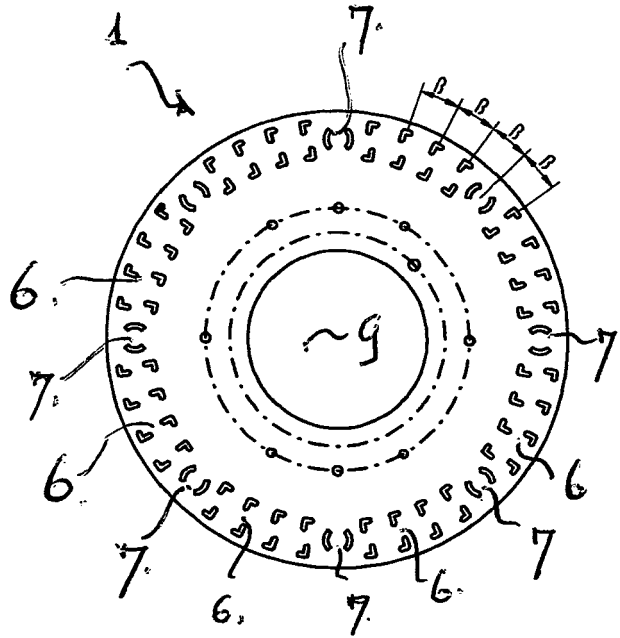


FIG. 1

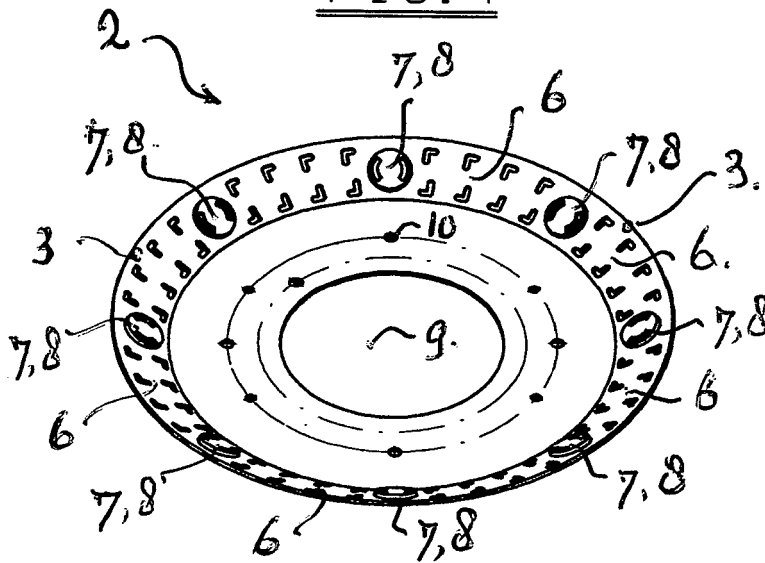


FIG. 2

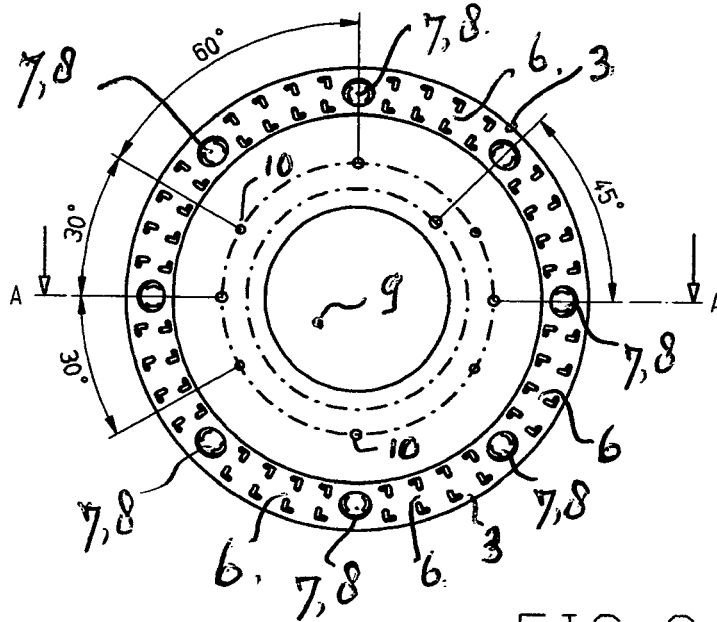


FIG. 3

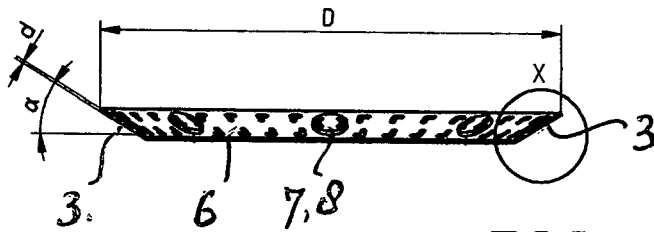


FIG. 4

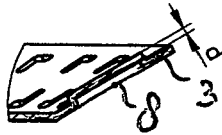


FIG. 5

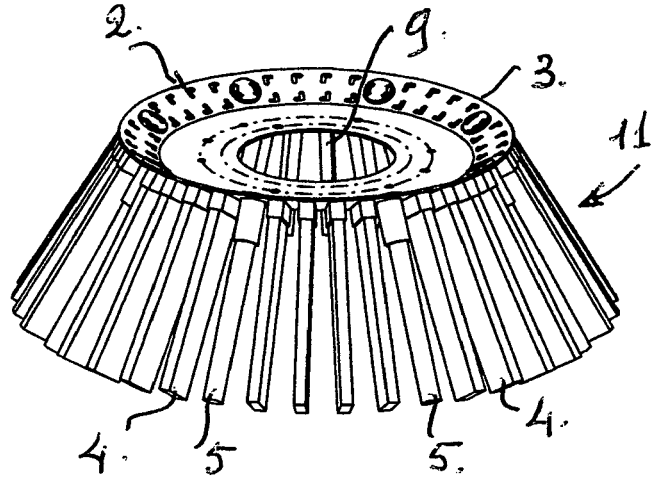


FIG. 6

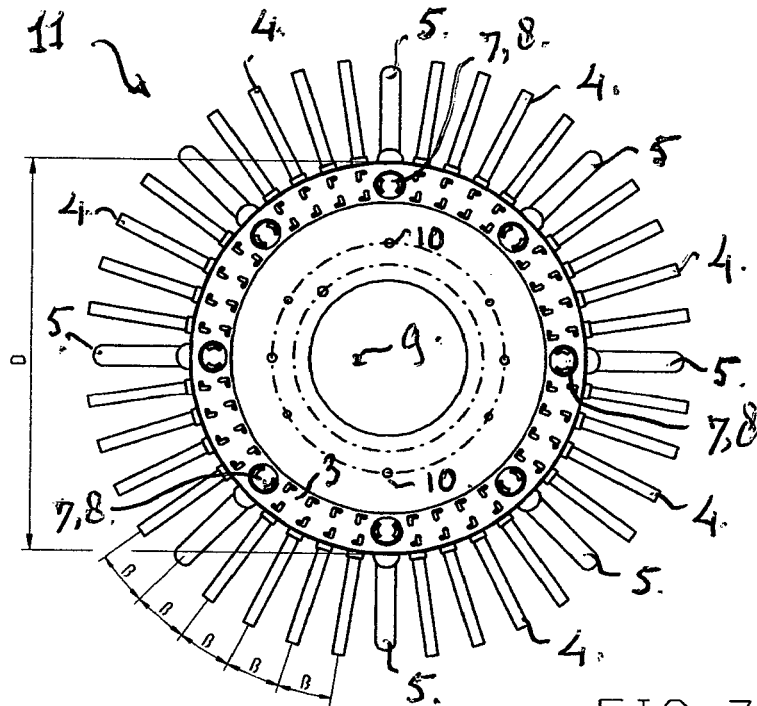


FIG. 7



EUROPEAN SEARCH REPORT

Application Number
EP 20 07 5013

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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 April 2021	Examiner Douskas, K
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 20 07 5013

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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08-04-2021

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REFERENCES CITED IN THE DESCRIPTION

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