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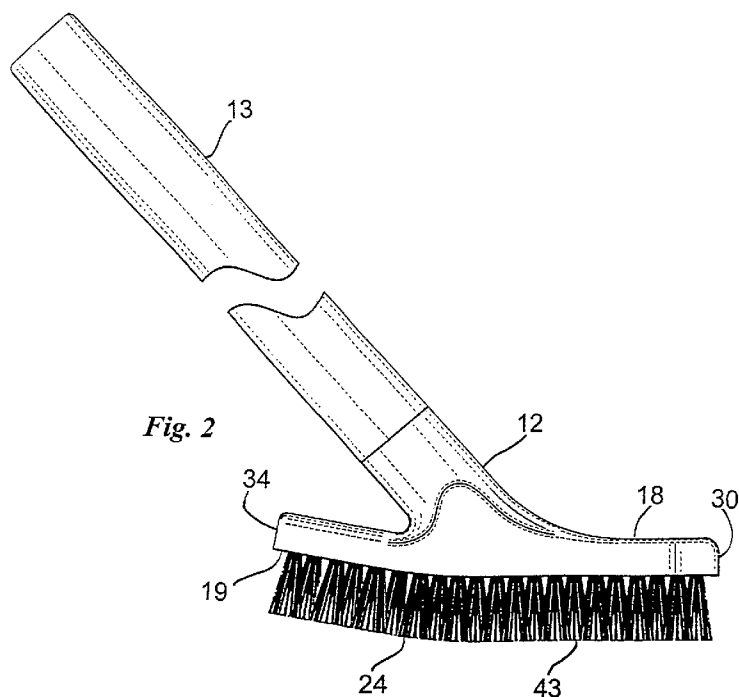
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(54) Title: BRUSH



(57) Abstract: A brush particularly adapted for scrubbing along grooves such as grouted or mortared joints in tiled surfaces. The brush comprises an elongated body portion having an upper-side and an under-side, and a main plane which extends in the direction of said elongation and at right angles to said under-side. A handle portion extends in the direction of the main plane from said upper side, and an array of stiff bristles extends from the under-side.

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## BRUSH

### Field of the Invention

- 5 This invention concerns the construction and use of brushes particularly adapted for scrubbing along grooves such as grouted or mortared joints in tiled surfaces.

### Background to the Invention

- 10 Surfaces subjected to wear or wetness are often covered with tiles or stone having grouted grooves or mortar joints between surface portions. Such mortared or grout lines or grooves are notoriously difficult to clean. Typically they are cleaned with detergent or other chemical cleaners often using a stiff bristle brush to scrub the area.
- 15 However when existing brushes are used in such applications, it is common that the widthways spread of the bristles is too wide for effective concentration of the cleaning effort into the grouted groove. It is also common for a person to have to kneel down to scrub the grooves with a small brush. It is also common for a person to attempt to increase the concentration of scrubbing effort by tilting the brush so as
- 20 to direct more pressure to the bristles at the front or rear of the brush and this results in premature spreading of the bristles.

- An aim of the present invention is to provide a novel configuration of brush which may more efficiently clean such grooves with less physical effort by the user and
- 25 which, in various embodiments, alleviates one or more of the abovementioned problems.

### Summary of the Invention

- 30 Accordingly, in one aspect the invention provides a brush comprising:
- an elongated body portion having an upper-side and an under-side,

- a main plane which extends in the direction of said elongation and at right angles to said upper-side and said under-side,
- a handle portion extending in the direction of the main plane from said upper side, and
- 5     – an array of stiff bristles extending from said under-side.

The handle portion preferably includes a socket portion extending from about the centre of the body portion. Preferably the socket portion has a main axis along its bore and said main axis extends in said main plane and is angled at between 35° and  
10     50° to the generally flat underside of the rearward portion of the body portion.

Preferably a long handle may be fitted into said socket, said handle extending in said main plane from the body portion, such that a person may use the brush to scrub a floor surface while the person is standing on said floor.

15

Preferably the body portion has a forward portion having a generally flat underside, a rearward portion having a generally flat underside, and a central portion having a curved underside. The forward portion is preferably longer than the rearward portion. The forward portion preferably comprises between 40% and 60% of the length of the  
20     body portion. The rearward portion preferably comprises between 20% and 40% of the body portion. The central portion preferably comprises between 10% and 30% of the body portion.

Preferably said bristles extend from said under-side to free tips of the bristles, and  
25     said free tips form a configuration which follows a surface aligned at right angles to said main plane and bent. Preferably said free tips of the bristles occupy a configuration which, when viewed in said main plane, follows a surface having the form of a plane with its ends bent towards said upper-side. Preferably said free tips of the bristles occupy a configuration which is generally flat towards each end and  
30     curved over a region between the generally flat ends. Preferably the under-side of the body portion is generally flat over a portion towards each end of said body portion

and curved over a region between said flat portions of the body portion, said bristles being all of approximately the same length.

Preferably the body portion has a tapered forward end. The body portion may have a  
5 squared-off rear end.

The bristles preferably extend from the body portion in tufts, at least some of which are aligned in a pair of rows extending in said direction of elongation. The tufts in each one of said pair of rows are preferably angled towards the tufts in the other of  
10 said pair of rows. The tufts in each one of said pair of rows are preferably angled at between 5° and 15° relative to the tufts in the other of said pair of rows.

In another aspect the invention provides a method of cleaning a grouted or mortared joint line comprising holding a brush as defined above, aligning the direction of  
15 elongation of said elongated body portion with said joint line, and scrubbing the bristles in said direction of elongation along the joint line.

### **Brief Description of the Drawings**

20 In order that the invention may be more fully understood there will now be described, by way of example only, preferred embodiments and other elements of the invention with reference to the accompanying drawings where:

Figure 1 is a side elevation of a brush according to one embodiment of the invention;

25 Figure 2 is an enlarged view of the brush in Figure 1;

Figure 3 is a perspective view of the head portion of the brush in Figure 1;

Figure 4 is a side elevation of the head portion shown in Figure 3;

Figure 5 is an end view of the head portion shown in Figure 3; and

Figure 6 is an underside view of the head portion shown in Figure 3.

**Description of the Preferred Embodiment and Other Examples of the Invention**

Referring to Figures 1 to 6, the brush 10 comprises a brush head 12 and a long handle 13 screwed into the head 12. The head 12 has a body portion 16 having an upper-side 18 and an under-side 20. A handle portion 21 extends from the upper-side 18 and an array 23 of stiff bristles 24 extend from the under-side 20. The long handle 13 is screwed into a threaded socket 14 formed in the handle portion 21.

The body portion 16 has a plane of symmetry 26, shown by a dashed line on Figures 4 and 5, which is referred to in this specification as the "main plane". The main plane 26 extends at right angles to the upper-side 18 and under-side 19. The handle 14 and handle portion 21 extend in the direction of the main plane 26.

The body portion 16 is elongated in the direction of the main plane 26. The body portion 16 has a forward portion 28, a rearward portion 32 and a central portion 36. The forward portion 28 and the rearward portion 32 each have respective generally flat undersides 29 and 33 respectively. The central portion 36 has an underside 37 which is upwardly curved. The undersides 29 and 33 are angled at 10° to each other in the preferred embodiment. In general it is preferred that this angle is in the range of 8° to 15°.

The forward end 30 of the body portion 16 is tapered in the direction of the main plane, ie from side to side, which usefully allows the brush to be pushed into corners. In contrast, the rearward end 34 of the body portion 16 is squared-off, which usefully provides greater room for bristle tufts in the place where it is anticipated that most of the scrubbing pressure will be applied to the head.

The bristles 24 are arranged in tufts 40 which have one end 41 bonded into the material of the body portion 16 and the other end 42 free to form the operating end of the bristles. The tufts 40 are arranged in a pair of rows 44 and 45 which run for substantially the full length of the body portion. At the forward end 30 a single tuft 46 is positioned centrally to provide maximum cleaning ability within corners.

The body portion 16 is approximately 155mm long and 25mm wide. In the preferred embodiment described, the degree of elongation of the body portion, when expressed as a ratio of length to width, is thus 155/25 or 6.2:1. In general it is preferred that this ratio is in the range of 4:1 to 8:1.

5

The rows 44 and 45 are approximately 140mm long, and spaced 11mm apart (centreline to centreline). The tufts 40 are about 4mm diameter and include about 20 bristles 24. The bristles are made of a plastics material and the body portion 16 is a plastics material moulded around the ends of the tufts. The bristles extend about  
10 25mm from the body portion 16.

The long handle 13 is about 1.4m in length and may be made from timber, metal or plastic or any suitable combination of materials. The handle 13 is unusually long compared with the length of the body portion 16. In the preferred embodiment  
15 described, the ratio of these lengths is 1400/155 or 9:1. In general it is preferred that this ratio is in the range of 7:1 to 11:1.

The forward portion 28 comprises approximately 50% of the total length of the body portion 16, the rearward portion 32 comprises approximately 30% and the central  
20 portion comprises approximately 20% of the total length of the body portion.

The curved central portion 36 forms a bend in the underside 19. As the bristles 24 are all substantially the same length, their free ends 42 form a configuration which is parallel to the surface of the underside 19 and thus adopts a surface 43 which is  
25 aligned at right angles to the main plane 26 but has a bend in it. The bend is aligned such that it is upturned at its ends.

When using the brush, the curve in the central portion permits an increased downward pressure to be applied without it being concentrated upon less-supported bristles at  
30 the front or rear of the brush. However the flat portions of the brush surface allow maximum coverage when required.

Conventionally, tufts of bristles in brushes extend at about right angles to the surface of the body of the brush. In contrast, as best seen in Figure 4, the tufts 40 in rows 44 and 45 of the present invention extend from the underside 19 of the body portion 16 at a 5° angle from the perpendicular 48. The tufts in each one of rows 44 and 45 are angled towards the other row. As each tuft is angled at 5° to the perpendicular 48, the tufts in row 44 are angled at 10° to the tufts in row 45. The angling inwards of the bristles provides an increased concentration of bristles into a groove being scrubbed. While 10° is the angle between the alignments of laterally adjacent tufts in the preferred embodiment described, in general it is preferred that the angle is in the range of 8° to 12°.

The socket 14 has a main axis 15 along its bore 17 and that axis 15 is angled at 45° to the underside 29 of the forward end. While 45° is the particularly preferred angle for the embodiment described, in a general sense it is preferred that the angle is in the range of 35° to 55°. The socket 14 cannot move relative to the body portion 16, so the long handle always maintains the same position relative to the body portion 16.

As the long handle 13 is aligned with the main plane 26, and the direction of elongation of the body portion 16 is also aligned with the main plane 26, a person using the brush can readily direct and concentrate the scrubbing action into a groove by using a relatively easy fore and aft scrubbing action. The long handle permits the grout/mortar joints in a floor to be scrubbed in this manner from a standing position.

Whilst the above description includes the preferred embodiments of the invention, it is to be understood that many variations, alterations, modifications and/or additions may be introduced into the constructions and arrangements of parts previously described without departing from the essential features or the spirit or ambit of the invention.

For example the handle portion may be made longer than that shown to permit easier use without attachment of the long handle. The socket 14 may even be deleted in some embodiments.

It will be also understood that where the word “comprise”, and variations such as “comprises” and “comprising”, are used in this specification, unless the context requires otherwise such use is intended to imply the inclusion of a stated feature or features but is not to be taken as excluding the presence of other feature or features.

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The reference to any prior art in this specification is not, and should not be taken as, an acknowledgment or any form of suggestion that such prior art forms part of the common general knowledge in Australia.

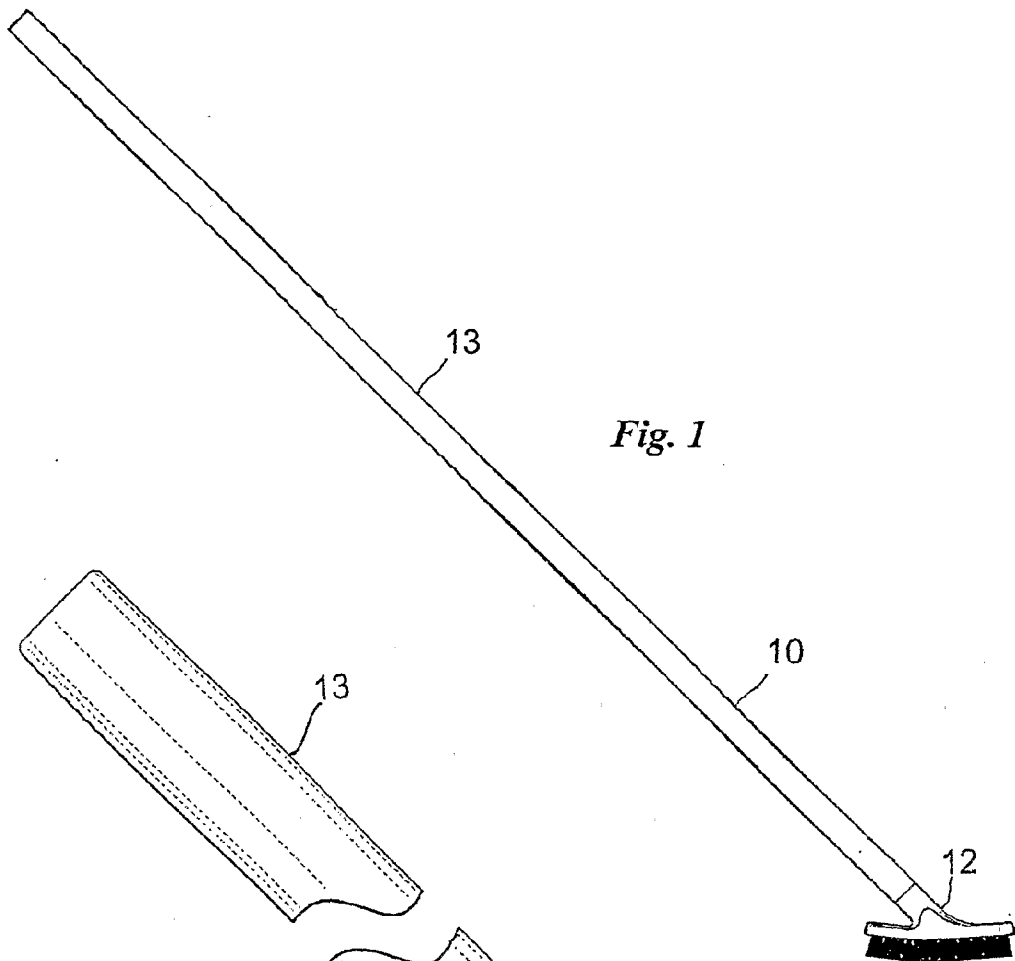


## Claims

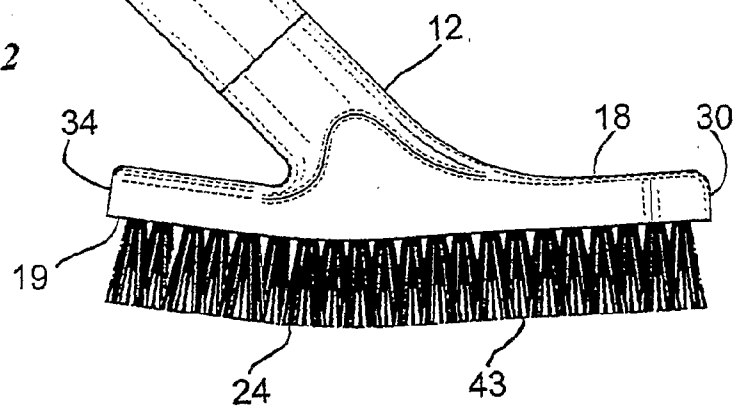
1. A brush comprising:
  - 5       – an elongated body portion having an upper-side and an under-side,
  - a main plane which extends in the direction of said elongation and at right angles to said under-side,
  - a handle portion extending in the direction of the main plane from said upper side, and
  - 10       – an array of stiff bristles extending from said under-side.
2. A brush according to claim 1 wherein said handle portion includes a socket portion extending from about the centre of the body portion.
- 15 3. A brush according to claim 2 wherein said socket portion has a main axis along its bore and said main axis extends in said main plane and is angled at between 35° and 50° to the generally flat underside of the rearward portion of the body portion.
- 20 4. A brush according to claim 2 or 3 wherein a long handle is fitted into said socket, said handle extending from the body portion in said main plane, such that a person may use the brush to scrub a floor surface while the person is standing on said floor.
- 25 5. A brush according to any one of claims 1 to 4 wherein the body portion has a forward portion having a generally flat under-side, a rearward portion having a generally flat under-side, and a central portion having a curved under-side.
- 30 6. A brush according to claim 5 wherein the forward portion is longer than the rearward portion.

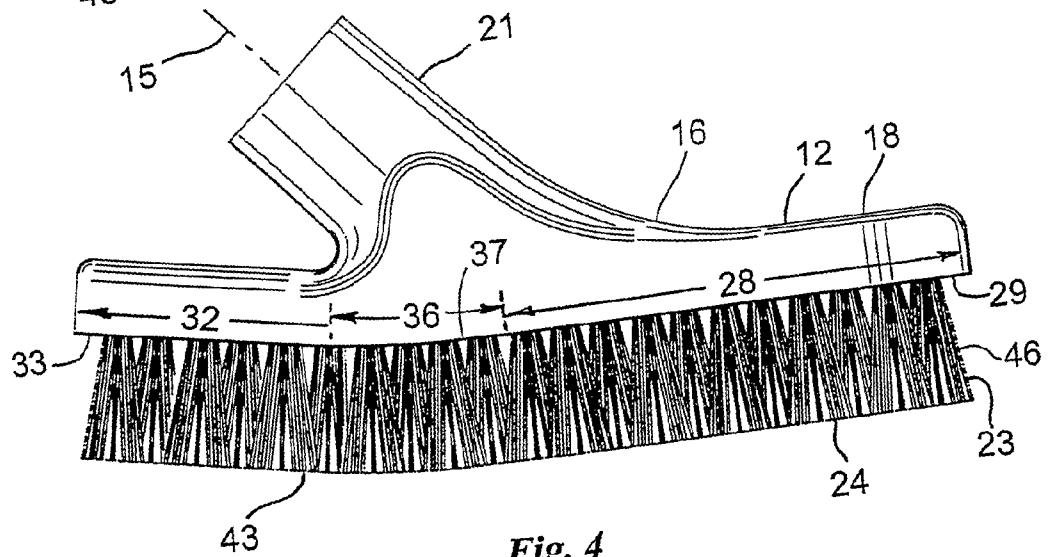
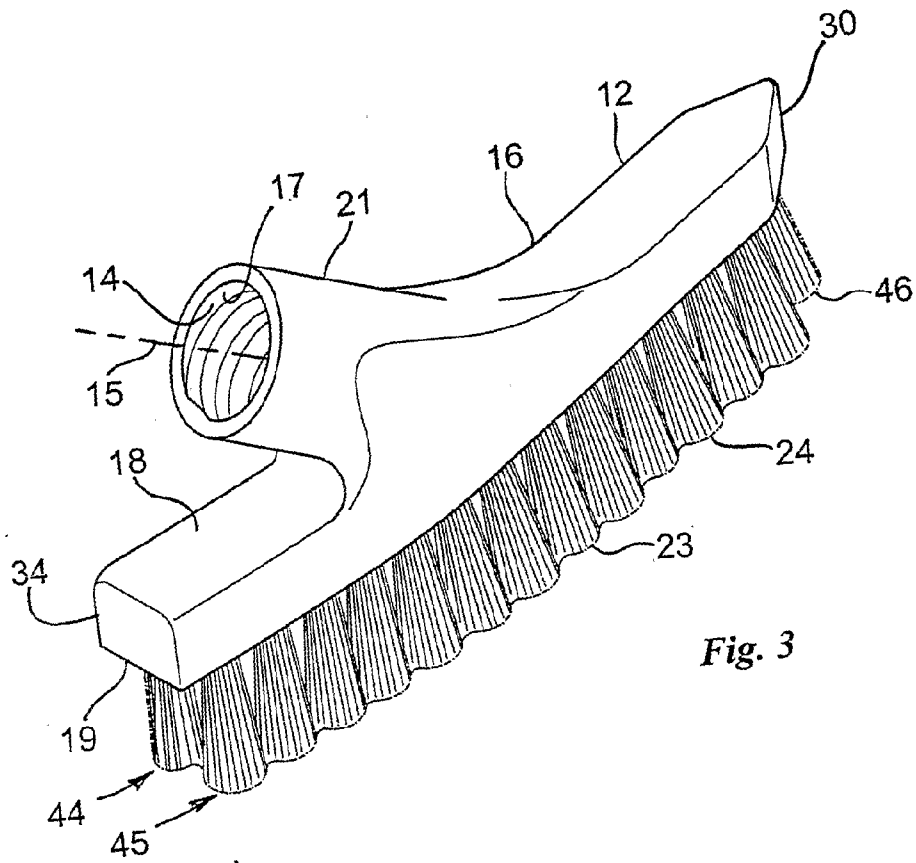
7. A brush according to claim 5 or 6 wherein the forward portion comprises between 40% and 60% of the length of the body portion.
8. A brush according to any one of claims 5 to 7 wherein the rearward portion  
5 comprises between 20% and 40% of the body portion.
9. A brush according to any one of claims 5 to 8 wherein the central portion comprises between 10% and 30% of the body portion.
- 10 10. A brush according to any one of claims 1 to 9 wherein:  
– said bristles extend from said under-side to free tips of the bristles, and  
– said free tips form a configuration which follows a surface aligned at right angles to said main plane and is bent.
- 15 11. A brush according to claim 10 wherein said free tips of the bristles occupy a configuration which, when viewed in said main plane, follows a surface having the form of a plane with its ends bent towards said upper-side.
12. A brush according to any one of claims 10 or 11 wherein said free tips of the  
20 bristles occupy a configuration which is generally flat towards each end and curved over a region between the generally flat ends.
13. A brush according to any one of claims 1 to 12 wherein the under-side of the body portion is generally flat over a portion towards each end of said body portion  
25 and curved over a region between said flat portions of the body portion, said bristles being all of approximately the same length.
14. A brush according to any one of claims 1 to 13 wherein the body portion has a tapered forward end.
- 30 15. A brush according to any one of claims 1 to 14 wherein the body portion may have a squared-off rear end.

16. A brush according to any one of claims 1 to 15 wherein the bristles extend from the body portion in tufts, at least some of which are aligned in a pair of rows extending in said direction of elongation.
- 5 17. A brush according to claim 16 wherein the tufts in each one of said pair of rows are angled towards the tufts in the other of said pair of rows.
18. A brush according to claim 17 wherein the tufts in each one of said pair of  
10 rows are angled at from  $5^{\circ}$  to  $15^{\circ}$  relative to the tufts in the other of said pair of rows.
19. A method of cleaning a grouted or mortared joint line comprising holding a brush defined by any one of the preceding claims, aligning the direction of elongation of said elongated body portion with said joint line, and rubbing the bristles in said  
15 direction of elongation along the joint line.



*Fig. 2*





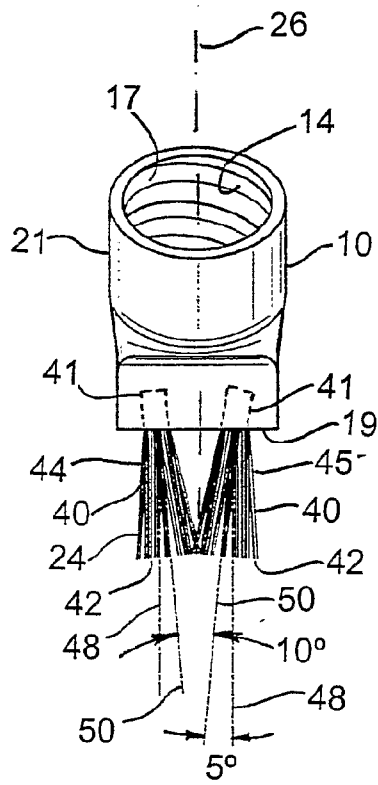


Fig. 5

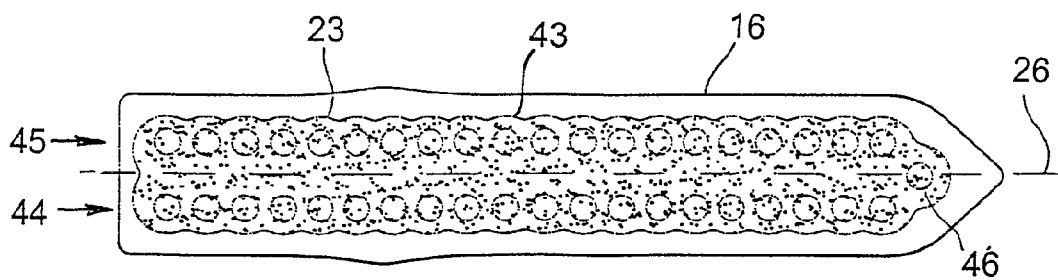


Fig. 6

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2005/001960

## A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

A46B 9/02 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DWPI IPC A46B 1/, 5/, 9/ and keywords: grout, joint, curve and similar terms

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6076221 A (BRADSHAW) 20 June 2000 Figs. 4b, 5	1-19
X	US 6694559 B1 (SLOAN et al) 24 February 2004 Figs. 1, 4, 5	1-19
X	AU 11213/88 (612620) B (TURNER et al) 4 August 1988 Page 3, lines 27-28; page 4, lines 33-35; figs. 1, 6, 7	1-19
X	WO 2005/068287 A1 (MARR) 28 July 2005 Fig. 1	1-18

☒ Further documents are listed in the continuation of Box C

☒ See patent family annex

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2005/001960

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5634232 A (BRENNEMAN) 3 June 1997 Fig. 1	1-19
X	GB 506945 A (MODERN BRUSHWARE LTD) 7 June 1939 Page 1, lines 35-45; fig. 1	1-19
X	US 6073298 A (O'BRIEN) 13 June 2000 Figs. 1-2	1-4, 10, 11, 14-19
X	US 5809604 A (OLSTYN) 22 September 1998 Figs. 1-5	1-4, 10, 11, 14-19
X	DE 29715666 U1 (KRINGE) 29 January 1998 Whole document	1-4, 10, 11, 14-19
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X	US 551994 A (O'KEEFFE) 24 December 1895 Page 1, lines 34-41; fig. 4	1, 2, 4-19
X	US 4606091 A (SARTORI) 19 August 1986 Fig. 3	1, 2, 4-19
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X	Derwent Abstract Accession No. 2003-117450/11, Class P24, JP 2002360340 A (AZUMA KOGYO KK) 17 December 2002	1, 14-19



# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2005/001960

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
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		WO	0245547	WO	0040116
WO	9314671	AU	33440/93	DE	4202312
				EP	0577798
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.					
END OF ANNEX					